TOWN OF BARNSTABLE

NOTICE OF MEETINGS OF TOWN DEPARTMENTS AND ALL TOWN BOARDS
As Required by Chapter 28 of the Acts of 2009, amending MGL Chapter 30A

NAME OF PUBLIC BODY – COMMITTEE, BOARD OR COMMISSION:

REGULAR MEETING AGENDA
COMMUNITY PRESERVATION COMMITTEE

19 JAN '23 PM 1:22
BARNSTABLE TOWN CLERK

DATE OF MEETING: Monday, January 23, 2023

TIME: 5:30 p.m.

PLACE: The Community Preservation Committee (CPC) meeting will be held by remote participation methods and will be closed to the public pursuant to the passage of legislation extending certain COVID-19 measures adopted during the state of emergency in the Commonwealth of Massachusetts.

Alternative public access to this meeting will be provided in the following manner:

1. The meeting will be televised via Channel 18 and may be accessed through the Channel 18 website at https://streaming85.townofbarnstable.us/CablecastPublicSite/

2. Real-time public comment can be addressed to the Community Preservation Committee utilizing the Zoom link or telephone number and access code for remote access below.
   Link: https://zoom.us/j/87122267429
   Or by calling the US Toll-free Telephone Number: 888-475-4499
   Meeting ID: 835 4545 5261

3. Applicants, their representatives, and individuals required or entitled to appear before the Community Preservation Committee may appear remotely and are not permitted to be physically present at the meeting and may participate through the link or telephone number provided above. Documentary exhibits and/or visual presentations should be submitted in advance of the meeting to Sarah.Beal@town.barnstable.ma.us so that they may be displayed for remote public access viewing.

Meeting materials will be available at https://www.townofbarnstable.us/boardscommittees/communitypreservationcommittee/ prior to the meeting.

Please note that tonight's meeting is recorded and broadcast on Channel 18 and, in accordance with MGL Chapter 30A, s. 20, the Chair must inquire whether anyone is taping this meeting and to please make their presence known

Call to Order:

Minutes:

- Approval of the Draft Community Preservation Committee Regular Meeting Minutes from November 21, 2022.

Letters of Intent:
None received.

Applications:

- Application from the Unitarian Church of Barnstable requesting $300,000 in Community Preservation Historic Preservation funds for the restoration and preservation of the church tower, pavilion and nave. Total cost of this project is $471,010.80 with a Massachusetts Historical Commission grant for $70,000 and $100,000 in private donations provided as matching funds. There is an existing preservation restriction recorded on this property.

- Application from the Centerville-Osterville-Marstons Mills (COMM) Water Department requesting a fund of $100,000 to enable COMM to obtain the professional services necessary to quickly respond to potential properties as they become available for the protection of COMM Water District drinking water supply.

- Application from the Department of Public Works requesting $300,000 in Open Space/Recreation Funds for Cape Cod Rail Trail Phase 4 pre-25% design services. Matching funds in the amount of $500,000 have been provided by a Mass Trails grant.

- Application from the Department of Public Works requesting $195,000 for Cape Cod Rail Trail Phase 3 engineering services. MassDOT has committed $12.3 million for construction of Barnstable and Yarmouth sections.

- Review of recreation restriction associated with the CPC Application from The Trustees of Reservations requesting $286,866 in Community Preservation Recreation funds for a new children's play area and renovation of the existing pathways to meet ADA regulations in the Kelley-Armstrong Park, Osterville.

Correspondence Received:
None received.

Project Updates:
- Application from the Department of Public Works for Phase I restoration work to the Zion Union Historic Museum was approved at Town Council public hearing December 15, 2022.
- Town Council public hearing for Tales of Cape Cod CPC Application is scheduled for February 2, 2023.
- An application from the Department of Public Works for restoration of the Osterville Recreation Playground is anticipated for a future CPC meeting.
- Marstons Mills Community Church will be returning to CPC with quotes for a building analysis report for their request for historic preservation funds for building upgrades.

Public Comment:

General Discussion:

Member Discussion:
- Community Preservation Coalition Dues 2023
- 2023 Community Preservation Committee Meeting Schedule
- CPC Handbook Updates.
- February 27, 2023 CPC Meeting Format

Adjournment:

Next Regularly Scheduled CPC Meeting February 27, 2023

Please Note: The list of matters is those reasonably anticipated by the chair, which may be discussed at the meeting. Not all items listed may be discussed and other items not listed may also be brought up for discussion to the extent permitted by law. It is possible that if it so votes, the Committee may go into executive session. The Committee may also act on items in an order other than they appear on this agenda. Public files are available for viewing during normal business hours at the Community Preservation office located at 367 Main Street, Hyannis, MA

For your information the section of the M.G.L. that pertains to postings of meetings is as follows: Except in an emergency, in addition to any notice otherwise required by law, a public body shall post notice of every meeting at least 48 hours prior to such meeting, excluding Saturdays, Sundays and legal holidays. In an emergency, a public body shall post notice as soon as reasonably possible prior to such meeting. Notice shall be printed in a legible, easily understandable format and shall contain: the date, time and place of such meeting and a listing of topics that the chair reasonably anticipates will be discussed at the meeting. Meetings of a local public body, notice shall be filed with the municipal clerk, and posted in a manner conspicuously visible to the public at all hours in or on the municipal building in which the clerk's office is located.

Unitarian Church of Barnstable:

Restoration and Preservation

An Application to the

Town of Barnstable

Community Preservation Committee

Submitted December 1, 2022

Table of Contents

Unitarian Church of Barnstable

3330 Main Street

PO Box 285

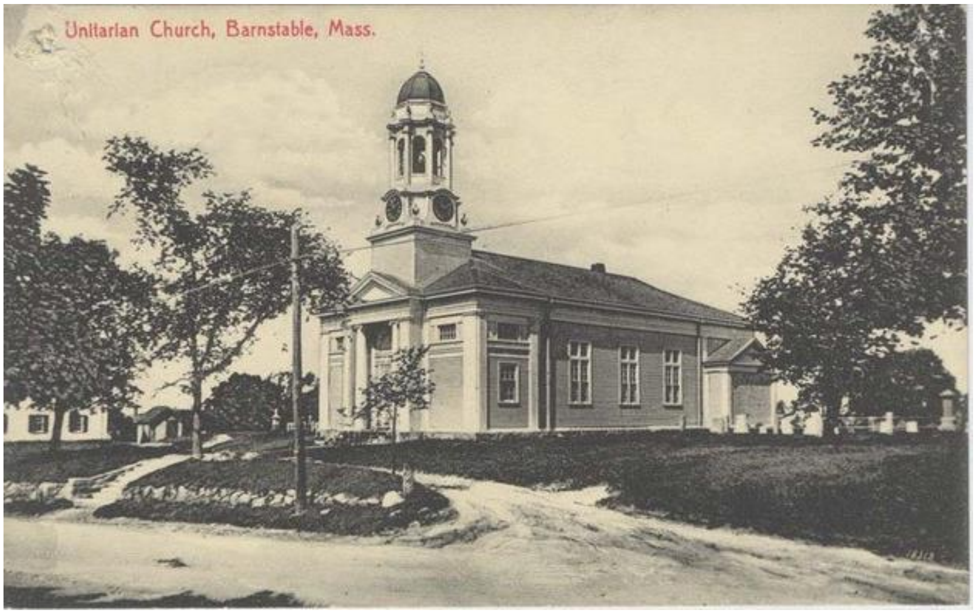
Barnstable MA 02630

December 1, 2022

Mr. Lindsey Counsell, Chair
Community Preservation Committee
Town of Barnstable
367 Main Street
Hyannis MA 02601

Dear Mr. Counsell and Members of the Committee:

The Unitarian Church of Barnstable hereby applies for support for a historic preservation and restoration project for its facility located at 3330 Main Street, Barnstable. The church is listed on the National Register of Historic Buildings as a part of the Old Kings Highway Historic District and is so designated by the State of Massachusetts and the Town of Barnstable as well. In applying, we are asking for support from the Town of Barnstable to ensure that we can preserve the historic integrity of the church building and the village of Barnstable and improve the safety and usability of the facility for the community. To meet the needs of both the church community and the larger community, we need a facility that is in good condition—safe, secure, sustainable, and architecturally true to its origins.



About 15 years ago, the membership of the church actively recognized that its financial practice of drawing on the endowment for operating costs was not sustainable, and it voted to end that practice. That decision led to serious rethinking of the fiscal operation of the church. The leadership of the church appointed a small study committee because members realized that the church might not survive its earlier practices of spending out of the endowment while failing to grow the service capacity of the church and maintain its facility. The study committee produced a report in 2014 entitled Choosing to Change (C2C).

Since that report was issued eight years ago, the church, under the leadership of its Governing Board, and particularly the Treasurer, Finance Committee, Investment Committee, and Building Committee have made significant efforts to ensure the sustainability of both the church building and the church finances. It is clear today that the church has put itself on a path toward financial stability and become much more deeply engaged in the community.

Since 2016 (6 years ago) UCB has made numerous building improvements, drawing on operating and capital funds, gifts, and bequests (the latter two for which we cannot plan). Those expenditures include:

Year	Activity	Cost to UCB
2016	Replaced the kitchen in Warren Hall	$87,226
2017	Installed a new lighted exterior sign	$ 6,000
2017	Replaced the heating system for the entire church building	$19,415
2018	Replaced the roof on Warren Hall	$ 7,400
2018	Installed solar panels on the south-facing roof of Warren Hall	$25,920
2018	Updated basement meeting rooms	$ 2,969
2018	Contracted with architect to develop designs for initial restoration activities	$14,000
2020	Replaced Warren Hall windows, restored all windows in the	$11,986

	sanctuary building, repaved ramp to connector entrance, replaced connector door, refaced outside of connector, repointed damaged masonry, installed moisture barrier under sanctuary, replaced sanctuary basement door, installed a metal fence around exterior steps to sanctuary basement (all funded by Barnstable CPC for $134,281.) UCB contributed after previous expenditures.	
2020	Replaced the double exterior doors at the west end of the Office section of the building	$ 6,829
2021	Contracted with Spencer Preservation Group (formerly Spencer Sullivan Vogt Architects) for an architectural assessment of the structure of the sanctuary building and tower	$15,231
2021	Installed 4 mini-split units to manage temperatures and humidity	$17,500
2021	Made safety investments	$ 6,985
2021	Contracted with Spencer Preservation Group for architectural and systems assessments for the remainder of the church building and complete assessment of the Old School House	$40,000
2021	Renovated 2 lower-level bathrooms	$ 4,786
	TOTAL CAPITAL EXPENDITURES BY UCB 2016-2022	$391,247

The congregation has worked to become fiscally sustainable by building the general endowment to a level at which the annual income from the endowment will cover capital costs (we are ½ to 2/3 of the way there at this point, but several years away from complete achievement of the goal). Six years ago, we had no capital expenditures fund, and we were rarely investing in capital improvements out of our operating budget. Today we have over $100,000 in that fund, even after having made the improvements noted above. The church has been the fortunate recipient of some unexpected and generous bequests, primarily from community members who value the presence of the church and its contributions to and support of the community. Our goal is to continue to grow that fund so that we can pay for necessary capital expenditures out of its earnings.
While we have made significant improvements to the building over the past 6 years, paying from our own funds and with the help of the Barnstable Community Preservation Committee. We now find ourselves, however, confronted with some significant issues requiring restoration and preservation, at costs beyond our capacity to fund the work ourselves.

The condition of the tower (steeple) and the pavilion are fundamental to the sustainability of the church and to its historic presence in the village. We must do significant work to ensure the structural viability of the building. Beyond that, the congregation views itself as obligated to honor the memories of those who passed before us in the use of this historic building by restoring and preserving it as it was designed. We also want to make certain that its iconic structure continues to be a credible part of the landscape of Barnstable. Its presence on the Old Kings Highway, prominently located at the top of the hill and at the east entrance to the town, is an argument for the importance of its appearance.

The restoration and preservation of the tower and the pavilion is a substantial project. While the tower remains stable and safe at this time, there is significant structural damage due to age and environment. The tower was built 116 years ago of old growth oak. Most of the massive beams and other supporting elements inside the tower are in good condition. There is, however, evidence of deterioration from water, and evidence of some weakening of the structural members as seen in cracks, breakage, etc. The copper cupola, in place since the construction of the building, is leaking. And water has come in repeatedly through the louvers around the belfry. The cupola needs to be restored with a newly constructed copper dome. Flashings, gutters, and exterior wood surfaces will be replaced and repainted throughout the tower and pavilion. The clock faces will be repainted and regilded, as will the rooster weathervane.

Beyond these specific aspects of the building, the architectural assessment uncovered deteriorating wood in many locations on the sanctuary building. Some of the rot is obvious on the surface, in some places to the extent of wood surface being missing from the exterior of the building. Knowing how deep the deterioration goes beneath the surface is a challenge at this point. Nevertheless, it is safe to say that clapboard siding, facia boards, pilasters, capitals, and other types of trim need to be replaced or repaired using a variety of appropriate techniques.

In addition to the issues just described, there is work to be done across the exterior of the sanctuary building. Much of the trim along the sides and rear of the building shows significant decay, and there is some need for repair of the stone and mortar as well. The roof of the sanctuary will need replacement in a few years. The techniques used to install the roof most recently do not ensure a connection to the building structure sufficiently secure to prevent deterioration and water infiltration.

The additions to the building also need some updating. The windows in the lower level of both sections of the additions must be replaced; there is significant wood deterioration, and a need for double-pane glass for better insulation from the weather. The window wells need barriers for the sake of human safety. The small wooden deck and its steps at the rear exit of Warren Hall must be replaced soon as it has significant deterioration. Finally, siding shows signs of deterioration and must be replaced. This part of the building requires repainting as well.

In sum, this work will result in a building with the same features as it has presently and the same features with which it was designed. It will look like the new structure of 1907. But it will have been made solid and strong again with a fresh exterior. It is our intent that it will once again be the pride of Barnstable Village, and an emblem of the historic past of the community that works to integrate its past with the present and the future of this beautiful area.

In the proposal that follows, you will find more detail about the precise strategies we intend to apply in resolving the problems described briefly here. The bids we have sought range from $471,958 to $855,236 to retore and preserve the tower, pavilion, and nave. We are asking the Barnstable Community Preservation Committee for a grant of $300,000. Members and friends of the Unitarian Church of Barnstable will contribute $350,000 to address the restoration and preservation of the original part of the existing building.

Sincerely,

Crystal J. Gips
Capital Projects Coordinator

CPC APPLICATION (Page 1)

Appropriated CPA funds require one or more deed restrictions (conservation / historic preservation / housing). Sample restrictions are available at the Official Website of the Town of Barnstable www.town.barnstable.ma.us. If the restriction is prepared by the applicant, the first draft of the restriction should be provided to the CPC Coordinator. If the applicant is not preparing the restriction, a consultant will contact the applicant to assist in the drafting of the appropriate restriction after funds are appropriated. The Town of Barnstable Legal Department and Legal Consultant shall review and approve the restriction prior to the final commitment of the CPA funds to the project.

Submission Date: December 1, 2022

Project Title: Unitarian Church of Barnstable: Restoration and Preservation

Project Map/Parcel Number: 136-145

Estimated Start Date: 4/23

Estimated Completion Date: 11/23

Purpose (please circle all that apply):

Open Space	Public
Community Housing	Private
Historic	Non-Profit
Recreation	Partnership (Describe below #3)
Town Affiliation**	

****Please note: All Town CPC Applications must be approved by the Town Manager prior to submission.**

Applicant Contact:

Name: Crystal Gips

Organization (if applicable): Unitarian Church of Barnstable

Address: 3330 Main Street, Barnstable, MA 02630

Mailing Address: P.O. Box 285, Barnstable MA 02630

Daytime Phone #: 518-527-0768

E-mail Address: crystal.gips@yahoo.com

Primary Contact (if different from applicant contact):

Name:

Address:

Mailing Address:

Daytime Phone #:

E-mail Address:

Deed Restriction: A deed restriction was prepared and approve related to a small funded project in 2009.

Appropriated CPA funds require one or more deed restrictions (conservation / historic preservation / housing). Sample restrictions are available at the Official Website of the Town of Barnstable www.town.barnstable.ma.us. If the restriction is prepared by the applicant, the first draft of the restriction should be provided to the CPC Coordinator. If the applicant is not preparing the restriction, a consultant will contact the applicant to assist in the drafting of the appropriate restriction after funds are appropriated. The Town of Barnstable Legal Department and Legal Consultant shall review and approve the restriction prior to the final commitment of the CPA funds to the project.

Budget Summary:

Total budget for project**: $680,225.80.**

CPA funding request**: $300,000**

Matching funds (committed/under consideration):

$70,000	Massachusetts Historic Commission, committed
$310,000	Unitarian Church of Barnstable from a capital campaign (In process)

The total projected cost for the complete restoration and preservation of the Unitarian Church of Barnstable is $680,225.80 over the next 10 years. *The project for which we are seeking immediate support includes the restoration and preservation of the tower, pavilion and nave, and must be addressed in the near term according to our architects*. The budget for that portion of the restoration and preservation project is **$471,010.80.** The plan for use of funds is to combine funds from Barnstable CPC and the award from MHC with our own funds to carry out the immediate project. We are confident that we will raise sufficient additional funds in our capital campaign to address the long-term work detailed in the Architectural Assessment Report and other restoration needs that may arise in the next 10 years.

As of December 1, 2022, the Unitarian Church of Barnstable has in hand approximately $100,000 and an additional amount of $70,000 committed by the Massachusetts Historical Commission) in support of restoration and preservation of the church building. The church has formed a capital campaign committee chaired by Mark Nichols and Polly Brazelton, both prominent and well-known members of the community and both having deep familial and historic connections to the church and to the village. The committee launched the public part of the campaign in September 2022 with an event attended by about 85 members of the community. We are hopeful that because the church building is physically so essential to the look and spirit of the village and because it has a long history of providing a place not only for church activities but also for activities of the broader community, many community members will be generous to the campaign. To date, we have received contributions in the amount of $40,000 from community members (included in the fund total above). Members of the church are stepping up as well with donations and pledges.

Project summary (description and goals):

Background:

The Unitarian Church of Barnstable is a historic church with an active Unitarian congregation of nearly 200 people situated on the Old Kings Highway (Route 6a) in Barnstable, Massachusetts. The building is listed on the National Register of Historic Places, both as an individual property and as a contributing resource to the Old Kings Highway Historic District, which is also a local historic district. Designed by renowned regional architect Guy Lowell in the Greek revival style, it was constructed in 1906-07 and has undergone relatively few changes since, maintaining its architectural integrity. Most notable changes are the addition of a two -story parish wing, joined to the original church by a modest connector, and another addition which provides two levels of meeting rooms and offices adjacent to the parish hall section. Deterioration of the church's tower and dome roof has led to active water infiltration, causing rot and damage to the structural framing and exterior architecture woodwork. Damage to the cornice at the main body of the church has led to rodent entry and subsequent damage to the interior. Deteriorated gutters, flashing, miscellaneous trim, wood rot, and delaminating paint are additional concerns.

<u>Gearing Up:</u>

In 2020, the Barnstable Unitarian church commissioned the team of preservation architects at Spencer Preservation Group (formerly Spencer, Sullivan & Vogt) to prepare a comprehensive conditions assessment of the building envelope with prioritized treatment recommendations. For the past two years, the church has been preparing to put these recommendations into action to ensure the continued preservation of this historic structure. The church and their architect have received in bids to address the plans and specifications for this critical restoration work, with the intent to engage a general contractor as soon as practical. The project will be supported in part by funds generated from the church's capital campaign and a modest grant from the Massachusetts Historical Commission. A grant from Barnstable's Community Preservation Committee Fund will allow this project to capture the economy of scale in addressing all the historic church's exterior envelope needs--leveraging the funds already raised to their fullest extent.

<u>Restoration of Tower:</u>

To keep pace with the bidding requirements and construction schedule outlined by the grant from the Massachusetts Historical Commission, this project is structured with a "base" scope of work to address the tower: replacing the deteriorated copper dome, structural reinforcements to the tower’s framing, replacement of deteriorated architectural woodwork throughout, re-flashing and weatherproofing the exterior envelope, restoration of the three clocks and weathervane, and repainting. Alternates for the replication of missing urn finials that once adorned the dome and clock level will be priced for inclusion and their long-awaited return.

<u>Restoration of Pavilion & Nave:</u>

Two additional scopes of work are being classified as "alternates", but no less critical: restoration of the church's front-facing façade ("pavilion"), and restoration of the remaining building perimeter ("nave"). To capture the economy of scale in mobilization and erection of staging, all scopes of work much be carried out together by a single contractor. The "pavilion" suffers from deteriorated gutters and damaged soffit assemblies, which have allowed rodents to enter the church and further damage interior features. All these issues will be repaired or replaced, alongside miscellaneous trim repairs elsewhere on the walls of the pavilion, and all work will be re-painted. In the "nave" scope, deteriorated gutters will be replaced to mesh seamlessly with the work done at the "pavilion", and miscellaneous siding and trim repairs will be made. The understanding that some existing paint is lead-containing makes capturing all the repainting work in one contract all the more critical.

The bidding process, now complete, has allowed us to plan to complete all of the short-term work—the base project and the alternate items as well for $471,958.80.

<u>Project Goals:</u>

The specific goals of the project are to:

a. Ensure the structural integrity of the tower by making repairs to the structural features inside the tower

b. Ensure that no water will get inside the tower through the louvers or through leaks in the cupola or other deteriorating external surfaces of the sanctuary with new flashing, gutters, and roof
c. Ensure that drainage elements are carrying rainwater, snow, and ice away from the tower structure and away from the building
d. Make certain that all exterior wood is sound by replacing deteriorating wood
e. Return the exterior of the church to its original pristine condition with painting of the entire exterior
f. Maintain the original features of the sanctuary building

Final Words:

This is a complex project, years in the making, but quite achievable with a skilled contractor and the funds to support the work. The asynchronous timelines of different grants have required us to think creatively on how to maximize every dollar that gets put into this project. By implementing the work as described above, funds from the congregation, community, MHC, and Barnstable CPC will flow together to ensure this historic church is preserved for another 115 years.

How does this project help preserve Barnstable's character?

The first settlers of the village of Barnstable arrived in 1639, led by the Reverend John Lothrop. First, they built a church about a mile west of the location of the present Unitarian Church of Barnstable. By the early 1700s the community was large enough to support two parishes, and the first church building at the present location (east parish) was erected on Cobb's Hill in 1717-18 and purchased by the congregation from the builders for $450. That building was the venue for all community activities, as church and government were one in those years. In the 1800s, some differences of theological views resulted in the west parish becoming a Congregational Church and the Cobb's Hill parish becoming a Unitarian Church. The town no longer needed such a large building because governmental buildings had been erected by that time in the spirit of separation of church and state, so in 1836, the original Cobb's Hill church was removed, and a new and smaller building erected soon after. That church burned in 1905; it was replaced with construction of our existing sanctuary 116 years ago in 1907. In 1960, a social hall (Warren Hall) and kitchen on the first floor were built, with several rooms for the religious education and additional meeting spaces on the lower level. In 1979, a small addition was built onto this new wing to house a church office and office space for the minister as well as more meeting rooms on the lower level.

The building was placed on the National Register of Historic Buildings in 1987 as a part of the Old Kings Highway Historic District of Barnstable. It was also designated then by the State of Massachusetts as a historic building.

The church is showing considerable signs of aging since its construction, with many components of each of the sections of the complete building beginning to suffer from use and the ravages of the environment. Most of the structure slated for restoration and preservation in this project is original to the 1907 building. For example, the copper dome of the cupola is pitted and leaking; some of the interior structural members within the tower are damaged from water, lead flashing is pitted, torn, and corroded; the wooden gutters have rotted and aluminum gutters are worn through; layers of paint are peeling off the surface, wood facings and siding have rotted away; clock faces are deteriorating; and the gold leaf on the clock numerals and hands and on the weathervane is significantly faded and chipped away.

The restoration and renovation actions we propose are intended to maintain the historic integrity and appearance of the building. The church is situated on Main Street, which is home to many other historic buildings, including homes, places of business, and historic sites. More particularly, the location of the church at the top of the hill from which visitors and residents of the town enter the village from the east, slowing down as they approach the traffic light, or accelerating up the hill as they head east out of the village, makes the church a very visible edifice. The maintenance of its historic integrity and presence is an essential aspect of the presentation of the village of Barnstable as one of this nation's first and best-preserved communities.

Partnership(s) Description:

While we do not consider the Massachusetts Historical Commission to be a partner applicant to the Barnstable Community Preservation Fund, we want to make clear that the Unitarian Church of Barnstable has received approximately $70,000 from the Massachusetts Historical Commission to restore the cupola and replace the copper dome. (The sum is described as approximate because after receiving an award of $50,000 in the MHC's regular award cycle, we were notified by phone from our liaison officer at MHC that approximately $20,000 additional dollars would be directed to us, with the exact amount to be determined later.

How does this project meet the General Criteria and Category Specific Criteria for CPC projects?

This proposal for the restoration and renovation of several aspects of the Unitarian Church of Barnstable meets the criteria for preservation of historic resources in the town, specifically by preserving essential characteristics of the town of Barnstable and protecting a resource that is otherwise threatened with increasing deterioration. The work proposed herein offers a positive cost benefit to the organizations of the town that use the facility. Moreover, it is an intrinsic part of the "village scape" of the town. To not restore and preserve this edifice would leave a hole in the historic face of the town's main street, or at the very least, it would scar it irreparably.

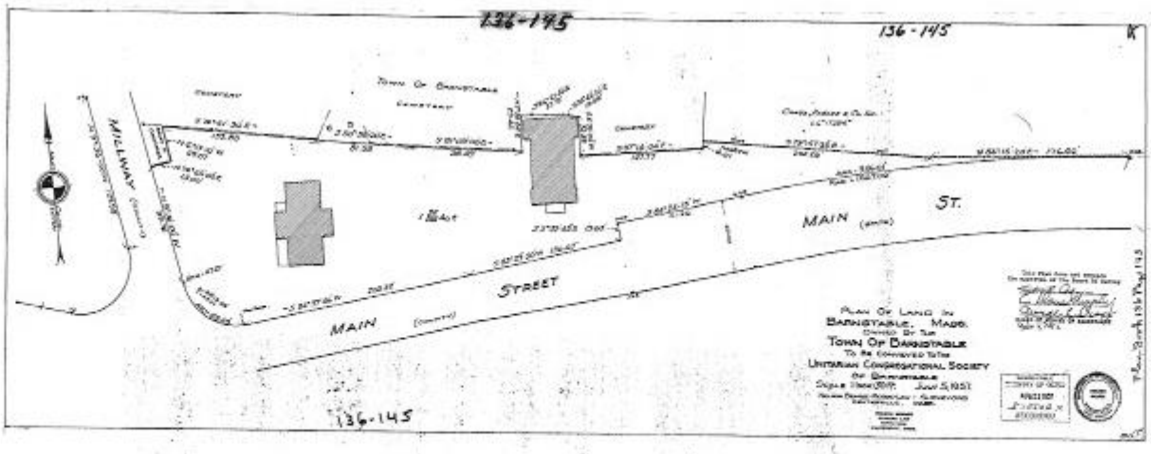
The Unitarian Church of Barnstable meets the standard for "nonprofit ownership that provides public access or other public benefit" and is "listed on the State or National Register of Historic Places or deemed historically significant by the Barnstable Historical Commission." The proposed restoration and renovations will result in "a public benefit" through the value of the appearance to the town as a part of its historic character.

The building also serves as a "public benefit" by hosting meetings and activities of many formal and informal community groups. Among them are various social support groups such as AA, a transgender support group, groups for young gay and lesbian groups, Al-Anon, and others. We provide space for a weekly meditation group and a T'ai Chi group. The Surftones, a large men's singing group, has practiced weekly in the church for over 20 years. A group of poets meets regularly to share their work and receive feedback. UCB also holds various activities to enhance equity and justice in the world. It has held many stand-out events on the lawn to support Black Lives Matter, attended by people from all across the Cape, and it hosts regular meetings of PATH, a group that works to reduce human trafficking. A variety of activities intended to increase sustainability and to protect the environment have originated from and continue to access space in the building for meeting and other activities. We recently hosted a take-back event for used electronics (to prevent them from going into trash receptacles and landfills). On a lighter note but also important to the life of the community, the church hosts a summer fleamarket and fair, a holiday fair, an auction, book sales, scone sales, and used jewelry sales. These events serve as moments for greeting and gathering friends, neighbors, and visitors to the community; they are upbeat events that bring cheer and character to Barnstable. We also have begun to partner with the Friends of the old Schoolhouse (FOSH) to share in open community events. While we held our 2022 summer fair and flea market, FOSH held a very successful sale of old buoys and attracted many interested visitors. In December, they will also participate in Holiday Fair events with their own simultaneous activities. Finally, UCB is the place of choice for many religious ceremonies for non-members of the church. We frequently host weddings and memorials services for persons with no connection to the church other than the historic beauty of the building and the reputation of the minister for her handling of such personal events.

While no building is perfect in its permanence, the work we propose is in most cases restoring and/or replacing construction elements from 1906 and 1960—evidence that we are attempting to provide reasonably permanent protection for maintaining the historic resource and providing a welcoming and supportive space in the community.

Assessors' Office identification map and map and parcel number:

Property Maps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Town Of Barnstable
Cemetery
Millway
Main
Street
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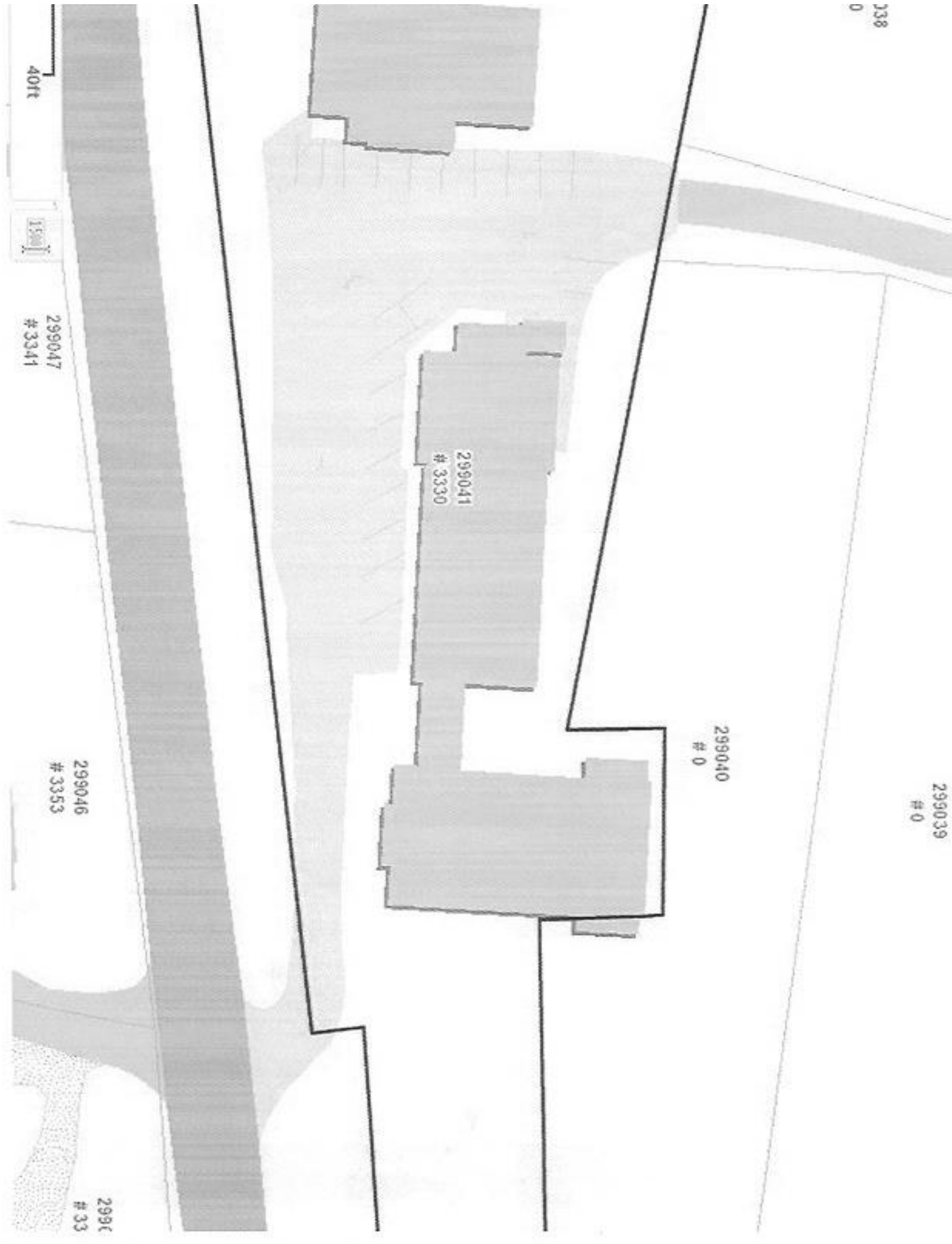
Plan Of Land In
Barnstable, Mass.
Owned By The
Town Of Barnstable
To Be Conveyed To The
Unitarian Congregational Society
Of Barnstable
July 5, 1957
136-145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3330
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Assessors’ Records 2022

Property Location 3330 MAIN ST./RTE 6A(BARN.) Map ID 299/ 041/ / / Bldg Name State Use 9600
Vision ID 23941 Account # Bldg # 1 Sec # 1 of 2 Card # 2 of 4 Print Date 11/14/2021 1:55:13 A

CURRENT OWNER	TOPO	UTILITIES	STRT / ROAD	LOCATION
UNITARIAN CONGREGATIONAL SOC 3330 MAIN STREET BARNSTABLE MA 02630				

SUPPLEMENTAL DATA

Alt Prcl ID		Plan Ref.	136/145
Split Zonin		Land Ct#	
BID Parcel		#SR	
ResExpt Q		Life Estate	
#DL 1		PP Acct	
#DL 2			
GIS ID	F_964058_2718248	Assoc Pid#	

CURRENT ASSESSMENT

Description	Code	Appraised	Assessed
EXEMPT	9600	2,724,200	2,724,200
EXM LAND	9600	762,300	762,300
	Total	3,486,500	3,486,500

801

FY2022
BARNSTABLE, MA

VISION

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	Q/U	V/I	SALE PRICE	VC

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
2021	9600	2,585,500	2020	9600	1,873,900	2019	9600	1,873,900
	9600	634,900		9600	305,900		9600	319,200
	9600	56,900		9600	62,400		9600	65,600
	Total	3,477,300		Total	2,242,200		Total	2,258,700

This signature acknowledges a visit by a Data Collector or Assessor

EXEMPTIONS

Year	Code	Description	Amount
		Total	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

ASSESSING NEIGHBORHOOD

Nbhd	Nbhd Name	B	Tracing	Batch
0109				BARNS

NOTES

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	2,517,400
Appraised Xf (B) Value (Bldg)	149,900
Appraised Ob (B) Value (Bldg)	56,900
Appraised Land Value (Bldg)	762,300
Special Land Value	0
Total Appraised Parcel Value	3,486,500
Valuation Method	C
Total Appraised Parcel Value	3,486,500

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments

VISIT / CHANGE HISTORY

Date	Id	Type	Is	Cd	Purpost/Result

LAND LINE VALUATION SECTION

Use Code	Description	Zone	LA	Land Type	Land Units	Unit Price	I. Factor	Site Index	Cond.	Nbhd.	Nbhd Adj	Notes	Location Adjustme	Adj Unit Pric	Land Value

Total Card Land Units | Parcel Total Land Area: | Total Land Value 762,300

Property Location 3330 MAIN ST./RTE 6A(BARN.) Map ID 299/ 041/ / / Bldg Name State Use 9600
Vision ID 23941 Account # Bldg # 1 Sec # 2 of 2 Card # 3 of 4 Print Date 11/14/2021 1:56:14 A

CONSTRUCTION DETAIL

Element	Cd	Description
Style	71	Churches
Model	96	Ind/Comm
Grade	B	Custom
Stories	2	
Occupancy	0.00	
Exterior Wall 1	14	Wood Shingle
Exterior Wall 2		
Roof Structure	03	Gable/Hip
Roof Cover	03	Asph/F Gls/Cmp
Interior Wall 1	03	Plastered
Interior Wall 2		
Interior Floor 1	12	Hardwood
Interior Floor 2		
Heating Fuel	03	Gas
Heating Type	04	Hot Air
AC Type	01	None
Size Adj Tbl	960I	Church Etc M96
Total Rooms		
Bedrooms	00	
Full Bathrooms	0	
Bath Split	00	0 Full-0 Half
Rms/Partitions	00	
Heat/AC	03	HEAT ONLY
Frame Type	02	WOOD FRAME
Baths/Plumbing	02	AVERAGE
Ceiling/Wall	06	CEIL & WALLS
Common Wall	02	10%
Wall Height	14.00	
1st Floor Use:	906I	

CONSTRUCTION DETAIL (CONTINUED)

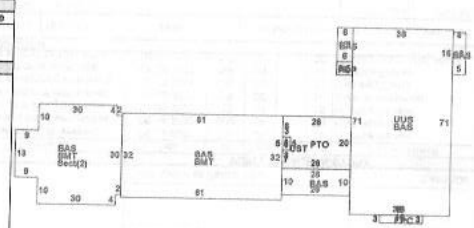
Element	Cd	Description

MIXED USE

Code	Description	Percentage
9600	Church-Temple M94	100
		0
		0

COST / MARKET VALUATION

RCN	2,514,955
Year Built	1950
Effective Year Built	1983
Depreciation Code	A
Remodel Rating	
Year Remodeled	
Depreciation %	28
Functional Obsol	0
External Obsol	0
Trend Factor	1
Condition	
Condition %	
Percent Good	72
RCNLD	1,665,100
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	



OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Code	Description	L/B	Units	Unit Price	Yr Blt	Cond. Cd	% Good	Grade	Grade Adj	Appr. Value
BMT	Basement-Unfin	B	1,362	26.01			72		0.00	23,800

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Floor Area	Eff Area	Unit Cost	Undeprec Value
BAS	First Floor	1,362	1,362	1,362	265.29	361,320
BMT	Basement Area	0	1,362	272	52.98	72,158
	Ttl Gross Liv / Lease Area	1,362	2,724	1,634		433,478

As a church, the property is tax exempt, and there are no tax records beyond the assessment valuation of $3,486,500.

8. Current Recorded Deed

981
197

Witness our hands and seals this seventh day of August 1957.

Donald W. Setterlund

Kathryn L. Setterlund

The Commonwealth of Massachusetts

Plymouth ss. Aug 7 1957

Then personally appeared the above named Donald W. Setterlund ~~and Kathryn L. Setterlund~~ and acknowledged the foregoing instrument to be their free act and deed, before me

Notary Public

My commission expires

BARNSTABLE

COMMONWEALTH OF MASSACHUSETTS DEEDS EXCISE AUG 21 57 1.00

NOTARY PUBLIC

(* Individual — Joint Tenants — Tenants in Common — Tenants by the Entirety.)

Barnstable, ss., Received August 21, 1957, and is recorded.

U.S. REV. STAMPS IN THE AMOUNT OF 55¢ WERE AFFIXED TO THIS INSTRUMENT AND CANCELLED.

THE INHABITANTS OF THE TOWN OF BARNSTABLE, a municipal corporation located within the County of Barnstable and Commonwealth of Massachusetts, for One ($1.00) Dollar paid, grant to the UNITARIAN CONGREGATIONAL SOCIETY in Barnstable village, within said Town of Barnstable, the Barnstable elementary school property bounded and described as follows:

On the West by Mill Way, 99.76 feet;
On the North 18 feet and on the West 29.07 feet by land of Mary H. Crocker;
On the North by the cemetery, 135.88 feet; 81.58 feet and 98.49 feet;
On the West by said cemetery, 29.42 feet;
On the North on two courses by said cemetery, 37.79 feet and 13.69 feet;
On the East by said cemetery, 32.88 feet, on the North by said cemetery, 107.77 feet and on the West by said cemetery, 6.01 feet;
On the North by land of Chase, Parker & Co.,Inc., 202.26 feet and 176.46 feet;
On the South by Main Street, 457.27 feet;
On the East by Main Street, 13.63 feet;
On the South on two courses by said Main Street, 136.67 feet and 205.32 feet; and
On the Southwest by the junction of said Main Street and Mill Way, 68.69 feet.

Containing an area of about 1.32 acres, together with all buildings thereon.

Said land is shown on a plan entitled "Plan of Land in Barnstable, Mass. owned by the Town of Barnstable to be Conveyed to the Unitarian Congregational Society of Barnstable" dated July 5, 1957, made by Nelson Bearse-Richard Law-Surveyors, Centerville, duly recorded with Barnstable County Deeds.

See Statement of Town Clerk in Book 1510, Page 56

(See Plan Book 136, Page 145)

981
198

Said land was formerly used for school purposes by the Town of Barnstable, which use has been determined to be no longer desirable, and this deed is given under authority of the vote of said Town under Article 98 of the last annual town meeting held on March 5, 1957.

IN WITNESS WHEREOF The Inhabitants of the Town of Barnstable have this 20th day of August, 1957, caused its corporate seal to be hereto affixed and these presents to be signed in its name and behalf by Victor F. Adams, George L. Cross and E. Thomas Murphy, its Selectmen, duly authorized by vote of said Town.

THE INHABITANTS OF THE TOWN OF BARNSTABLE

By

Victor F. Adams

George L. Cross

Thomas Murphy

Selectmen as aforesaid.

SEAL OF THE TOWN OF BARNSTABLE MASS. 1639 ADOPTED MAY 4, 1889

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss.

August 20, 1957.

Then personally appeared the above named Victor F. Adams, George L. Cross and E. Thomas Murphy, Selectmen as aforesaid, and acknowledged the foregoing instrument to be the free act and deed of the Town of Barnstable, before me

Howard W. Sears

Notary Public

My commission expires: My Commission Expires Feb. 24, 196[illegible]

Barnstable, ss., Received August 21, 1957, and is recorded.

14570

SUPERIOR COURT
BARNSTABLE, SS.
FILED
APR 6 1984
Barbara Holmes Neil
Clerk

COMMONWEALTH OF MASSACHUSETTS

BARNSTABLE, SS.

SUPERIOR COURT
NO. 43681

UNITARIAN CHURCH OF BARNSTABLE,
Plaintiff

VS.

INHABITANTS OF THE TOWN OF
BARNSTABLE,
Defendant

AGREEMENT FOR
JUDGMENT

Plaintiff's title is established in and to the premises in Barnstable, Barnstable County, Massachusetts, bounded and described as follows:

On the West by Mill Way, 99.76 feet;
On the North 18 feet and on the West 29.07 feet by land of Mary H. Crocker;
On the North by the cemetery, 135.88 feet; 81.58 feet and 98.49 feet;
On the West by said cemetery, 29.42 feet;
On the North on two courses by said cemetery, 37.79 feet and 13.69 feet;
On the East by said cemetery, 32.88 feet, on the North by said cemetery, 107.77 feet and on the West by said cemetery, 6.01 feet;
On the North by land of Chase, Parker & Co., Inc., 202.26 feet and 176.46 feet;
On the South by Main Street, 457.27 feet;
On the East by Main Street, 13.63 feet;
On the South on two courses by said Main Street, 136.67 feet and 203.32 feet; and
On the Southwest by the junction of said Main Street and Mill Way, 68.69 feet.

Containing an area of about 1.32 acres, together with all buildings thereon.

Said land is shown on a plan entitled "Plan of Land in Barnstable, Mass. owned by the Town of Barnstable to be Conveyed to the Unitarian Congregational Society of Barnstable" dated

See Book 981 Page 197

Project Type and Listing

The project is the restoration and preservation of a historic building. The Unitarian Church of Barnstable is listed on the National Register of Historic Places and is a part of the Old Kings Highway Historic District of Barnstable. The Massachusetts Historical Commission Record (below) attests to its historical designations.

Massachusetts Cultural Resource Information System

Scanned Record Cover Page

Inventory No: BRN.80
Historic Name: Unitarian Church of Barnstable
Common Name:
Address: 3330 Main St
City/Town: Barnstable
Village/Neighborhood: Barnstable Village
Local No: 89
Year Constructed: r 1906
Architect(s): Lowell, Guy
Architectural Style(s): Colonial Revival
Use(s): Church
Significance: Architecture; Religion
Area(s):
BRN.M: Old King's Highway Historic District
BRN.N: Barnstable Multiple Resource Area
BRN.O: Old King's Highway Regional Historic District
BRN.R: Cobb's Hill
Designation(s):
Local Historic District (05/01/1973); Nat'l Register MRA (03/13/1987); Nat'l Register District (03/13/1987); Preservation Restriction (01/22/2009)
Building Materials(s): Wall: Wood; Wood Clapboard

Letter from Barnstable Historic Commission (initially written to support the project application to Massachusetts Historical Commission)

28 February 2022
Paul Holtz, Co-Director & Historical Architect
Massachusetts Historical Commission
220 Morrissey Blvd.
Boston, MA 02125

RE: Barnstable Unitarian Church – 3330 Main Street, Barnstable, MA 02630

Dear Director Holtz,
The Barnstable Historical Commission held a public hearing on February 15, 2022 wherein the Commission discussed a request from the Barnstable Unitarian Church seeking support from the Commission to endorse their efforts in securing funding from the Massachusetts Historical Commission.The Unitarian Church of Barnstable and Social Hall, are listed on the National Register of Historic Places. Both structures reside in the Cobb's Hill Residential District and the Old King's Highway National Registered Historic District. A representative of the Barnstable Unitarian Church informed the Commission that both of the structures are in need of restoration and preservation. The Church has had architectural surveys and engineer assessments conducted on the structures. The most critical architectural feature that needs structural repair is the Church tower. Currently, the tower has water damage due to a consistent leak which has consequently resulted in rotted wood as well as damage to the flashings. The copper dome on the peak of the tower has holes which are responsible for the leaks. The Barnstable Unitarian Church's tower is a character defining feature.
The Unitarian Church is a cultural asset to Barnstable's history as it has contributed to the Town's community development and religious history. The original section of the structure was constructed in 1771. It was torn down in the 19th century when it no longer served as the town's central meeting venue and replaced by a smaller church structure. This structure burned down in 1905 and the present church was built in 1906. The structure's history demonstrates Barnstable's community development over time.
At the February 15, 2022 meeting, the Commission was in consensus that both of the structures are historically significant and the Commission supports the Barnstable Unitarian Church's efforts to secure funding through a grant from the Massachusetts Historical Commission preserve the structures.

Sincerely,

Nancy Clark, Chair
Cc: Crystal Gips, Barnstable Unitarian Church
Town of Barnstable
Planning & Development Department
Barnstable Historical Commission
367 Main Street, Hyannis, Massachusetts 02601
(508) 862-4787 Fax (508) 862-4784
grayce.rogers@town.barnstable.ma.us

Certificate of Appropriateness

Please accept the email communication below indicating approval from Old Kings Highway.

From: **Brown, Erica** Erica.Brown@town.barnstable.ma.us
Subject: RE: 3330 Main St
Date: December 2, 2022 at 4:07 PM
To: Crystal Gips crystal.gips@yahoo.com

EB

HI Crystal,

Thank you for sending the proposed improvements to me. The Chair, Paul, has reviewed these proposed improvements and he does not have concerns with any of the new items. No further action is needed from OKH.

Thank you for your time and patience with me,
Erica

From: Crystal Gips [mailto:crystal.gips@yahoo.com]
Sent: Thursday, December 1, 2022 4:52 PM
To: Brown, Erica
Subject: Re: 3330 Main St

Erica,

Note: The tower includes the cupola with dome, the clock tower, the belfry, and the base. The base sits on the pavilion which includes the front entry to the sanctuary and the narthex (inside). The sanctuary included the entire original 1907 building. We provided the original blueprints to the architectural firm (Spencer Preservation Group) for use in the development of the plans and drawings.

The restoration includes:
1. repair interior structural damage in the tower
2. repair/replace all damaged wood aspects of the exterior including cladding, siding, trim on the entire sanctuary building, pavilion, and tower
3. replace damaged original copper dome with a new copper dome
4. replace wooden (rotted) original gutters and disintegrated replacement aluminum gutters with copper gutters (for longevity) painted white to look like the original wooden gutters on the entire sanctuary building, pavilion, and tower
4. repair the louvres on the bell tower
5. replace the original urns with fiberglass urns high up on the tower to replicate the originals (we have the original plans).
6. repaint and regild the clock faces
7. regild the rooster weathervane
8. replace/repair flashing
9. make minor masonry repairs at the foundation level
10. paint the entire sanctuary, pavilion and tower with the same color paint as the building has always been —gray with white trim

The sanctuary will need its roof replaced in perhaps 10 years. We did not bid that work at this time.

I will attach the architectural drawings and the bid specs. The drawings are hard to see on a

The remaining text of my message indicates that I was attaching the architectural drawings and the bid specs.

Architectural Assessment Report

See separate files: Sanctuary, Parish Hall, School House

Compliance with Standards for Rehabilitation…of Historic Properties.

The restoration and preservation plan for the Unitarian Church of Barnstable is based on a deep respect for the Secretary's Standards for preservation of historic properties. We will replace the original materials with like materials with some minor exceptions with no changes in appearance from the original building. The basic structure and exterior materials of the church building are wood. While we may not be so fortunate as to have access to old growth oak as the original builder did, we will be using the current industry standard for appropriate wood to repair structural elements inside the tower and appropriate wood for cladding, siding and trim on the outside of the building. The original dome on the cupola at the top of the tower was cooper, and so will the new one be cooper.

In terms of alternate materials, one of the elements from the original construction that has held up least well is the gutters. The original wooden gutters have rotted, and the replacement aluminum gutters, where they were installed to replace the wood, have disintegrated as well. In the interest of sustainability and longevity, the plan calls for replacing all gutters with copper. The material is long lasting, and they will be painted white and will look exactly like the original wood gutters. Another element for which we will use an alternative material is a decorative one: the building was decorated at the time of construction with 12 urns which were reflective of the Greek Revival style elements we see elsewhere on the building. We believe, from our reading of the original blueprints we have in the church archives, that those urns were copper. Early photographs show them around the circumference of two levels of the tower. Somewhat later photographs reveal no urns. We plan to replace them with urns of similar shape and size, crafted of fiber glass. In the professional experience of our architect, fiberglass is an acceptable material for these high-abuse items. They maintain their coloring well, are not prohibitively expensive, maintain their shape/details remarkably wel, and are quite sturdy. They are very often used on historic projects, high-up where the public does not have close access to them. If these were closer to the ground and more readily visible, we would insist on original materials such as wood or copper. The standards often prescribe this practice; farther away and less-seen materials can be more forgiving, within reason.

Design Plans and Specifications

See separate files.

Letters of Support

CAPE COD & ISLANDS APPRAISAL GROUP LLP

Heather J. Ross, MRA, SRA, RA
info@capecodappraisal.com Jacob C. Ross, SRA
MA Cert Gen RE Appr Lic #1434 capecodappraisal.com MA Cert Res RE Appr Lic #70585
PO Box 545, Barnstable, MA 02630
Barnstable 508-362-9050 ~ Fax 508-375-0154

November 30, 2022

Lindsey Counsell, Chair
Community Preservation Committee
Barnstable Town Hall
367 Main Street
Hyannis, MA 02601

Historic District Preservation – Buildings
3330 Main Street, Route 6A, Barnstable Village
Town of Barnstable, MA 02630
Unitarian Congregational Church

Dear Lindsey Counsell;

Why preserve historic structures on Route 6A, in the Barnstable village historic district?

1. Route 6A AKA the "Old Kings Highway" is a meandering roadway initially "laid-out" by the Native American Indians of Cape Cod. Later it became a cart-path and was improved and modified by King George's army and the early post-revolutionary inhabitants. It now provides a unique historical experience in 2022 for residents and tourists. Homes and business have maintained and restored properties at the personal expense of owners and through community funds via conservation organizations in an effort to preserve the historic district. This district supports many periods of American architecture dating back to the 17th to 19th centuries. Along the 2.25 mile stretch of Route 6A from Barnstable village to Yarmouth Port, there exists an eclectic array of private residences, shops and limited business uses – the majority of which were built prior to 1900. Hence, the use of Community Preservation Act funds for historic preservation is supported.

2. Route 6A is one of America's most scenic drives; it is timeless and iconic. The Smithsonian Magazine identified it as "the most appealing stretch of highway in America"; in part due to the preservation of the "small village character".

3. Fact: Property values in historic districts and villages and along Route 6A have higher underlying real estate values due to the preservation of the historic buildings and landscapes. There are only a limited number of these original buildings which comprise the village centers.

4. Fact: The major "tourist draw" to Cape Cod is due to the historic preservation of antique buildings and villages and the environment with natural recreational amenities and resources.

5. Preservation of antique structures and historic buildings allows a direct experience to the viewer of the historical conditions and significance of history; an experience of our society and culture. One doesn't need a book or a video; the experience of architecture is direct and one might describe it as "beyond words". Example: the preservation of an entire community such as Williamsburg.

Why the Unitarian Church?

It is a “cornerstone” of the village antique structures[1]. The building stands within a “grouping” of historic buildings on both sides of Route 6A. The church sits on one of the highest elevations in the village sharing the site with the historic school house building. It abuts an ancient cemetery, and the “hollow” playground, where the 4th of July celebrations have taken place for decades. The setting represents a unique configuration of a colonial-village “layout”. In Colonial times the clock tower provided the “time” to residents and Sunday bell-ringing called villagers to prayer and community meetings. In contrast, today it is a cell phone “click-click” for the time and place without even taking note of one’s surroundings. Therefore, the preservation of the church is essential to maintain the Colonial aspect of the village due to its setting and the overall size and use of the structure. It is the only building of its kind in this category.
Historically, this community building was part of the earliest settlement of the village under John Lothrup; maybe as early as 1639. Churches historically were not only a place for worship but served as the center of community life, as a general meeting place for the preservation of the community and the welfare of residents in need or for protection. It is believed that the site supported a community church or facility since the 1700s – over 300 years. Today, the present edifice is about 117 years old.

In addition to these general features for the call to historic preservation, specific data on the building are:

1. The present church was designed by Boston architect Guy Lowell who also designed the Museum of Fine Arts in Boston;
2. Lowell designed the New York State Supreme Court building in Manhattan;
3. Lowell designed several buildings on the campus of Harvard University.

The conclusion is that Lowell was a well-recognized designer and builder of his era. The “little” church building in Barnstable village has “grand and nationally” known and recognized associations. This is a significant link for the inventory of historic buildings on Route 6A with Massachusetts and beyond.

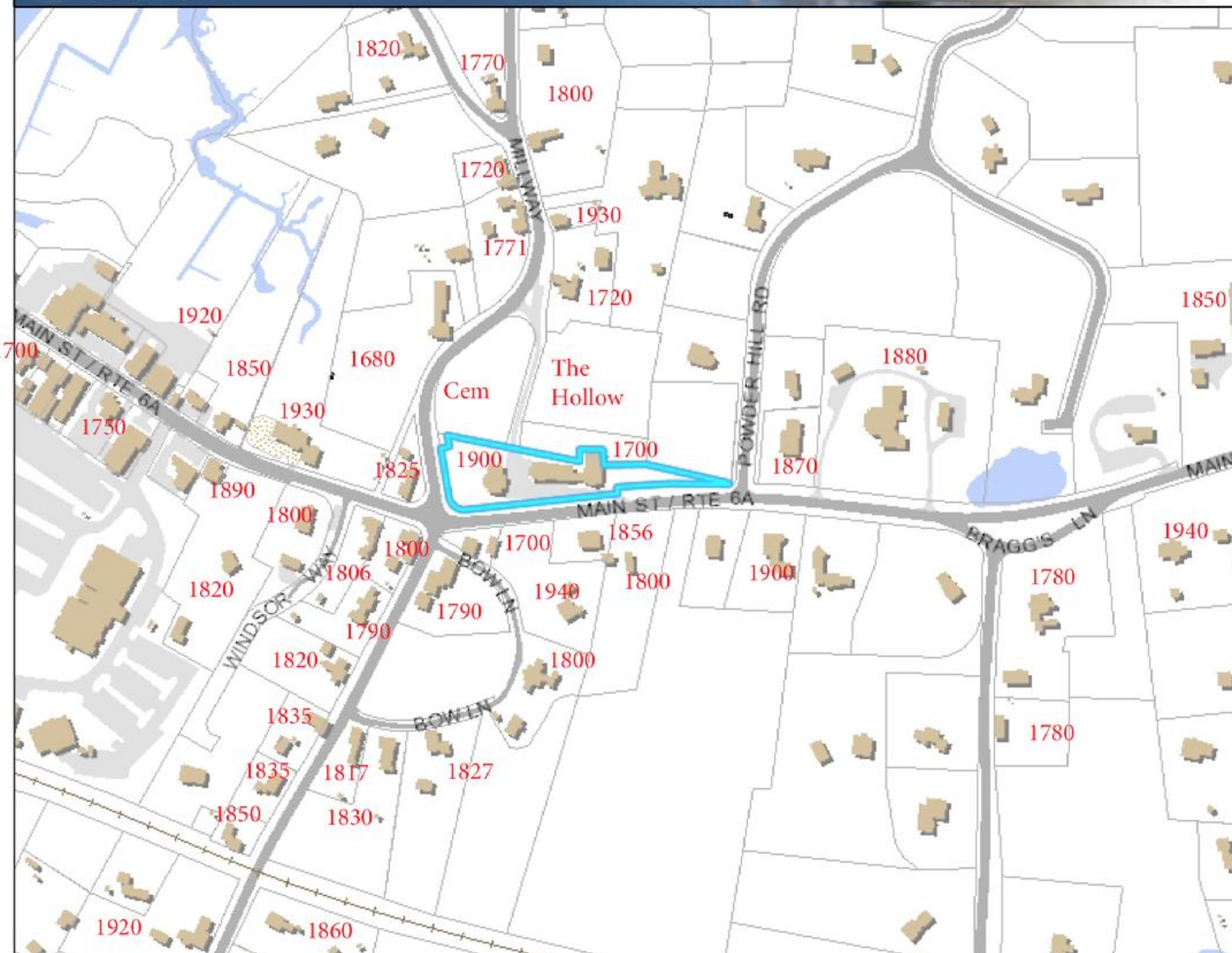
I am reaching out to you today as a Barnstable resident, to consider financial support for the preservation of the church as a significant amenity; not only for the village but also for the historic preservation of the Route 6A historic district and its village centers. As a real estate professional, the destruction of the Cape Cod environment has progressed rapidly with insufficient support to preserve its unique natural and historic features. These are the very attributes which distinguish this region from other resort-residential areas; it is not replicated elsewhere. The lack of support for historic building preservation undermines the community quality of life and extinguishes the possibility of future generations to experience historic buildings and architecture of the Colonial era “in person”, without the filter of digital technology. It’s a worthy investment of public funding and co-insides with the purposes and mission of the Community Preservation Act supported by the tax-payers.

Yours truly,

Heather J Ross
3311 Main St, Barnstable Village

[1] See attached map with the “date of construction” of buildings proximate 3330

TOWN OF BARNSTABLE **PROPERTY MAPS**



Map printed on: 11/30/2022

0 333 667 Feet

Approx. Scale: 1 inch = 333 feet

This map is for illustration purposes only. It is not adequate for legal boundary determination or regulatory interpretation. This map does not represent an on-the-ground survey. It may be generalized, may not reflect current conditions, and may contain cartographic errors or omissions.

Parcel lines shown on this map are only graphic representations of Assessor's tax parcels. They are not true property boundaries and do not represent accurate relationships to physical objects on the map such as building locations.

Legend

- Parcels
- Town Boundary
- Railroad Tracks
- Buildings
  - Approx. Building
  - Buildings
- Parking Lots
  - Paved
  - Unpaved
- Roads
  - Paved Road
  - Unpaved Road
- Bridge
- Paved Median
- Water Bodies

The Map Shows Assessor's Dates of Construction:

1680-1800 = 19 Buildings
1801 - 1940 = 26 Buildings

Conclusion: 42% of the antique building inventory prox 3330 Main St was constructed in the same era; the existing village inventory of antique structures supports the preservation of this building.

Town of Barnstable GIS Unit

367 Main Street, Hyannis, MA 02601
508-862-4624
gis@town.barnstable.ma.us

Lindsey Counsell, Chair
Barnstable Community Preservation Committee
Barnstable Town Hall
367 Main Street
Hyannis MA 02601

November 10, 2022

Dear Lindsey,

As one drives along Old King's Highway, a landmark siting is the Unitarian Church of Barnstable. It stands tall and says, I am still here, and I matter. In fact, it does. Though it is not the original version of the first 1639 church, built in 1907, it qualifies as an important historic point of interest. For centuries, it has and continues to serve a significant role in the town of Barnstable as a community entity as well as a religious center.

Protect Our Past is a non- profit focused on educating, inspiring and changing attitudes about the invaluable buildings that have woven the historic fabric of Cape Cod. We must slow down and stop the destruction of private and commercial properties that have shaped this peninsula's charming and quaint identity. This church is an example of what needs to be saved. In order to do this, one must invest in its restoration. The Unitarian Church of Barnstable has played a significant role serving many community groups, whether affiliated with this church or not. Because of its historic architectural stature and location, it continues to be scheduled for weddings, memorial services, public events such as seasonal fairs, in addition to its church services and outreach programs. As your role in supporting the community, it makes perfect sense that you would financially assist this current campaign designed to restore this significant historic structure. It is difficult to imagine 6A in Barnstable without this iconic church.

As the Barnstable Historic Preservation Committee, it makes perfect sense that you would invest in the future of Church of Barnstable. Thank the Unitarian you in advance for allocating the funds requested to do so.

Gratefully,

Ellen Briggs
Founder, President
Protect Our Pastwww.protectourpast.org

August 16, 2022

To Whom it May Concern,

The Transgender Social Support Group had been looking for a safe and accessible place to meet. As the group facilitator I made an appointment to speak to Rev. Dr. Kristen L. Harper.

My conversation with Rev. Harper was delightful and refreshing. It was wonderful to know the Barnstable UU Church is an open and welcoming church to the LGBTQIA+ community; and advocates for social justice and peace.

Chandra is the “Best” she is friendly and always helpful. As the group increased in numbers we outgrew the library. Chandra has made sure the group meeting time is on the church calendar even when we were meeting virtually due to Covid! The meeting is now a hybrid meeting both in person and via Zoom. Of course, Chandra was there to help with the technical piece of setting up our first meeting.

Ann Burke RN, M.Ed.
Cape Cod Advocate for the VRP/ Fenway Health

The Cape Cod Surftones
An A Cappella Chorus
15 White Pines Drive
Eastham MA 02642
508-470-1070
Ccsurftones@gmail.com

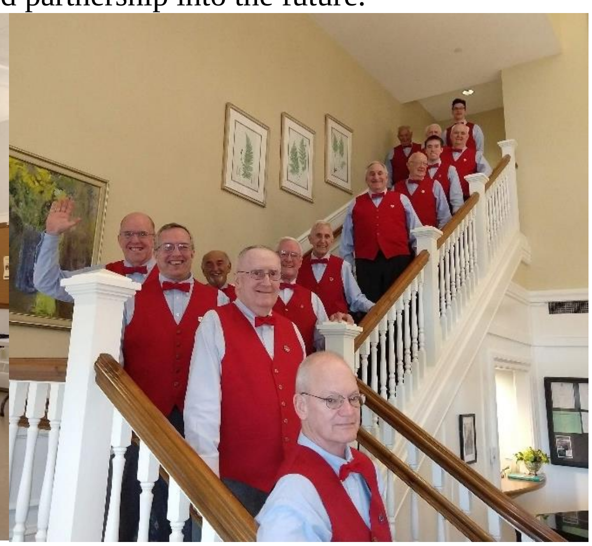
August 19, 2022

The Surftones, an A Cappella singing group with close to 50 years of tradition on Cape, has enjoyed a successful and cooperative relationship with the Unitarian church for over 3 decades. Their ongoing enthusiastic partnership with the Surftones allows us to bring our music and entertainment to the greater Cape Cod region.

The Church has graciously allowed the Surftones rehearsal space so that we have an established home where visitors and interested singers can consistently find us. In addition, they have made space available for the storage of our music, guest books, awards, photographs and other essential items. There is space also allocated to us to store uniforms and the props to our performances.

The rehearsal space within the church hall is ideally suited for our weekly practices. Not only because of the size of the room which accommodates numerous singers and visitors but because it offers the use of the kitchen area for our social activities. An important part of our mission is to welcome all people to sing with us, and that common theme shared by the Unitarian Church community is essential to our success.

Our ongoing presence in the community is due, in no small part, to the relationship and support we receive from the Unitarian Church and we value their continued partnership into the future.

November 15, 2022

Lindsey Counsell, Chair
Barnstable Community Preservation Committee
Barnstable Town Hall
367 Main Street
Hyannis MA 02601

Dear Mr. Counsell:

As a long-time participant in an Alanon group which has met for years at the Unitarian Church of Barnstable, I am pleased to offer support on behalf of the group for the church's application for a Development Grant for the purpose of restoring and preserving this historical building. I understand that the church has engaged in a very thorough architectural study of the facility, and that the study has revealed a need for significant repair to the building. I also know that the priority for restoration and preservation is the tower or steeple atop the building. Positioned as it is at the top of a large hill at the east end of the village, the church is a significant element in the fabric of this very beautiful historic village. It sets the scene for visitors and locals alike and reminds them always of the role this town played in the early development of Massachusetts communities.

The fact that the church makes itself available to so many community groups is testimony to the fact that history and present times live together and enrich each other in Barnstable. The presence of the church is important not only as a historic icon, but as a place that houses the community life of the residents of Barnstable and other communities stretched along Cape Cod. It is this integration of historic significance and community service that makes the preservation of the Unitarian Church of Barnstable so important to so many groups and individuals like my Alanon group.

I am sufficiently familiar with the congregation and the larger community of Barnstable to know that the cost of the total restoration project will demand much of the church membership in its effort to raise funds sufficient to carry out the restoration project. I am aware that they are already working on this effort, and that any contributions from the Massachusetts Historical Society will be of significant help in reaching their goal. I hope that the Commission will see its way to funding a part of the project.
Sincerely,

Judith LeGrand
175 Old Main Street
South Yarmouth MA 02554

Financial

<u>Sources of and Plans for Future Funding</u>

Below we provide a detailed description of the plans to finance the restoration of the tower, pavilion and nave of the Unitarian Church of Barnstable, as well as long term work that will come after the completion of this project. This first phase of the project for which we are seeking support from the Town of Barnstable is anticipated to cost $471,958.80 as shown in the bid table below. It will be followed by other work for which costs are also projected in the table below the bids. The projected cost of the long-term work is $144,010. In addition, the costs we have incurred for architectural services to assess the buildings and prepare the designs for the immediate project totaled $55,215. *The total project is projected to cost $680,010.80.*

We are presently seeking $300,000 from the Barnstable Community Preservation Committee to supplement the award from the Massachusetts Historical Commission and the funds raised by the church itself. We expect to fund the long-term work, other capital needs that arise, and ongoing maintenance and repair to the facility from several sources:

- The presently ongoing capital campaign which we expect to complete over the next several months
- UCB's Capital Endowment which we support via
  - unexpended operating costs at the close of the fiscal year
  - Earned payments from the use of the solar panels on the roof of Warren Hall
  - Unexpected gifts

We anticipate that these sources will allow us to take fiscal responsibility for the preservation of this important and very visible structure in Barnstable at a level not at all within the reach of the congregation 10-15 years ago.

The Old Schoolhouse, also a historic structure, sits on the property of the church. We have had for 20+ years and will continue into the foreseeable future, an agreement with the Friends of the School House Board (the group that operates the Old School House) a mutually satisfactory arrangement for rent and building upkeep. It is this: in return for rent of $1 per year, the School House Board takes responsibility for maintenance, repairs and capital improvements to the building. In practical terms they spend approximately $35,000 per year to address capital needs of the building. In recent years, for example, they have replaced all windows on the north and south sides of the building, and they installed a new heating system. The target of their next expenditure is the restoration of the chimney.

<u>Previous Funds from CPC</u>

We are grateful for two early instances of CPC funding for projects, the first in 2009 which primarily was used to renovate the library/meeting room at the north end of the sanctuary. Since the completion of that work, generous donors and the resources of the church have provided for new furniture, including a very elegant display case for important historical materials and an area rug that truly pulls the décor together to create a very pleasant space.

The second funding from CPC in the amount of $134,231 in 2020 was in support of

- restoration of all the original windows in the sanctuary
- replacement of windows on the first floor of Warren Hall
- refacing of the connector between the sanctuary and Warren Hall, including replacement of its door
- repaving of the ramp to our main entrance into the connector
- other masonry repairs
- replacement of the door to the sanctuary basement
- moisture-proofing of the crawl space under the sanctuary
- installation of a new safety fence around the exterior stairs to the sanctuary basement.

These modifications have set the stage for the work we hope to do in 2023.

Contractor Quotes

Bid Categories	Village Green	IFCC	MJ Mawn	Coastal Const.
General Conditions	$14,500.00	$ 83,700.00	$66,600.00	$ 16,500.00
General Requirements	$18,000.00	$ 10,000.00	$69,900.00	$ 54,000.00
Woodwork	$61,000.00	$ 50,000.00	$59,900.00	$ 109,000.00
Copper and Roofing	$28,290.00	$ 50,000.00	$64,900.00	$ 105,000.00
Painting and Finishes	$42,000.00	$ 45,000.00	$68,600.00	$ 64,000.00
Base Scope	**$ 163,790.00**	**$ 238,700.00**	**$ 329,900.00**	**$ 348,500.00**
Alternates				
Regilding Clock	$3,800.00	$ 24,700.00	$ 6,000.00	$ 11,460.00
Fiberglass Urns	$21,500.00	$ 18,700.00	$19,200.00	$ 18,700.00
Restoration of Pavilion	$47,800.00	$ 29,700.00	$69,900.00	$ 147,656.00
Restoration of Nave	$ 106,409.00	$ 31,700.00	$ 154,600.00	$ 144,714.00
Total Accepted Alt.	**$ 179,509.00**	**$ 104,800.00**	**$ 249,700.00**	**$ 322,530.00**
Total Contractor Costs	$ 343,299.00	$ 343,500.00	$ 579,600.00	$ 671,030.00
Contingencies	$68,659.80	$ 68,700.00	$ 115,920.00	$ 134,206.00
Architect/Engineer Oversight Fees	$60,000.00	$ 60,000.00	$ $60,000	$ 60,000.00
2023 Project Total	**$ 471,958.80**	**$ 472,200.00**	**$ 755,520.00**	**$ 865,236.00**

We have chosen to work with Village Green Construction company of East Falmouth Our architects are very familiar with their work, and MHC has approved use of the firm.

The total budget for the *entire church preservation project including work over the next 10 years over the next 10 years* is as follows:

Item	Cost
Tower, pavilion and nave*	$471,010.80
Future work within 10 years: Sanctuary roof; lower-level windows, covers on window wells for safety, two exterior doors, back deck and steps (all in additions) Contingency (x .2) Architectural and Engineering Oversight	$120,000 $ 24,000 $ 10,000
Architectural Planning Costs	$ 55,215
Total Project	**$680,225.80**

*From lowest bid

Project Timeline:

The timeline from funding forward is as follows, with the caveat that the church raises enough money to complete the project on the timeline laid out. We are committed to the Massachusetts Historic Commission by the virtue of their award to UCB to complete the work through item f. by June 30, 2023.

April 2023 a. Erect scaffolding around the tower and the pavilion of the church
b. begin repairs to the interior structural elements of the tower
c. Prepare materials for replacement of the copper dome

May 2023 d. Remove deteriorating flashing, trim, and cladding at the cupola level of the tower
e. Remove the existing copper dome and erect the new one in place at the top of the cupola
f. Begin replacement of wood elements and flashing at the cupola level
g. Continue explore the extent of the deterioration of wood elements from the belfry down the bottom of the tower

June 2023 h. Continue removing, repairing and replacing wood elements, flashing, and gutters as the work moves down the front of the sanctuary
July 2023 i. Identify specific needs for repair and restoration of wood elements on the rest of the sanctuary building
j. Repair exterior masonry as needed
k. Prepare all exterior surfaces of the sanctuary for painting

August 2023 l. Paint the exterior of the sanctuary
m. Regild the clock faces and the weathervane

Commitment Letter from MHC

The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

June 8, 2022

Daniel Ewing
Treasurer, Unitarian Church of Barnstable
330 Main Street (P.O. Box 285)
Barnstable, MA 02630-0285

RE: Unitarian Church of Barnstable, Barnstable, MA, MPPF #4306

Dear Mr. Ewing:

As Chairman of the Massachusetts Historical Commission, I am pleased to inform you that the above-mentioned project has been selected for a matching allocation of **$50,000** from the Commission's Round 28: Massachusetts Preservation Projects Fund (MPPF).

Due to the competitive nature of the program and limited funding, your award may differ from your requested amount. Please note that the capital grant fund is subject to reauthorization by the Office of Administration and Finance. The Massachusetts Historical Commission (MHC) will not be liable for any amount or loss caused by the non-reauthorization or non-allocation of said funds.

If said funds are reauthorized and allocated, the Commission will provide 50:50 matching funds for repairs to the belfry including carpentry, replacement of the copper roof, and repair of the existing weathervane.

This allocation is contingent upon the successful execution of the following steps, all of which must be completed before construction or pre-development work can begin:

1. Consultation with MHC Grants Division and Technical Staff to complete the full plans and specifications for project work items or to develop the pre-development Request for Proposals (RFPs).

   Please note that the MHC may require changes from the scope of work or budget as presented in your application in order to meet the program guidelines and funding allocation. **August 31, 2022** is the deadline for final approved construction documents or final approval for pre-development RFPs.

2. Execution of a grant contract with the Massachusetts Historical Commission.

   The MHC contract will define the grant-assisted project under applicable laws and regulations and include either plans and specifications or an RFP, a budget, and timetable for the full scope of eligible and approved work items.

220 Morrissey Boulevard, Boston, Massachusetts 02125
(617) 727-8470 • Fax: (617) 727-5128
www.sec.state.ma.us/mhc

June 8, 2022

Page 2

3. Participation in the Local Project Coordinators' (LPC) workshop.

The grants staff will hold a virtual LPC workshop through Zoom for Local Project Coordinators and other project participants on Thursday, **July 7, 2022** from **1:00 - 3:30 p.m.** Your assigned MHC project manager will contact you directly by email with details. We also encourage the attendance of other project team members, such as architects, preservation consultants, or engineers. Please come to this workshop prepared to schedule preliminary site visits with assigned MHC grants staff to finalize a mutually agreeable scope of work for your MPPF project. These site visits should preferably be scheduled prior to the end of July and will require the attendance of your architect/engineer for all development projects. A Local Project Coordinators' Manual will be mailed to you in advance of the workshop.

Please respond in writing to Brona Simon, Executive Director and State Historic Preservation Officer, MHC, by **July 7, 2022** with your intention to accept the grant allocation and meet with appropriate MHC personnel. You may email a scan of your signed letter to paul.holtz@sec.state.ma.us by July 7, 2022.

The Commission looks forward to working with you toward the successful completion of your project. We sincerely hope that this grant allocation will help you to achieve your preservation goals.

Sincerely,

William Francis Galvin

William Francis Galvin
Secretary of the Commonwealth
Chairman, Massachusetts Historical Commission

cc: Crystal Gips, Capital Projects Coordinator, LPC
Lynne Spencer and Doug Manley, Spencer Preservation Group

Signature of Applicant — Date: December 1, 2022

Crystal Gips

Signature of Applicant Partner ______________________ Date ______________________

______________________ ______________________

Signature of Town Manager (Town Affiliated Projects) Date

CONDITIONS ASSESSMENT

FINAL DRAFT

UNITARIAN CHURCH OF BARNSTABLE

3330 MAIN STREET | BARNSTABLE, MASSACHUSETTS

FEBRUARY 2021

Spencer, Sullivan & Vogt
ARCHITECTURE · PRESERVATION

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TABLE OF CONTENTS

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ACKNOWLEDGMENTS

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Chairperson, Community Preservation Task Force
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Barnstable, MA 02630

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Shawn Willett, AIA	Architect, Report Author

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Special Thanks To:

Crystal Gips, *Chairperson, Community Preservation Task Force*
Christie Gamp
Mark Nichols

EXECUTIVE SUMMARY

Stewardship of an historic church building is often cautiously viewed as competition for other worthy endeavors such as social justice initiatives, service to the community at large, green church activities, and the like. This can be memorably tagged, 'beware of the edifice complex.' On the other hand, stewardship of a structure like Barnstable's Unitarian Church can be seen for its value literally and symbolically: a reference point in the community, a gathering place for cultural and educational activities, a refuge for the troubled, a living place of hope and unity.

The following report is a comprehensive assessment of the exterior envelope of the church building, commissioned by the building committee in November 2020. Spencer, Sullivan & Vogt is grateful for the opportunity to participate in the preservation of this extraordinary structure and is especially appreciative of the participation of Crystal Gips of the committee along with Christie Gamp and Mark Nichols.

The Unitarian Church in Barnstable is the successor of several church buildings occupied by the congregation since its founding in 1639. Following a disastrous fire in 1907, architect Guy Lowell was retained to design the handsome Colonial Revival style building sheltering the congregation and its community partners today. Perhaps best known for the original building in the Huntington Avenue location of Boston's Museum of Fine arts, Guy Lowell was in demand for institutional, commercial and residential projects during his distinguished career. Neoclassical elegance and enduring qualities exemplified in the Unitarian Church building are visible to all who travel Route 6A, the historical roadway traversing the Cape. Located in the Old King's Highway Historic District, the Unitarian Church of Barnstable is recognized as a contributing building in the National Register district as well as being protected by local zoning historic district.

The Unitarian Church is generally well maintained but it is possible – even on a glorious sunny day – to see some problems that taken care of now can arrest more serious future problems. On a gloomy day in December 2020, these became even more evident, aided by an aerial lift to inspect hard to reach areas of the steeple (technically tower and cupola in architectural terms). Knowing that the assessment was catalyzed by problems with its periodic water penetration problems at the steeple, structural assessment by Coastal Engineering was included in the study. Indeed, the team also looked at all aspects of the building, including first floor framing, roofing and flashing, cladding and trim. Happily, the wood windows illuminating the sanctuary had been conserved in 2019 and are in good condition.

Widespread peeling paint attests to the glaring need for careful preparation by scraping to good substrate, priming, and painting with high quality products. In some areas, wood trim and cladding has been weathered to the point that actual repairs are needed, using a combination of techniques depending on the severity of the condition: wood inserts (dutchmen) replacing rotted wood, epoxy consolidation and patching, and in some cases, full replacement.

With the catalyst of the troubled exterior appearance of the tower/cupola and specifically the periodic water penetration, numerous problems were observed on close inspection, both inside the structure and outside. At this point, the interior structural defects are relatively minor and can be dealt with by reinforcing existing wood framing.

The exterior is a different matter: notably the original copper roof of the cupola dome is at the end of its service life and should be replaced. It is leaking. The cupola is supported on a belfry consisting of a complex geometrical plan, an octagon, with wood pilasters surmounted by ornamental urns. Those urns are long gone. What remains are the sheet metal flashings at the base of the urns, also aged and deteriorated. Moving downwards, the square base with the clock faces has niche indentations at the corners that once featured urns, also long gone with the same type of defective flashing. Notably the clock facing the cemetery has been painted over with its hands and digits long gone. The square base supporting this complex arrangement that is the architectural glory of the building is in need of relatively straightforward repairs, scrapping and painting.

Monumental historic buildings reaching their century mark are typically faced with significant repair and preservation challenges – the Unitarian Church of Barnstable is no exception. With the cupola roof and various flashings, woodwork repairs and painting, the noteworthy architectural expression of the building needs serious attention. Equally pressing is the façade with its pediment and columns, pilastered corners as the hip roofed section which returns to the side elevations forming the 'pavilion' supporting the tower/cupola. Here we see problems with the wood gutters and cornice cladding and trim.

For the purposes of this report, we have divided the treatment recommendations into two main parts: Short Term and Longer Term – although in truth both are necessary now and there will be a benefit cost-wise and preservation-wise to accomplishing both simultaneously.

The preliminary cost estimate for the short-term repairs outlined herein is **$548,357**. A detailed estimate is provided at the end of this report.

Improvements considered longer-term are estimated to cost an additional **$284,048**.

The Short-term preservation work focused on the façade with it tower and cupola, along with the sections of the flanking side elevations which support the tower, forming what can be termed the front pavilion. The scope of work is a combination of the cupola's dome roof and flashing replacement; treatment of wood trim and cladding, including the clock faces; preparation and painting. The estimated cost is $548,357. This work is urgently needed and should be address within the next 1 – 5 years.

A major part of the cost is staging to access all side of the tower and cupola, providing a safe and effective platform for the workers. As such, it is prudent to include as much of the necessary scope as possible, avoiding the costly erection of staging at a later date. The same logic of taking advantage of staging access applies to the lower portions of the façade and the flanking sections forming the front pavilion.

We understand that there is immediate interest in applying for Town of Barnstable Community Preservation funding to help support this endeavor. It is helpful to consider that the copper roof and flashing has a service life of 60 to 80 years – indeed the current dome has endured for well over 100 years. This is a project that may be the centerpiece of a capital campaign. The church leadership may want to consider an effort which is grounded in the congregation and amplified by reaching out to the National Fund for Sacred Places. Administered by the National Trust for Historic Preservation with the Partners for Sacred Places, the National Fund program includes a matching grant ($30,000 - $250,000), training and technical assistance. Highly competitive, it is also geographically distributed. Building capacity within the church and its community is a significant part of this program

The Longer-term preservation work addresses the balance of the church building, with repairs to wood elements, preparation and painting, and replacement of the asphalt shingle roof. The estimated cost is $248,048. This has a longer time frame, particularly as it applied to the roof. But the peeling paint and deteriorating woodwork argues for moving that project along as soon as possible. The longer it is deferred, the more problems with rot and decay.

Moving Forward

The Unitarian Church of Barnstable contributes to the rich cultural heritage of Barnstable through its distinctive architecture, and cultural and social outreach. We are mindful that the investment called for to preserve this building is significant. And to face the difficult decisions about how to proceed in these unprecedented times is daunting. It may be useful to reflect on what the congregation faced in 1906 after the fire: a sobering time. Rebuilding with spirit and a commitment for an enduring structure is clearly the legacy we see today. The challenge is how to continue that legacy of stewardship while be mindful of the many demands on resources and energy.

"Architecture is about the long haul. It is here to say that something that mattered yesterday still matters today, and more important, will still matter tomorrow. It is still a way that the generations speak to each other. If there is any real architectural goal, it is not to make one kind of building or another, but to make sure that the dialogue continues into the next generation and the generations to follow."

Paul Goldberger

Study Methodology

- Project kick-off meeting to discuss project background, repair history, and areas of concern.
- Review and synthesis available building documentation, including as built and/or design drawings, reports, specifications, historic documentation, photographs, and other available resources.
- Prepare measured drawings (plans and elevations) of existing conditions in AutoCAD, using existing plans and elevations as a basis.
- Identify the historic character-defining features of the building that should be retained in any restoration scheme. Identification of these features will be guided by the criteria established by the National Register of Historic Places.
- Assess and document (with drawings, photographs, and a narrative) the architectural conditions of the building envelope (and problem areas at the interior of the steeple). Lift survey with Cape Associates.
- Assess structural conditions at the steeple and envelop in general (Coastal Engineering).
- Synthesize architect's and consultants' findings report including a narrative with annotated drawings and photographs with recommendations guided by The Secretary of the Interior's Standards for the Treatment of Historic Properties.
- Prepare phased treatment recommendations.
- Prepare plans and outline specifications for cost estimating with Cape Associates.
- Synthesize documents into a summary report.
- NOTE: If the Church receives a Community Preservation grant, SSV will prepare the application for Certificate of Appropriateness from Old King's Highway Historic District Committee (OKH). Present findings of report to OKH and attend one meeting.

BUILDING HISTORY AND SIGNIFICANCE

Prior to its settlement by Europeans in the early 17th Century, the Barnstable area was well traveled by Native Americans who fished and hunted the salt marshes of the region. Recorded history of Barnstable began in the late 1630's, with the town being formally established in 1639. The first European settlers were a group led by Rev. John Lothrop who left England seeking religious independence and originally settled in Scituate. Their first meetinghouse was constructed in 1646 on Coggins Pond, about a mile west of the Unitarian Church of Barnstable.

By the early 1700's the town had grown sufficiently to require two parishes (or Precincts), an East and West Parish. In 1715-1717, the West Parish built its meetinghouse and later the East Parish built a new church on Cobb's Hill, on the site of the current church. This building is described in the Massachusetts Historical Commission's Form B as being a white, two-story wooden structure with "simple but graceful architecture".

In the early 19th century there was considerable theological debate in the "churches of the standing order" in New England. Many churches actually split over this debate, the traditionalists becoming Congregationalists and the liberals becoming Unitarians. Already recently divided along geographic lines, the church in Barnstable did not undergo this split. The church in the West Parish followed the line of tradition and is today a Congregational church. The East Parish, leaned toward the liberal side of the debate and later became identified as a Unitarian church.

The original Cobb's Hill East Parish Church was replaced with a larger building in 1836, a time when Barnstable's maritime and fishing industries brought prosperity to the town. This building has been said to be one story, about 60 feet by 75 feet, and featuring large Gothic windows. This building burned down in 1907, and was replaced by the structure that exists today – the subject structure of this study.

The current building was designed in a Colonial Revival style by Guy Lowell, a man from a noted Boston family and a talented architect and landscape architect. Guy Lowell is noted for designing a number of prominent public, academic, and institutional buildings, as well as distinctive residential properties. He is probably most noted locally as the architect of Boston's Huntington Avenue Museum of Fine Arts, but also in his portfolio of projects is the New York Supreme Court Building and public structures in Boston's Charles River Basin. A Parish Hall addition was designed by Richard Sears Gallagher and dedicated in 1960. That was followed by another parish house addition in 1979.

The Unitarian Church of Barnstable is a contributing structure to the Cobb's Hill Local Historic District, and the National Register Barnstable Multiple Resource District, and the Old King's Highway Historic District. A Preservation Restriction was agreed upon for the property in 2009.

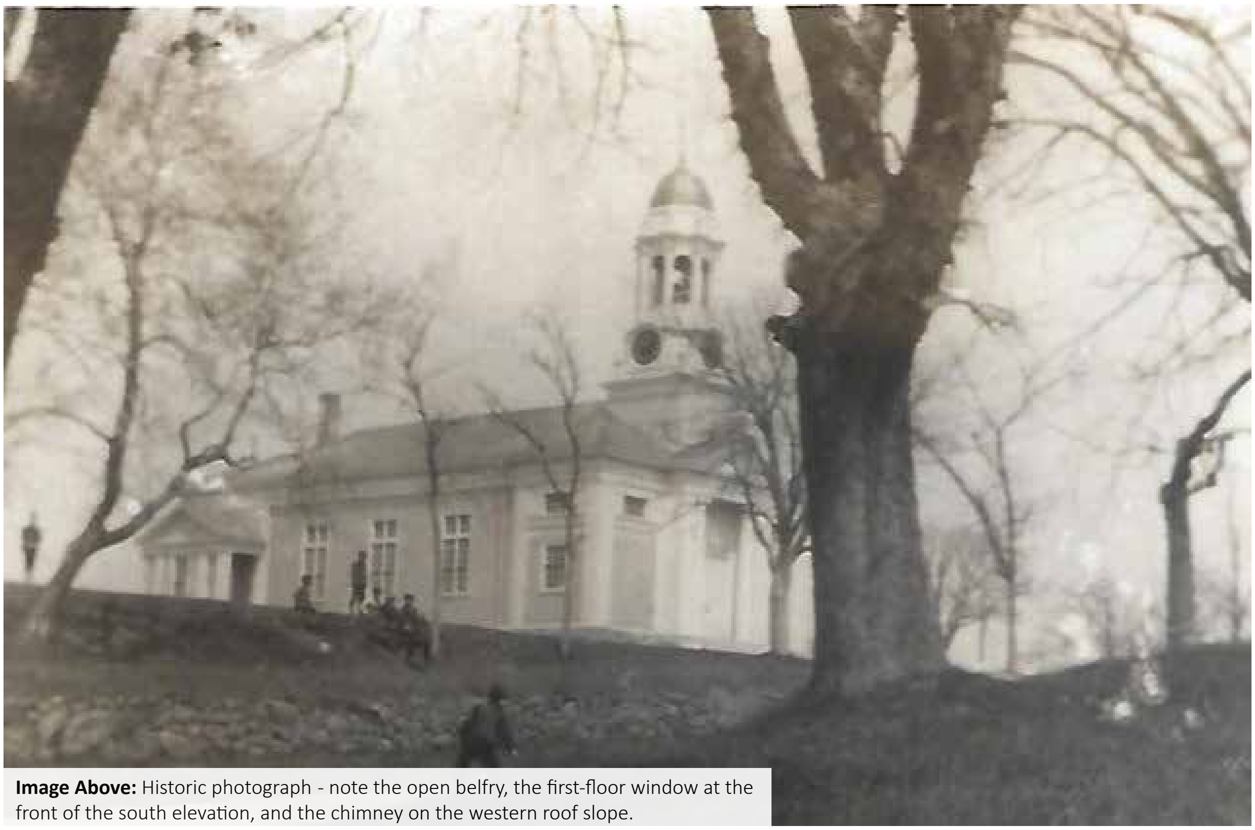

Image Above: Historic photograph - note the open belfry, the first-floor window at the front of the south elevation, and the chimney on the western roof slope.

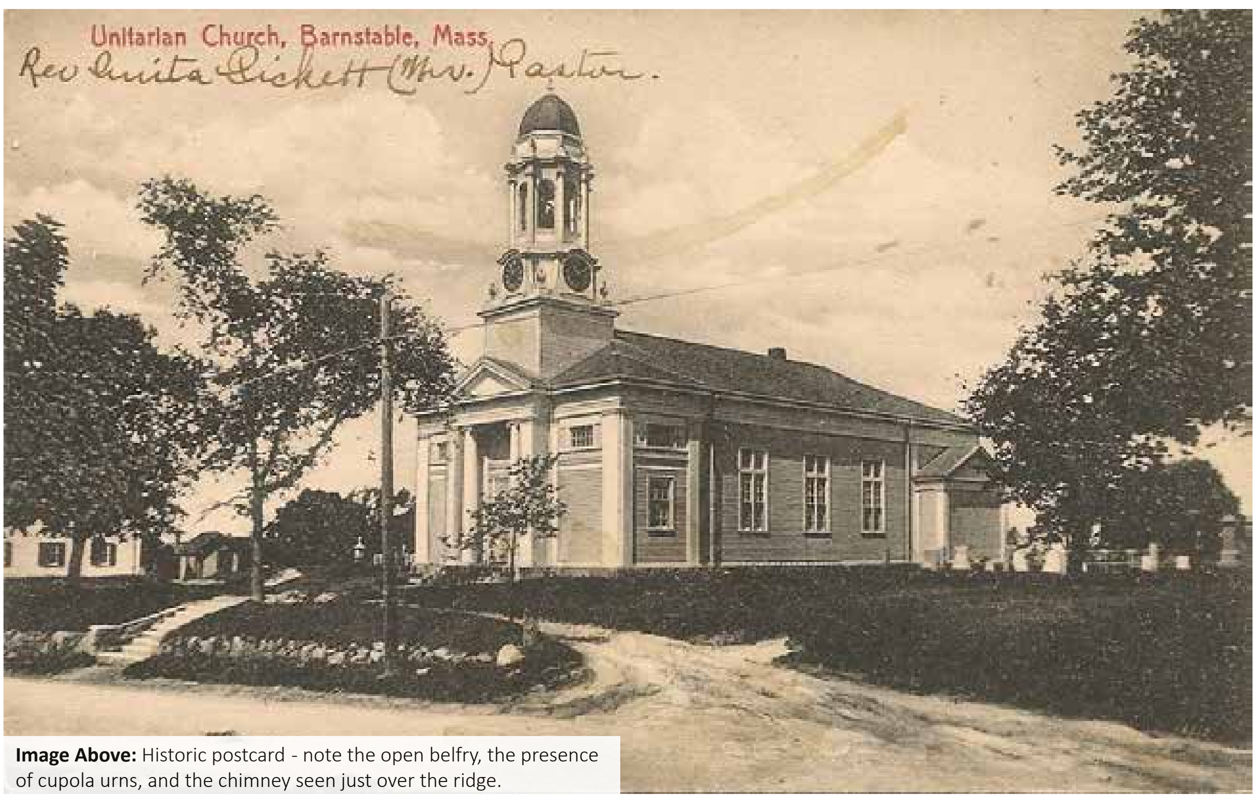

Image Above: Historic postcard - note the open belfry, the presence of cupola urns, and the chimney seen just over the ridge.

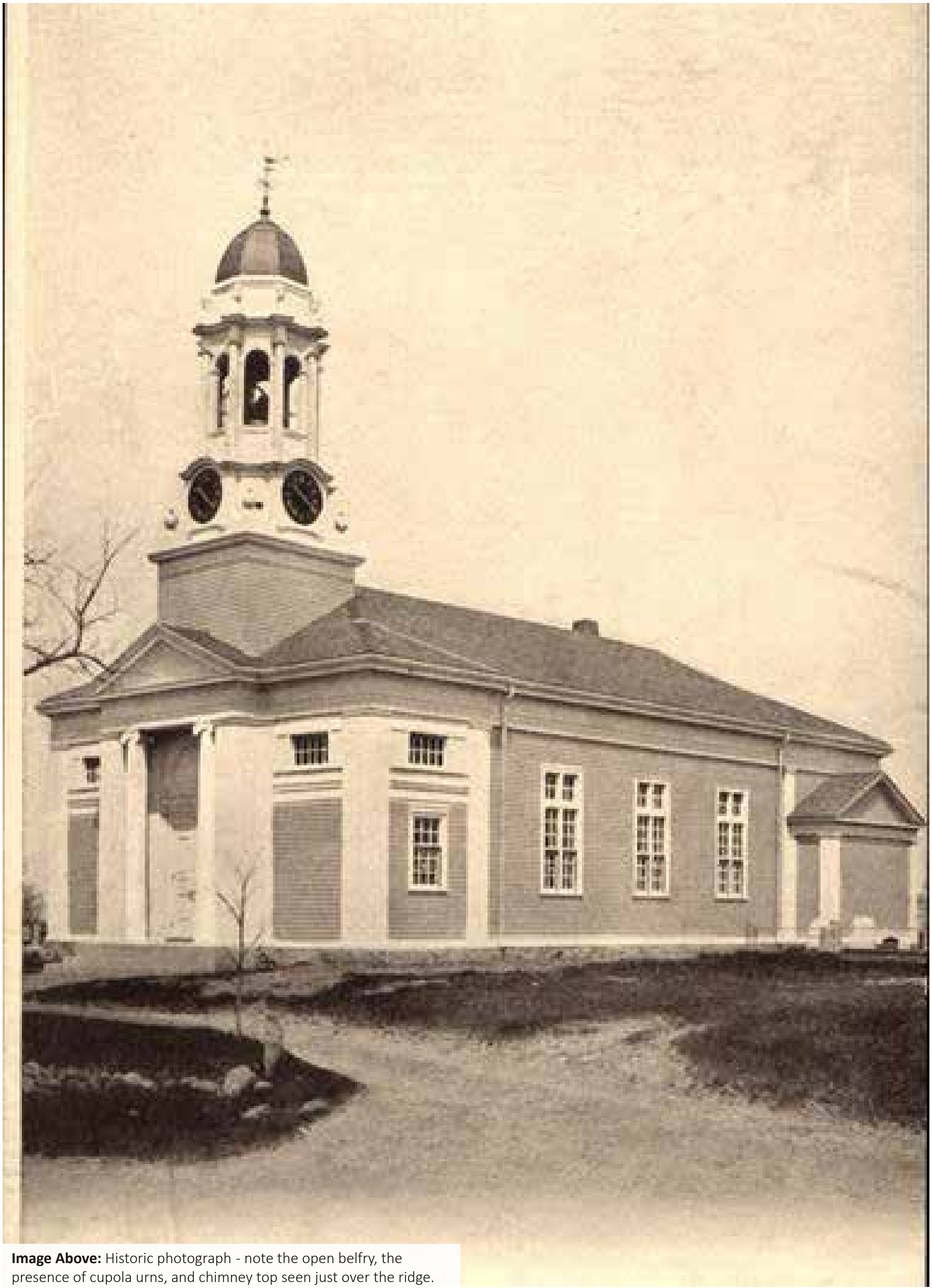

Image Above: Historic photograph - note the open belfry, the presence of cupola urns, and chimney top seen just over the ridge.

Image Above: Historic photograph, looking from the northwest. Note the open belfry and dark northern clock (blank today).

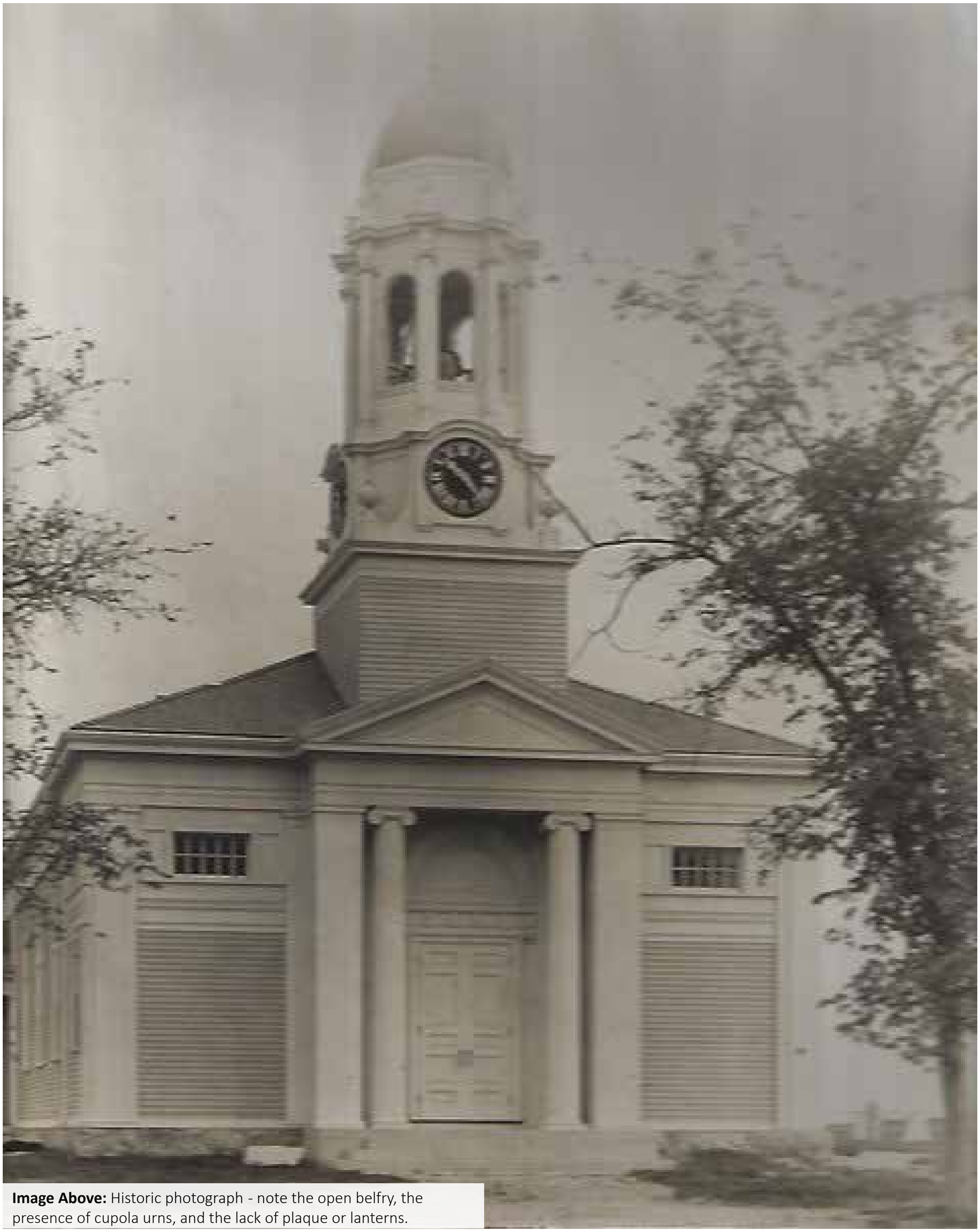

Image Above: Historic photograph - note the open belfry, the presence of cupola urns, and the lack of plaque or lanterns.

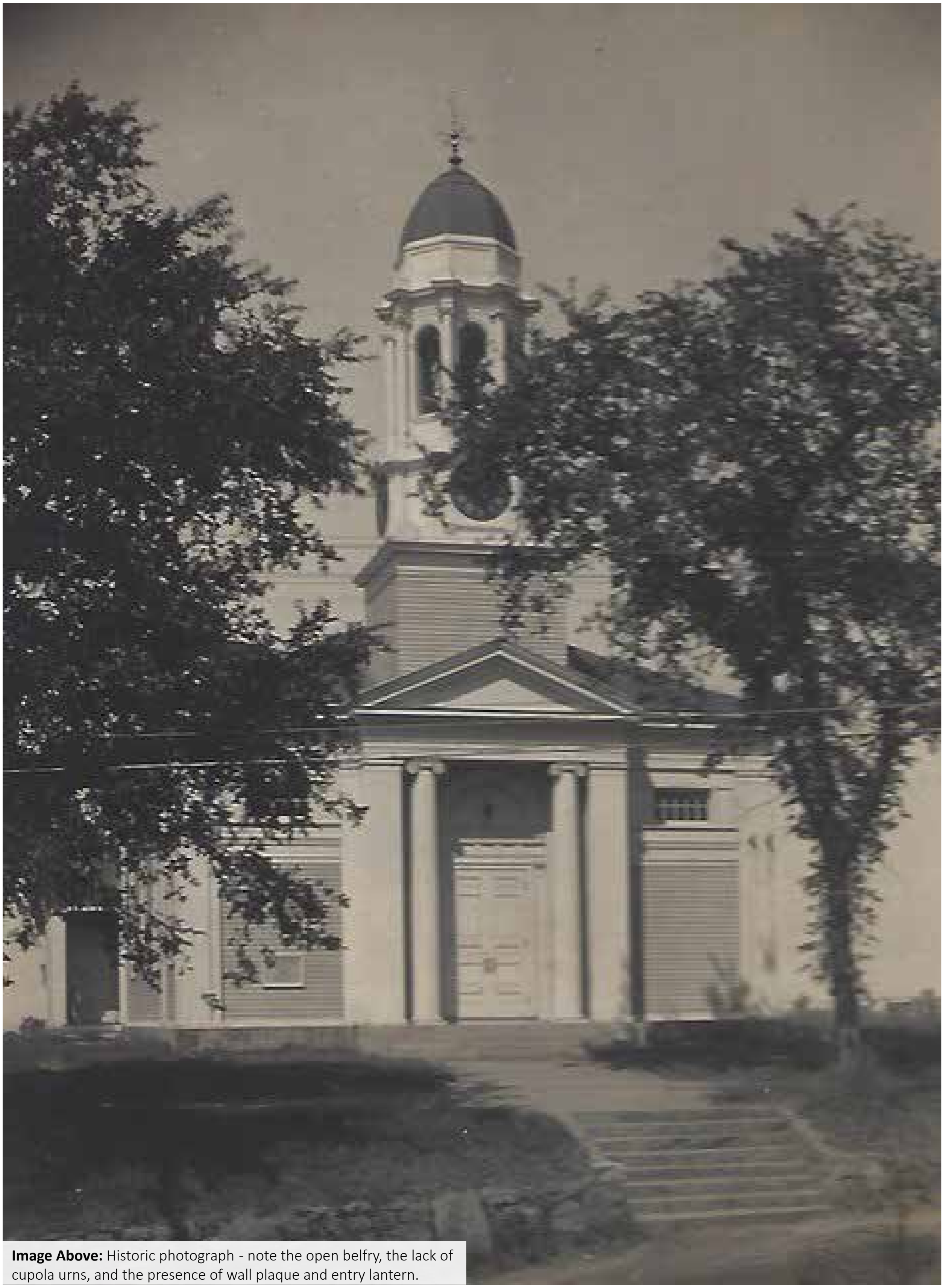

Image Above: Historic photograph - note the open belfry, the lack of cupola urns, and the presence of wall plaque and entry lantern.

EXISTING CONDITIONS DRAWINGS AND PHOTOGRAPHS

The following pages contain existing conditions drawings for reference, drawn originally by architect Guy Lowell. The church had the documents professionally scanned, and SSV digitally organized and cleaned the drawings for screen viewing.

Image Above: Existing front elevation. The entry at left faces south (south elevation). The broad facade at right faces east (east elevation).

Image Above: Existing rear elevation, facing north (north elevation).

01 SOUTH ELEVATION

1/8" = 1'-0"

02 EAST ELEVATION

1/8" = 1'-0"

ARCHITECT:	OWNER:	PROJECT:	ISSUE DATE:	SHEET TITLE:	SHEET #:
Spencer, Sullivan & Vogt ARCHITECTURE • PRESERVATION	BARNSTABLE UNITARIAN CHURCH 3330 MAIN STREET BARNSTABLE, MA 02630	BARNSTABLE UNITARIAN CHURCH CONDITIONS ASSESSMENT	Feb. 03, 2021 PROJECT #: 2037	EXISTING DRAWINGS: SOUTH + EAST ELEVATIONS	AX-01

01 WEST ELEVATION

1/8" = 1'-0"

02 NORTH ELEVATION

1/8" = 1'-0"

ARCHITECT:	OWNER:	PROJECT:	ISSUE DATE:	SHEET TITLE:	SHEET #:
Spencer, Sullivan & Vogt ARCHITECTURE • PRESERVATION	BARNSTABLE UNITARIAN CHURCH 3330 MAIN STREET BARNSTABLE, MA 02630	BARNSTABLE UNITARIAN CHURCH CONDITIONS ASSESSMENT	Feb. 03, 2021 PROJECT #: 2037	EXISTING DRAWINGS: NORTH + WEST ELEVATIONS	AX-02

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OBSERVATIONS & TREATMENT RECOMMENDATIONS

The following pages outline the observations and treatment recommendations which represent inspections and assessments of building conditions, including an aerial lift survey of the cupola. Narrative observations are accompanied by keyed photographs and a bulleted summary of treatments recommended at the end of each subsection.

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EXTERIOR CONDITIONS

WALLS, SIDING, & TRIM

Observations

The exterior walls of the church building throughout are clad in wood clapboards, painted. Wood trim accents each wall, the most generous of which adorn the south facade in the classical *Ionic order*. In general, the condition of the clapboards is consistent: possessing excellent integrity with little sign of deterioration of warping, thanks to vigilant maintenance and painting **[Image 01]**. There are, however, some signs of paint wear. Namely, at the projecting hipped roof pavilion by the church's northeast corner, where sections of paint have begun to exfoliate **[Image 02]**. Also at this wall, nail heads and clapboard joints are visible. This small gable wall should be scraped and repainted after clapboards and their nails have been fastened tightly to the sheathing. A few localized instances of peeling paint are apparent, such as those seen on the north facade **[Image 03]**. Organic growth by the northwest gabled porch should be cleaned **[Image 04]**, as well as anywhere else along the foundation line where similar discoloration occurs. The cupola itself is discussed in a subsequent section, but its square base is similarly clad, albeit with greater deterioration **[Image 05]**. These clapboards should be scraped and repainted. Where each cheek wall meets the roof, some clapboards exhibit some excessive deterioration where their exposed ends have wicked moisture **[Image 06]**. Individual clapboards that are sufficiently split or rotted should receive replacement splices in the shortest lengths practical.

Image 01: In general, wood clapboards are in excellent condition, both tight and sound.

Image 02: One instance at the northeast gabled 'wing' shows peeling paint and visible joints.

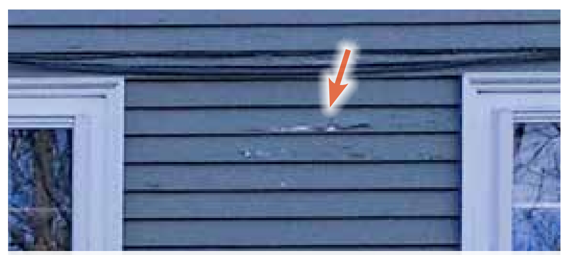

Image 03: An scant case of peeling paint elsewhere on the church's main body.

Image 04: Organic growth by the foundation at the northwest porch.

Image 05: Clapboards at the cupola's base show the most wear.

Image 06: Exposed end-grain by the roof is cause for clapboard deterioration.

Image 07: Wood mouldings at the pilaster bases may show more wear due to snowbanks and splashing rainwater.

Image 08: Discolored capitals and stray paint on the abacus flashing are unsightly.

Image 09: Column bases are more susceptible to wear.

Wood trim at the church runs the full height of each wall, from stone foundation to eave. Most of the wood is sound and dense, although the base mouldings of each decorative *pilaster* show discoloration and signs of rusted nail heads, in addition to worn paint **[Image 07]**. All discoloration should be cleaned, and the wood surfaces sanded and repainted. Ionic *capitals* atop the entry columns are in excellent shape and show no deterioration, but some discoloration is noticeable, as well as stray paint marks on the cap flashings of each capital's *abacus* **[Image 08]**. Column bases share a condition similar to the aforementioned pilasters **[Image 09]**. Stray paint and discoloration should be cleaned as a minimum. The entry door is enveloped by a classical *Doric entablature*, and is similarly in excellent shape. A keen eye may notice that a few *trigylphs* are missing one or two of their *guttae* **[Image 10]**. Over the years, a lack of thorough scraping of old paint before new coats were applied has lead to rather obtrusive 'high spots' on the entablature woodwork. In addition to the minor repairs of missing wood detail, the entire entablature should be thoroughly scraped or stripped to bare wood, and repainted.

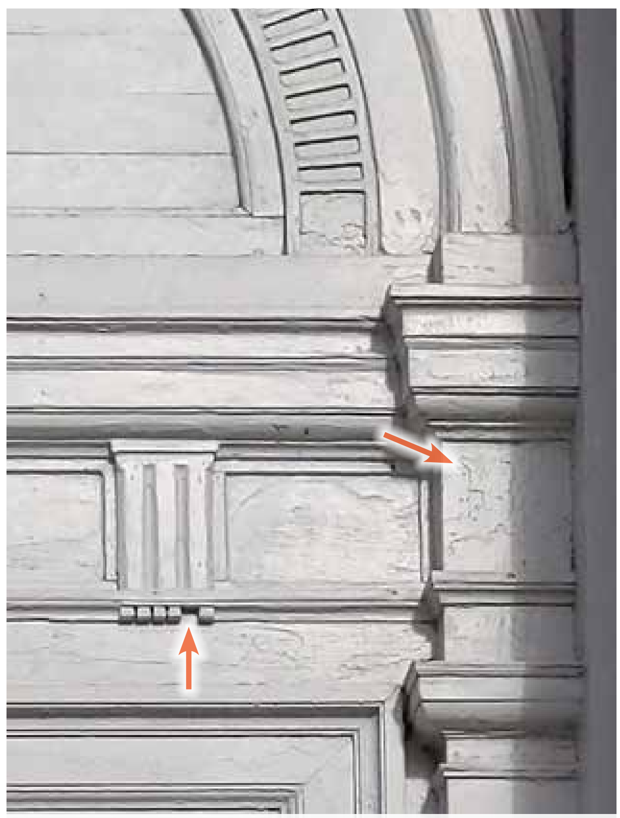

Image 10: Years of built-up paint create a non-uniform surface. A missing *guttae* is seen below one of the *trigylphs*.

Worn paint and bare wood is intermittent elsewhere **[Image 11]**, and the general recommendation given the age of the paint is that all woodwork should be scraped (or stripped), cleared of obtrusive fasteners, and repainted. Gaps seen at the mitered corners of the wood *architrave* indicate that refastening of trim is necessary **[Image 12]**. Additional repair is needed at the northwest porch pilasters, where base mouldings show a much greater degrees of deterioration than anywhere else **[Image 13]**. Although not strictly part of the wood trim, the stairs at this porch entry are unprotected and display signs of incipient rot, and should be replaced before failure.

Image 11: Bare wood is seen where paint is most worn or peeled altogether. Small nail heads are visible throughout.

Image 12: Gaps in the mitered corners of the wood *architrave* require refastening.

Image 13: Rotted mouldings and a deteriorating stair should all be replaced before failure.

Image 14: The wood *corona* was damaged and is at risk of water infiltration. Fortunately, the wood gutter above is intact.

Image 15: Deteriorated *fascia* boards need repair or replacement.

In at least two instances, damage to the church's *cornice* is evident. The most glaring case is above the entry, where the wood *corona* has been damaged at both its *fascia* (vertical) and *soffit* (underside) surfaces **[Image 14]**. All damaged wood should be rebuilt, but SSV recommends an immediate, temporary screen installed in this area to prevent entry by rodents. On the east facade by the southeast corner, more deterioration of the wood fascia is apparent **[Image 15]** and should be replaced. The metal gutter does not appear damaged, and is discussed further in a subsequent section.

Recommendations

- Fasten loose clapboards and inset visible nails.
- Scrape, sand, and paint select areas of wood clapboard.
- Replace deteriorated clapboards at cupola cheek walls
- Remove or inset protruding nails and fasteners at all wood throughout.
- Secure loose wood trim throughout.
- Repair deteriorated base mouldings at wood pilasters.
- Scrape and repaint all wood trim throughout. Strip paint with significant build-up.
- Temporarily screen, and then rebuild damaged wood fascias and soffits.
- Replace deteriorating wood stairs at northwest porch.

OPENINGS

Observations

The church has a variety of opening types, all in considerably good condition. The front entry door is a solid wood stile-and-rail door with panels and in very good condition, albeit in need of repainting along with the rest of the woodwork discussed in the prior section **[Image 16]**. Another wood door that serves as an egress-only function is found in the church's northwest porch, needing only annual inspection and maintenance **[Image 17]**. A basement stair areaway houses a hollow-metal door, which should be offered the same annual inspection **[Image 18]**.

Image 16: The front wood stile-and-rail door is in good condition, although requires preparation and repainting.

Image 18: A hollow metal door in the only basement areaway stair appears to be in good condition.

Image 17: The wood door at the side porch is intact and in good condition.

Image 19: The 10-lite windows high in the wood trim appear intact, although requiring some preparation and painting.

Image 20: The tall windows in the sanctuary have been protected by the exterior storm windows, but should be watched carefully.

The church's windows are also in excellent condition thanks in part to the storm windows affixed to many of the exteriors, effectively protecting the recently conserved window sashes of the sanctuary. At the front facade, high inward-tilting 10-lite sashes sit within the wood trim and paneling, and appear to require the same preparation and painting required of the adjacent wood surfaces **[Image 19]**. The large sanctuary windows flank the east and west walls, and feature a pair of double-hung 6-over-6 lite sashes with 4-lite fixed sashes above each **[Image 20]**. Metal storm windows protect each, which have so far been a blessing to them. However, the wood windows should be carefully inspected annually for sudden signs of paint wear or glazing putty deterioration, as storm windows have a known tendency to 'cook' windows from the inside due to prolonged heat-buildup.

Similarly-configured double-hung windows sit in the gabled wing and porch, with 6-over-6 lite **[Image 21]** and 9-over-9 lite configurations **[Image 22]** and storm windows, too. The north elevation is home to five high windows by the eave and cornice **[Image 23]**. These double-hung wood windows are in excellent condition thanks to the unique wood storm 'replica' windows that protect the exterior. The exterior wood storm windows should be repainted in concert with the adjacent wood trim.

Image 21: 6-over-6 lite windows at the sanctuary.

Image 22: 9-over-9 lite windows at the sanctuary.

Lastly, a narrow foundation wall vent with wire mesh sits at the base of north elevation, and should be kept clear of debris and inspected annually to ensure it hasn't been damaged **[Image 24a]**. A narrow '*gablet*' attic louver sits high atop the north-most point of the roof, and should be inspected annually and repainted on an as-need basis. Although not part of the formal church sanctuary building, the basement windows at the rear elevation of the parish wing are deteriorated and require replacement as well **[Image 24b]**.

Recommendations

- Repaint wood doors or wood storm windows in concert with adjacent wood trim, as outlined in the prior section.
- Annually inspect and monitor wood windows protected by storm windows in case heat build-up causes accelerated deterioration.
- Monitor and keep-clear foundation vent.
- Annually inspect and repaint the north '*gablet*' attic louver as needed.
- Replace the rear (north) basement windows of the parish wing.

Image 23: These 6-over-6 lite wooden hung windows are protected by well-detailed exterior wood storm windows.

Image 24a: The foundation's lone vent should be kept clean and clear of debris.

Image 24b: Although part of the newer parish wing, the basement windows are in need of replacement.

ROOFING & RAINWATER MANAGEMENT

Observations

The church's roof was originally clad in slate, since replaced with asphalt shingles, which appear fairly new and in good condition **[Image 25]**. The nature of asphalt and its longevity requires that annual inspections and a records of its installation be kept in anticipation of its cyclical replacement every 25-30 years.

In areas where the roof is intersected by the cheek walls of the tower, base flashing should be replaced alongside the repairs made to the wood clapboard siding **[Image 26]**. This includes all sides of the tower, particularly the north (rear) elevation **[Image 27]**.

Image 25: The asphalt roof is a far-cry from original slate, but it in good condition, requiring replacement every 25-30 years.

Image 26: Base flashing, concealed behind the wooden clapboards should replaced during clapboard removal.

Image 27: Concealed base flashing extends around all sides of the tower base..

Wood gutters crown the building's cornice at the front elevation, with detailed profiles mitered delicately at interior and exterior corners **[Image 28]**. Given the condition and tendency for these wood gutters to deteriorate rapidly, copper gutters matching the size and profile of the wood gutters are an acceptable substitute for wood gutters and offer greater longevity. On either side of the front facade, a slight cornice return marks the transition of wood gutters at the front (south) elevation into aluminum gutters which run the remaining length of the eaves **[Image 29]**. The aluminum gutters are what is know as the K-type. While a practical approach to a gutter, their profile is not in keeping with the historic character of a wood gutter.

Downspouts on all elevations appear in good condition, and at the south and east elevation drain directly to grade or gravel **[Image 30]**. Downspouts on the north and west elevation drain to in-grade downspout boots, presumably to a dry-well **[Image 31]** and should be camera-inspected for blockages and cleaned.

Recommendations

- Annually inspect and maintain records of asphalt roof condition/installation.
- Replace base flashings where roof intersects tower cheek walls, in accordance with wood clapboard repairs.
- Replace the deteriorating wood gutters at the front facade with matching copper profiles. Annually inspect and clean all copper and aluminum gutters.
- Camera-inspect and clear in-grade downspout boots for blockages.

Image 28: An articulated return of the wooden gutter is in very good condition..

Image 29: The wood gutter terminates abruptly, transitioning into a modern aluminum gutter.

Image 30: Some downspouts drain directly to gravel.

Image 31: Other downspouts drain into sub-surface dry-wells.

CUPOLA

Observations

The church tower and cupola sit above the front entry and serve as the building's most striking feature from afar **[Image 32]**. It is clad in both patinated and painted copper according to the original drawings, as well as wood board siding and trim. The weathervane's decorative rooster, directional arrow, and cardinal letters are gilded in gold leaf, but are tired and muted. The gold should be re-gilded, and the iron mast be painted to inhibit rust **[Image 33]**. The underside of the dome's top as seen from within appears dry and intact **[Image 34]**.

The cupola's roof is a *faceted dome* with an octagonal base. The exterior surfaces of the dome's flat copper panels have received an elastomeric coating, likely to address leaking pinholes or worn metal. This coating was colored to give the impression of a faux-patination of copper that has aged 25+ years **[Image 35]**. However, the underside of the dome sheathing, seen from within, continues to show signs of leaking and is damp in many places **[Image 36]**. The coating has reached the end of its service life and the copper dome cladding should be replaced with the same ribbed configuration.

Image 32: The church tower and cupola are well-articulated, although in need of repair and refinishing.

Image 33: A gilded weathervane is faded and worn.

Image 34: The immediate underside of the dome's top appears dry to the touch on a rainy day.

Image 35: The dark patch shows the copper beneath the coating. Generally only one application of such coatings can be applied with any expectation of usefulness..

Image 36: Soaked sheathing at the base of the dome and lower are a sign of failed copper and flashings.

The octagonal *tholobate* on which the dome sits is paneled in wood and shows considerably worn paint **[Image 37]**. The wood itself appears intact and may only require minor repairs by epoxy consolidation or replacement. Here and at all other woodwork throughout the cupola, paint should be scrapped and the surfaces sanded and repainted. On rainy days and seen from within, the wood framing and sheathing are visibly damp **[Image 38]**. While the exterior wood panels themselves appear intact, the ledge at the dome's base requires new copper flashing and a drip edge to mitigate water intrusion. At the base of each corner, a small empty pedestal once supported decorative urns, seen on the original drawings and historic photos. Ideally, in a complete restoration, these urns might be replaced. However, there is good reason why observation from early photographs show that they were short lived, and were missing not long after the building was constructed. Anchoring these urns so that they can withstand wind is a definite challenge. For a similar restoration at First Parish Dorchester, a Colonial Revival church of about the same time era as Barnstable Unitarian, urns were reinstalled. An important difference in these projects, however, is that the Dorchester urns were still in storage and required only repair and robust new mounting detail. Replicating new urns is quite costly, and they are an ornamental feature that add an aesthetic flourish, so the decision to replace them is a intriguing preservation debate.

Image 37: Paint on the octagonal tholobate- upon which the dome site- is indicative of open joints for water to enter.

Image 38: Soaked framing on the interior of the dome's tholobate prove that water may enter unencumbered.

Image 39: Peeling paint on the columns require scraping, sanding, and new paint.

Image 40: For many years, the belfry was open with no louvers. These louvers are functional, allowing air to circulate, the bell to sound, and generally designed to keep the water out.

Image 41: Bird-netting on the interior louvers keeps out wayward critters.


Image 42: A deliberately-blank clockface faces the north, and a missing urn once sat on a square pedestal.


Image 43: Loose and deteriorated boards at the clock require repair and refastening.


Image 44: One lone casement window sits high in the clock level.

At the belfry level of the cupola, wood columns and trim along the cornice show peeling and chipped paint **[Image 39]**, and should be scraped and repainted accordingly. The eight louvers are constructed with steep wood blades painted black, and appear in generally good condition **[Image 40]**. The tightly-spaced blades are quite effective at preventing water intrusion to the tower interior. At the interior, a wire mesh acts as a bird-deterrent **[Image 41]**. The blades should be repainted, and at the sill of each louver the copper flashing should be replaced to mitigate water intrusion.

At the clock level below the belfry, paint on the wood trim and siding is consistently worn, and should be scraped and repainted **[Image 42]**. Once paint is removed, the condition of the wood trim can be evaluated and repaired - typically via a range of remedies based the extent of deterioration. The first level of repair is epoxy consolidation, the second level would be dutchman or pieced inserts of new wood, and the final level would be full replacement. Dutchman repair should be with stable, rot-resistant wood species, such as South American mahogany. The east, south, and west elevations each house a wood clockface, painted black. The north elevation is equipped with a white-painted 'blank' clock with only numerals. At the operating clocks, the hands, numerals, and minute markers are made of wood and gilded with gold leaf -- all worn and in need of re-gilding **[Image 43]**. Some wood boards at the clock surround have started to fall apart and should be refastened or replaced. The northwest corner facet of the clock level houses a small, inconspicuous casement window **[Image 44]**.

At the four corners of the clock level's base, small pedestals once supported decorative urns, seen on the original drawings and historic photos. Replica urns could be fabricated from GFRP (Glass Fiber Reinforced Polymer) and returned to the missing location **[Images 45-46]**. Upward facing surfaces on the tower are typically clad with sheet metal, which looks to be galvanized steel. The paint coating currently in place on these surfaces should be chemically stripped so that the metal condition can be fully evaluated for the presence of pin holes and/or wear. Some of this metal work may require replacement, and replacement would allow for improved water shedding details. For example, some of the metal is fastened with exposed fasteners (nails) that are rusting and are vulnerable to leaks. Concealed fastening cleats, drip edges, and increased slope profiles in new flashing installations will improve water shedding performance and hence, bring longevity to the repairs.

The wood clapboard siding at the cupola's square tower base is addressed in a prior section.

Image 45: Example of recently restored cupola at First Parish Dorchester, showing fabricated decorative urns.

Image 46: Example of fabricated (formerly missing) urn at First Parish Dorchester, MA.

Recommendations

- Re-gild the weathervane in gold leaf, and paint the iron mast to inhibit rust.
- Replace all copper panels on the faceted dome, and replace the copper flashing at the base with a drip.
- Scrape, prep, and paint all woodwork throughout the cupola. Re-nail loose pieces and tighten gaps by caulking and re-nailing. Repair or replace instances of deteriorated woodwork.
- Chemically strip the paint from metal flashing and evaluate. Selectively replace metal flashing, providing the water shedding performance.
- Consider reinstalling the missing urns at the dome and clock levels, matching historic photographs and drawings. An alternative to replication in turned wood or spun copper or fiberglass casting.
- Repaint the belfry louver fins and replace sill flashing.
- Repaint the operating clock faces and re-gild their hands, numerals, and markers in gold leaf.

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STRUCTURAL REPORT

The following pages comprise the structural report, containing observations and recommendations prepared by Nicholas (Cole) Bateman, PE of Coastal Engineering Company, Inc.

Cole's inspection was focused on viewing structural members that were available for assessment without requiring destruction of finishes. This included first floor framing via the basement, roof framing via the attic, and the tower and cupola framing via their interiors. Generally, all framing is in good condition, with some minor fastening and connection concerns in the tower. The report also warns of the inevitable deterioration of wood framing members in the tower if current active leaks are not repaired.

COASTAL
engineering co.

Spencer, Sullivan, & Vogt
Attn: Doug Manley
1 Thompson Square, Suite 504
Charlestown, MA 02129
VIA EMAIL: dmanley@ssvarchitects.com

Re: Structural Conditions Assessment Report
The Unitarian Church of Barnstable Steeple

Dear Mr. Manley,

Per your request and authorization, Coastal Engineering Company, Inc. (CEC) conducted an inspection and evaluation of the steeple structure at the historic Unitarian Church of Barnstable.

The purpose of the inspection and evaluation was to observe the conditions of the steeple, provide recommendations for repair or alterations, and estimate the remaining useful life of components.

In summary, CEC found that the facility is generally in good condition, though repairs and maintenance are recommended. Recommendations include replacing damaged or deteriorated elements, improving connections, and maintaining the building envelope. The expected remaining useful life of components, with no improvement, ranges from 5-25 years. However this can be increased to 75 or even 100 years if recommended repairs are made and routine inspections are performed.

Please let us know if you have any questions regarding this report, or if we can provide further assistance.

Sincerely,
Coastal Engineering Company, Inc.

COMMONWEALTH OF MASSACHUSETTS
KEVIN M. DONOVAN
STRUCTURAL
No. 48972
REGISTERED
PROFESSIONAL ENGINEER

1/8/2021

Cole Bateman

Kevin Donovan, P.E.
Senior Structural Engineer

Nicholas (Cole) Bateman, P.E.
Structural Project Engineer

Structural Conditions Assessment Report

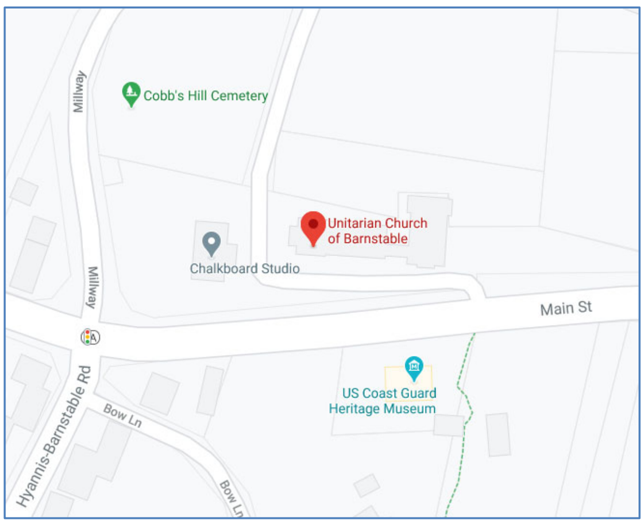
for

the Unitarian Church of Barnstable

with focus on

Steeple Structure

3330 Main Street,
Barnstable, MA



CEC Project No. C19542.00
January 8, 2021

Prepared by:

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260 Cranberry Highway
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(508) 255-6511

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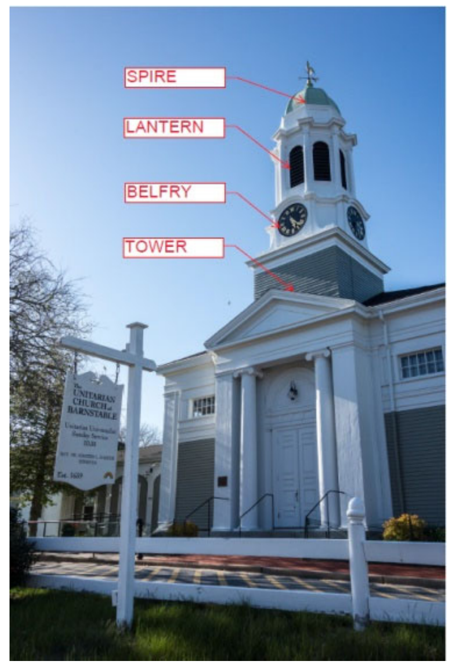
1.0 Introduction

The purpose of this assessment is to observe, document, and evaluate existing conditions within the steeple structure of the Unitarian Church of Barnstable and provide recommendations for repair or alterations as required to stabilize and preserve the historic structure.

Field work for the assessment occurred Tuesday, December 1, 2020 beginning approximately 10:00 a.m. The weather at the time of inspection was rainy with winds gusting from 15 to 20 miles per hour.

The day prior to the inspection, a wind and rain storm passed through the area, with gusts between 50 to 60 miles per hour.

1.1 Limits of Inspection



The inspection and evaluation of the structure have been conducted in accordance with the International Existing Building Code (IEBC), as amended by the Massachusetts 780 CMR Ninth Edition [referred to as "Building Code" throughout this report], which is an applicable reference standard for proposed work within existing structures.

Within the IEBC, Chapter 12 is dedicated to work on Historic Buildings. The scope of the Chapter covers repairs, fire safety, alterations, change of occupancy, and structural requirements. This report addresses the structural requirements and associated repairs for work within the historic structure.

The boundaries of the inspection were limited in plan to the perimeter of the steeple tower and steeple supports. The inspection was bounded vertically by the visible portions of the steeple foundation to the top of the spire.

The inspection was limited to those areas and components accessible and visible without destructive means within the interior of the steeple. Evaluation of the exterior façade of the steeple is not part of the project scope.

The inspection included observations for, and the documentation of:

- Structural member visible conditions
- Evidence of major overstressing of structural members
- Evidence of major deflections of structural members

- Visible deterioration or section loss
- Broken, damaged, or missing structural members
- Damage to building envelope components (as observable from interior of structure)
- Corrosion of metal components

The inspection did not include an exhaustive investigation of the structure, with sampling and testing of materials. Due to the indeterminable nature of, and limited access to, some structural components, it is not possible to assess every existing condition related to the condition of the structure. While every effort has been made to employ accumulated knowledge of historic wood-frame construction techniques and established engineering principles, it is beyond the scope of this investigation to provide an exhaustive assessment of every element. This report is therefore limited to conditions observed in the accessible areas investigated.

Furthermore, the investigation did not include a comprehensive structural analysis (determination of loads, member capacity, etc.) of the Church or steeple elements. The Building Code does not require mandatory upgrades to structural elements unless stress levels are increased due to alterations of space, (alterations of space are not proposed as part of this report), or if life-safety structural deficiencies are present (none of which were observed).

1.2 Background

The existing building is a Colonial Greek Revival style timber-framed church. According to the Massachusetts Cultural Resource Information System (MACRIS), a database recognized by the Massachusetts Historical Commission and the Secretary of the Commonwealth, the main church structure was constructed between 1905 and 1907. A parish house was added to the west side of the Church in 1960 and enlarged in 1980. See Appendix B: M.A.C.R.I.S. Historic Record for more information.

There are no known past inspection reports for the steeple structure to provide a comparison between the current conditions and past conditions. However, building plans are available. See Appendix C: Architectural Plans for select sheets of the provided plans. Based on these plans, it is suspected that the steeple was part of the original 1905-1907 construction.

Figure 2: Historic Photo of Church (MACRIS)

Both the main church structure and the 1960 addition pre-date the state Building Code. Work associated with the enlarging of the parish house in 1980 would have been subject to either the 3rd or 4th editions of the Building Code. Current Building is the 9th edition. For reference, the 9th edition calls for the following design parameters for new construction:

- The ground snow load is 30 pounds per square foot
- The minimum flat roof snow load (Pf) is 25 pounds per square foot
- The basic wind speed is 140 miles per hour (Vult)
- The short period seismic spectral response parameter (Ss) is 0.152
- The one-second period seismic spectral response parameter (S1) is 0.055

2.0 Existing Conditions

Within this report, observations of existing conditions have been classified as belonging to one of the following areas forming the steeple:

1. Steeple foundation
2. Tower framing
3. Belfry framing
4. Lantern framing
5. Spire framing

These areas are identified in Figure 1.

For the purpose of identifying direction in this report, the direction “south” is considered to be the direction from the main church toward Main Street. “North”, “east” and “west follow accordingly.

2.1 Steeple Foundation

The steeple foundation is comprised of large granite block perimeter walls along the south face and rubble piers within an internal crawlspace. The granite block perimeter walls were observed via the exterior while the internal piers were not accessible and are presumed to be present as shown on the Basement Plan (Appendix C: Architectural Plans).

2.2 Tower Framing

The tower (or lower part of the steeple) is located above the narthex. The tower was accessed through a pull down staircase on the mezzanine level within the sanctuary. Additional access, providing viewing of the north framing of the tower, was gained through an attic space above the sanctuary, which was accessible through a ceiling hatch within the second story school room on the north side of the Church. The tower is heavy-timber framed and square in shape in plan. The floor of the tower was covered with a metal pan base, likely installed to prevent water from passing into the space below. At the time of inspection, there were puddles of water at the base of the tower and some of the framing was wet, presumedly due to water infiltration from the prior day’s storm. The presence of a floor drain was not confirmed; however the water was well below the top of the metal pan, not near overflow. The floor framing was not accessible due to the pan.

The tower wall framing is comprised of four heavy-timber columns at the four corners of the tower. The columns likely extend continuously downward to the perimeter foundation walls and internal rubble piers within the crawlspace. The columns are braced with timber diagonal cross-braces. Purlins span vertically between the braces to support horizontal barn-board sheathing.

Within the square of the tower, sixteen rectangular columns are present, extending vertically from the base of the tower, positioned in an octagonal shape with two posts at each node of the octagon. The columns extend from the tower base to the top of the lantern/base of the spire. The columns are braced at the top of the tower/base of the belfry with timber blocks. These columns and braces make up the Main Wind Force Resisting System of the steeple.

2.3 Belfry Framing

The belfry is the level above the tower base. It houses the Church's analog clock assembly. There are clock faces on the east, west, and south faces. There is a window on the north face. The framing was accessed via a ladder in the tower. The geometry of the belfry is octagonal in plan, with the aforementioned sixteen columns extending from the tower base, forming the perimeter of the space.

Figure 3: Section Loss in Bracing Members

The belfry floor framing is comprised of timber floor joists supported by a perimeter spandrel beam at the top of the tower. The joists are decked with timber floor planks.

Figure 4: Deterioration at Bracing Node Points

The wall framing of the belfry is comprised of 2x4 stud perimeter curtain walls outboard of the sixteen perimeter columns. The curtain walls are sheathed with horizontal tongue and groove planks. Inboard of the curtain walls are the sixteen perimeter columns in the octagon formation. The perimeter columns are braced with vertical bays of diagonal timber cross-bracing that connect to the columns at regularly-spaced node points. Horizontal timber bracing members are also present and connect to the columns at the node points. Each bracing member is connected to a column with two to three toe nails. Some of the bracing members are pulling away from the node points. Additionally, some of the diagonal bracing members have section loss due to pest damage. The loss is generally between 25% and 50% of the original section area. Furthermore, some of the bracing members have deterioration at the node points.

2.4 Lantern Framing

The lantern is the level above the belfry and houses the antique bell. This area is also octagonal in plan. It is a partially open structure with screened louver panels on each of the eight sides. Horizontal slats of the louver panels pitch outward, however there was evidence of water present on the interior side of the panels. The floor of the lantern is covered with a waterproofing system that extends to the sills of the louver panels. There is a floor drain within the system with a pipe extending through the belfry space. The termination point of the drain was not confirmed. At the time of inspection, the floor was littered with sand and debris, and was very damp.

Figure 5: Spliced Lantern Columns (note color difference)

The floor of the lantern is comprised of tongue and groove planking, visible as the ceiling planks of the belfry. The lantern area's waterproofing system covers the tongue and groove planks.

The wall framing of the lantern is comprised of the sixteen continuous columns extending from the tower base to the top of the lantern. Some of the columns have been cut and spliced with newer pressure-treated columns of similar dimension, evidence of earlier repairs. The splice connection was concealed by the waterproofing system. The louvers are mounted directly to the sides of the columns. Above the louvers, is the walls contain a small section of horizontal barn board sheathing.

2.5 Spire Framing

The spire of the steeple is comprised of a copper dome structure atop timber framing. The spire is octagonal in plan at its base. The spire's framing consists of eight perimeter columns at the nodes of the octagon. Each column is aligned with a pair of the sixteen lower columns and is spliced to the pair with a vertical nailer. The eight columns are approximately four feet tall. At their tops they meet with internal timber framing of the copper dome. The eight columns are braced with diagonal timber cross-bracing and sheathed with horizontal barn board. At the interface between the copper dome and lower spire walls, moderate amounts of water and moisture were observed, the water making its way down to the tower base.

3.0 Evaluation and Assessment

Overall, the steeple structure is in good condition; however there are specific components that are in fair condition and require repair as outlined in each following steeple sections. Structural deficiencies requiring repair are moderate in severity, and while they do not significantly reduce the load bearing capacity of the steeple at this time, they should be addressed according to the recommendations and timeline presented in Section 4.0 below.

Additionally, it should be noted that water is infiltrating the steeple structure, primarily at the spire level. This water is causing deterioration in some of the structural bracing members. Recommendations associated with the water infiltration are included in the Section 4.0 recommendations below.

Currently, the remaining expected useful life of components, if no action is taken to implement the recommendations outlined in Section 4.0, is estimated to be between 5 years and 25 years, depending on the building component being considered. However, if the recommendations are implemented, and if routine inspections and maintenance are performed, useful life can increase dramatically, to 75 years, 100 years, or more.

3.1 Steeple Foundation

Due to the inaccessible nature of the internal rubble foundation piers, the condition of the foundation could not be directly assessed. However, evidence suggests that it is in good condition given the general squareness of the structure and its age. The exterior perimeter granite foundation at the steeple was accessible and was observed to be in good condition.

3.2 Tower Framing

Within the tower the framing is in good condition. All structural elements were observed to be sound.

As noted above, a pan is present at the floor level and was observed to contain water during the site visit. The water likely originates from the spire and ponds in the tower as it is the lowest floor of the steeple.

3.3 Belfry Framing

The belfry framing is in fair condition. All primary structural members are sound, however there are moderate-level defects and deterioration in the secondary bracing members as noted in Section 2.3:

- Pests and/or moisture have led to deterioration that has resulted in 25-50% section loss of some web and brace elements. These deteriorated elements should be replaced in kind.

- Some bracing members have pulled away from the perimeter columns, likely due to cyclical movement of the steeple from wind. These connections should be repaired and/or reinforced.

3.4 Lantern Framing

The lantern framing is in good to fair condition. All primary structural members are sound, however there are minor to moderate amounts of deterioration in some bracing members, likely due to recurring water infiltration from failed flashing interface between the dome and lantern. These members are not in need of replacement at this time; however, if water infiltration and the resulting bracing deterioration are allowed to persist, they will need to be replaced in the future. Action should be taken to arrest the water-infiltration as soon as practical.

3.5 Spire Framing

The spire framing is in good condition. All primary structural members are sound. However, the failed flashing at the interface between the dome and lantern (as noted above) leads to water infiltration that propagates throughout the steeple to the tower base, resulting in deterioration issues for the structural bracing members. Action should be taken to arrest the water-infiltration as soon as practical.

4.0 Recommendations

Recommendations are presented in three categories—immediate, short term, and long term—based on the level of urgency and magnitude of the undertaking.

Immediate recommendations are urgent and should be addressed as soon as possible. In the case of this investigation, the immediate recommendations are not associated with life-safety issues, but they are listed as "immediate" because lack of action can result in continued deterioration of structural components and/or other building damage.

Short term recommendations are less urgent than immediate recommendations, but should still be addressed as soon as practical. In the case of this investigation, (as with immediate recommendations), the short-term recommendations are not associated with life-safety issues, but they are listed as "short term" because lack of action can result in continued deterioration and/or failure of structural components.

Long term recommendations are listed to improve the structure's longevity. While these recommendations are less urgent, they should not be put off indefinitely. Generally speaking, the sooner the long term recommendations are implemented, the better the potential for the building to achieve an extended useful life.

The list of recommended repairs is presented in Table 1.

Structural Area	Immediate Recommendations	Short Term Recommendations	Long Term Recommendations
Belfry		Replace damaged and deteriorated bracing members in kind. Reinforce connections of bracing that have pulled away from column and/or other bracing members. Install ¾" plywood gusset plates with structural screws.	
Lantern	Clean out and maintain floor drains to prevent water backup.	Trace path of floor drain to ensure no leaks and discharge away from building.	
Spire	Monitor steeple framing after wind-driven rains. Provide mobile ventilation fans to dry space as needed.	Temporarily seal base of copper dome to prevent water infiltration.	Remove and replace copper dome and flashing to make the spire and its connection to lantern water-tight.

Table 1: Recommended Repairs

Prior to the removal or detachment of any structural components, temporary shoring must be installed to ensure the soundness and stability of the steeple during repair efforts. Responsibility for developing and installing temporary shoring typically belongs to 1the contractor performing the repairs.

In addition to recommendations noted in the table above, it is recommended that a routine structural inspection, similar in nature to that described in this report, be performed every five years until short term recommendations are made, and every ten years thereafter, (or sooner if there is a specific concern arising out of storm damage or other observed damage).

5.0 Appendix

Appendix A: Photos 12/01/2020

Photo 1: Front Elevation

Photo 2: Brace Connection

Photo 3: Tower Framing

Photo 4: Pest Damage

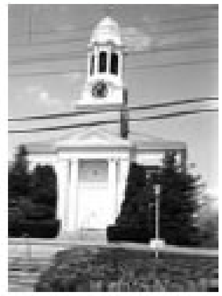
Photo 5: Evidence of Moisture

Photo 6: Debris in Belfry

Appendix B: M.A.C.R.I.S. Historic Record

Massachusetts Cultural Resource Information System

Scanned Record Cover Page



Inventory No:	BRN.80
Historic Name:	Unitarian Church of Barnstable
Common Name:	
Address:	3330 Main St
City/Town:	Barnstable
Village/Neighborhood:	Barnstable Village
Local No:	89
Year Constructed:	r 1906
Architect(s):	Lowell, Guy
Architectural Style(s):	Colonial Revival
Use(s):	Church
Significance:	Architecture; Religion
Area(s):	BRN.M: Old King's Highway Historic District BRN.N: Barnstable Multiple Resource Area BRN.O: Old King's Highway Regional Historic District BRN.R: Cobb's Hill
Designation(s):	Local Historic District (05/01/1973); Nat'l Register MRA (03/13/1987); Nat'l Register District (03/13/1987); Preservation Restriction (01/22/2009)
Building Materials(s):	Wall: Wood; Wood Clapboard

The Massachusetts Historical Commission (MHC) has converted this paper record to digital format as part of ongoing projects to scan records of the Inventory of Historic Assets of the Commonwealth and National Register of Historic Places nominations for Massachusetts. Efforts are ongoing and not all inventory or National Register records related to this resource may be available in digital format at this time.

The MACRIS database and scanned files are highly dynamic; new information is added daily and both database records and related scanned files may be updated as new information is incorporated into MHC files. Users should note that there may be a considerable lag time between the receipt of new or updated records by MHC and the appearance of related information in MACRIS. Users should also note that not all source materials for the MACRIS database are made available as scanned images. Users may consult the records, files and maps available in MHC's public research area at its offices at the State Archives Building, 220 Morrissey Boulevard, Boston, open M-F, 9-5.

Users of this digital material acknowledge that they have read and understood the MACRIS Information and Disclaimer (http://mhc-macris.net/macrisdisclaimer.htm)

Data available via the MACRIS web interface, and associated scanned files are for information purposes only. THE ACT OF CHECKING THIS DATABASE AND ASSOCIATED SCANNED FILES DOES NOT SUBSTITUTE FOR COMPLIANCE WITH APPLICABLE LOCAL, STATE OR FEDERAL LAWS AND REGULATIONS. IF YOU ARE REPRESENTING A DEVELOPER AND/OR A PROPOSED PROJECT THAT WILL REQUIRE A PERMIT, LICENSE OR FUNDING FROM ANY STATE OR FEDERAL AGENCY YOU MUST SUBMIT A PROJECT NOTIFICATION FORM TO MHC FOR MHC'S REVIEW AND COMMENT. You can obtain a copy of a PNF through the MHC web site (www.sec.state.ma.us/mhc) under the subject heading "MHC Forms."

Commonwealth of Massachusetts
Massachusetts Historical Commission
220 Morrissey Boulevard, Boston, Massachusetts 02125
www.sec.state.ma.us/mhc

This file was accessed on: Wednesday, December 30, 2020 at 1:06: PM

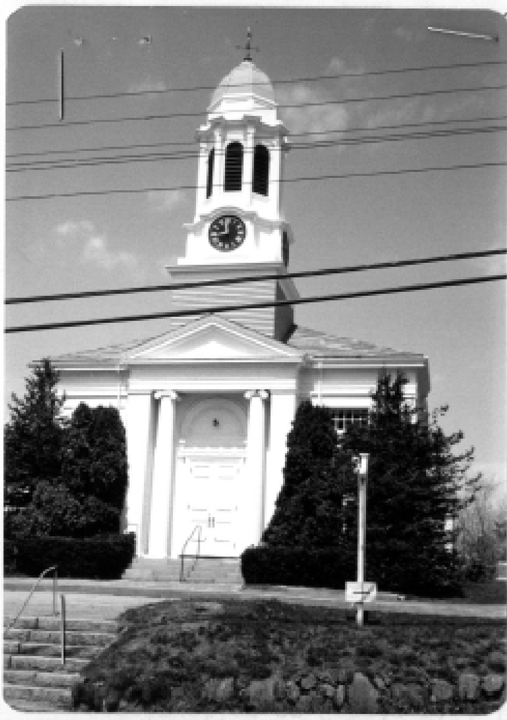
BRN.80 LHD-5/1/73 MRA-D-3/13/07

FORM B - BUILDING

Area	Form no.
M, R, N, O ~~BVC~~	~~89~~ 80

PR- 11/22/09

PR-Barn. Vill



ON
02108

Town Barnstable (Cobb's Hill)

#3350 2330 (PR 11/22/09)

Address Main St. (Rte 6A), Barnstable

Historic Name The Unitarian Church of Barnstable

Use: Original church

Present church

Ownership: ☐ Private individual
Private organization
The Unitarian Church
Public

Original owner The Unitarian Church

DESCRIPTION:

Date 1905 - 1907

Source The Unitarian Church, Our Heritage of Faith, 1976.

Style Col. ~~Greek Revival~~

Architect Guy Lowell

Exterior wall fabric wood clapboard

Outbuildings

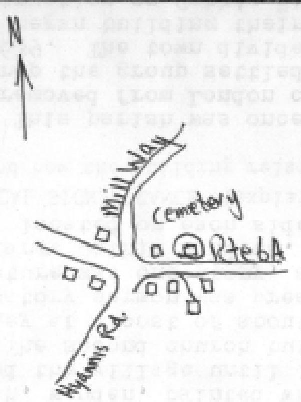
Major alterations (with dates)

Parish House added 1960

Parish House enlarged 1980

Moved Date

Approx. acreage 1.32a



Recorded by Patricia J. Anderson

Organization Barnstable Historical Commission

Date April 1981

Setting Residential - set on hill overlooking Barnstable Harbor and Cape Cod Bay

(Staple additional sheets [illegible]e)

BRN 80

ARCHITECTURAL SIGNIFICANCE (describe important architectural features and evaluate in terms of other buildings within community)

The first East Precinct church was a two-story colonial structure where community affairs were held as well as Sunday services. This church, wooden, painted white, with its simple but graceful architecture, served the village until it was taken down in 1835.

The second church building, constructed in 1836 by Capt. Joseph Bursley at a cost of about $4,600, was dedicated Dec. 28, 1836. The dedicatory sermon was preached by Rev. Dr. Kendall of Plymouth. The structure was one-story, about 65 ft. by 70 ft. with 22 ft. posts and had large Gothic windows. The church contained 70 closed pews and two open, located on each side of the pulpit, and a gallery across the Cont.

HISTORICAL SIGNIFICANCE (explain the role owners played in local or state history and how the building relates to the development of the community)

This parish was once part of the first Congregational church which had removed from London c1634. Under the leadership of Rev. John Lothrop the group settled first in Scituate and later came to Barnstable in 1639. The town divided into East and West Precincts in 1717 and each began building their own meeting houses. The East Parish began construction on Cobb's Hill land which had been acquired by 24 men from the east end of town. The 24 builders included men from the families of Cobb, Davis, Lothrop, Gorham, Dimock, Lewes, Lumbert, Hodsdon, Green, Bacon and Sturgis. All were instrumental in the early history of Barnstable and have many descendants living today. The Rev. Joseph Green was the first minister in the East Precinct of Barnstable, serving from 1725 until his death in 1770.

About 1825, due to theological controversy, there was a change in the church from that of traditional Congregationalist to the new Unitarian movement. A new meeting house which had been built on the same site in 1876 was destroyed by fire on Jan. 15, 1907. The present church was constructed between 1905 and 1907. On July 2, 1907 the dedication took place with Dr. Samuel A. Eliot, president of the American Unitarian Association giving the address.

In 1936 the church became legally known as the Unitarian Congregational Society in Barnstable Village and finally in 1965 again by legislative action, the present designation as The Unitarian Church of Barnstable became a reality.

BIBLIOGRAPHY and/or REFERENCES

Trayser, Donald G., Barnstable - Three Centuries of A Cape Cod Town, 1939.
Vuilleumier, Marion, Churches on Cape Cod, 1974.
The Unitarian Church, Our Heritage of Faith, 1976.

20M-2/80

BRN 80

INVENTORY FORM CONTINUATION SHEET

MASSACHUSETTS HISTORICAL COMMISSION
Office of the Secretary, Boston

Community: Barnstable (Cobb's Hill)	Form No: C-89
Property Name: The Unitarian Church	

Indicate each item on inventory form which is being continued below.

Architectural Sig. Cont.

front for the choir.

The present church edifice was designed by Guy Lowell, the distinguished architect of the Boston Museum of Fine Arts. The interior of this Greek Revival structure bears some similarity to the earlier church. The raised pulpit, with stairs at each side, is the focal point upon entering the main door which is flanked by two large columns. Inside the entry there are four columns with ornate capitals. There are nine pews on each side of the center aisle and two smaller pews in the front. The choir is now seated in the back of the church above the entry. The parish house, designed by Richard Sears Gallagher, was completed and dedicated in 1960. A new addition to the parish house was completed c1980.

Staple to Inventory form at bottom

BRN 80

INVENTORY FORM CONTINUATION SHEET

Town: Barnstable
Property Address: Main St

Area(s): BRN
Form No.: 80

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

BUILDING INSPECTION DEPARTMENT—DISTRICT POLICE
PLAN RECORD

CASE B RACK 2 APART. 25 NO. 5865

BUILDING Unitarian Church STORIES 1B

CITY OR TOWN Barnstable STREET

TO BE USED FOR Religious Purposes CLASS Church

OWNER Unitarian Society Wood

ARCHITECT Guy Lowell

CERTIFICATE APPROVAL—SPECIFICATION REQUIREMENTS—REFERRED

DATE Jan 12/06

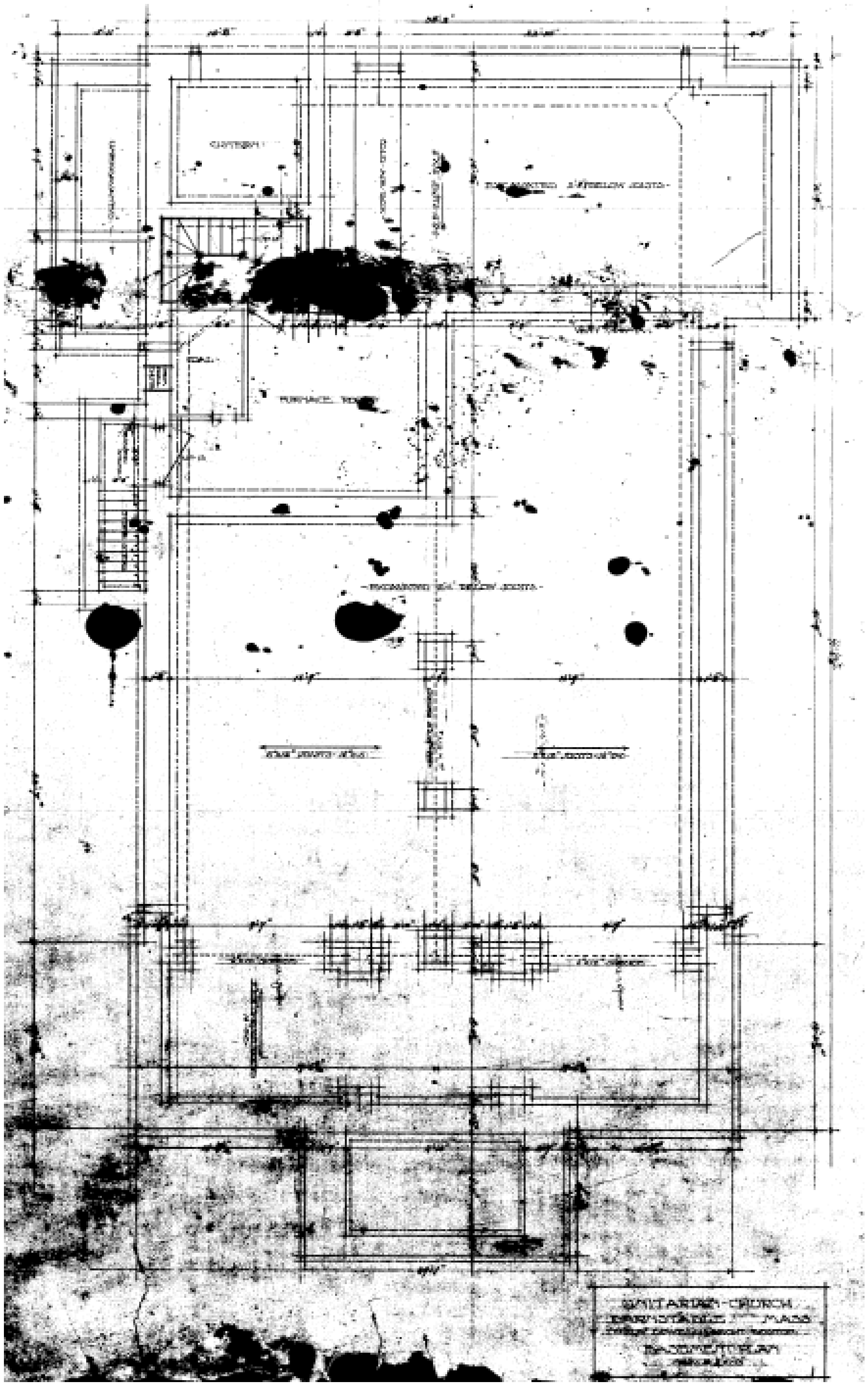
INSPECTOR Brown

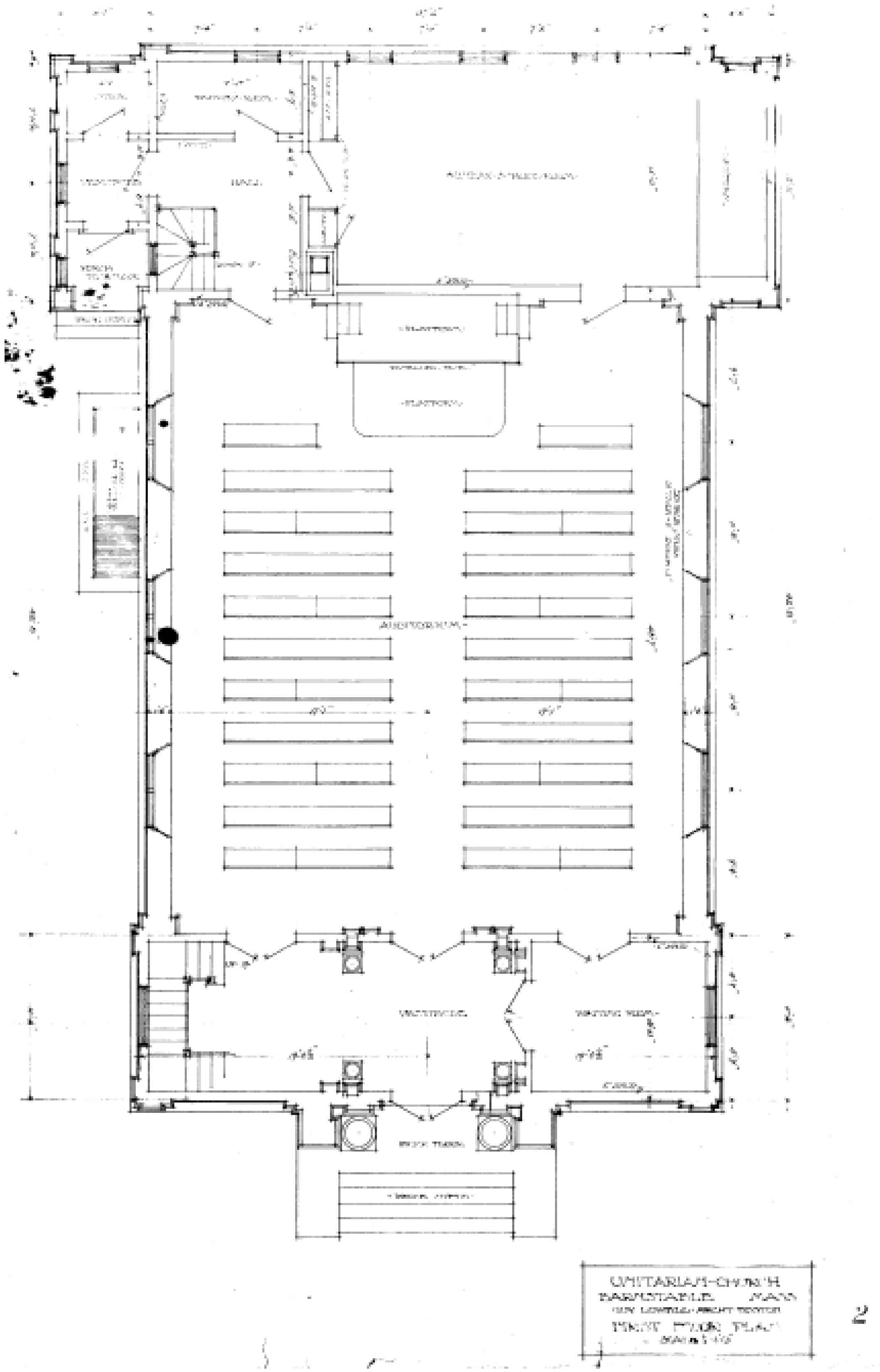
FORM 41. 10,000.

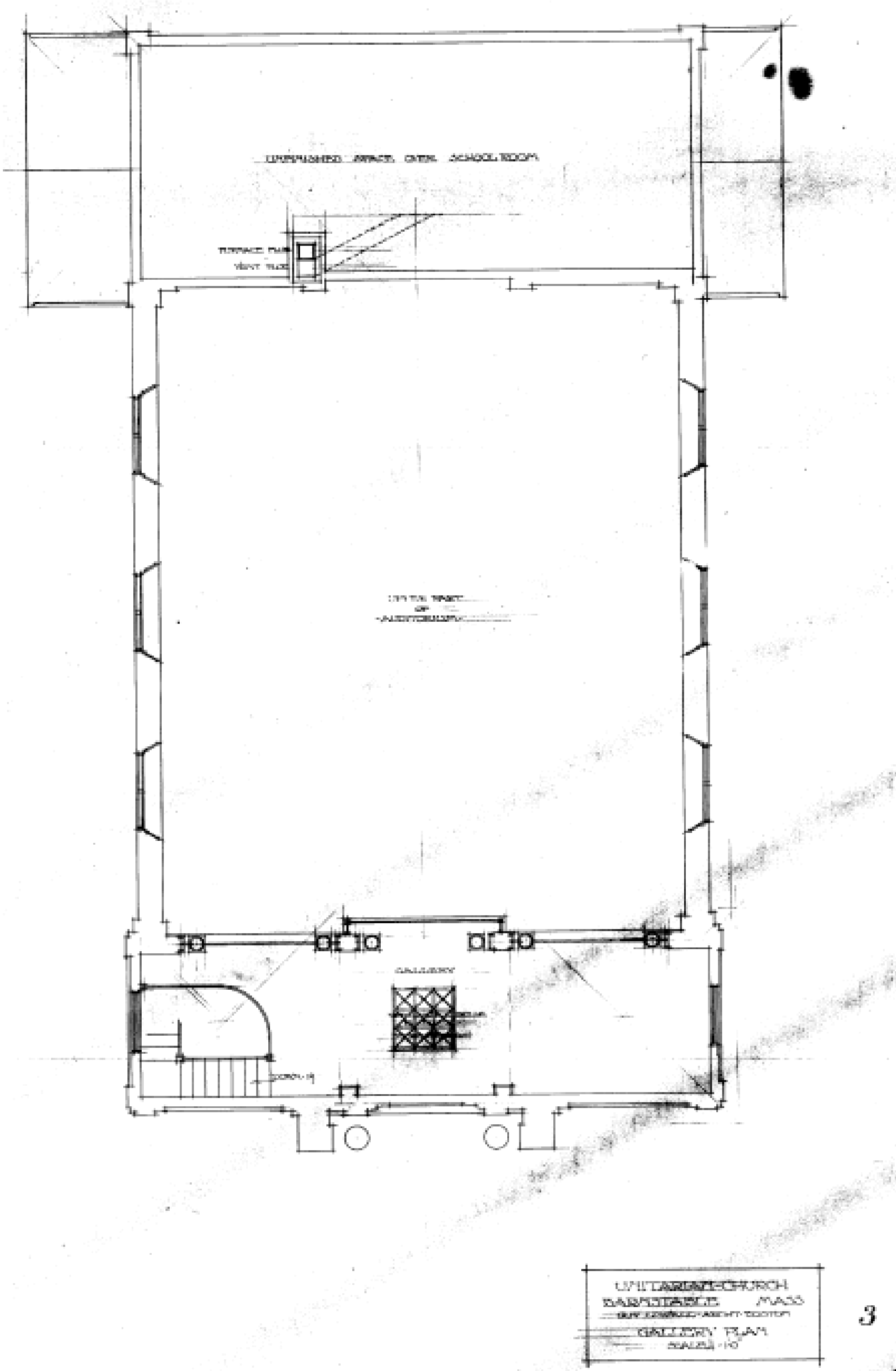
1/95

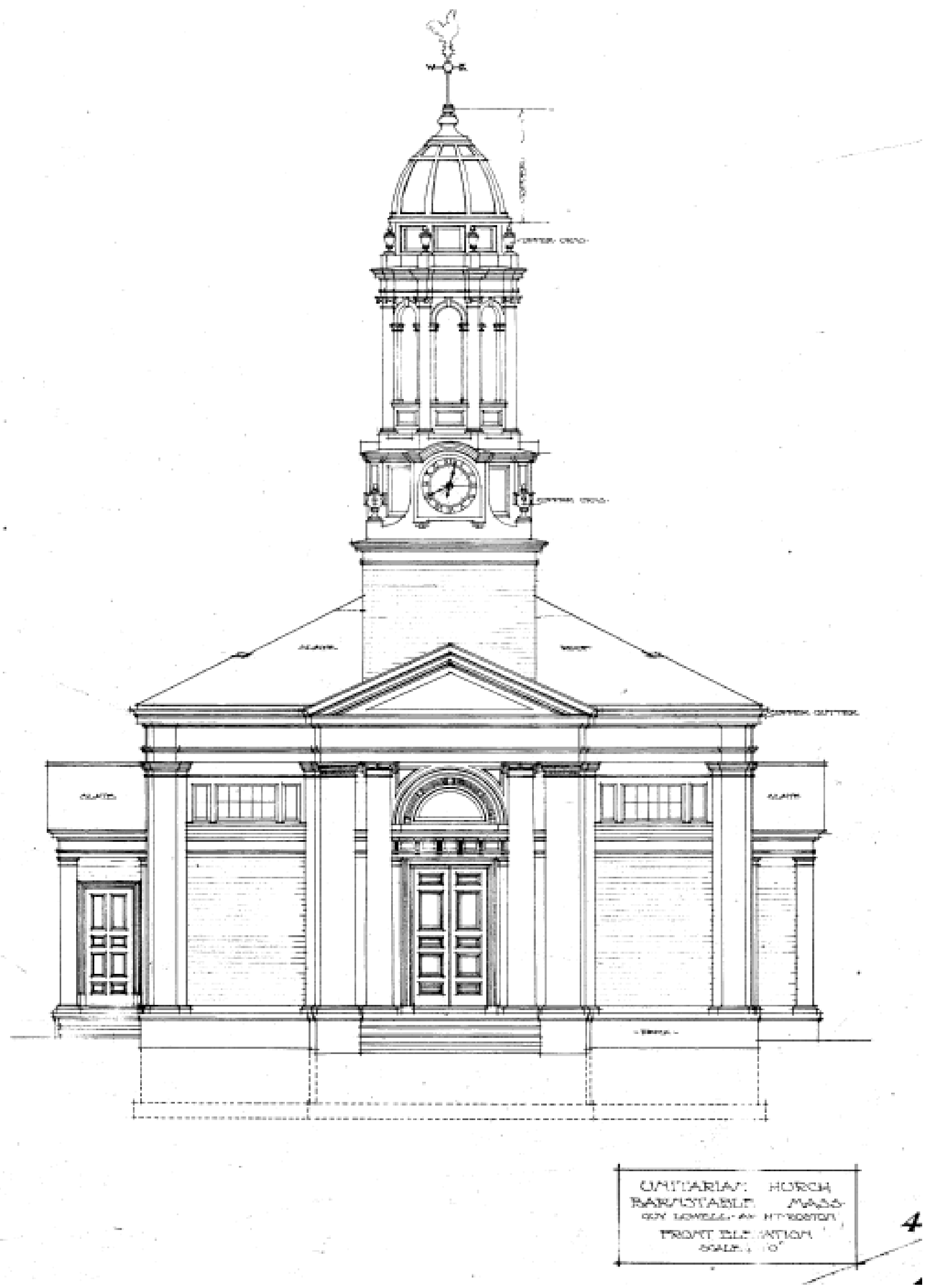
Appendix C: Architectural Plans

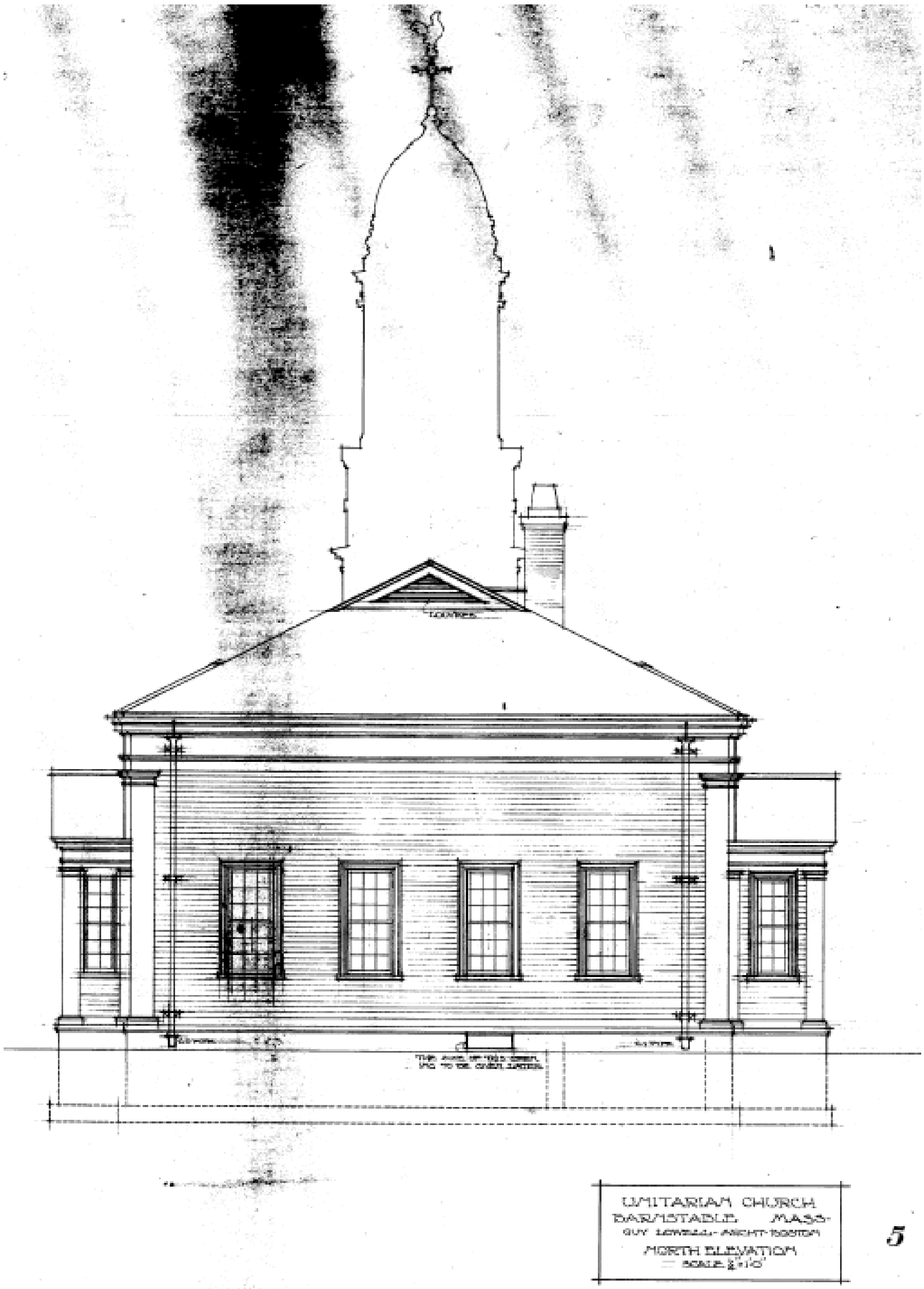
Note: Plans are not to scale.



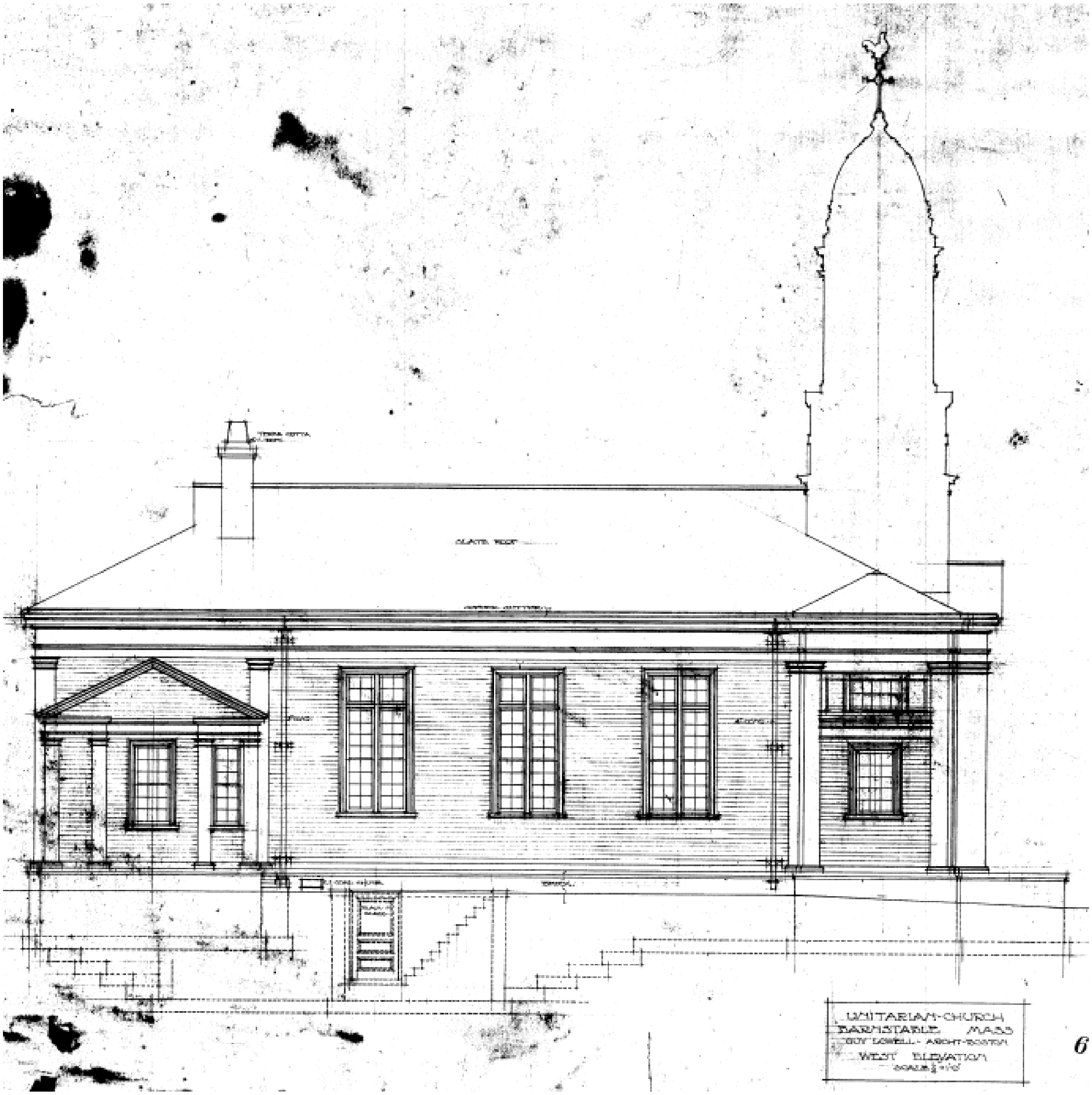

AUDITORIUM
VESTIBULE
UNITARIAN-CHURCH
BARNSTABLE MASS
FIRST FLOOR PLAN
2

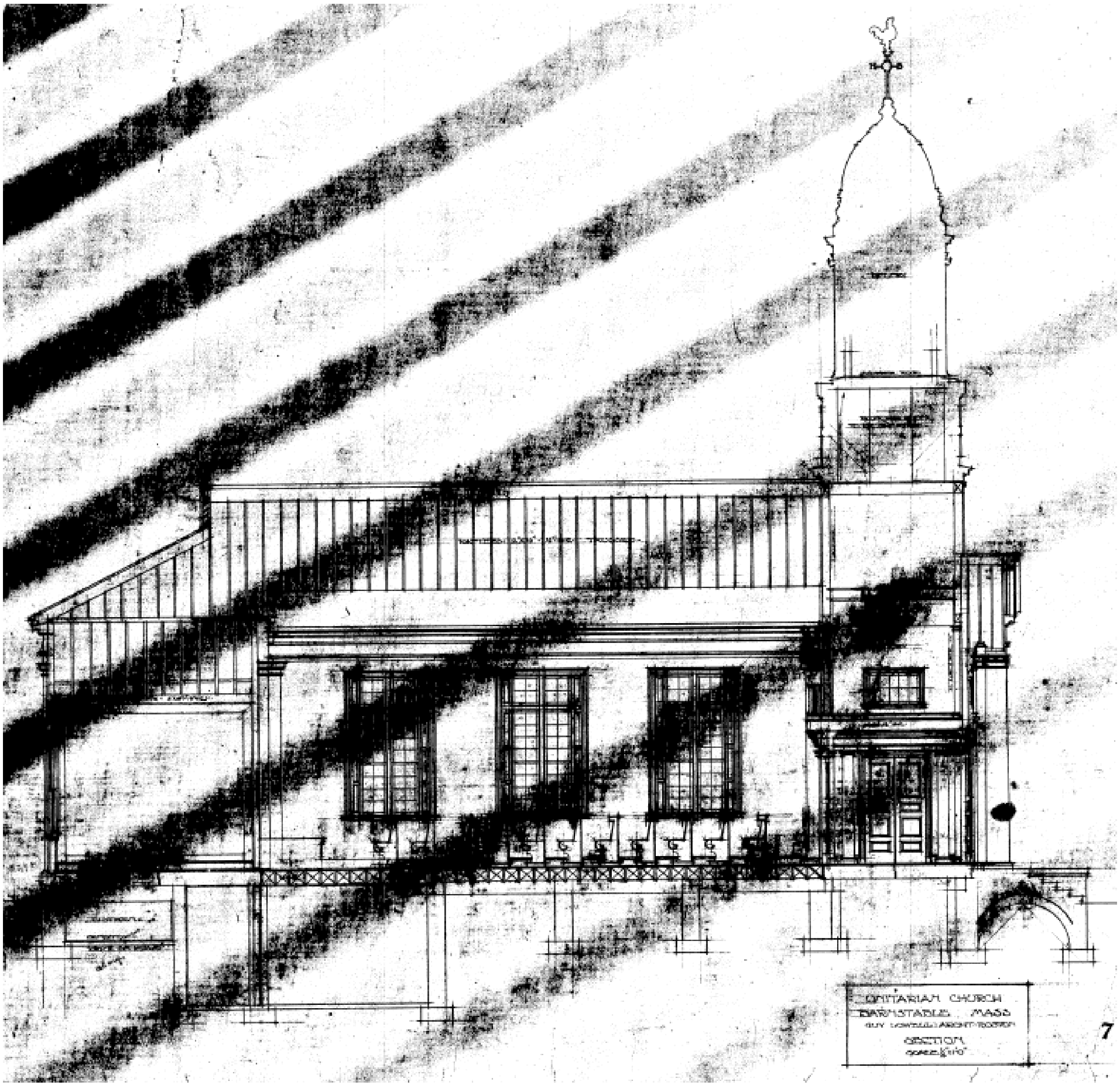

UNFINISHED SPACE OVER SCHOOL ROOM
GALLERY
UNITARIAN CHURCH
BARNSTABLE MASS
GALLERY PLAN
3

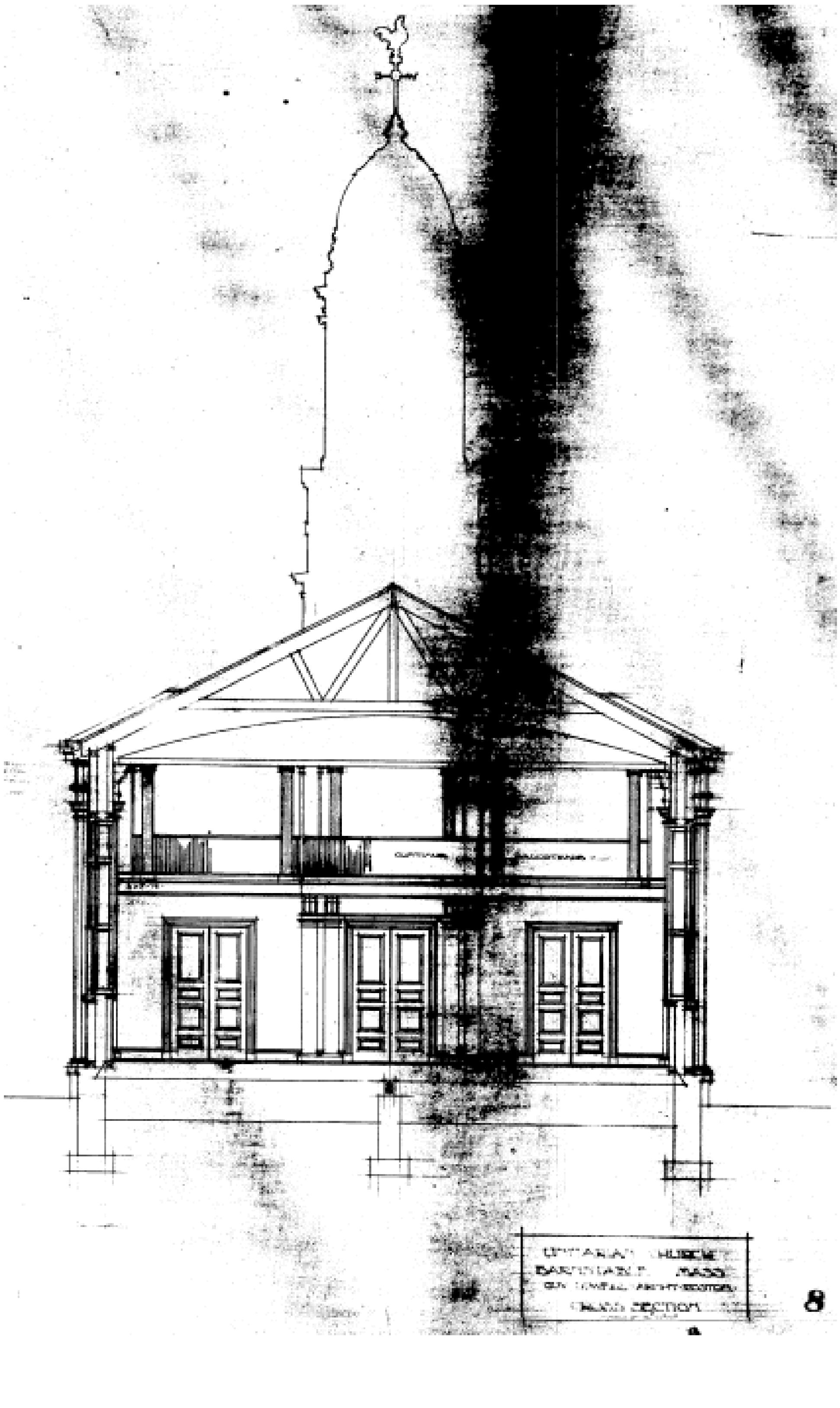

UNITARIAN
BARNSTABLE MASS
FRONT
4


UNITARIAN CHURCH
BARNSTABLE MASS.
GUY LOWELL - ARCHT - BOSTON
NORTH ELEVATION
SCALE ⅛" = 1'-0"

5


UNITARIAN-CHURCH
BARNSTABLE MASS
WEST ELEVATION
6


UNITARIAN CHURCH
BARNSTABLE . MASS
SECTION
7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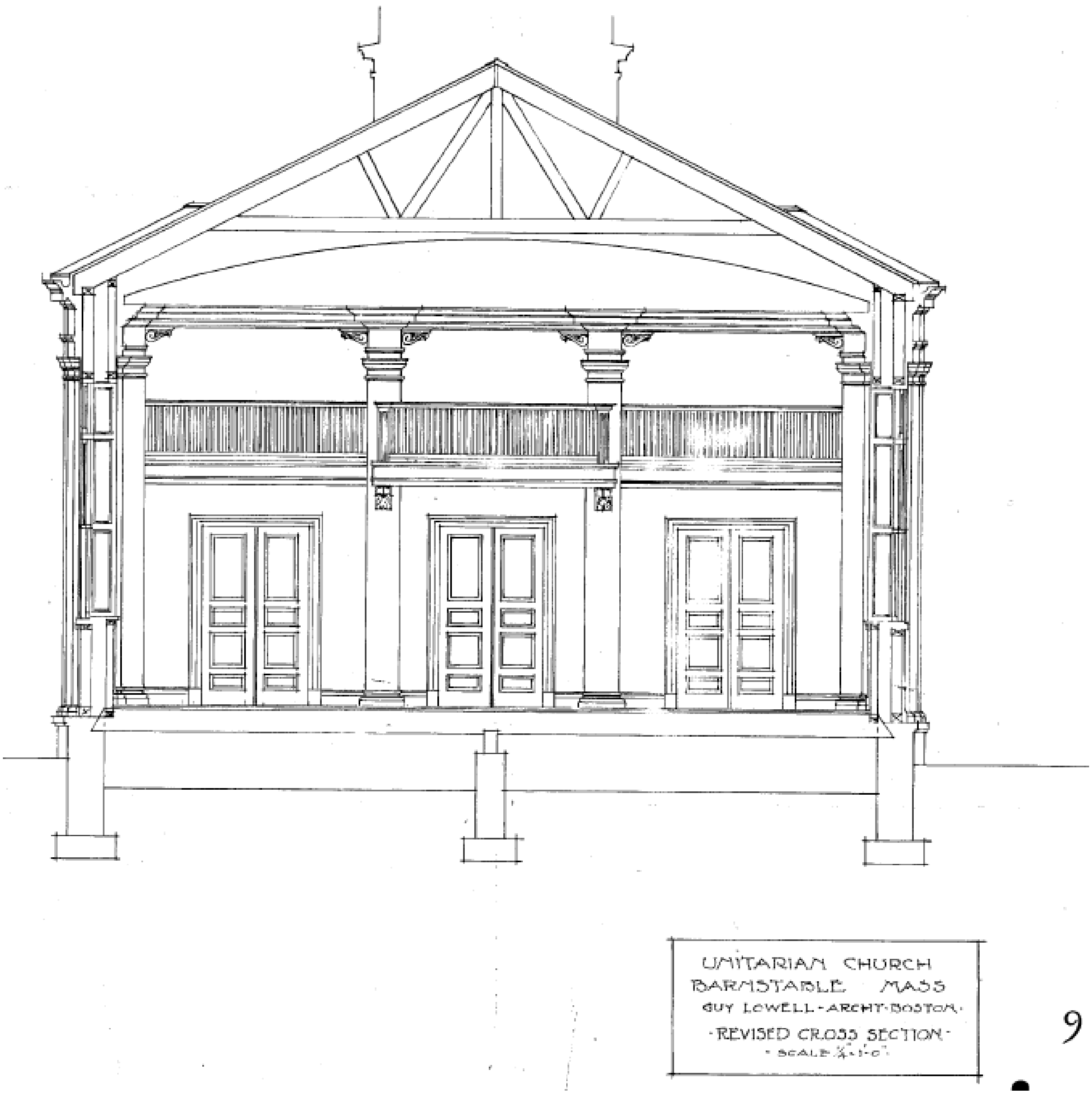
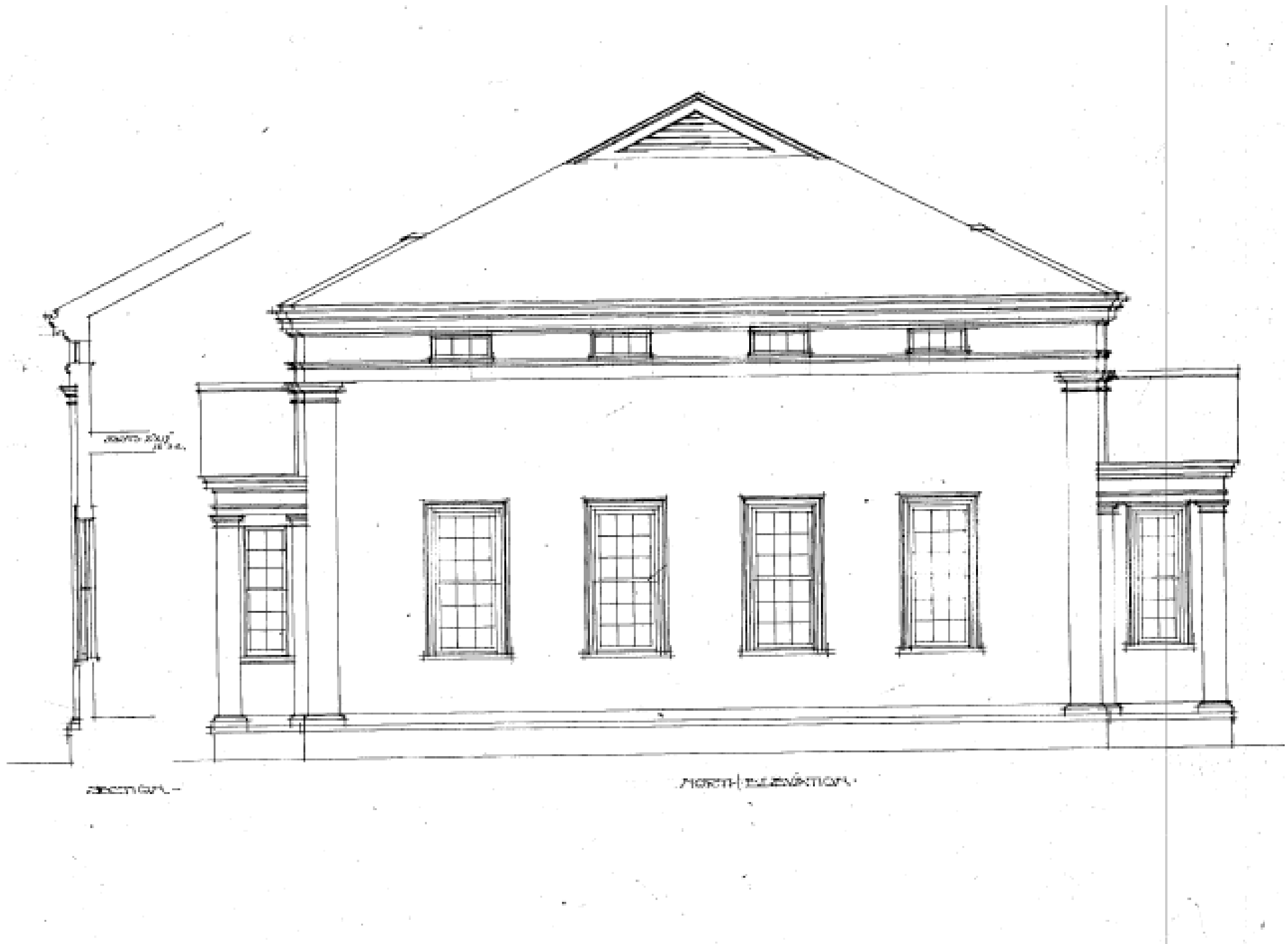
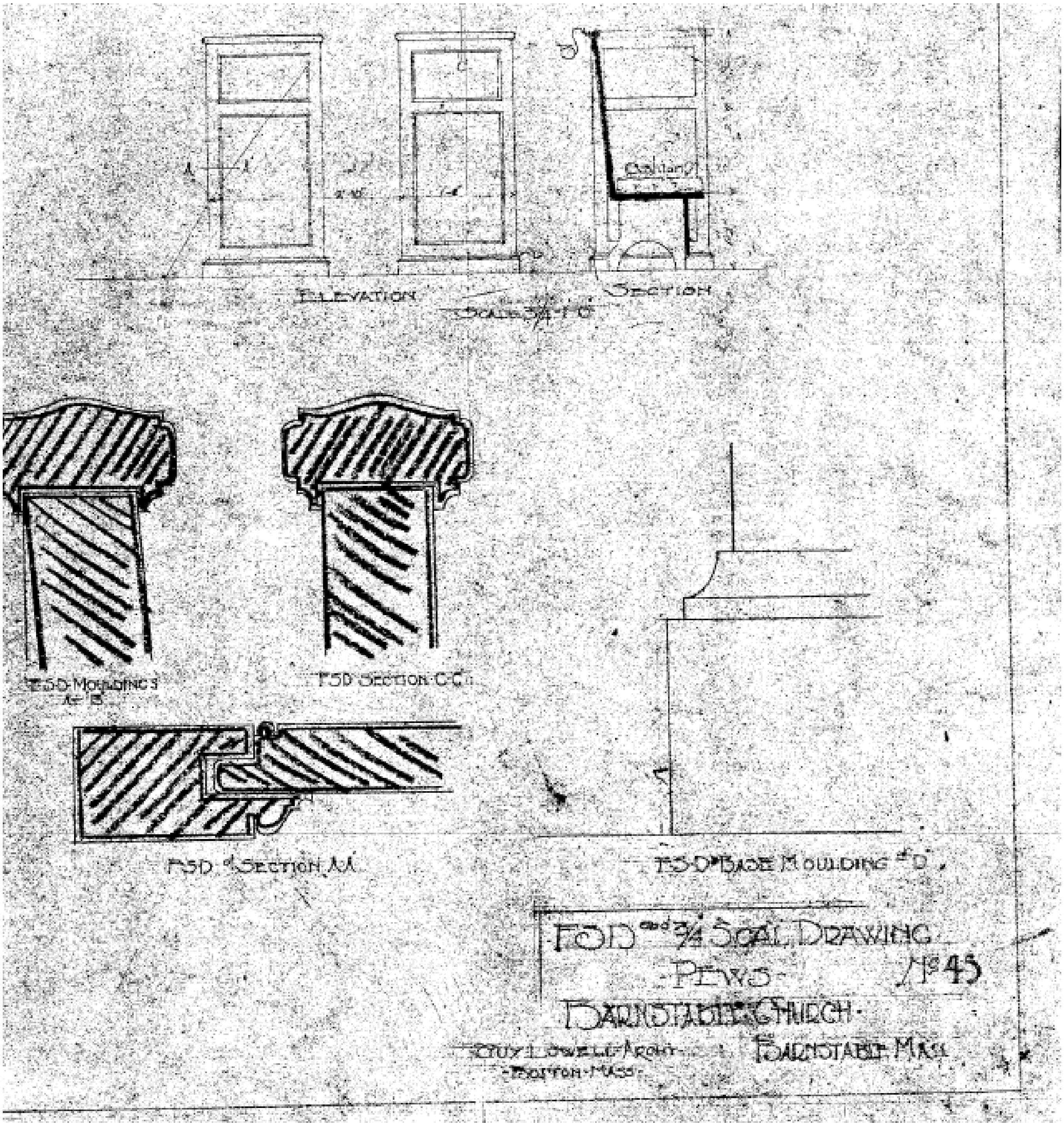
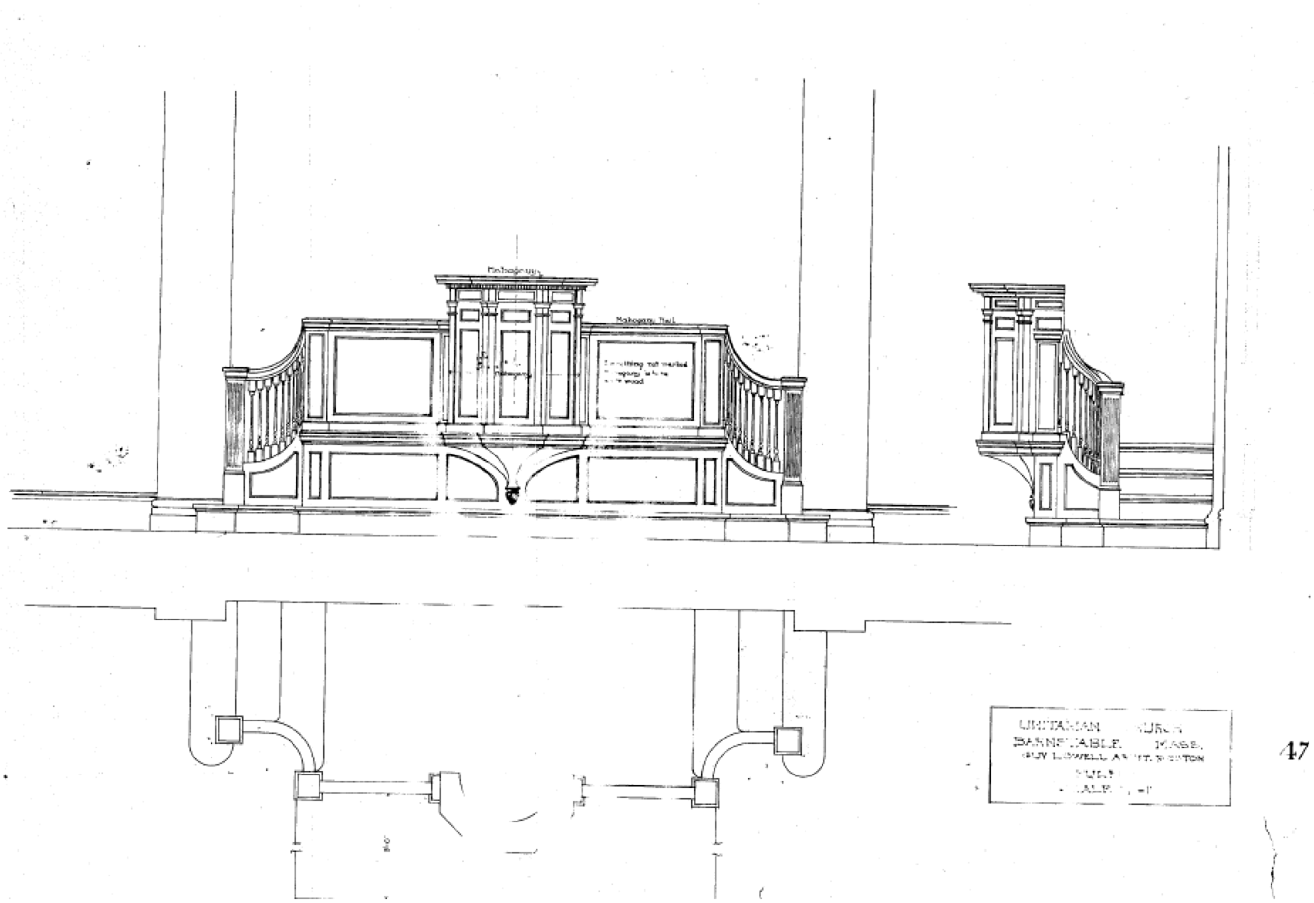

UNITARIAN CHURCH
BARNSTABLE MASS
GUY LOWELL - ARCHT - BOSTON -
- REVISED CROSS SECTION -
9


SECTION
NORTH ELEVATION


ELEVATION
SECTION
SCALE 3/4"-1'-0"
F.S.D. MOULDING'S' AT 'B'
F.S.D. SECTION C-C
F.S.D. of SECTION A.A.
F.S.D. BASE MOULDING "D"
F.S.D. and 3/4 SCAL DRAWING
-PEWS-
No 45
BARNSTABLE CHURCH
GUY LOWELL ARCHT
BOSTON MASS
BARNSTABLE MASS


MASS.
47

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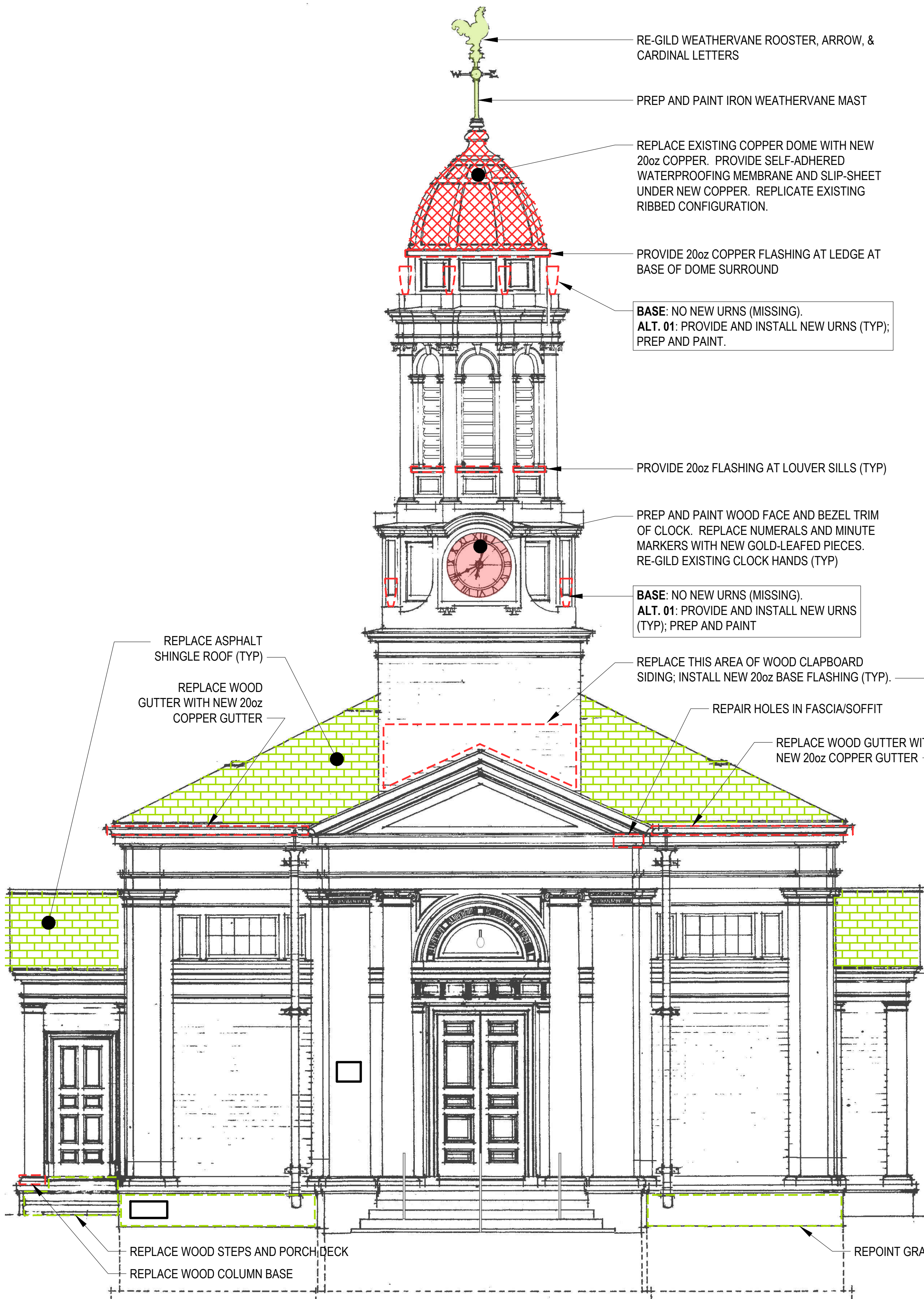
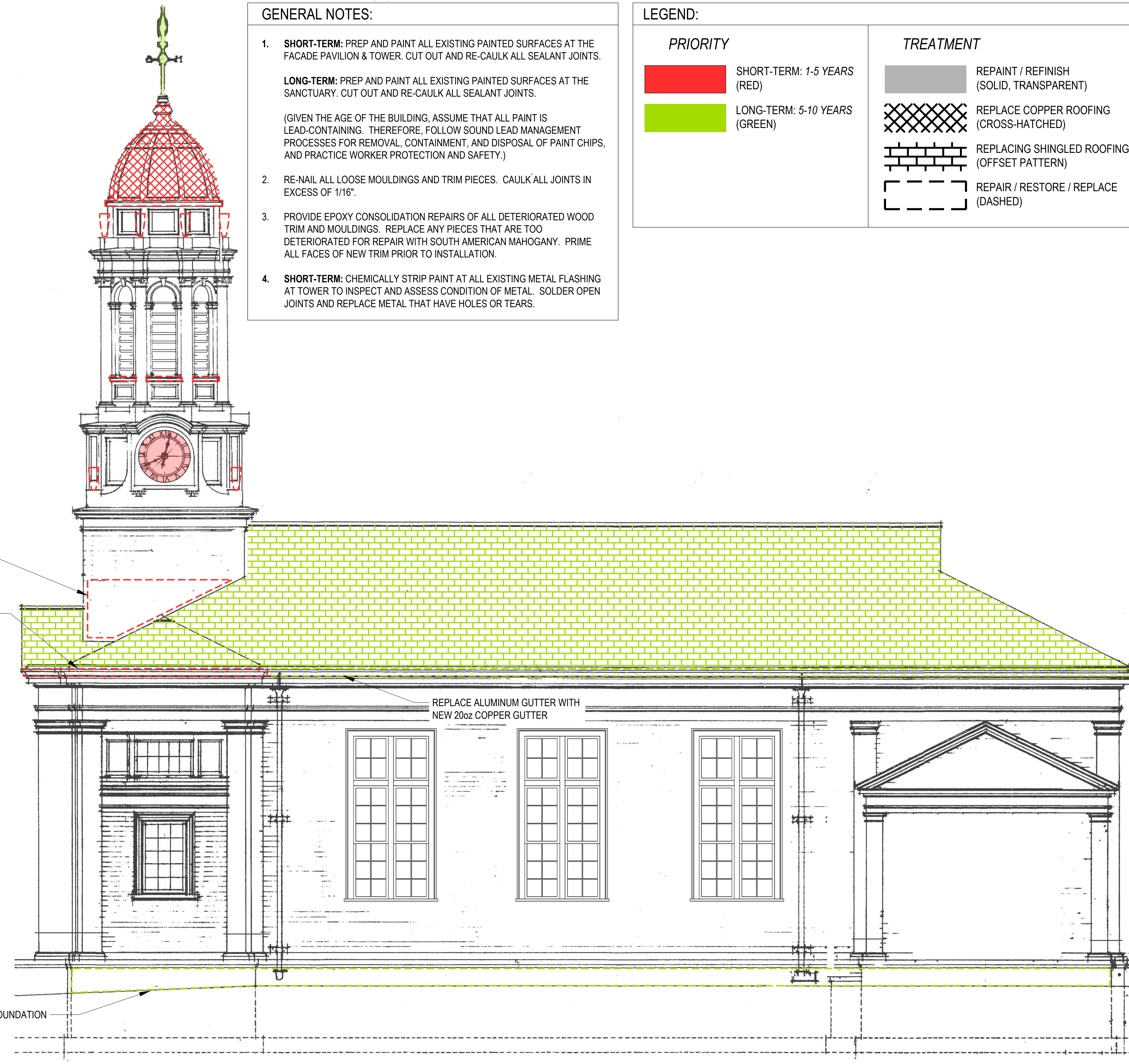
PRIORITIZED TREATMENT DRAWINGS & OUTLINE SPECIFICATION

The following pages contain prioritized treatment drawings for each elevation of the church. A legend on each page identifies the color-coding and symbology used to denote priorities and recommended treatments. In addition, an outline specification for the identified work is provided.



01 SOUTH ELEVATION
1/8" = 1'-0"



02 EAST ELEVATION
1/8" = 1'-0"

GENERAL NOTES:

1. **SHORT-TERM:** PREP AND PAINT ALL EXISTING PAINTED SURFACES AT THE FACADE PAVILION & TOWER. CUT OUT AND RE-CAULK ALL SEALANT JOINTS.

   LONG-TERM: PREP AND PAINT ALL EXISTING PAINTED SURFACES AT THE SANCTUARY. CUT OUT AND RE-CAULK ALL SEALANT JOINTS.

   (GIVEN THE AGE OF THE BUILDING, ASSUME THAT ALL PAINT IS LEAD-CONTAINING. THEREFORE, FOLLOW SOUND LEAD MANAGEMENT PROCESSES FOR REMOVAL, CONTAINMENT, AND DISPOSAL OF PAINT CHIPS, AND PRACTICE WORKER PROTECTION AND SAFETY.)

2. RE-NAIL ALL LOOSE MOULDINGS AND TRIM PIECES. CAULK ALL JOINTS IN EXCESS OF 1/16".

3. PROVIDE EPOXY CONSOLIDATION REPAIRS OF ALL DETERIORATED WOOD TRIM AND MOULDINGS. REPLACE ANY PIECES THAT ARE TOO DETERIORATED FOR REPAIR WITH SOUTH AMERICAN MAHOGANY. PRIME ALL FACES OF NEW TRIM PRIOR TO INSTALLATION.

4. **SHORT-TERM:** CHEMICALLY STRIP PAINT AT ALL EXISTING METAL FLASHING AT TOWER TO INSPECT AND ASSESS CONDITION OF METAL. SOLDER OPEN JOINTS AND REPLACE METAL THAT HAVE HOLES OR TEARS.

LEGEND:

PRIORITY

- SHORT-TERM: *1-5 YEARS* (RED)
- LONG-TERM: *5-10 YEARS* (GREEN)

TREATMENT

- REPAINT / REFINISH (SOLID, TRANSPARENT)
- REPLACE COPPER ROOFING (CROSS-HATCHED)
- REPLACING SHINGLED ROOFING (OFFSET PATTERN)
- REPAIR / RESTORE / REPLACE (DASHED)

ARCHITECT:	OWNER:	PROJECT:	ISSUE DATE:	SHEET TITLE:	SHEET #:
Spencer, Sullivan & Vogt ARCHITECTURE • PRESERVATION	BARNSTABLE UNITARIAN CHURCH 3330 MAIN STREET BARNSTABLE, MA 02630	BARNSTABLE UNITARIAN CHURCH CONDITIONS ASSESSMENT	Feb. 23, 2021 PROJECT #: 2037	CONDITIONS ASSESSMENT DRAWINGS: SOUTH + EAST ELEVATIONS	A-01

GENERAL NOTES:

1. **SHORT-TERM:** PREP AND PAINT ALL EXISTING PAINTED SURFACES AT THE FACADE PAVILION & TOWER. CUT OUT AND RE-CAULK ALL SEALANT JOINTS.

   LONG-TERM: PREP AND PAINT ALL EXISTING PAINTED SURFACES AT THE SANCTUARY. CUT OUT AND RE-CAULK ALL SEALANT JOINTS.

   (GIVEN THE AGE OF THE BUILDING, ASSUME THAT ALL PAINT IS LEAD-CONTAINING. THEREFORE, FOLLOW SOUND LEAD MANAGEMENT PROCESSES FOR REMOVAL, CONTAINMENT, AND DISPOSAL OF PAINT CHIPS, AND PRACTICE WORKER PROTECTION AND SAFETY.)

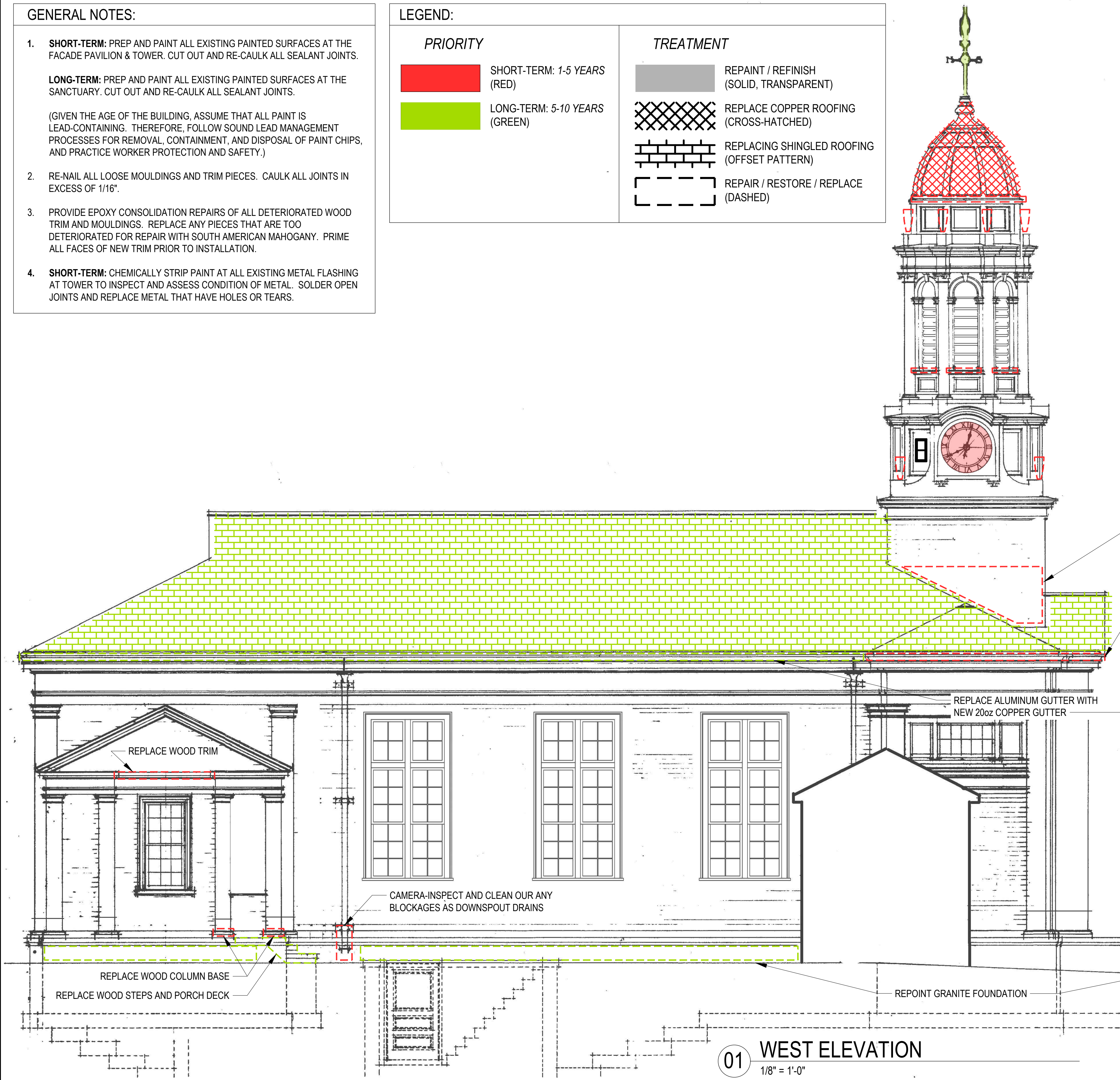
2. RE-NAIL ALL LOOSE MOULDINGS AND TRIM PIECES. CAULK ALL JOINTS IN EXCESS OF 1/16".

3. PROVIDE EPOXY CONSOLIDATION REPAIRS OF ALL DETERIORATED WOOD TRIM AND MOULDINGS. REPLACE ANY PIECES THAT ARE TOO DETERIORATED FOR REPAIR WITH SOUTH AMERICAN MAHOGANY. PRIME ALL FACES OF NEW TRIM PRIOR TO INSTALLATION.

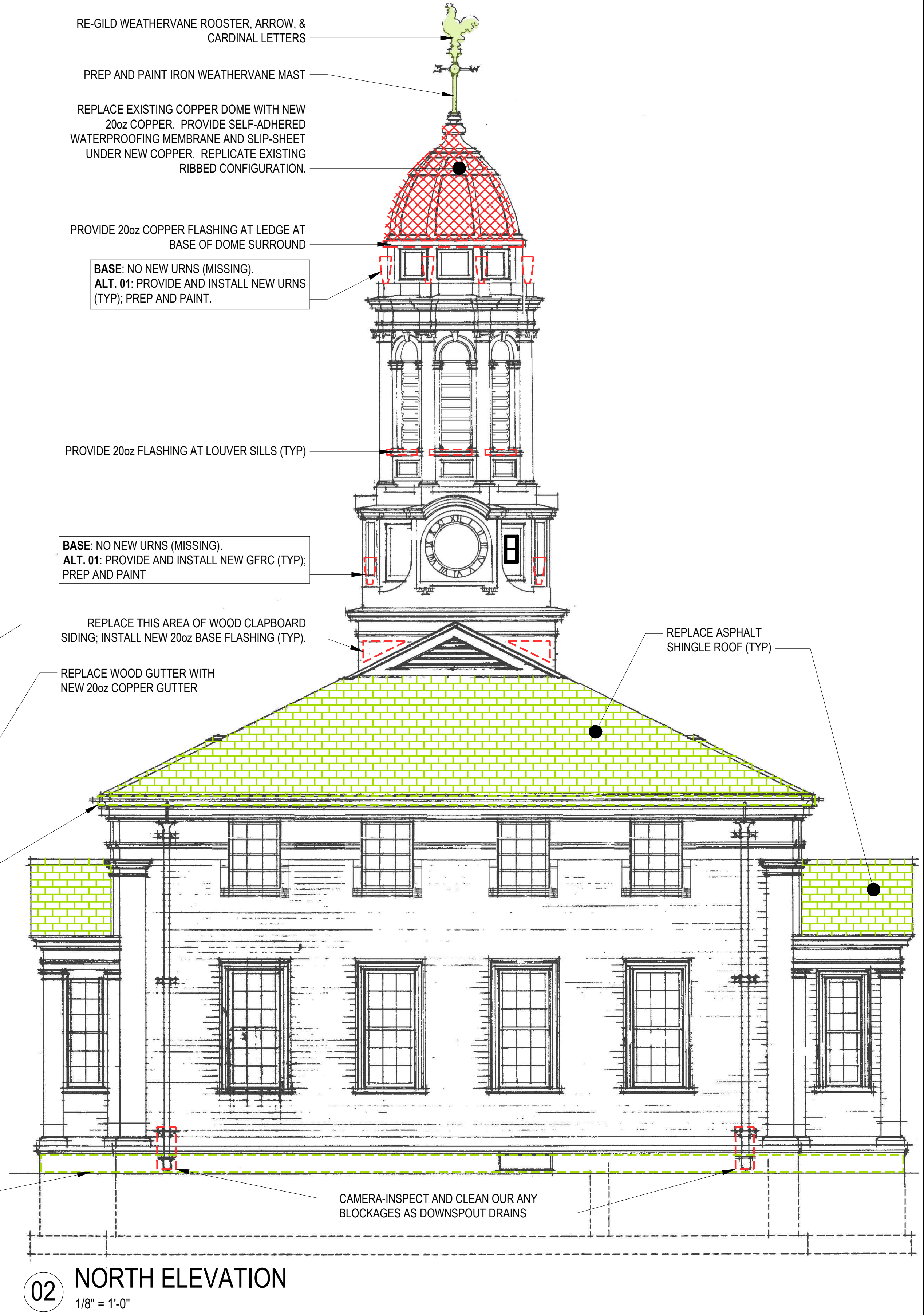
4. **SHORT-TERM:** CHEMICALLY STRIP PAINT AT ALL EXISTING METAL FLASHING AT TOWER TO INSPECT AND ASSESS CONDITION OF METAL. SOLDER OPEN JOINTS AND REPLACE METAL THAT HAVE HOLES OR TEARS.

LEGEND:

PRIORITY	*TREATMENT*
SHORT-TERM: *1-5 YEARS* (RED)	REPAINT / REFINISH (SOLID, TRANSPARENT)
LONG-TERM: *5-10 YEARS* (GREEN)	REPLACE COPPER ROOFING (CROSS-HATCHED)
	REPLACING SHINGLED ROOFING (OFFSET PATTERN)
	REPAIR / RESTORE / REPLACE (DASHED)



01 WEST ELEVATION
1/8" = 1'-0"



02 NORTH ELEVATION
1/8" = 1'-0"

ARCHITECT:	OWNER:	PROJECT:	ISSUE DATE:	SHEET TITLE:	SHEET #:
Spencer, Sullivan & Vogt ARCHITECTURE • PRESERVATION	BARNSTABLE UNITARIAN CHURCH 3330 MAIN STREET BARNSTABLE, MA 02630	BARNSTABLE UNITARIAN CHURCH CONDITIONS ASSESSMENT	Feb. 23, 2021 PROJECT #: 2037	CONDITIONS ASSESSMENT DRAWINGS: NORTH + WEST ELEVATIONS	A-02

Spencer, Sullivan & Vogt
ARCHITECTURE • PRESERVATION

1 Thompson Square, Suite 504 • Charlestown, MA 02129

BARNSTABLE UNITARIAN CHURCH
Barnstable, Massachusetts
February 2021

OUTLINE SPECIFICATIONS

The following outline specifications are developed based on the building assessment needs

01 00 00	**GENERAL REQUIREMENTS**
01 10 00	**Summary** Restoration and repair of building exterior of the sanctuary and tower.
01 50 00	**Temporary Facilities and Controls** Barricades, direction signage, general public safety controls Access to Work, lifts, staging, hoisting
02 00 00	**EXISTING CONDITIONS AND SITE**
02 40 00	**Demolition** Removal and disposal of all features designated to be replaced.
02 80 00	**Remediation** Lead-based paint management
03 00 00	**CONCRETE**
03 39 00	**Glass Fiber Reinforced Polymer** Provide replacement urns in GFRP to match historic profiles
04 00 00	**MASONRY** Repointing of granite foundation

06 00 00 WOODS, PLASTICS AND COMPOSITES

06 10 00 Rough Carpentry

Framing repairs recommended in the structural report:
Replace damaged and deteriorated framing members in tower
Add reinforcing and gussets at framing members

06 40 00 Architectural Woodwork

Repair/Replace deteriorated wood trim pieces
Selective replacement of clapboards

07 00 00 THERMAL AND MOISTURE PROTECTION

07 50 00 Roofing

Replace asphalt shingles with asphalt shingles
Replace sheet metal flashings with new 20 oz. copper
Install high temperature ice and water shield and rosin paper under all flashings
Replace wood gutters with new 20 oz. copper gutters.
Camera inspect downspout boots and clear any blockages

07 90 00 Joint Sealants and Caulking

Caulk all flashing reglets and joints in finish carpentry

09 00 00 FINISHES

09 90 00 Painting and Coatings

Chemically strip existing paint from sheet metal flashings to allow inspection and evaluation of metal
Prep and paint all exterior painted surfaces.

End of Outline Specifications

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COST ESTIMATE FOR TREATMENT RECOMMENDATIONS

The following is a cost estimate for the work identified in the Outline Specification and the Prioritized Treatment Drawings. The scope work has been divided into 2 priority phases.

Short-Term is identified as scope that focuses on the church tower, which includes the belfry and cupola and all of the supporting structure, along with the flanking portions of the façade and side elevations that engage the tower; otherwise referred to as the facade pavilion. This work is seen as a priority because conditions at the tower are more seriously deteriorated, and are sources of active leaks. Tower work has been understandably differed, as access is a costly prerequisite to performing the work. Proposed repairs at the tower will arrest water infiltration, correct internal structural deficiencies, and enhance water-shedding performance – and longevity – at the tower.

Long-Term work focuses on the remaining portion of the church sanctuary. These repairs are a lower priority, mainly as tribute to the diligence of maintenance at the areas that are more easily accessed. This also includes roof replacement, given the wear pattern of the asphalt shingles.

Short-Term work should be completed within the next 5 years, whereas Long-Term work would be required within the next 5-10 years. There are overall savings to be captured if both phases are done in a single phase.

In both phases, preparation of and the painting of wood siding and trim are included, and these are normal items that should be scheduled into the property's cyclical maintenance.

Itemized cost components presented here were provided by Cape Associates, Inc., who are familiar with the building and congregation from past projects.

Cost Estimate

Unitarian Church of Barnstable
Building Assessment

Spencer, Sullivan & Vogt
ARCHITECTURE • PRESERVATION

1 Thompson Square, Suite 504 • Charlestown, MA 02129

February, 2021

DIV. 01 - *GENERAL REQUIREMENTS*	SHORT-TERM	LONG-TERM	OPTIONAL	REMARKS
Permits	$3,500	$1,000		
Supervision	$7,500	$3,000		
Temporary Facilities	$7,000	$5,000		
Equipment Rentals	$20,000	$10,000		
Cleaning	$3,000	$3,000		
SUBTOTAL	**$41,000**	**$22,000**		

DIV. 04 - *MASONRY*	SHORT-TERM	LONG-TERM		REMARKS
Repointing of Granite Foundation		$11,500		
SUBTOTAL		**$11,500**		

DIV. 06 - *WOOD, PLASTICS, AND COMPOSITES*	SHORT-TERM	LONG-TERM		REMARKS
Replace damaged and deteriorated belfry bracing members	$17,500			
Install plywood gussets at belfy bracing connections	$5,000			
Fascia and soffit repairs	$3,000			
Epoxy consolidation repairs of wood trim and mouldings	$3,500	$1,000		
Replacement of deteriorated wood trim and mouldings 1	$7,000	$1,500		
Replace wood column bases	$3,100			
Selectively replace wood siding	$12,000	$2,000		
Replace wood steps and porch decking		$11,000		
SUBTOTAL	**$51,100**	**$15,500**		

DIV. 07 - *THERMAL AND MOISTURE PROTECTION*	SHORT-TERM	LONG-TERM		REMARKS
Strip off paint at flashings, inspect	$3,500			
New flashing at lantern louver sills	$7,600			
Replace wood gutters with copper profiles	$5,700			
Replace aluminum gutters with copper profiles		$15,200		
Replace copper roof at dome	$110,000			
Miscellaneous copper flashings of upward facing projections	$5,500	$1,000		
Replace asphalt roof at sanctuary		$47,600		
Clean lantern floors and internal drainage paths	$3,450			
Camera inspect and clean downspout drains	$1,350			
SUBTOTAL	**$137,100**	**$63,800**		

Page 1 of 2

DIV. 08 - OPENINGS	SHORT-TERM	LONG-TERM	
Replace north basement windows at parish hall wing.	$2,100		
SUBTOTAL	**$2,100**		

DIV. 09 - *FINISHES*	SHORT-TERM	LONG-TERM		REMARKS
Re-gild the weathervane	$6,500			
Re-gild clock hands	$10,500			
New gold leaf minute markers and numerals	$10,500			
Prep and paint clock faces, bezels and trim	$3,750			
Prep and paint siding, trim, windows, doors - façade pavilion and tower	$100,000			
Prep and paint siding, trim, windows, doors - Sanctuary		$75,000		
SUBTOTAL	**$131,250**	**$75,000**		

DIV. 10 - *SPECIALTIES*	SHORT-TERM	LONG-TERM	OPTIONAL	REMARKS
Replace missing ornamental urns			$48,000	
SUBTOTAL			**$48,000**	

	SHORT-TERM	LONG-TERM	OPTIONAL
SUBTOTAL	**$362,550**	**$187,800**	**$48,000**
General Conditions: +	$36,255	$18,780	
HARD COST SUBTOTAL	**$398,805**	**$206,580**	**$48,000**
Overhead + Profit: +	$39,881	$20,658	
CONSTRUCTION COST SUBTOTAL	**$438,686**	**$227,238**	**$48,000**
Contingency: +	$43,869	$22,724	
Architecture/Engineering Fees: +	$65,803	$34,086	
GRAND TOTAL	**$548,357**	**$284,048**	**$48,000**

Page 2 of 2

UNITARIAN CHURCH OF BARNSTABLE

Exterior Restoration

PROJECT MANUAL

FOR BID | OCTOBER 25, 2022

Spencer Preservation Group
PRESERVATION ARCHITECTS

www.**SpencerPreservationGroup**.com
(617) 227-2675

SECTION 00 01 03 – PROJECT DIRECTORY

OWNER:
Crystal Gips, Local Project Coordinator (*Owner's Representative*)
Unitarian Church of Barnstable
3330 Main Street
Barnstable, MA 02630
(518) 527-0768
crystal.gips@yahoo.com

ARCHITECT:
Shawn Willett AIA, CSI (*Project Architect)*
Spencer Preservation Group
41 Valley Road, Suite 211B
Nahant, MA 01908
(617) 227-2675
shawn@spencerpreservationgroup.com

END OF SECTION

SECTION 00 01 10 – TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 01 – GENERAL REQUIREMENTS

DIVISION 02 – EXISTING CONDITIONS

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

DIVISION 09 – FINISHES

END OF DOCUMENT

SECTION 00 01 13 – ADVERTISEMENT FOR BIDS

1.1 PROJECT INFORMATION

A. **Notice to Bidders**: Qualified bidders are invited to submit bids for Project as described in this Document according to the Instructions to Bidders.

1. Requirements: The project is being funded with a grant from the Massachusetts Preservation Projects Fund (MPPF). All work must meet the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

2. All communication regarding this bid by prospective contractors shall be made directly to the Architect. To avoid perception of unfair or biased process and possible disqualification of bid, contacting the owner, its representatives, or building administrative staff outside the lines of communication with the Architect, is discouraged.

B. **Project Identification**: Unitarian Barnstable Church – Exterior Restoration

1. **Project Location**:
Unitarian Church of Barnstable
3330 Main Street
Barnstable, MA 02630

C. **Owner**: Unitarian Church of Barnstable

1. **Owner's Representative**: Crystal Gips, Local Project Coordinator

D. **Architect**: Spencer Preservation Group, Inc.

E. **Project Description**: Project consists of making repairs to and restoring the exterior envelope of the church building. Base work is focused on restoration of the tower and cupola with limited structural reinforcement of existing internal framing.

F. **Construction Contract**: Bids will be received for the following Work:

1. General Contract (all trades).

1.2 BID SUBMITTAL AND OPENING

A. Owner will receive bids until the bid time and date at the location indicated below. Bids shall be submitted electronically as a single PDF document (preferred), or as paper copy. Owner will consider bids prepared in compliance with the Instructions to Bidders issued by Owner and received as follows:

1. **Bids Due**: **Thu, Nov. 27, 2022 at 5:00pm**
2. **Email address**, if electronic:
   Shawn A. Willett AIA, CSI
   shawn@spencerpreservationgroup.com

3. **Physical address**, if paper copy:
   ATTN: Shawn A. Willett AIA, CSI
   Spencer Preservation Group, Inc.
   41 Valley Road | Suite 211B
   Nahant, MA 01908

B. Bids must be received at the email or physical address listed above on or before the bid date and time, will be thereafter privately opened. Results available on request.

1.3 PREBID CONFERENCE

A. Pre-Bid Meeting: A Pre-Bid meeting for all bidders will be held at the Project Site on **Wed, Nov. 09, 2022 at 10:00 am**. Attendance is strongly encouraged.

1.4 DOCUMENTS

A. Electronic copies of the Bidding and Contract documents may be obtained at no charge by email request to the Architect. Requests shall be addressed no earlier than **Thu, Oct. 27, 2022** to:

1. Shawn A. Willett AIA, CSI
   shawn@spencerpreservationgroup.com

1.5 TIME OF COMPLETION

A. Bidders shall begin the Work on receipt of the Notice to Proceed and shall complete the Work prior to the following firm deadlines:

1. **MPPF Rnd 28-Funded Work**: June 15, 2023.

2. **All other remaining work:** October 15, 2023

1.6 BIDDER'S QUALIFICATIONS

A. Bidders must complete and submit with bids a Contractor's Qualification Statement for sufficient experience and expertise in the following areas:

1. **Historic Building Restoration**

B. Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work.

C. State Law prohibits discrimination. Awarding of this contract is subject to Affirmative Action and Equal Opportunity guidelines.

END OF DOCUMENT

SECTION 00 21 13 – INSTRUCTIONS TO BIDDERS

1.1 DEFINITIONS

A. Bidding Documents include the Bidding Requirements and the Proposed Contract Documents.

1. The **Bidding Requirements** consist of:

   a. The Advertisement or Invitation to Bid
   b. Instructions to Bidders
   c. Supplementary Instructions to Bidders
   d. The Bid Form
   e. Other bidding forms

2. The **Proposed Contract Documents** consist of:

   a. The unexecuted Form of Agreement between Owner and Contractor
   b. The Agreement's Exhibits
   c. Conditions of the Contract
   d. Drawings
   e. Specifications
   f. Addenda

B. **Addenda**: written or graphic instruments issued by the Architect which – by additions, deletions, clarifications, or corrections – modify or interpret the Bidding Documents.

C. **Bid**: a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

D. **Base Bid**: the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents. The Work may be added to or deleted by sums stated in Alternate Bids.

E. **Alternate Bid/Alternate**: the amount stated in the Bid to be added to or deducted from, or does not change, the Base Bid if the corresponding change in the Work described in the Bidding Documents is accepted.

F. **Unit Price**: an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services. Or, a portion of the Work, as described in the Bidding Documents.

G. **Bidder**: a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

H. **Sub-bidder**: a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

1.2 BIDDERS REPRESENTATIONS

A. By submitting a Bid, the Bidder represents that:

1. They have read and understand the Bidding Documents

2. They understand how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction.

3. Their bid complies with the Bidding Documents.

4. They have visited the site, become familiar with local conditions under which the Work is to be performed, and have correlated their observations with the requirements of the Proposed Contract documents.

5. Their bid is based upon the materials, equipment, and systems required by the Bidding Documents with exception.

6. They have read and understand the provisions for liquidated damages, if any, set forth in the form of Agreement between Owner and Contractor.

1.3 BIDDING DOCUMENTS

A. Distribution

1. Bidders shall obtain complete Bidding Documents from the issuing office designated in the Advertisement or Invitation to bid.

2. Bidding Documents will not be issued directly to Sub-Bidders. Bidders shall furnish Sub-Bidders with complete Bidding Documents to ensure coordination with Work.

3. Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

4. The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

B. Modifications or Interpretations

1. Bidders shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request interpretation.

2. Requests for interpretation of the Bidding documents shall be submitted by the Bidder in writing to the Architect at least seven days prior to the date for receipt of bids.

3. Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations made in any other manner shall not be binding, and Bidders shall not rely upon them.

C. Substitutions

1. The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

D. Substitution Process

1. Written requests for substitutions shall be submitted to the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting interpretations.

2. Bidders shall submit substitution requests on the following form:

   a. CSI Form 1.5C, *Substitution Request (During the Bidding/Negotiating Stage)*

3. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

4. If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

5. No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

E. Addenda

1. Addenda will be transmitted to Bidders known by the office to have received complete Bidding Documents via email.

2. Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes the postponement of the date for receipt of Bids.

3. Prior to submitting a Bid, each Bidder shall ascertain that they have received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

1.4 BIDDING PROCEDURES

A. Preparation of Bids

1. Bids shall be submitted on the forms included with or identified in the Bidding Documents.

2. All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

3. Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

4. Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

5. All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

6. Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

7. A bidder shall incur all costs associated with the preparation of its Bid.

B. Bid Security

1. No bid security is required.

C. Submission of Bids

1. A Bidder shall submit its Bid in the format indicated in the Advertisement or Invitation to Bid.

2. Paper copies (if required) of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing enveloped with the notation "SEALED BID ENCLOSED" on the face thereof.

3. Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

4. The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

5. A Bid submitted by any method other than that indicated will not be accepted.

D. Modification or Withdrawal of Bid

1. Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

2. Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in this document, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

3. After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this document, the bid security will be attended to as follows:

   a. No bid security is required.

1.5 CONSIDERATION OF BIDS

A. Opening of Bids

1. Bids properly identified and received within the specified time limits will be opened and, if applicable, announced in the manner indicated in the Advertisement or Invitation to Bid.

B. Rejection of Bids

1. Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

C. Acceptance of Bid (Award)

1. It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interest.

2. Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

1.6 POST-BID INFORMATION

A. Submittals

1. After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

   a. Designation of the Work to be performed with the Bidder's own forces.

b. Names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each.

c. Names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

2. The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

3. Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, the bid security will not be forfeited.

4. Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

1.7 PERFORMANCE BOND AND PAYMENT BOND

A. Bond Requirements

1. If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

2. If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

3. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

4. Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

B. Time of Delivery and Form of Bonds

1. The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this document.

2. Unless otherwise provided, the bonds shall be written on the following form:

   a. **AIA Document A312, Performance Bond and Payment Bond**

3. The bonds shall be dated on or after the date of the Contract.

4. The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

END OF DOCUMENT

SECTION 00 41 13 – BID FORM, STIPULATED SUM

1.1 BID INFORMATION

A. **Bidder:** ______________________________.

B. **Project Name**: Barnstable Unitarian Church – Exterior Restoration

C. **Project Location**: Barnstable Unitarian Church, 3330 Main Street, Barnstable, MA 02630

D. **Owner:** Barnstable Unitarian Church

E. **Architect:** Spencer Preservation Group, Inc.

1.2 CERTIFICATIONS AND BASE BID

A. The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by the Architect and Architect's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:

--	General Conditions:	______________ *Written*	$ ______________ *Numerals*
Div. 01	General Requirements:	______________ *Written*	$ ______________ *Numerals*
Div. 06	Wood, Plastics, Comp.:	______________ *Written*	$ ______________ *Numerals*
Div. 07	Thermal & Moisture Prot:	______________ *Written*	$ ______________ *Numerals*
Div. 09	Finishes:	______________ *Written*	$ ______________ *Numerals*
	TOTAL BASE BID:	______________ *Written*	$ ______________ *Numerals*

1.3 SCHEDULE OF UNIT PRICES

A. **No unit prices are scheduled for this project.**

1.4 ALTERNATE BIDS

A. The undersigned Bidder proposes the amount below be added to or deducted from the Base Bid if alternates are accepted by Owner. Amounts listed for each alternate include costs of related coordination, modification, or adjustment.

B. If the alternate does not affect the Contract Sum, the Bidder shall indicate "NO CHANGE."

C. If the alternate does not affect the Work of this Contract, the Bidder shall indicate "NOT APPLICABLE."

D. The Bidder shall be responsible for determining from the Contract Documents the effects of each alternate on the Contract Time and the Contract Sum.

E. Owner reserves the right to accept or reject any alternate, in any order, and to award or amend the Contract accordingly within 60 days of the Notice of Award unless otherwise indicated in the Contract Documents.

F. Acceptance or non-acceptance of any alternates by the Owner shall have no effect on the Contract Time unless the "Schedule of Alternates" Article below provides a formatted space for the adjustment of the Contract Time.

1.5 SCHEDULE OF ALTERNATES

A. **Alternate No. 1A** – *Fiberglass Capitals*

1. ADD: _____ DEDUCT:____ NO CHANGE:____ NOT APPLICABLE:____

2. ____ Dollars ($__________________)
Written *Numerals*

B. **Alternate No. 1B** – *Regild Clock*

1. ADD: _____ DEDUCT:____ NO CHANGE:____ NOT APPLICABLE:____

2. ____ Dollars ($__________________)
Written *Numerals*

C. Alternate No. 1C – *Wood Urns*

1. ADD: _____ DEDUCT:____ NO CHANGE:____ NOT APPLICABLE:____

2. ____ Dollars ($__________________)
Written *Numerals*

D. **Alternate No. 1D** – *Copper Urns*

1. ADD: _____ DEDUCT:____ NO CHANGE:____ NOT APPLICABLE:____

2. ____ Dollars ($__________________)
Written *Numerals*

E. **Alternate No. 1E** – *Fiberglass Urns*

1. ADD: _____ DEDUCT:____ NO CHANGE:____ NOT APPLICABLE:____

2. ____ Dollars ($__________________)
Written *Numerals*

F. **Alternate No. 02** – *Pavilion Overall*

1. ADD: _____ DEDUCT:____ NO CHANGE:____ NOT APPLICABLE:____

2. ____ Dollars ($__________________)
Written *Numerals*

G. **Alternate No. 2A** – *Pavilion Fiberglass Gutters*

1. ADD: _____ DEDUCT:____ NO CHANGE:____ NOT APPLICABLE:____

2. ____ Dollars ($__________________)
Written *Numerals*

H. **Alternate No. 03** – *Nave Overall*

1. ADD: _____ DEDUCT:____ NO CHANGE:____ NOT APPLICABLE:____

2. ____ Dollars ($__________________)
Written *Numerals*

I. **Alternate No. 3A** – *Nave Fiberglass Gutters*

1. ADD: _____ DEDUCT:____ NO CHANGE:____ NOT APPLICABLE:____

2. ____ Dollars ($__________________)
Written *Numerals*

1.6 BID SECURITY

A. No bid security is required.

1.7 TIME OF COMPLETION

A. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Architect, and shall fully complete the Work by **June 15, 2023**.

1.8 ACKNOWLEDGMENT OF ADDENDA

A. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

1. Addendum No. 1, dated ____________________.

2. Addendum No. 2, dated ____________________.

3. Addendum No. 3, dated ____________________.

4. Addendum No. 4, dated ____________________.

1.9 BID SUPPLEMENTS

A. The following supplements are a part of this Bid Form and are attached hereto.

1. Contractor's Qualification Statement

1.10 CONTRACTOR'S LICENSE

A. The undersigned further states that it is a duly licensed contractor, for the type of work proposed, in **The Commonwealth of Massachusetts**, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

1.11 SUBMISSION OF BID

Respectfully submitted this _______ day of ____________, 2022.

Submitted By: ________________________________
(Name of bidding firm or corporation)

Authorized Signature: ________________________________
(Handwritten signature)

Signed By: ________________________________
(Type or print name)

Title: ________________________________
(Owner/Partner/President/Vice President)

Attest: ________________________________
(Handwritten signature)

By: ________________________________
(Type or print name)

Title: ________________________________
(Corporate Secretary or Assistant Secretary)

Street Address: ______________________________

City, State, Zip ______________________________

Phone: ______________________________

License No.: ______________________________

Federal ID No.: ______________________________

(Affix Corporate Seal Above)

END OF DOCUMENT

SECTION 00 44 40 – CONTRACTOR'S QUALIFICATION STATEMENT

1.1 BID FORM SUPPLEMENT

A. A completed Contractor's Qualification Statement is required to be attached to the Bid Form.

1.2 BIDDER QUALIFICATIONS

1. All bidders must demonstrate past successful experience with work on at least three (3) historic buildings (buildings listed on the State Register of Historic Places) with similar conditions in the last five years, that feature the type of work specified in **Document 00 01 14 – Advertisement for Bids**. For each project, list the property address, contact information for Designer and Owner, approximate value of the work and date of completion of work, and a brief description of the scope of work.

1.3 PREVIOUS PROJECTS

A. **Project One**:

1. Project Name and Address:

____

____

____

2. Value of Work: ____

3. Date of Completion: ____

4. Architect / Designer (Name and Phone): __________________________________

5. Owner (Name and Phone): ____

6. Brief Description:

____

____

____

7. Indicate State Register Listing Type. Check all that apply.

_____ Local, State, or National Historic Landmark

_____ National Register Individual Listing

_____ National Register District (Contributing)

_____ Local Historic District (Contributing)

_____ National Register Multiple Resource Area

_____ Preservation Restriction (MHC Approved)

B. **Project Two**:

1. Project Name and Address:

____

____

____

2. Value of Work: ____

3. Date of Completion: ____

4. Architect / Designer (Name and Phone): ________________________________

5. Owner (Name and Phone): ____

6. Brief Description:

____

____

____

7. Indicate State Register Listing Type. Check all that apply.

_____ Local, State, or National Historic Landmark

_____ National Register Individual Listing

_____ National Register District (Contributing)

_____ Local Historic District (Contributing)

_____ National Register Multiple Resource Area

_____ Preservation Restriction (MHC Approved)

C. **Project Three**:

1. Project Name and Address:

   ____

   ____

   ____

2. Value of Work: ____

3. Date of Completion: ____

4. Architect / Designer (Name and Phone): _________________________________

5. Owner (Name and Phone): ____

6. Brief Description:

   ____

   ____

   ____

7. Indicate State Register Listing Type. Check all that apply.

   _____ Local, State, or National Historic Landmark

   _____ National Register Individual Listing

   _____ National Register District (Contributing)

   _____ Local Historic District (Contributing)

   _____ National Register Multiple Resource Area

   _____ Preservation Restriction (MHC Approved)

END OF DOCUMENT

DOCUMENT 00 60 00 – PROJECT FORMS

1.1 FORM OF AGREEMENT AND GENERAL CONDITIONS

A. The following form of Owner/Contractor Agreement and form of the General Conditions shall be used for this Project:

1. AIA Document A104-2017, Standard Abbreviated Form of Agreement between Owner and Contractor, or

2. AIA Document A105-2017, Standard Short Form of Agreement Between Owner and Contractor.

3. Copies of AIA standard forms may be obtained from the American Institute of Architects; https://www.aiacontracts.org; (800) 942-7732.

1.2 ADMINISTRATIVE FORMS

A. Information and Modification Forms:

1. **Requests for Interpretation** (RFIs):
   a. CSI Form 13.2A-1994 "Request for Interpretation"

2. **Request for Proposal** (PR):
   a. AIA Document G709-2018 "Proposal Request"

3. **Architect's Memorandum for Minor Changes in the Work** (ASI):
   a. AIA Document G710-207 "Architect's Supplemental Instructions"

4. **Change Order Request** (COR):
   a. CSI Document 13.6A-2013 "Change Order Request"

5. **Change Order** (CO):
   a. AIA Document G701-2017 "Change Order"

6. **Change Directive** (CCD):
   a. AIA Document G714-2017 "Construction Change Directive"

B. Payment Forms:

1. **Payment Application**:
   a. AIA Document G702-1992 "Application and Certificate for Payment"

2. **Schedule of Values Form**:
   a. AIA Document G703-1992 "Continuation Sheet to the G702"

3. **Contractor's Affidavit**:

a. AIA Document G706-1994 “Contractor's Affidavit of Payment of Debts and Claims”

4. **Affidavit of Release of Liens**:
   a. AIA Document G706A-1994 “Contractor's Affidavit of Payment of Release of Liens”

5. **Consent of Surety**:
   a. AIA Document G707-1994 “Consent of Surety to Final Payment”

C. Closeout Forms:

1. **Substantial Completion Form**:
   a. AIA Document G704-2017 “Certificate of Substantial Completion”

END OF DOCUMENT

DOCUMENT 00 73 16 – INSURANCE REQUIREMENTS

1.1 CONTRACTOR'S INSURANCE

A. The Contractor shall protect the job site and the Work, and shall repair or replace, at its own cost and expense, any loss, claim or damage to the building or the Owner, occurring during the term of the Contract or prior to the final delivery and acceptance by the Owner of the Work, by reason of any act, omission, negligence, or for any reason caused either directly or indirectly by the Contractor, its agents or employees, in the performance or default of this contract, except that the Owner shall also maintain property insurance upon all buildings for all permanent construction and installations thereof. The Contractor shall be wholly responsible for the carrying out of this Work, subject to approval and final acceptance by the Owner. Any payment made to the Contractor shall not relieve the Contractor from the responsibility for the carrying out of said Work.

B. The Contractor shall furnish and maintain during the life of the Contract such public liability and property damage insurance with a waiver of subrogation in favor of the Owner as shall protect it and any subcontractor or person performing Work covered by this Contract, from claims for damages for personal injury, including accidental death, except by persons protected by workers compensation statute, and from claims for property damage, which might arise from operations under this Contract. The minimum amounts of such insurance shall be as follows (said enumeration shall in no way limit the Contractor's liability); and the Contractor may procure at its cost such additional amounts that in its judgment, deems desirable:

1. General Liability Insurance:

a. Includes Premises/Operations; Independent Contractor's Protection; Products and Completed Operation; Broad Form Property Damage; and Contractual Liability.

1) Bodily Injury: $1,000,000 Each Occurrence
$2,000,000 Annual Aggregate

2) Property Damage: $500,000 Each Occurrence
$1,000,000 Annual Aggregate

3) Personal Injury: $1,000,000 Aggregate

2. Automobile Liability Insurance:

1) Bodily Injury: $1,000,000 Each Person
$2,000,000 Each Accident

3. Workers' Compensation Insurance:

a. Worker's Compensation

b. Employer's Liability: $500,000

C. Prior to commence of any Work, Contractor shall furnish the Owner with; (1) workers compensation certificates (showing that they have coverage for the classification of work); (2) Certificates of Insurance naming the Owner and its officers, director and agents of the Owner as additional insureds and agreeing to notify the Owner before termination thereof; and (3) Insurance Declaration pages with policies attached covering all of the insurance heretofore mentioned. The Owner at its option, may terminate this Contract without cost if Contractor fails to deliver properly executed insurance certificates prior to commencement of the Work.

1.2 OWNER'S INSURANCE

A. The owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

1.3 PROJECT MANAGEMENT PROTECTIVE INSURANCE

A. Optionally, the Owner may require the Contractor to purchase and maintain Project Management Protective Liability insurance from the Contractor's usual sources as primary coverage for the Owner's, Contractor's and Architects vicarious liability for construction operations under the Contract. Unless otherwise required by the Contract Documents, the Owner shall reimburse the Contractor by increasing the Contract Sum to pay the cost of purchasing and maintaining such optional insurance coverage, and the Contractor shall not be responsible for purchasing any other liability insurance on behalf of the Owner. The minimum limits of liability purchased with such coverage shall be equal to the aggregate of the limits required for Contractor's Liability insurance.

B. The extent of damages are covered by Project Management Protective Liability insurance and the Owner, Contractor, and Architect waive all rights against each other for damages, except such rights as they may have to the proceeds of such insurance. The policy shall provide for such waivers of subrogation by endorsement or otherwise.

C. The Owner shall not require the Contractor to include the Owner, Architect or other persons or entities as additional insureds on the Contractor's Liability insurance.

1.4 PROPERTY INSURANCE

A. The Owner shall maintain existing property insurance policies during the term of the Contract.

B. The Owner shall file a copy of each policy with the Contractor before an exposure to loss may occur. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will now be reduced, until at least 30 days prior written notice has been given to the Contractor.

END OF DOCUMENT

SECTION 01 10 00 – SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes, but is not limited to, the following:

1. Project Information
2. Work Narrative
3. Work Covered by Contract Documents
4. Alternates
5. Contractor's Use of Site and Premises
6. Coordination with Occupants
7. Work Restrictions
8. Specification and Drawing Conventions

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. **Project Identification**: Unitarian Barnstable Church – Exterior Restoration

1. **Project Location**:
   Unitarian Church of Barnstable
   3330 Main Street
   Barnstable, MA 02630

B. **Owner**: Unitarian Church of Barnstable

1. **Owner's Representative**: Crystal Gips, Local Project Coordinator

C. **Architect**: Spencer Preservation Group, Inc.

1.3 WORK NARRATIVE:

A. **Background:** In February 2021, the Unitarian Church of Barnstable commissioned an exterior envelope conditions assessment of their historic church building by a preservation firm – the same team which is leading the project described herein. The tower and cupola were identified is requiring urgent restoration, which has served as the catalyst for the current larger project.

B. **Project Intent**: This project focuses on a base scope of work to repair and restore the tower and cupola including replacement of the copper dome, repair to exterior woodwork, replacement of all copper flashings, and limited structural reinforcement of the interior framing. In addition to the restoration work undertaken at the tower, restoration of the front façade is incorporated as additional, alternate scopes of work comprised of wood repair, gutter replacement, and repainting. Similar restoration work is included as an alternate scope of work for the remainder of the church body.

This narrative may not be all-inclusive of all work scope items enumerated in the contract drawings.

C. **Special Grant Considerations:** This project is partially-funded by the Massachusetts Historical Commission (MHC) with a grant from the Massachusetts Preservation Projects Fund (MPPF). As such, special consideration much be made for submittals and mock-ups. In addition to typical submittal requirements outlined in this Project Manual, MHC must approve of all submittals (through the architect or engineer).

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:
1. Structural reinforcement of existing internal framing at tower.
2. Replacement of deteriorated wood sheathing, trim, and siding at tower.
3. Replacement of copper dome and regilding of weathervane.
4. Repair and repainting of clocks.
5. Replacement of all copper flashings.
6. Replacement of EPDM roofing at the belfry floor.
7. Repainting of all woodwork at the tower.
8. Alternates for fabrication of missing historic finials.
9. Alternates for replacement of wood or fiberglass gutters.
10. Alternates for wood repair at the body of the church.
11. Alternates for repainting of all wood trim and siding at the body of the church.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 UNIT PRICES

A. **Definitions**
1. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

B. **Procedures**
1. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
2. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

C. **Schedule of Unit Prices**
1. No unit prices are scheduled for this project.

1.6 ALTERNATES

A. **Coordination**: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Execute accepted alternates under the same conditions as other work of the Contract.

C. **Schedule of Alternates**:

1. **Alternate No. 1A** – *Fiberglass Capitals*
   a. **Base Bid**: Fabricate/install replacement **wood** capitals.
   b. **Alternate**: Fabricate/install replacement **fiberglass** capitals.

2. **Alternate No. 1B** – *Regild Clock*
   a. **Base Bid**: Repaint clock hands, numerals, ticks in **gold paint**.
   b. **Alternate**: Regild clock hands, numerals, ticks in **gold leaf**.

3. **Alternate No. 1C** – *Wood Urns*
   a. **Base Bid**: No work to be performed in the areas shown.
   b. **Alternate**: Fabricate/install missing urns at tower in **wood**.

4. **Alternate No. 1D** – *Copper Urns*
   a. **Base Bid**: No work to be performed in the areas shown.
   b. **Alternate**: Fabricate/install missing urns at tower in **spun copper**.

5. **Alternate No. 1E** – *Fiberglass Urns*
   a. **Base Bid**: No work to be performed in the areas shown.
   b. **Alternate**: Fabricate/install missing urns at tower in **fiberglass**.

6. **Alternate No. 02** – *Pavilion Overall*
   a. **Base Bid**: No work to be performed in the areas shown.
   b. **Alternate**: Execute the work described in the areas shown.

7. **Alternate No. 2A** – *Pavilion Fiberglass Gutters*
   a. **Base Bid**: Fabricate/install **copper** gutters to match existing wood profile.
   b. **Alternate**: In lieu of copper, provide **fiberglass** gutters to match profile.

8. **Alternate No. 03** – *Nave Overall*
   a. **Base Bid**: No work to be performed in the areas shown.
   b. **Alternate**: Execute the work described in the areas shown.

9. **Alternate No. 3A** – *Nave Fiberglass Gutters*
   a. **Base Bid**: Fabricate/install **copper** gutters to match existing wood profile.
   b. **Alternate**: In lieu of copper, provide **fiberglass** gutters to match profile

1.7 CONTRACTOR'S USE OF SITE AND PREMISES

A. **Restricted Use of Site**: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits, if applicable, and as indicated by requirements of this Section.

B. **Limits on Use of Site**: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. **Driveways, Walkways, and Entrances**: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.

C. **Condition of Existing Building**: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

D. **Condition of Existing Grounds**: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.8 COORDINATION WITH OCCUPANTS

A. **Full Owner Occupancy**: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1.9 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

B. **On-Site Work Hours**: Limit work in the existing building to normal business working hours of **7 a.m. to 3 p.m.**, Monday through Friday, unless otherwise indicated.

C. **Existing Utility Interruptions**: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.

D. **Noise, Vibration, Dust, and Odors**: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.

1. Notify Owner not less than two days in advance of proposed disruptive operations.

E. **Smoking and Controlled Substance Restrictions**: Use of tobacco products, alcoholic beverages, and other controlled substances on Owner's property is not permitted.

F. **Employee Identification**: If required by Owner, provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

G. **Employee Screening**: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

A. **Specification Content**: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. **Division 00 Contracting Requirements**: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.

C. **Division 01 General Requirements**: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 20 00 – PRICE AND PAYMENT PROCEDURES

1.1 SUMMARY

A. Section includes administrative and procedural requirements for:

1. Unit Prices
2. Alternates
3. Substitution Procedures
4. Contract Modification Procedures
5. Payment Procedures

1.2 DEFINITIONS

A. **Unit price**: An amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

B. **Alternate**: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.

2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

C. **Substitutions**: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 UNIT PRICES

A. Procedures

1. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

2. **Measurement and Payment**: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

3. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

4. **List of Unit Prices**: If applicable to the project, a schedule of unit prices is included in Section 01 10 00 - Summary. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

1.4 ALTERNATES

A. Procedures

1. **Coordination**: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

   a. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

2. Execute accepted alternates under the same conditions as other work of the Contract.

3. **Schedule**: If applicable to the project, a schedule of alternates is included in Section 01 10 00 - Summary. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

1.5 SUBSTITUTION PROCEDURES

A. Action Submittals

1. **Substitution Requests**: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

   a. **Substitution Request Form**: Use form provided in Project Manual.

   b. **Documentation**: Show compliance with requirements for substitutions.

   c. **Architect's Action**: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

1) **Forms of Acceptance**: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.

2) Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

B. Quality Assurance

1. **Compatibility of Substitutions**: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

C. Procedures

1. **Coordination**: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

D. Substitutions

1. **Substitutions for Cause**: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

a. **Conditions**: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1) Requested substitution is consistent with the Contract Documents and will produce indicated results.

2) Substitution request is fully documented and properly submitted.

3) Requested substitution will not adversely affect Contractor's construction schedule.

4) Requested substitution has received necessary approvals of authorities having jurisdiction.

5) Requested substitution is compatible with other portions of the Work.

6) Requested substitution has been coordinated with other portions of the Work.

7) Requested substitution provides specified warranty.

2. **Substitutions for Convenience**: Architect will consider requests for substitution if received within 60 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Architect.

a. **Conditions**: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1) Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

2) Requested substitution does not require extensive revisions to the Contract Documents.

3) Requested substitution is consistent with the Contract Documents and will produce indicated results.

4) Substitution request is fully documented and properly submitted.

5) Requested substitution will not adversely affect Contractor's construction schedule.

6) Requested substitution has received necessary approvals of authorities having jurisdiction.

7) Requested substitution is compatible with other portions of the Work.

8) Requested substitution has been coordinated with other portions of the Work.

9) Requested substitution provides specified warranty.

1.6 CONTRACT MODIFICATION PROCEDURES

A. Minor Changes in the Work

1. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on form included in Project Manual.

a. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.

B. Proposal Requests

1. **Owner-Initiated Proposal Requests**: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

a. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.

b. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

1) Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

2) Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

3) Include costs of labor and supervision directly attributable to the change.

4) Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

2. **Contractor-Initiated Proposals**: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

a. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.

b. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

d. Include costs of labor and supervision directly attributable to the change.

e. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

f. Comply with requirements in "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

C. Change Order Procedures

1. On Owner's approval of a Work Change Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on form included in Project Manual.

D. Construction Change Directive

1. **Construction Change Directive**: Architect may issue a Construction Change Directive on form included in Project Manual. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

   a. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

2. **Documentation**: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

   a. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.7 PAYMENT PROCEDURES

A. Schedule of Values

1. **Coordination**: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

   a. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.

   b. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

2. **Format and Content**: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

   a. Arrange schedule of values consistent with form included in Project Manual.

   b. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.

   c. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

      1) Differentiate between items stored on-site and items stored off-site.

   d. Overhead Costs: Include total cost and proportionate share of general overhead and profit for each line item.

3. **Schedule of Values Revisions**: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

B. Applications for Payment

1. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

2. **Payment Application Times**: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

   a. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.

3. **Application for Payment Forms**: Use form included in Project Manual.

4. **Application Preparation**: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

   a. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.

   b. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.

   c. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

5. **Transmittal**: Submit one signed and notarized original copy of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

6. **Initial Application for Payment**: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

   a. List of subcontractors.

   b. Schedule of values.

   c. Contractor's construction schedule (preliminary if not final).

   d. Products list (preliminary if not final).

   e. Schedule of unit prices.

f. Submittal schedule (preliminary if not final).

g. List of Contractor's staff assignments.

h. List of Contractor's principal consultants.

i. Copies of building permits.

j. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.

k. Initial progress report.

l. Report of preconstruction conference.

7. **Application for Payment at Substantial Completion**: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

a. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

b. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

8. **Final Payment Application**: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

a. Evidence of completion of Project closeout requirements.

b. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.

c. Updated final statement, accounting for final changes to the Contract Sum.

d. **Contractor's Affidavit of Payment**: use form included in Project Manual.

e. **Contractor's Affidavit of Release of Liens**: use form included in Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 30 00 – ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Project Management and Coordination
2. Submittal Procedures

1.2 DEFINITIONS

A. **Activity**: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. **Action Submittals**: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

C. **Informational Submittals**: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 PROJECT MANAGEMENT AND COORDINATION

A. Informational Submittals

1. **Subcontract List**: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

a. Name, address, telephone number, and email address of entity performing subcontract or supplying products.

b. Number and title of related Specification Section(s) covered by subcontract.

c. Drawing number and detail references, as appropriate, covered by subcontract.

B. General Coordination Procedures

1. **Coordination**: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

   a. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

   b. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.

   c. Make adequate provisions to accommodate items scheduled for later installation.

2. **Administrative Procedures**: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

   a. Preparation of Contractor's construction schedule.

   b. Preparation of the schedule of values.

   c. Installation and removal of temporary facilities and controls.

   d. Delivery and processing of submittals.

   e. Progress meetings.

   f. Preinstallation conferences.

   g. Project closeout activities.

   h. Startup and adjustment of systems.

C. REQUEST FOR INTERPRETATION (RFI)

1. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

   a. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.

   b. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

2. RFI Forms: Form included in Project Manual.

3. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow three days for Architect's response for each RFI. RFIs received by Architect after 1 p.m. will be considered as received the following working day.

   a. The following Contractor-generated RFIs will be returned without action:

      1) Requests for approval of submittals.

      2) Requests for approval of substitutions.

      3) Requests for approval of Contractor's means and methods.

      4) Requests for coordination information already indicated in the Contract Documents.

      5) Requests for adjustments in the Contract Time or the Contract Sum.

      6) Requests for interpretation of Architect's actions on submittals.

      7) Incomplete RFIs or inaccurately prepared RFIs.

   b. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architectof additional information.

   c. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal.

      1) If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within five days of receipt of the RFI response.

D. PROJECT MEETINGS

1. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

2. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

   a. Agenda: Discuss items of significance that could affect progress, including the following:

      1) Responsibilities and personnel assignments.
      2) Tentative construction schedule.
      3) Phasing.
      4) Critical work sequencing and long lead items.
      5) Designation of key personnel and their duties.
      6) Lines of communications.
      7) Use of web-based Project software.
      8) Procedures for processing field decisions and Change Orders.

9) Procedures for RFIs.
10) Procedures for testing and inspecting.
11) Procedures for processing Applications for Payment.
12) Distribution of the Contract Documents.
13) Submittal procedures.
14) Preparation of Record Documents.
15) Use of the premises and existing building.
16) Work restrictions.
17) Working hours.
18) Owner's occupancy requirements.
19) Responsibility for temporary facilities and controls.
20) Procedures for moisture and mold control.
21) Procedures for disruptions and shutdowns.
22) Construction waste management and recycling.
23) Parking availability.
24) Office, work, and storage areas.
25) Equipment deliveries and priorities.
26) First aid.
27) Security.
28) Progress cleaning.

b. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

3. Progress Meetings

a. Coordinate dates of meetings with preparation of payment requests.

b. **Minutes**: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

1.4 SUBMITTAL PROCEDURES

A. Submittal Schedule

1. **Submittal Schedule**: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and Construction Manager and additional time for handling and reviewing submittals required by those corrections.

B. Submittal Formats

1. **Submittal Information**: Include the following information in each submittal:

a. Project name.
b. Date.
c. Name of Architect.
d. Name of Contractor.

e. Name of firm or entity that prepared submittal.
f. Names of subcontractor, manufacturer, and supplier.
g. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
h. Category and type of submittal.
i. Submittal purpose and description.
j. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
k. Drawing number and detail references, as appropriate.
l. Indication of full or partial submittal.
m. Location(s) where product is to be installed, as appropriate.
n. Other necessary identification.
o. Remarks.
p. Signature of transmitter.

2. **Options**: Identify options requiring selection by Architect.

3. **Deviations and Additional Information**: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

4. **Electronic Submittals**: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

C. Submittal Procedures

1. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

   a. **Email**: Prepare submittals as PDF package, and transmit to Architect by sending via email. Include information in email subject line as requested by Architect.

2. **Coordination**: Coordinate preparation and processing of submittals with performance of construction activities.

   a. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

   b. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.

   c. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

3. **Processing Time**: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit

submittals enough in advance of the Work to permit processing, including resubmittals.

a. **Initial Review**: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

b. **Resubmittal Review**: Allow 15 days for review of each resubmittal.

4. **Resubmittals**: Make resubmittals in same form and number of copies as initial submittal.

5. **Distribution**: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

6. **Use for Construction**: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

D. Submittal Requirements

1. **Product Data**: Collect information into a single submittal for each element of construction and type of product or equipment.

a. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.

b. Mark each copy of each submittal to show which products and options are applicable.

c. Include the following information, as applicable:

1) Manufacturer's catalog cuts.
2) Manufacturer's product specifications.
3) Standard color charts.
4) Statement of compliance with specified referenced standards.
5) Testing by recognized testing agency.
6) Application of testing agency labels and seals.
7) Notation of coordination requirements.
8) Availability and delivery time information.

d. For equipment, include the following in addition to the above, as applicable:
1) Wiring diagrams that show factory-installed wiring.
2) Printed performance curves.
3) Operational range diagrams.
4) Clearances required to other construction, if not indicated on accompanying Shop Drawings.

e. Submit Product Data before Shop Drawings, and before or concurrent with Samples.

2. **Shop Drawings**: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

a. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

1) Identification of products.
2) Schedules.
3) Compliance with specified standards.
4) Notation of coordination requirements.
5) Notation of dimensions established by field measurement.
6) Relationship and attachment to adjoining construction clearly indicated.
7) Seal and signature of professional engineer if specified.

b. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).

3. **Samples**: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

a. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

b. **Identification**: Permanently attach label on unexposed side of Samples that includes the following:

1) Project name and submittal number.
2) Generic description of Sample.
3) Product name and name of manufacturer.
4) Sample source.
5) Number and title of applicable Specification Section.
6) Specification paragraph number and generic name of each item.

a. **Paper Transmittal**: Include paper transmittal including complete submittal information indicated.

b. **Disposition**: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

1) Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

c. **Samples for Initial Selection**: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

1) Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

d. **Samples for Verification**: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

1) **Number of Samples**: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.

a) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

b) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Contractor’s Review

1. **Action Submittals and Informational Submittals**: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

2. **Contractor's Approval**: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

a. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

F. Architect’s Review

1. **Action Submittals and Informational Submittals**: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

2. **Contractor's Approval**: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval,

and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

a. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

b. **Electronic Submittals**: Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

3. **Informational Submittals**: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

4. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

5. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

6. Architect will return without review submittals received from sources other than Contractor.

7. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 35 91 – HISTORIC TREATMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general protection and treatment procedures for restoration of the building façade.

1.2 DEFINITIONS

A. **Consolidate**: To strengthen loose or deteriorated materials in place.

B. **Dismantle**: To disassemble and detach items by hand from existing construction to the limits indicated, using small hand tools and small one-hand power tools, so as to protect nearby historic surfaces; and legally dispose of dismantled items off-site, unless indicated to be salvaged or reinstalled.

C. **Existing to Remain**: Existing items that are not to be removed or dismantled.

D. **Historic**: Spaces, areas, rooms, surfaces, materials, finishes, and whose overall appearance is important to the successful preservation and rehabilitation as determined by the Architect.

E. **Match**: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish, as approved by the Architect.

F. **Reconstruct**: To remove existing item, replicate damaged or missing components, and reinstall in original position.

G. **Refinish**: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

H. **Reinstall**: To protect removed or dismantled item, repair and clean it as indicated for reuse, and reinstall it in original position, or where indicated.

I. **Remove**: Specifically for historic spaces, areas, rooms, and surfaces, the term means to detach an item from existing construction to the limits indicated, using hand tools and hand-operated power equipment, and legally dispose of it off-site, unless indicated to be salvaged or reinstalled.

J. **Repair**: To correct damage and defects, retaining existing materials, features, and finishes while employing as little new material as possible. Includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

K. **Replace**: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

L. **Replicate**: To reproduce in exact detail, materials, and finish, unless otherwise indicated.

M. **Reproduce**: To fabricate a new item, accurate in detail to the original, and in either the same or a similar material as the original, unless otherwise indicated.

N. **Restore**: To consolidate, replicate, reproduce, repair, and refinish as required to achieve the indicated results.

O. **Retain**: To keep existing items that are not to be removed or dismantled.

P. **Reversible**: New construction work, treatments, or processes that can be removed or undone in the future without damaging historic materials, unless otherwise indicated.

Q. **Salvage**: To protect removed or dismantled items and deliver them to Owner ready for reuse.

R. **Stabilize**: To provide structural reinforcement of unsafe or deteriorated items while maintaining the essential form as it exists at present; also, to reestablish a weather-resistant enclosure.

S. **Strip**: To remove existing finish down to base material, unless otherwise indicated.

1.3 INFORMATIONAL SUBMITTALS

A. **Pre-construction Documentation**: Show pre-existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by Contractor's historic treatment operations.

B. **Fire-Prevention Plan**: Submit before work begins.

1.4 QUALITY ASSURANCE

A. **Historic Treatment Specialist Qualifications**: An experienced firm regularly engaged in historic treatments similar in nature, materials, design, and extent to this work as specified in each section, and that has completed a minimum of five recent projects with a record of successful in-service performance that demonstrate the firm's qualifications to perform this work.

1. **Field Supervisor Qualifications**: Full-time supervisors experienced in historic treatment work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on Project site during times that historic treatment work is in progress. Supervisors shall not be changed during Project except for causes beyond the control of the specialist firm.

2. **Worker Qualification**: Persons who are experienced in historic treatment work of types they will be performing.

B. **Fire-Prevention Plan**: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-prevention devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include each fire watch's training, duties, and authority to enforce fire safety.

C. **Regulatory Requirements**: Comply with notification regulations of authorities having jurisdiction before beginning removal and dismantling work. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.5 STORAGE AND PROTECTION OF HISTORIC MATERIALS

A. Salvaged Historic Materials:

1. Clean only loose debris from salvaged historic items unless more extensive cleaning is indicated.

2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.

3. Store items in a secure area until delivery to Owner.

4. Transport items to Owner's storage area designated by Owner.

5. Protect items from damage during transport and storage.

B. Salvaged Historic Materials for Reinstallation:

1. Repair and clean historic items as indicated and to functional condition for reuse.

2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.

3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make item functional for use indicated.

C. **Existing Historic Materials to Remain**: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after historic treatment and construction work in the vicinity is complete.

D. **Storage and Protection**: When taken from their existing locations, catalog and store historic items within a weathertight enclosure where they are protected from wetting by rain, snow, condensation, or ground water, and from freezing temperatures.

1. Identify each item with a nonpermanent mark to document its original location. Indicate original locations on plans elevations, sections, or photographs by annotating the identifying marks.

2. Secure stored materials to protect from theft.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. **Preparation for Removal and Dismantling**: Examine construction to be removed or dismantled to determine best methods to safely and effectively perform removal and dismantling work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed or dismantled and location of utilities and services to remain that may be hidden by construction that is to be removed or dismantled.

1. Verify that affected utilities have been disconnected and capped.

2. Inventory and record the condition of items to be removed and dismantled for reinstallation or salvage.

3. Before removal or dismantling of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

B. **Survey of Existing Conditions**: Record existing conditions by use of measured drawings preconstruction photographs and preconstruction videotapes or other method that will allow clear interpretation of appearance and material and dimensional qualities of items salvaged or demolished for this work.

3.2 PROTECTION, GENERAL

A. Comply with temporary barrier requirements in Section 01 50 00 "Temporary Facilities and Controls."

B. Ensure that supervisory personnel are on-site and on duty when historic treatment work begins and during its progress.

C. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from historic treatment procedures.

1. Use only proven protection methods, appropriate to each area and surface being protected.

2. Provide barricades, barriers, and temporary directional signage to exclude public from areas where historic treatment work is being performed.

3. Contain dust and debris generated by removal and dismantling work and prevent it from reaching the public or adjacent surfaces.

4. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.

5. Protect floors and other surfaces along haul routes from damage, wear, and staining.

D. Temporary Protection of Historic Materials:

1. Protect existing historic materials with temporary protections and construction. Do not deface or remove existing materials.

2. Do not attach temporary protection to historic surfaces except as approved by Architect.

E. **Existing Drains**: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is in working order.

1. Prevent solids such as stone or mortar residue from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from historic treatment work.

2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

F. **Existing Roofing**: Prior to the start of work in an area, install roofing protection.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or damage resulting from applications of chemical cleaners and paint removers.

3.4 PROTECTION FROM FIRE

A. **General**: Follow fire-prevention plan and the following.

1. Remove and keep area free of combustibles including, rubbish, paper, waste, and chemicals, except to the degree necessary for the immediate work.

   1. If combustible material cannot be removed, provide fire blankets to cover such materials.

2. Prohibit smoking by all persons within Project work and staging areas.

B. Heat-Generating Equipment and Combustible Materials:

1. Use of open-flame equipment is not permitted.

2. As far as practical, restrict heat-generating equipment to shop areas or outside the building.

3. **Fire Watch**: Before working with heat-generating equipment or highly combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows.

   2. Train each fire watch in the proper operation of fire-control equipment and alarms.

   3. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.

   4. Cease work with heat-generating equipment whenever fire-watch personnel are not present.

   5. Have fire watch perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work at Project site to detect hidden or smoldering fires and to ensure that proper fire-prevention is maintained.

   6. Maintain fire-watch personnel at Project site until 60 minutes after conclusion of daily work.

C. **Fire Extinguishers, Fire Blankets, and Rag Buckets**: Maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire watch are trained in fire-extinguisher and blanket operation.

3.5 GENERAL HISTORIC TREATMENT

A. Ensure that supervisory personnel are present when historic treatment work begins and during its progress.

B. Halt the process of deterioration and stabilize conditions, unless otherwise indicated. Perform work as indicated on Drawings. Follow the procedures in subparagraphs below and procedures approved in historic treatment program:

   1. Retain as much existing material as possible; repair and consolidate rather than replace.

   2. Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.

   3. Use reversible processes wherever possible.

   4. Use historically accurate repair and replacement materials and techniques unless otherwise indicated.

C. Notify Architect of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing; or due to structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

D. Where missing features are indicated to be repaired or replaced, provide features whose designs are based on accurate duplications rather than on conjectural designs, subject to approval of Architect.

E. Where Work requires existing features to be removed or dismantled and reinstalled, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.

F. Identify new and replacement materials and features with permanent marks hidden in the completed work to distinguish them from original materials. Record a legend of identification marks and the locations of the items on record Drawings.

3.6 HISTORIC REMOVAL AND DISMANTLING

A. **General**: Have removal and dismantling work performed by qualified personnel entrusted with work on historic fabric.

B. Anchorages:

1. Remove anchorages associated with removed items.

2. Dismantle anchorages associated with dismantled items.

3. In non-historic surfaces, patch holes created by anchorage removal or dismantling according to the requirements for new work.

4. In historic surfaces, patch or repair holes created by anchorage removal or dismantling with material duplicating the historic surface or appropriate to the historic surface.

END OF SECTION

SECTION 01 40 00 – QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1.2 DEFINITIONS

A. **Experienced**: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. **Field Quality-Control Tests and Inspections**: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

C. **Installer/Applicator/Erector**: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

D. **Mockups**: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.

1. Mockups are used for one or more of the following:

   a. Verify selections made under Sample submittals.
   b. Demonstrate aesthetic effects.
   c. Demonstrate the qualities of products and workmanship.
   d. Demonstrate successful installation of interfaces between components and systems.
   e. Perform preconstruction testing to determine system performance.

2. **Product Mockups**: Mockups that may include multiple products, materials, or systems specified in a single Section.
3. **In-Place Mockups**: Mockups constructed on-site in their actual final location as part of permanent construction.

E. **Preconstruction Testing**: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.

F. **Product Tests**: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

G. **Source Quality-Control Tests and Inspections**: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.

H. **Testing Agency:** An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."

I. **Quality-Assurance Services**: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

J. **Quality-Control Services**: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.3 CONFLICTING REQUIREMENTS

A. **Conflicting Standards and Other Requirements**: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.

B. **Minimum Quantity or Quality Levels**: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

A. **Permits, Licenses, and Certificates**: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.5 REPORTS AND DOCUMENTS

A. **Test and Inspection Reports**: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, telephone number, and email address of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

1.6 QUALITY ASSURANCE

A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. **Manufacturer Qualifications**: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. **Fabricator Qualifications**: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. **Installer Qualifications**: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. **Professional Engineer Qualifications**: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. **Testing and Inspecting Agency Qualifications**: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

G. **Mockups**: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups of size indicated.
2. Build mockups in location indicated or, if not indicated, as directed by Architect.
3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
4. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed to perform same tasks during the construction at Project.
5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain Architect's approval of mockups before starting corresponding work, fabrication, or construction.

    a. Allow seven days for initial review and each re-review of each mockup.

7. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
8. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
10. Demolish and remove mockups when directed unless otherwise indicated.

1.7 QUALITY CONTROL

A. **Owner Responsibilities**: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor.

B. **Contractor Responsibilities**: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
2. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
3. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
4. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. **Retesting/Reinspecting**: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

D. **Coordination**: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's and authorities' having jurisdiction reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017000 "Execution and Closeout Requirements."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. **Section 01 10 00 – Summary** for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

A. Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.

B. **Water and Sewer Service from Existing System**: Water from Owner's existing water system is available for use in cleaning or mixing. Provide connections and extensions of services and metering as required for construction operations.

C. **Electric Power Service from Existing System**: Electric power from Owner's existing system is available for use of construction tools and light equipment. Provide connections and extensions of services and metering as required for construction operations.

1.3 QUALITY ASSURANCE

A. **Electric Service**: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. **Tests and Inspections**: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. **Fire Extinguishers**: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

A. **Conservation**: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

3.2 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

A. **General**: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. **Sanitary Facilities**: Provide temporary toilet and wash facilities for works. Bathrooms inside the building will not be available for contractor's use.

C. **Temporary Heating and Cooling**: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

D. **Lighting**: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.4 SUPPORT FACILITIES INSTALLATION

A. **Field Offices**: Not required. Space in the building may be identified by Owner for contractor's use. Coordination with owner critical.

B. **Traffic Controls**: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.

2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. **Parking**: Limited off-street parking is available for contractors. Coordinate quantity and schedule with Owner. On-street, unmetered parking is available.

D. **Storage and Staging**: Coordinate designated areas of Project site for storage and staging needs with Owner.

E. **Dewatering Facilities and Drains**: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

F. **Project Signs**: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as indicated on Drawings.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

   a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touch up signs so they are legible at all times.

G. **Waste Disposal Facilities**: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. **Security Enclosure and Lockup**: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

B. **Barricades, Warning Signs, and Lights**: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

C. **Temporary Enclosures**: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

D. **Temporary Fire Protection**: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. For specific provisions, see Section 013591 “Historic Treatment Procedures”.

3.6 MOISTURE AND MOLD CONTROL

A. **Moisture and Mold Protection**: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.

B. **Exposed Construction Period**: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.

3.7 OPERATION, TERMINATION, AND REMOVAL

A. **Supervision**: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. **Maintenance**: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities where required to achieve indicated results and to avoid possibility of damage.

C. **Termination and Removal**: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017000 "Execution and Closeout Procedures."

END OF SECTION

SECTION 01 60 00 – PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Section 012000 "Price and Payment Procedures" for substitution requirements.

1.2 DEFINITIONS

A. **Products**: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. **Named Products**: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. **New Products**: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
3. **Comparable Product**: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. **Basis-of-Design Product Specification**: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. **Comparable Product Request Submittal**: An action submittal requesting consideration of a comparable product, including the following information:

1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.

D. **Basis-of-Design Product Specification Submittal**: An action submittal complying with requirements in Section 013000 "Administrative Procedures."

E. **Substitution**: Refer to Section 012000 "Price and Payment Procedures" for definition and limitations on substitutions.

1.3 QUALITY ASSURANCE

A. **Compatibility of Options**: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

1.5 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. **Manufacturer's Warranty**: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
2. **Special Warranty**: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.

B. **Special Warranties**: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. **Manufacturer's Standard Form**: Modified to include Project-specific information and properly executed.
2. **Specified Form**: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. **General Product Requirements**: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. **Product Selection Procedures**:

1. **Non-Limited List of Products**: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.

   a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."

2. **Non-Limited List of Manufacturers**: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.

   a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."

3. **Basis-of-Design Product**: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

   a. For approval of products by unnamed manufacturers, comply with requirements in Section 012000 "Price and Payment Procedures" for substitutions for convenience.

C. **Visual Matching Specification**: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012000 "Price and Payment Procedures" for proposal of product.

D. **Visual Selection Specification**: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. **Conditions for Consideration of Comparable Products**: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:

1. Installation of the Work.
2. Cutting and patching.
3. Progress cleaning.
4. Protection of installed construction.

B. Related Requirements:

1. Section 011000 "Summary" for coordination of, and limits on use of Project site.

1.2 DEFINITIONS

A. **Cutting**: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. **Patching**: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 QUALITY ASSURANCE

A. **Cutting and Patching**: Comply with requirements for and limitations on cutting and patching of construction elements.

1. **Structural Elements**: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. **Operational Elements**: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
3. **Other Construction Elements**: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
4. **Visual Elements**: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities.

Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. **Manufacturer's Installation Instructions**: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with requirements specified in other Sections.

B. **In-Place Materials**: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

C. **Cleaning Agents**: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. **Examination and Acceptance of Conditions**: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. **Field Measurements**: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. **Space Requirements**: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. **Review of Contract Documents and Field Conditions**: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for interpretation to Architect in accordance with requirements in Section 013000 "Administrative Procedures."

3.3 INSTALLATION

A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb, and make horizontal work level.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. **Tools and Equipment**: Select tools or equipment that minimize production of excessive noise levels.

G. **Templates**: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. **Attachment**: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.

1. **Mounting Heights**: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. **Joints**: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

J. Repair or remove and replace damaged, defective, or nonconforming Work.

1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.4 CUTTING AND PATCHING

A. **General**: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. **Existing Warranties**: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. **Temporary Support**: Provide temporary support of Work to be cut.

D. **Protection**: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. **Adjacent Occupied Areas**: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."

F. **Existing Utility Services and Mechanical/Electrical Systems**: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

G. **Cutting**: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Proceed with patching after construction operations requiring cutting are complete.

H. **Patching**: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. **Inspection**: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. **Exposed Finishes**: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. **Exterior Building Enclosure**: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. **Cleaning**: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROGRESS CLEANING

A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

    a. Use containers intended for holding waste materials of type to be stored.

B. Site: Maintain Project site free of waste materials and debris.

C. **Work Areas**: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. **Installed Work**: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. **Concealed Spaces**: Remove debris from concealed spaces before enclosing the space.

F. **Exposed Surfaces**: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. **Waste Disposal**: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. **Limiting Exposures**: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. **Protection of Existing Items**: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

END OF SECTION

SECTION 01 77 00 – CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.

1.2 ACTION SUBMITTALS

A. **Product Data**: For each type of cleaning agent.

B. **Contractor's List of Incomplete Items**: Initial submittal at Substantial Completion.

1.3 SUBSTANTIAL COMPLETION PROCEDURES

A. **Contractor's List of Incomplete Items**: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.

B. **Procedures Prior to Substantial Completion**: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
3. Complete final cleaning requirements.
4. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

C. **Inspection**: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1.4 FINAL COMPLETION PROCEDURES

A. **Submittals Prior to Final Completion**: Before requesting final inspection for determining Final Completion, complete the following:

1. Submit a final Application for Payment in accordance with Section 012000 "Price and Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. **Inspection**: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1.5 LIST OF INCOMPLETE ITEMS

A. **Organization of List**: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Cleaning Agents**: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. **Perform final cleaning**. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. **Cleaning**: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

    a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
    b. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    c. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    d. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
    e. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    f. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
    g. Remove labels that are not permanent.
    h. Leave Project clean and ready for occupancy.

C. **Construction Waste Disposal**: Comply with waste-disposal requirements in Section 015000 "Temporary Facilities and Controls."

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations required by Section 017300 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION

SECTION 02 83 19 - LEAD-BASED PAINT CONSIDERATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies furnishing all labor, worker training, materials, equipment and tools for the minimum requirements needed for removal any painted materials, and for surface preparation of previously-painted surfaces prior to the application of new paint systems.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary conditions and other related Sections, apply to this Section.

1.3 RELATED WORK

A. Work in this Section is related to and shall be coordinated and performed with work specified in the following Sections:

1. Section 09 91 13 “Exterior Painting”

1.4 WORK INCLUDED

A. Provide all labor, materials, services, insurance and equipment necessary to perform the work in accordance with these Specifications and with all applicable local, state and federal regulations.

B. The work of this Section specifies minimum requirements for the disturbance, removal, containment and disposal of lead-containing paint and associated waste generated as a result of renovation/demolition activities as outlined in the Specification.

C. Due to the age of the existing structure, it should be assumed that there is lead-containing paint within the layers of existing paint.

1. NOTE: Any amount of lead present on painted surfaces requires compliance with 29 CFR 1926.62 OSHA “Lead in Construction; Interim Final Rule”.

D. Determining airborne lead concentrations for each work method performed which will impact the lead painted surfaces in accordance with the methods specified in this Section.

E. Preparation of each work area location in accordance with the methods described in this Section.

F. Conduct the work in each work area using appropriate respiratory protection, protective clothing, and engineering controls to minimize the exposure of employees and the public in areas of the building adjacent to work areas to airborne lead particulate.

G. Proper clean-up procedures, handling and disposal of the waste generated in accordance with the methods described in Section 3.03 of this document.

H. Periodic visual inspection of surfaces outside of the work area shall be performed by the Contractor to identify any visible suspect lead dust, debris, or particulate. Ambient air monitoring should be performed by the contractor to document airborne lead levels during construction activities. If any visible suspect lead dust or debris is observed, an immediate clean-up of the area shall be performed using HEPA-filtered vacuums and Tri-Sodium Phosphate solution in accordance with the methods described in Section 3.03 of this document.

I. All debris generated from activities which disturb lead-based paint shall be collected using HEPA-filtered vacuums or other appropriate methods. Disposal of all lead contaminated waste shall be in accordance with applicable Federal, State and local regulations. Disposal shall be based on results of TCLP analysis.

1.5 STANDARDS AND GUIDELINES

A. The Contractor(s) shall comply with all federal, state, and local regulations pertaining to the Contract. These regulations include but are not limited to:

1. Code of Federal Regulations (CFR)

a. CFR 29 Part 1910 Occupational Safety and Health Standards.

b. CFR 29 Part 1926 Safety and Health Regulations for Construction.

c. CFR 40 Part 148 Hazardous Waste Injection Restrictions.

d. CFR 40 Part 260 Hazardous Waste Management System: General.

e. CFR 40 Part 261 Identification and Listing of Hazardous Waste.

f. CFR 40 Part 262 Standards Applicable to Generators of Hazardous Waste.

g. CFR 40 Part 263 Standards Applicable to Transporters of Hazardous Waste.

h. CFR 40 Part 264 Standards for Owners and Operations of Hazardous Waste Treatment, Storage, and Disposal Facilities.

i. CFR 40 Part 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.

j. CFR 40 Part 268 Land Disposal Restrictions.

k. CFR 49 Part 172 Hazardous Material Table, Special Provisions, Hazardous Material Communications, Emergency Response Information, and Training Requirements.

l. CFR 49 Part 178 Specifications for Packaging.

2. Code of Massachusetts Regulations (CMR)

a. 454 CMR 22.00 De-leading Regulations and all policy statements.

b. 310 CMR 30.00 Hazardous Waste Regulations.

3. National Fire Protection Association (NFPA)

a. NFPA 701-1989 Methods of Fire Test for Flame-Resistant Textiles and Films

4. National Institute for Occupational Safety and Health (NIOSH)

a. NIOSH OSHA Booklet 3142 Lead in Construction

5. Underwriters Laboratories (UL)

a. UL 586-1990 High-Efficiency, Particulate, Air Filter Units

6. American National Standards Institute (ANSI)

a. 9.2-1979(R1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems

b. Z88.2-1992 Respiratory Protection

1.6 CONTRACTOR RESPONSIBILITY

A. Prior to performance of work activities which will disturb lead-based paint, provide workers with a comprehensive medical examination as required by 29 CFR 1926.62 (I) (1) (i) & (ii). The examination shall not be required if adequate records show that employees have been examined as required by 29 CFR 1926.62(I) within the last year.

B. Medical Records. Maintain complete and accurate medical records of employees in accordance with 29 CFR 1910.20.

C. The Contractor shall employ a competent person who will be responsible for the following.

1. Employee Training in accordance with 29 CFR 1926.62.
2. Directing air monitoring.
3. Ensuring work is performed in strict accordance with specifications at all times.
4. Ensuring hazardous exposure to personnel and to the environment are adequately controlled at all times.

D. Respiratory Protection Program:

1. Furnish each employee required to wear a negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least every 6 months thereafter as required by 29 CFR 1926.62.
2. Establish and implement a respiratory protection program as required by 29 CFR 1910.134, 29 CFR 1910.1025, and 29 CFR 1926.62.

E. Hazard Communication Program: Establish and implement a Hazard Communication Program as required by 29 CFR 1910.1200.

F. Hazardous Waste Management: The Hazardous Waste Management plan shall comply with applicable requirements of Federal, State, and local hazardous waste regulations and address.

1. Identification of hazardous wastes associated with the work.
2. Estimated quantities of wastes to be generated and disposed of.
3. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and a 24-hour point of contact. Furnish a copy of the EPA hazardous waste permits and EPA Identification number.
4. and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.
5. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.
6. Spill prevention, containment, and cleanup contingency measures to be implemented.
7. plan and schedule for waste containment, removal and disposal. Wastes shall be cleaned up and containerized daily.
8. Cost for hazardous waste disposal according to this plan.

G. Site specific Health and Safety Plan.

1.7 SUBMITTALS

A. Submittals shall be in accordance with General Conditions Division I, SUBMITTALS.

B. The Contractor shall provide three (3) copies of the following submittals prior to commencement of work.

1. Notifications, permits, licenses, and application as required by all Federal, State and local regulations.

2. A written project schedule including proposed workshift size and work hours.
3. records as required by 29 CFR 1926.62 including results of venous blood lead and ZPP levels. Blood lead level test must have been conducted within thirty (30) days of project commencement.
4. Name, address, and EPA Identification Numbers of the hazardous waste transporter and disposal facility (if applicable).
5. Hazard Communication Program.
6. Hazardous Waste Management Program.

PART 2 - PRODUCTS

2.1 QUALITY ASSURANCE

A. All materials and work shall be subject to acceptance by the Owner or the Owner's Representative. Contractor shall submit a listing of all pertinent material and equipment prior to start of abatement.

2.2 MATERIALS

A. The following materials and equipment will be provided by the Contractor during work on this project:

1. Washing agent: 5% tri-sodium phosphate at one ounce per gallon of water.
2. Polyethylene sheeting: 6-mil conforming to ASTM EI54, C-156, D-124B, D-2103 and D-4379.
3. Disposal Drums or other Containers: Per EPA, DEP, and DOT regulations.
4. Spray encapsulant: Spray material that encases lead dust particles in an adhesive matrix.
5. Spray adhesive: To assist adhesion in areas (i.e., concrete, etc.) that are otherwise difficult for duct tape alone.
6. Duct tape: Aluminum backed high adhesion tape.
7. Vacuum equipment: All vacuum equipment employed in the work area shall utilize HEPA filtration systems 99.97% efficient to 0.3 microns particulate size.
8. Lead warning and health signs: Submit samples.
9. Barrier tape: 2 inch wide, yellow, non-adhesive tape with the words "CAUTION - LEAD PAINT ABATEMENT"

B. Replacement and covering materials shall be approved per requirements of the contract document.

C. Polyethylene sheeting for segregating lead contaminated work areas (where applicable) shall be a minimum of 6-mil thickness and shall be fire resistant in accordance with applicable local fire codes.

D. Polyethylene sheeting for shower enclosures (where applicable) shall be opaque white or black in color.

E. Disposal drums (where applicable) shall meet all applicable EPA, MA DEP and US DOT regulations.

F. Appropriate labels as per applicable EPA, DOT, OSHA and MA DPH regulations shall be permanently affixed to all waste disposal containers (if applicable).

G. Lead contamination warning signs (where applicable) shall be in conformance with OSHA 29 CFR 1926.62 (R) (2)(i).

H. ABC type fire extinguishers, properly pressurized and in good working condition shall be conspicuously located in all work areas.

I. An adequately stocked first aid kit shall be conspicuously located in all work areas.

J. Only non-caustic strippers shall be allowed for use in this project.

2.3 NOTIFICATIONS

A. The Contractor shall give a minimum of five (5) days advance notice to the Owner and Owner Representative of the date abatement will commence, the estimated completion date, and the method of abatement.

2.4 EQUIPMENT

A. Provide approved respirators and protective clothing to all workers and all representatives of the Authority who may inspect the work site.

B. Protective clothing requirements:

1. Full body coveralls, including head covering, ("TYVEK" or a material equally resistant to dust penetration): these coveralls will be worn one time only and properly disposed of; hard hats, eye protection, and gloves.
2. All disposable protective clothing shall be disposed of as hazardous waste unless TCLP analysis is performed and the clothing is found to be below the threshold for hazardous disposal.

C. Require that ALL persons wear all appropriate protective equipment during all facets of work where lead exposure may exceed the OSHA PEL.

D. Respiratory protective equipment shall be according to OSHA Regulations: 29 CFR 1926.62, 29 CFR 1910.134 and ANSI Z88.2-1980. Respirators must also be NIOSH approved for protection against lead exposure.

E. Respirators:

1. Respirator selection shall be according to the following table:

Airborne Concentration of Lead	Respirator Type
Not in excess of 500 µg/m^3	• 1/2 mask air purifying respirator with high efficiency filters. • 1/2 mask supplied air respirator operated in demand (negative pressure) mode.
Not in excess of 1,250 µg/m^3	• Loose fitting hood or helmet powered air purifying respirator with high efficiency filters. • Hood or helmet supplied air respirator operated in a continuous-flow mode - e.g., type CE abrasive blasting respirators operated in a continuous-flow mode.
Not in excess of 2,500 µg/m^3	• Full facepiece air purifying respirator with high efficiency filters. • Tight fitting powered air purifying respirator with high efficiency filters. • Full facepiece supplied air respirator operated in demand mode. • 1/2 mask or full facepiece supplied air respirator operated in a continuous-flow mode. • Full facepiece self-contained breathing apparatus (SCBA) operated in demand mode.
Not in excess of 50,000 µg/m^3	• 1/2 mask supplied air respirator operated in pressure demand or other positive-pressure mode.
Not in excess of 100,000 µg/m^3	• Full facepiece supplied air respirator operated in pressure demand or other positive-pressure mode - e.g., type CE abrasive blasting respirators operated in a positive-pressure mode.
Greater than 100,000 µg/m^3 or unknown concentration	• Full facepiece SCBA operated in pressure demand or other positive-pressure mode.

2. The Contractor is responsible for determining airborne lead concentrations in each work area for each phase of work, i.e. demolition, clean-up, transport from building, cutting, etc. Personal air sampling shall be conducted at the start of each phase of work. Each personal air sample shall run a minimum of seven hours at a minimum of 2 liters per minute. It is the responsibility of the Contractor to insure that workers wear suitable respiratory protection at all times if exposure to airborne lead is a possibility. Daily air monitoring (personal) shall be conducted. Written results shall

be submitted to the Owner or the Owner's representative within 48 hours of the sampling period. If these sample results are not submitted within 48 hours of their collection the work will stop until the air sample results are submitted.

3. Workers shall perform positive and negative air pressure fit tests each time a respirator is put on, whenever the respirator's design so permits. Powered air-purifying respirators shall be tested for adequate flow each time upon entry to the work area as specified by the manufacturer.
4. Workers shall be given a qualitative fit test in accordance with procedures detailed in appendix D, OSHA 29 CFR 1926.62 for all 1/2 face, negative pressure respirators to be used on this project. An appropriately administered quantitative fit test may be substituted for the qualitative fit test.
5. Documentation of adequate respirator fit shall be submitted to the Authority prior to beginning work.
6. No one wearing a beard shall be permitted to wear a negative pressure respirator and enter the work area.

F. Ventilation devices where applicable, shall include filters capable of filtering particles of 0.3µ diameter at 99.97% efficiency (HEPA filters). Air filtering devices must be approved by the environmental consultant on-site. The ventilation units must be exhausted outside of the building away from walkways and building air intakes unless on-site, in position DOP tests (conforming to ANSI N-S10) certify that filters are functioning as specified. The environmental consultant may, at any time, require DOP testing of any or all HEPA filtered equipment. Reasons for requiring on-site, in position DOP tests may include, but are not limited to:

1. Obvious holes or gouges in HEPA filter
2. Cracked, brittle or otherwise inferior exhaust flex ducts

G. All vacuums used to clean protective clothing or surfaces within lead contaminated work areas must be equipped with HEPA filters (99.97% efficient at 0.3µ diameter).

H. All equipment shall be used according to OSHA Safety and Health Standards for the Construction Industry (29 CFR, Part 1926).

I. Any equipment which cannot be adequately cleaned before removal from the work area (brushes, vacuum wands, gloves, etc.) shall be placed into (2) 6-mil thickness polyethylene bags that shall be sealed airtight before removal from the work area.

PART 3 - EXECUTION

3.1 PREPARATION

A. Post caution signs meeting the specifications of OSHA 29 CFR 1926.62 (k) at any location or approach to a location where airborne lead concentrations may exceed 30 µg/m3. Caution signs shall be posted at a sufficient distance from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure.

Additional caution signs may need to be posted following construction of workplace enclosure barriers (if applicable).

B. Contractor shall evaluate each task required to complete the work described herein and in other sections of the contract documents to determine if employee exposure to lead may occur.

C. Until the Contractor documents that employee exposures are below the PEL for each type of activity where lead is present including manual demolition of structures (dry wall, plasters, wood, etc.), preparation of surfaces for painting, clean-up activities, or at any other time when exposure to lead is a possibility, the Contractor shall provide the following:

1. Appropriate respiratory equipment as specific herein and as required by OSHA 29 CFR 1926.62 (f).
2. Appropriate personal protective equipment as specific herein and as required by 29 CFR 1926.62 (g).
3. Change areas as required by 29 CFR 1926.62 (i)(2).
4. Hand washing facilities as required by 29 CFR 1926.62 (i)(5).
5. Biological monitoring as required by 29 CFR 1926.62 (j)(1)(i).
6. Training as required by 29 CFR 1926.62 (l)(1)(i), 29 CFR 1926.62 (l)(2)(ii)(c) and 29 CFR 1926.21.

3.2 CONDUCTING THE WORK

A. Contractor shall provide appropriate respiratory and other personal protective equipment to all employees who may be exposed to airborne lead in excess of 50 μg/m3.

B. Lead based paint removal operations where airborne lead concentrations exceed 30 μg/m3 shall be fully contained and separated from other areas by polyethylene sheeting forming a work enclosure and requires decontamination facilities.

C. Lead based paint removal operations where airborne lead concentrations exceed 50 μg/m3.shall be fully contained and separated from other areas by polyethylene sheeting forming a work enclosure, be under negative pressure and require decontamination facilities.

D. Demolition activity shall be engineered and conducted such that the least amount of airborne dust is generated. The following work practices shall be employed when demolition of building components which contain lead paint is performed.

1. No person under the age of 18 years shall be permitted to work on renovation and/or rehabilitation projects.
2. Whenever there is an exposure to lead dust, a respirator and personal protective clothing such as those listed in 454 CMR 22.00 shall be worn.
3. The employer shall not permit employees to eat, drink, smoke, chew (gum or tobacco), or apply cosmetics in any work area.

4. When tools and/or equipment are removed from the work area, they shall be cleaned with a solution of tri-sodium phosphate or vacuumed with a HEPA vacuum. All work areas shall be cleaned at the end of the job with a HEPA vacuum.
5. Adequate precautions shall be implemented to ensure that the outside environment is protected, according to applicable EPA and DEP regulations.
6. To prevent contamination of adjacent areas, the employer shall seal off the work areas, in accordance with 454 CMR 22.11.
7. The preparation, transportation and disposal of waste material containing lead shall follow the work practice requirements set forth in 454 CMR 22.00.

3.3 CLEAN-UP AND DISPOSAL OR SALVAGE

A. Clean-up activities shall include the use of HEPA filtered vacuums and a 5% solution of Tri-sodium Phosphate to clean all surfaces within the work area which may be contaminated with lead dust or particulate.

B. Prior to disposal, any debris which may contain lead shall be analyzed to determine the quantity of lead which may leach from the debris if it were buried in a conventional landfill. This analytical procedure is called toxicity characteristic leachate procedure (TCLP) and is required by US EPA regulation. The US EPA requires that materials which, when analyzed using TCLP, leach greater than 5 milligrams lead per liter of water (mg/L), be disposed of as hazardous waste.

C. All wastes shall be sampled using TCLP to determine if the material is hazardous waste. These wastes may include, but may not be limited to, disposable protective clothing, waste water, paint chips, polyethylene sheeting used as work area barriers, etc. Contractor shall provide analytical results to the Authority’s Representative prior to disposal of said wastes.

D. Materials which have salvage value shall be appropriately salvaged. Salvage site shall be informed, in writing, of lead content of materials from this site to be salvaged.

E. Clean-up of the work area shall be conducted until a level of no visible suspect paint chips or dust is achieved on the interior horizontal and vertical surfaces, including the floor, desks, and cabinets.

F. If visible suspect debris is observed outside of the work area, re-cleaning will be required until a level of no visible suspect lead dust or debris is achieved.

▪ END OF SECTION ▪

SECTION 06 40 14 - ARCHITECTURAL WOODWORK REPAIR AND REPLACEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. The intention is to preserve as much original material as possible. To achieve this, “repair” as indicated on the drawings is defined as the application of either wood “Dutchmen” splices, epoxy consolidant and patching compound as defined in this specification. When replacement is warranted, the new work will duplicate the existing with respect to size, shape, profile and density of historic wood.

B. Work included: Provide all finish carpentry needed for restoration and replacement and proper installation including, but not necessarily limited to:
   1. Selective repair and replacement of wood trim elements.

C. Related Requirements:

   1. Section “01 10 00 Summary of Work".
   2. Section “09 91 13 Exterior Painting”

1.2 INFORMATIONAL SUBMITTALS

A. Product data: Submit within 15 calendar days of the award of the Contract. Fabrication may not commence without the Architect's written approval of the following:

   1. Epoxy consolidant.
   2. Epoxy fairing putty.
   3. Adhesives.
   4. Fasteners,
   5. Finish screws for exposed wood work.
   6. Finish nails for exposed wood work.

1.3 SAMPLES

A. Submit 18-inch long samples of each of the following.
   1. All proposed shaped replacement moulding pieces.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Only skilled craftsmen who are familiar and experienced with the materials and methods specified and are familiar with the design requirements shall be used for finish carpentry.
   1. Only skilled craftsmen shall be present at all times during wood repair work and shall personally direct the work.

B. Mockups:
   1. Provide in-place mockup of decorative wood urns, of each unique type, if alternate for wood material is accepted.

PART 2 - PRODUCTS

2.1 REPLACEMENT WOOD

A. Woodwork, trim, mouldings, and decorative urns:

   1. Species and grade: sound stock, thoroughly seasoned clear, vertical grained heartwood, kiln-dried to a moisture content no greater than 12%, South American mahogany, FEQ.

2.2 EPOXY CONSOLIDANT

A. Epoxy consolidant designed for wood repair shall be low modulus, low viscosity two component epoxy resin by the following manufacturers:

   1. West System 105 epoxy resin mixed with either the 205 or 206 hardener, manufactured by Gourgeon Brothers, Inc., Bay City Michigan
   2. Liquid Wood, Abatron, Inc., Kenosha, WI
   3. Approved Equal.

2.3 EPOXY FAIRING PUTTY

A. Epoxy fairing putty designed for wood by the following manufacturers:

   1. Araldite av (resin) and hv (hardener) Manufactured by Ciba-Geigy corporation, 4917 Dawn Ave, East Lansing, MI 48823-5691
   2. West System 105 resin mixed with hardener 205 or 106 and fairing fillers 407 or 410;
   3. Woodepox, Abatron, Inc., Kenosha, WI (414) 653-2000)

B. (note: filler should be varied to suit condition, as each filler imparts a different workability and hardness).

2.4 ADHESIVES

A. Waterproof polyurethane glues by the following manufacturers:

1. Gorilla Glue, manufactured by the Gorilla Glue Group in Santa Barbara California;
2. Titebond Polyurethane Glue, manufactured by Franklin International Columbus, Ohio
3. Excel polyurethane glue.
4. Approved Equal.

2.5 SILICONE JOINT SEALANTS

A. Mildew-Resistant Neutral-Curing Silicone Joint Sealant: ASTM C 920.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Dow Corning Corporation.
2. Pecora Corporation.
3. Sika Corporation; Construction Products Division.
4. Tremco Incorporated.

   a. Type: Single component (S) or multicomponent (M). Paintable. Grade: Pourable (P) or nonsag (NS). Class: 100/50. Uses Related to Exposure: Nontraffic (NT).

2.6 CLEANING MATERIALS

A. Water: Potable.

B. Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 1/2 cup of laundry detergent that contains no ammonia, 5 quarts of 5 percent sodium hypochlorite bleach, and 15 quarts of warm water for each 5 gal. of solution required.

C. Mildewcide: Commercial proprietary mildewcide or a job-mixed solution prepared by mixing 1/3 cup of household detergent that contains no ammonia, 1 quart of 5 percent sodium hypochlorite bleach, and 3 quarts of warm water.

2.7 MISCELLANEOUS MATERIALS

A. Exterior Blocking, Shims, and Nailers: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

1. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC3b.
2. Kiln dry lumber after treatment to a maximum moisture content of 19 percent.
3. Mark lumber with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee's (ALSC) Board of Review.

B. Nails for Exterior Use: Stainless steel.

C. Screws for Exterior Use: Stainless steel.

D. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage.

PART 3 - EXECUTION

3.1 GENERAL WOOD REPAIR

A. INSPECTION

1. Test soundness of wood with an ice pick or an awl. Sound wood will separate in long fibrous splinters. Decayed wood will lift up in short irregular pieces due to the breakdown of fiber strength.
2. The intention is to preserve as much as original material as possible. To achieve this, “repair” as indicated on the drawings is defined as the application of either wood “Dutchmen” splices, epoxy consolidant and patching compound, or similar techniques, and as defined in this specification. When replacement is indicated, the new work will duplicate the existing with respect to size, shape, and profile.

3.2 INSTALLATION

A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation, and to protect the work and materials of all other trades.

1. Prime all six sides of replacement wood pieces before installation with an alkyd primer.
2. Prime all cuts with same primer.

B. Quality Standard: Install woodwork to comply with same grade specified in Part 2 for type of woodwork involved.

C. Install woodwork true and straight with no distortions. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

D. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.

E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk concealed fasteners and blind nailing. Use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork.

F. Install trim with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Scarf running joints and stagger in adjacent and related members.

G. Complete finishing work specified in this Section to extent not completed at shop or before installation of woodwork. Fill nail and screw holes with matching filler where exposed.

H. Refer to Division 09 Sections for final finishing of installed architectural woodwork.

I. Clean woodwork on exposed and semiexposed surfaces.

J. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.3 STABILIZATION

A. For minor repair of wood that is split, checked or shows signs of rot, follow this procedure:

1. Dry the wood; Treat decayed areas with a fungicide;
2. Waterproof with two or three applications of boiled linseed oil (every 24 hours);
3. Fill cracks and holes with putty;
4. After a "skin" forms on the putty, paint the surface.

3.4 JOINT REPAIRS

A. Where joints have failed disassemble the joint. Salvage intact splines, pegs, dowels or other historic fasteners for reuse.

1. For each component of the joint repair with Dutchmen, consolidants or epoxies as required.
2. Allow work on components to fully cure to prevent bonding between elements when rejoined.
3. Reassemble joint and secure with salvaged splines, pegs, dowels or new as required.

3.5 EPOXY REPAIRS

A. Where width of areas of decayed wood exposed at the face of the woodwork is less than 1/2" epoxy repair is allowed. (Width is the measure perpendicular to prevailing wood grain).

1. Read and understand manufacturers instructions and bring to the attention of the Architect any conflicts with the contract documents prior to start of work.
2. Paint removal as necessary for repairs.
3. Follow the written instructions of the manufacturer of Epoxy consolidant and adhesive filler.
4. Remove decayed wood down to sound wood material and allow to dry completely.
5. Apply low viscosity epoxy consolidant by saturating the wood completely.
6. Continuously saturate with epoxy. DO NOT let epoxy harden. Apply epoxy until no more liquid is being absorbed.
7. Apply epoxy filler to fill the voids after the consolidant has cured. It can be applied with a putty knife.
8. After curing the epoxy can be shaped and smoothed with chisels, planes, and sandpaper.

3.6 "DUTCHMEN"

A. Where width of areas of decayed wood exposed at the face of the woodwork exceeds 1/2""Dutchmen" replacement of decayed wood is required or where woodwork cannot physically or economically be repaired, replace with new to match the existing in all details. (Width is the measure perpendicular to prevailing wood grain).

1. Cut out deteriorated, rotted or damaged sections to solid smooth substrate surfaces with beveled or otherwise shaped edges to facilitate a tight fitting infill patch.
2. Cut infill patch to fit prepared mortise. Patch must match species density, moisture content and grain tightness of existing wood.
3. Set patch with appropriate glue and small finish nails or brads if required.
4. Plane and sand smooth continuous finished surface with minimal filler at nail holes and slight open cracks.

3.7 REPLACEMENT

A. Where condition of wood or its absence requires replacement the following steps are required:

1. Manufacture replacement pieces from approved restoration wood species to approved profile samples.
2. Treat all new wood with wood preservative.
3. Back prime entire piece.
4. Paint as specified under Division 9 - "Exterior Painting."

3.8 SEALING

A. Wood repair is not considered complete until the material is sealed.

1. Apply mildewcide to all wood trim.
2. Apply sealer thinned to 50/50 mineral spirits/sealer solution to all wood trim. Allow to dry for 24 hours minimum.
3. Paint finish coats as specified in Division 9 - "Exterior Painting

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▪ END OF SECTION ▪

SECTION 07 53 23 – ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. New adhered EPDM reinforced membrane roofing system at the floor of the belfry.

1.2 QUALITY ASSURANCE

A. **Installer Qualifications**: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

B. **Source Limitations**: Obtain components including for membrane roofing system from same manufacturer as membrane roofing.

C. **Exterior Fire-Test Exposure**: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

1.3 PROJECT CONDITIONS

A. **Weather Limitations**: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.4 WARRANTY

A. **Special Warranty**: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 30 years from Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 EPDM MEMBRANE ROOFING (REINFORCED)

A. **EPDM**: ASTM D 4637, Type I, reinforced, uniform, flexible EPDM sheet.
   1. **Basis-of-Design Manufacturer**: Subject to compliance with requirements, provide products by the following:
      a. Carlisle SynTec Incorporated.
   2. **Thickness**: 75 mils, nominal.
   3. **Exposed Face Color**: Black.

2.2 AUXILIARY MEMBRANE ROOFING MATERIALS

A. **General**: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
   1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
   2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
      a. Plastic Foam Adhesives: 50 g/L.
      b. Gypsum Board and Panel Adhesives: 50 g/L.
      c. Multipurpose Construction Adhesives: 70 g/L.
      d. Fiberglass Adhesives: 80 g/L.
      e. Contact Adhesive: 80 g/L.
      f. Single-Ply Roof Membrane Sealants: 450 g/L.
      g. Non-membrane Roof Sealants: 300 g/L.
      h. Sealant Primers for Nonporous Substrates: 250 g/L.
      i. Sealant Primers for Porous Substrates: 775 g/L.
      j. Other Adhesives and Sealants: 250 g/L.

B. **Sheet Flashin**g: 60-mil thick EPDM, partially cured or cured, according to application

C. **Bonding Adhesive:** Manufacturer's standard.

D. **Seaming Material**: Manufacturer's standard, synthetic-rubber polymer primer and 6-inch-wide minimum, butyl splice tape with release film.

E. **Fasteners**: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to roofing system manufacturer.

F. **Miscellaneous Accessories**: Provide lap sealant, water cutoff mastic, metal termination bars, metal battens, pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

2.3 SUBSTRATE BOARDS

A. **Substrate Board**: ASTM C1177/C1177M, glass-mat, water-resistant gypsum board or ASTM C1278/C1278M, fiber-reinforced gypsum board.
   1. **Thickness**: 1/2 inch
   2. **Surface Finish**: Unprimed

B. **Fasteners**: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate panel to desk.

PART 3 - EXECUTION

3.1 SUBSTRATE BOARD

A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.

   1. Fasten substrate board to existing wood roof sheathing boards to resist uplift pressure at corners, perimeter, and field of roof according to membrane roofing system manufacturers' written instructions.

3.2 ADHERED MEMBRANE ROOFING INSTALLATION

A. Adhere membrane roofing over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll membrane roofing and allow to relax before installing.

B. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

C. **Bonding Adhesive**: Apply to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.

D. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeters.

E. **Adhesive Seam Installation**: Clean both faces of splice areas, apply splicing cement, and firmly roll side and end laps of overlapping membrane roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of membrane roofing terminations.

F. **Tape Seam Installation**: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping membrane roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of membrane roofing terminations.

G. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.

3.3 BASE FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.

E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.4 FIELD QUALITY CONTROL

A. **Testing Agency**: Owner will engage a qualified independent testing agency to perform inspections.

B. **Final Roof Inspection**: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

C. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.

END OF SECTION

SECTION 07 61 00 – SHEET METAL ROOFING AND FLASHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Replacement of copper flashing and panels.
2. Replacement of copper gutters and downspouts.

1.2 RELATED SECTIONS:

A. **Section 01 10 00 – Summary** for identification for coordination of base scope and alternate work.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show installation layout of sheet metal roofing, flashing and trim, including plans, elevations, expansion joint locations, and keyed details. Distinguish between shop- and field-assembled work.

1. Include details for forming, joining, and securing sheet metal roofing and flashing, including pattern of seams, termination points, fixed points, expansion joints, roof penetrations, edge conditions, hips, special conditions, connections to adjoining work, and details of accessory items.
2. Details for reproduction of roof finial and attachment detail

C. Samples: For each exposed product and for each finish specified.

1. Copper sample for each weight to be used.
2. Lead sample for each weight to be used.
3. Solder.
4. Fastening accessories:
   a. Clips
   b. Rivets
   c. Other fasteners anticipated to be used on the project.

D. Coordination Drawings: Roof plans drawn to scale with coordinated details for penetrations and roof-mounted items.

E. Warranties: Sample of special warranties.

1.4 SPECIAL PROJECT CONDITIONS – FIRE VULNERABILITY

A. Project is an historic building with seasoned wood framing and sheathing in work areas.

B. EXTREME DILIGENCE is required for all heat producing operations. Enact full measures to monitor and protect against open flame or hidden combustion.

1.5 QUALITY ASSURANCE

A. Copper Roofing Standard: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

B. Sheet Metal Roofing Standard: Comply with SMACNA's "Architectural Sheet Metal Manual," unless more stringent requirements are specified or shown on Drawings.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Provide replacement profiles in 12″ lengths.
2. Build in-place mockup of typical flashing and trim replacement locations indicated on Drawings; approximately 24 inches square by full thickness, including attachments, underlayment, and accessories. Include all edge flashing, gutters and downspouts.

D. Pre-installation Conference: Conduct conference at Project site.

1.6 WARRANTY

A. Special Warranty: Warranty form in which Installer agrees to repair or replace components of sheet metal roofing that fail in materials or workmanship within two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ROOFING SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 temper, 20 oz./sq. ft., unless otherwise indicated.

1. Non-Patinated Exposed Finish: Red copper, mill finish.

2.2 ROOFING AND FLASHING SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 temper, 20 oz./sq. ft., unless otherwise indicated.

1. Non-Patinated Exposed Finish: Red copper, mill finish.

2.3 UNDERLAYMENT MATERIALS

A. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felts.

B. Slip Sheet: Building paper, 3-lb/100 sq. ft. (0.16-kg/sq. m) minimum, rosin sized.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for a complete roofing system and as recommended by primary sheet metal manufacturer unless otherwise indicated.

B. Fasteners: Wood screws, annular-threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

1. Fasteners for Copper Sheet: Copper, hardware bronze, or Series 300 stainless steel.

C. Solder:

1. For Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

2.5 ACCESSORIES

A. Sheet Metal Accessories: Provide components required for a complete sheet metal roofing assembly including trim, copings, fasciae, corner units, clips, flashings, sealants, gaskets, fillers, metal closures, closure strips, and similar items. Match material and finish of sheet metal roofing unless otherwise indicated.

1. Provide accessories as recommended by portable roll-forming equipment manufacturer to produce sheet metal roofing assemblies that comply with UL 580 for wind-uplift resistance classification specified in "Quality Assurance" Article.
2. Cleats: For mechanically seaming into joints and formed from the following materials:
   a. Copper Roofing: 20-oz./sq. ft. copper sheet.
3. Flashing and Trim: Formed from same material and finish as sheet metal roofing, minimum thickness matching the sheet metal roofing.

2.6 FABRICATION

A. General: Custom fabricate sheet metal roofing and flashing to comply with details shown and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions (panel width and seam height), geometry, metal thickness, and other characteristics of installation indicated. Fabricate sheet metal roofing and accessories at the shop to greatest extent possible.

1. Obtain field measurements for accurate fit before shop fabrication.
2. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
3. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.
4. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
6. Seams: Fabricate non-moving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
7. Low Slope Flat-Seam Roofing: Form flat-seam panels from metal sheets. Match existing sheet sizes with 3/4-inch notched and folded edges.
8. Solder joints at slopes of less than 4” per foot.

B. Form exposed sheet metal work to fit substrates without excessive oil canning, buckling, and tool marks; true to line and levels indicated; and with exposed edges folded back to form hems.

1. Form and fabricate sheets, seams, strips, cleats, valleys, ridges, edge treatments, integral flashings, and other components of metal roofing to profiles, patterns, and drainage arrangements shown on Drawings and as required for leak-proof construction.

C. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with bituminous coating, by applying self-adhering sheet underlayment to each contact surface, or by other permanent separation as recommended by fabricator of sheet metal roofing or manufacturers of the metals in contact.

D. Sheet Metal Accessories: Custom fabricate flashings and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Obtain field measurements for accurate fit before shop fabrication.

2.7 ROOF DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum **96-inch** long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

1. Accessories: Wire ball downspout strainer.
2. Expansion joints at intervals indicated by architect.

B. Downspouts: Fabricate downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Style: Round corrugated, 3" dia.
2. Fabricate from the following materials:

   a. Copper: 20 oz./sq. ft.

C. Copings: Fabricate in minimum 96-inch-long, but not exceeding 10-foot-long sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, seal, and solder or weld watertight. Fabricate from the following materials:

1. Copper: 20 oz./sq. ft.

D. Base Flashing: Fabricate from the following materials:

1. Copper: 20 oz./sq. ft.

E. Counterflashing and Flashing Receivers: Fabricate from the following materials:

1. Copper: 20 oz./sq. ft.

F. Roof-Penetration Flashing: Fabricate from the following materials:

1. Copper: 20 oz./sq. ft.

G. Valley Flashing, Drip Edges, and Eave, Rake, Ridge, and Hip Flashing: Fabricate from the following materials:

1. Copper: 20 oz./sq. ft.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that tops of fasteners are flush with surface.

3.2 UNDERLAYMENT INSTALLATION

A. Felt Underlayment: Install felt underlayment on roof sheathing under sheet metal roofing. Use adhesive for temporary anchorage. Apply at locations indicated on Drawings, in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

B. Apply slip sheet before installing sheet metal roofing.

3.3 INSTALLATION, GENERAL

A. General: Anchor sheet metal roofing and other components of the Work securely in place, with provisions for thermal and structural movement. Install fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for a complete roofing system and as recommended by fabricator for sheet metal roofing.

1. Field cutting of sheet metal roofing by torch is not permitted.
2. Provide metal closures at peaks and each side of ridge and hip caps.
3. Locate and space fastenings in uniform vertical and horizontal alignment. Predrill panels for fasteners.
4. Install hip caps as sheet metal roofing work proceeds.
5. Locate roofing splices over, but not attached to, structural supports. Stagger roofing splices and end laps to avoid a four-panel lap splice condition.
6. Lap metal flashing over sheet metal roofing to allow moisture to run over and off the material.

B. Thermal Movement. Rigidly fasten metal roof panels to structure at only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction.

1. Point of Fixity: Fasten each panel along a single line of fixing located at center of panel length.
2. Avoid attaching accessories through roof panels in a manner that will inhibit thermal movement.

C. Fasteners: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

D. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying self-adhering sheet underlayment to each contact surface, or by other permanent separation as recommended by SMACNA.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

3.4 CUSTOM-FABRICATED SHEET METAL ROOFING INSTALLATION

A. Fabricate and install work with lines and corners of exposed units true and accurate. Form exposed faces flat and free of buckles, excessive waves, and avoidable tool marks, considering temper and reflectivity of metal. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant. Fold back sheet metal to form a hem on concealed side of exposed edges unless otherwise indicated.

1. Install cleats to hold sheet metal panels in position. Attach each cleat with two fasteners to prevent rotation.
2. Fasten cleats not more than 12 inches (300 mm) o.c. Bend tabs over fastener head.
3. Provide expansion-type cleats and clips for roof panels that exceed 30 feet (9.1 m) in length.

B. Seal joints as shown and as required for watertight construction. For roofing with 3:12 slopes or less, use cleats at transverse seams. Use only silicone flexible sealants, do not over fill joints.

C. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.

1. **LIMIT FIRE RISK, DO NOT use torches for soldering.** Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
2. Copper Roofing: Tin edges of uncoated copper sheets, using solder for copper.

D. Flat-Seam Roofing: Attach flat-seam metal panels to substrate with cleats, starting at eave and working upward toward ridge. After panels are in place, mallet seams and solder.

1. Attach roofing panels with cleats spaced not more than 24 inches (610 mm) o.c. Lock and solder panels to base flashing.
2. Attach edge flashing to face of roof edge with continuous cleat fastened to roof substrate at 12 inches o.c. Lock panels to edge flashing and solder.

3.5 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored **twisted straps** spaced not more than 36 inches apart. Provide end closures and seal watertight with sealant. Slope to downspouts.

C. Built-in Gutters: Join sections with riveted and soldered or lapped joints sealed with sealant. Provide for thermal expansion. Slope to downspouts. Provide end closures and seal watertight with sealant.

1. Install felt underlayment layer in built-in gutter trough and extend to drip edge at eaves and under felt underlayment on roof sheathing. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with roofing nails. Install slip sheet over felt underlayment.

D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c. in between.

3.6 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete sheet metal roofing assembly including trim, copings, seam covers, flashings, sealants, gaskets, fillers, metal closures, closure strips, and similar items.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

3.7 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as sheet metal roofing is installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION

SECTION 07 71 23 – MANUFACTURED GUTTERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The provisions included under Division 1, General Requirements, are included as part of this section as though bound herein.

1.02 SUMMARY

A. Provide material necessary for furnishing a complete installation of the fiberglass gutter system.

1.03 SUBMITTALS

A. Product Data: Each type of product specified. Submit manufacturer's detailed technical product data, installation instructions and recommendations, dimensions of individual components, profiles, and finishes

B. Shop Drawings: Show fabrication and installation of fiberglass gutter system including fully dimensioned roof plans, expansion joint locations, sections and details of components and other related trims.

1.04 SAMPLES

A. Submit 18-in long sample of each of the following:
   1. All proposed fiberglass gutter profiles

1.05 QUALITY ASSURANCE

A. Where pre-engineered manufactured products are specified, other field fabricated or shop/field fabricated substitutions will not be accepted. However, where shop/field fabrications are indicated pre-engineered systems will be considered with Architect approval.

B. Obtain all components and related accessories from one single source manufacturer.

C. Follow manufacturer's printed instructions for installing fiberglass gutter system. Follow primary roofing manufacturer's printed instructions for installing associated roof material for flashing gutter system to roof.

1.06 DELIVERY, STORAGE & HANDLING

A. All products delivered shall be stored in a clean dry location prior to installation.

1.07 PROJECT CONDITIONS

A. Coordinate work of this Section with adjoining work for proper sequencing to ensure protection from inclement weather

B. Do not install fiberglass gutter system during inclement weather. When installing in cold climates, warm adhesives, caulks, and primers to at least 50 degrees Fahrenheit prior to application.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Manufacturer: "FiberGutter" A division of Fiberglass Building Products Inc. 546-A Plymouth St Halifax, MA 02338 Phone (781) 754-4890 www.fibergutter.com

2.02 TYPE

A. Custom profile to match existing historic wood gutter profile.

2.03 MATERIALS & FABRICATION

A. FiberGutter is constructed by pultrusion using polyester resin and fiberglass

1. Lengths are available for delivery up to 40'

2.04 ACCESSORIES

B. Fasteners to be used are 3" Stainless Structural Screw (U2 or GRK RSS)

C. Outlets are manufactured in Schedule 40 PVC

D. Endcaps are manufactured in fiberglass

E. Sealant: Shal be GutterGlue for all miters, endcaps and outlets

2.06 FINISHES

A. General: Can be painted with Acrylic Latex Paint after prep. Refer to painting instructions

PART 3 EXECUTION

3.01 EXAMINATION

A. The installer must examine substrates and conditions under which gutter system will be installed. All wood plates and/or fascia boards shall be installed true, straight, and free of splits, cracks, or other irregularities. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Installer shall thoroughly read and follow manufacturer's installation instructions before proceeding with installation.

3.03 INSTALLATION

A. General: The fiberglass gutter system shall be installed in strict accordance with manufacturer's printed instructions. Deviations from the instructions are not allowed.
B. Slope: 1/2" slope in 40 linear feet. Install fiberglass gutter with 3″ structural screw at every rafter end
C. Endcap Installation
   1. Sand any bonding surfaces where the endcap is to be installed (including on the gutter).
   2. Apply 2P10 Superglue to edge
   3. Stick Endcap in place so that it is flush with edge of gutter
   4. Give area another wipe clean once endcap is in place
   5. Use GutterGlue along edge of intersection between gutter & endcap. You can use your finger (with glove on) or tongue depressor to smooth it out.
D. Outlet Installation
   1. You can use a manufacturers outlet or 2″ Schedule 40 PVC Pipe cut to a 3″ length
   2. (Leave enough space for downspout to fit between outlet and fascia)
   3. Drill through gutter with a 2-3/8″ hole sa
   4. Use Sandpaper to clean up edge and increase bond strength. Give it a quick wipe with acetone
   5. Outlet should be a tight fit to gutter. If it is loose or will not sit straight use 2P10 Superglue to hold it in place while applying final bonding agent.
   6. Use GutterGlue to complete outlet Installation

E. Miter / Seaming Installation
1. Use GutterGlue to seal miter on inside. If outside needs touch up you can use GutterGlue and sand after curing.
2. Make sure area 2″ on either side of seam has been sanded (36 Grit ONLY)
3. Wipe with acetone and use 2P10 superglue (recommended) to temporarily hold seam together
4. Wet out Fibergutter Fiberglass Cloth with GutterGlue and lay into Miter/Seam.
5. Use tongue depressor to smooth inside of seam with GutterGlue over fiberglass tape
6. Allow 30 minutes before handling

END OF SECTION

SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 Section includes surface preparation and the application of paint systems on exterior substrates.

1. All exterior woodwork and siding.

B. Related Requirements:

1. Section 028319 “Lead-Based Paint Remediation” for management of lead-containing painted surfaces.

1.3 DEFINITIONS

A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

B. Samples: For each type of paint system and each color and gloss of topcoat.

1.5 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Final approval of color selections will be based on mockups.

   a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Sherwin-Williams Company (The)
2. Benjamin Moore & Co.
3. PPG Architectural Finishes, Inc.
4. Dulux (formerly ICI Paints); a brand of PPG Architectural.

2.2 PAINT, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. VOC Content: For field applications, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 50 g/L.
3. Dry-Fog Coatings: 150 g/L.

4. Primers, Sealers, and Undercoaters: 100 g/L.

5. Rust-Preventive Coatings: 100 g/L.

6. Zinc-Rich Industrial Maintenance Primers: 100 g/L.

7. Pretreatment Wash Primers: 420 g/L.

8. Shellacs, Clear: 730 g/L.

9. Shellacs, Pigmented: 550 g/L.

D. Colors: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Wood: 15 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

3.3 SURFACE PREPARATION

A. General: Perform preparation and cleaning procedures in strict accordance with the paint manufacturers instructions and as herein specified, for each particular substrate condition.

1. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from the cleaning process will not fall onto wet, newly painted surfaces.

2. Scrape with hand tools all surfaces exhibiting areas of loose paint or poor adhesion. Feather all rough edges with sandpaper to provide smooth transition between paint layers of substrate. A sample of the desired quality level of scraping and sanding and feathering shall be provided by the Contractor for approval by the Architect.

3. Clean wood surfaces to be refinished before applying stain, varnish, shellac, or other wood finishes.

B. Wood:

1. Remove all staples, fasteners, and non-historical unused appurtenances attached to trim, doors, and woodwork or varnish.

2. Clean wood surfaces to be painted of all dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finishes surfaces exposed to view, and dust off.

3.4 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks. Complete cover all surfaces.

C. Apply additional coats when undercoats or other conditions show through the final coat of paint until the paint film is of uniform finish, color, and appearance.

D. All paints shall be applied by brush ONLY.

3.5 CLEANING AND PROTECTION

A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Wood Substrates: Architectural woodwork, window and window frames, exterior metal grilles.

1. Latex System MPI EXT 6.3A

a. Prime Coat: Primer, alkyd for exterior wood, MPI #5.

1) Benjamin Moore, ‘Super Spec,’ Alkyd Exterior Primer, 176/K176.

2) PPG Architectural, ‘PPG Pittsburgh Paints,’ Prime220 Exterior Alkyd Wood Primer/Sealer, DR1102N.

3) Rust-Oleum, ‘Zinsser,’ AllPrime Oil Base Primer Sealer & Stain Blocker, 3651.

4) Sherwin Williams, ‘A-100,’ Exterior Fast Dry Stain Blocking Alkyd Primer, Y24WB8005.

b. Intermediate Coat: Latex, exterior, matching topcoat.

c. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11.

1) Sherwin Williams, ‘Duration’ Exterior 100% Latex Semi-Gloss.

2) Benjamin Moore, ‘Ultra Spec,’ Waterborne Exterior Gloss, N449/K449.

3) PPG Architectural, ‘PPG Pittsburgh Paints,’ Wonder Shield Exterior Gloss, DR18XXN.

▪ END OF SECTION ▪

SECTION 09 94 23 - GILDING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 Section includes surface preparation and the application of gold leaf to:

1. Previously gilded weathervane parts.

2. Clock numerals, hands, and ticks.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples: provide mock-up installation for review and approval.

PART 2 - PRODUCTS

2.1 GILDING MATERIALS

A. Metallic Leaf: 12K gold

1. Leaf Weight: 23 g per 1000 leaves measuring 3 3/8″ square.

B. Sizing: Oil type

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Comply with gilding materials manufacturer’s written instructions for inspection.

B. Begin gilding application only after unsatisfactory conditions have been corrected and when surfaces are dry.

3.2 APPLICATION

A. Apply according to manufacturer's written instructions and recommendations.

B. Apply gilding with adequate illumination that will not distort the condition of surfaces or materials being applied.

C. Apply sizing and metallic leaf to surfaces after nearby painting is completed and dry. Gently press metallic leaf into sizing with soft brush or a cotton or velvet cloth to fully adhere it to the surface. Gently remove overlapped edges with a soft brush after sizing has fully dried.

D. All paints shall be applied by brush ONLY.

3.3 CLEANING AND PROTECTION

A. Protect work of other trades against damage from metallic leaf application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION

BARNSTABLE UNITARIAN CHURCH

EXTERIOR RESTORATION

3330 MAIN STREET, BARNSTABLE, MA 02630

PROJECT TEAM:

ARCHITECT:

Spencer Preservation Group
PRESERVATION ARCHITECTS

41 Valley Road | Suite 211B
Nahant, MA 01908
(617) 227-2675
www.SpencerPreservationGroup.com

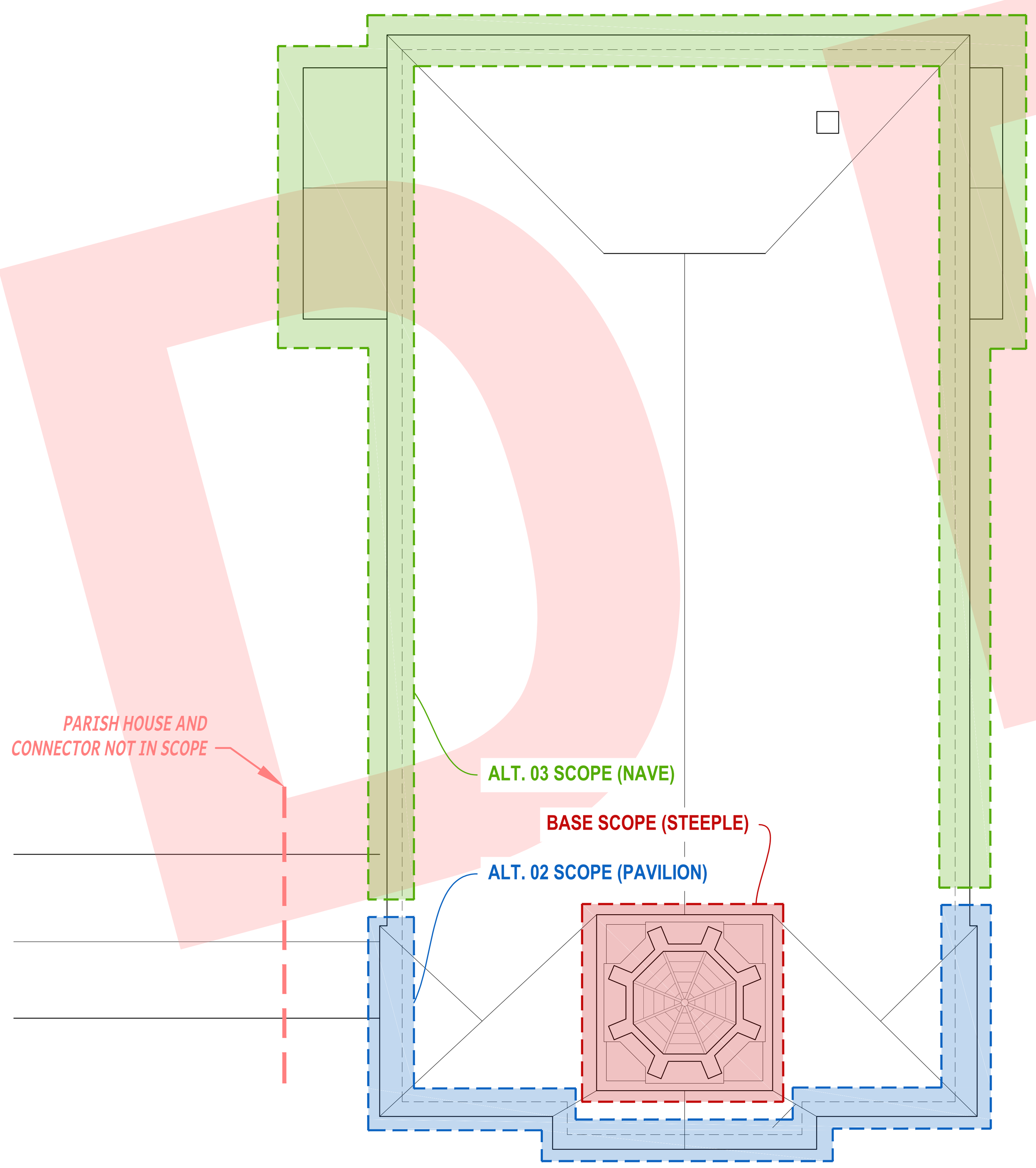
STRUCTURAL ENGINEER:

COASTAL engineering co.

260 Cranberry Highway
Orleans, MA 02653
(508) 255-6511
www.CoastalEngineeringCompany.com

DRAWING INDEX:

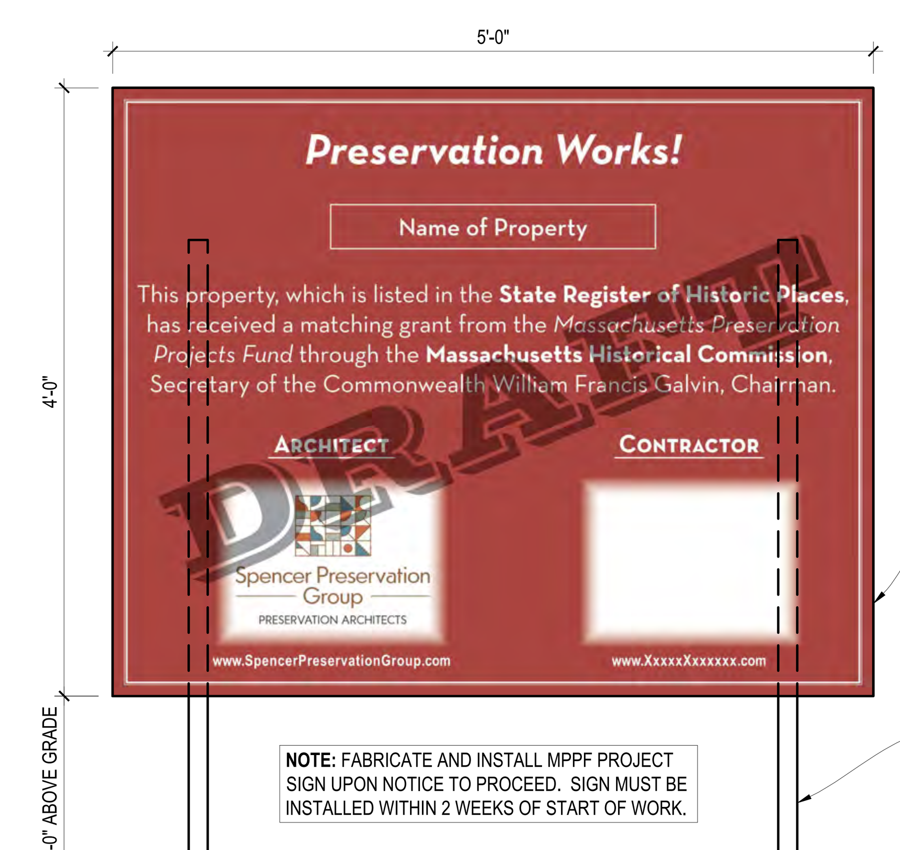
-- LOCUS MAP
NOT TO SCALE



-- SCOPE DIAGRAM
1/8" = 1'-0"

APPROX. LOCATION OF MPPF SIGN. COORD. WITH OWNER.

-- EXISTING AERIAL VIEW
NOT TO SCALE



NOTE: FABRICATE AND INSTALL MPPF PROJECT SIGN UPON NOTICE TO PROCEED. SIGN MUST BE INSTALLED WITHIN 2 WEEKS OF START OF WORK.

3/4" EXTERIOR-GRADE PLYWOOD WITH ADHERED SIGN. ARCHITECT TO PROVIDE DIGITAL FILE FOR PRINTING.

SIGN POST, FASTENED TO BACK OF PLYWOOD TO SUPPORT SIGN. STAKE INTO GROUND SUFFICIENT TO SUPPORT SIGN.

-- MPPF PROJECT SIGN
1" = 1'-0"

Spencer Preservation Group
PRESERVATION ARCHITECTS

41 Valley Road | Suite 211B
Nahant, MA 01908
(617) 227-2675
www.SpencerPreservationGroup.com

CONSULTANT:

OWNER:

UNITARIAN CHURCH OF BARNSTABLE
A Unitarian Universalist Congregation
3330 MAIN STREET
BARNSTABLE, MA 02630

PROJECT:

BARNSTABLE UNITARIAN CHURCH

EXTERIOR RESTORATION

3330 MAIN STREET
BARNSTABLE, MA 02630

OUTPUT:

LINEWEIGHT CHECK | COLOR CHECK R O Y G B V | SHEET CHECK ARCH D 24"×36" | TRANSPARENCY CHECK

PRINT SIZE CHECK: FULL SIZE SET MEASURES 1" / HALF SIZE SET MEASURES 1"

STATUS:

--	FOR BID	OCT 25, 2022

SEAL:

NOT FOR PERMITTING
BID
NOT FOR CONSTRUCTION

TITLE:
TITLE SHEET

SHEET:
A-0

STRUCTURAL GENERAL NOTES

1. PROJECT DESCRIPTION INCLUDES ALTERATIONS AND REPAIRS TO THE EXISTING INTERNAL STEEPLE STRUCTURE AT THE HISTORIC BARNSTABLE UNITARIAN CHURCH.

2. STRUCTURAL WORK SHALL CONFORM TO THE PROJECT SPECIFICATIONS, INCLUDING THE FOLLOWING GOVERNING STANDARDS:

   A. THE INTERNATIONAL BUILDING CODE (IBC–2015) WITH MASSACHUSETTS STATE BUILDING CODE, NINTH EDITION, AMENDMENTS (780 CMR).

   B. AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" LATEST EDITION.

   C. THE CODE FOR WELDING IN BUILDING CONSTRUCTION BY THE AMERICAN WELDING SOCIETY (AWS D1.1)

   D. THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION, WITH SUPPLEMENTS (2015 NDS).

3. CONSTRUCTION IS TO CONFORM TO THE MASSACHUSETTS STATE BUILDING CODE AND APPLICABLE PRODUCT AND DESIGN STANDARDS. ABSENCE OF SPECIFIC ITEMS FROM THESE DRAWINGS DOES NOT INFER THAT THE CONTRACTOR IS RELIEVED FROM THE STATUTORY CODE REQUIREMENTS.

4. THE CONTRACTOR SHALL VERIFY DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO COMMENCING WORK. ANY DISCREPANCY BETWEEN WHAT IS SHOWN ON THE DRAWING AND ACTUAL FIELD CONDITIONS SHALL BE REPORTED BACK TO THE ENGINEER IN WRITING BEFORE PROCEEDING WITH ANY WORK.

5. DESIGN VERTICAL LIVE LOADS:
ROOF:
– GROUND SNOW LOAD: 25 PSF

ATTIC/BELFRY/LANTERN:
–20 POUNDS PER SQUARE FOOT

6. DESIGN LATERAL LOADS:
WIND LOAD:
– EXPOSURE – B
– WIND SPEED (ULTIMATE): 140 MPH

SEISMIC:
–Ss=0.152
–S1=0.055

7. NOTIFY THE ENGINEER OF ANY ARCHITECTURAL MODIFICATION OR DIMENSION CHANGES THAT MAY AFFECT THE STRUCTURAL DESIGN.

WOOD FRAMING NOTES

1. FRAMING LUMBER SHALL CONFORM TO THE LATEST EDITION OF THE AFPA "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION", AND SUPPLEMENT "DESIGN VALUES FOR WOOD CONSTRUCTION", LATEST EDITION. MAXIMUM MOISTURE CONTENT SHALL BE 19%.

2. PRESSURE TREATED WOOD MEMBERS SHALL BE PRESSURE TREATED WITH ACQ PRESERVATIVE, OR APPROVED EQUAL, TO MINIMUM RETENTION OF 0.6 PCF IN ACCORDANCE WITH AWPA C3.

3. CONNECTORS, CONNECTIONS, FASTENERS, ETC. USED TO SECURE ACQ PRESSUE TREATED LUMBER SHALL BE STAINLESS STEEL.

4. LUMBER WHICH IS SPLIT, CRACKED, NOTCHED OR OTHERWISE ALTERED OR DAMAGED SHALL BE IMMEDIATELY REJECTED AND NOT ALLOWED FOR USE, UNLESS OTHERWISE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER.

5. THE FRAMING LUMBER SHALL BE OF THE FOLLOWING MINIMUM GRADE AND SPECIES FOR THE SPECIFIED USE. ALL LUMBER SHALL BE GRADE STAMPED BY A RECOGNIZED GRADING AGENCY AND SHALL BE SURFACE DRY:

DIMENSIONAL LUMBER

FOR EXPOSED PRESSURE TREATED MEMBERS*

–FLOOR FRAMING AND BEAMS	#2 SOUTHERN YELLOW PINE FB = 800 PSI, E = 1.4E6 PSI
–STUDS	#2 SOUTHERN YELLOW PINE FC = 1,400 PSI, E = 1.4E6 PSI
TIMBERS AND POSTS (NOT PILES) (5X5 AND LARGER)	#2 SOUTHERN YELLOW PINE FC = 525 PSI, E = 1.2E6 PSI

FOR NON–EXPOSED MEMBERS**

–FLOOR JOISTS & BEAMS	#2 SPRUCE PINE FIR FB = 875 PSI, E = 1.4E6 PSI
–STUDS	#2 SPRUCE PINE FIR FC = 1150 PSI, E = 1.4E6 PSI
–TIMBERS AND POSTS (5X5 & LARGER)	#2 SPRUCE PINE FIR FC = 500 PSI, E= 1.0E6 PSI

(*DESIGN VALUES ADJUSTED ONLY BY CM)
(**DESIGN VALUES NOT ADJUSTED)

6. DETAILS OF WOOD FRAMING SUCH AS NAILING, BLOCKING, BRIDGING, FIRESTOPPING, ETC. SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL DESIGN SPECIFICATION, THE TIMBER CONSTRUCTION MANUAL, THE WOOD FRAMED CONSTRUCTION MANUAL, AND ARCHITECTURAL GRAPHICS STANDARD BY RAMSEY & SLEEPER.

7. USE DOUBLE TRIMMERS AND HEADERS AT FLOOR OPENINGS WHERE BEAMS ARE NOT DESIGNATED.

8. USE FULLY NAILED METAL CONNECTORS (USP, SIMPSON, OR EQUAL), JOIST, OR BEAM HANGERS WHEN JOISTS OR BEAMS FRAME INTO OTHER JOISTS OR BEAMS. REFER TO FRAMING PLAN FOR CONNECTOR TYPES.

9. NAILS, FASTENERS, AND CONNECTORS EXPOSED TO THE WEATHER SHALL BE HOT–DIP GALVANIZED. CONNECTORS AND FASTENERS WHICH ARE USED WITH PRESSURE TREATED WOOD SHALL BE AISI 304 OR 316 STAINLESS STEEL.

10. WOOD PRODUCTS SHALL BE STORED IN A DRY LOCATION.

11. IN NO CASE SHALL JOISTS, BEAMS, STUDS OR ANY OTHER FRAMING MEMBER BE CUT, NOTCHED, DRILLED, OR OTHERWISE MODIFIED WITHOUT THE WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER.

TEMPORARY JACKING AND SHORING

1. THE CONTRACTOR MUST PROVIDE TEMPORARY STRUCTURAL SUPPORT OR SHORING, AS REQUIRED, TO INSTALL FOUNDATIONS AND FRAMING WORK AS SHOWN ON THE DRAWINGS.

2. NEW STRUCTURAL BEAMS AND JOISTS SHALL BE PLACED IN SUCH A MANNER TO TRANSFER ALL EXISTING LOADS TO THE FOUNDATIONS. TEMPORARY JACKING AND SHORING OF THE EXISTING STRUCTURE IS REQUIRED, TO RELIEVE ALL EXISTING APPLIED LOADS UNTIL NEW FOUNDATIONS AND CONNECTIONS HAVE BEEN COMPLETELY PLACED AND SECURED. JACKS MAY NOT BE RELIEVED, NOR SHORES REMOVED, UNTIL ALL NEW CONSTRUCTION WORK IS COMPLETE, THEREBY TRANSFERRING APPLIED LOADS TO NEW STRUCTURAL ELEMENTS.

3. FOR PURPOSES OF TEMPORARY SUPPORT OF SHORING SYSTEMS PLACED UPON EXISTING GRADE AND SOILS, A MAXIMUM SOIL BEARING CAPACITY OF 500 PSF SHALL BE ASSUMED.

LEGENDS, ABBREVIATIONS & NOTES

LEGENDS:

SHEAR WALL

FRAMING HANGER

ABBREVIATIONS:

F.H. – FULL HEIGHT
E.N. – EDGE NAILING W/ 8d COMMON
NAILS AT 6" O.C. U.N.O.
R/R – ROOF RAFTER
F/J – FLOOR JOIST
C/J – CEILING JOIST
D/J – DECK JOIST
E/S – EACH SIDE
HDR – HEADER
U.N.O. – UNLESS NOTED OTHERWISE
T.O. – TOP OF
CONT. – CONTINUOUS
CANT. – CANTILEVERED
BM – BEAM
F.F. – FLUSHED FRAMED
T.O.W.– TOP OF WALL
B.O.F.– BOTTOM OF FOOTING
T.O.C.– TOP OF CONCRETE
T.O.P– TOP OF PIER
T.O.S.– TOP OF STEEL
T.O.SH.– TOP OF SHELF
C.J.– CONTRACTION JOINT

"ISSUED FOR CONSTRUCTION"

COASTAL engineering co.
260 Cranberry Hwy. Orleans, MA 02653
508.255.6511 P 508.255.6700 F

NO.	DATE	REVISION	BY

SEAL

PROJECT:
STEEPLE ALTERATIONS
UNITARIAN CHURCH OF BARNSTABLE
3330 MAIN STREET BARNSTABLE, MA

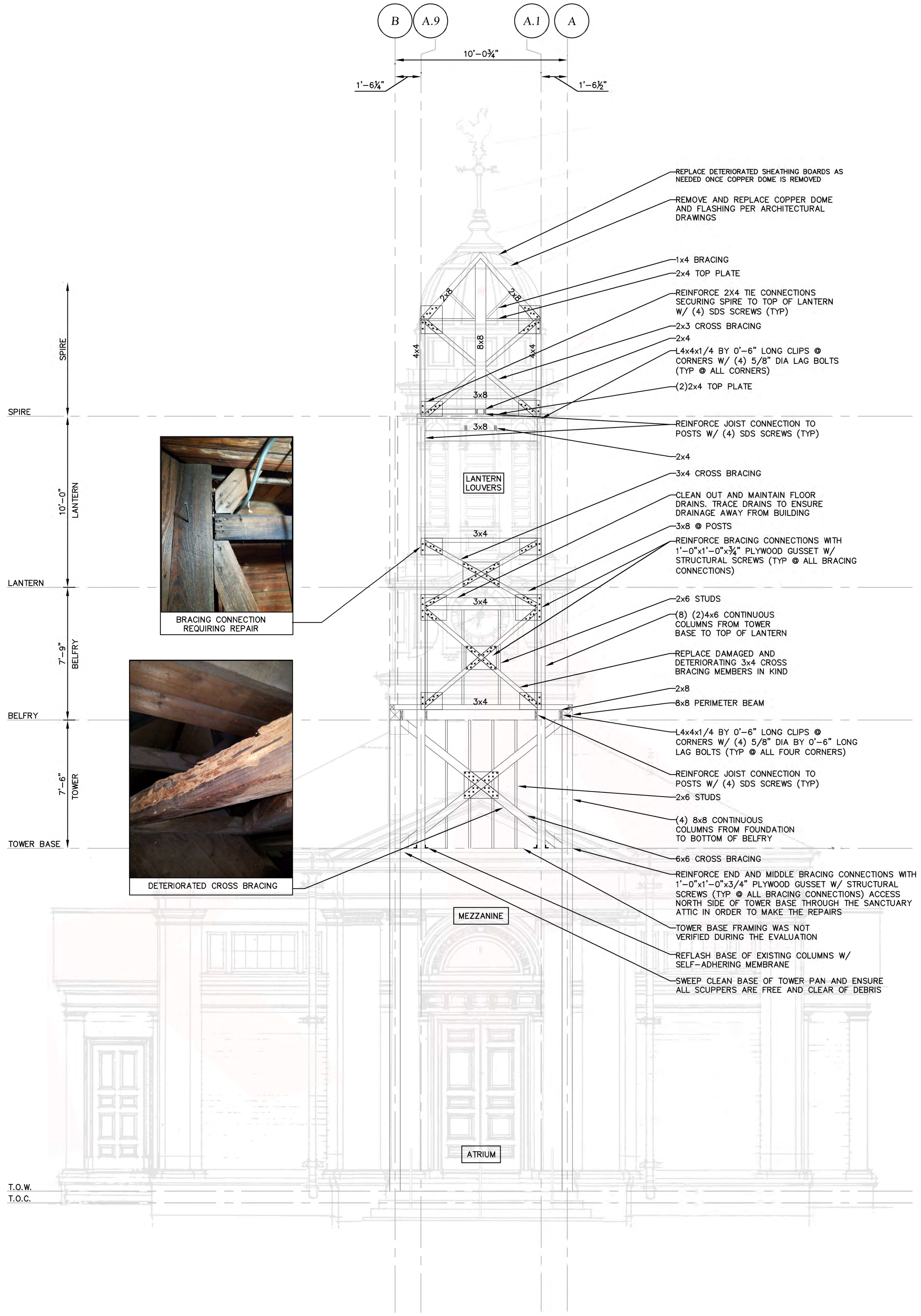
SHEET TITLE:
GENERAL NOTES

SCALE	AS NOTED
DESIGN BY	
DATE	10/25/2022
DRAWN BY	SER
CHECKED BY	NTB

S-100

1 OF 1 SHEETS

PROJECT NO. C19542.00



BUILDING SECTION A / S-200
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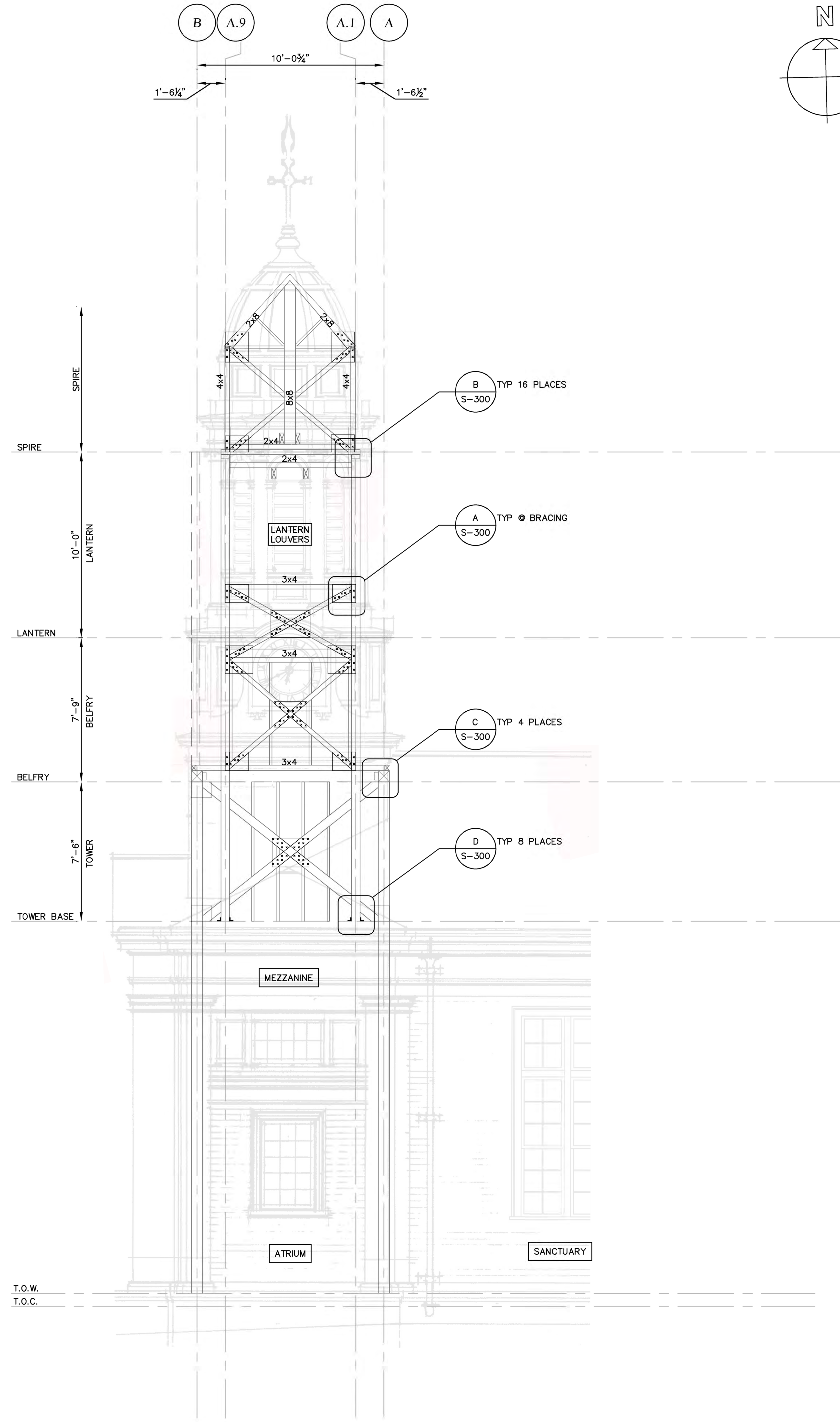

BUILDING SECTION B / S-200
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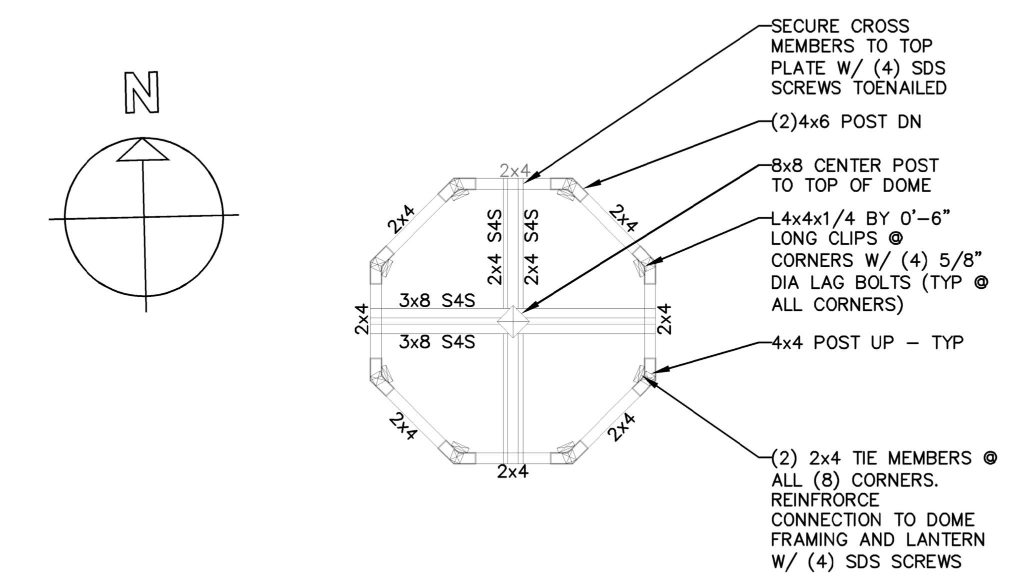

SPIRE FRAMING PLAN 1 / S-200
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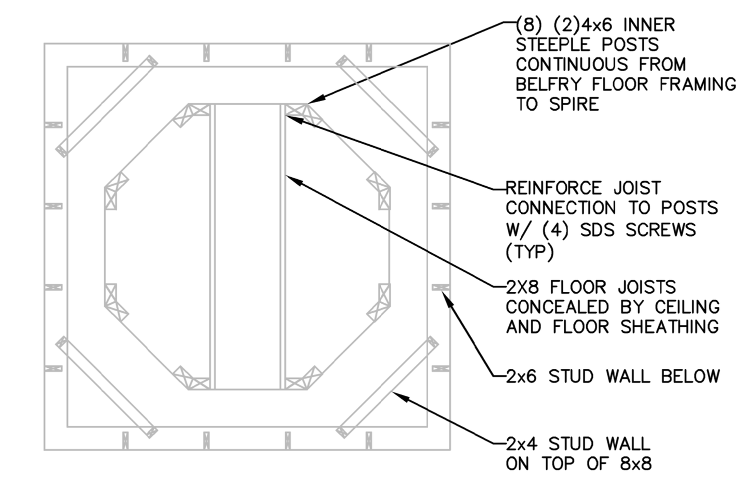
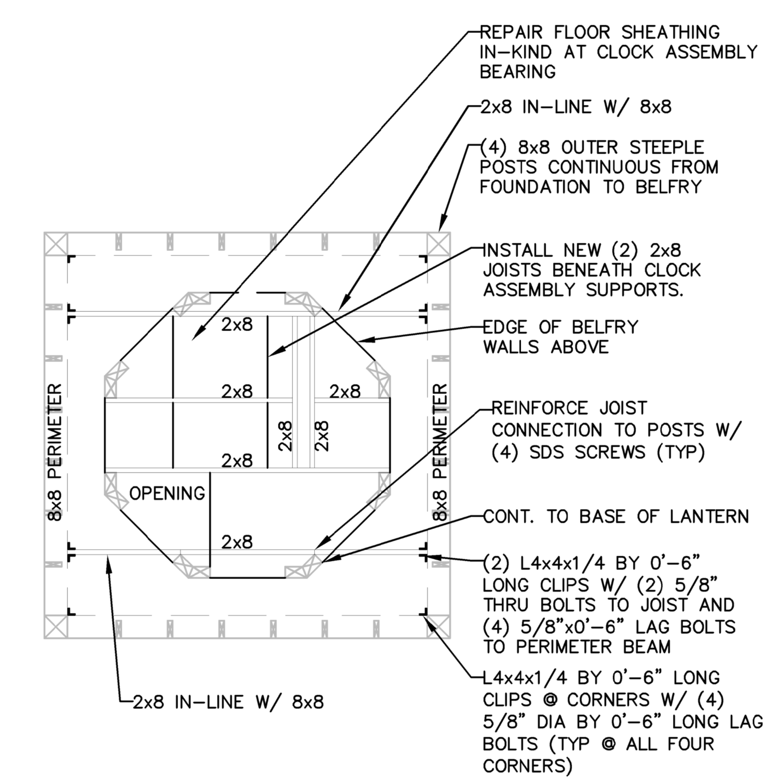
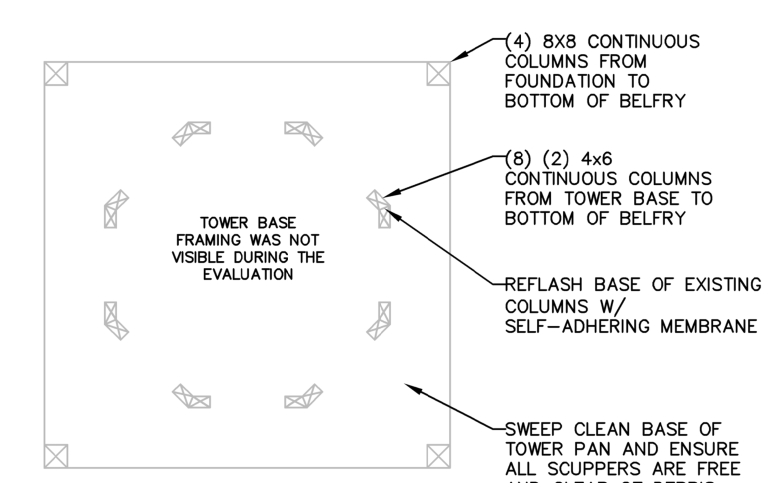


LANTERN FLOOR FRAMING PLAN 2 / S-200
SCALE: 1/4" = 1'-0"



BELFRY FLOOR FRAMING PLAN 3 / S-200
SCALE: 1/4" = 1'-0"



TOWER BASE FRAMING PLAN 4 / S-200
SCALE: 1/4" = 1'-0"

"ISSUED FOR CONSTRUCTION"

COASTAL engineering co.
260 Cranberry Hwy. Orleans, MA 02653
508.255.6511 P 508.255.6700 F

BY	REVISION	DATE	NO.

SEAL

PROJECT: STEEPLE ALTERATIONS
UNITARIAN CHURCH OF BARNSTABLE
3330 MAIN STREET BARNSTABLE, MA
SHEET TITLE: ELEVATIONS & FRAMING PLANS

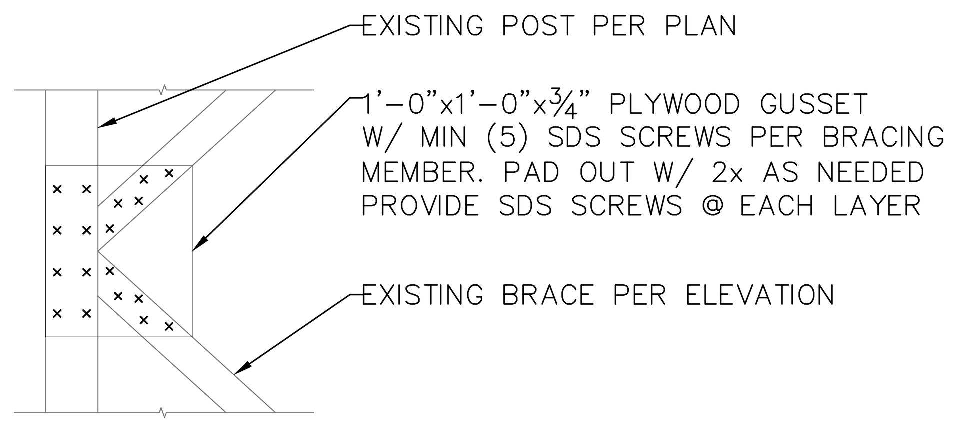
SCALE	AS NOTED
DESIGN BY	
DATE	10/25/2022
DRAWN BY	SER
CHECKED BY	NTB

S-200

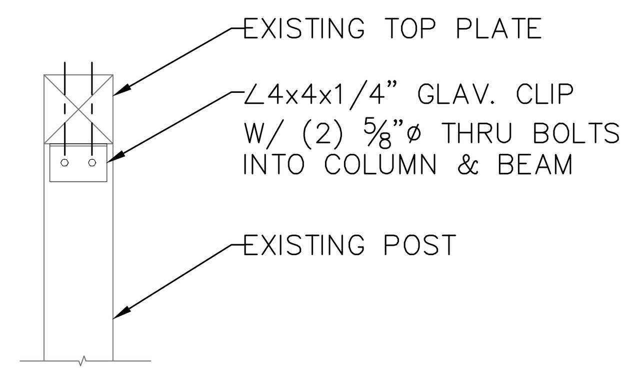
2 OF 3 SHEETS

PROJECT NO. C19542.00

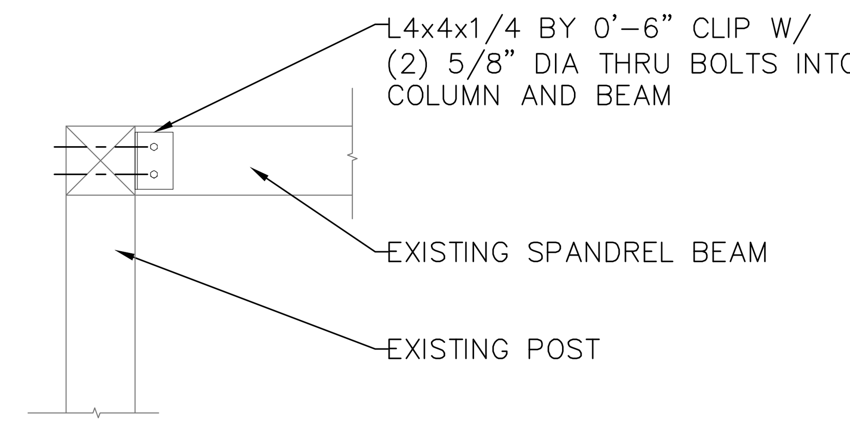
F:\SDSKPROJ\C19000\C19542\CAD\WIP\CEC-24X36-S-200.DWG 10/25/2022 @ 10:53 AM



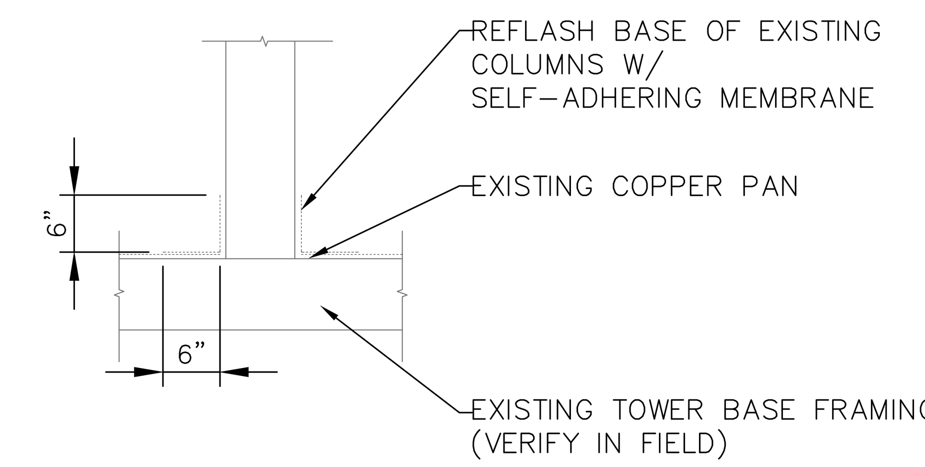
BRACING REINFORCEMENT A S-300
SCALE: 3/4" = 1'-0"



COLUMN CONNECTION REINFORCEMENT B S-300
SCALE: 3/4" = 1'-0"



BEAM CONNECTION REINFORCEMENT C S-300
SCALE: 3/4" = 1'-0"



COLUMN BASE FLASHING D S-300
SCALE: 3/4" = 1'-0"

"ISSUED FOR CONSTRUCTION"

COASTAL engineering co.
260 Cranberry Hwy. Orleans, MA 02653
508.255.6511 P 508.255.6700 F

NO.	DATE	REVISION	BY

SEAL

PROJECT: STEEPLE ALTERATIONS
UNITARIAN CHURCH OF BARNSTABLE
3330 MAIN STREET BARNSTABLE, MA

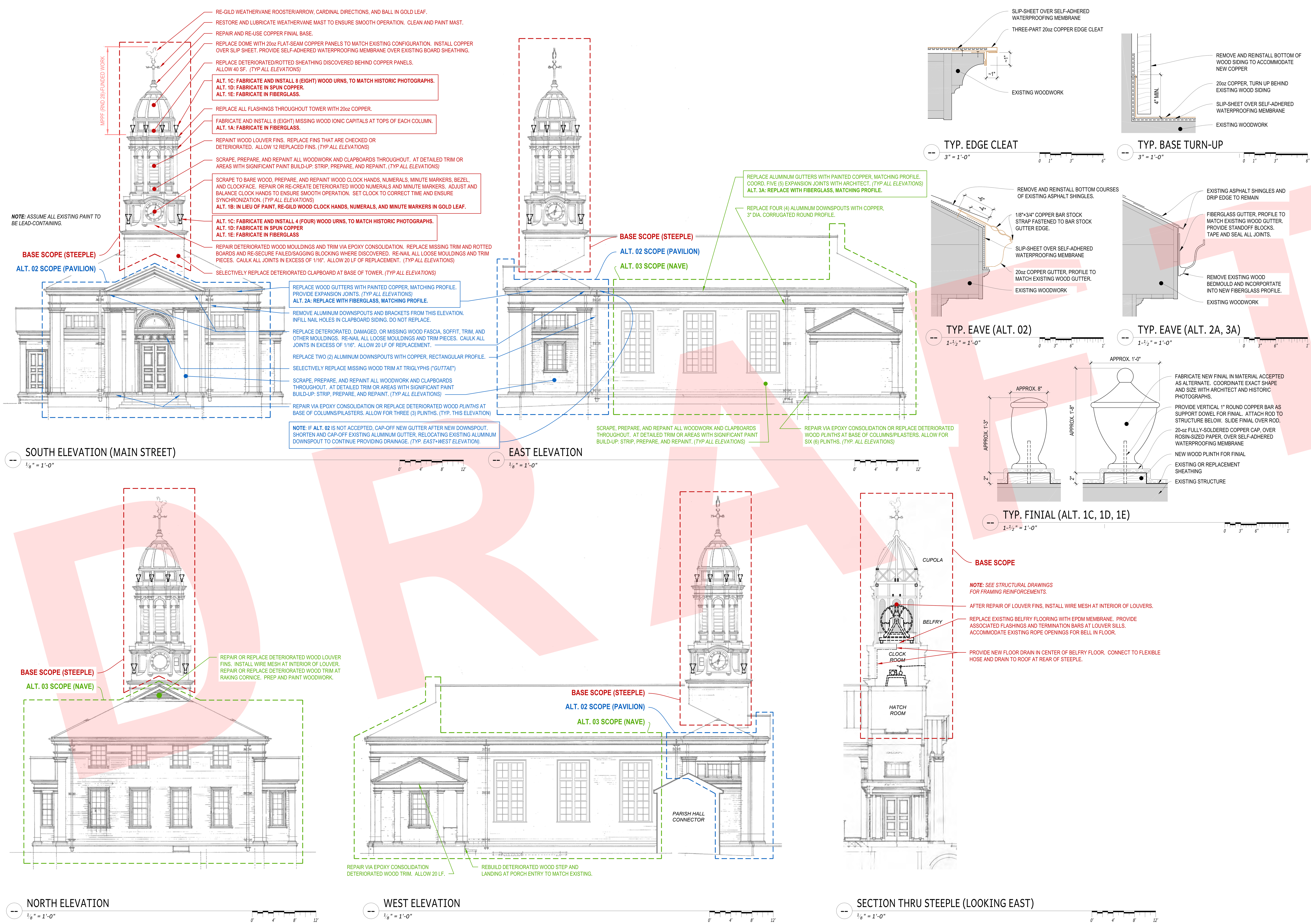
SHEET TITLE: STRUCTURAL DETAILS

SCALE	AS NOTED
DESIGN BY	
DATE	10/25/2022
DRAWN BY	SER
CHECKED BY	NTB

S-300

1 OF 1 SHEETS

PROJECT NO. C19542.00



Spencer Preservation Group
PRESERVATION ARCHITECTS
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Nahant, MA 01908
(617) 227-2675
www.SpencerPreservationGroup.com

CONSULTANT:

OWNER:

UNITARIAN CHURCH OF BARNSTABLE
A Unitarian Universalist Congregation
3330 MAIN STREET
BARNSTABLE, MA 02630

PROJECT:

BARNSTABLE UNITARIAN CHURCH

EXTERIOR RESTORATION

3330 MAIN STREET
BARNSTABLE, MA 02630

OUTPUT:
LINEWEIGHT CHECK | COLOR CHECK R O Y G B V | SHEET CHECK ARCH D 24"×36" | TRANSPARENCY CHECK
PRINT SIZE CHECK: FULL SIZE SET MEASURES 1" / HALF SIZE SET MEASURES 1"

STATUS:

--	FOR BID	OCT 25, 2022

NEW ↑ OLD

SEAL:

NOT FOR PERMITTING
BID
NOT FOR CONSTRUCTION

TITLE:
ELEVATIONS, SECTIONS, & DETAILS

SHEET:
A-1

-- WEATHERVANE

-- DOME

-- DRUM AND MISSING URN

-- BELFRY LOUVER

-- BASE OF BELFRY

-- CLOCK

-- BLIND CLOCK AND MISSING URN

-- BASE OF TOWER

-- TYPICAL MISSING TRIM

-- INTERIOR OF BELFRY (VIEWED FROM BOTTOM OF MAST)

-- INTERIOR OF BELFRY FRAMING AT DRUM

-- INTERIOR OF BELFRY LOUVERS

-- HISTORIC PHOTO WITH MISSING URNS (UNCONFIRMED DATE)

NOTE: THESE REFERENCE PHOTOS ARE A COURTESY PROVIDED FOR THE BENEFIT OF BIDDERS. THEY ARE NOT ALL-ENCOMPASSING AND MAY NOT REFLECT ALL PRESENT-DAY CONDITIONS. THEY DO NO RELIEVE BIDDERS FROM CONDUCTING THEIR OWN OBSERVATIONS.

Spencer Preservation Group
PRESERVATION ARCHITECTS
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CONSULTANT:

OWNER:

UNITARIAN CHURCH OF BARNSTABLE
A Unitarian Universalist Congregation
3330 MAIN STREET
BARNSTABLE, MA 02630

PROJECT:

BARNSTABLE UNITARIAN CHURCH

EXTERIOR RESTORATION

3330 MAIN STREET
BARNSTABLE, MA 02630

OUTPUT:

LINEWEIGHT CHECK | COLOR CHECK R O Y G B V | SHEET CHECK ARCH D 24"×36" | TRANSPARENCY CHECK

PRINT SIZE CHECK: FULL SIZE SET *MEASURES 1"* / HALF SIZE SET *MEASURES 1"*

STATUS:

--	**FOR BID**	**OCT 25, 2022**

NEW ↑ OLD

SEAL:

NOT FOR PERMITTING
BID
NOT FOR CONSTRUCTION

TITLE:
REFERENCE PHOTOS

SHEET:
A-2

CENTERVILLE-OSTERVILLE-MARSTONS MILLS
WATER DEPARTMENT
PO BOX 369 – 1138 MAIN STREET
OSTERVILLE, MA 02655
WWW.COMMWATER.COM

OFFICE OF
BOARD OF WATER COMMISSIONERS
WATER SUPERINTENDENT
Tel 508-428-6691
Fx 508-428-3508

January 9, 2023 via email

Attn: Mr. Lindsey B. Counsell, CPC chair

Re: Drinking Water Supply Protection/ OPEN SPACE/ Recreation

Dear Mr. Counsell:

Thank you for your support to protect our groundwater. Please find this letter as a statement of need for funding to enable COMM to research and quickly respond to potential properties as they become available for the protection of our Drinking Water Supply. The $100,000 requested would allow for the professional services necessary to present properties to our residents for required approval.
The estimated timeline to perform the professional services on various properties would vary but begin in 2023 then present the potential properties to voters in May of 2024 or 2025. We would seek partnership with MASSDEP and others to acquire any properties at the appropriate time.

We look forward to your cooperation in our endeavor to protect existing sources and provide additional groundwater sources to insure the needs of future generations of the District.

Please feel free to call to discuss this matter. I can be reached at 428-6691 or ccrocker@commfiredistrict.com.

Sincerely,

Craig A. Crocker, Supt.

CC: C-O-M.M. Prudential committee
Chairman, C-O-MM. Board of Water Commissioners.

CPC APPLICATION (Page l)

Submission Date: 1-18-2023

Project Title: COMM Drinking Water Protection Program

Project Map/Parcel Number: This will vary by project.

Estimated Start Date: February 2023

Estimated Completion Date: December 2025

Purpose (please circle all that apply):

Open Space – Land to be protected
Community Housing
Historic
Recreation Walking and other activities allowed
Town Affiliation**

Public - Drinking Water Protection
Private
Non-Profit
Partnership (Describe below#3)

****Please note: All Town CPC Applications must be approved by the Town Manager prior to submission.**

Applicant Contact:

Name: Craig Crocker

Organization (if applicable): Centerville Osterville Marstons Mills Water Department

Address: 1138 Main Street Osterville, MA 02655

Mailing Address: P.O Box 369 Osterville, MA 02655

Daytime Phone #: 508-428-6691

E-mail Address: ccrocker@commfiredistrict.com

Primary Contact (if different from applicant contact):

Name: Address:

Mailing Address:

Daytime Phone#:

E-mail Address:

CPC APPLICATION (page2)

Budget Summary:

Total budget for project: $100,000

CPA funding request: $100,000

Matching funds (committed/under consideration): Staff and volunteer time, possible grants. District vote on budget being considered

Please address the following questions:

1. Project summary (description and goals): To identify properties, appraisals, perform legal work to prepare potential properties for voter approval, boundary surveys, determine groundwater flows and sub watersheds as needed.

2. How does this project help preserve Barnstable's character? Protecting open land will preserve the Town's rural character by being undisturbed and provide ground water protection fo water supply. It will provide recreation areas for walkers, preserve wildlife habitat and protect rare species. Open land preserves property values. Hunting, an old tradition in town, is allowed in appropriate areas and is another recreational activity.

3. Partnership(s) Description: Potential partners for this project are Land Trusts, State and Federal agencies through grant funding and landowners through bargain sales and gifts of land.

4. Provide a detailed project timeline: Over the next two years the District will continue to analyze various properties for protection. From that review and selection process owners will be approached and projects will be selected for acquisition.

5. How does this project meet the General Criteria and Category Specific Criteria for CPC projects? It will provide Open Space for drinking water protection and Recreation opportunities. An additional benefit will be wildlife habitat and vegetation protection reducing potential pollution.

6. Provide a detailed budget, including the following information, as applicable: (Fiscal Year, Total Cost, CPC Funds Requested, Other Sources of Funding sought and received, and cost estimates/quotes received): This will vary depending upon the results from Item 4. Grants will be sought where possible. District voters will be asked for funding as needed.

7. Assessors office identification map and map and parcel number: This will also vary as project review goes forward.

Signatureof Applicant — Date 1/9/23

Signature of Applicant Partner — Date

Signature of Town Manager (Town Affiliated Projects) — Date

COMM Service Area (Wells and Tanks)

Cape Water Resources, LLC

PROJECT

Centerville, Osterville, Marston Mills, Fire District Water Department Project COMM-2014-W-10

DESCRIPTION

Site Plan

The Town of Barnstable
Department of Public Works
382 Falmouth Road, Hyannis, MA 02601
508.790.6400

Daniel W. Santos, P.E.
Director

Robert R. Steen, P.E.
Assistant Director

January 17, 2023

Mr. Lindsey Counsell, Chair
Town of Barnstable Community Preservation Committee
367 Main Street
Hyannis, MA 02601

RE: Application for Funding for the Cape Cod Rail Trail Phase 4 Project

Dear Mr. Counsell:

On behalf of the Town of Barnstable Department of Public Works, we respectfully submit the enclosed application for funding design services for the Cape Cod Rail Trail Phase 4 project.

When constructed, this project will extend the Cape Cod Rail Trail westward approximately 10 miles, from Mary Dunn Road in Barnstable to the Barnstable/Sandwich town line.

This project is essential to the state and regional vision of a continuous shared use path from the Cape Cod Canal to Provincetown. The trail will also serve local needs for commuting, recreation, and tourism.

This project is currently in the beginning of the pre-25% design phase. Additional funding is urgently needed as the Town applied for two grants totaling $800,000 but was only awarded $500,000. An additional $300,000 is needed to cover the unfunded portion of the pre-25% design, which, when completed, will be submitted to MassDOT with a request for a commitment of State Transportation Improvement Project (TIP) funds for future construction.

Thank you for your consideration in this matter.

Sincerely,

Paul Graves

Paul Graves, P.E.
Senior Project Manager

Encl: CPC Application

CPC APPLICATION (Page 1)

Appropriated CPA funds require one or more deed restrictions (conservation / historic preservation / housing). Sample restrictions are available at the Official Website of the Town of Barnstable www.town.barnstable.ma.us. If the restriction is prepared by the applicant, the first draft of the restriction should be provided to the CPC Coordinator. If the applicant is not preparing the restriction, a consultant will contact the applicant to assist in the drafting of the appropriate restriction after funds are appropriated. The Town of Barnstable Legal Department and Legal Consultant shall review and approve the restriction prior to the final commitment of the CPA funds to the project.

Submission Date: 1/17/2023

Project Title: Cape Cod Rail Trail Phase 4

Project Map/Parcel Number: See parcels list attached

Estimated Start Date: October 2022 (pre-25% design start)

Estimated Completion Date: June 2024 (pre-25% design completion)

Purpose (please circle all that apply):

Open Space	$\boxed{\text{Public}}$
Community Housing	Private
Historic	Non-Profit
$\boxed{\text{Recreation}}$	$\boxed{\text{Partnership (Describe below \#3)}}$
$\boxed{\textbf{Town Affiliation**}}$	

****Please note: All Town CPC Applications must be approved by the Town Manager prior to submission.**

Applicant Contact:
Name: Paul Graves, P.E.

Organization (if applicable): Town of Barnstable Department of Public Works

Address: 382 Falmouth Road, Hyannis, MA 02601

Mailing Address: same

Daytime Phone #: 774-487-0641

E-mail Address: paul.graves@town.barnstable.ma.us

Primary Contact (if different from applicant contact):
Name:

Address:

Mailing Address:

Daytime Phone #:

E-mail Address:

CPC APPLICATION (page 2)

Appropriated CPA funds require one or more deed restrictions (conservation / historic preservation / housing). Sample restrictions are available at the Official Website of the Town of Barnstable www.town.barnstable.ma.us. If the restriction is prepared by the applicant, the first draft of the restriction should be provided to the CPC Coordinator. If the applicant is not preparing the restriction, a consultant will contact the applicant to assist in the drafting of the appropriate restriction after funds are appropriated. The Town of Barnstable Legal Department and Legal Consultant shall review and approve the restriction prior to the final commitment of the CPA funds to the project.

Budget Summary:

Total budget for project: **$800,000**

CPA funding request: **$300,000**

Matching funds (committed/under consideration): **$500,000 MassTrails Grant (committed)**

Please address the following questions:

1. Project summary (description and goals): **Land surveying and preliminary design for a proposed new 12-foot wide shared use path from Mary Dunn Road near Israel Pond to the Barnstable/Sandwich town line on Service Road.**

2. How does this project help preserve Barnstable's character? **The Town of Barnstable's 2018 Open Space and Recreation Plan includes the following descriptions about the Town's character in the context of recreation (edited for brevity):**

- **Barnstable is geographically the largest town on Cape Cod and also the most populous community on Cape Cod.**
- **Barnstable includes seven villages, each having a dynamic history of development and a unique village character.**
- **Barnstable serves as the commercial, transportation, cultural, social service, and health care center of Cape Cod.**
- **The Town has taken a leadership role in addressing many growth management issues, including the protection of open space and the provision of recreational facilities.**
- **For open space and recreation planning, the age distribution suggests that Barnstable needs to provide a broad mix of active and passive recreation opportunities, and should gear facilities and programs to meet the needs of young families as well as retired adults.**
- **Barnstable also has significant populations with special socioeconomic needs that should be considered in setting priorities and allocating resources for open space and recreation facilities and programs.**

This project will help to preserve the Town's character by providing safe and enjoyable non-motorized transportation and recreation opportunities, for residents and visitors, providing access to all that Barnstable has to offer via connections to branch trails throughout Town. It will contribute to the mix of recreational opportunities the Town seeks to provide, for people of all ages and all socioeconomic circumstances. It will facilitate healthy lifestyles, reduce reliance on motor vehicles, and enhance tourism and commerce.

3. Partnership(s) Description: **The project is anticipated to be a future partnership between the Town of Barnstable and the Commonwealth of Massachusetts Department of Transportation (MassDOT). The Town is responsible for planning, design, permitting, and land/easements acquisition, while MassDOT will responsible for construction assuming this project is accepted as a State Transportation Improvement Project.**

4. Provide a detailed project timeline: **Please see the attached project schedule.**

5. How does this project meet the General Criteria and Category Specific Criteria for CPC projects?

GENERAL PROJECT CRITERIA		
Criteria	Meets Criteria?	How Met
Consistent with the Local Comprehensive Plan and other planning documents that have received wide scrutiny and input and have been adopted by the town	YES	5. Preserve and enhance historic and maritime character, public viewsheds and cultural landscapes. 6. Enhance pedestrian activity in historic village centers. 7. Preserve and enhance access to public spaces including the waterfront. 9. Promote traffic reduction, traffic management, alternate transportation modes, property interconnections, and travel demand management. 10. Foster and support public transit while planning for associated parking, pedestrian and bicycle travel needs.
Preserve the essential character of the town	YES	Words typically used to describe the Town of Barnstable include: historic, scenic, unique, quaint, idyllic, beautiful, destination. The trail will enhance these characteristics and provide a more pleasant way to experience the Town.
Save resources that would otherwise be threatened and/or serve a currently under-served population	YES	There is anecdotal evidence of substantial latent demand for completing the CCRT to provide a continuous trail along the entire length of Cape Cod. Not only will it serve the biking and recreational populations, but it will also improve safety and access for individuals who rely on transit and non-motorized forms of transportation.
Demonstrate practicality and feasibility, and demonstrate that they can be implemented expeditiously and within budget	YES	The CCRT has a history of success in other towns, which this project builds on.
Produce an advantageous cost/benefit value	YES	The CCRT will likely have a useful life well over 100 years (with routine maintenance). Its benefits will exceed its costs amortized over time.
Leverage additional public and/or private funds; applications that identify commitment from other funding sources will receive a higher priority	YES	All told, the Town's investment is expected to leverage 10 times as much state/federal funding for this project. In addition to CPC funds, this project benefited from a $500,000 MassTrails grant in 2022.
Receive endorsement by other municipal boards or departments	YES	The Town's Planning & Development Dept., Town Council, and numerous stakeholder groups have expressed support for the CCRT.
Serves more than one CPA purpose	YES	The project contributes to a number of Open Space criteria including: Provide opportunities for passive recreation; Provide connections with existing trails or potential trail linkages; and Provide public access.

Projects may be subject to review by CPC consultants	TBD	If reviewed, we anticipate the reviewers will agree that this project is consistent with CPA goals and it will be exceptionally beneficial for the Town and region.
SPECIFIC PROJECT CRITERIA		
Support multiple recreation uses	YES	The trail will provide opportunities for cycling, walking, running, roller skating, scooters, wheelchairs, cross-country skiing, etc.
Serve a significant number of residents	YES	Cape Cod Commission counts on a section of the existing CCRT in the Town of Brewster there were approximately 2,000 users per day during the spring and summer months. Given Barnstable's larger geographic size and population, we might anticipate peak use several times that amount, which would be statistically significant.
Expand the range of recreational opportunities available to residents of all ages	YES	In addition to serving as a 'highway' for non-motorized transportation to and from various locations, the trail will be a destination in its own right for all members of the community to enjoy.
Jointly benefit Conservation Commission and Recreation Commission initiatives by promoting passive recreation such as hiking, biking and cross-country skiing on town-owned property	YES	This is literally what the CCRT will do.
Maximize the utility of land already owned by the Town	YES	We anticipate the selected route will utilize Town property wherever feasible.
Promote creative uses of public corridors or pathways for safe and healthful non-motorized transportation opportunities	YES	The majority of the existing CCRT and other proposed sections of the CCRT are or will be located primarily along established roadway corridors.
Promoting visit-ability	YES	Anecdotal evidence suggests the CCRT will promote additional tourism.
Giving priority to local residents or Town Employees	YES	Local residents have had a say (through public forums and town leaders) in the preferred alignment of the CCRT, and residing locally they will naturally have the most opportunities to use the trail.
Intermingling affordable and market rate housing at levels that exceed state requirements	NO	The CCRT does many things, but it does not directly promote affordable housing – although the trail may help residents in affordable housing by increasing their affordable transportation options.

6. Provide a detailed budget, including the following information, as applicable: (Fiscal Year, Total Cost, CPC Funds Requested, Other Sources of Funding sought and received, and cost estimates/quotes received): **Please see the attached detailed budget.**

7. Assessors office identification map and map and parcel number: **Please see the attached assessor's map.**

Paul Graves

1/17/2023

Signature of Applicant
Paul Graves, P.E., Senior Project Manager

Date

N/A

Signature of Applicant Partner

Date

Signature of Town Manager (Town Affiliated Projects)
Mark S. Ells, Town Manager

Date

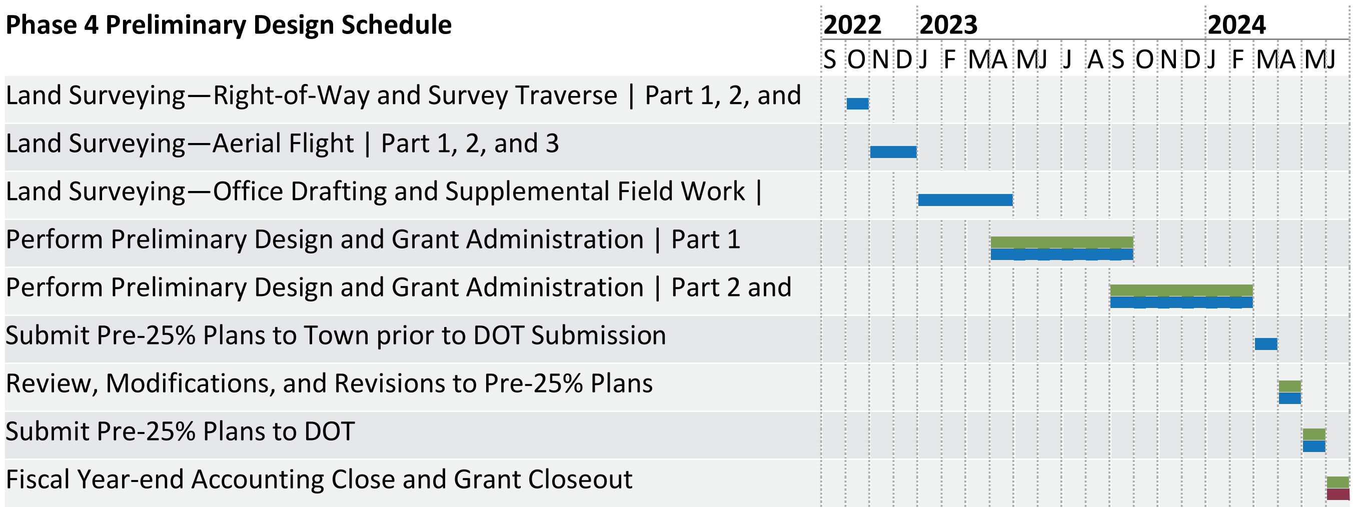
PARCELS LIST

Following is a preliminary list of properties on which the proposed shared use path is anticipated to be located if it cannot fit entirely within the Town right-of-way (or if trail segments are shifted away from the right-of-way for other reasons), listed in sequential order generally progressing from east to west:

Item #	Parcel No.	Address	Owner	Land Use for Assessment
1	347002001	0 Mary Dunn Road	Massachusetts, Commonwealth of, Div of Fisheries & Wildlife	9220 – Department of Corrections, Division of Youth Services
2	331003X01	0 Mary Dunn Road	Barnstable, Town of (Brnwater)	9300 - Municipal Vacant
3	331003003	0 Mary Dunn Road	Barnstable, Town of (Brnwater)	9300 - Municipal Vacant
4	331005	789 Mary Dunn Road	Barnstable, Town of (Brnwater)	9310 - Municipal-Imp M
5	313008B00	0 South Flint Rock Road	Barnstable, Town of (Mun)	9300 - Municipal Vacant
6	332010002	0 Independence Drive	Barnstable, Town of (Mun)	9300 - Municipal Vacant
7	314001	211 South Flint Rock Road	Independence Park Inc	4400 - Ind Ld Dv
8	314026003	246 South Flint Rock Road	Barnstable, Town Of (Mun)	9300 - Municipal Vacant
9	314003	0 South Flint Rock Road	Barnstable Fire District	9380 - District Vacant
10	314027001	145 Breed's Hill Road	Barnstable, Town of (Mun)	9300 - Municipal Vacant
11	314027005	45 Breed's Hill Road	Barnstable, Town of (Arp)	9300 - Municipal Vacant
12	313014	844 Kidd's Hill Road	Barnstable, Town of (Arp)	9300 - Municipal Vacant
13	314022	15 Breed's Hill Road	Barnstable, Town of (Arp)	9300 - Municipal Vacant
14	295016	0 Hyannis-Barnstable Road	Barnstable, Town of (Arp)	9300 - Municipal Vacant
15	295022	0 Independence Drive	Barnstable, Town of (Arp)	9300 - Municipal Vacant
16	295030	0 Independence Drive	Barnstable, Town of (Arp)	9300 - Municipal Vacant
17	295007	30 Perseverance Way	Bacon, Jeffrey L & M Connie [and others]	3190 - Whse Condo
18	295004001	0 Wilkens Lane	Wilkens Lane Properties LLC	955V - Char Hosp M-00
19	296039	35 Wilkens Lane	Wilkens Lane Properties LLC	9550 - Hospitals

20	296047	1550 Phinney's Lane	Cape Cod Aggregates Corp	4100 - Sand&Gravl
21	296036	195 Kidd's Hill Road	Nannicelli, Thomas E Tr	410C - Sand&Gravl
22	296035	65 Kidd's Hill Road	Cape Cod Aggregates Corp	4400 - Ind Ld Dv
23	296034	145 Kidd's Hill Road	Nannicelli, Thomas E Tr	4100 - Sand&Gravl
24	296033	105 Kidd's Hill Road	Cape Cod Aggregates Corp	4400 - Ind Ld Dv
25	296032	75 Kidd's Hill Road	Cape Cod Aggregates Corp	1300 - Vac Land M-00
26	297085	55 Kidd's Hill Road	Barnstable, Town of (Con)	9320 - Conserv Vacant
27	275069	45 Kidd's Hill Road	Barnstable, Town of (Con)	9320 - Conserv Vacant
28	275031	30 Carol Circle	Barnstable, Town of (Con)	9320 - Conserv Vacant
29	275068	10 Carol Circle	Barnstable, Town of (Con)	9320 - Conserv Vacant
30	275066	11 Carol Circle	Barnstable, Town of (Con)	9320 - Conserv Vacant
31	275065	1510 Phinney's Lane	Barnstable, Town of (Con)	9320 - Conserv Vacant
32	275064	1490 Phinney's Lane	Barnstable, Town of (Con)	9320 - Conserv Vacant
33	275063	1480 Phinney's Lane	Barnstable, Town of (Con)	9320 - Conserv Vacant
34	275062	0 Gravel Place	Barnstable, Town of (Con)	9320 - Conserv Vacant
35	275059	5 Gravel Place	Barnstable, Town of (Mun)	9300 - Municipal Vacant
36	275002	1431 Phinney's Lane	Barnstable, Town of (Rec)	9300 - Municipal Vacant
37	274005	0 Phinney's Lane	Barnstable, Town of (Rec)	9300 - Municipal Vacant
38	274003003	1355 Phinney's Lane	Mushinsky, Sophie A & John P	1300 - Vac Land M-00
39	274003004	1337 Phinney's Lane	Mushinsky, Sophie & Mary Ann	1300 - Vac Land M-00
40	274016X01	0 Iyannough Road/Rte132	Massachusetts, Commonwealth of, Dept of Public Works	9240 - Mass Hway
41	274003003	1355 Phinney's Lane	Mushinsky, Sophie A & John P	1300 - Vac Land M-00
42	274003002	250 Attucks Lane	Mushinsky, Sophie A & James A	1300 - Vac Land M-00

43	274003001	230 Attucks Lane	Mushinsky, Sophie A & Ronald P	1300 - Vac Land M-00
44	274003	210 Attucks Lane	Mushinsky, Albert J	1300 - Vac Land M-00
45	275001	0 Attucks Lane	Barnstable Land Trust Inc	9500 - Cons Org Vacant
46	254018	1650 Iyannough Road/Rte132	Barnstable Fire District	9390 - District Imp M96
47	254016	1800 Iyannough Road/Rte132	Barnstable, Town of (LB)	9310 - Municipal-Imp M
48	254015	10 Attucks Lane	Macgregor, J Bruce Tr	3540 - Transit WHS
49	254016	1800 Iyannough Road/Rte132	Barnstable, Town of (LB)	9310 - Municipal-Imp M
50	255001	0 Midcape Hghwy(West) Rte 6	Barnstable, Town of (LB)	9300 - Municipal Vacant
51	235021	1860 Iyannough Road/Rte132	Barnstable, Town of (LB)	9300 - Municipal Vacant
52	235006	1910 Iyannough Road/Rte132	Barnstable, Town of (LB)	9300 - Municipal Vacant
53	235009	1990 Iyannough Road/Rte132	Massachusetts, Commonwealth of, Dept of Public Works	9240 - Mass Hway
54	235004	2005 Iyannough Road/Rte132	Massachusetts, Commonwealth of, Dept of Public Works	9240 - Mass Hway
55	234058B00	15 Shootflying Hill Rd	Massachusetts, Commonwealth of, Dept of Public Works	9240 - Mass Hway
56	235001B00	6 Shootflying Hill Rd	Cape Cod Chamber of Commerce	1300 - Vac Land M-00
57	235001W00	6 Shootflying Hill Rd	Cape Cod Chamber of Commerce	1320 - Undevable MDL
58	234059	8 Shootflying Hill Rd	Patel, Jitendra B Tr	3010 - Motels M94
59	NA	Service Road/Route 6 Right-of-Way	Massachusetts, Commonwealth of, Dept of Transportation (assumed)	NA
60	129010	0 Route 149	Barnstable, Town of (Con)	9320 - Conserv Vacant
61	129008	0 MidCape Hghwy(west) Rte 6	Barnstable, Town of (Con)	9320 - Conserv Vacant
62	86001	875 Service Road	Barnstable, Town of (Con)	9320 - Conserv Vacant
63	NA	Service Road/Route 6 Right-of-Way	Massachusetts, Commonwealth of, Dept of Transportation (assumed)	NA


Phase 4 Preliminary Design Schedule
2022
2023
2024
S O N D J F M A M J J A S O N D J F M A M J
Land Surveying—Right-of-Way and Survey Traverse | Part 1, 2, and
Land Surveying—Aerial Flight | Part 1, 2, and 3
Land Surveying—Office Drafting and Supplemental Field Work |
Perform Preliminary Design and Grant Administration | Part 1
Perform Preliminary Design and Grant Administration | Part 2 and
Submit Pre-25% Plans to Town prior to DOT Submission
Review, Modifications, and Revisions to Pre-25% Plans
Submit Pre-25% Plans to DOT
Fiscal Year-end Accounting Close and Grant Closeout

Application Checklist

Cape Cod Rail Trail Phase 4

☒ *Cover letter clearly identifying statement of need*

☒ *Application*

N/A ☐ *First draft of deed restriction [Housing, Historic Preservation, Conservation] if it is being provided by the applicant. A consultant will be contacted to draft the appropriate restriction after appropriation by the Town Council.*

Data

N/A ☐ Identification Map – Assessor's Records
N/A ☐ Copy of Current Recorded Deed
N/A ☐ Title Examination / Title Insurance / Tax Information
N/A ☐ Appraisal and/or Agreement (Open Space / Recreation)
N/A ☐ Survey Plan (Open Space)
N/A ☐ Reports (21E / Zoning / HazMat / Historic Structure Reports)
N/A ☐ MA Historical Commission Historic Inventory Sheet - Form B (Historic)
N/A ☐ Detailed Set of Plans
☒ Project Timeline
☒ Letters of Support

Financial

N/A ☐ Project Costs and Prioritization
☒ Detailed Budget
N/A ☐ Minimum of 3 quotes from Licensed Contractors
N/A ☐ Matching Fund Correspondence
N/A ☐ Additional Fees (Closing Costs / Legal Fees)

Visual

☒ Maps
N/A ☐ Natural Resource Limitations (wetlands, flood plain)

Photos

N/A ☐ Renderings/Plans

Submission

☒ ***One (1) electronic copy via email to:***
CommunityPreservationCommittee@town.barnstable.ma.us
(No hard copies required if submitted electronically.)

The Commonwealth of Massachusetts

MASSACHUSETTS SENATE

BOSTON, MA 02133-1053
TEL. (617) 722-1570
JULIAN.CYR@MASENATE.GOV
WWW.MASENATE.GOV

CHAIR

Joint Committee on Mental Health,
Substance Use and Recovery

VICE CHAIR

Joint Committee on Elder Affairs
Joint Committee on Racial Equity, Civil Rights, and Inclusion

Joint Committee on COVID-19 and
Emergency Preparedness and Management
Joint Committee on Health Care Financing
Joint Committee on Public Health
Joint Committee on Telecommunications, Utilities and Energy
Special Joint Committee on Redistricting
Senate Committee on Redistricting

January 28, 2022

Amanda Lewis,MassTrails Program Manager
Department of Conservation and Recreation
136 Damon Road
Northhampton, MA 01060

Re: *Letter of Support for Town of Barnstable's MassTrails Grant Application*

Dear Ms. Lewis,

I write in support of the Town of Barnstable's Application for a MassTrails Grant. The town seeks funding for preliminary design of a proposed Cape Cod Rail Trail extension form Mary Dunn Road to Route 132 (Iyannough Road).

This project is one component of a coordinated vision to provide a continuous shared use path running the full length of Cape Cod, from the Canal to Provincetown. Existing segments of the Cape Cod Rail Trail provide outstanding recreational, tourist, and multi-modal transportation opportunities for pedestrians and cyclists. Extending the existing trail will increase and diversify those benefits for both new and current users.

If awarded, the grant funds for design are expected to be leveraged several times the awarded amount in Transportation Improvement funds through MassDOT for future construction of the trail extension. These funds will substantially advance the goal of creating accessible travel and promoting walking, biking, and access to all communities across Barnstable and Cape Cod.

Thank you for your consideration of this worthy application.

Respectfully,

Julian Cyr

Julian Cyr
Assistant Majority Whip
State Senator
Cape & Islands

The Commonwealth of Massachusetts
House of Representatives
State House, Boston 02133-1054

January 25, 2022

Amanda Lewis, MassTrails Program Manager
Department of Conservation and Recreation
136 Damon Road
Northampton, MA 01060

Re: Letter of Support for Town of Barnstable's MassTrails Grant Application

Dear Ms. Lewis:

I am writing to express support for the Town of Barnstable's MassTrails Grant Application, which seeks funding for preliminary design of a proposed Cape Cod Rail Trail extension from Mary Dunn Road to Route 132 (Iyannough Road).

This is one component of a coordinated vision to provide a continuous shared use path the full length of Cape Cod, from the Canal to Provincetown. Existing segments of the Cape Cod Rail Trail provide outstanding recreational, tourism, and multi-modal transportation opportunities for pedestrians and bicyclists. Extending the trail will increase and diversify those benefits for existing and new users. If awarded, the grant funds for design are expected to leverage several times that amount in Transportation Improvement Program funds through MassDOT for future construction of the trail extension.

Thank you for your consideration in this matter.

Sincerely,

Kip A.Diggs
State Representative
2nd Barnstable District

The Town of Barnstable
Office of Town Manager
367 Main Street, Hyannis, MA 02601
Office: 508.862.4610
Fax: 508.790.6226
www.town.barnstable.ma.us
Citizens' Resource Line: 508.862.4925

Mark S. Ells, Town Manager
mark.ells@town.barnstable.ma.us

M. Andrew Clyburn, Assistant Town Manager
andy.clyburn@town.barnstable.ma.us

January 25, 2022

Amanda Lewis, MassTrails Program Manager
Department of Conservation and Recreation
136 Damon Road
Northampton, MA 01060

Re: Letter of Support for the Cape Cod Rail Trail Phase 4 Project

Dear Ms. Lewis:

I am writing to express support for the Town of Barnstable's Cape Cod Rail Trail Phase 4 Project, which will extend the trail from Mary Dunn Road to the Barnstable/Sandwich town line.

Existing segments of the Cape Cod Rail Trail provide outstanding recreational, tourism, and multi-modal transportation opportunities for pedestrians and bicyclists. Extending the trail will increase and diversify those benefits for current and new users, and bring us closer to achieving the goal of a continuous trail from the Canal to Provincetown.

There is widespread community support for this project, as demonstrated by input received during the planning process. The proposed trail is consistent with the Town's Open Space and Recreation Plan, which also received extensive public support.

We are excited to begin the design of this major project, and we appreciate the opportunity to apply for a MassTrails grant to assist in this endeavor. If awarded, the grant funds for design are expected to leverage several times that amount in Transportation Improvement Project funds through MassDOT for future construction of the trail.

Thank you for your work in helping to expand and improve the network of trails in our state.

Sincerely,

Mark S. Ells
Town Manager

cc: Daniel W. Santos, P.E., DPW Director

MARSTONS MILLS VILLAGE ASSOCIATION
PO Box 545
Marstons Mills, MA 02648
Tax I.D. # 222882524

Amanda Lewis, MassTrails Program Manager
Department of Conservation and Recreation
136 Damon Road
Northampton, MA 01060

Re: Letter of Support for Town of Barnstable's MassTrails Grant Application

Dear Ms. Lewis:

As Vice President of Marstons Mills Village Association, I am writing to express support for the Town of Barnstable's MassTrails Grant Application, which seeks funding for preliminary design of a proposed Cape Cod Rail Trail extension from Mary Dunn Road to Route 132 (Iyannough Road).

The residents and visitors to the Town of Barnstable would benefit from the continuous shared use path the full length of Cape Cod, from the Canal to Provincetown as you know currently it stops in Yarmouth. As daily active walkers, my husband and I would personally use this trail.

Thank you for your consideration in this matter.

Sincerely,

Debbie Lavoie

P.O. Box 121
Cotuit, MA 02635
E-Mail: cotuitcivicassociation@gmail.com

Our mission is to educate, communicate and promote a sense of community in our Village

January 26, 2022

Amanda Lewis
MassTrails Program Manager
Department of Conservation and Recreation
136 Damon Road
Northampton, MA 01060
RE: Letter of Support for Town of Barnstable's MassTrails Grant Application

Dear Ms. Lewis:

I am the President of the Cotuit- Santuit Civic Association (the "Association") located in Cotuit, MA on Cape Cod. I am writing on behalf of the Association to express our support for the Mass Trails Grant Application of the Town of Barnstable. That application is seeking funding for preliminary design of a proposed extension of the Cape Cod Rail Trail from Mary Dunn Road to Rte. 132 (Iyannough Road). This letter has been authorized by the Executive Board of the Association.

This proposed extension Is one component of a coordinated vision that seeks to provide a continuous shared use path running the entire length of Cape Cod, from the Canal to Provincetown. Existing segments of the Cape Cod Rail Trail provide outstanding recreational, tourism and multi-modal transportation opportunities for pedestrians and bicyclists that are used by many residents and visitors alike. Extending the trail should both increase and diversify those benefits for existing and new users, and make them more readily available to a greater geographic portion of the Cape.

If awarded, the grant funds for design should leverage several times that amount in Transportation Improvement Program Funds through Mass DOT for future construction of the trail extension. We strongly support this application.

Thank you for your consideration of this matter.

Very truly yours,

James F. Dannhauser

James F. Dannhauser.
President, Cotuit-Santuit Civic Association

January 26, 2021

Amanda Lewis, MassTrails Program Manager
Department of Conservation and Recreation
136 Damon Road
Northampton MA 01060

Re: Support for Town of Barnstable's MassTrails Grant Application

---

Dear Ms. Lewis:

I am writing to express the Cape Cod Chapter of the New England Mountain Bike Association's support for the Town of Barnstable's MassTrails Grant Application, which seeks funding for preliminary design of a proposed Cape Cod Rail Trail extension from Mary Dunn Road to Route 132 (Iyannough Road).

The New England Mountain Bike Association (NEMBA) is a recreational trails advocacy organization with 27 chapters throughout New England and has over 7,000 members. Our mission is to promote the best that mountain biking has to offer, steward the trail systems where we recreate and preserve open space. We are an educational 501 (c) 3 non-profit. Many of us continue to enjoy the experience of riding on facilities such as the Cape Cod Rail Trail and we recognize the benefit of growing a bicycling culture on Cape Cod.

We support the extension of the Cape Cod Rail Trail through Barnstable and look forward to safer bicycle access to existing and potentially new local riding areas within and beyond Barnstable. If awarded, the grant funds for design are expected to leverage several times that amount in Transportation Improvement Program funds through MassDOT for future construction of the trail extension.

We look forward to working with the town and state to create natural surface sidepaths in certain areas to retain and enhance the pathway network's connections.

Thank you for your consideration in this matter.

Sincerely,

Frank Merola, President
Cape Cod Chapter, New England Mountain Bike Association

Cape Cod Cycling Club

"All Kinds of Cycling for All Kinds of People"

Amanda Lewis, MassTrails Program Manager
Department of Conservation and Recreation
136 Damon Road
Northampton, MA 01060

Re: Letter of Support for Town of Barnstable's MassTrails Grant Application

Dear Ms. Lewis:

After discussing this matter at a general board meeting, we are writing to express our support for the Town of Barnstable's MassTrails Grant Application, which seeks funding for preliminary design of a proposed Cape Cod Rail Trail extension from Mary Dunn Road to Route 132 (Iyannough Road).

This is one component of a coordinated vision to provide a continuous shared use path the full length of Cape Cod, from the Canal to Provincetown. Existing segments of the Cape Cod Rail Trail provide outstanding recreational, tourism, and multi-modal transportation opportunities for pedestrians and bicyclists. Extending the trail will increase and diversify those benefits for existing and new users.

If awarded, the grant funds for design are expected to leverage several times that amount in Transportation Improvement Program funds through MassDOT for future construction of the trail extension.

Thank you for your consideration in this matter.

Sincerely,

Richard Poire
Board of Directors

Estimated Current and Near-Term Funding Needs for Cape Cod Rail Trail Phase 4
10-24-2022

Item No.	Description	Cost	Comments
1	Unfunded portion of pre-25% design fee	$239,000.00	Per VHB's engineering services proposal (attached). This omits the $500,000 already funded by MassTrails.

Subtotal	$239,000.00
20% Contingency	$ 47,800.00
5% Project Management	$ 11,950.00
Total	$298,750.00
Rounded Total	$299,000.00
Say	$300,000.00

August 19, 2022 | Response to Request for Quotes
Town of Barnstable

Cape Cod Rail Trail Phase 4 Design

August 19, 2022

Paul Graves, PE
Senior Project Manager
Town of Barnstable Department of Public Works
paul.graves@town.barnstable.ma.us

Re: Request for Quotations to Provide Engineering Services for Cape Cod Rail Trail Phase 4 Design

Dear Mr. Graves:

Phase 4 of the Cape Cod Rail Trail Extension (CCRT) project further closes the gap on creating a continuous off-road bike facility from Provincetown to the Cape Cod Canal. VHB has partnered with the towns of Barnstable, Yarmouth, Dennis, and Sandwich to bring this vision to reality. We have a long history of delivering innovative solutions to multimodal transportation challenges for our municipal clients and are eager to continue to move the Cape Cod Trail easterly for the Town of Barnstable. Our team will draw upon this experience to develop implementable solutions that reflect stakeholder values and available budget while maintaining schedule deadlines. The combination of the knowledge gained from our past work experiences in Barnstable and specifically on the CCRT, our ongoing work in Cape Cod, and the depth and breadth of integrated, multidisciplinary services our team offers makes VHB the right partner for this significant project.

Since 1979, VHB has had the pleasure of working with communities throughout the Commonwealth and along the Eastern Seaboard from Florida to Maine to develop and deliver successful non-motorized transportation projects, including bike path and rail-to-trail projects, and we will continue to bring the lessons learned on these assignments to benefit the Town of Barnstable. Additionally, VHB has developed an unparalleled resume of work that has resulted in a deep understanding of state and local processes and municipal priorities. We were selected by the Town to develop the CCRT Phase 4 Feasibility Study, and have supported the Town in securing MassTrails grants for advancing Phase 4 into survey base mapping and design development. We are also actively working on the Cape Cod Rail Trail Phase 3 project, with an anticipated construction advertisement date in 2024; Bearse's Way Shared Use Path in Hyannis; the Sandwich Service Road Shared Use Path; and planning studies to extend the Service Road Shared Use Path across Route 6 and to the Canal. We are working with the towns of Bourne and Falmouth to develop a rail-with-trail project that will extend the Shining Sea Bikeway northerly from its terminus at County Road in Falmouth to the Cape Cod Canal. We are also working on major roadway reconstruction projects along Route 132 in Hyannis, Route 28 in West Dennis, Dennis Port and West Harwich, and along Route 6A in Yarmouth. Recently constructed projects in Barnstable include the Hyannis Commercial Center (Independence Drive, Attucks Lane, Kidd's Hill Road) sidewalk and signal project and the reconstruction of Wheeler Road.

As you can see from our proposal and from our experience in developing the CCRT Phase 4 Feasibility Study, VHB has a deep understanding of the key points of the project area and is ready to develop the project following the procedures requested in the RFQ. The VHB team has thoroughly reviewed the RFQ document and understands all sections and provisions therein.

We have developed a project management structure to assure quality, coordination of team members, assignment of staff, and prompt responses to the Town. I will serve as Principal-in-Charge and Steve Rhoads, PE, as Project Manager. Steve will act as first point of contact for the Town and be responsible for technical quality, cost, and schedule performance. VHB has been privileged to have worked closely with the Town for decades, and is committed to delivering the responsive, efficient, and accurate services you have come to expect. We are confident that our integrated team's collective experiences and innovative project approach will allow us to successfully partner with the Town to deliver this project.

We welcome an opportunity to discuss our submission with you and to respond to any questions you may have about our team, our qualifications, and our approach to executing the scope of work. Should you have any questions regarding our submittal, please contact Steve at 617.607.2723 or srhoads@vhb.com. Thank you for the opportunity to submit this proposal and to serve the Town.

Sincerely,

VHB

Trish Domigan, PE
Principal-in-Charge
pdomigan@vhb.com

Steve Rhoads, PE
Project Manager
srhoads@vhb.com

In partnership with:

Green Seal Environmental, LLC

Contents

1

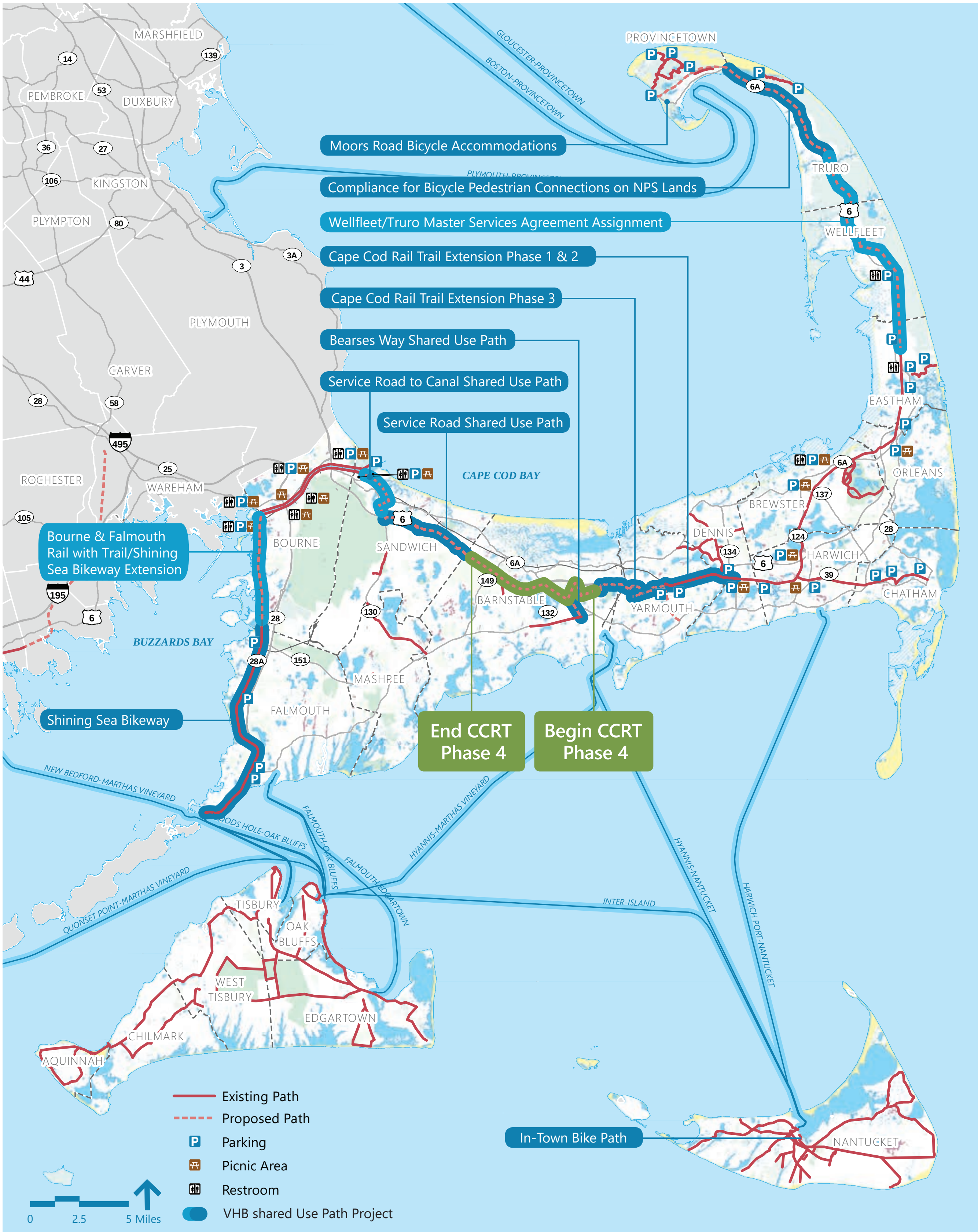
Project Understanding

The Town of Barnstable has been working diligently on Phase 3 of the Cape Cod Rail Trail (CCRT) Extension for a number of years and the project is now primed to proceed into construction in 2024. In advance of Phase 3 moving toward a solidified groundbreaking date, the Town has also been planning Phase 4 of the extension for nearly four years. VHB has had the good fortune to be able to continue our work on the CCRT corridor by assisting the Town in the planning and alternatives analysis stage of Phase 4. Through our work on this stage of the project we have an unmatched depth of knowledge—through on-the-ground field work, public outreach, and coordination with the Town—on the details of the project.

History of Work on the CCRT

As shown in the Shared Use Path Project Experience map on the following page, to date VHB has played a large part in the development of the regional multimodal network outlined by the Cape Cod Commission's Vision 88, which has a goal of connecting the Cape Cod Canal to Provincetown with a continuous shared use path. The town's of the Cape and the State have taken steps to align with this goal for a connected trail. VHB has worked on the western extension of the CCRT beginning in Dennis and progressing into Yarmouth via Phase 1 and 2 and into Barnstable via Phase 3. VHB has worked on another portion of the western extension along Service Road in Sandwich, which is a project that will be adjacent to the western limit of work of Phase 4, with a minor connection to be made by Sandwich from Chase Road to the Barnstable and Sandwich town line.

VHB's Constructed and Proposed Shared Use Path Experience



VHB has also been involved in planning level work via feasibility studies with MassDOT and Sandwich to complete the western extension to the Canal and will soon begin a feasibility study to extend the CCRT north through Wellfleet and Truro.

Local Knowledge in the Project Area

VHB's understanding of the vision of the project goes beyond the shared use path itself. As shown in the Project Experience in Barnstable map on the following page, we have been working in and around the planned route of Phase 4 for many years and have a deep understanding of the challenges present in the project area. We have upgraded traffic signals at Attucks Lane and Bearse's Way, and designed sidewalks and drainage improvements along Independence Drive, Kidd's Hill Road, and Attucks Lane, and have completed improvements at the Barnstable Municipal Airport. As part of the regional multimodal network and future potential connections to the network, we are designing a shared use path along Bearse's Way to just south of Route 132.

Raising the Bar on Pedestrian/Bike Projects

VHB is a nationally recognized leader in pedestrian and bicycle projects: We have helped set policy by working on important ped/bike guidelines for the Federal Highway Administration, and our projects have received recognition from the U.S. Department of Transportation and American Trails. VHB also actively supports trail advocates such as the Rails-to-Trails Conservancy and the East Coast Greenway Alliance.

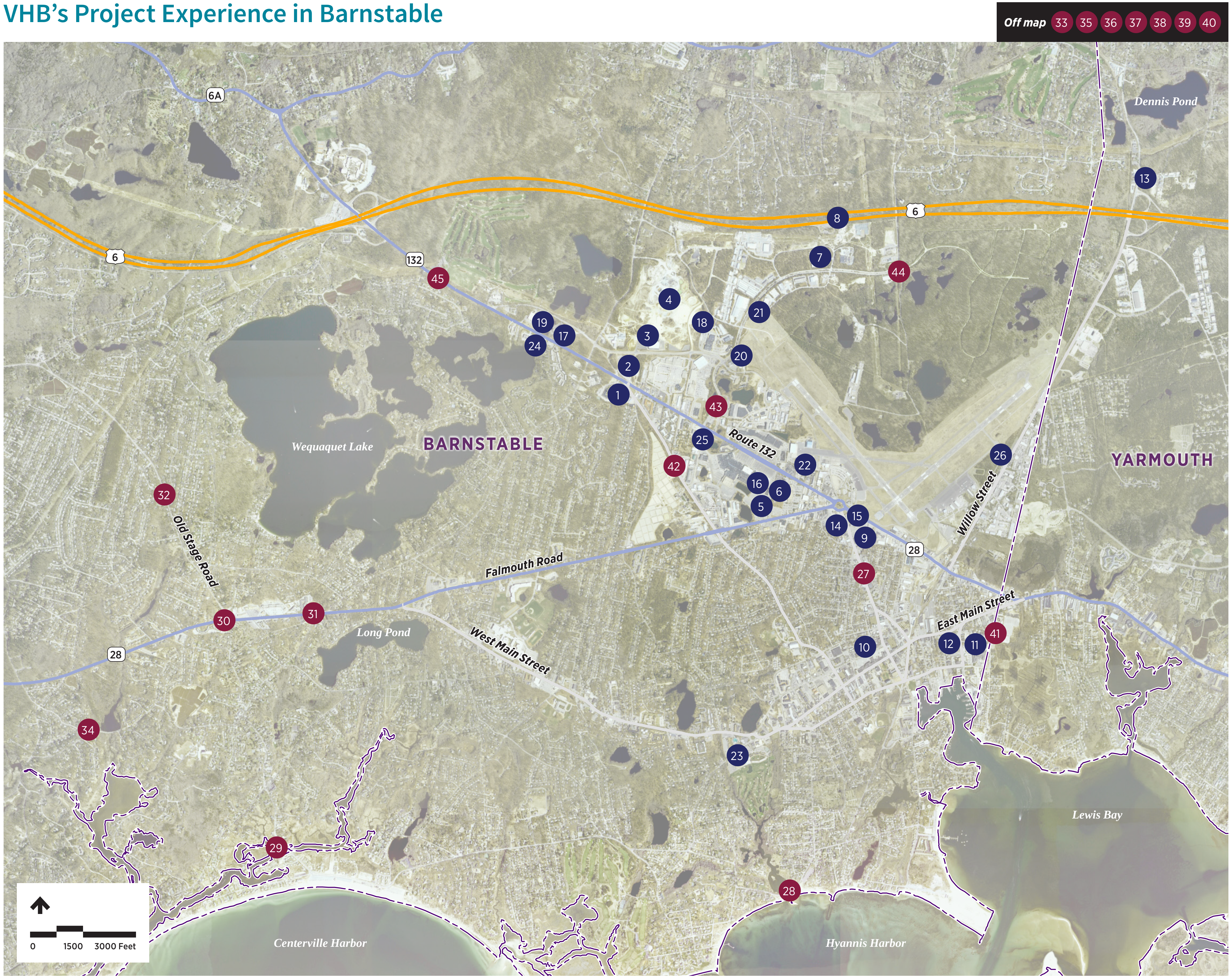
Design Approach

For CCRT Phase 4, VHB is uniquely positioned to continue the momentum gained by the near completion of the design of CCRT Phase 3 and the completion of design of the Service Road Shared Use Path (SUP). We will put our recent experiences on design preferences of MassDOT District 5 into the pre-25% plan development with a goal of meeting the expectations of the Town and MassDOT. Starting with the land area that encompasses CCRT Phase 3, the bike path corridor is transitioning into a vastly different land use area with Phase 4 proposed to traverse through Independence Park and other commercial areas. We will put our knowledge of this area from the Hyannis Commercial Center project to use in carving the path through this area. Specifically, we have the signal design for Kidd's Hill Road at Phinney's Lane ready and waiting to update for the inclusion of a shared use path into one of the crosswalk legs of the intersection. We have extensive knowledge of the grading challenges and business frontages on the same side or opposite side of the street, where the SUP may be from a user experience, safety, and receptiveness perspective.

As the SUP approaches Route 132, the presence of the existing SUP on the south side of the roadway introduces a new element to the design. With anticipated MassDOT involvement, it will be necessary to explore connection options between the proposed SUP and the existing SUP at the intersection of Attucks Lane and Route 132 and possibly Shootflying Hill Road and Route 132. MassDOT will want to pursue these connections to "complete the intersection," which we anticipate the Town and other stakeholders will see as a safety and user experience benefit.

VHB has a strong background in pedestrian/bicycle grade separated crossings along the CCRT—including three recently constructed bridges as part of Phase 1 and 2: one over Station Avenue in Yarmouth, one over Route 134 in Dennis, and one over the Bass River in Dennis. We will bring this knowledge to the table to prepare alternatives for the grade separated crossing of Route 132 and Shootflying Hill Road to the northwest of the Hyannis Golf Course.

VHB's Project Experience in Barnstable



Private Sector Clients

1. Cape Codder Resort Expansion
2. Stop & Shop Expansion CCC (DRI)*
3. BJ's Expansion CCC (DRI)*
4. Cape Cod Hospital Outpatient Campus CCC (DRI)*
5. Marriott Courtyard Hotel Expansion
6. Circuit City CCC (DRI)*
7. Cape Cod Cooperative Bank Headquarters CCC (DRI)*
8. Exit 6½ Feasibility Study
9. Bob's Furniture Store
10. Abrahams Petroleum Fueling/Convenient Facility
11. Cape Cod Hospital Campus Access/Circulation Improvement CCC (DRI)*
12. Cape Cod Hospital Bed Tower Expansion CCC (DRI)*
13. International Federation of Animal Welfare (World Headquarters) CCC (DRI)*
14. CVS/TD Bank CCC (DRI)*
15. Walgreens/Retail
16. Target/Dick's
17. Cape Cod Five Cents Bank Headquarters CCC (DRI)*
18. Total Athletics CC CCC (DRI)*
19. Greenside Office CCC (DRI)*
20. 700 Attucks PP CCC (DRI)*
21. Cape Cod Potato Chips CCC (DRI)*
22. BJ's Gas
23. Sturgis West Campus CCC (DRI)*
24. Office Building
25. Chick-fil-A
26. Car Wash

Public Sector Clients

27. Barnstable Road Reconstruction
28. Ocean Avenue Reconstruction
29. Craigville Road Reconstruction
30. Old Stage Road Signal Improvements
31. Route 28 @ Phinney's Lane
32. Old Stage Road Reconstruction
33. Old Falmouth Road Reconstruction
34. Bumps River Road Reconstruction
35. S. County @ Route 28
36. Main Street Reconstruction
37. Old Oyster Road Reconstruction
38. Route 149 @ Route 128
39. Chippingstone Road Reconstruction
40. Wakeby Road Reconstruction
41. Bayview Street Reconstruction
42. Bearse's Way Shared Use Path
43. Hyannis Commercial Center Municipal Signal & Sidewalk Project
44. Cape Cod Rail Trail Extension Phase 3 Final Design
45. Cape Cod Rail Trail Extension Phase 4 Feasibility Study

* Cape Cod Commission (DRI)

Continuing west, the SUP will follow parallel to Service Road for a significant portion of the project. Our recent work in completing the Sandwich Service Road SUP will provide major efficiencies to the project development as the typical section and design approach will be very similar to that of the project in Sandwich, which has gone through substantial vetting with the Town and MassDOT.

From working with MassDOT on the Sandwich project we know the ins and outs of the right-of-way (ROW) process for any work the project may require (such as new drainage outfalls) within the Route 6 State Highway Layout. Our work with District 5 has also pointed us in the direction of fill and cut slopes being preferred over the use of retaining walls within the Route 6 SHLO, save for instances where substantial tree clearing may be avoided by the installation of a retaining wall.

Bikers and pedestrians enjoying the CCRT Route 134 Bridge Installation.

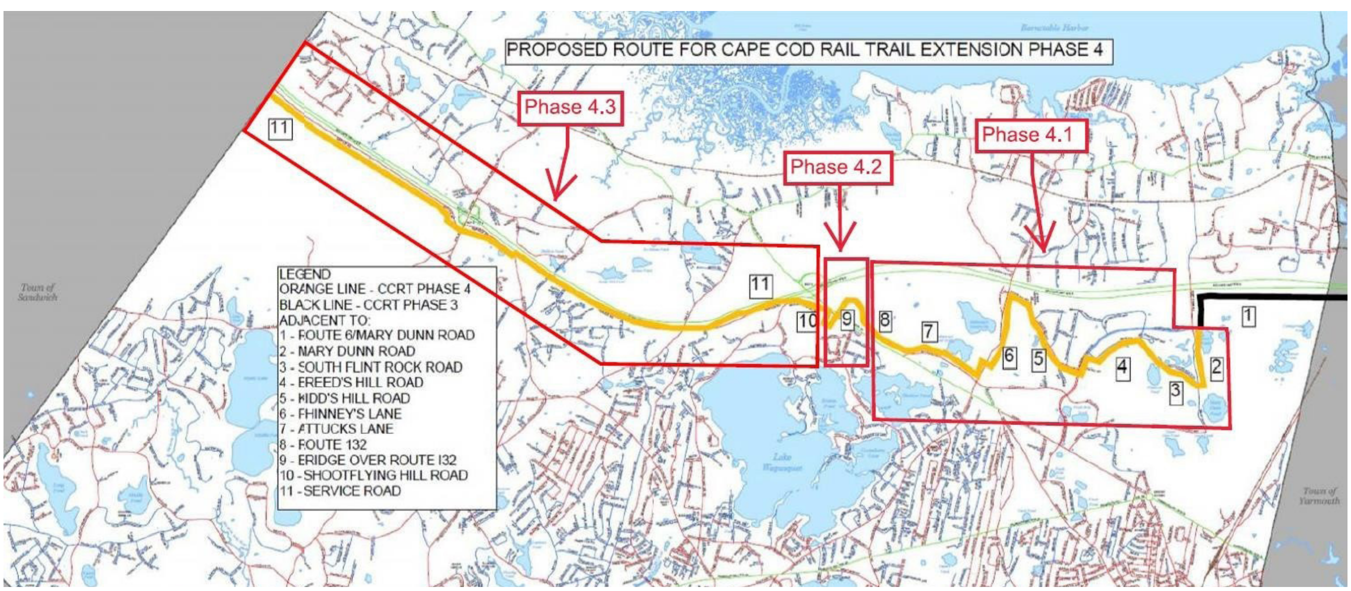
vhb

2

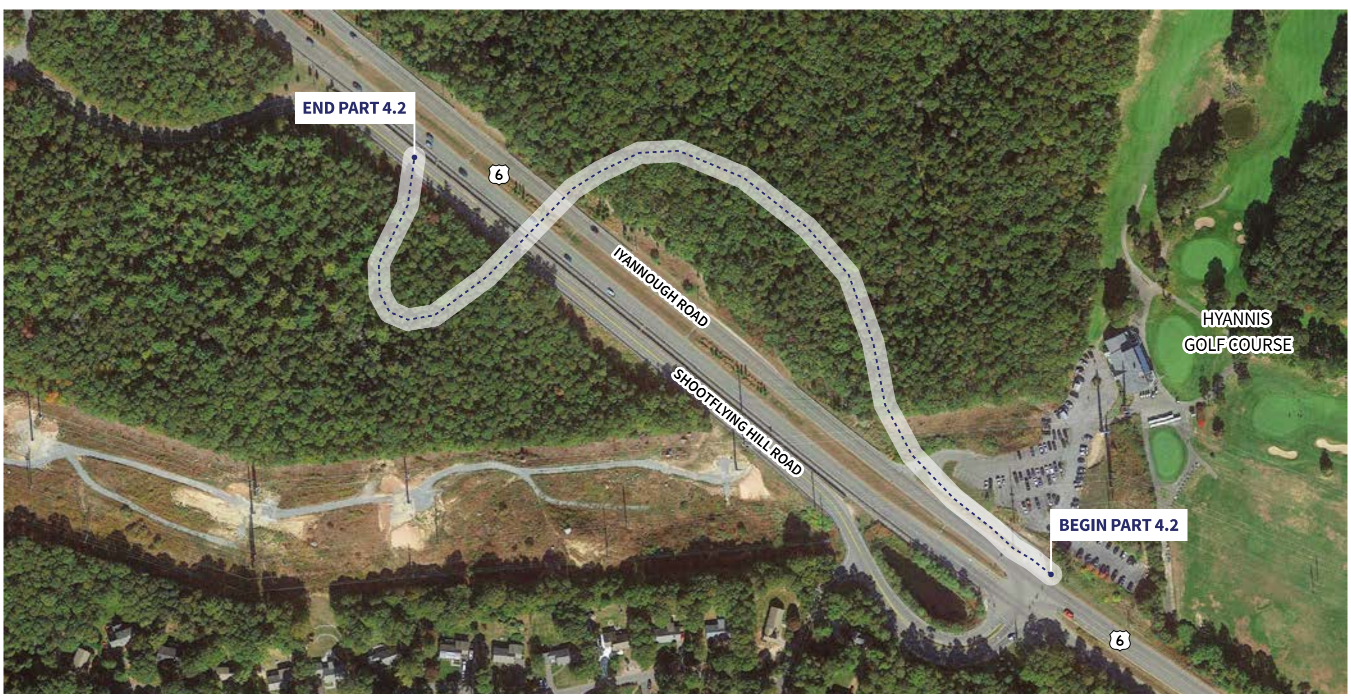
Scope of Services

Cape Cod Rail Trail Extension—Phase 4, Parts 1, 2, and 3

As noted in the RFQ, given typical limitations on the availability of Transportation Improvement Program (TIP) funds, the Town intends to divide the project into three parts.



» **Phase 4.1:** Mary Dunn Road near the Hyannis Ponds Wildlife Management Area access drive to the north side of Iyannough Road (Route 132) at the intersection with the Hyannis Golf Course Drive and Shootflying Hill Road—total length: 21,000 linear feet



» **Phase 4.2:** Proposed pedestrian/bicycle bridge over Iyannough Road (Route 132), including the bridge approaches, between the Hyannis Golf Course and Mid-Cape Highway (Route 6)—total length: 2,000 linear feet

» **Phase 4.3:** Shootflying Hill Road near the proposed pedestrian/bicycle bridge over Iyannough Road (Route 132) to Service Road at the Barnstable/Sandwich town line—total length: 25,500 linear feet

The scope in this section includes:

» Environmental scope as identified in the RFQ for parts 1, 2, and 3

» Survey base plan work identified in the RFQ for parts 1, 2, and 3

» Pre-25% scope identified in the RFQ for all of Part 1 and portions of Part 2

The scope and fee as described below can be completed for the grant amount that the Town has been awarded as part of the MassTrails grant program. We have also added an additional section (Cape Cod Rail Trail Extension—Phase 4, Remainder of Parts 2 and 3—see page 13) that describes the scope and associated fee for work that exceeds the grant funding amount. See Section 5, page 59 for supplemental lump sum pricing of these scope tasks.

The following sections include scope language from the RFQ as well as additional work that VHB has identified from our understanding of the project that will be performed (within the MassTrails grant amount).

Section 150 Environmental

Portions of the project are within the buffer zones associated with wetland resource areas that are jurisdictional pursuant to the Massachusetts Wetlands Protection Act. Additionally, portions of Part 1 are within the limits of Priority Habitat of Rare Species (PH 290, PH 295, and PH 297) and Estimated Habitat of Rare Wildlife (EH 283 and EH 287).

Additionally, portions of Part 3 are within the limits of Priority Habitat of Rare Species (PH 407) and Estimated Habitat of Rare Wildlife (EH 371).

For parts 4.1, 4.2, and 4.3, VHB will review the project in the field to determine boundaries of jurisdictional wetland resources and document existing conditions within rare species habitat as described in the tasks below.

176 Wetland Resource Area Delineation

For parts 4.1, 4.2, and 4.3, VHB will conduct wetland resource area delineation in accordance with the Massachusetts Wetlands Protection Act (WPA), the Federal Clean Water Act, the Corps of Engineers Wetlands Delineation Manual (1987 edition), and guidance in the U.S. Army Corps of Engineers' (USACE) memorandum Clarification and Interpretation of the 1987 Manual, dated March 6, 1992. This shall include all field time associated with delineating the wetland boundaries and time attending local, state, and federal site meetings to review and verify wetland boundary lines. If applicable, documentation will be provided on state Appendix G Wetland Delineation Forms or USACE Wetland Determination Forms for submittal to regulatory agencies.

184 Wildlife/Rare Species Assessment

For parts 4.1, 4.2, and 4.3, VHB will obtain photographic documentation of existing conditions in areas of Priority Habitat of Rare Species and Estimated Habitats of Rare Wildlife regulated by the Natural Heritage and Endangered Species Program (NHESP) within the proposed layout. VHB will also support MassDOT Environmental Staff in coordination with NHESP and assumes attendance at one (1) coordination meeting with NHESP and MassDOT staff as needed.

Section 300 Pre-25% Highway Design

Field Surveys

For parts 4.1, 4.2, and 4.3, through our aerial mapping subconsultant, VHB will obtain new aerial photography and LIDAR to develop mapping of a 100-foot-wide swath of the project over its full longitudinal limits at scale of 20 feet to an inch with 1 foot contour intervals. Green Seal Environmental (GSE, subconsultant) will supply the mapping subconsultant with X, Y, and Z coordinate control values, as necessary, to develop the mapping product.

GSE will perform supplemental field survey to locate existing ground features through the project limits. The survey will include the locations of such features as paved areas, curbing, landscaping, sidewalk, walls, surface utilities, and wetlands that are located within the limits of work. In addition, ground elevations will be taken at sufficient locations to produce one-foot contours throughout the project limits. Benchmarks will be set at approximately 500-foot intervals throughout the length of the roadway. Horizontal and vertical control will be based on the Massachusetts Grid System of 1983 and NAVD of 1988.

The right-of-way will be determined from record layout plans. Property lines abutting said right-of-way will be shown based on plans and deeds of record. Right-of-way and boundary monuments will be field measured, compiled with record data, and shown on the plan. Any easement abutting said ROW will also be shown based on plans and deeds of record. Updated abutter names will be obtained and revised in the existing base plan.

Any deed restrictions determined from said research on abutting properties will be labeled on the base plan.Surface utilities within the limit of the roadway will be field located. Underground utilities will be shown from plans of record supplied by the utility companies. Drainage and sewer rims and inverts will be determined and shown on the base plan.

The survey will meet current MassDOT English standards including horizontal and vertical control. The base plan will be drafted in a current AutoCAD Civil 3D drawing format acceptable to the Town.

302 Utility Coordination

For Parts 4.1 and 4.2, VHB will review the proposed shared use path alignment against record existing utilities plans and in the field to determine utility infrastructure requiring relocation as a result of the path construction. Required relocations will be added to the pre-25% design plans. Outreach to impacted utility companies will be done under a future phase of design, in coordination with MassDOT.

303 Survey Coordination—Access Permit

For Parts 4.1 and 4.2, GSE will prepare and submit a State Highway Layout Access Permit in order to access the Route 132 SHLO at the proposed bridge crossing and potentially along Route 132 from Attucks Lane and the Route 132 intersection to the proposed bridge crossing. GSE will assemble plans showing the area of survey work within the SHLO and the proposed temporary traffic control required for the work. GSE will submit one electronic package for MassDOT review and respond to comments on the first submission, and submit one revised electronic package—two total submissions are budgeted.

305 Field Reconnaissance

For parts 4.1, 4.2, and 4.3, VHB will perform field review of base plan information against the shared use path alignment and complete any required base plan updates.

VHB will perform site investigations to observe the general site conditions, traffic patterns, and other relevant features. VHB will take photographs and/or video of the existing facility and surrounding environment.

307 Meetings and Liaison

For Parts 4.1 and 4.2, VHB will schedule and attend progress check-in meetings/calls with the Town. This scope includes 36 hours of scheduling, preparation, attendance, and follow-up notes.

VHB will schedule and attend pre-25% meetings with the Town and MassDOT to present the development of the horizontal and vertical alignment, to review road crossing locations, and to discuss constructability of the shared use path. This scope includes one virtual meeting for Part 4.1 with four hours of scheduling, preparation, attendance and follow-up notes for three VHB staff members, for a total of 12 hours. It also includes one sitewalk for Part 4.1 with eight hours of scheduling, preparation, attendance and follow-up notes for three VHB staff members for a total of 24 hours.

309 Preliminary Horizontal Geometry

For Parts 4.1 and 4.2, VHB will draft the conceptual path alignment shown on the feasibility study plans on the survey base plan and develop horizontal geometry based on the proposed bike path cross section, horizontal clearances, and the proposed design speed.

For Part 4.2, VHB will work to determine the most suitable location for the bike/pedestrian bridge across Route 132 and develop the approach alignment from the end of the path alignment in Part 1 and the approach alignment from the southwest side of Shootflying Hill Road. The path will tie into the existing road shoulder on Shootflying Hill Road in this part of the overall project. Part 3 will continue the SUP from the point that Part 2 ends along Shootflying Hill Road.

For Part 4.1, this task includes preparation of pre-25% roll plans of the path alignment and limits of grading to review with the Town and MassDOT. The finalization of the pre-25% roll plans for Part 4.2 will occur after the vertical geometry is developed under the scope in the CCRT Phase 4 - Remainder of Parts 2 and 3 section.

310 Preliminary Vertical Geometry

For Part 4.1, VHB will develop vertical geometry of the bike path based on the proposed design speed, giving consideration to drainage, horizontal clearances, and construction cost.

311 Cross-Section Studies

For Part 4.1, VHB will conduct iterative horizontal and vertical geometry refinements for critical cross sections based on the interface with the proposed path cross-section and existing features. VHB will evaluate impacts to resource areas and the need for retaining walls to limit impacts to resource areas, limit tree removals, or limit impacts on abutting properties.

The locations and limits of the retaining walls will be presented to the Town for discussion and incorporated into the design development. Any structural design development of the walls will be included in a future design phase.

The work done under this task will produce preliminary limits of grading to be shown on roll plans developed under Task 309.

315 Typical Sections

For Part 4.1, VHB will prepare representative typical sections for the shared use path to be used in discussions with the Town and MassDOT. This scope will not include a detailed list of baseline station limits that the typical sections apply to. It is assumed that four typical section drawings of the path will be developed—cut condition on both sides; fill on both sides; cut on one side and fill on one side; and cut/fill on one side with wall on one side.

320 Roadway Crossing Treatments

For Part 4.1, based on findings from Task 309, VHB will evaluate at-grade crossing alternatives for the shared use path across the following intersections/mid-block locations:

- Either Mary Dunn Road at terminus of Cape Cod Rail Trail Phase 3 Extension or Mary Dunn Road at South Flint Rock Road
- Independence Drive at Kidd's Hill Road
- Phinney's Lane at Kidd's Hill Road
- Attucks Lane at Phinney's Lane
- Iyannough Road (Route 132) at Shootflying Hill Road/Hyannis Golf Course Driveway (for Part 1, the path is anticipated to either cross the Hyannis Golf Course site driveway and end on the west side of the driveway or end at the east side of the driveway with no crossing)

Based on review of the latest MassDOT top crash locations interactive map, the intersection of Route 132 at Shootflying Hill Road is a 2017–2019 Highway Safety Improvement Program (HSIP) crash cluster location. A Roadway Safety Audit (RSA) is not included in this scope of services. Once pre-25% level design development is complete, an RSA will be included in a future design phase.

Alternatives will be developed using the design guidance provided in the MassDOT Project Development and Design Guide. It is anticipated that the alternatives will consist of integration into existing traffic signal system pedestrian phases, signed/striped standard crosswalks, raised crossings, rapid flashing beacons, or pedestrian hybrid beacon signals.

VHB will review the alternatives with the Town and prepare pre-25% level plans depicting the preferred crossing treatment.

326 Preliminary Construction Estimate

For Part 4.1, VHB will prepare an updated conceptual cost estimate using MassDOT's Weighted Average Bid Application (WABA). The updated cost estimate will be based on the development of the horizontal and vertical geometry included in this contract.

328 Modifications and Revisions

For Part 4.1, VHB will revise the pre-25% roll plans showing the path alignment and limits of grading based on review comments from the Town and MassDOT. This scope includes development of one revised set of roll plans. VHB will submit responses to comments made on the pre-25% roll plans.

Cape Cod Rail Trail Extension—Phase 4, Remainder of Parts 2 and 3

Section 300 Pre-25% Highway Design

The scope in this section includes pre-25% scope identified in the RFQ for the remaining portions of Parts 2 and 3 that are not covered by the $500,000 grant award. The following sections include scope language from the RFQ as well as additional work that VHB has identified from our understanding of the project that will be performed.

302 Utility Coordination

For Part 4.3, VHB will review the proposed shared use path alignment against recorded existing utilities plans and in the field to determine utility infrastructure requiring relocation as a result of the path construction. Required relocations will be added to the pre-25% design plans. Outreach to impacted utility companies will be done under a future phase of design, in coordination with MassDOT.

307 Meetings and Liaison

For Parts 4.2 and 4.3, VHB will schedule and attend progress check-in meetings/calls with the Town. This scope includes 18 hours of scheduling, preparation, attendance, and follow-up notes. VHB will schedule and attend pre-25% meetings with the Town and MassDOT to present the development of the horizontal and vertical alignment, to review road crossing locations and to discuss constructability of the shared use path. This scope includes four virtual meetings with four hours of scheduling, preparation, attendance, and follow-up notes for three VHB staff members, for a total of 48 hours. It also includes two site walks with scheduling, preparation, attendance, and follow-up notes for three VHB staff members for a total of 60 hours.

309 Preliminary Horizontal Geometry

For Parts 4.2 and 4.3, VHB will draft the conceptual path alignment shown on the feasibility study plans on the survey base plan and develop horizontal geometry based on the proposed bike path cross section, horizontal clearances, and the proposed design speed.

For Part 4.2, this task includes evaluation of potential span arrangements, span length(s), and vertical bridge clearance for bike/pedestrian bridge over Iyannough Road (Route 132) and Shootflying Hill Road.

This task includes preparation of pre-25% roll plans of the path alignment and limits of grading to review with the Town and MassDOT.

310 Preliminary Vertical Geometry

For Parts 4.2 and 4.3, VHB will develop vertical geometry of the bike path based on the proposed design speed, giving consideration to drainage, horizontal clearances, and construction cost.

311 Cross-Section Studies

For Parts 4.2 and 4.3, VHB will conduct iterative horizontal and vertical geometry refinements for critical cross sections based on the interface with the proposed path cross-section and existing features. VHB will evaluate impacts to resource areas and the need for retaining walls to limit impacts to resource areas, limit tree removals, or limit impacts on abutting properties.

The locations and limits of the retaining walls will be presented to the Town for discussion and incorporated into the design development. Any structural design development of the walls will be included in a future design phase.

The work done under this task will produce preliminary limits of grading to be shown on roll plans developed under Task 309.

315 Typical Sections

For Parts 4.2 and 4.3, VHB will prepare representative typical sections for the shared use path to be used in discussions with the Town and MassDOT. This scope will not include a detailed list of baseline station limits that the typical sections apply to. It is assumed that five typical section drawings of the path will be developed—cut condition on both sides; fill on both sides; cut on one side and fill on one side; cut/fill on one side with wall on one side; and walls on both sides (bridge approach).

320 Roadway Crossing Treatments

For Part 4.3, based on findings from Task 309, VHB will evaluate at-grade crossing alternatives for the shared use path across the following intersections/mid-block locations:

» Shootflying Hill Road at or near the Route 6 Eastbound off-ramp to Shootflying Hill Road

» Oak Street at Service Road

» Service Road near Old Stage Road

» Route 149 at Service Road

» Crossing Service Road at or near the Sandwich town line, depending on the side of Service Road on which Sandwich advances the existing SUP from the existing terminus at Chase Road/Service Road

Alternatives will be developed using the design guidance provided in the MassDOT Project Development and Design Guide. It is anticipated that the alternatives will consist of signed/striped standard crosswalks, raised crossings, rapid flashing beacons, or pedestrian hybrid beacon signals.

VHB will review the alternatives with the Town and prepare pre-25% level plans depicting the preferred crossing treatment.

326 Preliminary Construction Estimate

For Parts 4.2 and 4.3, VHB will prepare an updated conceptual cost estimate using MassDOT's Weighted Average Bid Application (WABA). The updated cost estimate will be based on the development of the horizontal and vertical geometry included in this contract.

328 Modifications and Revisions

For Parts 4.2 and 4.3, VHB will revise the pre-25% roll plans showing the path alignment and limits of grading based on review comments from the Town and MassDOT. This scope includes development of one revised set of roll plans. VHB will submit responses to comments made on the pre-25% roll plans.

329 Boring Plan Development

For Parts 4.2 and 4.3, VHB will begin the preparation of a boring location plan for bridge and wall borings to be reviewed by MassDOT as part of a later phase of design. The boring locations will be based on the design development included in Task 309.

3

The Project Team

Founded in **1979**

1,600 passionate professionals including engineers, scientists, planners, and designers

30 locations throughout the east coast

62nd on ENR Top 500 Design Firms List

For this project, VHB has assembled a team with long-term experience and an in-depth understanding of pedestrian/bicycle pathway design, traffic engineering, civil engineering, environmental permitting, and urban design. Barnstable will benefit by having the services of a large, multidisciplinary firm combined with the personal attention and knowledge of a local business.

Leading our team will be **Principal-in-Charge Trish Domigan, PE,** and **Project Manager Steve Rhoads, PE.** Trish, who serves as VHB's Director of Massachusetts Municipal Services, is an experienced project manager with a strong history of leading complex and diverse projects for similar Massachusetts communities and state agencies. With 34 years of experience, she has overseen many of our signature bikeway and roadway designs, complete street designs, and downtown revitalization projects. She helps communities to design projects to be context sensitive and understands how to balance the needs of all corridor users.

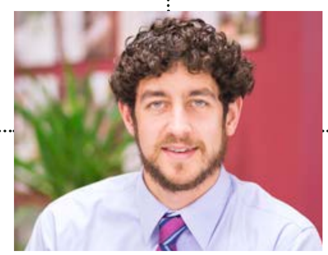
Steve has over a decade's worth of professional experience working on roadway and pedestrian improvement projects on the Cape, including the Bearse's Way Shared Use Path and the Hyannis Commercial Center (Independence Drive, Attucks Lane, and Kidd's Hill Road) Project in Hyannis, Wheeler Road Reconstruction in Marstons Mills, the Service Road Shared Use Path in Sandwich, and the Cape Cod Rail Trail Extension, Phases 1, 2, and 3. As Project Manager, Steve will ultimately be responsible for the quality and execution of the work, as well as the main point of contact for the Town.

The VHB Team's experience, skills, and qualifications is enhanced by the addition of our subcontractor, **Green Seal Environmental, LLC (GSE)**. Opened in 1997 to support several environmental concerns on Cape Cod and Southeastern Massachusetts, GSE provides a full range of infrastructure and environmental consultation and engineering services to municipal, federal, and private clients. GSE's survey staff use AutoCAD and Civil 3D software for plan production, and are proficient in many other programs for data collection, GPS processing, least squares adjustment, and coordinate transformation. They have developed in-house software for specific projects.

The organizational chart below presents the structure of the project team, and is followed by resumes of the identified key personnel.

Town of Barnstable

QA/QC
Susan Kremer, PE, NETTCP QAT, ENV SP



Project Manager
Steve Rhoads, PE

Principal-in-Charge
Trish Domigan, PE

Shared Use Path Design
Scott Brunner, PE
Campbell Narron, EIT

Traffic Analysis & Planning
Laura Castelli, EIT
Matt Duranleau, PE

Environmental
Dan Cannata
Samantha Dolabany, ENV SP

Structural
Alex Schulz, PE
Kris Kretsch, PE, CQA, QAT, ENV SP

Survey
Craig Robertson
Michael Currier (GSE)
Brandon Hood, SIT (GSE)
Richard Hood, PLS (GSE)
David Tannen Trip (GSE)

Right-of-Way
Scott Brunner, PE

Subconsultant
GSE Green Seal Environmental

Patricia Domigan, PE

Principal-in-Charge

Trish is a VHB Principal and Senior Project Manager in VHB's Transportation Engineering Division with extensive experience with roadway design, bike path design, multimodal design, downtown revitalization projects, complete streets corridor projects, and the development of contract documents for various types of municipal transportation projects. Trish works with communities to secure design and construction funding for public projects. She has worked on complex transportation projects for municipalities across Massachusetts as well as for Massachusetts state agencies, many of which have had a healthy community focus.

34 years of professional experience

Final Design of the Westerly Extension of the Cape Cod Rail Trail—Phases 1, 2, and 3 | Barnstable, Dennis, and Yarmouth, MA

The Massachusetts Department of Transportation (MassDOT) is planning an 8-mile extension to the Cape Cod Rail Trail (CCRT) from Peter Homer Park in Yarmouth to Mary Dunn Road in Barnstable. Trish is managing the design, which includes the construction of a pedestrian bridge over Willow Street in Yarmouth, the design of a 12-foot-wide path through the Department of Fish and Game property in Barnstable, and the reconstruction of an existing path in Yarmouth. Roadway crossings, including the reconfiguration of the Yarmouth Transfer Station entrance, have been designed as part of the project.

Bourne Rail-with-Trail Design, Phase 1 and 2 | Bourne, MA

Trish is Principal-in-Charge for these two projects, which consist of the connection of design and permitting of the Bourne Rail-with-Trail project that will ultimately connect the Shining Sea Bikeway in Falmouth to the Cape Cod Canal Bike Paths in the Town of Bourne. The trail is located adjacent and parallel to the existing active MassCoastal railroad tracks from the grade crossing at the southern end of the Canal Bikeway to Valley Bars Road, for a total distance of approximately 14,000 feet. Trish coordinated with the Town, MassDOT Rail Division, and MassDOT Highway Division on design development and presentations to the various departments in the Town.

Minuteman Bikeway Extension Improvement Project | Bedford, MA

Trish managed design development of the extension of the Minuteman Bikeway from its current terminus at Depot Park to the Concord town line. The project included an alternative analysis for an on-road section of the route, located on Railroad Avenue, public outreach, preparation of a Project Need Form and Project Initiation form to submit to MassDOT for construction funding support, the evaluation of flashing beacons for roadway crossings, and the preparation of design plans for submission to MassDOT. Trish also facilitated the completion of the feasibility study, conducted community outreach meetings, obtained project approval from the Selectmen, and prepared funding applications for construction through the Enhancement Program offered by MassDOT.

Education

BS, Civil Engineering, University of Massachusetts, 1987

Registrations and Certifications

Professional Engineer (Civil), MA, 06/2022

Affiliations and Memberships

American Public Works Association

American Society of Civil Engineers

Boston Society of Civil Engineers

Essex County Highway Association

Massachusetts Highway Association

Norfolk-Bristol-Middlesex Highway Association

Worcester County Highway Association

Patricia Domigan, PE

Yankee Doodle Bike Path | Billerica, MA

Trish is the Project Manager for the planning and design of the Yankee Doodle Bike Path, a 2.5-mile recreational multiuse path that will connect educational, recreational, and conservation areas in the southern portion of the Town of Billerica. She oversaw the preparation of the Alternatives Analysis, which led to a preferred path alignment selection by the Town and prepared MassDOT funding applications for the project, which were approved by MassDOT. She is currently leading the advancement to 25% design and submission to MassDOT.

Blackstone River Greenway, Segment 1 | Blackstone, Millville, and Uxbridge, MA

Trish managed the design of Segment 1 of the Blackstone River Greenway, in the towns of Blackstone, Millville, and Uxbridge. She worked with the Department of Conservation and Recreation (DCR) to design the 3.5-mile corridor to meet the Lieutenant Governor's vision to build the Blackstone River Greenway, from Rhode Island to the City of Worcester. This segment, the southernmost section of the greenway included the rehabilitation of six former railroad bridges, the construction of four miles of greenway, and the re-installation of a bridge over Route 126 in Blackstone, and an underpass under Church Street. The project also included the rehabilitation of the Triad Bridge in Millville. This three-level bridge crosses over the active Providence and Worcester railroad, as well as the Blackstone River. The greenway has been designed to be the top level of the bridge.

DCR, Southern New England Trunkline Trail (SNETT) | Uxbridge and Douglas, MA

One of the longest rail trails in Massachusetts, the SNETT stretches from Franklin to the Connecticut state line in Douglas, Massachusetts. VHB was retained by DCR to develop a 12-mile portion of the SNETT from Elmwood Avenue to the Connecticut state line into a paved shared-use accessible pathway to serve a variety of users of all ages and abilities. Trish managed the design of the 12-mile bike path, which included survey, environmental permitting, structural design, landscape architecture and place-making, and bike path design. As part of the design development, it was determined that a significant amount of wetlands had overtaken the former railbed, resulting in over 5,000 sf of wetland impacts. VHB conducted an alternatives analysis that evaluated the use of boardwalk and alignment shifts to avoid impacts to wetland to the greatest extent possible. The result of the alternatives analysis was the reduction of direct wetland impacts to under 5,000 square feet.

DCR, Watertown Greenway | Watertown, MA

Trish worked with DCR to design a bike path on an abandoned railroad right-of-way, from School Street to Grove Street. The alignment, which is behind the Arsenal Mall, crosses the Nichols Street intersection with Arlington Street, a five-legged intersection with high traffic volumes.

Stephen Rhoads, PE

Project Manager

Steve is a Project Manager with VHB's Transportation Department. A Professional Engineer registered in Massachusetts with over a decade of experience in transportation and civil engineering, he provides engineering services that include plan, specifications, and estimate development, with a particular focus on roadway, shared use path, and sidewalk improvements, for both public- and private-sector clients.

Education

BS, Civil Engineering, Northeastern University, 2007

Registrations and Certifications

Professional Engineer (Civil), MA, 06/2022

OSHA 10-Hour Construction Safety and Health Certificate

Affiliations and Memberships

Barnstable County Public Works Association

Massachusetts Highway Association

15 years of professional experience

Cape Cod Rail Trail Extension, Phases 2 and 3 | Barnstable, Yarmouth, and Dennis, MA

Steve worked with MassDOT and the towns of Dennis and Yarmouth to finalize the design of Phase 2 of the rail trail extension. The project extended the Cape Cod Rail Trail from its former western terminus in Dennis to Peter Homer Park in Yarmouth. Steve worked to complete the design details of the shared use path at the proposed bridge crossing the Bass River at the Yarmouth/Dennis town line. He also coordinated a redesign of the roadway work associated with the shared use path crossing at North Main Street in Yarmouth, which incorporates a rapid flashing warning beacon to provide safe crossing to trail users. Phase 3 of the extension will provide a critical connection in the overall path network by extending the trail to Mary Dunn Road in Hyannis. This will benefit the users of the recently constructed sidewalk along Independence Drive by extending recreational walking/biking opportunities and potentially bike commuting options into Yarmouth and Dennis. Steve is leading a team that will provide 100% and plans, specifications, and estimates (PS&E) design submissions to the towns of Barnstable and Yarmouth and MassDOT, including shared use path and bridge plans, specifications, and an itemized quantity estimate.

Bearse's Way Shared Use Path | Barnstable, MA

Steve is Project Manager for the design of a multimodal shared use path adjacent to Bearse's Way in Barnstable. A safe connection to existing bicycle and pedestrian facilities on Bearse's Way just south of Iyannough Road (Route 132) will be provided by the construction of the shared use path. The project includes the development of horizontal and vertical geometry of approximately 4,200 feet of paved path and landscape design to provide screening and to supplement the creation of the path. The project also includes design of gathering areas for path users at locations where pedestrians and bicyclists may enter the path. Steve has worked directly with the Town of Barnstable to develop the preliminary and final design of the path.

Service Road Shared Use Path | Sandwich, MA

Steve worked with the Town of Sandwich and MassDOT in the development of a MassDOT Transportation Improvement Program (TIP) project to construct a shared use path along the north side of Service Road from Robin Road to Chase Road—a distance of four miles. The project will provide an important starting point of the Cape Cod Rail Trail spine in Sandwich and a linking point for the extension of the Cape Cod Rail Trail in Barnstable. Steve led a team from preliminary to PS&E design, including roadway crossing treatments (flashing beacons and a hybrid pedestrian signal), parking lot design and gathering area/amenity area design.

Stephen Rhoads, PE

Bayview Street | Barnstable to Yarmouth, MA

Steve is Project Manager for the reconstruction of 3,700 feet of Bayview Street from Main Street in Barnstable to Windmill Lane in Yarmouth, as well as the reconstruction of Willow Street in Yarmouth from 200 feet north of Arlington Street to Bayview Street. The project calls for pavement mill and overlay, full depth pavement reconstruction, and the addition of a continuous sidewalk throughout the corridor with sidewalks on both sides of the road designed in the Barnstable portion of the project. A closed drainage system is proposed to complement existing drainage and provide complete stormwater treatment for the length of the roadway. Steve has worked directly with the towns of Barnstable and Yarmouth to review the final design and refine the details of the project as it moves forward.

Town of Barnstable, On-Call for Wheeler Road Improvements | Barnstable, MA

Steve was a joint project manager and technical consultant for the Wheeler Road project, which focused on designing improvements to the existing drainage system and reconstructing the pavement over the length of the ¾-mile-long roadway. Steve worked with the Town's project manager along with residents of Wheeler Road to develop a preliminary and final design, resulting in roadway bid documents for the Town. Steve and his team worked with VHB's water resource consultants to prepare the planset, special provisions, and estimate incorporating the drainage design and roadway reconstruction. Steve provided support to the Town during the construction period.

In-Town Bike Path | Nantucket, MA

Steve was project engineer for the final stages of the project, assisting the Town of Nantucket with the PS&E design submission to MassDOT. The project will provide a shared use path connection adjacent to Nantucket Harbor between Washington Street Extension and Orange Street. The shared use path construction will formalize an existing walking trail and will provide a safe, dedicated corridor for pedestrians and bicyclists as an addition to the Town's extensive shared use path network. Steve worked with the Town and MassDOT to finalize project funding and successfully bid the project.

Main Street (Route 28) Improvements | Harwich and Dennis, MA

Steve worked with the towns of Harwich and Dennis in the development of a MassDOT TIP project to make improvements to Main Street (Route 28) in West Harwich's business and historical district from Division Street at the Dennis/Harwich town line to the Herring River Bridge in Harwich. The proposed project includes traffic signal reconstruction, roadway rehabilitation, and bicycle and pedestrian improvements. VHB assisted the towns with public outreach, including a site walk and brainstorming sessions with the community in order to capture the neighbors' vision for the project. Steve prepared a concept plan of the improvements to the corridor for the towns' use in preparing a Project Notification Form and Project Initiation Form to begin the project development with MassDOT. The design has advanced to a pre-75% level.

Susan Kremer, PE, NETTCP QAT, ENV SP

QA/QC

Susan is the Chief Highway Engineer in VHB's Transportation Engineering Group where her responsibilities include quality assurance and quality control (QA/QC) for bridge and roadway projects in Massachusetts. These include reviewing projects for technical quality, completeness, and conformance with federal, state, and local standards, including American Association of State Highway & Transportation Officials (AASHTO) and MassDOT design guidelines. She also provides senior technical support assistance to staff and participates in the design of roadway projects, providing assistance in grading and alignment. Susan is an NETTCP-certified QA Technologist, qualifying her to be a QA Administrator on Massachusetts design-build projects.

32 years of professional experience

Final Design of the Westerly Extension of the Cape Cod Rail Trail—Phases 1, 2, and 3 | Barnstable, Dennis, and Yarmouth, MA

Susan provided QA/QC for this eight-mile extension to the Cape Cod Rail Trail (CCRT) from the trail head located at the intersection of Route 134 in the Town of Dennis through Dennis, Yarmouth, and into Barnstable. This extension will extend the existing bike trail into Barnstable where future phases will extend that trail through Barnstable and into Sandwich.

Bearse's Way Shared Use Path | Barnstable, MA

Susan provided QA/QC review on VHB's design a multimodal shared-use path adjacent to Bearse's Way in Barnstable. The project includes the development of horizontal and vertical geometry of approximately 4,200 feet of paved path and landscape design to provide screening and to supplement the creation of the path. The project also includes design of gathering areas for path users at locations where pedestrians and bicyclists may enter the path.

Shining Sea Bikeway | Falmouth, MA

Providing QA/QC for the Shining Sea Bikeway, Susan was responsible for reviewing the design and a variety of cross-sectional details necessary to construct 6.5 miles of a multi-use facility along an abandoned rail facility. The path is located in a challenging topographical and environmentally sensitive corridor including salt marsh and cranberry bogs. This facility provides connectivity to a variety of institutional, residential, and recreational destinations in North and West Falmouth.

DCR, Watertown—Cambridge Greenway—Phase II | Watertown and Cambridge, MA

Susan was responsible for QA/QC of the design of a 5,600-linear-foot portion of this greenway for DCR. This phase is a vital link in the Regional Bikeway network. The construction of this segment signifies the completion of an important regional connection linking the Charles River path system, the Minuteman Bikeway, the Alewife Greenway, and the Mystic River Reservation into an interconnected off-road pathway network.

Route 130 Bike Path Extension Design | Mashpee, MA

Susan provided QA/QC services on the extension of the Route 130 bike path on Cape Cod, from Heritage Park to Pickerel Cove Road, a distance of approximately 2,700 feet.

Education

BS, Civil Engineering, Vanderbilt University, 1983

Registrations and Certifications

Professional Engineer (Civil), MA, 06/2022 (reg# 37990)

Professional Engineer (Civil), VT, 07/2022 (reg# 110506)

Professional Engineer (Civil—Highway), NH, 05/2022 (reg# 7118)

Professional Engineer, CT, 01/2023 (reg# 35677)

NorthEast Transportation Training and Certification Program (NETTCP) (QA Technologist), 12/2022 (reg# 868)

Envision™ Sustainability Professional

Notary Public, MA, 2023

Affiliations and Memberships

American Society of Civil Engineers, Boston, 1981

WTS International, Boston, 2016

Susan Kremer, PE, NETTCP QAT, ENV SP

Hummock Pond Bike Path | Nantucket, MA

In addition to being responsible for quality control for the design of this 2.5-mile bike path, Susan assisted in the laying out of the horizontal and vertical alignment. The bike path was designed along a heavily traveled roadway providing access to a popular beach for the Nantucket Planning Commission.

Columbia Greenway | Westfield, MA

For the City of Westfield, Susan was responsible for QA/QC of the ongoing Columbia Greenway rails-to-trails greenway project. The project consists of constructing a 3.2-mile multi-use trail and related improvements. The project includes a 12-foot paved trail, rehabilitation of three bridges and replacement of six bridges, pathway lighting, access ramps/walkways, emergency vehicle access points, landscaping, retaining walls, safety rails, drainage, benches, parking, and trail safety lighting.

Route 28, Three Locations | Barnstable, MA

For a project for the Town of Barnstable to provide engineering and traffic signal design services for the reconstruction of the three locations on Route 28, Susan led the QA/QC review on all three locations. She reviewed design drawings for roadway geometric improvements and signal installation at the three intersections.

Bayview Street | Barnstable and Yarmouth, MA

Susan was responsible for the quality control for the preliminary through the final design of 3,700 feet of Bayview Street near the Cape Cod Hospital. The improvements to the town roadway consist of pavement mill and overlay, full depth pavement reconstruction, and the addition of a continuous sidewalk.

Matthew Duranleau, PE

Traffic Analysis and Planning

As a Project Engineer in VHB's Watertown office, Matt analyzes and models current and future vehicle, pedestrian, and bicycle traffic demands for public roadway and private development projects across Massachusetts. Matt reviews existing roadway networks and safety data, determines future traffic volumes and conditions, analyzes intersection operations, evaluates existing and proposed pedestrian and bicycle networks, writes memorandums and reports to explain project methodology and results, and analyzes utilization of existing parking facilities.

Education

BS, Civil Engineering, Northeastern University, 2016

Registrations and Certifications

Professional Engineer, MA

Affiliations and Memberships

Institute of Transportation Engineers

6 years of professional experience

Route 132 Improvements | Barnstable, MA

Matt is the lead Transportation Planner for the Route 132 Improvements project in Barnstable. The project involves redesigning Route 132 between Bearse's Way and the Airport Rotary to promote non-motorized transportation and enhance the aesthetics of the roadway. Matt is responsible for reviewing the existing and future conditions on the corridor for vehicles, pedestrians, and bicyclists; identifying safety deficiencies; and helping to evaluate different alternatives to improve the corridor for all users.

Shared Use Path and Service Road | Sandwich, MA

Matt was a Transportation Planner for the design of a 4.9-mile shared use path to reduce conflicts between pedestrians, cyclists, and motorists currently sharing the Service Road from Route 130 to the Barnstable town line. The existing roadway shoulder does not meet current standards for bicycle accommodation and the shared use path will provide a safer non-motorized alternative for pedestrians and cyclists. Matt analyzed current and future traffic conditions to help determine appropriate traffic control methods at each roadway crossing along the proposed shared use path and helped to develop the Functional Design Report.

Traffic Impact and Access Studies (Multiple Locations) | Barnstable, MA

Matt was the traffic analyst for several Traffic Impact and Access Studies and Cape Cod Commission (CCC) Development of Regional Impact Studies (DRIs) in Barnstable. As the traffic analyst, Matt evaluated the existing conditions for each project, determined the impacts of each individual project, and identified potential mitigation measures to offset the impacts of the projects. Specifically, Matt worked on studies for the following projects:

- Tractor Supply Company, Bearse's Way
- Cape Cod Five Cents Savings Bank, Corporate Headquarters Development
- Cape Cod Hospital Bed-Tower Expansion
- Cape Cod Mall Redevelopment (Target/Dick's Sporting Goods)
- Cape Cod Potato Chips Factory Expansion

Matthew Duranleau, PE

DCR, Lynnway Feasibility Study | Lynn, MA

The Lynnway Feasibility Study is a comprehensive study of the Lynnway looking at ways to improve the mobility, appearance, and recreational value of the corridor from the General Edwards Bridge to the Nahant Rotary. Today, high travel speeds, expansive pavement, and inhospitable landscape prevent the Lynnway from reaching its full mobility potential for safe, comfortable, and enjoyable travel for users of all ages and abilities. Matt is the traffic task leader for the study and is responsible for analyzing existing and future traffic conditions and evaluating the proposed alternatives from a traffic perspective.

Boston Street Alternative Analysis | Salem, MA

Matt is a member of the team providing transportation planning services, alternative analysis, and public outreach involved with the development of improvements along Boston Street from Essex Street to the Peabody City Line. The project will improve complete streets design elements along the roadway, including the provision of dedicated bicycle facilities, improved intersection safety, and an evaluation of pedestrian crossings along the corridor. Matt is responsible for analyzing vehicular, pedestrian, and bicycle volumes along the corridor, helping to develop different alternatives to serve all the different users, and developing the Function Design Report that was submitted to MassDOT.

Hartwell Avenue/Bedford Street Transportation Improvements | Lexington, MA

Matt is a traffic analyst for the Hartwell Avenue/Bedford Street Transportation Improvements project in Lexington. The project will improve Hartwell Avenue and Bedford Street by incorporating multimodal accommodations for all roadway users. Matt is responsible for reviewing existing and future roadway volumes and evaluating potential concepts in terms of traffic operations and multimodal connectivity.

MassDOT, Lynn Transit Action Plan | Lynn, MA

Matt was the traffic lead for the Lynn Transit Action Plan, which identified strategies for faster, more reliable transit services for the residents of Lynn. The multimodal analysis aimed to address the unique transit demands of the diverse community of Lynn while accommodating for future growth. This project resulted in a plan with near- and long-term recommendations and a defined path to implementation. Matt's role on the project was to conduct traffic analyses to determine the impact of several different transit improvement alternatives on vehicle and bus operations. Matt also led a parking inventory analysis to determine the on-street parking demand on several of the corridors that were identified for transit improvements.

Laura Castelli, EIT

Traffic Analysis and Planning

Education

BS, Civil Engineering, University of Massachusetts Amherst, 1999

Affiliations and Memberships

Institute of Transportation Engineers

Laura leads complex transportation planning and corridor studies, multimodal transportation plans, community and institutional master plans, and transportation tasks related to National Environmental Policy Act (NEPA) permitting efforts. She understands the interrelationship among traffic, pedestrian, transit, and bicycle operations and works to balance these considerations to deliver plans that enhance safety and mobility while providing economic development opportunities. Laura has extensive experience with public agencies at the municipal, state, and federal levels and with public outreach. She is a Project Manager with VHB's Transportation Systems Group.

23 years of professional experience

Sandwich Local Comprehensive Plan | Sandwich, MA

Laura worked with the Town of Sandwich to develop a transportation element for the Town's Local Comprehensive Plan. She quantified and evaluated existing demographics and travel patterns, traffic, parking, public transportation, and bicycle and pedestrian activity in the Town, with analysis completed for both annual average and peak season traffic conditions. The project also included development of a build-out land use scenario to identify future transportation conditions for the Town, which was based on both current and proposed zoning laws and Cape Cod Commission open space requirements. Once future transportation issues were identified, Laura helped identify transportation services, infrastructure improvements, and policies that would help the Town manage its transportation system into the future.

Route 28 Corridor Study | Yarmouth, MA

For the Town of Yarmouth, Laura was Project Manager for transportation planning and traffic services in the development of short- and long-term improvements for two sections of the Route 28 corridor. Short-term improvements focused on elements the Town could implement immediately as it strives to realize longer-term goals, such as traffic signal timing improvements and driveway consolidation. Long-term goals also included improving safety and mobility along the corridor, providing multimodal accommodation for all transportation users, developing access management strategies to ease congestion along the corridor, and incorporating the principles of context-sensitive design.

Rehabilitation of Moors Road with Bicycle Accommodations in the Province Lands, Environmental Assessment/Assessment of Effect | Provincetown, MA

For the Denver Service Center and the National Park Service (NPS), Laura developed a traffic study and associated traffic calming measures to address safety concerns along the main road through the Cape Cod National Seashore. She identified measures that could complement improvement alternatives that were being considered to reconstruct Moors Road and include bicycle accommodations. Other options considered included restricting heavy traffic using the park as a bypass route. Bicycle lanes were constructed along Moors Road at the conclusion of the project.

Laura Castelli, EIT

Route 132 Corridor Study | Barnstable, MA

Laura is managing the traffic and transportation planning tasks in evaluating roadway improvements along Route 132 in Barnstable from Bearse's Way to the Airport Rotary. Responsibilities included preparing a conceptual design improvement plan that will improve vehicular access and safety while focusing on providing fully dedicated pedestrian and bicycle accommodations. The team will work with the Town of Barnstable to secure funding for the project once the conceptual design is finalized.

Lafayette-Loring Streets | Salem, MA

Laura served as transportation task manager evaluating the potential benefits and impacts of conducting a parking separated bicycle lane pilot program along Lafayette Street. Tasks included evaluation of cross-sections along the route and potential constraints or modifications required at major intersections.

Monsignor O'Brien Highway | Cambridge, MA

Laura served as Project Manager for the design development process of 5.24 million square feet of mixed-use development in East Cambridge, which included the reconstruction of approximately 2,000 feet of the O'Brien Highway corridor to better accommodate the multimodal users of the corridor. The project includes the design and construction of sidewalk-level separated bike paths along O'Brien Highway that connect into the regional bicycle system. The project also includes a number of shared use paths and a portion of the community path that connects to the Charles River.

Shared Use Path and Service Road | Sandwich, MA

Laura led the traffic planning and operations task for the design of a 4.9 mile shared use path to reduce conflicts between pedestrians, cyclists, and motorist currently sharing the Service Road from Route 130 to the Barnstable Town Line. The existing roadway shoulder does not meet current standards for bicycle accommodation and the shared use path will provide a safer non-motorized alternative for pedestrians and cyclists.

Watertown Community Path | Watertown, MA

Laura is serving as Project Manager to assist the city in design and construction of an extension of the Watertown Community Path that will connect the existing Watertown Greenway to the existing Linear Path. The project includes design and construction through constrained rights of way with substantial utility conflicts. A portion of the project also includes construction through an existing parking lot and the need to reconstruct the lot to prioritize bicyclist safety while maintaining parking.

Education

BS, Civil and Environmental Engineering, Northeastern University, 2008

Registrations and Certifications

Professional Engineer (Civil), MA, 6/2022 (reg# 52670)

Affiliations and Memberships

American Society of Civil Engineers, 2008

Boston Society of Civil Engineers, 000000951080, 2008

Scott Brunner, PE

Shared Use Path Design/Right of Way

Scott is a member of the Transportation Group in VHB's Watertown, Massachusetts, office. A Professional Engineer registered in Massachusetts, he performs a variety of tasks for state and municipal agencies, private developers, and utility companies. He has experience with horizontal and vertical design of intersections, roundabouts, and long roadway and bike path corridors. He also has experience with design plan preparation, preliminary right-of-way plans, layout plans, project specifications, and quantity and cost estimates.

17 years of professional experience

DCR, Segment 1 of the Blackstone River Greenway | Blackstone, MA

For DCR, Scott was the Project Engineer for the design of a 10-foot, paved multi-use path for Segment 1, Phase 1 of the Blackstone River Greenway. The greenway extends 4.1 miles from Route 146A in Uxbridge to just north of the Rhode Island state border along the abandoned railroad corridor. Tasks included horizontal and vertical alignments, roadway crossings, gateways and amenities, and the preparation of specifications and bid documents. Scott also completed construction phase services for DCR including shop drawing reviews, Request of Information (RFI) responses, and coordination with the DCR Resident Engineer and VHB's two subconsultants. Scott is currently involved with the design development for the Phase 2 project, which will connect the completed Phase 1 project to Rhode Island.

DCR, Watertown-Cambridge Greenway | Watertown, MA

For DCR, Scott provided support for the design of a 12-foot, paved multi-purpose path constructed by MassDOT. The path extends from School Street to Arlington Street. It provides the first segment of a potential future connection between the Minuteman Path at Alewife Station in Cambridge and Watertown Square, where it could connect with the Dr. Paul Dudley White Bike Path. The Watertown Greenway follows the abandoned B&M railroad right-of-way. Scott led the design by coordinating with the landscape and lighting subconsultants. He also developed the horizontal and vertical alignments, and grading of the roadway crossings and prepared estimates and project specifications.

MassDOT, Kelley Square Improvements | Worcester, MA

Scott was the Project Engineer involved with the Kelley Square Improvements project led by MassDOT. The project addressed poor safety and operational conditions for all users and included a robust and comprehensive outreach program. The project included an aggressive design and public outreach schedule for VHB, the City, and MassDOT and navigated the design process in under one year. The proposed improvements included a Hybrid Roundabout as the preferred alternative, which enhanced the neighborhood connectivity.

Scott Brunner, PE

MassDOT, Middlesex Turnpike Phase 3 Transportation Improvements | MA

Scott is the Project Engineer for the roadway and transportation improvement project currently in construction that spans 1.6 miles along Middlesex Turnpike. The proposed improvements include widening of the existing Middlesex Turnpike from a two-lane roadway to a four-lane roadway with the addition of a raised median, protected left turn lanes, traffic signals, bike lanes, and sidewalks. The work also entails full depth roadway construction, reclamation, drainage, stormwater management systems, water line improvements, sewer modifications, private utility connections and utility coordination, retaining walls, slope stabilization systems, and reconstruction of the bridge (culvert) at the Shawsheen River. The project design involved extensive right-of-way acquisitions, environmental permitting, and construction cost analysis. In 2018, FHWA recognized the towns, VHB, and MassDOT for their efforts and coordination to secure the complicated right-of-way for the project. Scott was the leader of the VHB right-of-way efforts and coordination.

Intersection Improvements at Route 28/Route 39 at Quanset Road | Orleans, MA

This four-way unsignalized intersection serves as one of the primary access points from the south on Route 28 to Orleans Center. Scott is the Project Engineer working with MassDOT and the Town and he has helped develop the PS&E design documents. The project improvements include the installation of a single lane roundabout at the intersection, roadway and sidewalk reconstruction, utility modifications, retaining wall design, signing, and pavement markings.

Concord Street (North) Roadway Restoration and Construction Inspection | Framingham, MA

Scott was the Project Engineer for the restoration of 1.6 miles of this busy corridor through Framingham. The work entailed pavement reclamation, horizontal and vertical alignments, corridor design, extensive grading exercises and challenges, bicycle and pedestrian accommodations, traffic signal design, utility pole relocation, and construction costs estimating. Scott also coordinated directly with an appraiser to help the City secure the necessary easements for the project.

Intersection of Edgell Road, Water Street, and Edmunds Road | Framingham, MA

Scott was the Project Engineer for the installation of a new traffic signal system and roadway geometric modifications at the intersection of Edgell Road, Edmunds Road, and Water Street. The work entails pavement reclamation, horizontal and vertical alignments that avoid major underground utility relocations, corridor design, extensive intersection grading exercises and challenges, traffic signal design, utility pole relocation, special provisions, and construction cost estimating. Scott has coordinated with the City on the lighting design and the replacement of a City fiber optic line and has worked directly with the appraiser to help the City secure the easements that are required for the project.

Campbell Narron

Shared Use Path Design

Campbell is a member of the Transportation Group in VHB's Watertown office. He performs a variety of tasks for roadway and shared use path projects for both public- and private-sector clients that include plan, specification, and estimate development.

4 years of professional experience

Education

BS, Civil Engineering, University of Massachusetts, 2018

Bearse's Way Shared Use Path | Barnstable, MA

Campbell is a design engineer on the team involved in the design of the shared use path adjacent to Bearse's Way in Barnstable. He was involved with updating the corridor model for the project, incorporating preferred utility changes, and progressing the plans and estimate to the 75% submission phase. He also progressed the development of the preliminary right-of-way plans.

Cape Cod Rail Trail Extension, Phase 3 | Barnstable and Yarmouth, MA

For a MassDOT project to provide a critical connection in the overall path network by extending the trail to Mary Dunn Road in Hyannis, Campbell has worked on the full 75% and 100% designs, including updating the drainage and utility design, advancing the corridor model, fine-tuning the path layout per review comments, and updating an itemized construction quantity and cost estimate. He also helped develop preliminary right-of-way plans and address Town and MassDOT comments and concerns.

MassDOT, Service Road Shared Use Path | Sandwich, MA

Campbell worked with the Town of Sandwich and MassDOT in the development of a MassDOT TIP project to construct a shared use path along the north side of Service Road from Robin Road to Chase Road—a distance of four miles. The project will provide an important starting point of the Cape Cod Rail Trail spine in Sandwich and linking point for the extension of the Cape Cod Rail Trail in Barnstable. Campbell aided in the development of the project's plans, estimates, ROW, and more.

MassDOT, Yankee Doodle Bike Path | Billerica, MA

Campbell developed the alignment alternatives analysis as well as the wetlands and floodplain impact analysis for the Yankee Doodle Bike Path, a 2.5-mile recreational multiuse path that will connect educational, recreational, and conservation areas in the southern portion of the Town of Billerica. The alternatives analysis led to a preferred path alignment selection by the Town and approval of the project funding by MassDOT. He led the design plans and estimate development for 75% submission to MassDOT.

MassDOT, Bourne Rail Trail, Phase 1 | Bourne, MA

Campbell created 25% estimate and design plans for the Bourne Rail Trail Phase 1 project that will ultimately connect the Shining Sea Bikeway in Falmouth to the Cape Cod Canal shared use path in the Town of Bourne. The trail is located adjacent and parallel to the existing active MassCoastal railroad tracks from the grade crossing at the southern end of the Canal Bikeway to Monument Neck Road, for a total distance of approximately 2,700 feet.

Campbell Narron

MassDOT, Main Street (Route 28) Improvements | Harwich and Dennis, MA

Campbell worked with the towns of Harwich and Dennis in the development of a MassDOT TIP project to make improvements to Main Street (Route 28) in West Harwich's business and historical district from Division Street at the Dennis/Harwich town line to the Herring River Bridge in Harwich. The proposed project includes traffic signal reconstruction, roadway rehabilitation, bicycle, and pedestrian improvements. VHB assisted the towns with public outreach, including a site walk and brainstorming sessions with the community in order to capture the neighbors' vision for the project. Campbell aided in preparing design plans and the design justification workbook. The design has advanced to a pre-75% level.

Thorndike Street (Lord Overpass) | Lowell, MA

For the City of Lowell, Campbell provided corridor work, assisted with the utility design and plans and estimate development for the Thorndike Street (Lord Overpass) project. Lord Overpass is an existing bridge over Thorndike Street. The project proposed to bring Thorndike Street up to grade with Lord Overpass. The typical roadway cross section has many complete street features such as 10-foot shared use paths separated from the travel lanes with grass strips and dedicated bus lanes. Campbell also provided preliminary ROW and layout plans for the project.

Kristofer Kretsch, PE, CQA, QAT, ENV SP

Structural Engineering

Kris is a Senior Structural Engineer with diverse experience in bridge engineering and construction that includes quality assurance and quality control (QA/QC), inspection, rating, analysis, and design for highway and railroad structures. Kris's responsibilities have included seismic analysis of bridges, structural analysis and design for tunnels, buildings, earth retention systems, sign support structures, and mast arm installations. Kris is also an ASQ Certified Quality Auditor.

34 years of professional experience

Final Design of the Westerly Extension of the Cape Cod Rail Trail—Phases 1, 2, and 3 | Barnstable, Dennis, Yarmouth, MA

Kris was Senior Engineer and Structural Task Manager for the design of three bridges associated with the construction of a mixed-use trail along a former railroad. The trail was designed for the towns of Yarmouth and Dennis and included three bridge crossings—over Route 134 in Dennis, over the Bass River at the towns' border, and over Station Avenue in Yarmouth.

Columbia Greenway—Central | Westfield, MA

Kris is a Senior Engineer and Structural Task manager for the design of five pedestrian bridges as part of a rail trail project through a dense neighborhood in Westfield for the City and MassDOT. The structures along the path corridor include a prefabricated steel truss bridge, three steel thru-girder bridges, rehabilitation of an existing historic steel truss railroad bridge, and several retaining walls.

MBTA, Rail Bridge Replacements Design-Build Project | Various Locations, MA

Kris is the QA/QC Administrator for a Design-Build contract with the MBTA to replace six bridges along various branches of the Commuter Rail system. He is responsible for oversight of the Design and Construction QA/QC Management, and ensuring that project quality plans are being followed.

Rhode Island Department of Transportation (RIDOT), Washington Bridge North Phase 2 Design-Build, Providence and East | Providence, RI

Kris is the Quality Control Administrator for the Washington Bridge North Phase 2 Design-Build project for RIDOT. The Washington Bridge carries I-195 over the tidal waters of the Seekonk River. VHB is part of the Design-Build Team tasked by RIDOT to design and implement improvements largely for superstructure rehabilitation, bridge deck widening (to add an additional westbound travel lane), and on- and off-ramp reconfigurations and additions for Gano Street and Waterfront Drive. Kris is responsible for the development and implementation of the overall quality management plan for the design and construction teams and is overseeing the integration of design and construction reviews.

MassDOT, I-495 over Riverwalk | Amesbury, MA

Kris was the Senior Engineer and Structural Task Manager for the structural design of the bridge replacement project for MassDOT. The existing three-span superstructures were demolished and replaced with precast concrete culverts using accelerated bridge construction techniques.

Education

BS, Civil Engineering, University of Massachusetts Lowell, 1988

AAS, Architectural Engineering, Vermont Technical College, 1981

Registrations and Certifications

Professional Engineer, RI

Professional Engineer (Structural I), VT

Professional Engineer, FL

National Bridge Inspection Standards (NBIS) Certified Bridge Inspector (Safety Inspection)

Envision™ Sustainability Professional

ASQ Certified Quality Auditor (Quality Auditing), 2022

NorthEast Transportation Training and Certification Program

Affiliations and Memberships

American Railway Engineering and Maintenance-of-Way Association

American Society of Civil Engineers

Kristofer Kretsch, PE, CQA, QAT, ENV SP

Replacement of Ped/Bike Bridge over Passagassawakeag River | Belfast, ME

Kris was Project Engineer for prestressed concrete superstructure design, pile bent design, and detailing for the replacement of a 1,030-foot pedestrian and bicycle bridge over the Passagassawakeag River. The project also included substructure and pile foundation design for a bascule span over the navigable channel.

Cross Street Bridge Over Otter Creek, Design-Build | Middlebury, VT

Kris was Senior Engineer for the design-build project to construct a new bridge. His responsibilities included analysis and design and QA/QC for a new prestressed/post-tensioned three-span bridge for the Town of Middlebury and Middlebury College. The 480-foot signature bridge consists of two 120-foot prestressed box spans and a 240-foot post-tensioned main span that is the longest single span using precast-prestressed New England bulb tee girders.

MBTA, Design Engineering Services for Repair/Replacement of Systemwide Bridges | MA

Kris is Project Manager for this task-order-based contract with the MBTA, responsible for overall quality and consistency for all assignments within the contract. Under this contract, VHB has received task orders for design and construction phase services for two bridge replacement projects, one for th e bridge carrying the Franklin Line over East Street in Westwood and the other for the bridge carrying the Needham Line over Robert Street in Boston's Roslindale neighborhood. The site conditions at each of the bridges requires unique design and accelerated construction techniques due to the urban locations and frequent commuter rail service. Kris's responsibilities include project management, lead structural engineer, constructability, and QA/QC for structural engineering for the Robert Street assignments.

VHB also is providing engineering and construction phase services task orders for the rehabilitation of the historic Lechmere Viaduct carrying the Green Line over Nashua Street, the Charles River, Museum Way, and Charlestown Avenue in Boston and Cambridge. The rehabilitation includes replacement of the track and superstructure elements and strengthening of the existing historic concrete arches and floor beams with Carbon Fiber Reinforced Polymer (CFRP) wrap.

Alex Schulz, PE

Structural Engineering

Alex is a Structural Design Engineer in VHB's Watertown, Massachusetts, office. His experience includes concrete, steel, and wood structures. He has worked on numerous culverts, bridges, and roadside structures. Alex has assisted on many aspects of projects including task management, plan development, construction inspection, load ratings, cost estimating, and structural design.

9 years of professional experience

Education

BS, Civil Engineering, Northeastern University, 2013

Registrations and Certifications

Professional Engineer (Structural), MA, 06/2022 (reg# 54619)

OSHA 10-Hour Construction Safety and Health Certificate (reg# 4137_826211)

Affiliations and Memberships

American Society of Civil Engineers, Boston (BSCES), 2009

MassDOT, Cape Cod Rail Trail | Dennis, Yarmouth, and Barnstable, MA

Alex provided design services for four new pedestrian bridges as part of an eight-mile, shared-use path project for MassDOT. The two bridges in Phase One consisted of 100-foot-span, prefabricated trusses over existing roadways and were supported by stub abutments on approaches retained by Mechanically Stabilized Earth (MSE) walls. The bridge in Phase Two of the project consisted of a 160-foot-span, prefabricated truss over a tidal river and was supported by abutments on piles driven to 100-foot depths. The bridge in Phase Three of the project was designed as a 180-foot single-span, prefabricated truss over existing railroad and roadway facilities. Alex's responsibilities included the development of the Bridge Type Selection Reports, conceptual superstructure design, final substructure design, plan development, cost estimating, coordination with contractors and subconsultants, and management of construction phase services.

Columbia Greenway—Central | Westfield, MA

Alex assisted in the design of five pedestrian bridges as part of a rail trail project through a dense neighborhood in Westfield for the City and MassDOT. The structures along the path corridor include a prefabricated steel truss bridge, three steel thru-girder bridges, rehabilitation of an existing historic steel truss railroad bridge, and several retaining walls. Alex helped to finalize the design by drafting structural plans, developing cost estimates, writing specifications, and preparing submission documents. He continues to work closely with the City, state engineers, subconsultants, and contractors during construction. Alex coordinates all construction phase services related to the five bridges, including review of shop drawings and construction procedures, RFI response, and construction inspection.

DCR, Cambridge—Watertown Greenway | Watertown, MA

Alex worked on a project that will transform an abandoned railroad corridor into a recreational shared use path. The project includes modifications to existing structures as well as design and construction of new structures along the path. Alex assisted in all structural tasks associated with the project, including designing and detailing repair procedures to vertical and overhead concrete surfaces at existing bridges.

Alex Schulz, PE

MassDOT, Route 44 Over Route 24 Design-Build Bridge Replacement | Raynham, MA

As part of a design-build team under contract with MassDOT, Alex worked on a project replacing the bridge carrying Route 44 over Route 24 in Raynham. VHB collaborated with lead contractor SPS New England to develop an innovative design and construction approach for the bridge replacement, eliminating a full phase of construction, simplifying traffic management, and improving safety. The project included the complete removal of the existing structurally deficient four-span structure and construction of a new two-span structure, with improved bicycle and pedestrian accommodations along Route 44 and increased clearance over Route 24. A portion of the superstructure was slid into place using Accelerated Bridge Construction (ABC) techniques. Alex was involved with all aspects of the design and construction phase services, including bridge substructure and superstructure design, drafting, and submittal reviews.

Culvert Inventory | Holden, MA

Under a contract with the Town of Holden, Alex was responsible for coordinating the inventory of over 120 culverts in the Town. The project requires a visual inspection of each culvert location with GIS software to evaluate and document the structural condition and identify any necessary repairs. Alex conducted inspections in the field and generated a report prioritizing repair recommendations to the Town.

MassDOT, Kelley Square Improvements | Worcester, MA

Alex led the design of all structural elements of the Kelley Square Improvements project including mast arm foundation design and concrete slab design. He also assisted in construction phase services by reviewing shop drawings and construction procedures for structural items.

MassDOT, I-495 over Riverwalk | Amesbury, MA

Alex assisted on all structural design aspects of the bridge replacement project for MassDOT. The existing three-span superstructures were demolished and replaced with precast concrete culverts using accelerated bridge construction techniques. Alex's responsibilities included generating the Bridge Type Selection Report, substructure design, plan development, cost estimation, coordination with subconsultants, construction staging planning, and construction phase services.

MBTA, Newton Stations Conceptual Design and Operations Analysis, Architectural and Engineering Services | Newton, MA

Alex is part of a team of structural engineers for the upgrade of the three Worcester Line commuter rail stations in Newton for accessibility and operational efficiency improvements. The project includes the development of conceptual and final design for the three stations. Alex coordinates with subconsultants and assists on the structural design of the platforms, station structural elements, pedestrian access structures, and adjacent existing bridge modifications.

Daniel Cannata

Environmental

Dan is an Environmental Scientist in VHB's Watertown office, where he works on projects for clients within the transportation, land development, and energy sectors. His experience focuses on environmental due diligence, environmental compliance monitoring, wetland delineation, rare species investigations, and state and federal permitting for transportation and private development projects.

Education

BS, Environmental Sciences, University of Rhode Island, 2010

Professional Development

40-hour Wetland Delineation Environmental Concern, 2014

7 years of professional experience

Phase 1 Rail Trail | Bourne, MA

Dan conducted environmental due diligence and documentation for a section of a proposed shared-use path in Bourne. He coordinated and led a wetland delineation team, which reviewed the project limits for various resources including salt marsh, coastal dunes, and bordering vegetated wetland. Dan also prepared Early Environmental Coordination documentation as required by MassDOT for the project's 25% design and permitting pursuant to the Massachusetts Wetlands Protection Act (WPA).

Ashuwillticook Rail Trail Extension | Adams and North Adams, MA

Dan conducted environmental due diligence and documentation for a proposed extension of the Ashuwillticook Rail Trail in Adams and North Adams. He assisted with a multiple day wetland delineation effort which included various resources within the Hoosic River watershed. Dan also prepared Early Environmental Coordination documentation as required by MassDOT for the project's 25% design and Notice of Intent permit applications pursuant to the WPA in both communities.

Minuteman Bikeway Extension | Bedford, MA

VHB was retained by the Town of Bedford to design the proposed extension of the Minuteman Bikeway, which will make a 1,665-foot portion of Railroad Avenue accessible to bikes and provide 8,800 feet of bikeway along the existing Reformatory Branch Trail in Bedford. Dan was responsible for preparing environmental permitting applications pursuant to the Massachusetts Wetlands Protection Act and Federal Clean Water Act and preparing documentation for the Project pursuant to the National Environmental Policy Act (NEPA).

Norwottuck Rail Trail | Amherst and Belchertown, MA

Dan was the direct point of contact with MassDOT and was responsible for developing the scope of services for environmental due diligence along an approximately 1.5-mile section of the existing Norwottuck Rail Trail. He was responsible for leading wetland delineation efforts along the trail that will be critical to permitting and minimizing impacts during the design of the proposed rehabilitation of the trail.

Edgell Road at Central Street Intersection Improvements Project | Framingham, MA

VHB was retained by the City of Framingham and MassDOT to redesign the intersection of Edgell Road and Central Street in Framingham. Dan completed environmental documentation for the project's 25%/75% design submission, including Early Environmental Coordination, Wetland Delineation, and due diligence, as well as permitting pursuant to the WPA and coordination of review pursuant to the Massachusetts Environmental Policy Act (MEPA).

Daniel Cannata

MassDOT, Kelley Square Improvements Project | Worcester, MA

VHB was retained by the City of Worcester and MassDOT to redesign the Kelley Square intersection, which was known to have the highest rate of crashes in the Commonwealth. Dan completed environmental documentation for the project's 25%/75% design submission, including Early Environmental Coordination and due diligence as well as permitting pursuant to the Massachusetts Wetlands Protection Act.

MassDOT, MEPA/NEPA General Support | Boston, MA

Dan has provided on-call support statewide to MassDOT Environmental Service's MEPA/NEPA Unit for the past six years while serving as an extension of its staff. He has conducted reviews of project designs and permit applications and has helped perform early environmental coordination and due diligence and produce documentation pursuant to MEPA and NEPA.

Samantha Dolabany, ENV SP

Environmental

Education

MS, Earth Science, University of New Hampshire, 2014

BS, Environmental Sciences, University of Massachusetts Lowell, 2011

Samantha is a Senior Environmental Planner in VHB's Watertown, Massachusetts, office where she is working on Article 80, MEPA, and NEPA permitting for transportation, development, and water supply projects. Previously, she worked as an Environmental Analyst for the MassDOT Highway Division where she was responsible for reviewing roadway and bridge projects and ensuring compliance under NEPA and MEPA regulations. She also led a collection of climate change initiatives and worked on developing a resiliency screening and implementation strategy into asset management. Additionally, Samantha was responsible for reviewing shared use path projects and participated in a team to help simplify and identify key milestones for these projects. Samantha has experience working on complex projects requiring varying levels of Article 80, MEPA, and NEPA documentation.

11 years of professional experience

MassDOT Highway Division, MEPA/NEPA Support | Boston, MA

Samantha provides on-call support to the MassDOT Highway Division Environmental Department. This includes review and documentation of its projects statewide under MEPA and NEPA. Additionally, Samantha supports the MassDOT MEPA/NEPA Unit with understanding MEPA's environmental justice regulatory updates and implementing these changes into its review processes and documentation. She also is a member of a workstream team with the Environmental Department to identify and implement efficiencies that streamline current processes and ultimately facilitate improved MEPA and NEPA documentation.

Massachusetts Water Resources Authority (MWRA), Metropolitan Water Tunnel Program | MA

Samantha is assisting in the MEPA documentation to construct approximately 14 miles of two new water supply deep rock tunnels that will provide redundancy for MWRA's existing Metropolitan Tunnel System. She continues to closely collaborate with MWRA and various consultants through this complex project. She played an integral role in preparing and filing the Environmental Notification Form (ENF) and is now advancing the Draft Environmental Impact Report (DEIR).

Logan Airport, Environmental Data Reports (EDRs)/Environmental Status and Planning Reports (ESPRs) | Boston, MA

Samantha is the Project Manager for the 2020/2021 EDR, and previously served as the Deputy Project Manager for the 2017 ESPR and 2018/2019 EDR. These annual reports are filed with the MEPA Office and have facilitated the permitting and approval of the Logan Airport projects with their comprehensive reporting of air, noise, ground access and water quality conditions. These reports serve as effective tools for providing information to the surrounding impacted communities and allow for disclosure of project initiatives in a transparent manner.

MassDOT, MEPA Support/South Boston Bypass Road | Boston, MA

Samantha prepared the Request for Advisory Opinion (RAO) technical report for MassDOT's submission to the MEPA Office for the proposed 12-month South Boston Bypass Road (SBBR) and High Occupancy Vehicle (HOV) Pilot Re-Evaluation Program. This program proposed to allow unrestricted use of the SBBR and portions of the HOV system.

Samantha Dolabany, ENV SP

Seaport Circle | Boston, MA

Samantha is Project Manager for a planned 650,000-square-foot laboratory and office development in Boston's Seaport District. The developed is slated to be built on a 2.5-acre Massport-owned site on Congress Street known as Parcel H. The project has completed Boston Planning and Development Agency (BPDA) review and is currently within the three-step MEPA review process, with the DEIR underway.

401 Congress (Massport Parcel A2) | Boston, MA

This 18-story mixed-use development has two floors of publicly accessible space that connect the existing elevated viaduct of World Trade Center Avenue with Boston's Congress Street. Samantha supported the Principal-in-Charge in permitting services, including filings with the MEPA Office and the BPDA. VHB led the coordination and development of an Environmental Notification Form (ENF), Project Notification Form (PNF), and joint Draft Environmental Impact Report (DEIR)/Draft Project Impact Report (DPIR). VHB led the project team through a Final Environmental Impact Report (FEIR) and additional coordination with the BPDA.

MassDOT, Shared Use Path Planning and Design Guide | MA

Prior to joining VHB, while at MassDOT, Samantha assisted the Project Manager in the development of a shared use path planning and design guide. This guide is intended to help agencies, consultants, and municipalities plan and design a shared use path project. Samantha coordinated efforts between the working group and other agencies and ensured schedule deadlines were met. She presented this work at the Massachusetts Trails Conference and the 2018 New England Bike Walk Summit.

Education

BS, Building Surveying, Napier University (Scotland), 1997

Affiliations and Memberships

Massachusetts Association of Land Surveyors and Civil Engineers, Eastern Massachusetts, 1997

Craig Robertson

Survey Task Manager

Craig is a Senior Project Surveyor and Project Manager with VHB's Survey Group in the Watertown, Massachusetts, office. He has considerable experience in all types of land surveying, with responsibilities that include developing proposals, crew coordination, checking field notes and procedures, final plan checks, and budget analysis for a wide range of public- and private-sector clients. He has performed diverse survey tasks for numerous projects in the Greater Boston area for both public and private clients, many for institutional sites.

25 years of professional experience

Cape Cod Rail Trail Extension, Phase 3 | Barnstable and Yarmouth, MA

Craig is providing survey and right-of-way services for the final design submissions of Phase 3 of the CCRT extension, which will provide a critical connection in the overall path network by extending the trail to Mary Dunn Road in Hyannis. Following MassDOT ROW guideline requirements, Craig will help complete the 100% design submission and recordable easement plan development to the Towns of Barnstable and Yarmouth and MassDOT.

Bruce Freeman Rail Trail | Sudbury, MA

Craig is providing survey services for the 25% design of a full-length rail-trail project in Sudbury.

MIT, Roadway Mitigation | Cambridge, MA

VHB is providing survey, design, and engineering services for bicycle and intersection improvements on Ames Street between Main Street and Memorial Drive. In addition to the separated bicycle facility on Ames Street, VHB is responsible for developing bicycle and intersection improvements at the intersection of Main Street and Vassar Street. Construction on the project will begin in the spring of 2020 and will extend the existing raised cycle tracks on Vassar Street to the intersection of Main Street. As Survey Project Manager, Craig was responsible in performing survey to prepare an Existing Conditions Roadway Survey for the engineers to utilize.

Atlantic Wharf (formerly Russia Wharf) Redevelopment | Boston, MA

Craig surveyed sites of three historic buildings in the Fort Point Channel area that were to be developed into a mixed-use facility with 200 residential units, office space, and retail space. This project consisted of property line and existing conditions survey, American Land Title Association/American Congress on Surveying and Mapping (ALTA/ACSM) land title survey, as-built survey of the wharf, preparation of various property line and easement plans, and construction layout.

Boston Porous Alley Permeable Pavement Demonstration | Boston, MA

Craig provided survey services for the first ever "green alley" project completed by the City of Boston, which involved permeable pavement solution. The survey consisted of preparing an Existing Conditions Plan of the alleyway, which included property line determination, topography, and utilities lines within the limits of work.

Craig Robertson

Voke Lofts | Worcester, MA

Located in downtown Worcester, Voke Lofts transformed a deteriorated historic mill into a vibrant residential opportunity. Voke Lofts features 84 rental apartments, of which more than half are dedicated affordable units. The project re-established the connection to Gateway Park—a growing center of research, innovation, and commerce owned by Worcester Polytechnic Institute. VHB's efforts providing civil engineering, permitting, survey, landscape architecture, and environmental services helped to successfully complete this mill renovation. Craig performed survey services for this project.

Bullfinch Crossing Development, Greenline T Survey/One Congress Street | Boston, MA

Craig is part of a team providing engineering and permitting services for the multi-phased 2.3-million-square-foot mixed-use development at One Congress Street in downtown Boston. The 4.8-acre site, which consists of an underutilized 1960s urban renewal era above-grade concrete parking garage, will be redeveloped into a collection of vibrant, transit-oriented buildings with pedestrian-friendly streetscapes and a new public plaza set on two urban blocks.

Mary Ellen McCormack Redevelopment | South Boston, MA

VHB is providing services to support the redevelopment of the Mary Ellen McCormack (MEM) public housing community located on a 31-acre site in South Boston. The MEM project will replace the existing 1,016 residential units with a new 1.06-million-gross-square-foot mixed-income, mixed-use development within 18 buildings. The project is composed of 3,300 new residential units (affordable replacement units and new middle-income and market rate units), 70,000 sf of retail space, and 32,000 sf of community space. It will also include off-street parking, open space improvements, and new supporting infrastructure. The project has been designed to adapt to projected climate change impacts, including sea level rise and increased precipitation. VHB is overseeing the Boston Article 80, MEPA, and NEPA review processes, and is providing civil engineering services. Craig has been involved as part of the team providing survey services for this project.

Michael Currier

CAD TECHNICIAN

QUALIFICATIONS

- A.S. Computer Drafting and Design, ITT Technical Institute, Norwood, MA

TRAINING AND CERTIFICATIONS

- Ability to oversee and perform field work for ALTA surveys, Existing Conditions surveys Elevation Certificates, Certified Plot Plans, As-Builts, Property and Construction layouts, and Mortgage Inspections
- Residential Survey Project Manager
- Property research at Land Court, Registry of Deeds and Town Assessor's and Engineering Departments
- Proficient with a variety of survey instruments including total stations, data collectors GPS
- Proficient in AutoCAD, Civil 3D, Land Desktop, Carlson Civil and Survey Suites, Star*Net Least Squares, Photoshop, Adobe Acrobat, Revit and Microsoft Office Suite

PROFESSIONAL EXPERIENCE

Mr. Currier has 19 total years of land surveying experience with five years as a dedicated CAD specialist. He is experienced in project coordination, managing survey data, drafting plans according to client specifications, compiling subservice utilities based on record documents to show on plans and researching for property and utility records.

EXPERIENCE / PROJECTS

SUBCONTRACTOR / SURVEY TECHNICIAN | PLYMOUTH, MA. Residential Survey Drafter, Researcher, Data Manager and Project Manager for Spruhan Engineering, PC, Peter Nolan & Associates and Land Manage Systems, Inc. Oversaw data management and drafting for large commercial existing conditions site plan for the entire property of the Beth Israel Hospital, Plymouth for Gateway Survey Associates, LLC. Pricing and managing some of my own survey projects.

SURVEY TECHNICIAN | MIDDLEBORO, MA. Utilized Civil 3D 2016 to draft plans of land and calculate construction layout, utilized Star*Net to balance traverse using least squares adjustments, research for all necessary documents to perform land survey, helped develop company CAD and drawing standards with Alpha Survey Group, LLC.

SURVEY TECHNICIAN | BOSTON, MA. Utilized Carlson Civil/Survey 2015 to draft plans of land and calculate construction layout and also to balance traverse and adjust level elevations. Research for all necessary documents to perform a land survey, worked on field crews as needed, with Feldman Land Surveyors.

SURVEY TECHNICIAN / CREW CHIEF | BRIGHTON, MA. Managed residential survey projects, oversaw and performed all necessary field work to complete plans of land and construction layout, utilized Autodesk Land Desktop 2004 to draft plans of land and calculate construction layout, research for all necessary documents to perform a land survey, with Peter Nolan & Associates, LLC.

FIELD SURVEYOR / DATA TECHNICIAN | PLYMOUTH, MA. Field work for energy infrastructure surveys, occasionally as an entry level crew chief, downloaded and interpreted / edited raw survey data for large energy infrastructure projects, utilized Microsoft applications to organize and keep digital records of survey data, utilized AutoCAD for entry level drafting tasks with Coler and Colantonio, Inc.

FIELD SURVEYOR / INSTRUMENT OPERATOR | KINGSTON, MA. Independently performed field work for mortgage loan inspection plans with South Shore Survey Consultants.

FIELD SURVEYOR / RODMAN | PLYMOUTH, MA. Independently performed work on a survey field crew for A.R. Vannozzi & Associates with Allied Personnel Services, Inc.

RECENT PROJECTS

- **EXISTING CONDITIONS SURVEY | BOURNE, MA.** Train tracks from the Buzzards Bay Train Bridge to Monument Neck Road, prepared for VHB Engineering.

- **DEFORMATION MONITORING FOR JACKING AND UNDERPINNING | SOMERVILLE, MA.** McGrath Highway Bridge project.
- **SEWER AS-BUILTS | BARNSTABLE, MA.** Includes Kidd's Hill Road, Merchant's Way and Business Lane projects.
- **ALTA SURVEY | NORWOOD, MA.** Norwood Hospital project.
- **ALTA SURVEY | FALL RIVER, MA.** Atlantis Charter Middle School project.

- **ALTA/NSPS LAND TITLE SURVEY | GREATER BOSTON AREA, MA.** 37 parcels, prepared for EA Fish Development, and 1235-1237 V.F.W. Parkway & 165-175 Gardner Street, prepared for ND Oak Row, LLC.

EXISTING CONDITIONS SURVEY, MBTA BUS CORRIDER IMPROVEMENTS | BOSTON, MA. Park Drive and Brighton Avenue, Cambridge Street, Warren Street, and several streets in the Roslindale neighborhood of Boston prepared for McMahon Associates.

EXISTING CONDITIONS SURVEYs, MBTA BUS STOP IMPROVEMENTS | GREATER BOSTON, MA. Many bus stops in Boston and the Greater Boston area, prepared for McMahon Associates.

EXISTING CONDITIONS SURVEY | WAREHAM, MA. Wareham Waste Water Treatment Facility, prepared for GHD, Inc.

DRAINAGE SYSTEM MAPPING | MIDDLEBORO, MA. Municipal stormwater program 2022

LETTER OF MAP REVISION | FALMOUTH, MA. Composed a LOMR (Letter of Map Revision) at 26 Birch Lane, Falmouth, MA, based on FEMA specifications and topographic survey plan to prove that our client is above the base flood elevation and does not require flood insurance

EXISTING CONDITIONS SURVEY | MIDDLEBORO, MA. Existing conditions plan at Dunkin Donuts, prepared for Sardinha Family Trust

EXISTING CONDITIONS SURVEY | NORTH PROVIDENCE, RI. Existing conditions plan at Prima Care, 1040 Charles Street, prepared for ConServ

EXISTING CONDITIONS SURVEY | CENTERVILLE. Existing conditions plan for approximately 6 acres, located at 61 Old Stage Road

APPROVAL NOT REQUIRED AND LOT CONSOLIDATION PLANS | NORWOOD, MA. For Norwood Hospital

AS-BUILT PLAN | BARNSTABLE, MA. Drainage and new pavement as-built at the fire training academy located at 155 Flint Rock Road, prepared for BETA Group, LLC

SURVEYING AND DRAFTING

PREPARING SURVEY PLANS TO MASSDOT CAD STANDARDS. Prepared several existing conditions plans to MassDOT specifications, on a variety of projects including road improvements, proposed utility lines and railroads.

DRAFTING A VARIETY OF SURVEY PLANS. Drafted and prepared existing conditions plans, certified plot plans and ALTA plans for residential and commercial sites, based on client specifications, to the satisfaction of registered professional land surveyors.

3D MODELING TERRAIN SURFACES. Utilized survey software to generate 3D models of the topography of a site to provide surface files to the client and show topographic features on a plan.

DRAFTING CIVIL PLANS. Drafted civil design plans to the satisfaction of registered professional engineers.

COMPILING EXISTING PUBLIC UTILITIES. Utilized a combination of field data and public records to draft utilities to show on survey plans.

DRAFTING PROPERTY LINES. Compiled, calculated and drafted property lines to the satisfaction of registered professional land surveyors.

SURVEY DATA MANAGEMENT. Corresponded with field crews to bring survey data into a drawing, and made any necessary adjustments to ensure that the data is as accurate as possible. Tracked and organized data files and their file locations.

RESEARCH FOR PUBLIC RECORDS. Utilized online services and made the necessary phone calls and in person visits to obtain the necessary property and/or utility records to draft survey plans.

FIELD SURVEYOR. 14 years of experience working on field crews for various survey and construction projects, including five years of experience managing field projects.

Brandon Hood, S.I.T. #1145-EN-SI
SURVEY MANAGER

QUALIFICATIONS

- B.S. Business Administration/Marketing, University of Rhode Island, Kingston, RI

TRAINING AND CERTIFICATIONS

- Land Surveyor in Training MA #1145-EN-SI
- FAA Certified Drone Pilot Certificate – No. 4034011
- 3D Modelling Training, Eastpoint Lasers/Carlson Takeoff

PROFESSIONAL EXPERIENCE

Brandon Hood has 18 total years of land surveying experience with 10 years in responsible charge. He is experienced in project coordination, reporting data to senior level engineers, executing project plans and deadlines, and acting as a communications liaison between clients and town boards and commissions to effectively resolve issues. Currently, Brandon is licensed as a Land Surveyor in Training with the state of Massachusetts. He is currently working towards earning his Professional Land Surveyor's license. Brandon manages the day-to-day operations relating to the Survey Department at Green Seal Environmental, LLC. He is responsible for scheduling field-crews, data and drafting QA/QC, and acts as a reliable mentor to his colleagues within the department with regards to technical aspects of Land Surveying.

BOURNE RAIL WITH TRAIL & SHINING SEA BIKE PATH EXISTING CONDITIONS AND RIGHT-OF-WAY | BOURNE & FALMOUTH, MA. Managed survey field crews performing a route survey along the Mass Coastal Woods Hole line running from the Buzzards Bay Railroad Bridge to the Bourne and Falmouth town line. The project included two deliverables. First was an existing conditions plan of the right-of-way within the project limits. Second was a set of Preliminary Right-of-Way plans for submittal to MA DOT. Green Seal will be continuing work on Phase II.

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY BUS STOP IMPROVEMENT | BOSTON AND THE NORTH SHORE, MA. Provided field survey and base drawing preparation for improvements to bus-stop locations throughout the greater Boston and North Shore area. Considerations included, but were not limited to, extensive detail on handicap ramps for ADA compliance, above-ground utility location, 3D model creation, and Right-of-Way line determination.

WATER SEWER AND DRAINAGE REPLACEMENT PROJECT | BOURNE, MA. Provided field survey and base drawing preparation for replacement of the existing water main and sewer force main on Old Bridge Road from the intersection of Main Street to the Cape Cod Canal. A boundary and right-of-way component was included in the completion of this project.

TOWN OF MARSHFIELD EXISTING CONDITIONS SURVEY | WINSLOW STREET, MARSHFIELD, MA. Provided field survey and base drawing preparation for the construction of sidewalks along Winslow street from the Ocean street intersection to where Winslow becomes Standish street and ending at the Rexhame Beach parking area. A boundary and right-of-way component was included in the completion of this project.

BRISTOL COUNTY WATER AUTHORITY WATER MAIN REPLACEMENT | EAST PROVIDENCE, RI. Managed field crews charged with collecting survey data in East Providence, Rhode Island, for the purposes of redesigning and replacing aging sewer and water mains. Responsible for accurate data collection and organization for CAD Technicians to prepare existing conditions drawings for water main design.

MBTA EXISTING CONDITIONS SURVEY | VARIOUS SITES, MA. Provided field survey and base drawing preparation to be used for design improvements on various bus stop locations throughout Massachusetts. A boundary and right-of-way was included in the completion of several locations.

FIELD SURVEY OF RAILROAD PROPERTY BOUNDS AND RIGHT-OF-WAY | WAREHAM AND BOURNE, MA. Performed feasibility assessment to install a force-main running along the railroad from the Wareham Waste Water Treatment Facility down to the Cape Cod Canal for the Buzzards Bay Coalition. Project included researching right-of-way ownership and boundary lines, running survey crews in the field to locate monuments along the railroad right-of-way and surrounding properties, locating wetland flags, and detailing topographic features 200' to the North and 200' to the south of the Railroad Centerline.

MONPONSETT STORMWATER REMEDIATION | HALIFAX, MA. Managed field crews for operations on two sites along the shores of East Monponsett pond in Halifax in an effort to alleviate the nitrogen and phosphorous levels in the stormwater draining into the pond. Working in partnership with GHD, field crews were responsible to record accurate and appropriate data and convey to GHD design engineers.

TOWN OF ORLEANS DRAINAGE | ORLEANS, MA. Provided field survey and base drawing preparation for the improvement of drainage systems at several locations in the town of Orleans. A boundary and right-of-way component was included in the completion of this project.

WATER MAIN REPLACEMENT | MILTON, MA. Provided field survey and base drawing preparation in support of a new water main design servicing Adams Street from Granite Avenue to the Quincy Town line for the Town of Milton.

WASTE WATER TREATMENT FACILITY SURVEY | UXBRIDGE, MA. Provided field survey and base drawing preparation in the Town of Uxbridge at multiple sites related to an infrastructure upgrade at the Waste Water Treatment Facility. The project involved collecting accurate and intricate field data at the Town of Uxbridge DPW, a 1700' stretch of street layout on Douglas Street in Uxbridge, and ending at The Uxbridge Waste Water Treatment facility.

BOSTON WATER AND SEWER MAIN REPLACEMENT PROJECT, PHASE II | BOSTON, MA. Provided field survey and base drawing preparation in support of a water main replacement project in the city of Boston. Managed field crews charged with collecting survey data on 11 sites through Dorchester, South Boston, and The South End for the purposes of redesigning and replacing aging sewer and water mains. Responsible for accurate data collection and organization for CAD Technicians to prepare existing conditions drawings for water main design.

DPW MENAUHANT ROAD SEA WALL AND JETTY PROJECT | FALMOUTH, MA. Managed a survey crew in the field to collect data necessary for the town of Falmouth to reconstruct a sea wall on Menauhant Road along with three jetty's in the same area. The project involved calculations to find the location of Mean-Low-Water as it pertains to land ownership along the private beach. The drawing showed contours at 1-foot intervals, existing conditions, and spot grades; all of which on NAVD88. Deliverables for this project included Existing Conditions Plans on MA State Plane Coordinate system.

BOSTON WATER AND SEWER WATER MAIN IMPROVEMENTS, PHASE I | BOSTON, MA. Provided field survey and base drawing preparation in support of a water main replacement project in the city of Boston. Managed a survey field crew to collect necessary data for the BETA Group to make design improvements to the Boston City water mains in several areas in Brighton. These detailed surveys included locations of underground utilities, topographic cross-sections on roadways, existing sewer rim elevations and inverts; all of which were delivered on the MA State Plane Coordinate system and on NAVD88.

CASELLA WASTE MANAGEMENT | SOUTHBRIDGE, MA. Monitored airspace at the Southbridge landfill with bi-weekly aerial surveys. Supplemental ground survey work was done to cross check data generated by aerial means.

MONTAGUE ROAD, AMHERST, ALTA/NSPS TITLE INSURANCE SURVEY | AMHERST, MA. Provided an existing conditions plan with topographical features as well as a completed boundary component to assist and the design of a solar field. Advanced the existing conditions plan to an ALTA plan to facilitate the sale of the property.

BURNETT STREET CONDOMINIUMS | BOSTON, MA. Provided construction support for layout of column lines to erect a steel framed structure. Working in tandem with the Construction Supervisor, Mr. Hood's survey crew accurately laid out the location of column line intersections using baseline methods.

NEW BEDFORD HARBOR CLEANUP, JACOBS ENGINEERING | NEW BEDFORD & ACUSHNET, MA. Performed an aerial survey with supplement ground survey to support in the remediation of pollution in specific areas along the shores of New Bedford Harbor. Jacobs Engineering provided bathymetric data that went beyond mean low water; the data was blended with topographic spot elevations record by reflectorless total station as well as point cloud data collected by aerial means.

Richard J. Hood, P.L.S. #35031

Professional Land Surveyor

EDUCATION

- B.A. Roanoke College, VA
- Civil & Map Drafting and Surveying, Albuquerque Technical Vocational Institute, NM

TRAINING AND CERTIFICATIONS

- Professional Land Surveyor, #35031
- NSPS, National Society of Professional Surveyors

PROFESSIONAL EXPERIENCE

Mr. Hood is responsible for managing all survey activities for company projects from project inception through the completion of construction. He is responsible for scheduling staff, preparing proposals and budgeting, client interaction, and construction phase oversight.

With over 40 years in the profession, Mr. Hood has considerable experience in land development projects, including roadway and site design, residential subdivisions, municipal, commercial, and coastal development site plans. In addition, he has had personal responsibility for a myriad of boundary surveys for title insurance (ALTA/NSPS), property line disputes, and cadastral surveys. Mr. Hood's technical proficiency with computer applications enables McKenzie Engineering Group to provide more efficient surveys with a quicker turn-around time resulting in cost-saving measures for our clients.

Prior to joining Green Seal Environmental, LLC, Mr. Hood was President of Hood Survey Group, LLC, where he had overall responsibility for all operations, including project management, computer network administration, and staff training and development. He now brings his vast experience and expertise to the MEG team, which offers complete land surveying, civil engineering, land planning, and permitting services.

Responsible for all survey activities on all company projects from the bid stage though final completion. Responsible for Scheduling, Proposals, Project Timelines and Project costs, Budgets, Closeouts, Client interaction, Construction oversight, Overseeing of Plan preparation of Definitive Subdivision plans, Large Scale Mapping with the use of GPS, Town GIS Systems, Existing Condition Plans, Site Plans, Easement and Right of Way Plans, Alta Surveys, Boundary Surveys, Domestic Property Line Surveys, Domestic Property Line Surveys, Construction Layout, As Built.

Other Responsibilities include:

- Primary responsibility is to manage all of the surveying activities.
- Oversight of all survey crews of their daily routines.
- Perform Title research at the various County Registry websites. Compile data to facilitate operations for field personnel.
- Review fieldwork and perform calculations.
- Review all plans comprising property line information prior to publication.

RELEVANT PROJECTS

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MHD) | BOSTON, MA. Developed and approved state highway takings, layouts, and easement plans associated with the Central Artery/Third Harbor tunnel.

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY BUS STOP IMPROVEMENT | BOSTON AND THE NORTH SHORE, MA. Provided field survey and base drawing preparation for improvements to bus-stop locations throughout the greater Boston and North Shore area. Considerations included, but were not limited to, extensive detail on handicap ramps for ADA compliance, above-ground utility location, 3D model creation, and Right-of-Way line determination.

David Tannen Tripp

CONSTRUCTION SUPERVISOR/CREW CHIEF

QUALIFICATIONS	Upper Cape Vocational Technical School, Bourne, MA
TRAINING AND CERTIFICATIONS	Construction Supervisor – MA License #075469 Home Improvement Contractor – MA License #183476 OSHA 40-hour HAZWOPER Mass Coastal RR 2019 RWP Training Certificate

With over 30 years of progressive experience in construction services, Mr. Tripp has extensive knowledge of every facet of the residential and commercial construction industry. As a contractor, he is proficient in site work, concrete, carpentry, construction layout, energy efficiency, land surveying and has general knowledge in electrical, plumbing and HVAC. As a construction supervisor, Mr. Tripp is experienced in sales, cost estimating, permitting, construction and design, job safety, working effectively with subcontractors and meeting time-sensitive build schedules.

PROFESSIONAL EXPERIENCE

LASER SCANNNING

Coordinating schedule with the facilities director, office managers, environmental services and security personnel to assure tasks are completed in the most efficient and least disruptive manner as possible. Perform a comprehensive laser scan of the interior and exterior of the facilities using the Leica RTC360 laser scanner, BLK2GO handheld scanner and the Cyclone Field 360 software. Upload and process the data using Cyclone Register 360 software. Apply survey control to data and publish to desired file type.

LASER SCANNING PROJECTS

- Glenwood Medical Mall | West Monroe, LA - 200,00 sq. ft. single-story building
- St. Joseph's Medical Center | Houston, TX - Campus consisted of six buildings with over 1.25 million sq. ft.
- Norwood Hospital | Norwood, MA - 370,000 sq. ft. four-story building
- St. Anne's Hospital | Fall River, MA - 315,000 sq. ft.
- Rockledge Regional Medical Center | Rockledge, FL - 240,000 sq. ft.
- Rhinehart Railroad Construction | Hyannis, MA - Pre-construction scan to produce an E57 file

SURVEY

Topographic, aerial, boundary, existing conditions, as built, deformation monitoring, bathometric and construction layout surveys. Access Registry of Deeds to search for property deeds, titles, plans and easements. Perform calculations from record data to perform field work. Q/C field data using Carlson Survey 2020 field to finish.

SURVEY PROJECTS

DEFORMATION MONITORING, BARLETTA | SOMERVILLE, MA. Perform a weekly deformation monitoring survey on a compromised elevated highway.

MBTA BUS STOP IMPROVEMENTS, **MCMAHON AND ASSOCIATES | VARIOUS CITIES, MA.** Perform an existing conditions survey on multiple MBTA bus stops from Salem to Rockland. These detailed surveys included locations of underground utilities, topographic cross-sections on roadways, existing sewer rim elevations and inverts; all of which were delivered on the MA State Plane Coordinate system and on NAVD88.

SOLID WASTE TRANSFER FACILITY | LEOMINSTER, MA. Responsible for laying out building and rail locations and elevations for the construction of a new 10,000 sq. ft. C& D transfer facility with rail access. Site visits to Q C contractor progress during key phases of construction. This project was all designed and engineered using the older DATUM of NGVD29.

MASSDOT RAIL DIVISION PROJECT, FOXBORO FREIGHT SIDING TRACK, BRIDGE AT MP 5.19 AND CRASH WALL AT MP 5.29 PROJECT, **MAS BUILDING AND BRIDGE, INC.** Performed pre-construction existing conditions survey, provided and maintained control and stationing throughout construction, provided construction layout for bridge and crash wall and performed a post construction as built survey.

MASSDOT RAIL DIVISION PROJECT | HYANNIS YARD, STORAGE AND INTERIM TRACK CONSTRUCTION PROJECT. RHINEHART RAILROAD CONSTRUCTION **|** Performed pre-construction existing conditions survey, provided and maintained survey control throughout construction and performed a post construction as built survey.

MASSDOT RAIL DIVISION PROJECT | FRAMINGHAM SECONDARY & MIDDLEBORO SUBDIVISION GRADE CROSSING REHABILITATION PROJECT in the towns of Foxborough , Medfield, Sherborn, Taunton and South Walpole, MA RHINEHART RAILROAD CONSTRUCTION **|** Performed pre-construction existing conditions survey, provided and maintained survey control throughout construction and performed post construction as built survey.

New Bedford Harbor Superfund Site (NBHSS) | New Bedford, MA Topographic survey with drone produced photogrammetry performed for Jacobs Engineering to aid in the U.S. Army Corps of Engineers New England District (USACE NAE) effort to provide environmental remediation and restoration. The USACE was requested by the US Environmental Protection Agency (EPA) to clean up PCB-contaminated sediments from the harbor.

New Bedford State Pier | New Bedford, MA Establish control and perform pre and post construction survey for the northeast corner of the pier. The scope included a new concrete relieving platform, new bearing piles, a new pier deck and a new fender system.

JOINT BASE CAPE COD | BOURNE, MA Performed field work for several different companies at the JBCC, a joint-use base home to five military commands located on Cape Cod.

WATER/SEWER

BRISTOL COUNTY WATER AUTHORITY | EAST PROVIDENCE, RI. Field Technician responsible for collecting data necessary for BETA Group to design improvements to the Bristol County water infrastructure. These detailed surveys included locations of underground utilities, topographic cross-sections on roadways, existing sewer rim elevations and inverts; all of which were delivered on the RI State Plane Coordinate system and on NAVD88.

MASSACHUSETTS WATER RESOURCES AUTHORITY | DEDHAM, MA. Field Technician tasked with setting layout points along the route and collect as built data on the Southern Extra High Pipeline for P. Gioso & Son. Five communities in the southern portion of the service area, including Dedham, are served by a single water transmission main that was installed in the 1950s. This project will provide a second water transmission main, 36" in diameter, to ensure service would not be interrupted if the older main were to fail.

TOWN OF WAREHAM | WAREHAM, MA. Responsible for the daily oversight of construction activities and documentation all related testing work including review of pre/post-cleaning and post-construction video data. The wastewater design and construction project consisted of cleaning and relining with cured in place pipe (CIPP), approximately 1,568 feet of 8-inch asbestos cement (AC) gravity sanitary sewer at Swifts Beach and 315 feet of 21-inch reinforced concrete (RCP) gravity sanitary sewer at Viking Drive.

BOSTON WATER AND SEWER WATER MAIN IMPROVEMENTS | BOSTON MA. Field Technician responsible for collecting data necessary for BETA Group to design improvements to the Boston City water mains in several areas. These detailed surveys included locations of underground utilities, topographic cross-sections on roadways, existing sewer rim elevations and inverts; all of which were delivered on the MA State Plane Coordinate system and on NAVD88.

WASTE WATER TREATMENT FACILITY SURVEY | UXBRIDGE, MA. Field Technician responsible for collecting data in the Town of Uxbridge at 3 sites relating to an infrastructure upgrade at the Waste Water Treatment Facility. The project involved collecting accurate and intricate field data at the Town of Uxbridge DPW, a 1700’ stretch of street layout on Douglas Street in Uxbridge, and ending at The Uxbridge Waste Water Treatment facility.

TOWN OF ORLEANS | ORLEANS, MA. Performed field work to produce Existing Conditions used for Stormwater mapping for the Town of Orleans.

SURFACE / SUBSURFACE GROUNDWATER SAMPLING

MASSACHUSETTS WATER RESOURCES AUTHORITY | QUINCY, MA. Field Technician in charge of monthly gauging at 38 monitoring wells covering a plume from a leaking underground storage tank on the adjacent property and biannual low flow sampling of 9 of the wells. Prepare tables summarizing the monthly depth to product and depth to water, as well as tables summarizing low-flow sampling parameters.

ADDITIONAL SITES INCLUDE:

- Tunnel Hill – Brockton, MA
- Massachusetts Water Resources Authority - Quincy, MA
- Stoughton Landfill – Stoughton, MA
- Private Client – Nantucket, MA
- Robert Childs – Dennis, MA
- Robert B. Our, Inc. – Dennis, MA
- Town of Acton Landfill
- City of Newton Landfill

CONSTRUCTION

- Naval Station Newport – Newport, RI
- Paine's Patio Showroom – Bourne, MA
- Penikese Island School- Woods Hole, MA
- Plymouth Community Development Housing Rehab Program – Plymouth, MA
- Multiple custom residential homes across SE Massachusetts

SOLID WASTE FACILITY INTAKE AUDITS

Connecticut Department of Energy and Environmental Protection

EQUIPMENT

Leica RTC360 Laser Scanner, BLK2GO handheld scanner, Leica Robotic TS-13, Javad Triumph-LS, Leica RTK, Drone

COMPUTER

Cyclone Register 360, RECAP, MassGIS, Adobe, Office, Carlson Civil, Google Earth Pro, AutoCad, Drone Deploy, Corpscon, Dropbox, Outlook. Download and install firmware updates for data collectors, scanning software and RTK's.

4

Relevant Project Experience

Client satisfaction is at the forefront of any project the VHB Team takes on, and we pride ourselves on the strong connections developed with our clients. We have worked in more than 280 Massachusetts communities as well as with numerous state agencies over the past 40-plus years. The VHB Team has a longstanding relationship with the Town of Barnstable, and is pleased to be one of the select consultants with pedestrian/bike path experience on Cape Cod. Working alongside our clients and relevant stakeholders provides us with the opportunity to assist in preservation and enhancement of our communities so that they continue to be places where people from diverse backgrounds can and want to live, work, and play. Please see the following pages for our team's most relevant projects.

Final Design of the Westerly Extension of the Cape Cod Rail Trail—Phases 1, 2, and 3

Barnstable, Dennis, and Yarmouth, Massachusetts

Clients

Towns of Barnstable, Dennis, and Yarmouth, MassDOT, and MA DCR

Schedule

Started: 2009

Status: Ongoing

MassDOT, the Massachusetts Department of Conservation and Recreation (DCR), and the towns of Barnstable, Yarmouth, and Dennis are planning an eight-mile extension to the Cape Cod Rail Trail (CCRT) from the trail head located at the intersection of Route 134 in the Town of Dennis through Dennis, Yarmouth, and into Barnstable, where future phases are planned to further extend the CCRT through Barnstable and into Sandwich. The existing CCRT extends approximately 22 miles from Dennis, through the towns of Harwich, Brewster, Orleans, Eastham, and Wellfleet, ending in South Wellfleet.

The towns of Dennis, Yarmouth, and Barnstable selected VHB to provide design services for the extension of this multi-use path, and to design four bridges for the project—at Route 134 in Dennis, at Station Avenue in Yarmouth, at the Bass River crossing, and at Willow Street in Yarmouth. VHB is also performing right-of-way services, environmental permitting, drainage design, and construction phase services.

Construction for Phase 1 was completed in the fall of 2017. Phase 2 was completed in the fall of 2018. Phase 3 is under design development with an anticipated construction advertisement date in 2025. Following the construction of each phase, the DCR will be entering into an agreement with MassDOT and the respective towns to take over the post-construction operations and maintenance of the multi-use rail trail.

Service Road Shared Use Path

Sandwich, Massachusetts

Clients

Town of Sandwich and MassDOT

Schedule

Started: August 2016

Status: Ongoing

MassDOT and the Town of Sandwich are planning the construction of a new four-mile-long shared use path along Service Road from Robin Road to Chase Road. The path will be part of the future spine of the CCRT, which has a goal of one day providing a continuous trail from Provincetown to the Cape Cod Canal. The construction of the path will serve as a destination for the alignment of Phase 4 of the CCRT Extension through Barnstable. The existing Cape Cod Rail Trail extends approximately 22 miles from Dennis, through the towns of Harwich, Brewster, Orleans, Eastham, and Wellfleet, ending in South Wellfleet.

The Town of Sandwich selected VHB to provide design services for this multiuse path and to design roadway crossing treatments for the path and a spur path to a new parking lot along Round Hill Road. VHB is also performing right-of-way services, environmental permitting, drainage design, and construction phase services.

Construction will begin in the winter of 2022/2023. Following the construction of the path, the Town will seek to enter into an agreement with DCR to take over the post-construction operations and maintenance of the path.

Bourne & Falmouth—Rail with Trail

Bourne and Falmouth, Massachusetts

Clients

Town of Bourne, Town of Falmouth, and MassDOT

Schedule

Started: April 2019

Status: Ongoing

The Shining Sea Bikeway in Falmouth is a former NYNH&H Railroad corridor converted to a paved shared use path. The original bikeway, built in the 1980's, was one of the first rail trails in the US, but ran only 3 miles from downtown Falmouth to Woods Hole. In 2009, the Town retained VHB to design an 8 mile extension to North Falmouth ending at County Road.

The Bourne and Falmouth Rail with Trail project is an effort to connect the Shining Sea Bikeway to the Cape Cod Canal Bikeway in the Town of Bourne. The project will create an additional 6.5 miles of SUP from the north terminus of the Shining Sea Bikeway in Falmouth at County Road to the Cape Cod Canal Bikeway. MassDOT and the two Towns are planning the construction of the shared use path along the railroad right-of-way.

The project is divided into 4 phases and VHB is currently assisting the Towns with 75% development on Phase 1, pre-25% development on Phase 2 and pre-25% development on Phase 4 (Bourne and Falmouth joint phase).

The Towns of Bourne and Falmouth selected VHB to provide design services for this shared use path including layout of the horizontal and vertical geometry considering the active railroad to remain, boardwalk and structural design to support the path construction and to design roadway crossing treatments for the path. The path geometry and roadway crossing treatments involve coordination with MassDOT Rail Division in order for the path project to sync with ongoing or planned upgrades to the railroad crossing system infrastructure. VHB is also performing right-of-way services, environmental permitting, and drainage design.

GSE Projects

Sandwich High School—Existing Conditions Survey

Sandwich, Massachusetts | 2019

GSE teamed with VHB to provide an existing conditions survey base plan for the design and reconstruction of the Sandwich High School parking lot.

Bourne and Falmouth Rail with Trail—Phases 1, 2, and 4

Bourne and Falmouth, Massachusetts

Green Seal Environmental teamed with VHB to provide existing conditions survey and right-of-way for phases I, II, and IV of the Bourne Rail Trail.

Phase 1 | 2019

GSE provided full existing conditions and railroad right-of-way from the Cape Cod Canal Railroad Bridge to Presidents Road, a length of 2,800 linear feet.

Phase 2 | 2020

GSE provided existing conditions survey in connection with the design of Phase II of the Bourne Rail Trail in Bourne. The limit of work for Phase II included right-of-way from Presidents Road to Valley Bars Road, at Monks Park, a length of approximately 11,000 linear feet.

Phase 4 | 2021

GSE prepared a base plan that entailed the ground survey of approximately 6,980 linear feet of railroad within and adjacent to the track and right-of-way of the Falmouth Secondary Line between Scraggy Neck Road in the Village of Cataumet (Bourne) and County Road in Falmouth. The survey within the MassDOT ROW consisted of a full topographic survey to locate railroad tracks, top of rails, switches, guardrails, and cross sections every 50-feet; ROW boundary survey; and utility structure survey and investigation.

Shining Sea Bikeway Extension Phase III

Falmouth, Massachusetts

Client

Town of Falmouth

Schedule

Started: October 2003

Completed: June 2009

The Shining Sea Bikeway extension from Carlson Lane to County Road in North Falmouth extends the current trail an additional 6.5 miles through some of the most environmentally sensitive areas on Cape Cod. This additional section of bikeway will provide connectivity between County Road in North Falmouth and the Ferry Terminal in Woods Hole, an overall distance of approximately 10 miles. The bikeway follows the abandoned Old Colony railroad line and traverses the Great Sippewisset and Little Sippewisset Marshes, providing views of Buzzards Bay.

VHB provided the Town of Falmouth civil engineering support to design the bikeway's vertical and horizontal geometry, modifications to drainage, bikeway intersections with local streets, landscaping, and bikeway amenities. VHB designed structural modifications to a small bridge that traverses an open four-foot-wide waterway connecting cranberry bogs adjacent to each side of the proposed path, along with numerous retaining walls along the bikeway alignment. VHB also provided environmental consultation and coordination with the Falmouth Conservation Commission and the Massachusetts Division of Fisheries and Wildlife, as the project necessitated the filing of a Notice of Intent and the relocation of a rare plant species and protection for the endangered Eastern Box Turtle.

VHB also assisted the Town and MassHighway with community outreach efforts in the form of several meetings with the general public, concerned citizens, the Falmouth bikeway committee, and Town and state officials to help bring this project to a successful completion.

Designing and Planning Segment 1 of the Blackstone River Greenway

Blackstone, Millville, and Uxbridge, Massachusetts

Client

DCR

Schedule

Started: June 2010

Completed: January 2016

Segment 1 of the Blackstone River Greenway is a complex section of abandoned railway that DCR transformed into a vibrant bikeway for recreation and transportation. The 4.15-mile multiuse trail runs from St. Paul Street in Blackstone to Route 146A in Uxbridge. The Greenway is a paved recreational trail along a former rail line, the Southern New England Trunk Trail (SNETT), and travels through a mix of downtown areas and natural settings, including 11 bridges and several trailhead/parking areas. Several bridges are on the National Historic Register. The design of the Greenway takes advantage of existing features, such as natural views, historic locations, railroad infrastructure, and notable town buildings and destinations.

To achieve its goals, DCR chose a team led by VHB to create a design that maximizes available funding and focuses on constructability. This team provided survey, trail design and engineering, structural design, historic interpretation, and environmental permitting services. The team also coordinated with the Piedmont and Western Railroad (P&WRR) for trail construction along an active rail line.

Design, permitting, and right-of-way efforts were completed in two years. Three construction contracts were issued for historic bridge rehabilitation, trail construction, landscaping, and interpretive signing. Ultimately, the Blackstone River Bikeway/Greenway will extend 48 miles between Providence and Worcester, linking many of the significant historic features of the Blackstone River Valley National Heritage Corridor.

Greenough Boulevard Greenway Expansion

Cambridge, Massachusetts

Clients

The Lawrence and Lillian Solomon Foundation, DCR

Schedule

Started: October 2013

Completed: October 2015

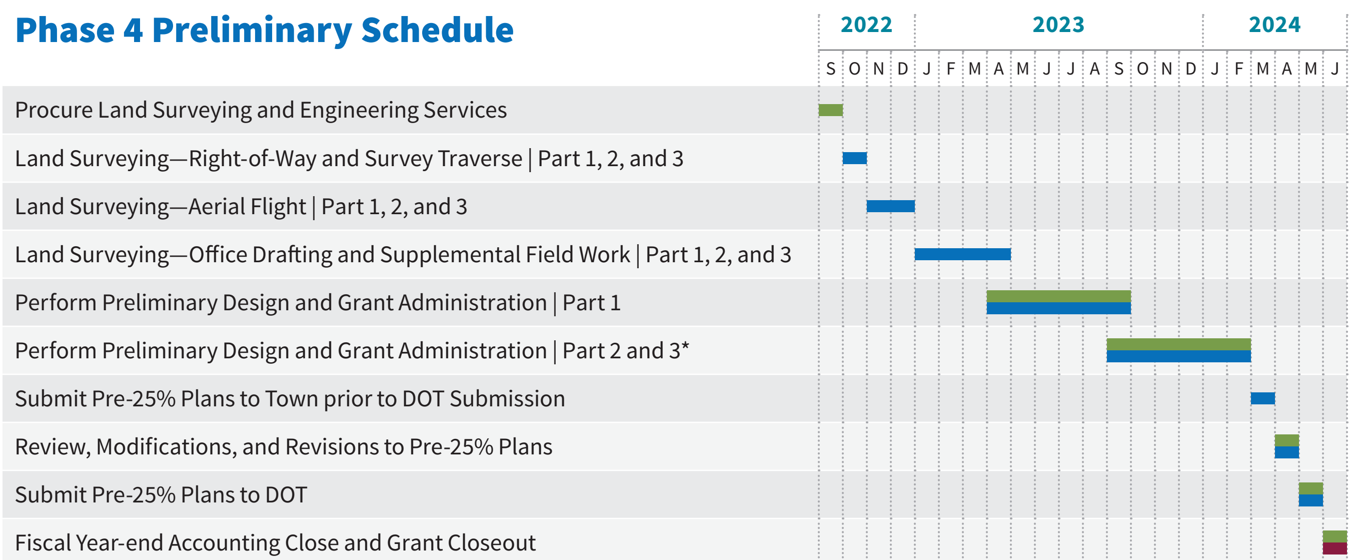
Through a $1.4 million public/private partnership, DCR and The Lawrence and Lillian Solomon Foundation collaborated to reconfigure and right-size Greenough Boulevard to create a more balanced and appealing greenway corridor. To help realize this vision, The Solomon Foundation engaged VHB to provide planning, engineering, environmental permitting, and construction phase services in support of reducing the roadway footprint and expanding the shared use path to a consistent 10-foot width. VHB accomplished the roadway right-sizing through a reduction of the previous four-lane roadway cross-section to a single travel lane in each direction with five-foot bicycle shoulders in each direction. The recaptured roadway footprint was reallocated to help support a wider 10-foot shared use path along with supporting the stormwater drainage needs. Through this process VHB collaborated with the City of Cambridge and the Watertown Conservation Commission to identify an appropriate open stormwater mitigation system. As part of the project design, the Grove Street pedestrian crossing was also updated to meet current Americans with Disabilities Act (ADA) standards. Other design elements included pavement markings and landscaping designed to make Greenough Boulevard a more inviting multimodal experience.

5

Pricing Proposal and Schedule

In accordance with the RFQ, VHB's lump sum pricing proposal broken down by tasks/milestone schedule is on the following page. The following preliminary project schedule will achieve 60% grant expenditure by June 30, 2023 with the completion of the survey expected in April 2023. 100% grant expenditure is projected to be achieved prior to June 30, 2024.

Phase 4 Preliminary Schedule



* **Note:** this timeline assumes a February 2023 MassTrails Grant application is successful or other funding source is identified to provide the remainder of services on Part 2 and 3 which are not covered by the $500,000 grant

Town
Consultant
MassTrails

Lump Sum Pricing Proposal

Task Description	PIC	PM	SE	ENG	AE	ET	Hours	Fee
Project Development Engineering	-	-	-	-	-	-	-	-
Environmental	-	-	52	-	64	-	116	$15,800
Functional Design Report	-	-	-	-	-	-	-	-
Design Justification Workbook	-	-	-	-	-	-	-	-
Pre-25% Highway Design	20	12	175	274	419	68	968	$128,400
Design Public Hearing	-	-	-	-	-	-	-	-
75% Highway Design Submission	-	-	-	-	-	-	-	-
100% Highway Design Submission	-	-	-	-	-	-	-	-
Right-of-Way	-	-	-	-	-	-	-	-
Geotechnical Design	-	-	-	-	-	-	-	-
Project Development—Structural	-	-	-	-	-	-	-	-
Sketch Plans	-	-	-	-	-	-	-	-
Final Bridge Design	-	-	-	-	-	-	-	-
PS&E Submission	-	-	-	-	-	-	-	-
Construction Engineering	-	-	-	-	-	-	-	-
Total Hours	**20**	**12**	**227**	**274**	**483**	**68**	**1084**	

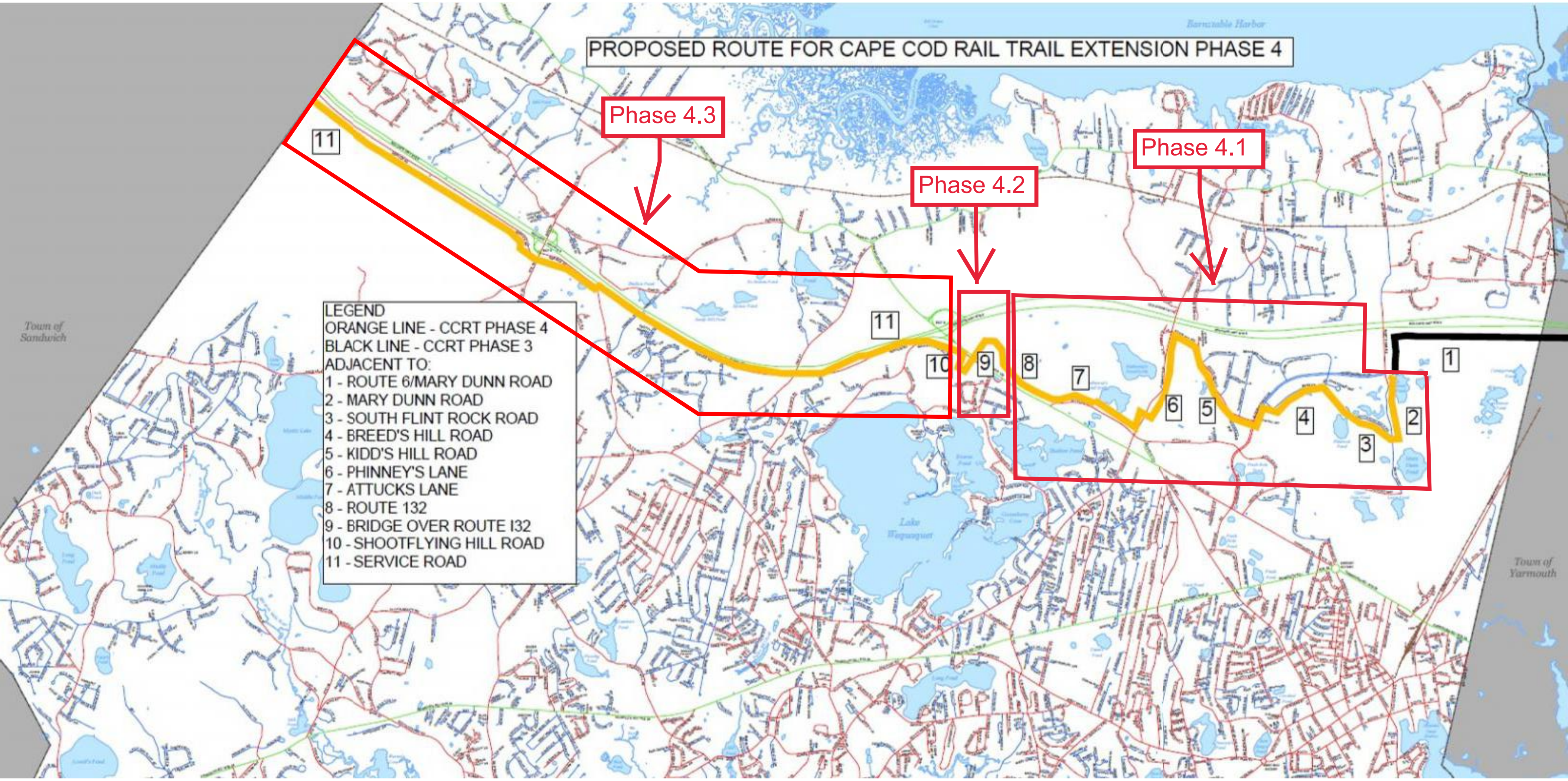
Total Labor Fee	$144,200
Green Seal Environmental Survey Base Mapping	$353,800
Direct Expenses	$2,000
Project Total	**$500,000**

Lump Sum Supplemental Scope Pricing Proposal

Task Description	PIC	PM	SE	ENG	AE	ET	Hours	Fee
Pre-25% Highway Design	74	56	272	530	637	168	1737	$238,000
Total Hours	**74**	**56**	**272**	**530**	**637**	**168**	**1737**	

Total Labor Fee	$238,000
Direct Expenses	$1,000
Project Total	$239,000

www.vhb.com


PROPOSED ROUTE FOR CAPE COD RAIL TRAIL EXTENSION PHASE 4
Phase 4.3
Phase 4.2
Phase 4.1
LEGEND
ORANGE LINE - CCRT PHASE 4
BLACK LINE - CCRT PHASE 3
ADJACENT TO:
1 - ROUTE 6/MARY DUNN ROAD
2 - MARY DUNN ROAD
3 - SOUTH FLINT ROCK ROAD
4 - BREED'S HILL ROAD
5 - KIDD'S HILL ROAD
6 - PHINNEY'S LANE
7 - ATTUCKS LANE
8 - ROUTE 132
9 - BRIDGE OVER ROUTE I32
10 - SHOOTFLYING HILL ROAD
11 - SERVICE ROAD
Town of Sandwich
Town of Yarmouth
Barnstable Harbor
Lake Wequaquet

The Town of Barnstable

Department of Public Works

382 Falmouth Road, Hyannis, MA 02601
508.790.6400

Daniel W. Santos, P.E.
Director

Robert R. Steen, P.E.
Assistant Director

January 17, 2023

Mr. Lindsey Counsell, Chair
Town of Barnstable Community Preservation Committee
367 Main Street
Hyannis, MA 02601

RE: Application for Funding for the Cape Cod Rail Trail Phase 3 Project

Dear Mr. Counsell:

On behalf of the Town of Barnstable Department of Public Works, we respectfully submit the enclosed application for funding design services for the Cape Cod Rail Trail Phase 3 project.

When constructed, this project will extend the Cape Cod Rail Trail westward approximately four miles, from Old Town House Road in Yarmouth to Mary Dunn Road in Barnstable. The funds requested in the attached application will apply only to the Town of Barnstable's share of the project.

This project is essential to the state and regional vision of a continuous shared use path from the Cape Cod Canal to Provincetown. The trail will also serve local needs for commuting, recreation, and tourism.

While this project has progressed to the 100% design phase (in-progress), additional funding is urgently needed to complete the remaining design, permitting, bid phase, and construction phase engineering tasks. The project budgeted on the state's Transportation Improvement Projects (TIP) list for construction in 2024-2026. Therefore, is critical for the Town to fund the remaining scope of services as soon as possible in order to keep the project on track.

Thank you for your consideration in this matter.

Sincerely,

Paul Graves

Paul Graves, P.E.
Senior Project Manager

Encl: CPC Application

CPC APPLICATION (Page 1)

Appropriated CPA funds require one or more deed restrictions (conservation / historic preservation / housing). Sample restrictions are available at the Official Website of the Town of Barnstable www.town.barnstable.ma.us. If the restriction is prepared by the applicant, the first draft of the restriction should be provided to the CPC Coordinator. If the applicant is not preparing the restriction, a consultant will contact the applicant to assist in the drafting of the appropriate restriction after funds are appropriated. The Town of Barnstable Legal Department and Legal Consultant shall review and approve the restriction prior to the final commitment of the CPA funds to the project.

Submission Date: 1/17/2023

Project Title: Cape Cod Rail Trail Phase 3

Project Map/Parcel Number: 333010, 347002001, 348016, 348036

Estimated Start Date: February 2024 (construction start)

Estimated Completion Date: February 2026 (construction completion)

Purpose (please circle all that apply):

Open Space	Public
Community Housing	Private
Historic	Non-Profit
Recreation	Partnership (Describe below #3)
Town Affiliation**	

****Please note: All Town CPC Applications must be approved by the Town Manager prior to submission.**

Applicant Contact:

Name: Paul Graves, P.E.

Organization (if applicable): Town of Barnstable Department of Public Works

Address: 382 Falmouth Road, Hyannis, MA 02601

Mailing Address: same

Daytime Phone #: 774-487-0641

E-mail Address: paul.graves@town.barnstable.ma.us

Primary Contact (if different from applicant contact):

Name:

Address:

Mailing Address:

Daytime Phone #:

E-mail Address:

CPC APPLICATION (page 2)

Appropriated CPA funds require one or more deed restrictions (conservation / historic preservation / housing). Sample restrictions are available at the Official Website of the Town of Barnstable www.town.barnstable.ma.us. If the restriction is prepared by the applicant, the first draft of the restriction should be provided to the CPC Coordinator. If the applicant is not preparing the restriction, a consultant will contact the applicant to assist in the drafting of the appropriate restriction after funds are appropriated. The Town of Barnstable Legal Department and Legal Consultant shall review and approve the restriction prior to the final commitment of the CPA funds to the project.

Budget Summary:

Total budget for project**: Approx. $13 million**

CPA funding request**: $195,000**

Matching funds (committed/under consideration): **$12,259,819 committed by MassDOT for construction in Barnstable and Yarmouth**

Please address the following questions:

1. Project summary (description and goals): **Design, permitting, bid phase, and construction phase engineering for a proposed new 12-foot wide shared use path from the Barnstable/Yarmouth town line, through the Hyannis Ponds Wildlife Management Area, to Mary Dunn Road near Israel Pond.**

2. How does this project help preserve Barnstable's character? **The Town of Barnstable's 2018 Open Space and Recreation Plan includes the following descriptions about the Town's character in the context of recreation (edited for brevity):**

- **Barnstable is geographically the largest town on Cape Cod and also the most populous community on Cape Cod.**
- **Barnstable includes seven villages, each having a dynamic history of development and a unique village character.**
- **Barnstable serves as the commercial, transportation, cultural, social service, and health care center of Cape Cod.**
- **The Town has taken a leadership role in addressing many growth management issues, including the protection of open space and the provision of recreational facilities.**
- **For open space and recreation planning, the age distribution suggests that Barnstable needs to provide a broad mix of active and passive recreation opportunities, and should gear facilities and programs to meet the needs of young families as well as retired adults.**
- **Barnstable also has significant populations with special socioeconomic needs that should be considered in setting priorities and allocating resources for open space and recreation facilities and programs.**

This project will help to preserve the Town's character by providing safe and enjoyable non-motorized transportation and recreation opportunities, for residents and visitors, providing access to all that Barnstable has to offer via connections to branch trails throughout Town. It will contribute to the mix of recreational opportunities the Town seeks to provide, for people of all ages and all socioeconomic circumstances. It will facilitate healthy lifestyles, reduce reliance on motor vehicles, and enhance tourism and commerce.

3. Partnership(s) Description: **The project is a partnership between the Town of Barnstable, the Town of Yarmouth, and the Commonwealth of Massachusetts Department of Transportation (MassDOT). The Towns are responsible for planning, design, permitting, and land/easements acquisition, while MassDOT is responsible for construction.**

4. Provide a detailed project timeline: **The project is currently in the 100% design phase. The timeline for remaining major milestones is as follows:**

- **100% design submittal to MassDOT: February 2023**
- **100% design approval by MassDOT: April 2023**
- **Final plans and specifications submittal to MassDOT: July 2023**
- **Final plans and specifications approval by MassDOT: October 2023**
- **Bid package submittal to MassDOT: October 2023**
- **Bid package approval by MassDOT: November 2023**
- **MassDOT advertise for bids: December 2023**
- **Bid opening: December 2023**
- **Issue construction notice to proceed: February 2024**
- **Construction completion: February 2026**

5. How does this project meet the General Criteria and Category Specific Criteria for CPC projects?

GENERAL PROJECT CRITERIA		
Criteria	Meets Criteria?	How Met
Consistent with the Local Comprehensive Plan and other planning documents that have received wide scrutiny and input and have been adopted by the town	YES	5. Preserve and enhance historic and maritime character, public viewsheds and cultural landscapes. 6. Enhance pedestrian activity in historic village centers. 7. Preserve and enhance access to public spaces including the waterfront. 9. Promote traffic reduction, traffic management, alternate transportation modes, property interconnections, and travel demand management. 10. Foster and support public transit while planning for associated parking, pedestrian and bicycle travel needs.
Preserve the essential character of the town	YES	Words typically used to describe the Town of Barnstable include: historic, scenic, unique, quaint, idyllic, beautiful, destination. The trail will enhance these characteristics and provide a more pleasant way to experience the Town.
Save resources that would otherwise be threatened and/or serve a currently under-served population	YES	There is anecdotal evidence of substantial latent demand for completing the CCRT to provide a continuous trail along the entire length of Cape Cod. Not only will it serve the biking and recreational populations, but it will also improve safety and access for individuals who rely on transit and non-motorized forms of transportation.
Demonstrate practicality and feasibility, and demonstrate that they can be implemented expeditiously and within budget	YES	The CCRT has a history of success in other towns, which this project builds on.
Produce an advantageous cost/benefit value	YES	The CCRT will likely have a useful life well over 100 years (with routine maintenance). Its benefits will exceed its costs amortized over time.

Leverage additional public and/or private funds; applications that identify commitment from other funding sources will receive a higher priority	YES	All told, the Town's investment is expected to leverage 10 times as much state/federal funding for this project. In addition to CPC funds, this project benefited from a MassTrails grant of approximately $120,000 in 2020.
Receive endorsement by other municipal boards or departments	YES	The Town's Planning & Development Dept., Town Council, and numerous stakeholder groups have expressed support for the CCRT.
Serves more than one CPA purpose	YES	The project contributes to a number of Open Space criteria including: Provide opportunities for passive recreation; Provide connections with existing trails or potential trail linkages; and Provide public access.
Projects may be subject to review by CPC consultants	TBD	If reviewed, we anticipate the reviewers will agree that this project is consistent with CPA goals and it will be exceptionally beneficial for the Town and region.
SPECIFIC PROJECT CRITERIA		
Support multiple recreation uses	YES	The trail will provide opportunities for cycling, walking, running, roller skating, scooters, wheelchairs, cross-country skiing, etc.
Serve a significant number of residents	YES	Cape Cod Commission counts on a section of the existing CCRT in the Town of Brewster there were approximately 2,000 users per day during the spring and summer months. Given Barnstable's larger geographic size and population, we might anticipate peak use several times that amount, which would be statistically significant.
Expand the range of recreational opportunities available to residents of all ages	YES	In addition to serving as a 'highway' for non-motorized transportation to and from various locations, the trail will be a destination in its own right for all members of the community to enjoy.
Jointly benefit Conservation Commission and Recreation Commission initiatives by promoting passive recreation such as hiking, biking and cross-country skiing on town-owned property	YES	This is literally what the CCRT will do.
Maximize the utility of land already owned by the Town	YES	We anticipate the selected route will utilize Town property wherever feasible.
Promote creative uses of public corridors or pathways for safe and healthful non-motorized transportation opportunities	YES	While the Town's portion of CCRT Phase 3 is entirely on open space, the majority of the existing CCRT and other proposed sections of the CCRT are or will be located primarily along established roadway corridors.
Promoting visit-ability	YES	Anecdotal evidence suggests the CCRT will promote additional tourism.
Giving priority to local residents or Town Employees	YES	Local residents have had a say (through public forums and town leaders) in the preferred alignment of the CCRT, and residing locally they will naturally have the most opportunities to use the trail.

Intermingling affordable and market rate housing at levels that exceed state requirements	NO	The CCRT does many things, but it does not directly promote affordable housing – although the trail may help residents in affordable housing by increasing their affordable transportation options.

6. Provide a detailed budget, including the following information, as applicable: (Fiscal Year, Total Cost, CPC Funds Requested, Other Sources of Funding sought and received, and cost estimates/quotes received): **Please see the attached detailed budget.**

7. Assessors office identification map and map and parcel number: **Please see the attached assessor's map.**

Paul Graves

1/17/2023

Signature of Applicant
Paul Graves, P.E., Senior Project Manager

Date

N/A

Signature of Applicant Partner

Date

Signature of Town Manager (Town Affiliated Projects)
Mark S. Ells, Town Manager

Date

Application Checklist

Cape Cod Rail Trail Phase 3

☒ *Cover letter clearly identifying statement of need*

☒ *Application*

N/A ☐ *First draft of deed restriction [Housing, Historic Preservation, Conservation] if it is being provided by the applicant. A consultant will be contacted to draft the appropriate restriction after appropriation by the Town Council.*

Data

- ☒ Identification Map – Assessor's Records
- N/A ☐ Copy of Current Recorded Deed
- N/A ☐ Title Examination / Title Insurance / Tax Information
- N/A ☐ Appraisal and/or Agreement (Open Space / Recreation)
- N/A ☐ Survey Plan (Open Space)
- N/A ☐ Reports (21E / Zoning / HazMat / Historic Structure Reports)
- N/A ☐ MA Historical Commission Historic Inventory Sheet - Form B (Historic)
- ☒ Detailed Set of Plans
- ☒ Project Timeline (provided in application form)
- ☒ Letters of Support

Financial

- N/A ☐ Project Costs and Prioritization
- ☒ Detailed Budget
- N/A ☐ Minimum of 3 quotes from Licensed Contractors
- N/A ☐ Matching Fund Correspondence
- N/A ☐ Additional Fees (Closing Costs / Legal Fees)

Visual

- ☒ Maps
- ☒ Natural Resource Limitations (wetlands, flood plain) (provided in plan set)

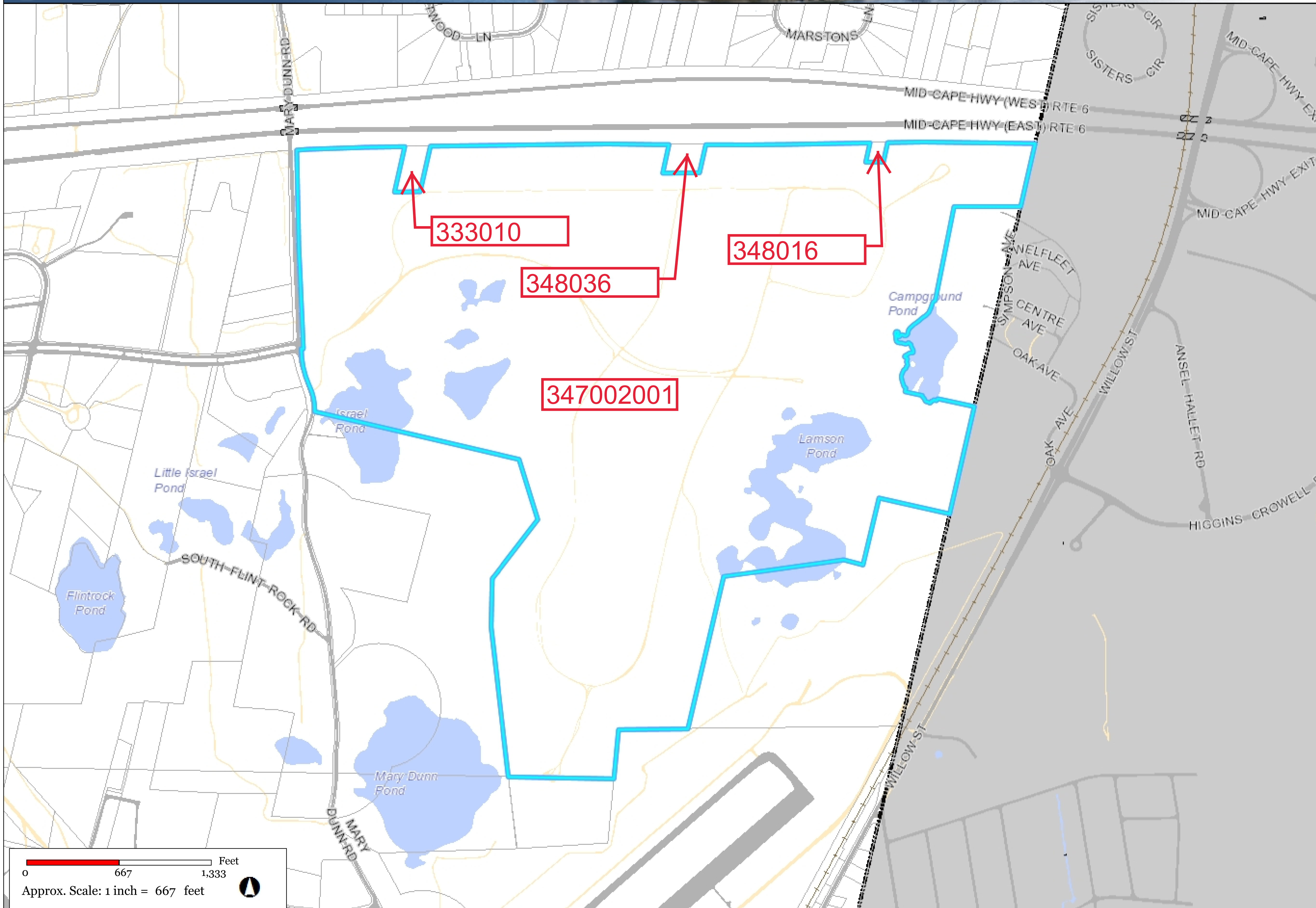
Photos

- N/A ☐ Renderings/Plans

Submission

☒ ***One (1) electronic copy via email to:***
CommunityPreservationCommittee@town.barnstable.ma.us
(No hard copies required if submitted electronically.)

TOWN OF BARNSTABLE **PROPERTY MAPS**



Legend
- Parcels
- Town Boundary
- Railroad Tracks
- Roads
  - Paved Road
  - Unpaved Road
  - Bridge
  - Paved Median
- Water Bodies

Parcel lines shown on this map are only graphic representations of Assessor's tax parcels. They are not true property boundaries and do not represent accurate relationships to physical objects on the map such as building locations.

This map is for illustration purposes only. It is not adequate for legal boundary determination or regulatory interpretation. This map does not represent an on-the-ground survey. It may be generalized, may not reflect current conditions, and may contain cartographic errors or omissions.

Town of Barnstable GIS Unit
367 Main Street, Hyannis, MA 02601
508-862-4624
gis@town.barnstable.ma.us

Map printed on: 1/11/2023

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

CAPE COD RAIL TRAIL EXTENSION - PHASE 3

BRIDGE NO. Y-01-018 (C8R)

IN THE TOWNS OF

BARNSTABLE & YARMOUTH

BARNSTABLE COUNTY

FEDERAL AID PROJECT NO. N/A

75% SUBMITTAL

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	01	267
PROJECT FILE NO. 607398			

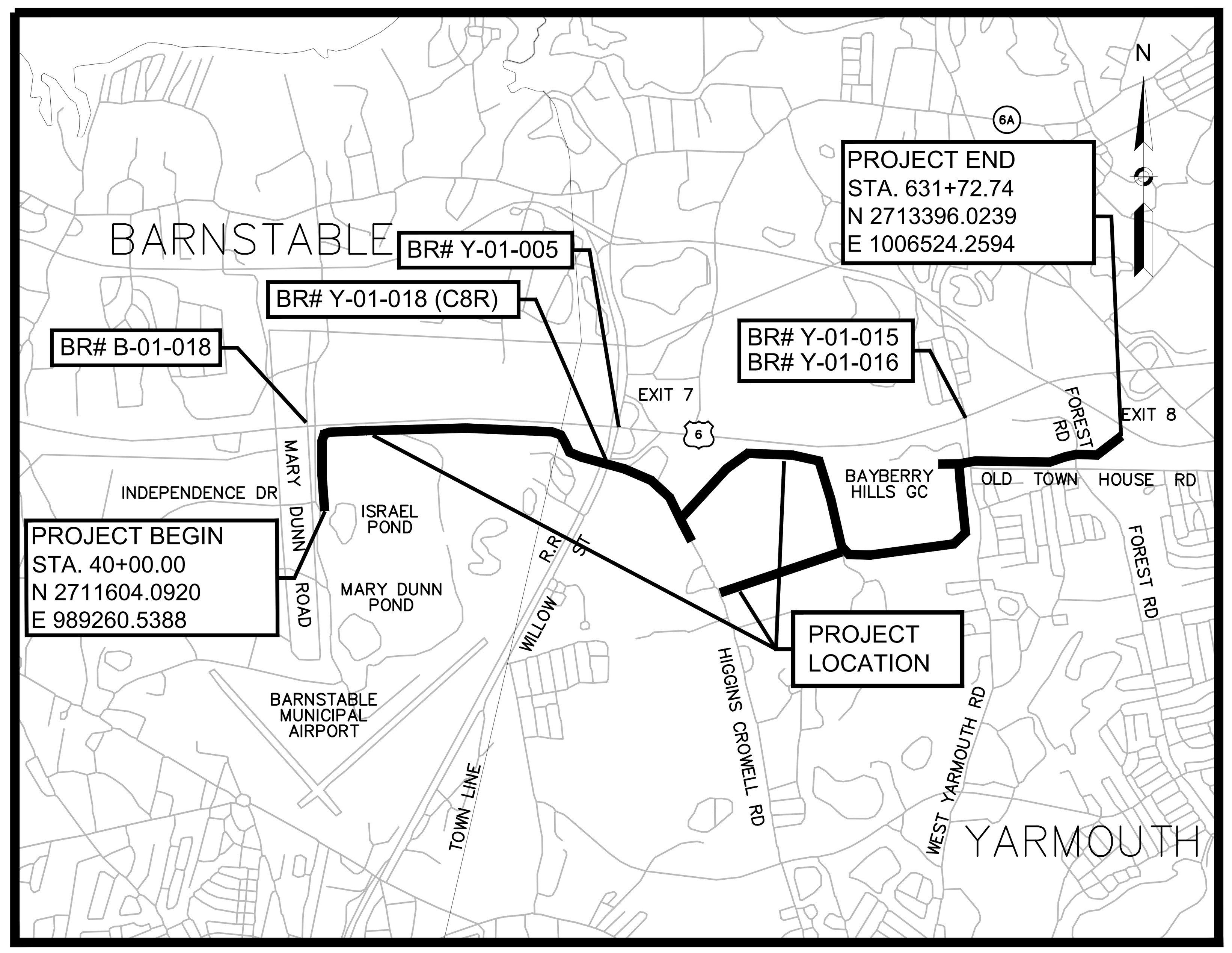
TITLE SHEET & INDEX

24-Nov-2021

607398_HD(COV).DWG

THESE PLANS ARE SUPPLEMENTED BY THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

INDEX



0 2500 5000 7500 10000

SCALE: 1" = 2500'

LENGTH OF PROJECT = 23,172.74 FEET = 4.389 MILES

DESIGN DESIGNATION (CAPE COD RAIL TRAIL EXTENSION)

DESIGN SPEED	18-25 MPH
FUNCTIONAL CLASSIFICATION	SHARED-USE PATH

DESIGN DESIGNATION (WILLOW STREET)

DESIGN SPEED	30 MPH
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL

DESIGN DESIGNATION (GOLF COURSE DRIVEWAY)

DESIGN SPEED	25 MPH
FUNCTIONAL CLASSIFICATION	--

DESIGN DESIGNATION (WEST YARMOUTH ROAD)

DESIGN SPEED	30 MPH
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL

DESIGN DESIGNATION (FOREST ROAD)

DESIGN SPEED	25 MPH
FUNCTIONAL CLASSIFICATION	LOCAL ROAD

DATE	DESCRIPTION	REV #
11/24/2021	75% SUBMISSION	

PLAN PREPARED BY:

vhb
101 WALNUT STREET
WATERTOWN, MA 02471

massDOT
Massachusetts Department of Transportation
Highway Division

RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED:

DIVISION ADMINISTRATOR DATE

APPROVED

HIGHWAY ADMINISTRATOR DATE

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	02	267

PROJECT FILE NO. 607398

LEGEND, GENERAL NOTES & ABBREVIATIONS

607398_HD(LEG).DWG 22-Nov-2021

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER ON BRIDGE OR JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
		FLARED END SECTION (FES)
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
	DMH/LB	DRAINAGE MANHOLE OR LEACHING BASIN
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		MSE RETAINING WALL / TEMPORARY SHEETING
		BALANCE STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		CHAIN LINK OR METAL FENCE
		SPLIT RAIL WOOD FENCE
		WOOD RAILING
		COMPOST FILTER TUBE
		TREE LINE OR LIMIT OF CLEARING AND GRUBBING
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT
		FULL DEPTH PAVEMENT
		RIP RAP SLOPE PROTECTION AND MODIFIED ROCK FILL
		DRAINAGE DITCH

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE - 12" WIDE
	CW	CROSSWALK - WIDTH AS NOTED
	SWL	SOLID WHITE LINE - 4" WIDE
	SYL	SOLID YELLOW LINE - 4" WIDE
	BWL	BROKEN WHITE LINE - 4" WIDE
	BYL	BROKEN YELLOW LINE - 4" WIDE
	DWL	DOTTED WHITE LINE - 4" WIDE
	DYL	DOTTED YELLOW LINE - 4" WIDE
	DWLEx	DOTTED WHITE LINE EXTENSION - 4" WIDE
	DYLEx	DOTTED YELLOW LINE EXTENSION - 4" WIDE
	DBWL	DOUBLE WHITE LINE - 4" WIDE
	DBYL	DOUBLE YELLOW LINE - 4" WIDE

ABBREVIATIONS

GENERAL

ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
BIT.	BITUMINOUS
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CCRT	CAPE COD RAIL TRAIL
CEM	CEMENT
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
DIA	DIAMETER
ELEV (or EL.)	ELEVATION
EOP	EDGE OF PAVEMENT
EXIST	EXISTING
FDN.	FOUNDATION
GP	GATE POST
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HMA	HOT MIX ASPHALT
L&S	LOAM AND SEED
LT, L	LEFT
MAX	MAXIMUM
MIN	MINIMUM
NTS	NOT TO SCALE
PROP	PROPOSED

ABBREVIATIONS (CONTINUED)

GENERAL (CONTINUED)

OD	OUTSIDE DIAMETER
PVM'T	PAVEMENT
REM	REMOVE
REMOD	REMODEL
RET	RETAIN
R&D	REMOVE AND DISCARD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT, R	RIGHT
SGE	SLOPED GRANITE EDGING
STA	STATION
SUP	SHARED USE PATH
TEMP	TEMPORARY
TOS	TOP OF SLOPE
TRANS	TRANSITION
TYP	TYPICAL

UTILITIES

CIP	CAST IRON PIPE
CIT	CHANGE IN TYPE
COND	CONDUIT
DB	DIRECT BURIAL
FES	FLARED END SECTION
F&C	FRAME & COVER
F&G	FRAME & GRATE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HW	HEADWALL
HYD	HYDRANT
INV	INVERT
LB	LEACHING BASIN
PVC	POLYVINYL CHLORIDE PIPE
PWW	PAVED WATER WAY
RCP	REINFORCED CONCRETE PIPE
TSV&B	TAPPING SLEEVE, VALVE, & BODY
UP	UTILITY POLE

GENERAL NOTES

1. TOPOGRAPHICAL INFORMATION FROM A SURVEY BY THE TOWN OF YARMOUTH BETWEEN THE DATES OF JUNE 2010 AND FEBRUARY 2014, VHB, WATERTOWN, MASSACHUSETTS BETWEEN JULY AND AUGUST 2014 , DOWN CAPE ENGINEERING IN MARCH 2017, AND BRACKEN ENGINEERING IN FEBRUARY & MARCH 2021. (HORIZONTAL DATUM: NAD83, VERTICAL DATUM: NAVD88).
2. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. CONTRACTOR SHALL NOTIFY "DIG-SAFE" (1-888-344-7233) AT LEAST 72 HOURS BEFORE EXCAVATING. CONTRACTOR SHALL CONTACT BARNSTABLE DPW (508-790-6400) FOR LOCATION OF DRAINAGE STRUCTURES; HYANNIS WATER SYSTEM (508-775-0063) FOR LOCATION OF WATER INFRASTRUCTURE; BARNSTABLE WATER POLLUTION CONTROL (508-790-6335) FOR LOCATION OF SEWER INFRASTRUCTURE. CONTRACTOR SHALL CONTACT YARMOUTH DPW (508-398-2231) FOR LOCATION OF DRAINAGE STRUCTURES AND YARMOUTH WATER DEPARTMENT (508-771-7921) FOR LOCATION OF WATER INFRASTRUCTURE.
3. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
4. THE CONTRACTOR SHALL ALTER THE MASONRY OF THE TOP SECTION OF ALL EXISTING DRAINAGE STRUCTURES AS NECESSARY FOR CHANGES IN GRADE, AND RESET ALL WATER AND DRAINAGE FRAMES, GRATES AND BOXES TO THE PROPOSED FINISH SURFACE GRADE. REQUIRED NEW MASONRY SHALL BE CLAY BRICK CONFORMING TO M4.05.2.
5. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
6. EXISTING UTILITY POLES WILL BE RELOCATED BY OTHERS.
7. TREES AND SHRUBS WITHIN THE LIMITS OF GRADING SHALL BE REMOVED ONLY UPON APPROVAL OF THE ENGINEER.
8. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE OWNER.
9. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).
10. JOINTS BETWEEN NEW HOT MIX ASPHALT ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDED
11. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS INDICATED OTHERWISE ON THE DRAWINGS
12. ALL LATERAL DRAIN PIPES SHALL BE INSTALLED WITH A PITCH OF 0.01 FOOT PER FOOT (MINIMUM) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
13. ALL EXISTING GRANITE CURB & EDGING SHALL BE RE-USED IN THE PROPOSED WORK, EXCEPT CURVED PIECES OF A DIFFERENT RADIUS THAN PROPOSED CURB.
14. ALL EXISTING STATE, COUNTY, CITY, AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATION ARE NOT GUARANTEED.
15. DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER CLASS B TRENCH EXCAVATION.

ABBREVIATIONS (CONTINUED)

ALIGNMENT/GRADING

BC	BOTTOM OF CURB
CC	CENTER OF CURVE
HP	HIGH POINT
LP	LOW POINT
PC	POINT OF CURVE
PI	POINT OF INTERSECTION
PNT	POINT
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSE CURVE
PT	POINT OF TANGENT
25.45	SPOT ELEVATION

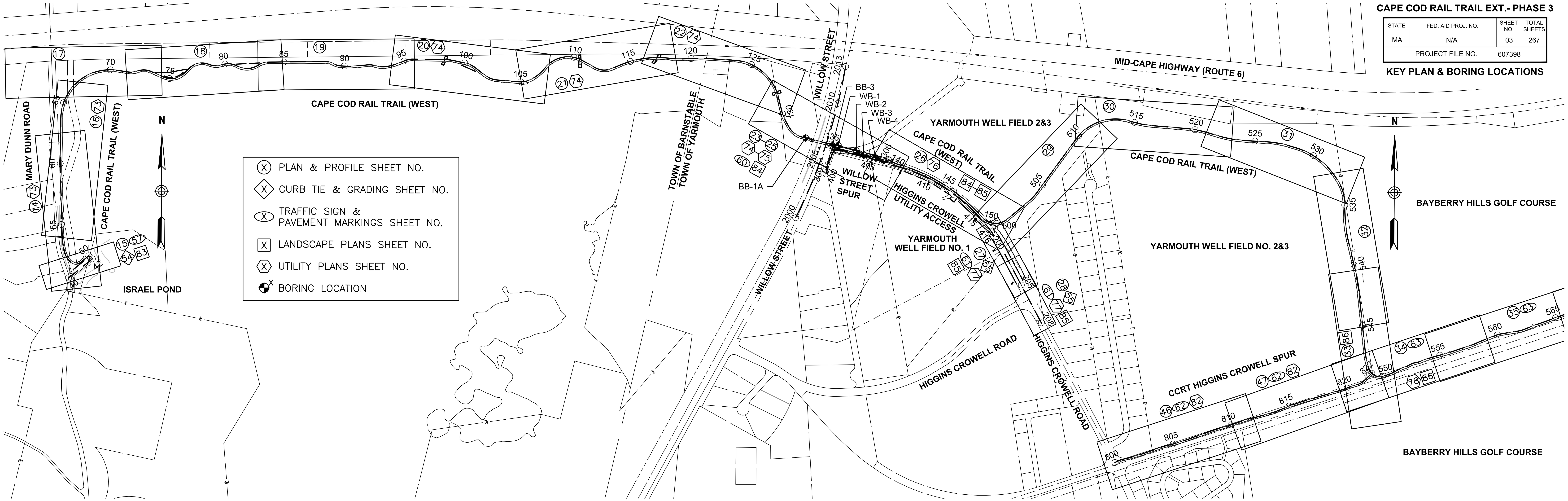
PROFILES

AD	ALGEBRAIC DIFFERENCE IN RATES OF GRADE
ELEV	ELEVATION
HSD	HORIZONTAL SIGHT DISTANCE
K	RATE OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVC	POINT OF VERTICAL CURVE
PVT	POINT OF VERTICAL TANGENT
PVRC	POINT OF VERTICAL REVERSE CURVE
PVCC	POINT OF VERTICAL COMPOUND CURVE
SSD	STOPPING SIGHT DISTANCE
VC	VERTICAL CURVE

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	03	267
	PROJECT FILE NO.	607398	

KEY PLAN & BORING LOCATIONS



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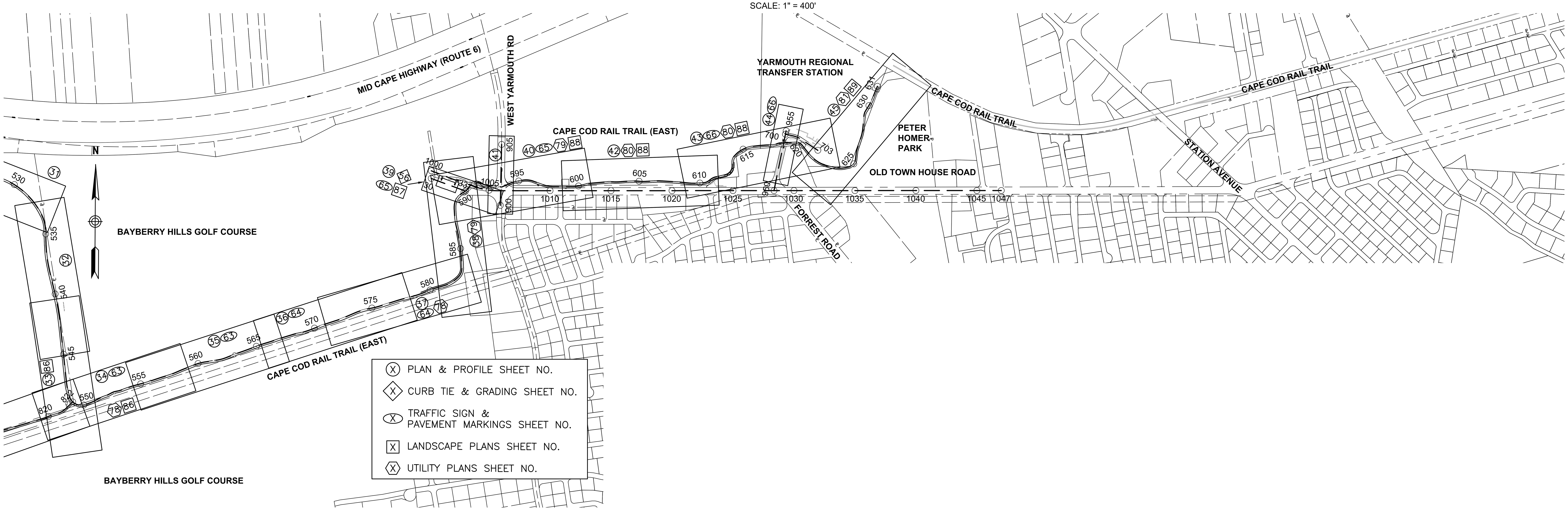
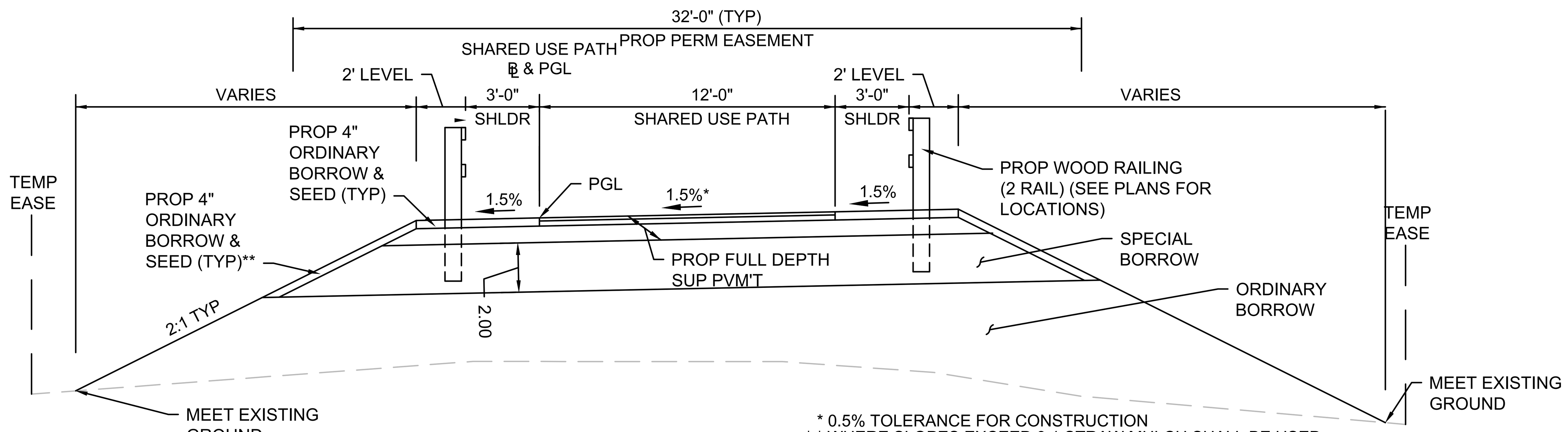


607398_HD(KEY).DWG Plotted on 22-Nov-2021 3:03 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	04	267
PROJECT FILE NO. 607398			

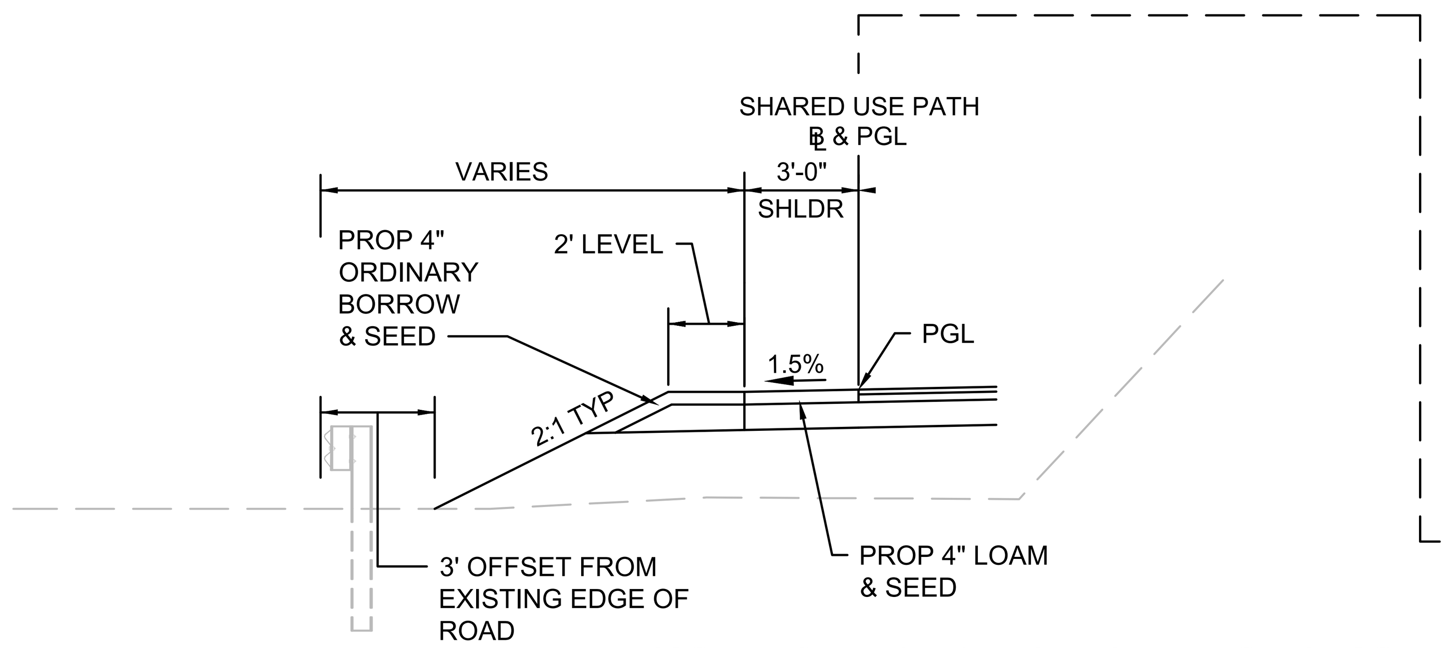
TYPICAL SECTIONS & PAVEMENT NOTES



* 0.5% TOLERANCE FOR CONSTRUCTION
* * WHERE SLOPES EXCEED 3:1 STRAW MULCH SHALL BE USED

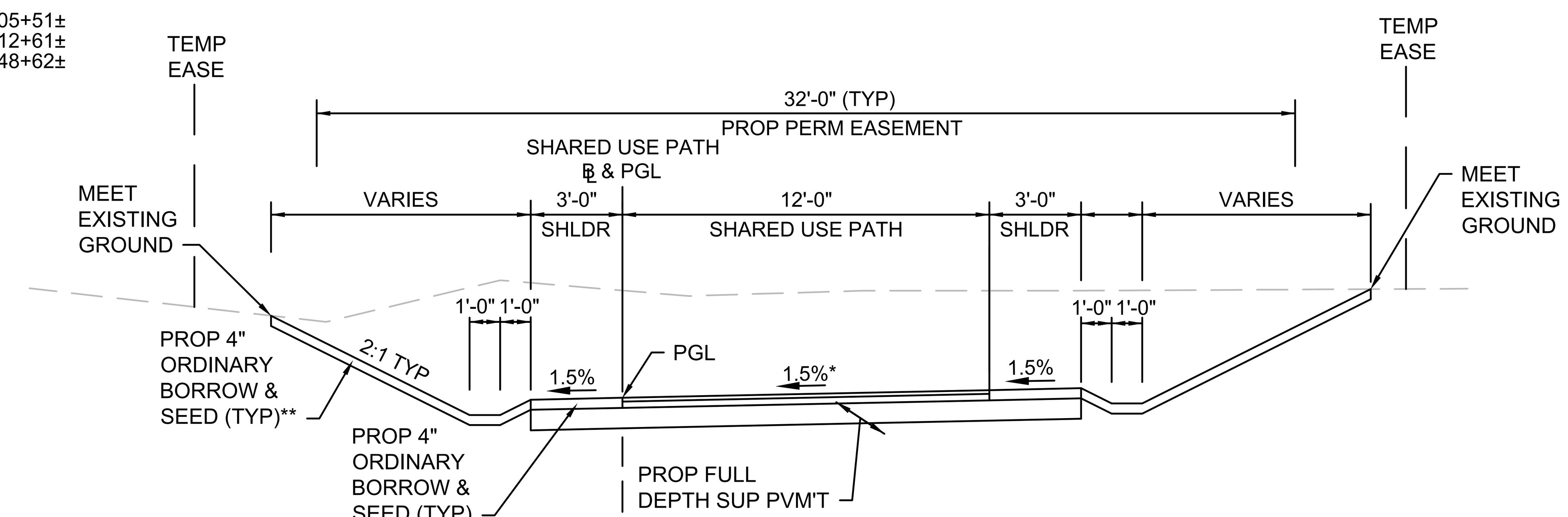
TYPICAL SHARED USE PATH SECTION - NO DITCH

CCRT EXTENSION - WEST
STA 50+59± TO STA 51+53±, STA 57+50± TO 58+90±, STA 59+68± TO STA 61+00±
STA 65+64± TO 66+49±, STA 72+53± TO STA 73+70±, STA 74+11± TO STA 77+21±
STA 81+38± TO STA 86+21±, STA 87+00± TO 89+89±, STA 91+57± TO STA 92+59±
STA 93+68± TO STA 96+29±, STA 97+15± TO STA 101+59±, STA 107+61± TO STA 111+03±
STA 113+65± TO STA 119+22±, STA 120+15± TO STA 122+11±, STA 123+86± TO STA 124+60±
STA 125+87± TO STA 126+34±, STA 127+56± TO STA 128+81±, STA 131+16± TO STA 133+30±
CCRT EXTENSION - EAST
STA 501+28± TO STA 502+10±, STA 502+69± TO STA 503+01±, STA 503+79± TO STA 505+51±
STA 505+98± TO STA 508+11±, STA 508+54± TO STA 509+11±, STA 512+38± TO STA 512+61±
STA 513+66± TO STA 522+20±, STA 523+19± TO STA 536+72±, STA 537+69± TO STA 548+62±
STA 549+35± TO STA 550+15±
NTS



TYPICAL SHARED USE PATH SECTION

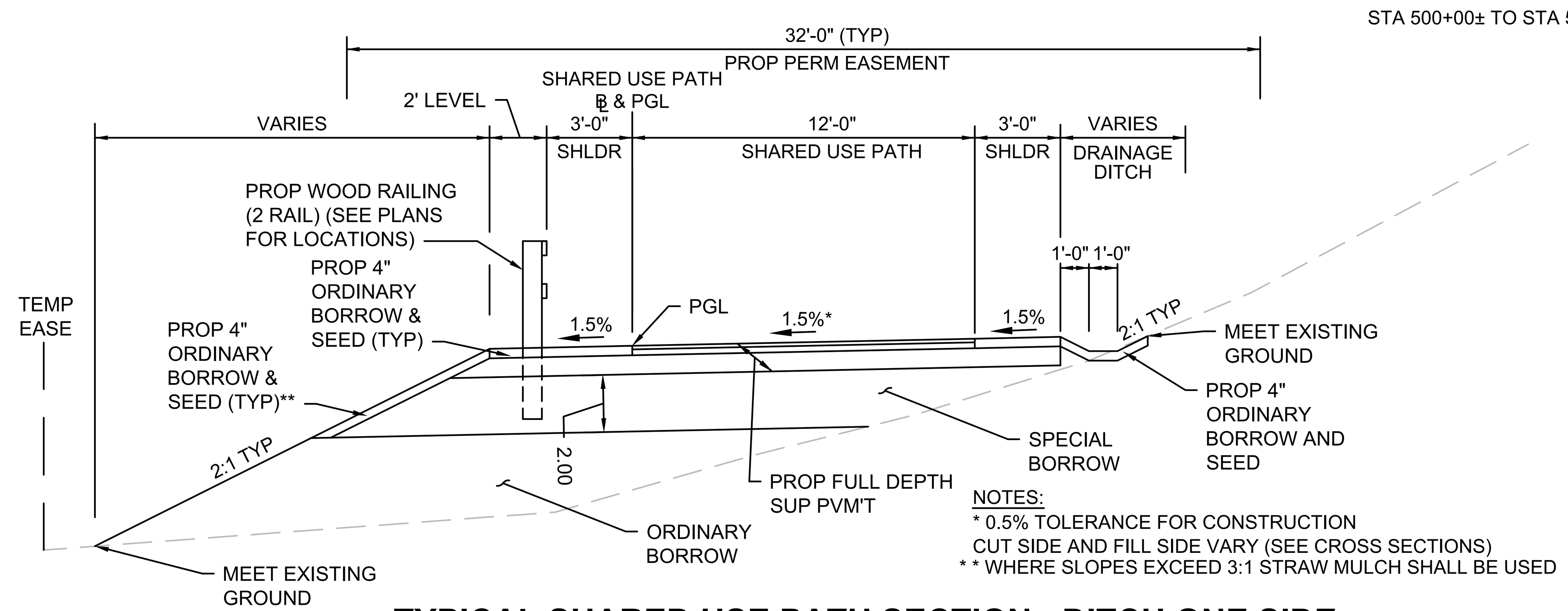
CCRT EXTENSION - WEST
STA 52+50± TO STA 55+50±
NTS



* 0.5% TOLERANCE FOR CONSTRUCTION
* * WHERE SLOPES EXCEED 3:1 STRAW MULCH SHALL BE USED

TYPICAL SHARED USE PATH SECTION - DITCH BOTH SIDES

CCRT EXTENSION - WEST
STA 51+59± TO STA 57+00±, STA 58+93± TO STA 59+44±, STA 61+39± TO ± STA 63+00±
STA 64+20± TO STA 65+20±, STA 66+49± TO STA 69+70±, STA 73+88± TO STA 74+11±
STA 77+60± TO STA 80+75±, STA 86+21± TO STA 86+56±, STA 102+20± TO STA 106+89±
STA 112+40± TO STA 113+65±, STA 118+70± TO STA 120+15±, STA 124+75± TO STA 125+87±
STA 126+90± TO STA 127+40±, STA 128+90± TO STA 130+60±
CCRT EXTENSION - EAST
STA 500+00± TO STA 500+89±, STA 509+60± TO STA 511+89±, STA 512+61± TO STA 513+60±
NTS



NOTES:
* 0.5% TOLERANCE FOR CONSTRUCTION
CUT SIDE AND FILL SIDE VARY (SEE CROSS SECTIONS)
* * WHERE SLOPES EXCEED 3:1 STRAW MULCH SHALL BE USED

TYPICAL SHARED USE PATH SECTION - DITCH ONE SIDE

CCRT EXTENSION - WEST
STA 57+00± TO STA 57+50±, STA 59+44± TO 59+68±, STA 61+00± TO STA 61+39±
STA 63+00± TO STA 64+20±, STA 65+20± TO STA 65+64±, STA 69+70± TO STA 72+53±
STA 73+70± TO STA 73+88±, STA 77+21± TO 77+60±, STA 80+75± TO STA 81+38±
STA 86+56± TO STA 87+00±, STA 89+89± TO STA 91+57±, STA 92+59± TO STA 93+68±
STA 96+29± TO STA 97+15±, STA 101+59± TO STA 102+20±, STA 106+89± TO STA 107+61±
STA 111+03± TO STA 112+40±, STA 119+22± TO STA 118+70±, STA 122+11± TO STA 123+86±
STA 124+60± TO STA 124+75±, STA 126+34± TO STA 126+90±, STA 127+40± TO STA 127+56±
STA 128+81± TO STA 128+90±, STA 130+60± TO STA 131+16±
CCRT EXTENSION - EAST
STA 500+89± TO STA 501+28±, STA 502+10± TO STA 502+69±, STA 503+01± TO STA 503+79±, STA 505+51± TO STA 505+98±
STA 508+11± TO STA 508+54±, STA 509+11± TO STA 509+60±, STA 511+89± TO STA 512+38±, STA 513+60± TO STA 513+66±
STA 520+22± TO STA 523+19±, STA 536+72± TO STA 537+69±, STA 548+62± TO STA 549+35
NTS

NOTES
1. ALL HOT MIX ASPHALT PAVEMENTS SHALL BE PRODUCED IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. ASPHALT EMULSION FOR TACK COAT (ITEM 452.) SHALL BE SPRAY APPLIED FOR TRIPLE OVERLAP COVERAGE AT 0.08 GAL/SY OVER MILLED SURFACES AND 0.07 GAL/SY OVER SMOOTH SURFACES.
3. HMA JOINT SEALANT (ITEM 453.) SHALL BE APPLIED IN SURFACE COURSE AT ALL VERTICAL COLD JOINTS PRIOR TO HMA PAVING.
4. ALL HOT MIX ASPHALT WALKS AND DRIVEWAYS SHALL BE ESTIMATED AND PAID FOR UNDER ITEM 702. OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
5. WHERE EXISTING SOIL WITHIN A DEPTH OF 2' BELOW SUBGRADE IS FOUND TO HAVE GREATER THAN 14% MATERIAL PASSING THE #200 MESH, THE MATERIAL SHALL BE EXCAVATED.
6. ALL SEED MIX SHALL BE ITEM 765.412 UNLESS NOTATED OTHERWISE ON LANDSCAPE PLANS.

PAVEMENT NOTES

PROPOSED FULL DEPTH SHARED USE PATH (SUP) PAVEMENT
SURFACE: 1.5" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
BASE: 2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)
SUBBASE: 8" GRAVEL BORROW, TYPE b

PROPOSED SHARED USE PATH (SUP) PAVEMENT OVERLAY
SURFACE: 1.5" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5)
LEVELING COURSE: VARIABLE DEPTH (1" MIN) SUPERPAVE LEVELING COURSE 9.5 (SLC-9.5)

PROPOSED FULL DEPTH PAVEMENT (ROADWAY)
SURFACE: 1.5" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)
BASE: 4.0" SUPERPAVE BASE COURSE 37.5 (SBC-37.5)
SUBBASE: 4" DENSE GRADED CRUSHED STONE OVER
8" GRAVEL BORROW, TYPE b

PROPOSED FULL DEPTH PAVEMENT (LESS THAN 4.0' WIDE)
SURFACE: 1.5" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)
BASE: 8" HIGH EARLY STRENGTH CEMENT CONCRETE BASE COURSE
SUBBASE: 8" GRAVEL BORROW, TYPE b

PROPOSED FULL DEPTH PARKING AREA
SURFACE: 1.5" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-12.5)
SUBBASE: 12" GRAVEL BORROW, TYPE b

PROPOSED PAVEMENT MICROMILLING AND OVERLAY - TYPE 1
SURFACE: 1.5" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
0.25" MAXIMUM PAVEMENT MILLING
LEVELING COURSE: VARIABLE DEPTH (1" MIN) SUPERPAVE LEVELING COURSE 9.5 (SLC-9.5)

PROPOSED PAVEMENT MICROMILLING AND OVERLAY - TYPE 2
SURFACE: 1.5" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
0.5" MAXIMUM PAVEMENT MILLING

* PROPOSED HOT MIX ASPHALT DRIVEWAY
SURFACE: 1.5" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
2.5" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC-12.5)
FOUNDATION: 8" GRAVEL BORROW, TYPE b

* PROPOSED HOT MIX ASPHALT WALK
SURFACE: 1.25" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
1.75" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC-12.5)
FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED CEMENT CONCRETE WHEELCHAIR RAMP/MEDIAN ISLAND
SURFACE: 4" CEMENT CONCRETE AIR ENTRAINED 4000 PSI, 3/4", 610
6"X6" W2.9 X W2.9 WELDED STEEL, FIBER MESH
(FOR WHEELCHAIR RAMPS ONLY)
FOUNDATION: 8" GRAVEL BORROW, TYPE b

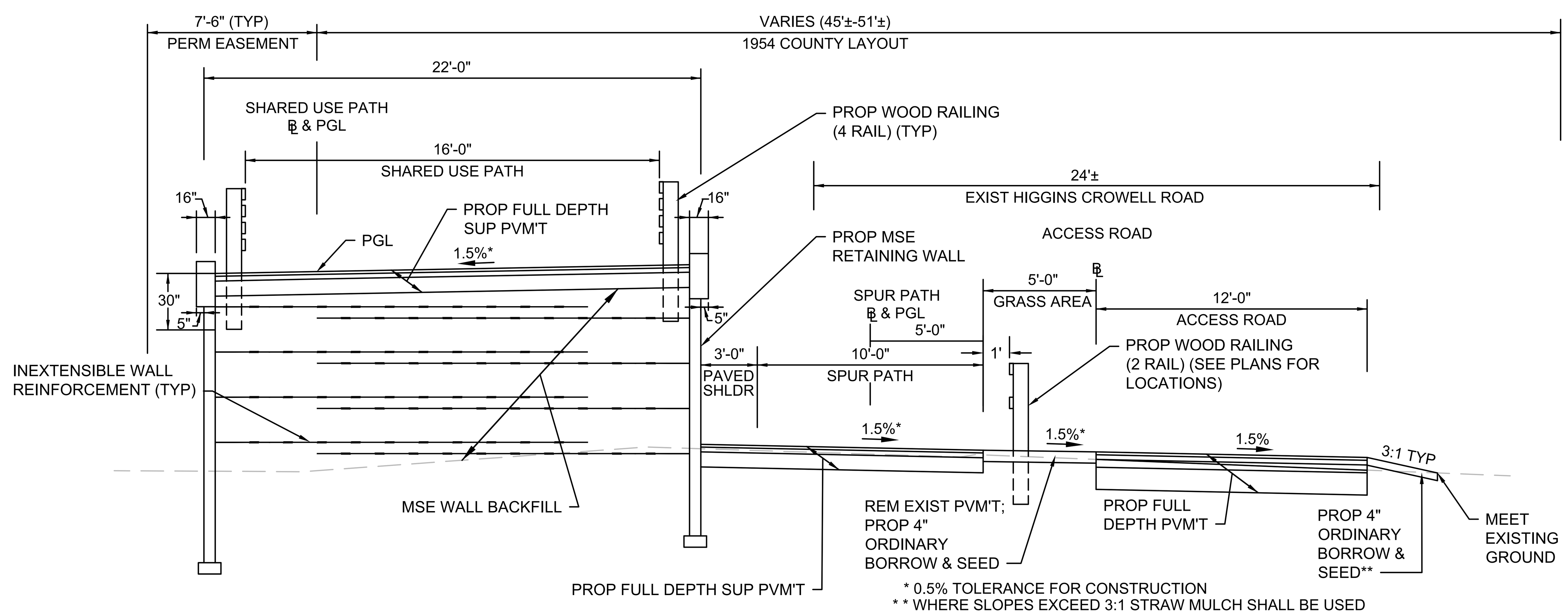
PROPOSED GRAVEL PATH / GRAVEL GOLF CART PATH
SURFACE: 4" DENSE GRADED CRUSHED STONE
FOUNDATION: 6" GRAVEL BORROW, TYPE b

Plotted on 22-Nov-2021 3:04 PM
607398_HD(TYP).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

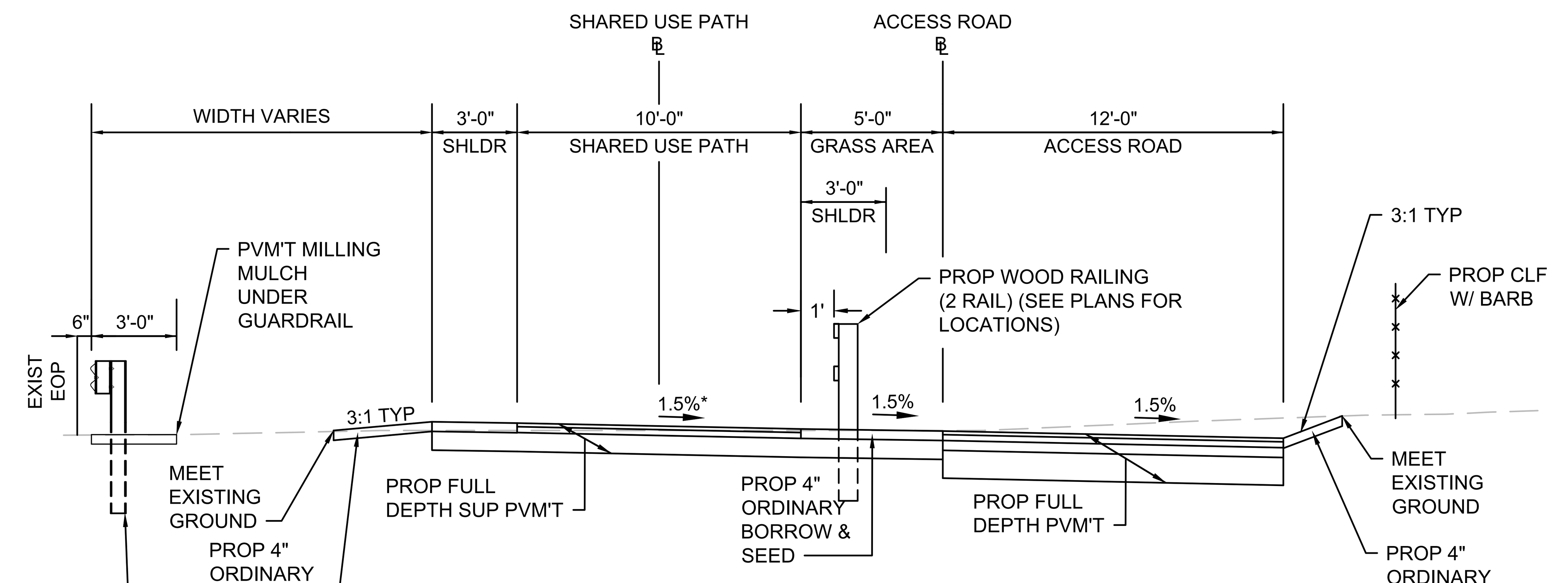
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	05	267
PROJECT FILE NO. 607398			

TYPICAL SECTIONS & PAVEMENT NOTES



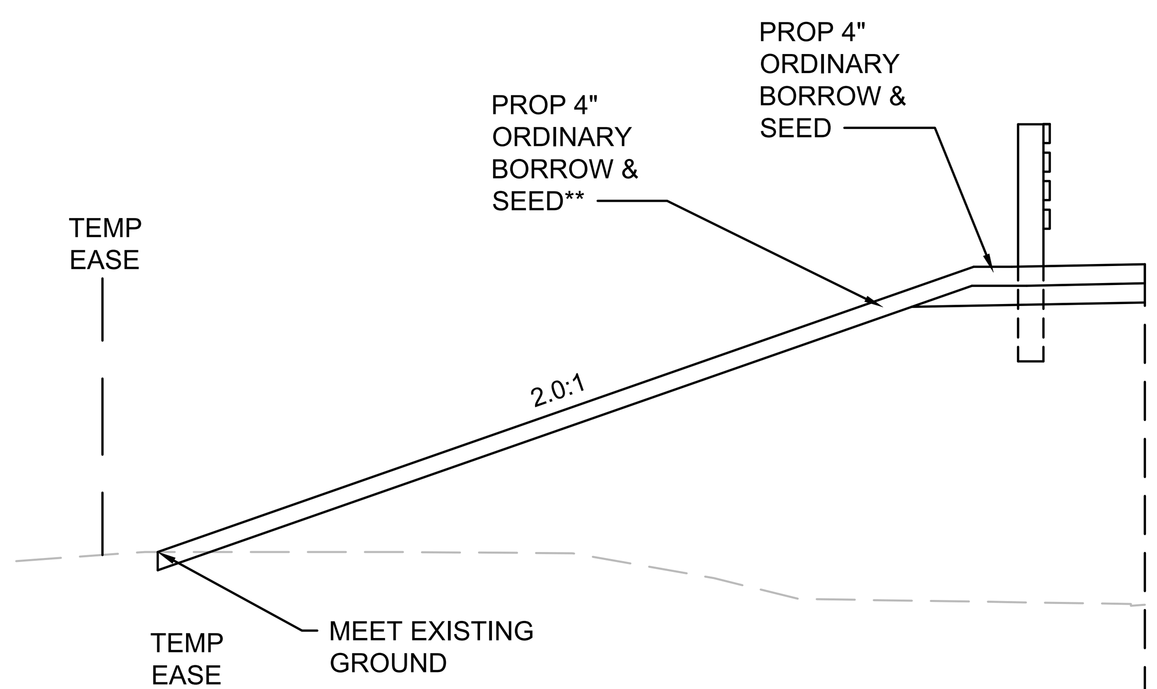
TYPICAL SHARED USE PATH SECTION

CCRT EXTENSION - WEST
STA 135+95± TO STA 136+98±
NTS



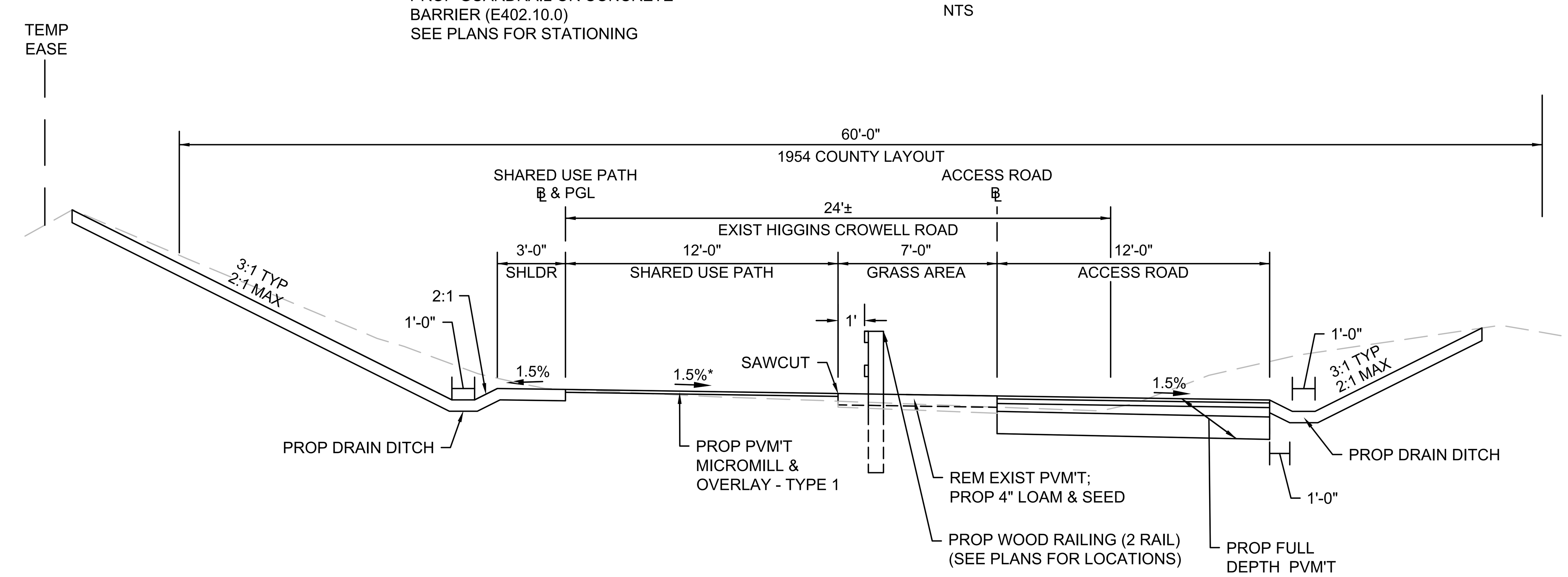
TYPICAL SECTION

WILLOW STREET SPUR
STA 300+54± TO STA 302+14±
NTS



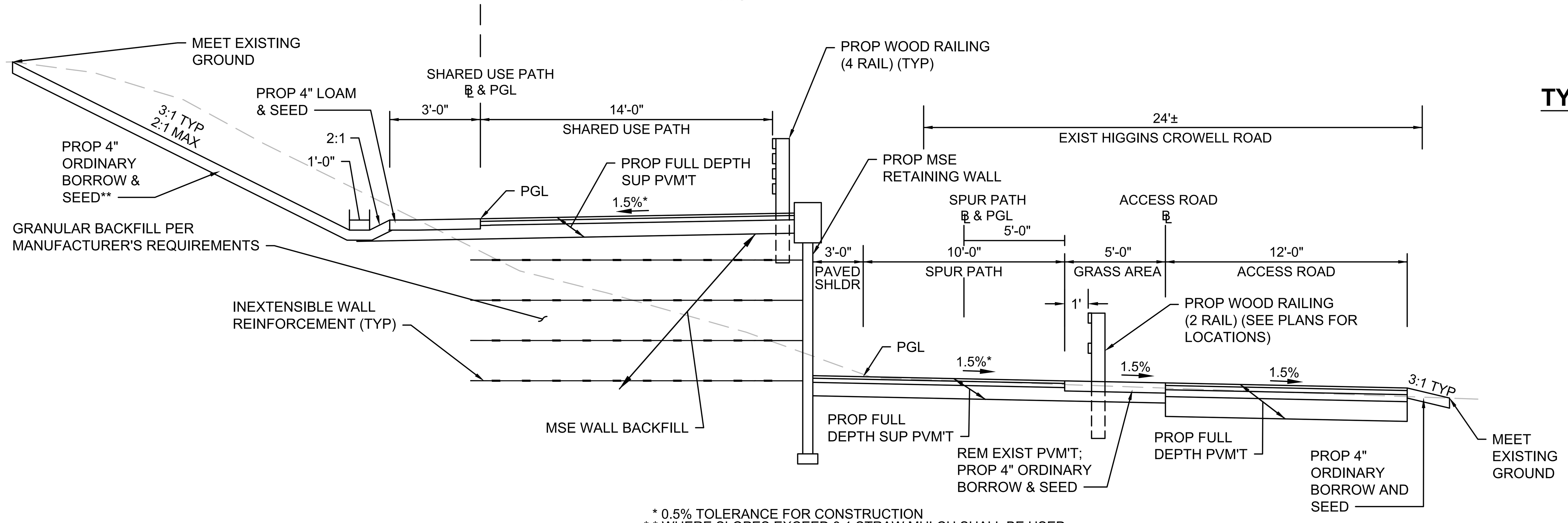
TYPICAL SHARED USE PATH SECTION

CCRT EXTENSION - WEST
STA 136+98± TO STA 137+86±
NTS



TYPICAL SHARED USE PATH SECTION

CCRT EXTENSION - WEST (HIGGINS CROWELL ROAD)
STA 140+69± TO STA 149+51±
NTS



TYPICAL SHARED USE PATH SECTION

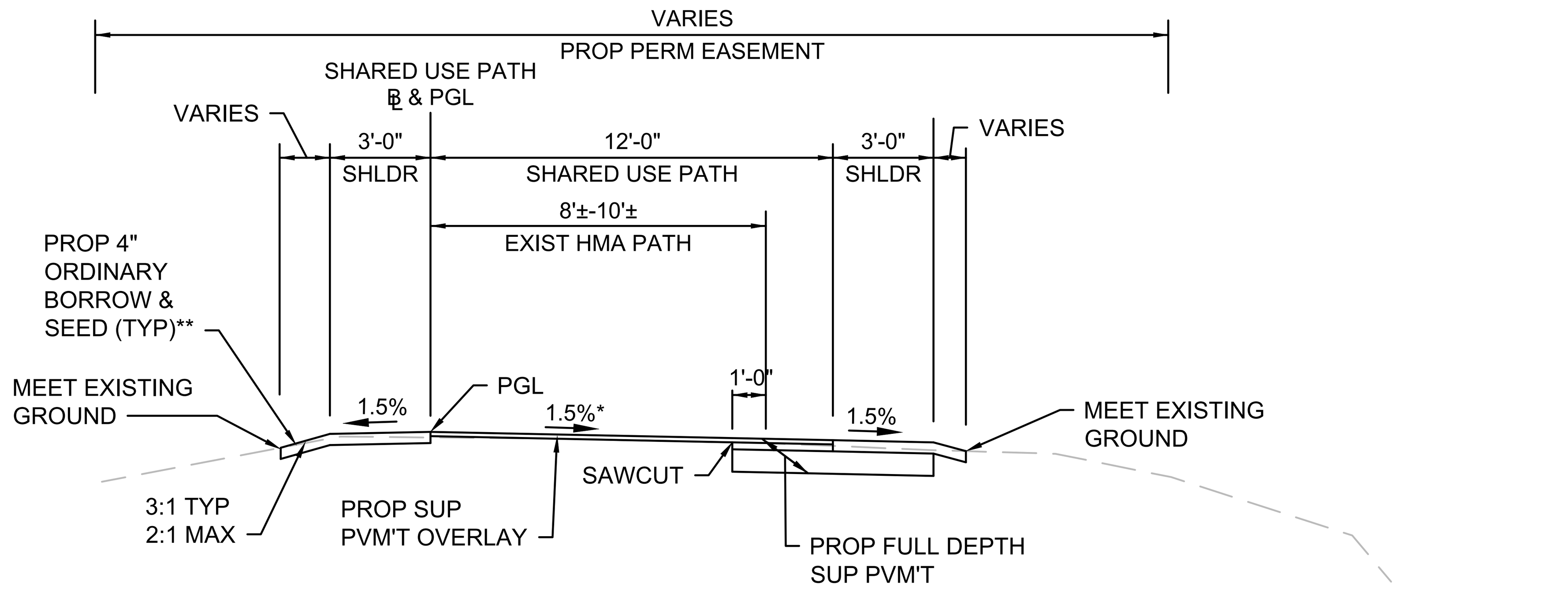
CCRT EXTENSION - WEST
STA 136+98± TO STA 139+48±
NTS

Plotted on 22-Nov-2021 3:04 PM
607398_HD(TYP).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	06	267
PROJECT FILE NO. 607398			

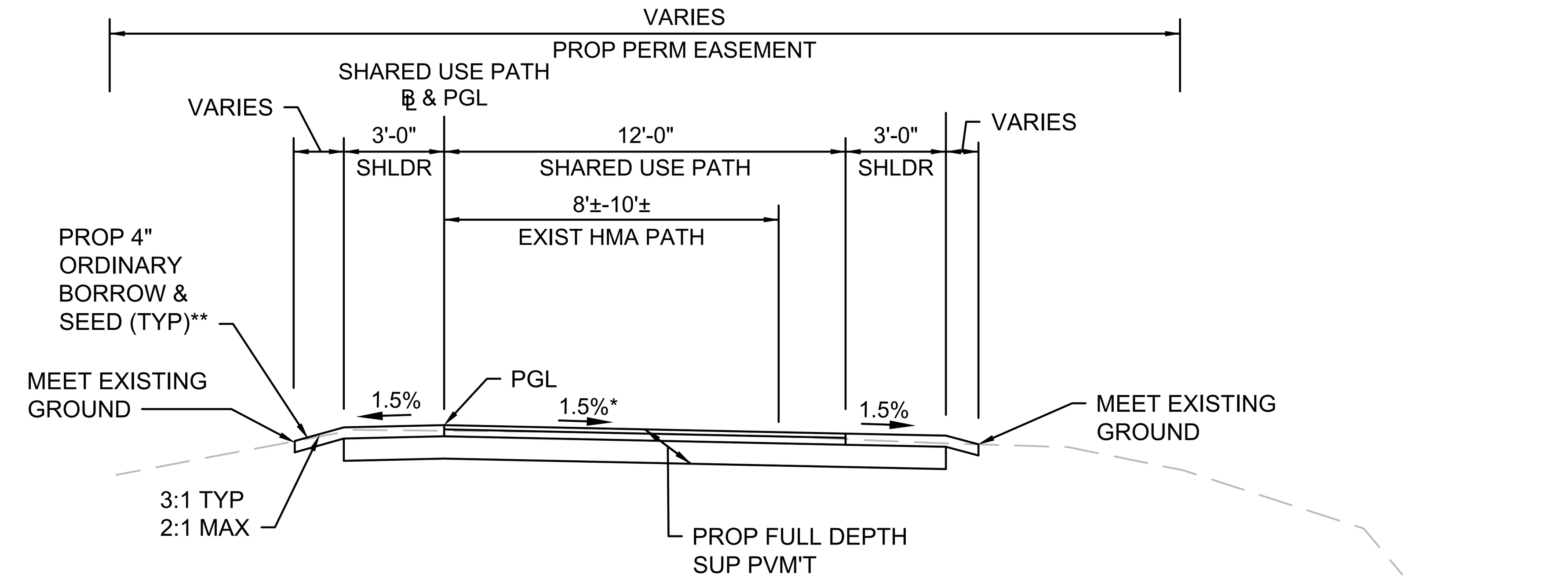
TYPICAL SECTIONS & PAVEMENT NOTES



* 0.5% TOLERANCE FOR CONSTRUCTION
** WHERE SLOPES EXCEED 3:1 STRAW MULCH SHALL BE USED

TYPICAL SHARED USE PATH SECTION

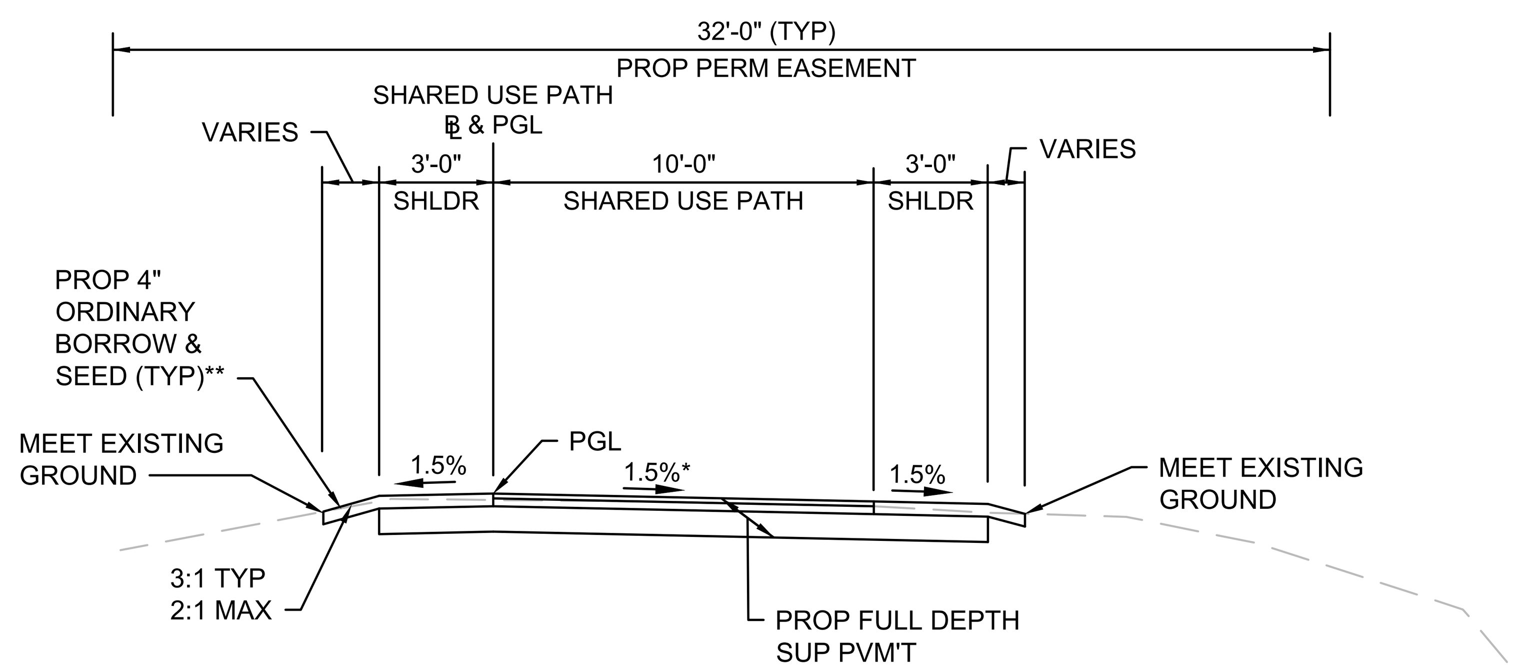
CCRT EXTENSION - EAST
STA 550+15± TO STA 560+51±, STA 565+61± TO STA 572+51±
STA 575+01± TO STA 588+52±
NTS



* 0.5% TOLERANCE FOR CONSTRUCTION
** WHERE SLOPES EXCEED 3:1 STRAW MULCH SHALL BE USED

TYPICAL SHARED USE PATH SECTION

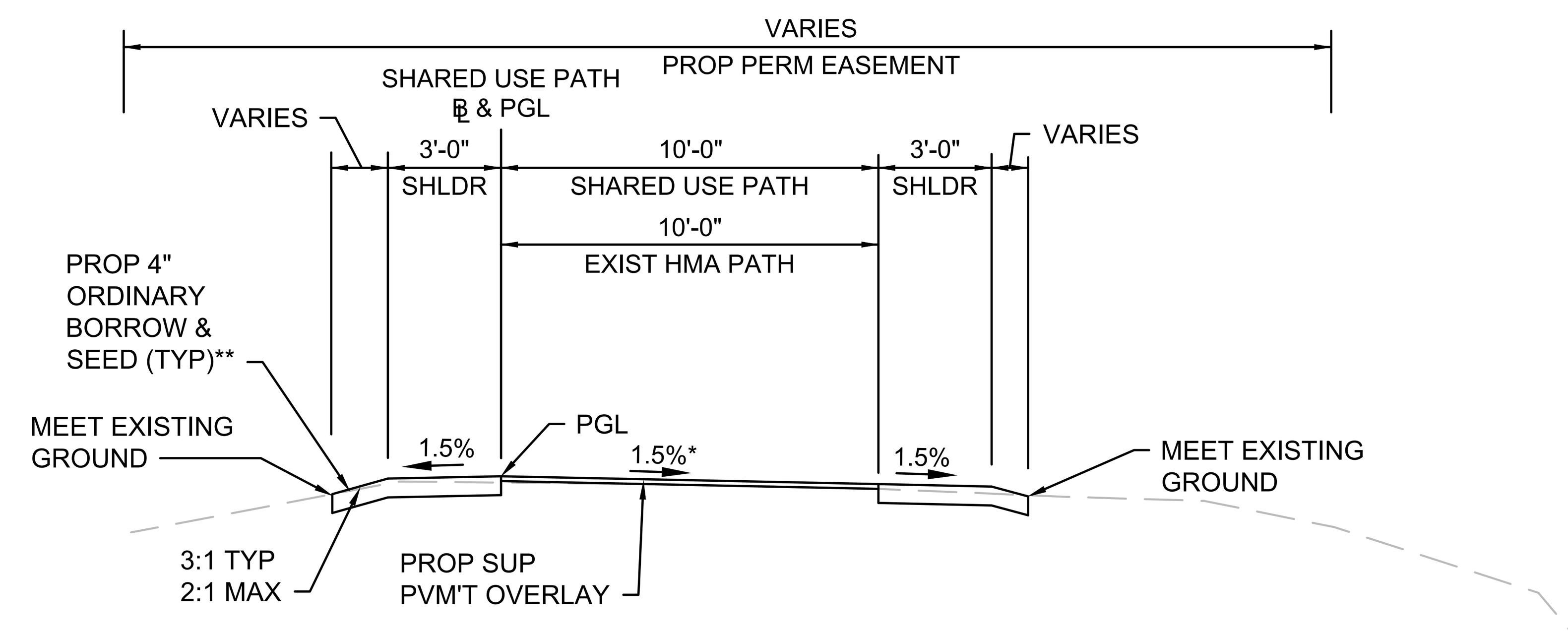
CCRT EXTENSION - EAST
STA 560+51± TO STA 565+61±, STA 572+51± TO STA 575+01±
STA 588+52± TO STA 590+31±, STA 591+60± TO STA 592+89±
NTS



* 0.5% TOLERANCE FOR CONSTRUCTION
** WHERE SLOPES EXCEED 3:1 STRAW MULCH SHALL BE USED

TYPICAL SHARED USE PATH SECTION

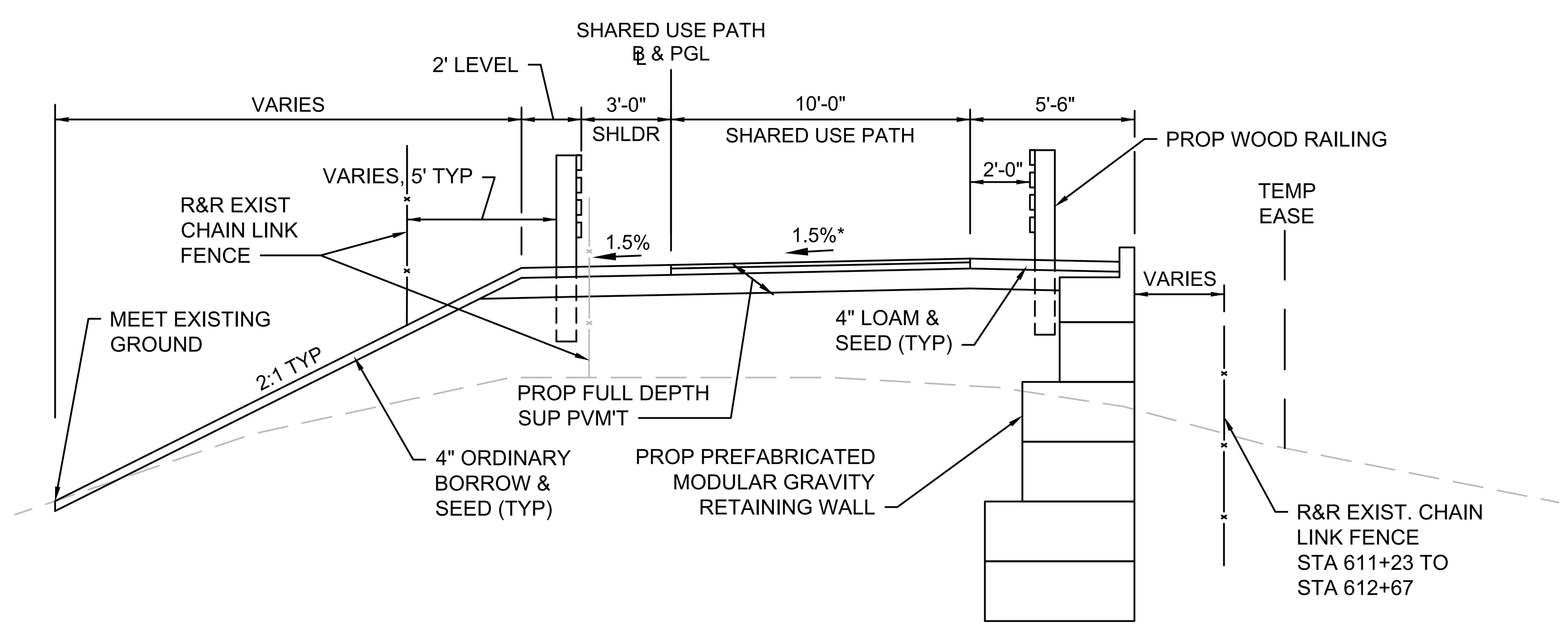
CCRT EXTENSION - EAST
STA 594+04± TO STA 602+94±, STA 607+62± TO STA 615+60±
NTS



* 0.5% TOLERANCE FOR CONSTRUCTION
** WHERE SLOPES EXCEED 3:1 STRAW MULCH SHALL BE USED

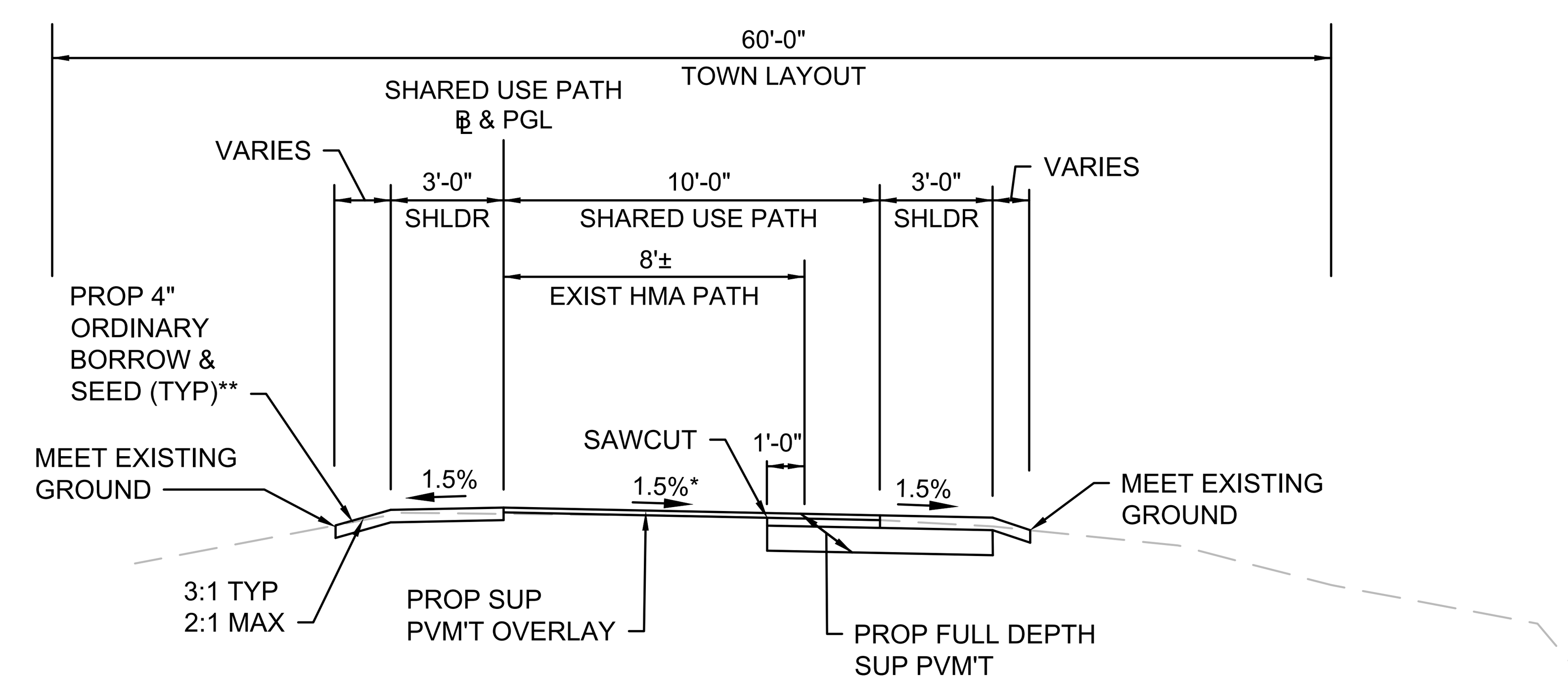
TYPICAL SHARED USE PATH SECTION

CCRT EXTENSION - EAST
STA 602+94± TO STA 607+62±, STA 615+60 TO STA 617+49±
STA 618+81± TO STA 631+73±
NTS



TYPICAL SHARED USE PATH SECTION

CCRT EXTENSION - EAST
STA 610+65± TO STA 613+52±
NTS



* 0.5% TOLERANCE FOR CONSTRUCTION
** WHERE SLOPES EXCEED 3:1 STRAW MULCH SHALL BE USED

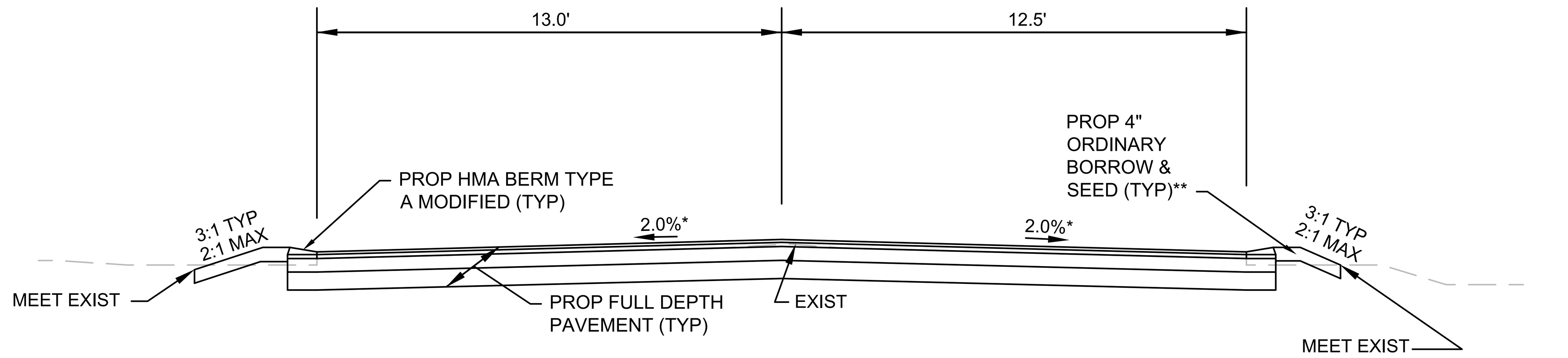
TYPICAL SHARED USE PATH SECTION

HIGGINS CROWELL ROAD SPUR
STA 800+80± TO STA 820+82±
NTS

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

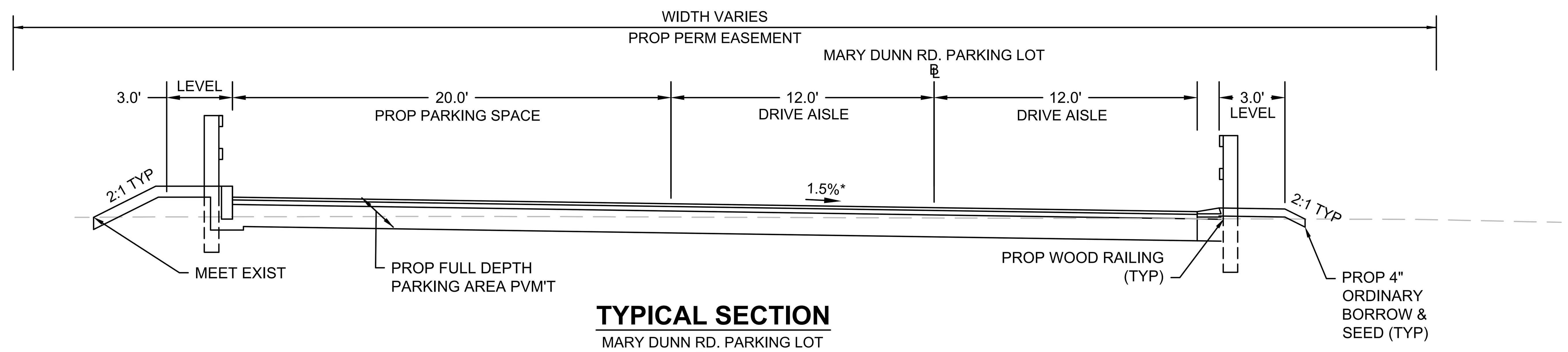
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	07	267
PROJECT FILE NO. 607398			

TYPICAL SECTIONS & PAVEMENT NOTES

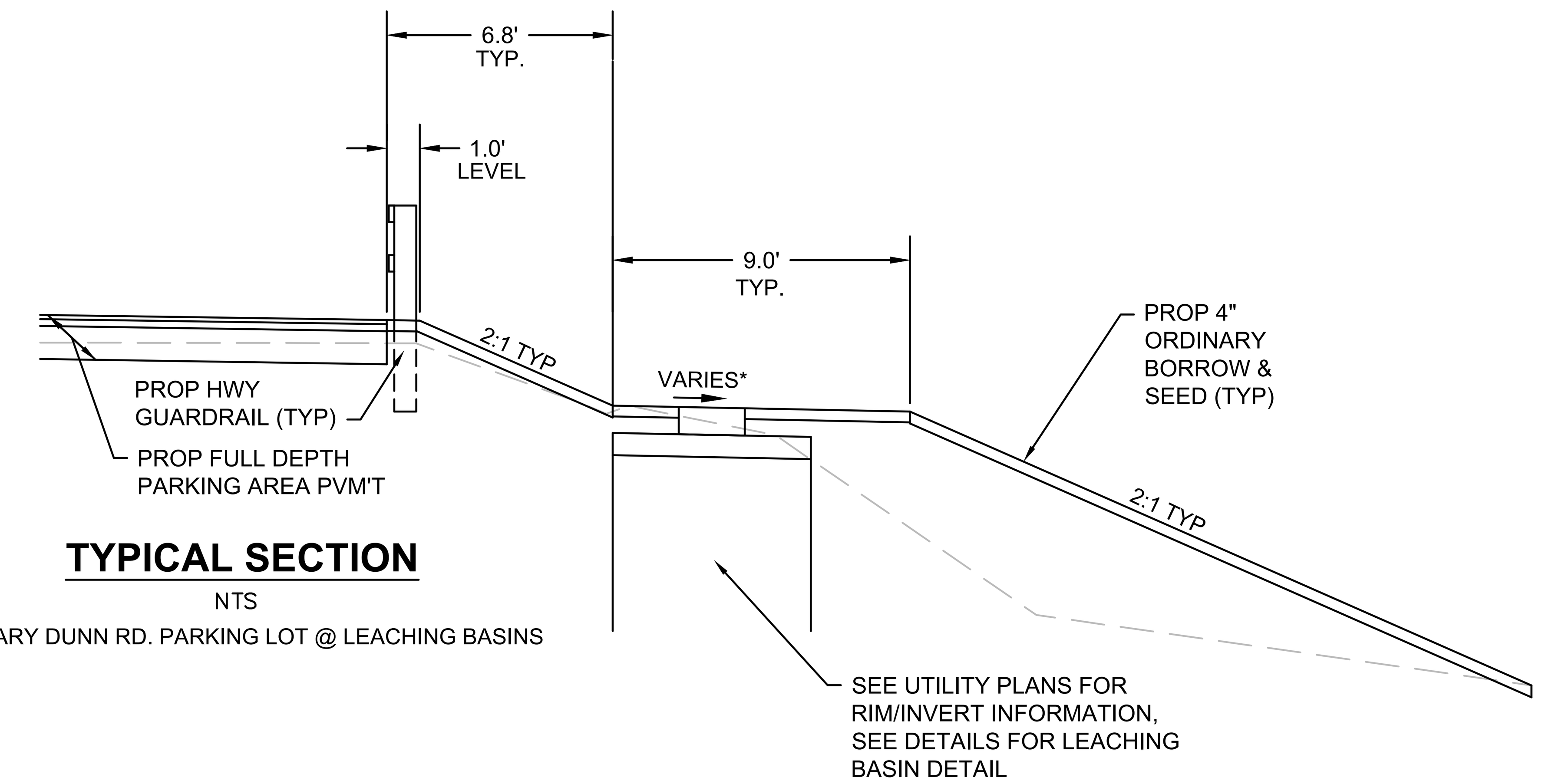


* 0.5% TOLERANCE FOR CONSTRUCTION
* * WHERE SLOPES EXCEED 3:1 STRAW MULCH SHALL BE USED

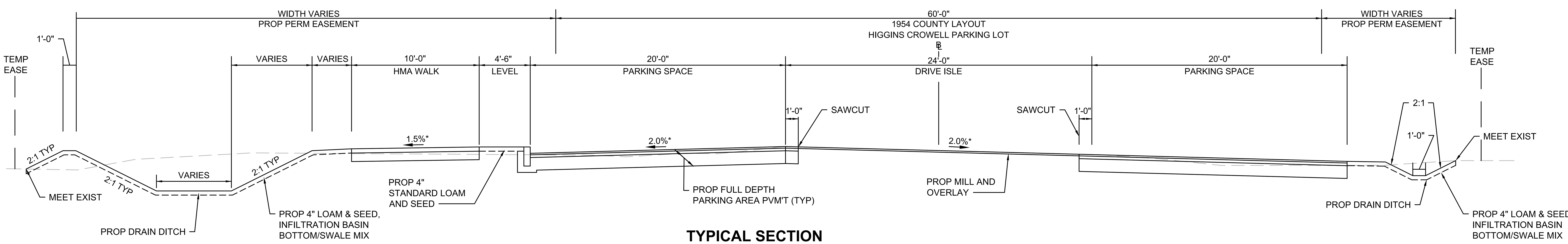
TYPICAL SPEED TABLE SECTION
FOREST ROAD EXTENSION
NTS



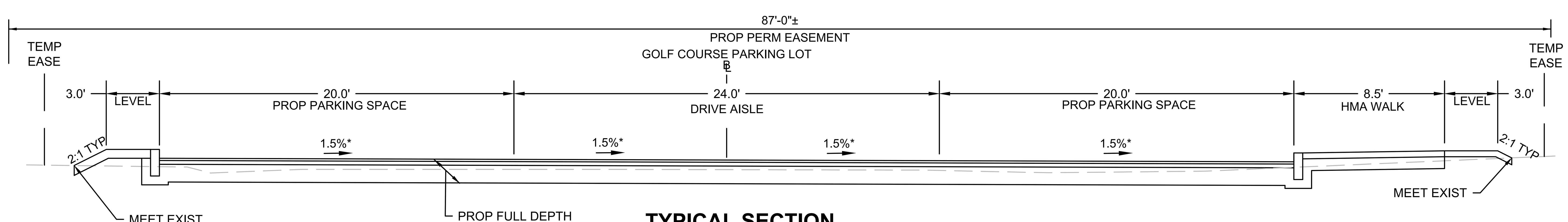
TYPICAL SECTION
MARY DUNN RD. PARKING LOT
NTS



TYPICAL SECTION
NTS
MARY DUNN RD. PARKING LOT @ LEACHING BASINS



TYPICAL SECTION
HIGGINS CROWELL ROAD PARKING LOT
STA 200+23± TO 204+73±
NTS



TYPICAL SECTION
GOLF COURSE PARKING LOT
NTS

607398_HD(TYP).DWG Plotted on 22-Nov-2021 3:04 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	08	267
PROJECT FILE NO. 607398			

CONSTRUCTION BASELINE DATA

607398_HD(BL-TIE).DWG   Plotted on 22-Nov-2021 3:05 PM

CCRT PHASE 3 - WEST CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	50+00.00	2711770.003	989421.055		S51° 18' 15"W 87.89'	50+87.89	2711715.057	989352.462
C1	50+87.89	2711715.057	989352.462	R=60.00' Δ=78°27'36" L=82.16' T=48.99'		51+70.05	2711715.765	989276.573
C2	51+70.05	2711715.765	989276.573	R=170.00' Δ=37°38'25" L=111.68' T=57.94'		52+81.73	2711809.369	989219.401
C3	52+81.73	2711809.369	989219.401	R=870.00' Δ=10°13'19" L=155.21' T=77.81'		54+36.95	2711963.058	989199.210
L2	54+36.95	2711963.058	989199.210		N2° 22' 25"W 120.75'	55+57.70	2712083.709	989194.209
C4	55+57.70	2712083.709	989194.209	R=170.00' Δ=12°26'15" L=36.90' T=18.52'		55+94.60	2712120.457	989196.679
C5	55+94.60	2712120.457	989196.679	R=170.00' Δ=12°27'07" L=36.95' T=18.55'		56+31.55	2712157.247	989199.147
L3	56+31.55	2712157.247	989199.147		N2° 23' 16"W 281.55'	59+13.10	2712438.552	989187.417
C6	59+13.10	2712438.552	989187.417	R=1000.00' Δ=3°31'52" L=61.63' T=30.82'		59+74.73	2712500.166	989186.747
L4	59+74.73	2712500.166	989186.747		N1° 08' 35"E 256.58'	62+31.31	2712756.699	989191.866
C7	62+31.31	2712756.699	989191.866	R=2000.00' Δ=0°53'17" L=31.00' T=15.50'		62+62.31	2712787.692	989192.244
L5	62+62.31	2712787.692	989192.244		N0° 15' 18"E 106.47'	63+68.78	2712894.164	989192.718
C8	63+68.78	2712894.164	989192.718	R=400.00' Δ=94°58'46" L=663.08' T=436.37'		70+31.86	2713290.715	989629.208
C9	70+31.86	2713290.715	989629.208	R=1000.00' Δ=3°46'24" L=65.86' T=32.94'		70+97.72	2713282.552	989694.544
L6	70+97.72	2713282.552	989694.544		S80° 59' 32"E 50.23'	71+47.94	2713274.688	989744.152
C10	71+47.94	2713274.688	989744.152	R=150.00' Δ=29°17'19" L=76.68' T=39.20'		72+24.62	2713282.137	989819.630
C11	72+24.62	2713282.137	989819.630	R=150.00' Δ=44°16'54" L=115.93' T=61.03'		73+40.55	2713278.467	989932.636
L7	73+40.55	2713278.467	989932.636		S65° 59' 56"E 111.36'	74+51.91	2713233.173	990034.364
C12	74+51.91	2713233.173	990034.364	R=150.00' Δ=68°24'05" L=179.07' T=101.94'		76+30.98	2713263.034	990200.328
L8	76+30.98	2713263.034	990200.328		N45° 35' 58"E 60.87'	76+91.85	2713305.624	990243.819
C13	76+91.85	2713305.624	990243.819	R=150.00' Δ=66°54'08" L=175.15' T=99.10'		78+67.00	2713337.034	990406.176
C14	78+67.00	2713337.034	990406.176	R=150.00' Δ=41°46'21" L=109.36' T=57.24'		79+76.36	2713334.019	990513.088
C15	79+76.36	2713334.019	990513.088	R=150.00' Δ=47°55'07" L=125.45' T=66.66'		81+01.81	2713324.060	990634.506
C16	81+01.81	2713324.060	990634.506	R=170.00' Δ=60°56'00" L=180.79' T=100.00'		82+82.61	2713329.532	990806.812
C17	82+82.61	2713329.532	990806.812	R=170.00' Δ=31°44'06" L=94.16' T=48.32'		83+76.77	2713355.806	990895.982
L9	83+76.77	2713355.806	990895.982		N89° 26' 58"E 455.70'	88+32.46	2713360.184	991351.656
C18	88+32.46	2713360.184	991351.656	R=150.00' Δ=28°59'51" L=75.92' T=38.79'		89+08.38	2713342.080	991424.549
C19	89+08.38	2713342.080	991424.549	R=150.00' Δ=25°45'18" L=67.43' T=34.29'		89+75.80	2713324.134	991488.956
L10	89+75.80	2713324.134	991488.956		S87° 18' 29"E 45.67'	90+21.47	2713321.989	991534.575
C20	90+21.47	2713321.989	991534.575	R=500.00' Δ=8°02'38" L=70.20' T=35.16'		90+91.67	2713323.617	991604.694
L11	90+91.67	2713323.617	991604.694		N84° 38' 54"E 100.49'	91+92.16	2713332.989	991704.747
C21	91+92.16	2713332.989	991704.747	R=150.00' Δ=23°15'20" L=60.88' T=30.87'		92+53.04	2713326.379	991764.850
C22	92+53.04	2713326.379	991764.850	R=200.00' Δ=27°16'39" L=95.22' T=48.53'		93+48.26	2713319.365	991858.909
C23	93+48.26	2713319.365	991858.909	R=500.00' Δ=12°46'48" L=111.53' T=56.00'		94+59.78	2713349.601	991966.018

CCRT PHASE 3 - WEST CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L12	94+59.78	2713349.601	991966.018		N67° 50' 47"E 51.65'	95+11.44	2713369.078	992013.857
C24	95+11.44	2713369.078	992013.857	R=150.00' Δ=22°52'18" L=59.88' T=30.34'		95+71.31	2713380.140	992072.300
L13	95+71.31	2713380.140	992072.300		S89° 16' 55"E 258.46'	98+29.77	2713376.901	992330.739
C25	98+29.77	2713376.901	992330.739	R=400.00' Δ=11°33'52" L=80.73' T=40.50'		99+10.51	2713367.777	992410.818
L14	99+10.51	2713367.777	992410.818		S77° 43' 03"E 97.85'	100+08.35	2713346.962	992506.425
C26	100+08.35	2713346.962	992506.425	R=200.00' Δ=26°09'26" L=91.31' T=46.46'		100+99.66	2713308.192	992588.217
L15	100+99.66	2713308.192	992588.217		S51° 33' 38"E 91.35'	101+91.01	2713251.402	992659.767
C27	101+91.01	2713251.402	992659.767	R=200.00' Δ=33°42'58" L=117.69' T=60.60'		103+08.70	2713208.734	992767.635
L16	103+08.70	2713208.734	992767.635		S85° 16' 36"E 172.56'	104+81.26	2713194.525	992939.606
C28	104+81.26	2713194.525	992939.606	R=200.00' Δ=36°54'44" L=128.85' T=66.75'		106+10.10	2713224.586	993062.617
C29	106+10.10	2713224.586	993062.617	R=400.00' Δ=18°40'48" L=130.41' T=65.79'		107+40.52	2713310.666	993159.814
C30	107+40.52	2713310.666	993159.814	R=240.00' Δ=80°04'44" L=335.43' T=201.67'		110+75.95	2713368.683	993463.106
L17	110+75.95	2713368.683	993463.106		S60° 47' 24"E 122.08'	111+98.03	2713309.108	993569.659
C31	111+98.03	2713309.108	993569.659	R=150.00' Δ=51°59'25" L=136.11' T=73.14'		113+34.14	2713301.734	993700.941
L18	113+34.14	2713301.734	993700.941		N67° 13' 11"E 74.08'	114+08.22	2713330.420	993769.247
C32	114+08.22	2713330.420	993769.247	R=800.00' Δ=30°34'00" L=426.79' T=218.60'		118+35.01	2713385.447	994187.388
C33	118+35.01	2713385.447	994187.388	R=500.00' Δ=10°07'18" L=88.33' T=44.28'		119+23.34	2713381.252	994275.501
L19	119+23.34	2713381.252	994275.501		N87° 39' 53"E 139.45'	120+62.79	2713386.935	994414.834
C34	120+62.79	2713386.935	994414.834	R=500.00' Δ=5°56'33" L=51.86' T=25.95'		121+14.64	2713386.359	994466.665
L20	121+14.64	2713386.359	994466.665		S86° 23' 34"E 239.00'	123+53.64	2713371.323	994705.187
C35	123+53.64	2713371.323	994705.187	R=400.00' Δ=73°02'19" L=509.91' T=296.19'		128+63.54	2713064.503	995069.205
L21	128+63.54	2713064.503	995069.205		S13° 21' 15"E 113.29'	129+76.83	2712954.279	995095.371
C36	129+76.83	2712954.279	995095.371	R=300.00' Δ=16°02'51" L=84.02' T=42.29'		130+60.86	2712876.292	995125.899
L22	130+60.86	2712876.292	995125.899		S29° 24' 06"E 60.92'	131+21.77	2712823.222	995155.805
C37	131+21.77	2712823.222	995155.805	R=170.00' Δ=46°33'32" L=138.14' T=73.14'		132+59.92	2712741.758	995262.669
L23	132+59.92	2712741.758	995262.669		S75° 57' 38"E 659.95'	139+19.87	2712581.660	995902.910
C38	139+19.87	2712581.660	995902.910	R=300.00' Δ=17°18'07" L=90.59' T=45.64'		140+10.46	2712546.846	995986.174
C39	140+10.46	2712546.846	995986.174	R=300.00' Δ=15°28'14" L=81.00' T=40.75'		140+91.47	2712514.507	996060.174
C40	140+91.47	2712514.507	996060.174	R=1400.00' Δ=33°06'24" L=808.95' T=416.12'		149+00.41	2712086.772	996733.548
C41	149+00.41	2712086.772	996733.548	R=150.00' Δ=51°46'27" L=135.54' T=72.79'		150+35.96	2712035.404	996854.034

CCRT PHASE 3 - EAST CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C42	500+00.00	2712035.404	996854.034	R=150.00' Δ=37°01'55" L=96.95' T=50.24'		500+96.95	2712070.031	996942.789
L24	500+96.95	2712070.031	996942.789		N50° 10' 18"E 226.80'	503+23.75	2712215.295	997116.964
C43	503+23.75	2712215.295	997116.964	R=400.00' Δ=13°57'06" L=97.40' T=48.94'		504+21.15	2712286.126	997183.470
L25	504+21.15	2712286.126	997183.470		N36° 13' 12"E 545.94'	509+67.09	2712726.569	997506.061
C44	509+67.09	2712726.569	997506.061	R=400.00' Δ=69°41'59" L=486.60' T=278.52'		514+53.69	2712874.873	997938.478
L26	514+53.69	2712874.873	997938.478		S74° 04' 49"E 43.21'	514+96.90	2712863.021	997980.030
C45	514+96.90	2712863.021	997980.030	R=800.00' Δ=11°08'09" L=155.48' T=77.99'		516+52.38	2712835.126	998132.743
L27	516+52.38	2712835.126	998132.743		S85° 12' 58"E 258.44'	519+10.82	2712813.573	998390.281
C46	519+10.82	2712813.573	998390.281	R=1000.00' Δ=12°28'06" L=217.61' T=109.24'		521+28.44	2712772.065	998603.463
L28	521+28.44	2712772.065	998603.463		S72° 44' 52"E 52.03'	521+80.47	2712756.634	998653.151
C47	521+80.47	2712756.634	998653.151	R=1000.00' Δ=13°50'20" L=241.53' T=121.36'		524+22.00	2712713.416	998890.190
L29	524+22.00	2712713.416	998890.190		S86° 35' 11"E 178.71'	526+00.71	2712702.775	999068.581
C48	526+00.71	2712702.775	999068.581	R=800.00' Δ=13°13'15" L=184.60' T=92.71'		527+85.30	2712670.716	999249.956
L30	527+85.30	2712670.716	999249.956		S73° 21' 57"E 56.55'	528+41.86	2712654.528	999304.142
C49	528+41.86	2712654.528	999304.142	R=600.00' Δ=48°10'51" L=504.55' T=268.27'		533+46.40	2712334.963	999675.349
C50	533+46.40	2712334.963	999675.349	R=300.00' Δ=23°12'50" L=121.55' T=61.62'		534+67.95	2712217.619	999703.690
L31	534+67.95	2712217.619	999703.690		S1° 58' 17"E 128.78'	535+96.73	2712088.919	999708.120
C51	535+96.73	2712088.919	999708.120	R=1000.00' Δ=11°21'05" L=198.12' T=99.39'		537+94.85	2711892.881	999734.441
L32	537+94.85	2711892.881	999734.441		S13° 19' 22"E 207.04'	540+01.89	2711691.415	999782.150
C52	540+01.89	2711691.415	999782.150	R=2000.00' Δ=7°14'50" L=252.98' T=126.66'		542+54.87	2711442.217	999824.742
L33	542+54.87	2711442.217	999824.742		S6° 04' 32"E 477.96'	547+32.83	2710966.940	999875.329
C53	547+32.83	2710966.940	999875.329	R=500.00' Δ=8°08'31" L=71.05' T=35.59'		548+03.88	2710897.058	999887.835
L34	548+03.88	2710897.058	999887.835		S14° 13' 03"E 42.79'	548+46.67	2710855.582	999898.344
C54	548+46.67	2710855.582	999898.344	R=100.00' Δ=96°17'01" L=168.05' T=111.62'		550+14.71	2710786.476	1000030.304
L35	550+14.71	2710786.476	1000030.304		N69° 29' 56"E 57.96'	550+72.68	2710806.776	1000084.596
C55	550+72.68	2710806.776	1000084.596	R=220.00' Δ=10°11'44" L=39.15' T=19.63'		551+11.82	2710823.668	1000119.855
C56	551+11.82	2710823.668	1000119.855	R=405.00' Δ=12°27'11" L=88.02' T=44.19'		551+99.85	2710860.059	1000199.815
C57	551+99.85	2710860.059	1000199.815	R=160.00' Δ=13°17'57" L=37.14' T=18.65'		552+36.99	2710875.656	1000233.428
C58	552+36.99	2710875.656	1000233.428	R=150.00' Δ=22°32'19" L=59.01' T=29.89'		552+95.99	2710895.971	1000288.422
C59	552+95.99	2710895.971	1000288.422	R=200.00' Δ=12°58'00" L=45.26' T=22.73'		553+41.26	2710908.031	1000331.947
C60	553+41.26	2710908.031	1000331.947	R=1000.00' Δ=7°15'17" L=126.62' T=63.40'		554+67.88	2710947.855	1000452.054
L36	554+67.88	2710947.855	1000452.054		N75° 17' 01"E 68.83'	555+36.71	2710965.340	1000518.625
C61	555+36.71	2710965.340	1000518.625	R=550.00' Δ=3°47'34" L=36.41' T=18.21'		555+73.12	2710975.747	1000553.508

CCRT PHASE 3 - EAST CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L37	555+73.12	2710975.747	1000553.508		N71° 29' 27"E 106.35'	556+79.47	2711009.510	1000654.361
C62	556+79.47	2711009.510	1000654.361	R=1000.00' Δ=2°15'25" L=39.39' T=19.70'		557+18.86	2711021.276	1000691.950
C63	557+18.86	2711021.276	1000691.950	R=700.00' Δ=7°23'18" L=90.26' T=45.19'		558+09.12	2711052.048	1000776.741
L38	558+09.12	2711052.048	1000776.741		N66° 21' 34"E 32.33'	558+41.45	2711065.013	1000806.358
C64	558+41.45	2711065.013	1000806.358	R=700.00' Δ=2°07'32" L=25.97' T=12.99'		558+67.42	2711074.983	1000830.337
L39	558+67.42	2711074.983	1000830.337		N68° 29' 06"E 106.52'	559+73.94	2711114.048	1000929.434
C65	559+73.94	2711114.048	1000929.434	R=350.00' Δ=12°34'50" L=76.85' T=38.58'		560+50.79	2711134.189	1001003.439
L40	560+50.79	2711134.189	1001003.439		N81° 03' 56"E 113.48'	561+64.28	2711151.814	1001115.546
C66	561+64.28	2711151.814	1001115.546	R=300.00' Δ=13°17'32" L=69.60' T=34.96'		562+33.88	2711170.465	1001182.436
L41	562+33.88	2711170.465	1001182.436		N67° 46' 24"E 55.83'	562+89.71	2711191.584	1001234.117
C67	562+89.71	2711191.584	1001234.117	R=600.00' Δ=3°15'40" L=34.15' T=17.08'		563+23.86	2711203.596	1001266.080
L42	563+23.86	2711203.596	1001266.080		N71° 02' 04"E 73.85'	563+97.70	2711227.595	1001335.917
C68	563+97.70	2711227.595	1001335.917	R=800.00' Δ=1°48'42" L=25.30' T=12.65'		564+23.00	2711236.194	1001359.707
L43	564+23.00	2711236.194	1001359.707		N69° 13' 22"E 99.83'	565+22.83	2711271.609	1001453.049
C69	565+22.83	2711271.609	1001453.049	R=800.00' Δ=5°26'04" L=75.88' T=37.97'		565+98.71	2711295.123	1001525.161
C70	565+98.71	2711295.123	1001525.161	R=400.00' Δ=3°46'48" L=26.39' T=13.20'		566+25.10	2711302.940	1001550.362
L44	566+25.10	2711302.940	1001550.362		N70° 52' 37"E 59.11'	566+84.21	2711322.303	1001606.207
C71	566+84.21	2711322.303	1001606.207	R=550.00' Δ=2°07'05" L=20.33' T=10.17'		567+04.54	2711328.607	1001625.535
L45	567+04.54	2711328.607	1001625.535		N72° 59' 42"E 107.55'	568+12.09	2711360.060	1001728.379
C72	568+12.09	2711360.060	1001728.379	R=400.00' Δ=5°27'04" L=38.06' T=19.04'		568+50.14	2711369.443	1001765.245
L46	568+50.14	2711369.443	1001765.245		N78° 26' 46"E 29.43'	568+79.57	2711375.337	1001794.075
C73	568+79.57	2711375.337	1001794.075	R=450.00' Δ=9°51'54" L=77.48' T=38.84'		569+57.05	2711397.298	1001868.278
L47	569+57.05	2711397.298	1001868.278		N68° 34' 51"E 92.08'	570+49.13	2711430.923	1001953.996
C74	570+49.13	2711430.923	1001953.996	R=800.00' Δ=3°34'40" L=49.96' T=24.99'		570+99.08	2711447.703	1002001.042
L48	570+99.08	2711447.703	1002001.042		N72° 09' 31"E 101.36'	572+00.44	2711478.759	1002097.529
C75	572+00.44	2711478.759	1002097.529	R=500.00' Δ=5°38'53" L=49.29' T=24.66'		572+49.73	2711496.146	1002143.629
L49	572+49.73	2711496.146	1002143.629		N66° 30' 38"E 102.46'	573+52.19	2711536.984	1002237.596
C76	573+52.19	2711536.984	1002237.596	R=550.00' Δ=13°18'22" L=127.73' T=64.15'		574+79.92	2711573.896	1002359.576
L50	574+79.92	2711573.896	1002359.576		N79° 49' 00"E 21.57'	575+01.49	2711577.709	1002380.804
C77	575+01.49	2711577.709	1002380.804	R=400.00' Δ=7°22'19" L=51.47' T=25.77'		575+52.95	2711590.038	1002430.735
L51	575+52.95	2711590.038	1002430.735		N72° 26' 41"E 158.03'	577+10.98	2711637.703	1002581.403
C78	577+10.98	2711637.703	1002581.403	R=1000.00' Δ=2°40'01" L=46.55' T=23.28'		577+57.53	2711650.705	1002626.094
L52	577+57.53	2711650.705	1002626.094		N75° 06' 42"E 92.39'	578+49.92	2711674.443	1002715.381

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	09	267
PROJECT FILE NO. 607398			

CONSTRUCTION BASELINE DATA

607398_HD(BL-TIE).DWG Plotted on 22-Nov-2021 3:05 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	10	267

PROJECT FILE NO. 607398

CONSTRUCTION BASELINE DATA

CCRT PHASE 3 - EAST CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C79	578+49.92	2711674.443	1002715.381	R=800.00' Δ=8°13'02" L=114.73' T=57.47'		579+64.65	2711711.758	1002823.773
L53	579+64.65	2711711.758	1002823.773		N66° 53' 41"E 18.40'	579+83.05	2711718.979	1002840.698
C80	579+83.05	2711718.979	1002840.698	R=700.00' Δ=9°43'40" L=118.85' T=59.57'		581+01.90	2711756.136	1002953.436
C81	581+01.90	2711756.136	1002953.436	R=280.00' Δ=32°14'00" L=157.52' T=80.91'		582+59.42	2711832.672	1003088.742
C82	582+59.42	2711832.672	1003088.742	R=100.00' Δ=46°05'41" L=80.45' T=42.55'		583+39.87	2711905.601	1003117.237
L54	583+39.87	2711905.601	1003117.237		N1° 42' 21"W 28.11'	583+67.98	2711933.697	1003116.401
C83	583+67.98	2711933.697	1003116.401	R=500.00' Δ=2°58'40" L=25.99' T=13.00'		583+93.97	2711959.640	1003114.953
L55	583+93.97	2711959.640	1003114.953		N4° 41' 01"W 108.23'	585+02.20	2712067.507	1003106.115
C84	585+02.20	2712067.507	1003106.115	R=350.00' Δ=5°39'43" L=34.59' T=17.31'		585+36.78	2712101.783	1003101.594
L56	585+36.78	2712101.783	1003101.594		N10° 20' 44"W 75.87'	586+12.65	2712176.420	1003087.969
C85	586+12.65	2712176.420	1003087.969	R=500.00' Δ=3°11'55" L=27.91' T=13.96'		586+40.56	2712203.724	1003082.193
L57	586+40.56	2712203.724	1003082.193		N13° 32' 38"W 48.73'	586+89.30	2712251.101	1003070.780
C86	586+89.30	2712251.101	1003070.780	R=500.00' Δ=9°52'27" L=86.17' T=43.19'		587+75.46	2712336.193	1003057.901
L58	587+75.46	2712336.193	1003057.901		N3° 40' 12"W 36.37'	588+11.83	2712372.488	1003055.573
C87	588+11.83	2712372.488	1003055.573	R=500.00' Δ=4°11'37" L=36.60' T=18.31'		588+48.43	2712409.063	1003054.568
C88	588+48.43	2712409.063	1003054.568	R=130.00' Δ=63°55'35" L=145.04' T=81.12'		589+93.48	2712525.162	1003128.494
C89	589+93.48	2712525.162	1003128.494	R=100.00' Δ=25°52'08" L=45.15' T=22.97'		590+38.63	2712553.021	1003163.537
L59	590+38.63	2712553.021	1003163.537		N38° 34' 53"E 49.99'	590+88.62	2712592.102	1003194.715
C90	590+88.62	2712592.102	1003194.715	R=60.00' Δ=90°57'38" L=95.25' T=61.01'		591+83.87	2712600.955	1003279.817
C91	591+83.87	2712600.955	1003279.817	R=60.00' Δ=32°12'14" L=33.72' T=17.32'		592+17.60	2712587.716	1003310.352
L60	592+17.60	2712587.716	1003310.352		S82° 39' 44"E 134.36'	593+51.95	2712570.556	1003443.609
L61	593+51.95	2712570.556	1003443.609		N67° 37' 56"E 51.68'	594+03.63	2712590.222	1003491.400
C92	594+03.63	2712590.222	1003491.400	R=60.00' Δ=10°34'39" L=11.08' T=5.55'		594+14.71	2712595.356	1003501.197
C93	594+14.71	2712595.356	1003501.197	R=100.00' Δ=20°55'05" L=36.51' T=18.46'		594+51.22	2712609.242	1003534.743
L62	594+51.22	2712609.242	1003534.743		N77° 58' 22"E 74.03'	595+25.25	2712624.668	1003607.148
C94	595+25.25	2712624.668	1003607.148	R=175.00' Δ=31°57'27" L=97.61' T=50.11'		596+22.86	2712618.029	1003703.267
L63	596+22.86	2712618.029	1003703.267		S70° 04' 11"E 92.34'	597+15.20	2712586.551	1003790.079
C95	597+15.20	2712586.551	1003790.079	R=200.00' Δ=19°37'53" L=68.53' T=34.60'		597+83.73	2712574.575	1003857.211
L64	597+83.73	2712574.575	1003857.211		S89° 42' 04"E 169.47'	599+53.19	2712573.691	1004026.677
C96	599+53.19	2712573.691	1004026.677	R=200.00' Δ=15°10'29" L=52.97' T=26.64'		600+06.16	2712580.392	1004079.065
L65	600+06.16	2712580.392	1004079.065		N75° 07' 27"E 60.03'	600+66.20	2712595.804	1004137.088
C97	600+66.20	2712595.804	1004137.088	R=150.00' Δ=9°56'37" L=26.03' T=13.05'		600+92.23	2712600.276	1004162.700
L66	600+92.23	2712600.276	1004162.700		N85° 04' 04"E 151.18'	602+43.42	2712613.274	1004313.324

CCRT PHASE 3 - EAST CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C98	602+43.42	2712613.274	1004313.324	R=200.00' Δ=7°44'14" L=27.01' T=13.52'		602+70.42	2712613.775	1004340.307
L67	602+70.42	2712613.775	1004340.307		S87° 11' 42"E 32.68'	603+03.10	2712612.176	1004372.947
C99	603+03.10	2712612.176	1004372.947	R=200.00' Δ=7°09'52" L=25.01' T=12.52'		603+28.11	2712612.515	1004397.938
L68	603+28.11	2712612.515	1004397.938		N85° 38' 26"E 59.61'	603+87.72	2712617.046	1004457.374
C100	603+87.72	2712617.046	1004457.374	R=200.00' Δ=2°38'51" L=9.24' T=4.62'		603+96.96	2712617.536	1004466.601
L69	603+96.96	2712617.536	1004466.601		N88° 17' 16"E 64.82'	604+61.78	2712619.472	1004531.387
C101	604+61.78	2712619.472	1004531.387	R=250.00' Δ=6°59'34" L=30.51' T=15.27'		604+92.29	2712618.523	1004561.865
L70	604+92.29	2712618.523	1004561.865		S84° 43' 10"E 19.25'	605+11.54	2712616.751	1004581.037
C102	605+11.54	2712616.751	1004581.037	R=250.00' Δ=8°27'59" L=36.94' T=18.50'		605+48.48	2712616.076	1004617.939
L71	605+48.48	2712616.076	1004617.939		N86° 48' 51"E 79.93'	606+28.41	2712620.518	1004697.741
C103	606+28.41	2712620.518	1004697.741	R=500.00' Δ=6°53'33" L=60.15' T=30.11'		606+88.56	2712620.244	1004757.853
L72	606+88.56	2712620.244	1004757.853		S86° 17' 36"E 138.52'	608+27.08	2712611.289	1004896.084
C104	608+27.08	2712611.289	1004896.084	R=500.00' Δ=2°12'58" L=19.34' T=9.67'		608+46.42	2712609.666	1004915.354
L73	608+46.42	2712609.666	1004915.354		S84° 04' 38"E 56.61'	609+03.03	2712603.824	1004971.662
C105	609+03.03	2712603.824	1004971.662	R=500.00' Δ=10°01'41" L=87.51' T=43.87'		609+90.54	2712602.438	1005059.050
L74	609+90.54	2712602.438	1005059.050		N85° 53' 42"E 40.38'	610+30.91	2712605.328	1005099.322
C106	610+30.91	2712605.328	1005099.322	R=75.00' Δ=32°28'06" L=42.50' T=21.84'		610+73.42	2712619.903	1005138.642
L75	610+73.42	2712619.903	1005138.642		N53° 25' 36"E 26.94'	611+00.36	2712635.957	1005160.279
C107	611+00.36	2712635.957	1005160.279	R=100.00' Δ=24°11'07" L=42.21' T=21.42'		611+42.57	2712653.319	1005198.411
L76	611+42.57	2712653.319	1005198.411		N77° 36' 43"E 78.38'	612+20.95	2712670.135	1005274.969
C108	612+20.95	2712670.135	1005274.969	R=75.00' Δ=79°47'52" L=104.45' T=62.71'		613+25.41	2712746.249	1005333.824
L77	613+25.41	2712746.249	1005333.824		N2° 11' 09"W 26.14'	613+51.55	2712772.372	1005332.827
C109	613+51.55	2712772.372	1005332.827	R=75.00' Δ=45°36'58" L=59.71' T=31.54'		614+11.26	2712826.793	1005353.306
L78	614+11.26	2712826.793	1005353.306		N43° 25' 49"E 18.86'	614+30.12	2712840.491	1005366.273
C110	614+30.12	2712840.491	1005366.273	R=150.00' Δ=15°14'42" L=39.91' T=20.07'		614+70.03	2712865.505	1005397.222
L79	614+70.03	2712865.505	1005397.222		N58° 40' 30"E 13.57'	614+83.60	2712872.559	1005408.812
C111	614+83.60	2712872.559	1005408.812	R=230.00' Δ=25°10'06" L=101.03' T=51.34'		615+84.63	2712904.759	1005503.720
L80	615+84.63	2712904.759	1005503.720		N83° 50' 36"E 55.01'	616+39.64	2712910.658	1005558.408
C112	616+39.64	2712910.658	1005558.408	R=800.00' Δ=3°52'21" L=54.07' T=27.05'		616+93.71	2712914.637	1005612.323
L81	616+93.71	2712914.637	1005612.323		N87° 42' 57"E 59.94'	617+53.65	2712917.026	1005672.216
C113	617+53.65	2712917.026	1005672.216	R=60.00' Δ=24°40'39" L=25.84' T=13.12'		617+79.49	2712923.499	1005697.028
C114	617+79.49	2712923.499	1005697.028	R=60.00' Δ=22°54'30" L=23.99' T=12.16'		618+03.48	2712929.871	1005719.991
L82	618+03.48	2712929.871	1005719.991		N85° 56' 49"E 60.15'	618+63.64	2712934.122	1005779.994

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	11	267

PROJECT FILE NO. 607398

CONSTRUCTION BASELINE DATA

CCRT PHASE 3 - EAST CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L83	618+63.64	2712934.122	1005779.994		N87° 27' 08"E 76.82'	619+40.46	2712937.537	1005856.739
C115	619+40.46	2712937.537	1005856.739	R=60.00' Δ=54°10'22" L=56.73' T=30.69'		619+97.19	2712914.845	1005906.444
L84	619+97.19	2712914.845	1005906.444		S38° 22' 30"E 93.97'	620+91.16	2712841.174	1005964.782
C116	620+91.16	2712841.174	1005964.782	R=280.00' Δ=37°56'16" L=185.40' T=96.24'		622+76.56	2712742.950	1006118.038
L85	622+76.56	2712742.950	1006118.038		S76° 18' 46"E 54.07'	623+30.63	2712730.155	1006170.577
C117	623+30.63	2712730.155	1006170.577	R=200.00' Δ=25°02'48" L=87.43' T=44.42'		624+18.06	2712728.393	1006257.294
L86	624+18.06	2712728.393	1006257.294		N78° 38' 26"E 32.03'	624+50.09	2712734.702	1006288.697
C118	624+50.09	2712734.702	1006288.697	R=70.00' Δ=71°47'10" L=87.70' T=50.66'		625+37.80	2712794.976	1006344.410
L87	625+37.80	2712794.976	1006344.410		N6° 51' 16"E 63.33'	626+01.13	2712857.854	1006351.968
C119	626+01.13	2712857.854	1006351.968	R=100.00' Δ=11°28'22" L=20.02' T=10.05'		626+21.15	2712877.364	1006356.326
L88	626+21.15	2712877.364	1006356.326		N18° 19' 38"E 105.56'	627+26.71	2712977.573	1006389.520
C120	627+26.71	2712977.573	1006389.520	R=350.00' Δ=13°43'39" L=83.86' T=42.13'		628+10.57	2713059.560	1006406.146
L89	628+10.57	2713059.560	1006406.146		N4° 36' 00"E 93.60'	629+04.17	2713152.854	1006413.652
C121	629+04.17	2713152.854	1006413.652	R=100.00' Δ=27°47'29" L=48.51' T=24.74'		629+52.67	2713198.404	1006428.889
L90	629+52.67	2713198.404	1006428.889		N32° 23' 29"E 49.37'	630+02.04	2713240.090	1006455.335
C122	630+02.04	2713240.090	1006455.335	R=300.00' Δ=10°32'57" L=55.24' T=27.70'		630+57.27	2713289.185	1006480.476
L91	630+57.27	2713289.185	1006480.476		N21° 50' 31"E 61.11'	631+18.39	2713345.912	1006503.214
L92	631+18.39	2713345.912	1006503.214		N22° 46' 53"E 54.35'	631+72.74	2713396.024	1006524.259

607398_HD(BL-TIE).DWG Plotted on 22-Nov-2021 3:05 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	12	267
PROJECT FILE NO. 607398			

CONSTRUCTION BASELINE DATA

607398_HD(BL-TIE).DWG Plotted on 22-Nov-2021 3:05 PM

CCRT - HIGGINS-CROWELL SPUR CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L93	800+00.00	2710077.953	997823.398		N65° 55' 06"E 48.66'	800+48.66	2710097.810	997867.826
C123	800+48.66	2710097.810	997867.826	R=100.00' Δ=11°01'17" L=19.24' T=9.65'		800+67.90	2710103.927	997886.032
L94	800+67.90	2710103.927	997886.032		N76° 56' 22"E 60.70'	801+28.60	2710117.645	997945.164
C124	801+28.60	2710117.645	997945.164	R=100.00' Δ=3°43'56" L=6.51' T=3.26'		801+35.12	2710119.322	997951.457
L95	801+35.12	2710119.322	997951.457		N73° 12' 27"E 99.66'	802+34.78	2710148.115	998046.868
C125	802+34.78	2710148.115	998046.868	R=100.00' Δ=2°34'52" L=4.51' T=2.25'		802+39.28	2710149.513	998051.150
L96	802+39.28	2710149.513	998051.150		N70° 37' 34"E 94.31'	803+33.60	2710180.800	998140.123
C126	803+33.60	2710180.800	998140.123	R=100.00' Δ=1°10'55" L=2.06' T=1.03'		803+35.66	2710181.504	998142.062
L97	803+35.66	2710181.504	998142.062		N69° 26' 39"E 48.39'	803+84.05	2710198.496	998187.374
C127	803+84.05	2710198.496	998187.374	R=100.00' Δ=3°31'13" L=6.14' T=3.07'		803+90.20	2710200.475	998193.190
L98	803+90.20	2710200.475	998193.190		N72° 57' 51"E 45.67'	804+35.86	2710213.855	998236.854
C128	804+35.86	2710213.855	998236.854	R=100.00' Δ=3°54'27" L=6.82' T=3.41'		804+42.68	2710215.629	998243.438
L99	804+42.68	2710215.629	998243.438		N76° 52' 18"E 46.22'	804+88.90	2710226.127	998288.449
C129	804+88.90	2710226.127	998288.449	R=200.00' Δ=1°23'25" L=4.85' T=2.43'		804+93.76	2710227.286	998293.162
L100	804+93.76	2710227.286	998293.162		N75° 28' 53"E 32.30'	805+26.05	2710235.383	998324.428
C130	805+26.05	2710235.383	998324.428	R=100.00' Δ=4°00'06" L=6.98' T=3.49'		805+33.04	2710237.369	998331.123
L101	805+33.04	2710237.369	998331.123		N71° 28' 47"E 97.42'	806+30.45	2710268.312	998423.493
C131	806+30.45	2710268.312	998423.493	R=200.00' Δ=2°09'42" L=7.55' T=3.77'		806+38.00	2710270.843	998430.601
L102	806+38.00	2710270.843	998430.601		N69° 19' 05"E 48.13'	806+86.13	2710287.843	998475.633
C132	806+86.13	2710287.843	998475.633	R=115.00' Δ=2°38'12" L=5.29' T=2.65'		806+91.43	2710289.597	998480.625
L103	806+91.43	2710289.597	998480.625		N71° 57' 18"E 44.76'	807+36.18	2710303.462	998523.181
C133	807+36.18	2710303.462	998523.181	R=100.00' Δ=2°18'26" L=4.03' T=2.01'		807+40.21	2710304.786	998526.984
L104	807+40.21	2710304.786	998526.984		N69° 38' 52"E 95.84'	808+36.04	2710338.117	998616.837
C134	808+36.04	2710338.117	998616.837	R=200.00' Δ=3°36'04" L=12.57' T=6.29'		808+48.61	2710342.115	998628.752
L105	808+48.61	2710342.115	998628.752		N73° 14' 56"E 58.96'	809+07.57	2710359.107	998685.206
C135	809+07.57	2710359.107	998685.206	R=300.00' Δ=1°33'41" L=8.18' T=4.09'		809+15.75	2710361.357	998693.066
L106	809+15.75	2710361.357	998693.066		N74° 48' 37"E 15.96'	809+31.71	2710365.539	998708.469
C136	809+31.71	2710365.539	998708.469	R=300.00' Δ=1°31'46" L=8.01' T=4.00'		809+39.72	2710367.740	998716.168
L107	809+39.72	2710367.740	998716.168		N73° 16' 51"E 41.16'	809+80.87	2710379.580	998755.588
C137	809+80.87	2710379.580	998755.588	R=100.00' Δ=2°40'33" L=4.67' T=2.34'		809+85.54	2710381.028	998760.027
L108	809+85.54	2710381.028	998760.027		N70° 36' 18"E 27.09'	810+12.64	2710390.025	998785.582
C138	810+12.64	2710390.025	998785.582	R=200.00' Δ=0°52'23" L=3.05' T=1.52'		810+15.68	2710391.015	998788.464
L109	810+15.68	2710391.015	998788.464		N71° 28' 41"E 48.85'	810+64.54	2710406.533	998834.785
C139	810+64.54	2710406.533	998834.785	R=200.00' Δ=1°11'46" L=4.18' T=2.09'		810+68.71	2710407.901	998838.730

CCRT - HIGGINS-CROWELL SPUR CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L110	810+68.71	2710407.901	998838.730		N70° 16' 55"E 43.84'	811+12.55	2710422.693	998880.003
C140	811+12.55	2710422.693	998880.003	R=100.00' Δ=3°20'49" L=5.84' T=2.92'		811+18.40	2710424.503	998885.556
L111	811+18.40	2710424.503	998885.556		N73° 37' 43"E 47.73'	811+66.13	2710437.956	998931.351
C141	811+66.13	2710437.956	998931.351	R=100.00' Δ=3°45'45" L=6.57' T=3.28'		811+72.69	2710439.599	998937.708
L112	811+72.69	2710439.599	998937.708		N77° 23' 29"E 45.16'	812+17.85	2710449.456	998981.778
C142	812+17.85	2710449.456	998981.778	R=100.00' Δ=2°43'29" L=4.76' T=2.38'		812+22.61	2710450.604	998986.393
L113	812+22.61	2710450.604	998986.393		N74° 40' 00"E 94.47'	813+17.07	2710475.584	999077.495
C143	813+17.07	2710475.584	999077.495	R=300.00' Δ=0°33'14" L=2.90' T=1.45'		813+19.97	2710476.365	999080.289
L114	813+19.97	2710476.365	999080.289		N74° 06' 46"E 44.19'	813+64.17	2710488.463	999122.795
C144	813+64.17	2710488.463	999122.795	R=100.00' Δ=5°42'04" L=9.95' T=4.98'		813+74.12	2710491.658	999132.214
L115	813+74.12	2710491.658	999132.214		N68° 24' 41"E 90.54'	814+64.66	2710524.972	999216.405
C145	814+64.66	2710524.972	999216.405	R=200.00' Δ=2°09'12" L=7.52' T=3.76'		814+72.18	2710527.868	999223.340
L116	814+72.18	2710527.868	999223.340		N66° 15' 30"E 40.89'	815+13.07	2710544.331	999260.768
C146	815+13.07	2710544.331	999260.768	R=100.00' Δ=6°18'35" L=11.01' T=5.51'		815+24.08	2710548.201	999271.072
L117	815+24.08	2710548.201	999271.072		N72° 34' 05"E 40.37'	815+64.45	2710560.295	999309.589
C147	815+64.45	2710560.295	999309.589	R=200.00' Δ=1°18'06" L=4.54' T=2.27'		815+68.99	2710561.705	999313.908
L118	815+68.99	2710561.705	999313.908		N71° 15' 59"E 45.61'	816+14.60	2710576.354	999357.103
C148	816+14.60	2710576.354	999357.103	R=100.00' Δ=2°29'15" L=4.34' T=2.17'		816+18.95	2710577.659	999361.244
L119	816+18.95	2710577.659	999361.244		N73° 45' 14"E 198.06'	818+17.01	2710633.070	999551.398
C149	818+17.01	2710633.070	999551.398	R=100.00' Δ=1°58'49" L=3.46' T=1.73'		818+20.47	2710634.094	999554.699
L120	818+20.47	2710634.094	999554.699		N71° 46' 25"E 46.21'	818+66.68	2710648.549	999598.594
C150	818+66.68	2710648.549	999598.594	R=100.00' Δ=3°11'00" L=5.56' T=2.78'		818+72.24	2710650.139	999603.917
L121	818+72.24	2710650.139	999603.917		N74° 57' 25"E 49.29'	819+21.52	2710662.931	999651.515
C151	819+21.52	2710662.931	999651.515	R=100.00' Δ=2°30'44" L=4.38' T=2.19'		819+25.91	2710664.162	999655.724
L122	819+25.91	2710664.162	999655.724		N72° 26' 41"E 46.28'	819+72.19	2710678.121	999699.849
C152	819+72.19	2710678.121	999699.849	R=100.00' Δ=4°29'52" L=7.85' T=3.93'		819+80.04	2710680.780	999707.233
L123	819+80.04	2710680.780	999707.233		N67° 56' 49"E 41.18'	820+21.22	2710696.241	999745.398
C153	820+21.22	2710696.241	999745.398	R=100.00' Δ=6°00'35" L=10.49' T=5.25'		820+31.70	2710699.662	999755.308
L124	820+31.70	2710699.662	999755.308		N73° 57' 25"E 50.01'	820+81.72	2710713.485	999803.375
C154	820+81.72	2710713.485	999803.375	R=150.00' Δ=28°10'28" L=73.76' T=37.64'		821+55.48	2710750.138	999866.528
L125	821+55.48	2710750.138	999866.528		N45° 46' 57"E 83.00'	822+38.48	2710808.019	999926.012

MARY DUNN PARKING LOT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L126	40+00.00	2711588.715	989255.519		N51° 18' 15"E 250.00'	42+50.00	2711745.011	989450.638

HIGGINS CROWELL PARKING LOT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C155	200+00.00	2711966.496	996812.704	R=1550.00' Δ=6°46'38" L=183.34' T=91.78'		201+83.34	2711810.069	996908.131
L127	201+83.34	2711810.069	996908.131		S27° 59' 46"E 666.66'	208+50.00	2711221.426	997221.069

GOLF COURSE PARKING LOT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L128	30+00.00	2712640.660	1002865.867		S69° 49' 54"E 300.00'	33+00.00	2712537.226	1003147.472

WILLOW STREET CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C156	2000+00.00	2712082.119	995209.292	R=4400.00' Δ=17°02'05" L=1308.17' T=658.95'		2013+08.17	2713319.522	995618.658

WILLOW STREET SPUR - DOT YARD TO MAIN PATH CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L129	300+00.00	2712474.422	995457.502		N17° 42' 00"E 143.38'	301+43.38	2712611.014	995501.093
C157	301+43.38	2712611.014	995501.093	R=47.00' Δ=86°20'22" L=70.82' T=44.09'		302+14.20	2712642.320	995557.270
L130	302+14.20	2712642.320	995557.270		S75° 57' 38"E 343.13'	305+57.33	2712559.081	995890.150
C158	305+57.33	2712559.081	995890.150	R=75.00' Δ=22°28'40" L=29.42' T=14.90'		305+86.76	2712546.597	995916.585
C159	305+86.76	2712546.597	995916.585	R=47.00' Δ=40°19'39" L=33.08' T=17.26'		306+19.84	2712537.474	995947.677
C160	306+19.84	2712537.474	995947.677	R=20.00' Δ=58°42'45" L=20.49' T=11.25'		306+40.33	2712548.202	995964.091

HIGGINS CROWELL ROAD UTILITY ACCESS CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L131	400+00.00	2712440.181	995457.071		N17° 42' 00"E 176.13'	401+76.13	2712607.973	995510.620
C161	401+76.13	2712607.973	995510.620	R=37.00' Δ=86°20'22" L=55.76' T=34.71'		402+31.89	2712632.619	995554.844
L132	402+31.89	2712632.619	995554.844		S75° 57' 38"E 343.13'	405+75.01	2712549.380	995887.724
C162	405+75.01	2712549.380	995887.724	R=65.00' Δ=21°54'13" L=24.85' T=12.58'		405+99.86	2712538.946	995910.109
C163	405+99.86	2712538.946	995910.109	R=100.00' Δ=24°35'31" L=42.92' T=21.80'		406+42.78	2712521.862	995949.125
C164	406+42.78	2712521.862	995949.125	R=1381.00' Δ=37°37'35" L=906.91' T=470.49'		415+49.69	2712074.302	996719.213
C165	415+49.69	2712074.302	996719.213	R=500.00' Δ=4°43'05" L=41.17' T=20.60'		415+90.87	2712044.386	996747.485
C166	415+90.87	2712044.386	996747.485	R=500.00' Δ=10°38'12" L=92.82' T=46.55'		416+83.69	2711973.822	996807.586

OLD TOWN HOUSE ROAD CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L133	1000+00.00	2712703.686	1002866.790		S68° 44' 29"E 179.69'	1001+79.69	2712638.536	1003034.249
C167	1001+79.69	2712638.536	1003034.249	R=800.00' Δ=2°17'46" L=32.06' T=16.03'		1002+11.75	2712627.514	1003064.352
L134	1002+11.75	2712627.514	1003064.352		S71° 02' 15"E 179.34'	1003+91.08	2712569.238	1003233.958
C168	1003+91.08	2712569.238	1003233.958	R=540.00' Δ=18°59'14" L=178.95' T=90.30'		1005+70.03	2712539.933	1003409.663
L135	1005+70.03	2712539.933	1003409.663		N89° 58' 31"E 4129.97'	1047+00.00	2712541.713	1007539.629

WEST YARMOUTH ROAD CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L136	900+00.00	2712419.970	1003432.797		N1° 10' 38"E 500.00'	905+00.00	2712919.864	1003443.069

FOREST ROAD EXT. CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L137	950+00.00	2712540.910	1005676.211		N11° 30' 01"E 500.00'	955+00.00	2713030.871	1005775.898

TRANSFER STATION DRIVEWAY CONSTRUCTION BASELINE DATA

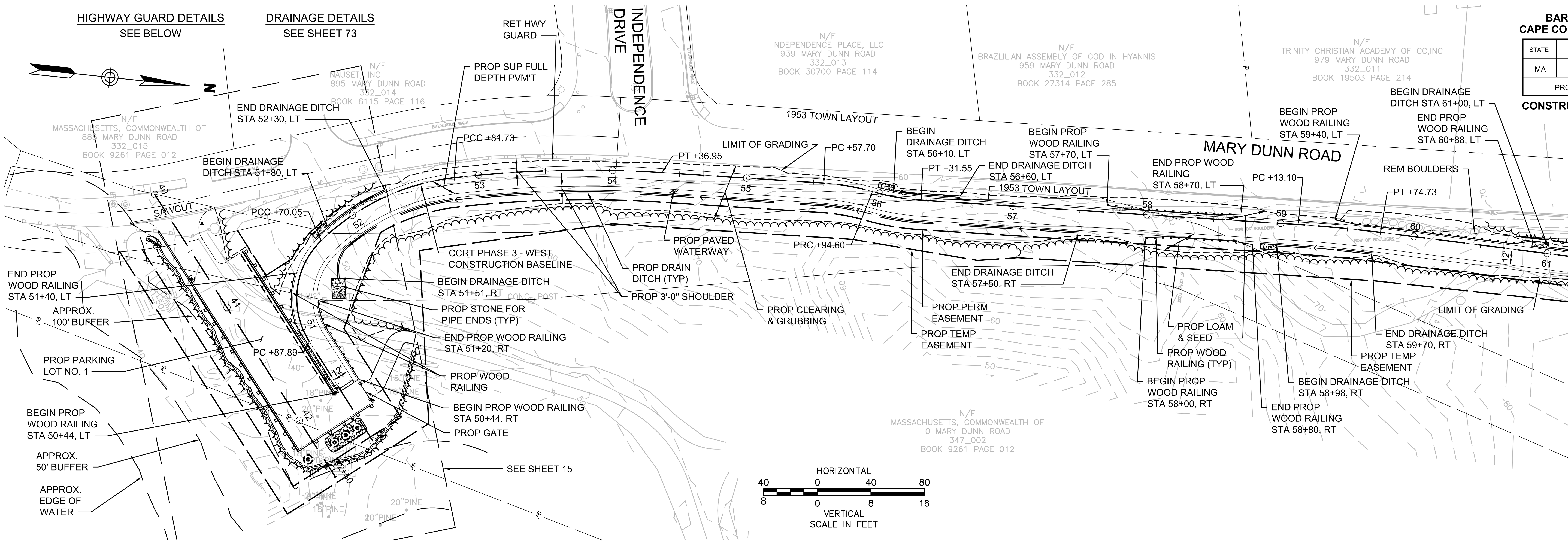
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L138	700+00.00	2713003.382	1005770.078		S78° 29' 59"E 57.94'	700+57.94	2712991.830	1005826.859
C169	700+57.94	2712991.830	1005826.859	R=200.00' Δ=21°48'29" L=76.12' T=38.53'		701+34.07	2712962.990	1005896.814
L139	701+34.07	2712962.990	1005896.814		S56° 41' 30"E 165.93'	703+00.00	2712871.870	1006035.486

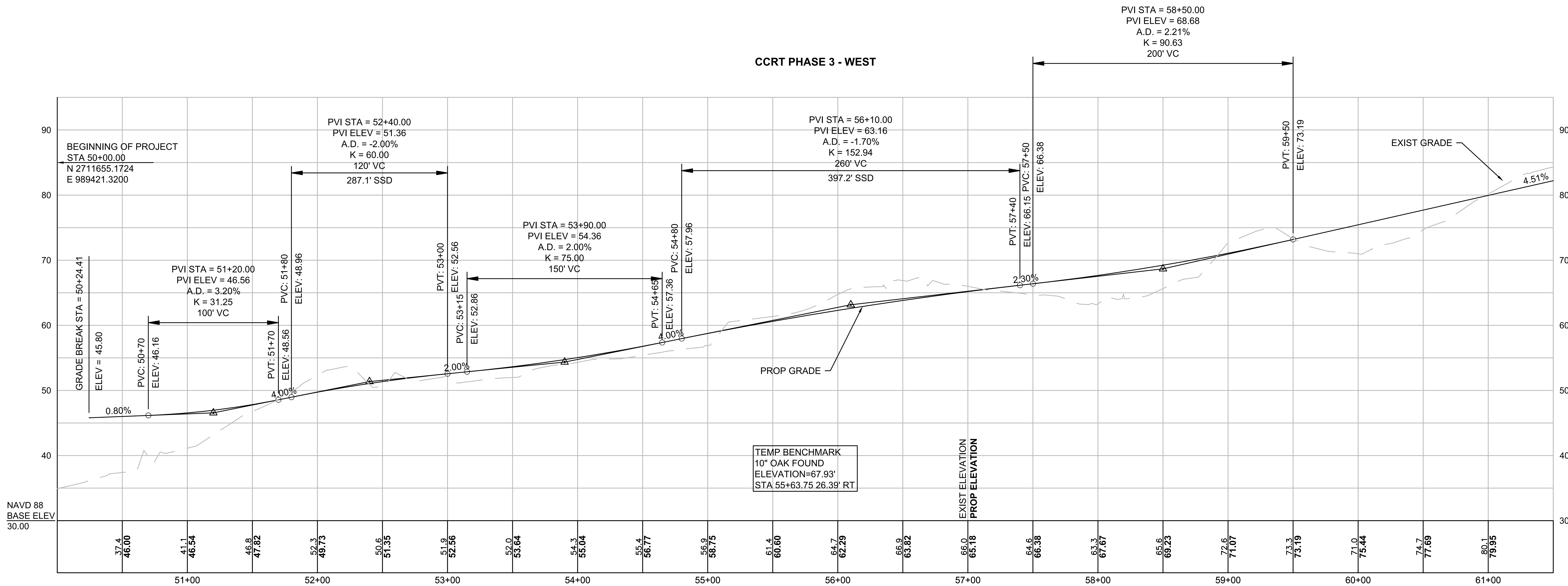
607398_HD(BL-TIE).DWG Plotted on 22-Nov-2021 3:06 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	14	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES



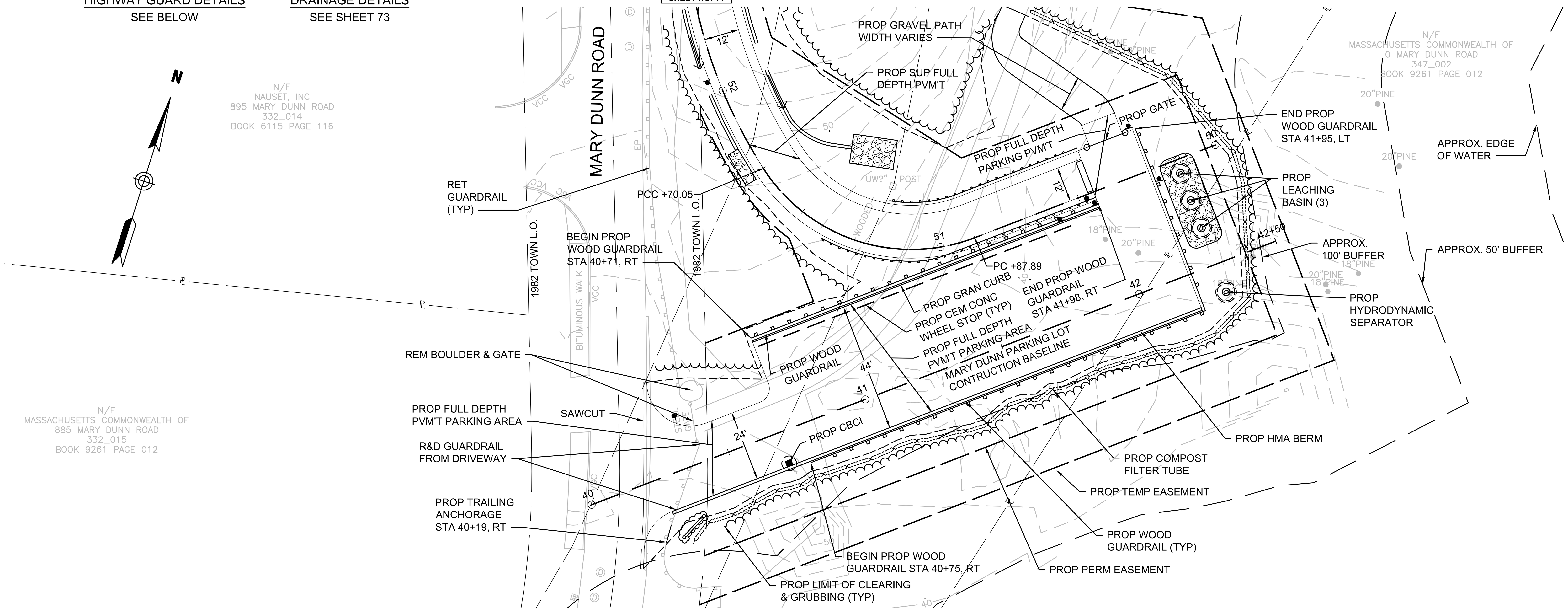


Plotted on 22-Nov-2021 3:10 PM
607398_HD(GEN).DWG

HIGHWAY GUARD DETAILS
SEE BELOW

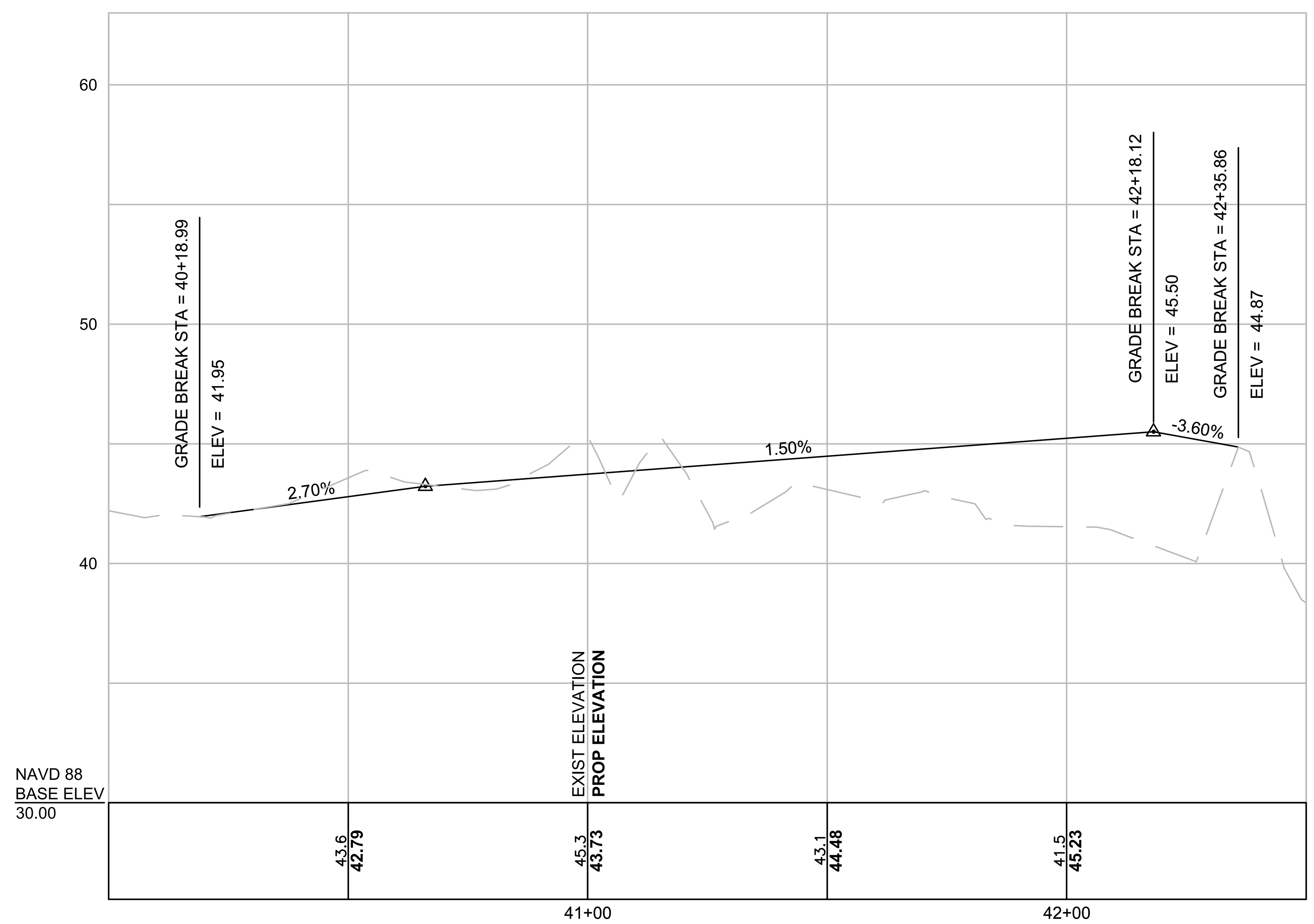
DRAINAGE DETAILS
SEE SHEET 73

CONTINUED ON SHEET NO. 14



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

PARKING LOT NO. 1 - MARY DUNN ROAD



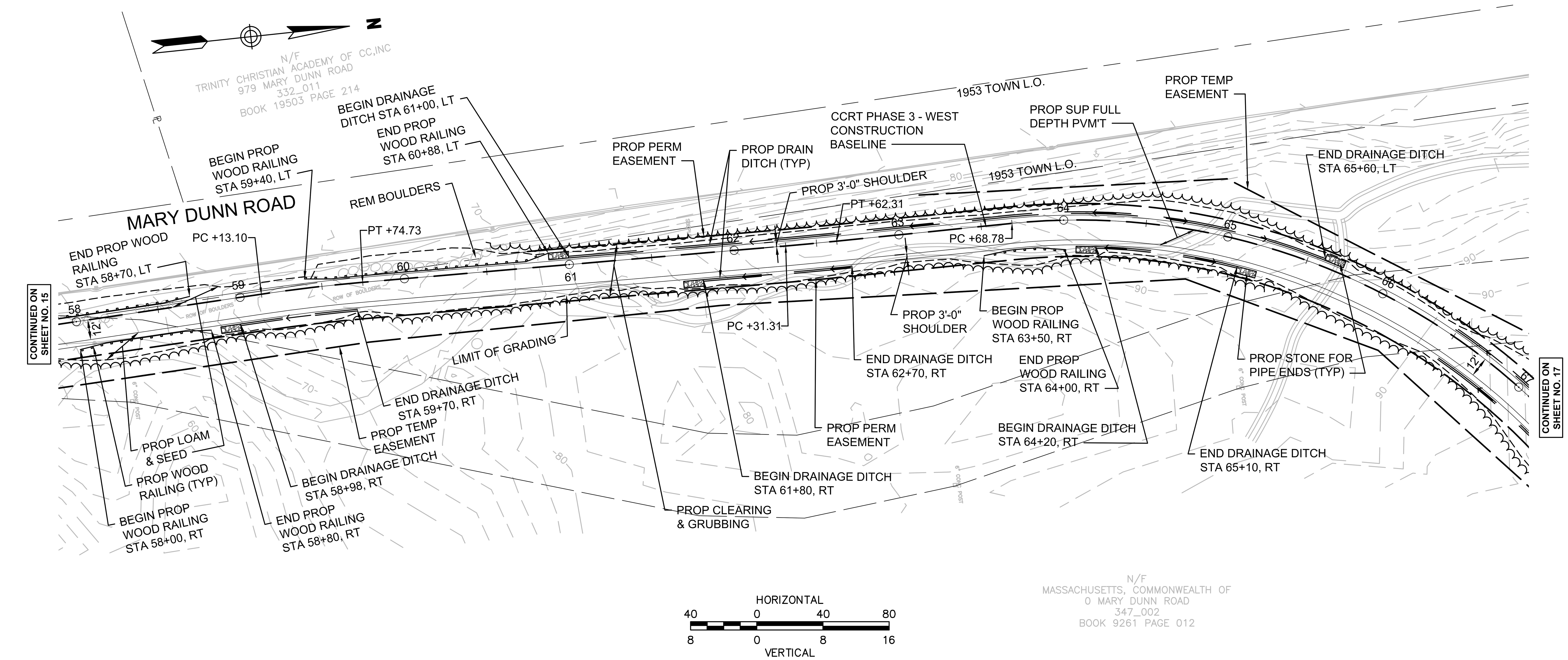
HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 73

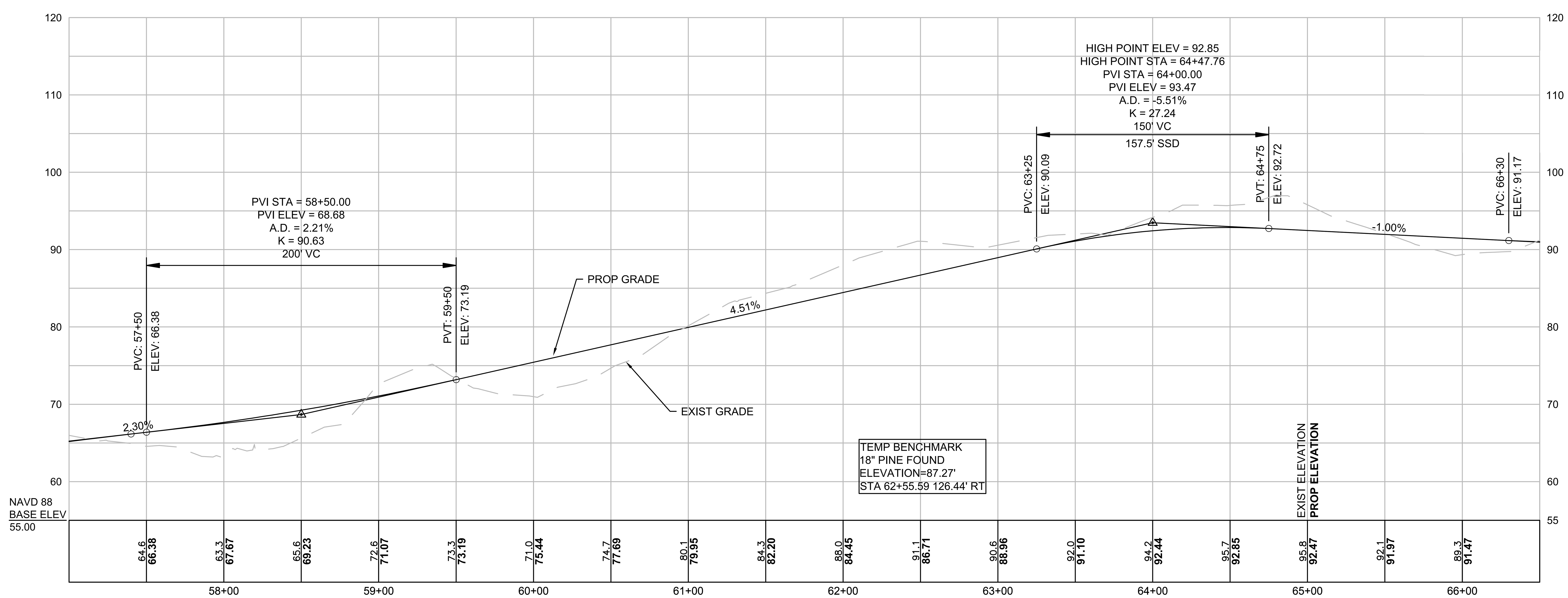
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	16	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES



CCRT PHASE 3 - WEST



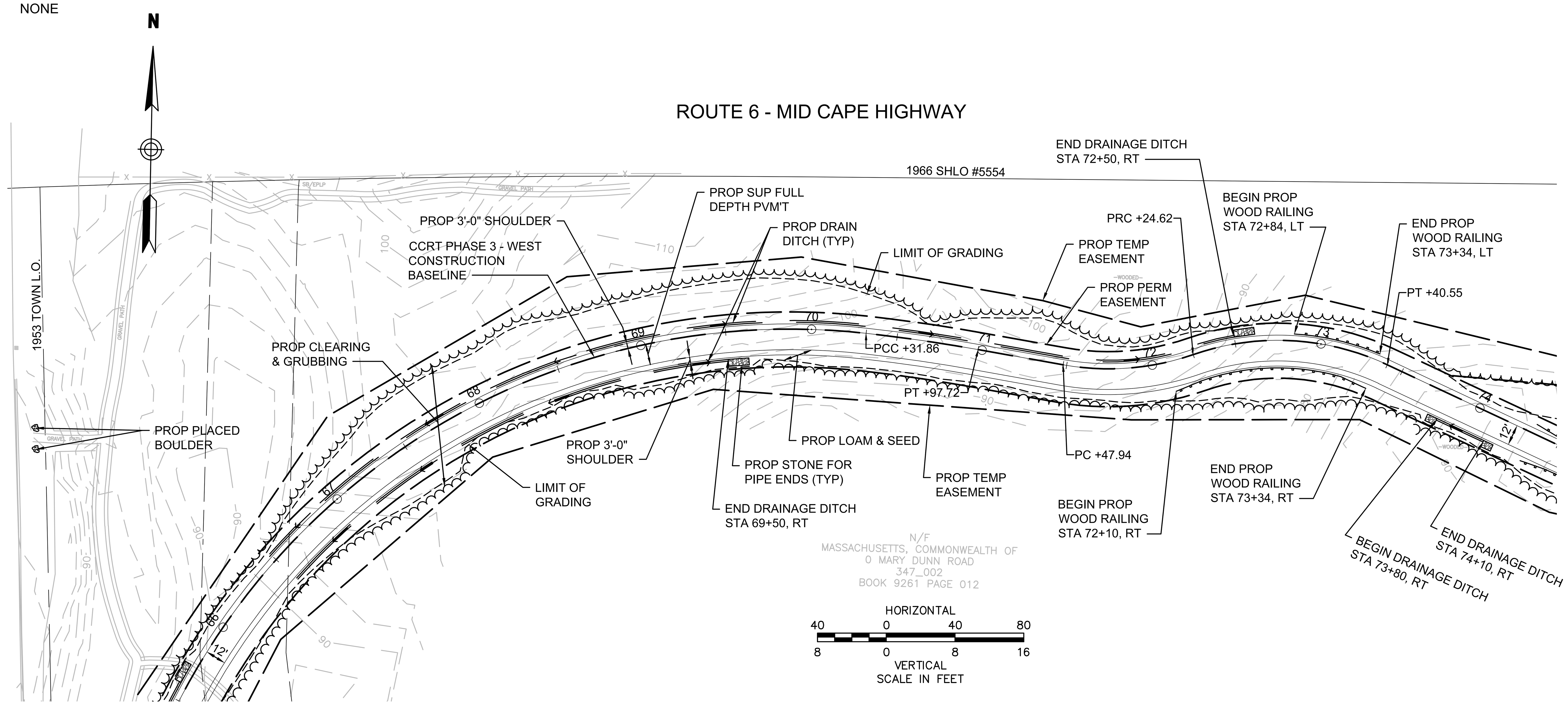
HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
NONE

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	17	267
PROJECT FILE NO. 607398			

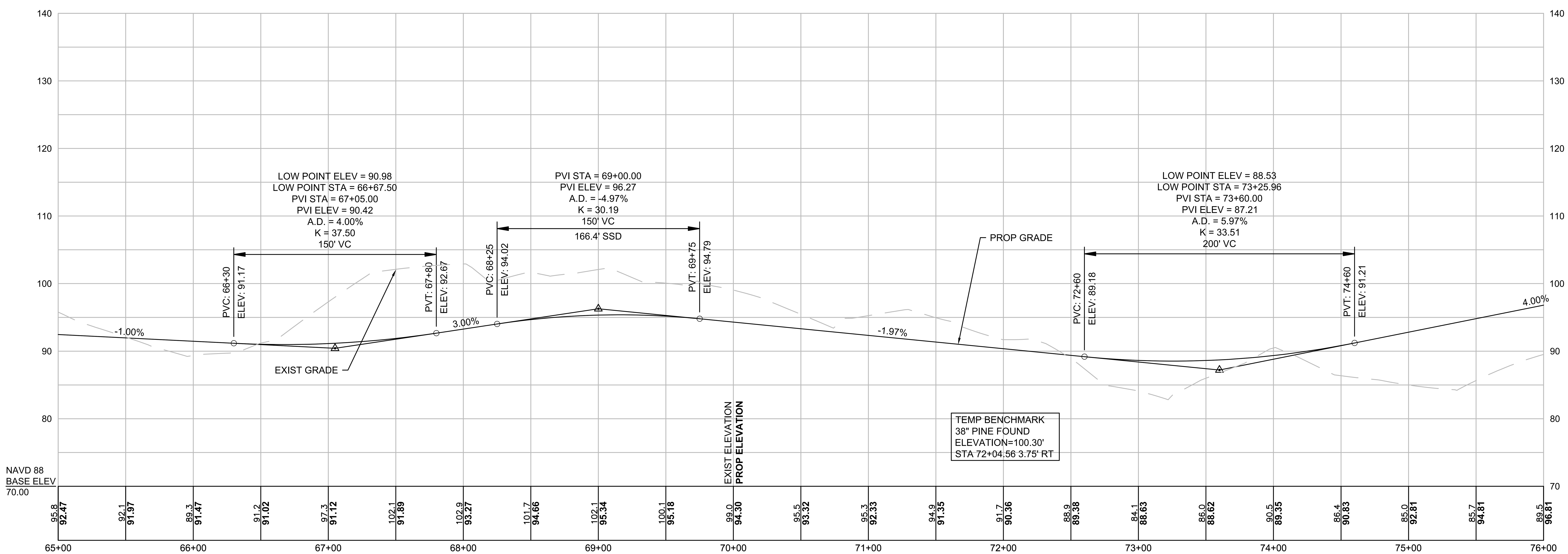
CONSTRUCTION PLANS & PROFILES



CONTINUED ON SHEET NO. 16

CONTINUED ON SHEET NO. 18

CCRT PHASE 3 - WEST



607398_HD(GEN).DWG Plotted on 22-Nov-2021 3:14 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	18	267

PROJECT FILE NO. 607398

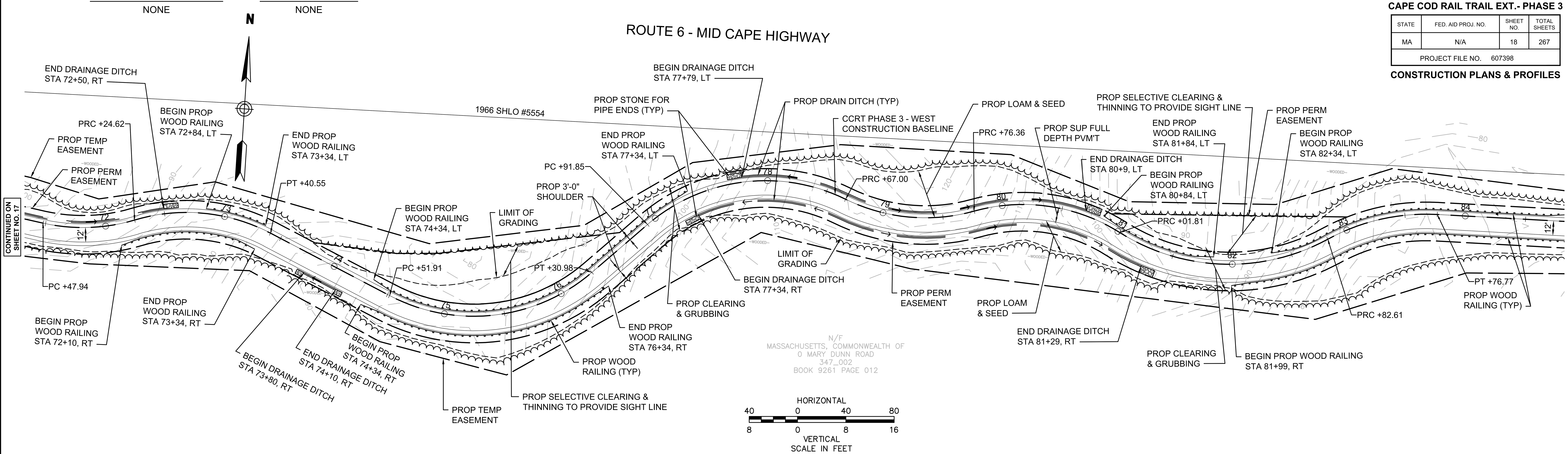
CONSTRUCTION PLANS & PROFILES

Plotted on 22-Nov-2021 3:15 PM

607398_HD(GEN).DWG

HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
NONE



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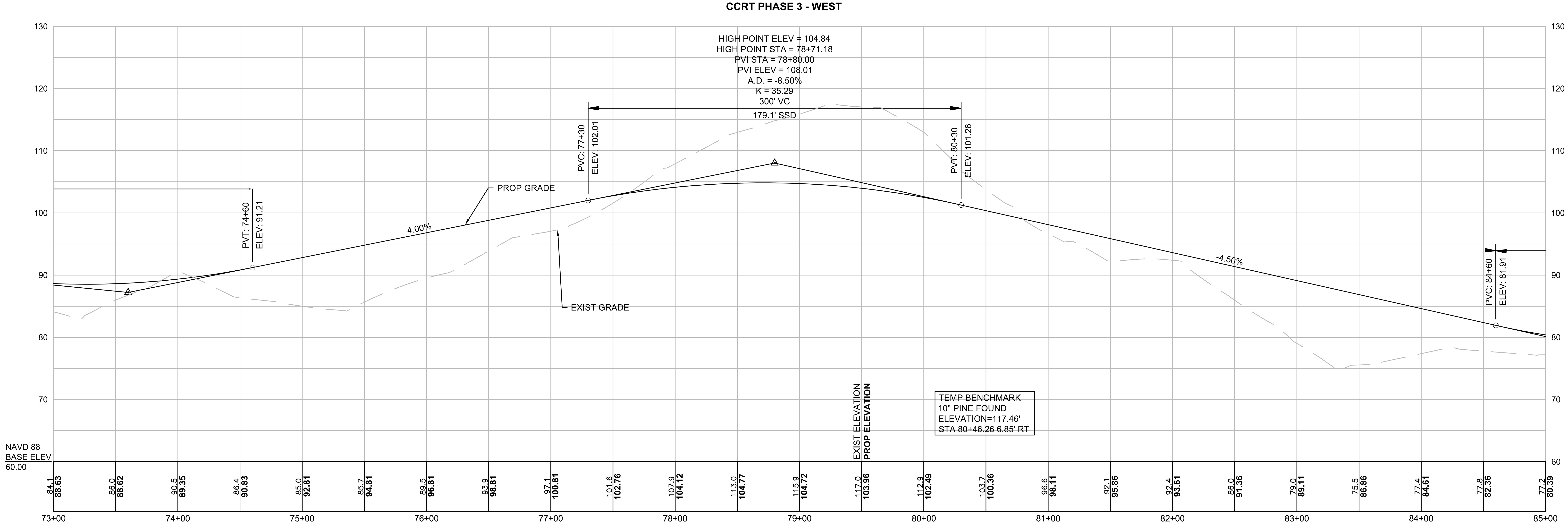


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	19	267

PROJECT FILE NO. 607398

CONSTRUCTION PLANS & PROFILES

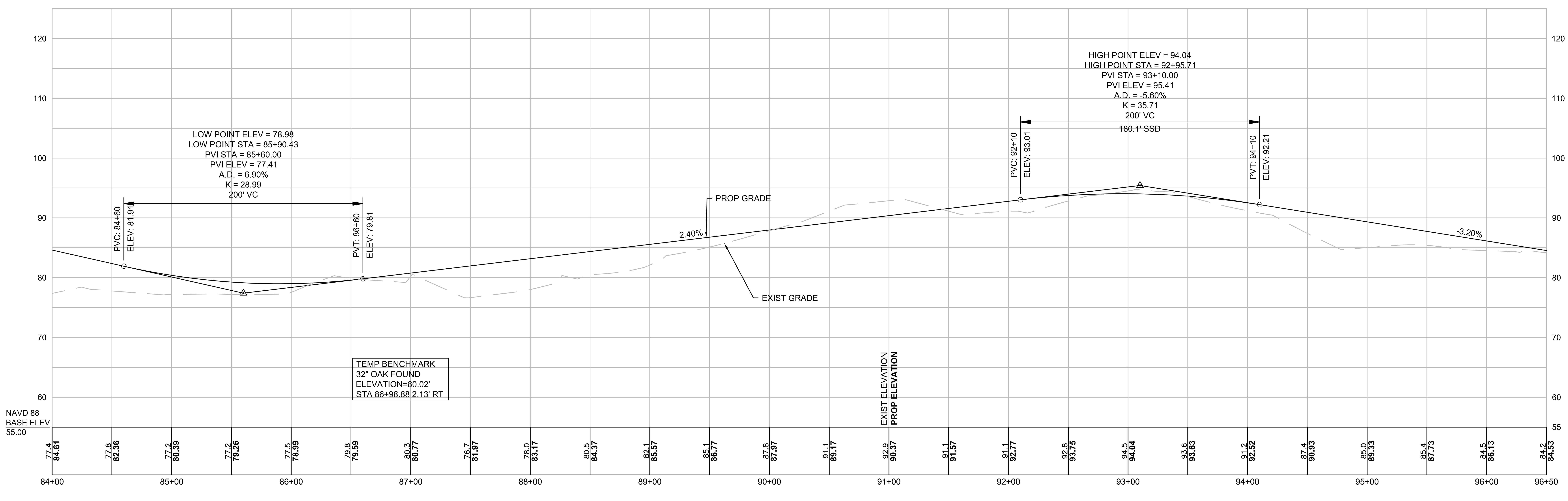
Plotted on 22-Nov-2021 3:16 PM

607398_HD(GEN).DWG

HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
NONE

CCRT PHASE 3 - WEST



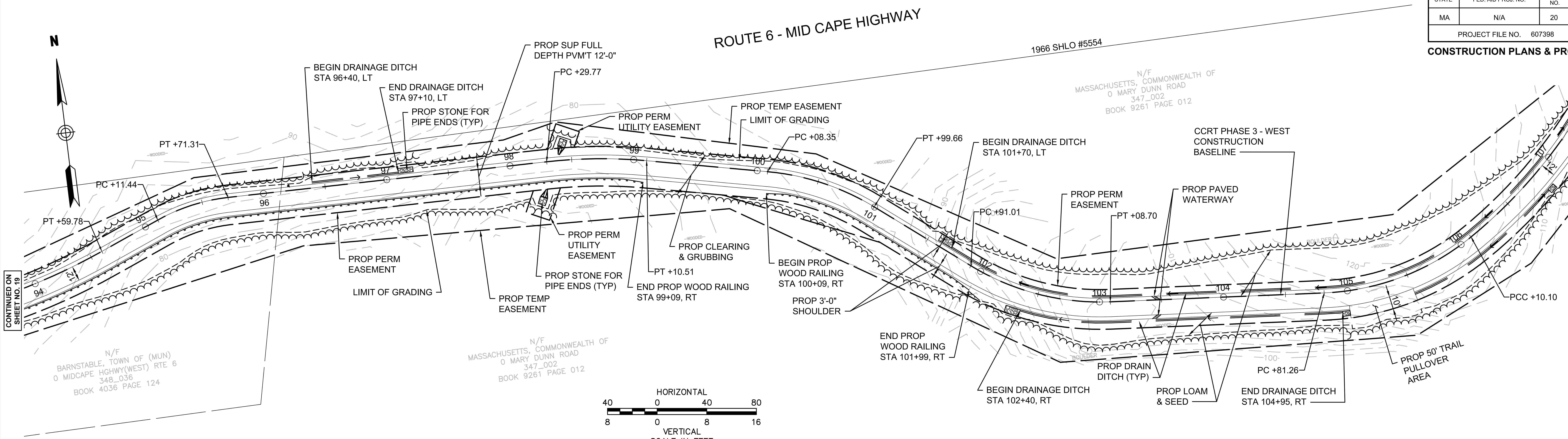
HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 74

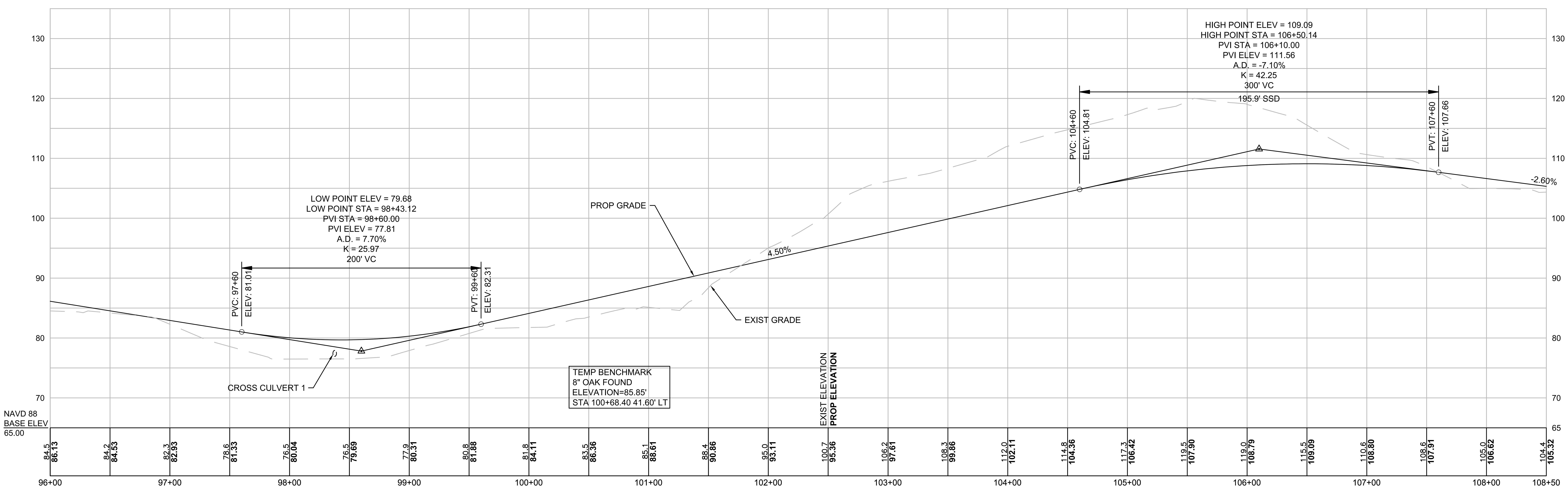
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	20	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES



CCRT PHASE 3 - WEST



STATION	EXIST ELEVATION	PROP ELEVATION
96+00	84.5	86.13
	84.2	84.53
97+00	82.3	82.93
	78.6	81.33
98+00	76.5	80.04
	76.5	79.69
99+00	77.9	80.31
	80.8	81.88
100+00	81.8	84.11
	83.5	86.36
101+00	85.1	88.61
	88.4	90.86
102+00	95.0	93.11
	100.7	95.36
103+00	106.2	97.61
	108.3	99.86
104+00	112.0	102.11
	114.8	104.36
105+00	117.3	106.42
	119.5	107.90
106+00	119.0	108.79
	115.5	109.09
107+00	110.6	108.80
	108.6	107.91
108+00	105.0	106.62
108+50	104.4	105.32

Plotted on 22-Nov-2021 3:18 PM
607398_HD(GEN).DWG

HIGHWAY GUARD DETAILS
NONE

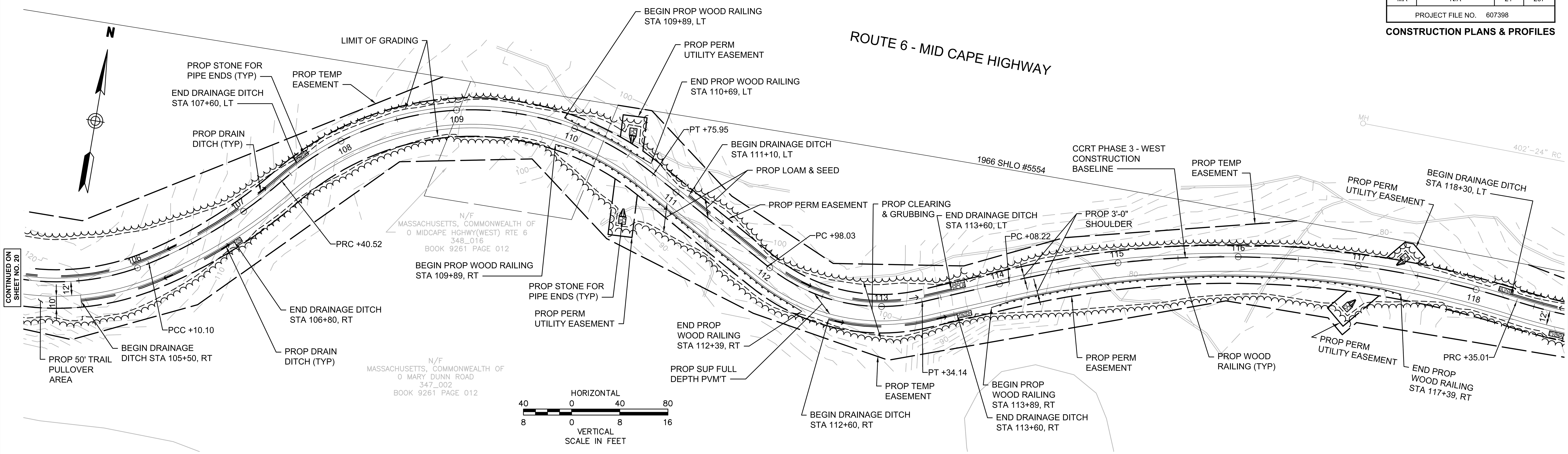
DRAINAGE DETAILS
SEE SHEET 74

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

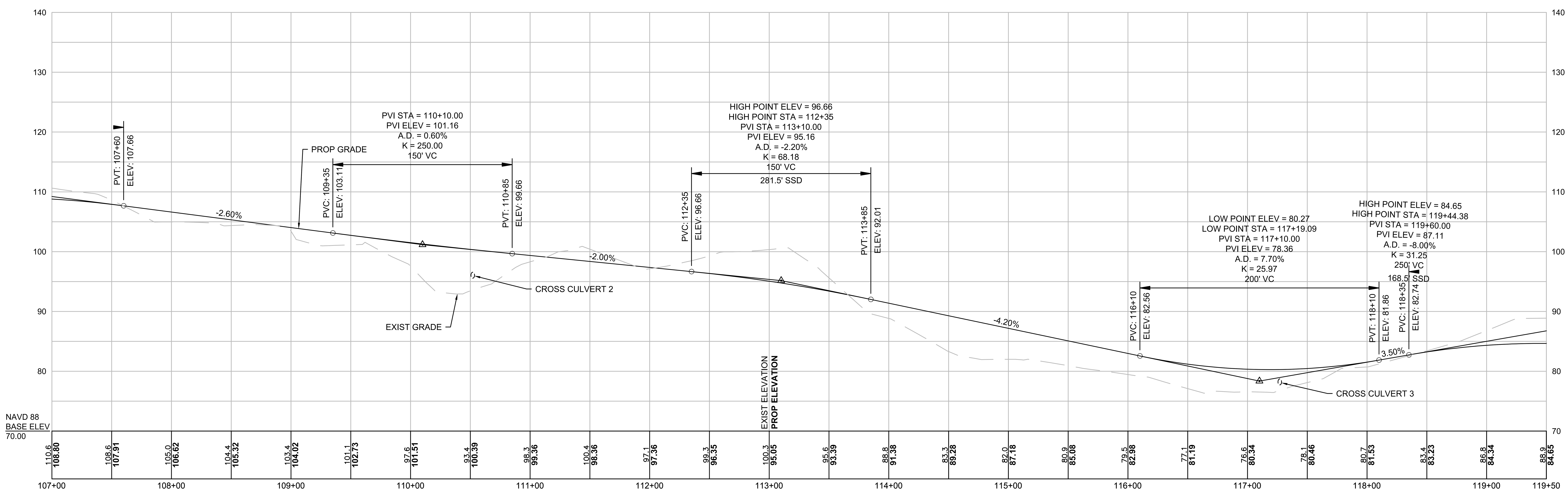
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	21	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

Plotted on 22-Nov-2021 3:19 PM
607398_HD(GEN).DWG



CCRT PHASE 3 - WEST



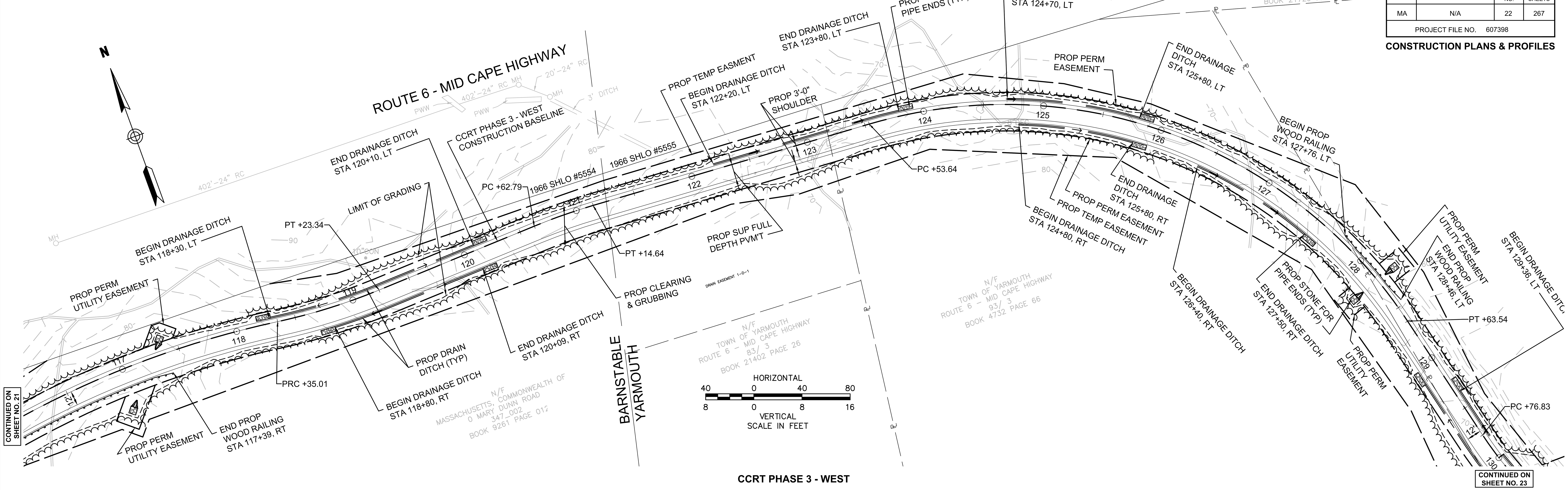
HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 74

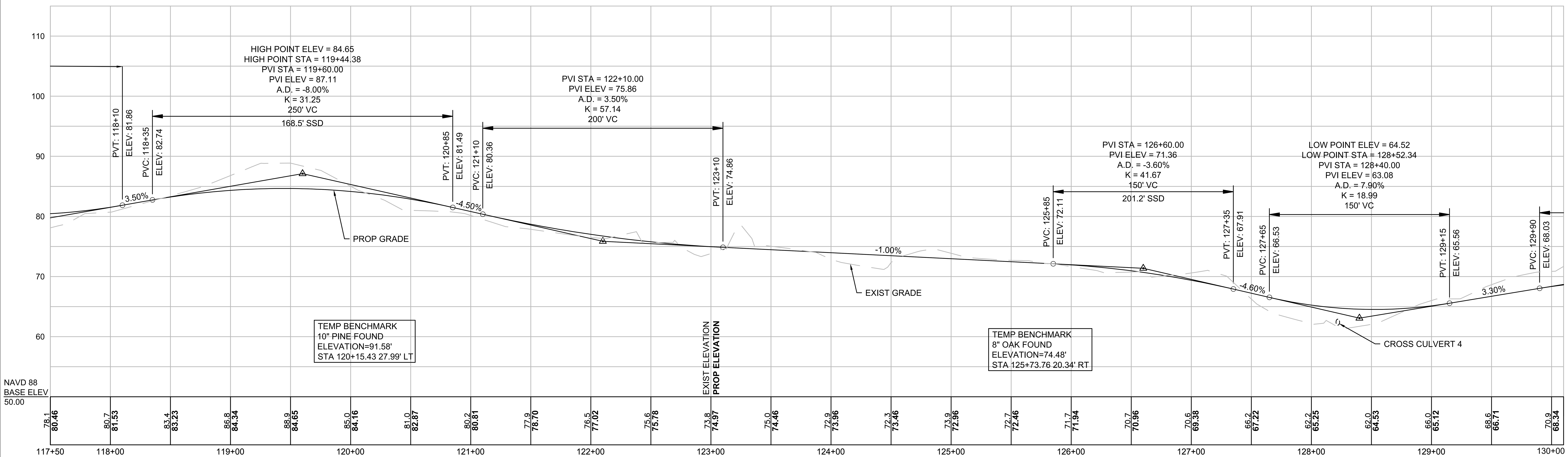
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	22	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES



CCRT PHASE 3 - WEST



607398_HD(GEN).DWG Plotted on 22-Nov-2021 3:21 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	23	267
PROJECT FILE NO. 607398			

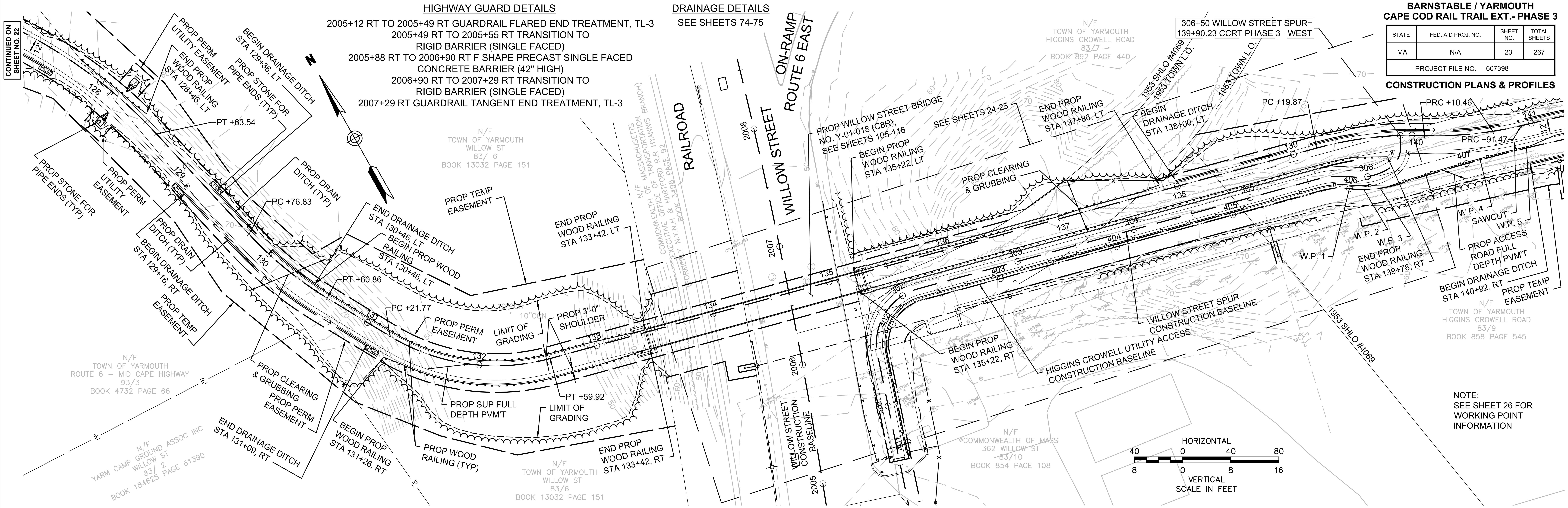
CONSTRUCTION PLANS & PROFILES

HIGHWAY GUARD DETAILS

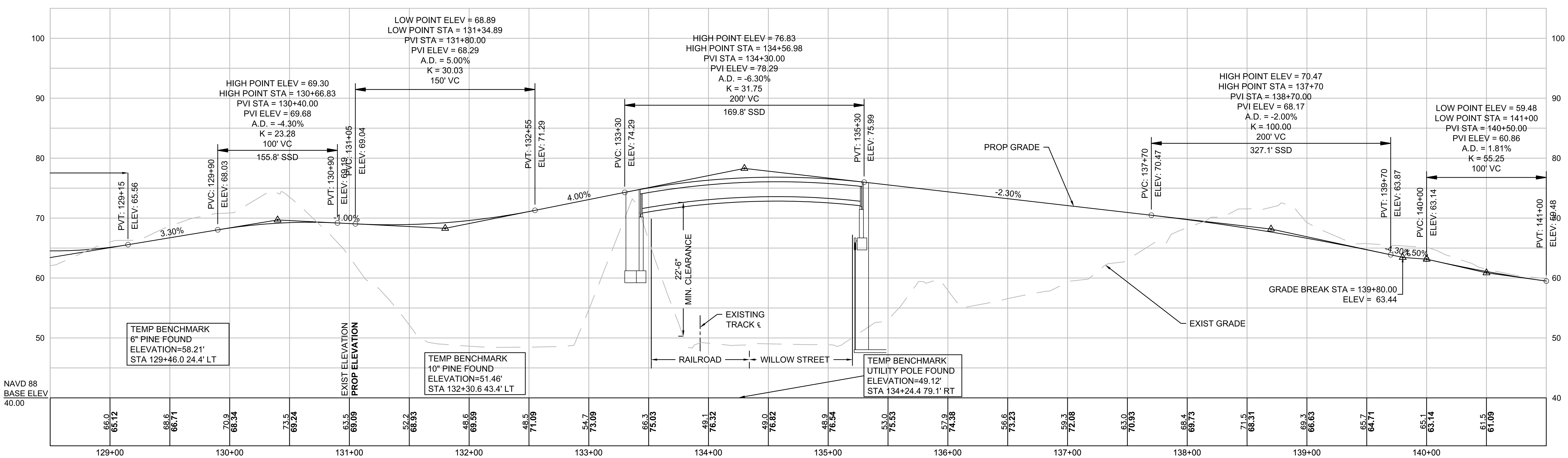
2005+12 RT TO 2005+49 RT GUARDRAIL FLARED END TREATMENT, TL-3
2005+49 RT TO 2005+55 RT TRANSITION TO RIGID BARRIER (SINGLE FACED)
2005+88 RT TO 2006+90 RT F SHAPE PRECAST SINGLE FACED CONCRETE BARRIER (42" HIGH)
2006+90 RT TO 2007+29 RT TRANSITION TO RIGID BARRIER (SINGLE FACED)
2007+29 RT GUARDRAIL TANGENT END TREATMENT, TL-3

DRAINAGE DETAILS

SEE SHEETS 74-75



CCRT PHASE 3 - WEST



Plotted on 22-Nov-2021 3:22 PM
607398_HD(GEN).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	24	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

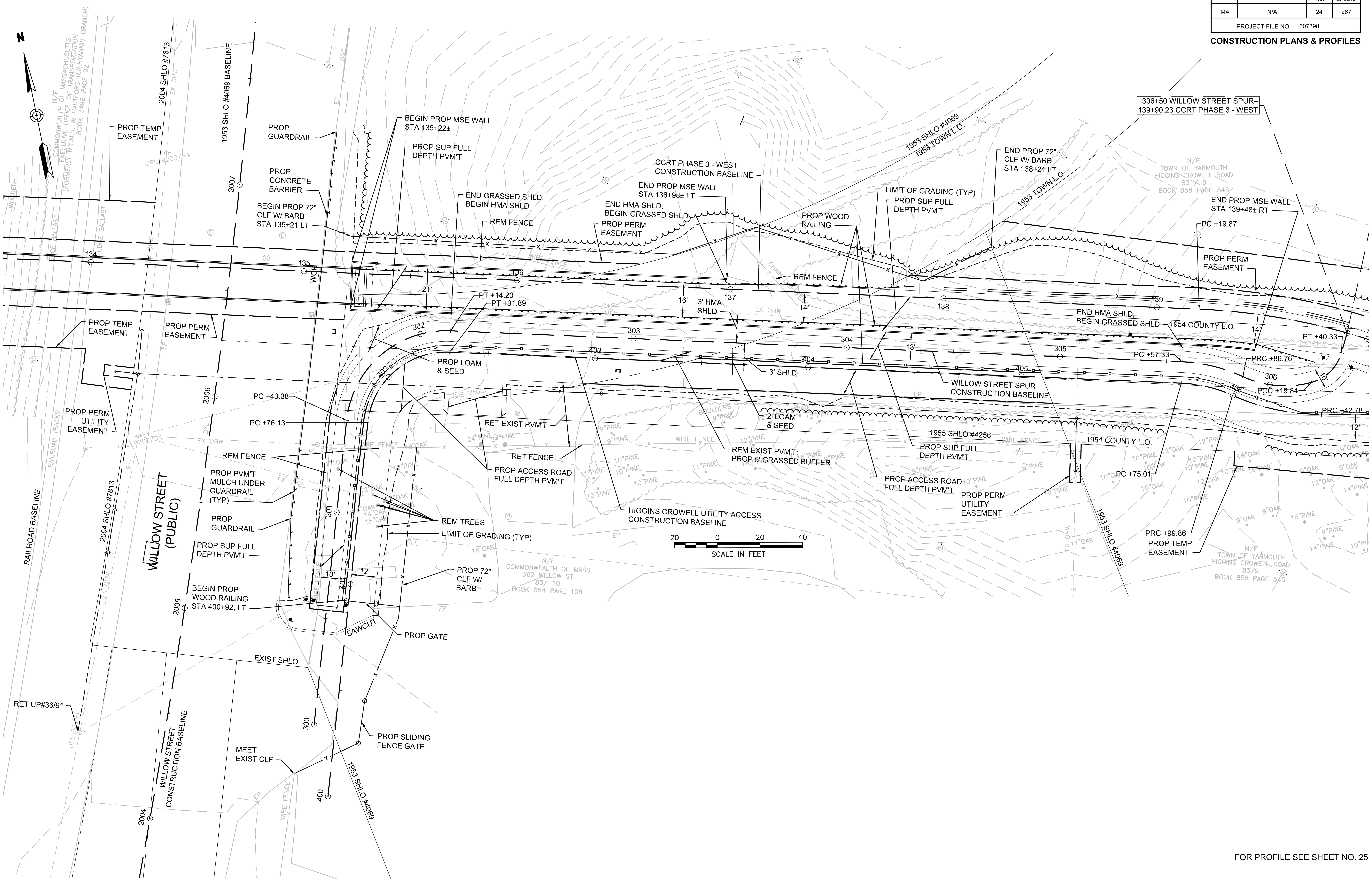
Plotted on 24-Nov-2021 5:14 PM
607398_HD(GEN).DWG

HIGHWAY GUARD DETAILS
SEE SHEET 23

DRAINAGE DETAILS
SEE SHEET 75

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
NONE



FOR PROFILE SEE SHEET NO. 25

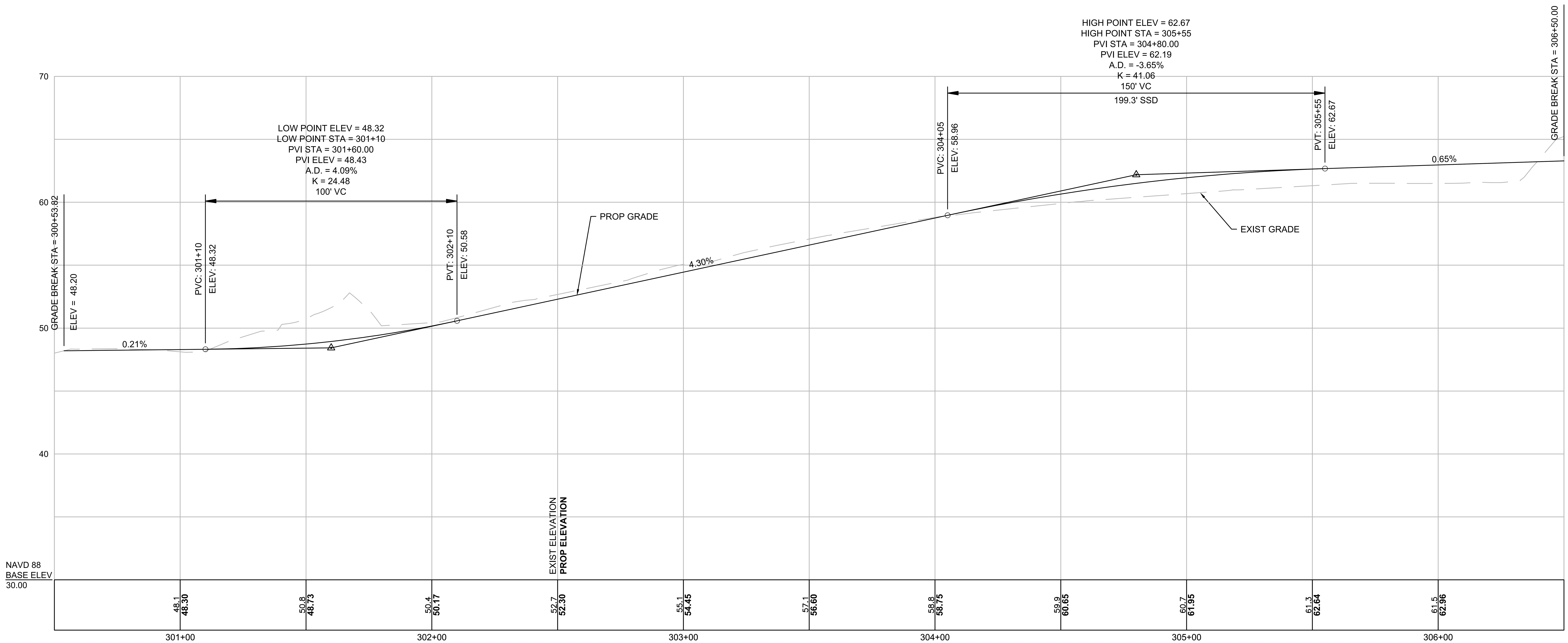
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	25	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

Plotted on 22-Nov-2021 3:24 PM
607398_HD(GEN).DWG

WILLOW STREET SPUR



FOR PLAN SEE SHEET NO. 24

HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 76

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

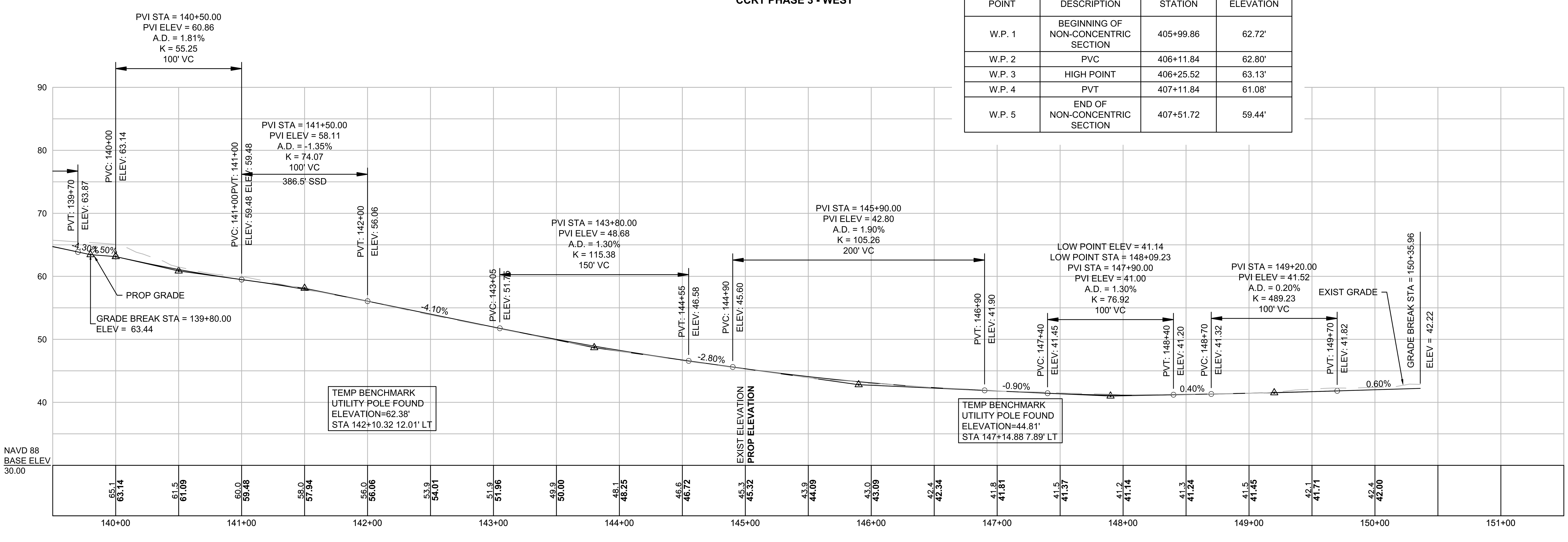
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	26	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

Plotted on 22-Nov-2021 3:25 PM
607398_HD(GEN).DWG

CCRT PHASE 3 - WEST

HIGGINS CROWELL ROAD UTILITY ACCESS ELEVATION POINTS			
POINT	DESCRIPTION	STATION	ELEVATION
W.P. 1	BEGINNING OF NON-CONCENTRIC SECTION	405+99.86	62.72'
W.P. 2	PVC	406+11.84	62.80'
W.P. 3	HIGH POINT	406+25.52	63.13'
W.P. 4	PVT	407+11.84	61.08'
W.P. 5	END OF NON-CONCENTRIC SECTION	407+51.72	59.44'



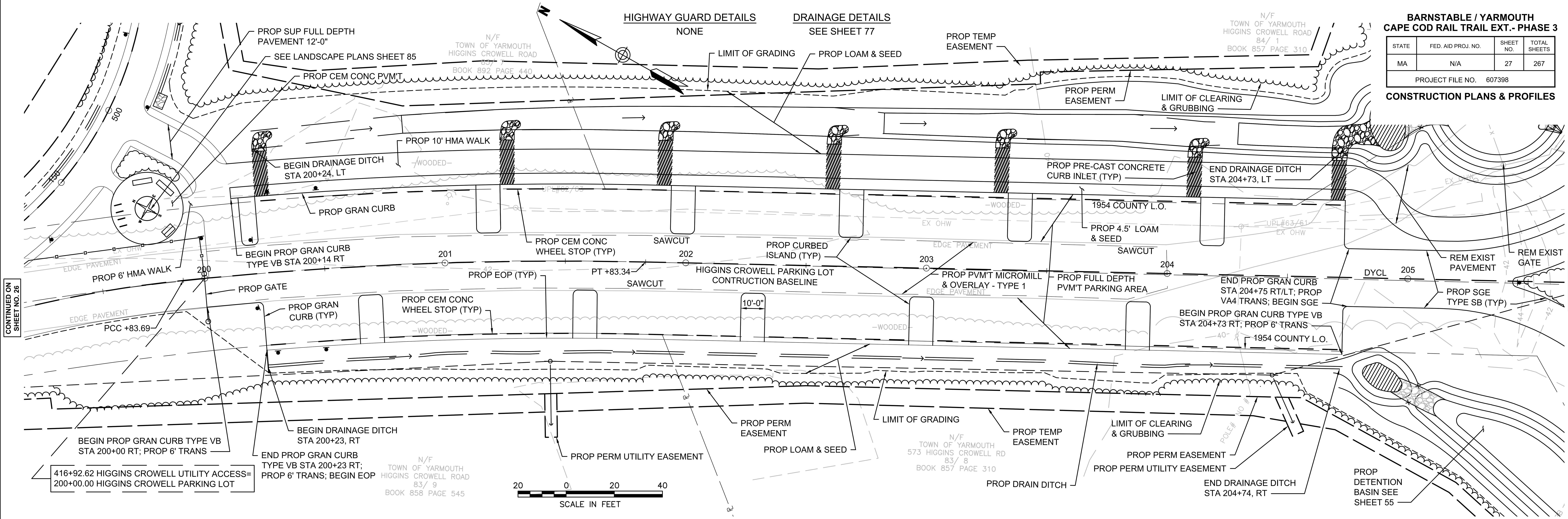
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	27	267
PROJECT FILE NO. 607398			

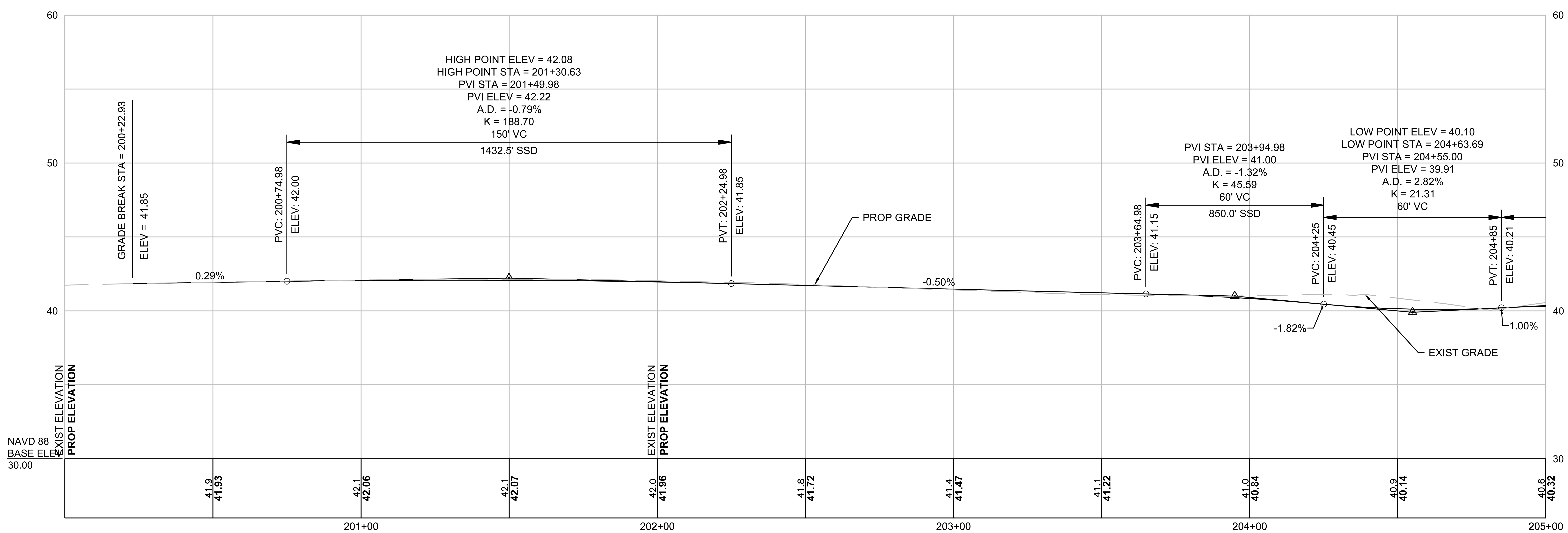
CONSTRUCTION PLANS & PROFILES

HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 77



PARKING LOT NO. 2 - HIGGINS CROWELL ROAD



Plotted on 22-Nov-2021 3:27 PM
607398_HD(GEN).DWG

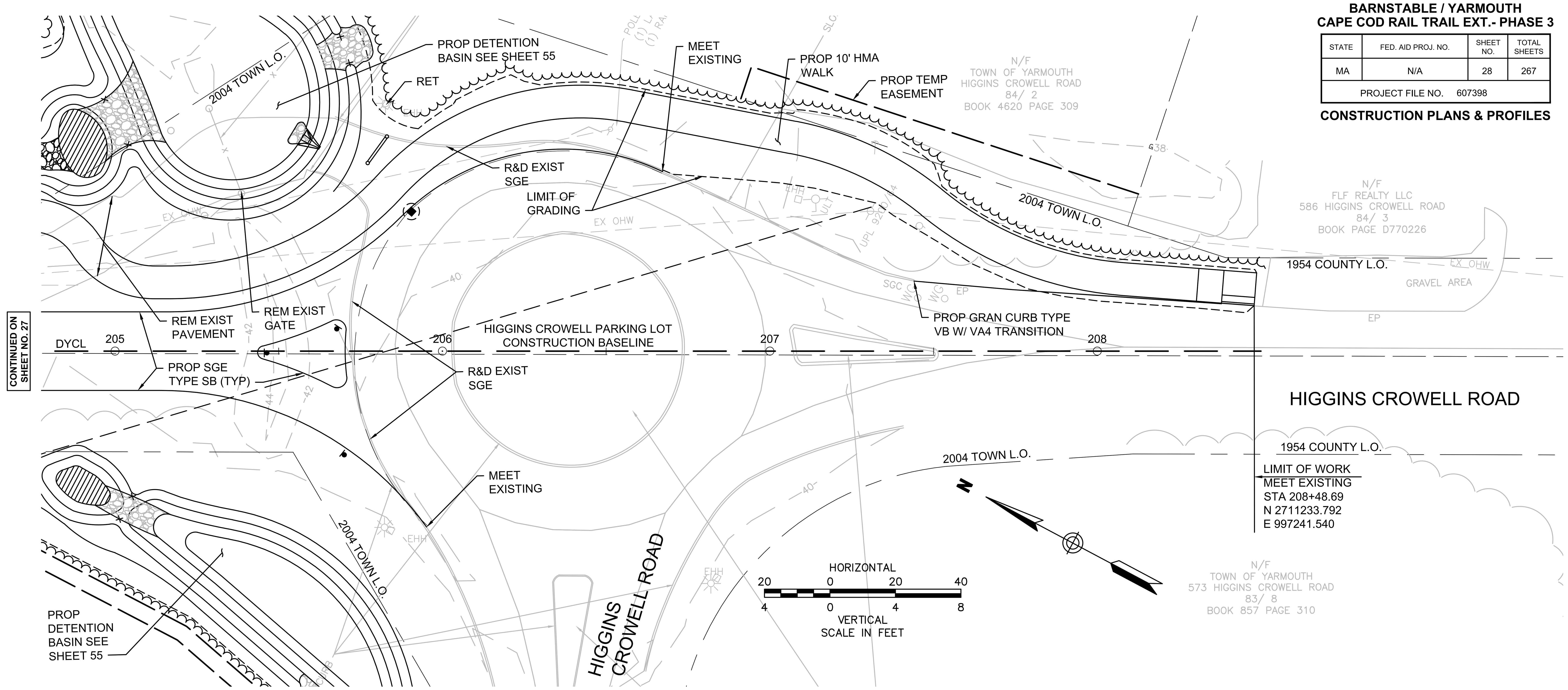
HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 77

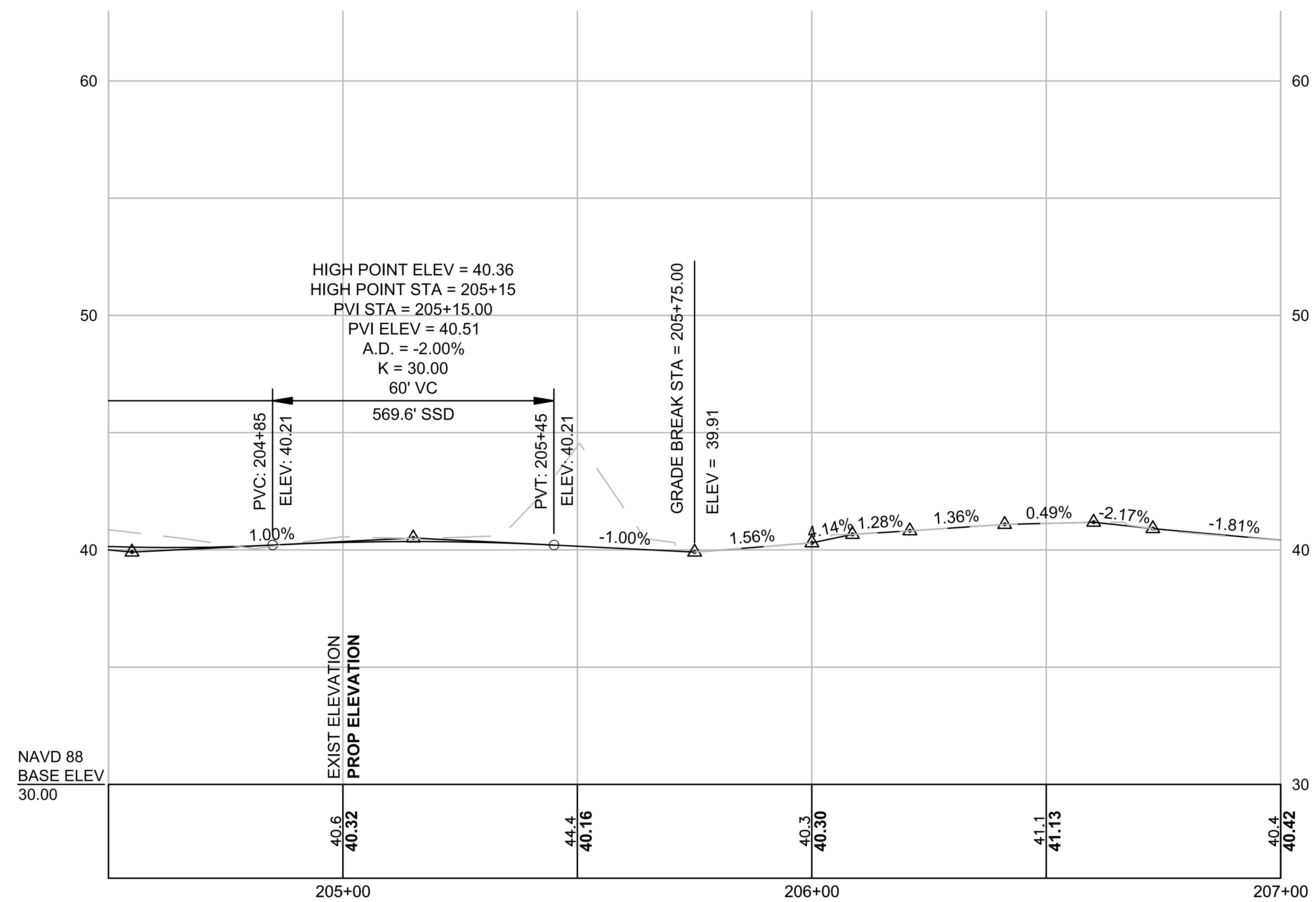
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	28	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES



PARKING LOT NO. 2 - HIGGINS CROWELL ROAD



Plotted on 22-Nov-2021 3:28 PM
607398_HD(GEN).DWG

CONTINUED ON SHEET NO. 26

HIGHWAY GUARD DETAILS
NONE

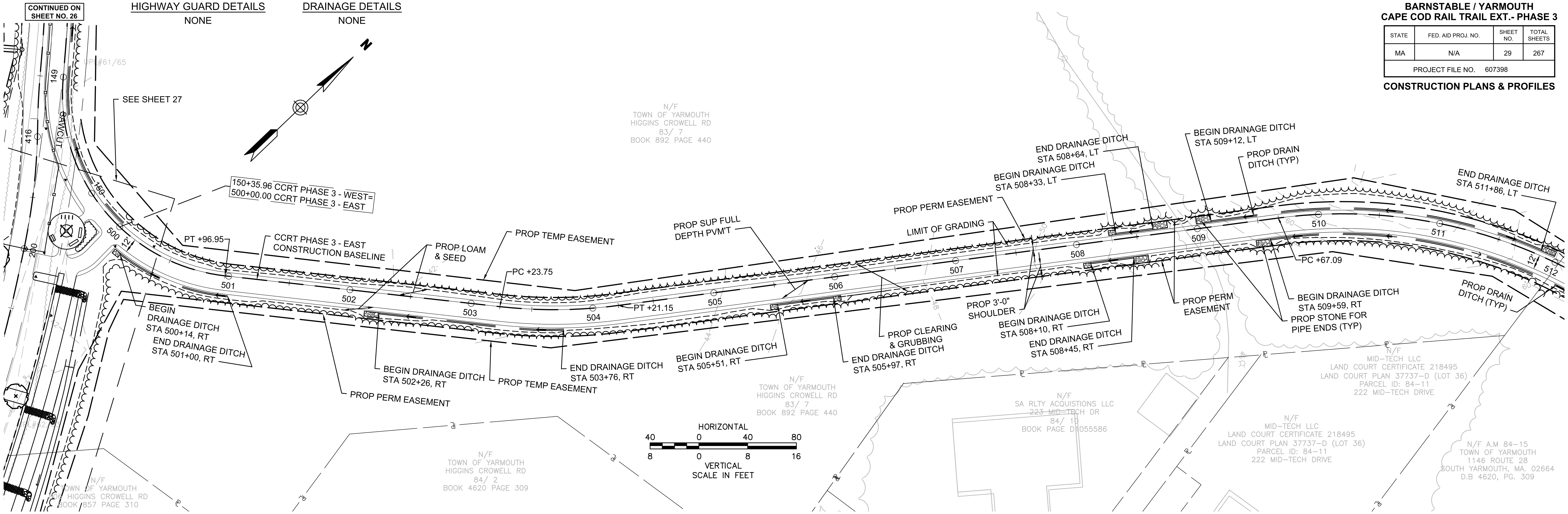
DRAINAGE DETAILS
NONE

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

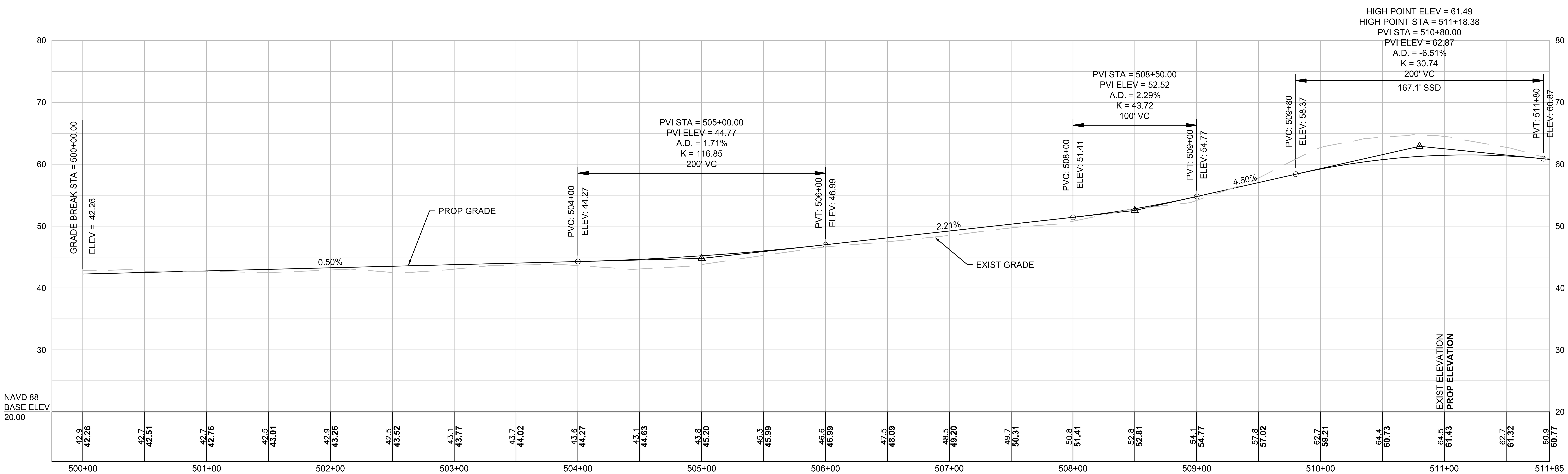
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	29	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

607398_HD(GEN).DWG Plotted on 22-Nov-2021 3:29 PM



CCRT PHASE 3 - EAST



STATION	EXIST ELEVATION	PROP ELEVATION
500+00	42.9	42.26
	42.7	42.51
501+00	42.7	42.76
	42.5	43.01
502+00	42.9	43.26
	42.5	43.52
503+00	43.1	43.77
	43.7	44.02
504+00	43.6	44.27
	43.1	44.63
505+00	43.8	45.20
	45.3	45.99
506+00	46.6	46.99
	47.5	48.09
507+00	48.5	49.20
	49.7	50.31
508+00	50.8	51.41
	52.8	52.81
509+00	54.1	54.77
	57.8	57.02
510+00	62.7	59.21
	64.4	60.73
511+00	64.5	61.43
	62.7	61.32
511+85	60.9	60.77

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	30	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

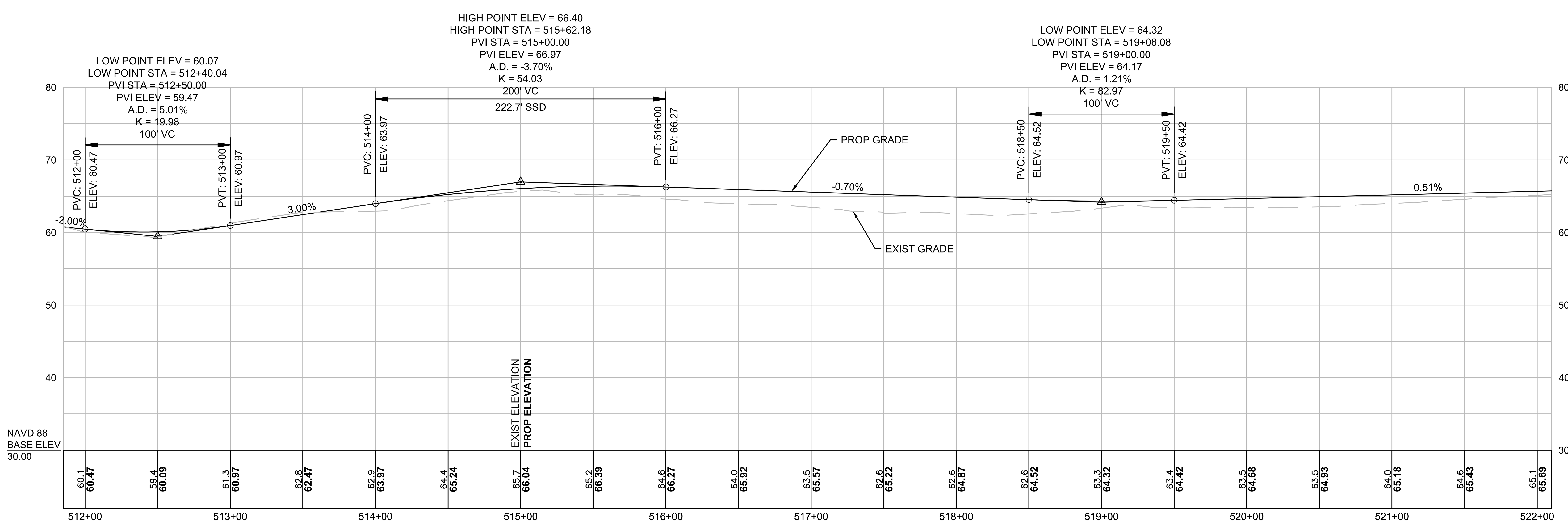
Plotted on 22-Nov-2021 3:31 PM

607398_HD(GEN).DWG

HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
NONE

CCRT PHASE 3 - EAST



HIGHWAY GUARD DETAILS
NONE

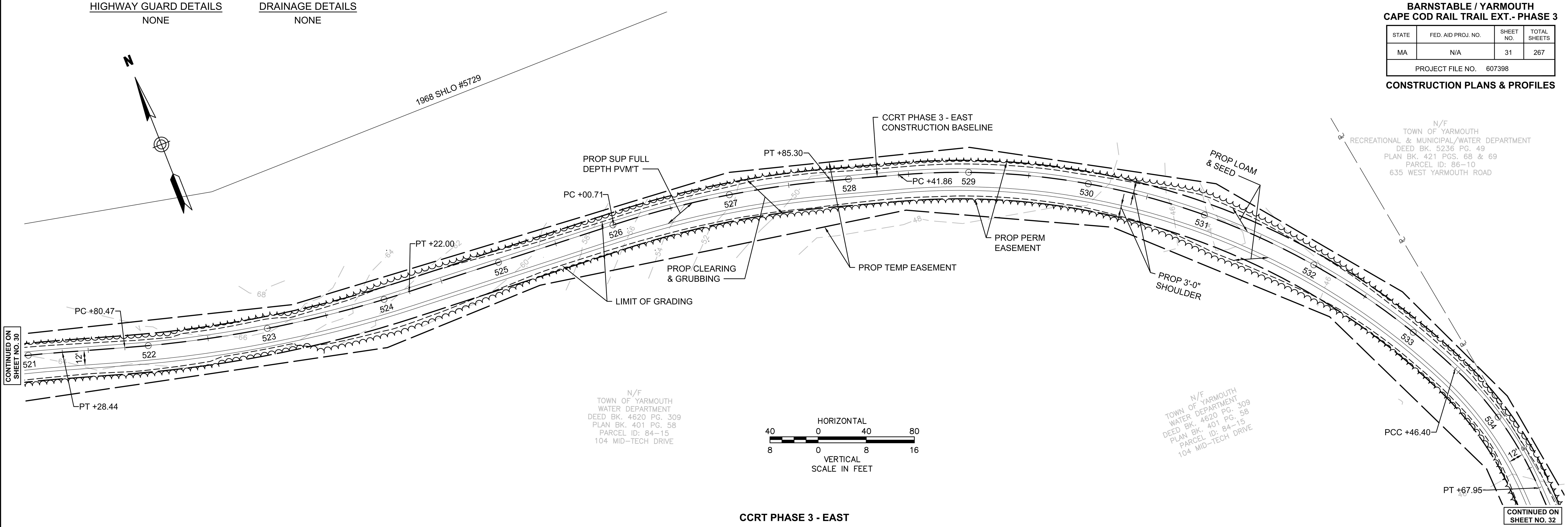
DRAINAGE DETAILS
NONE

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

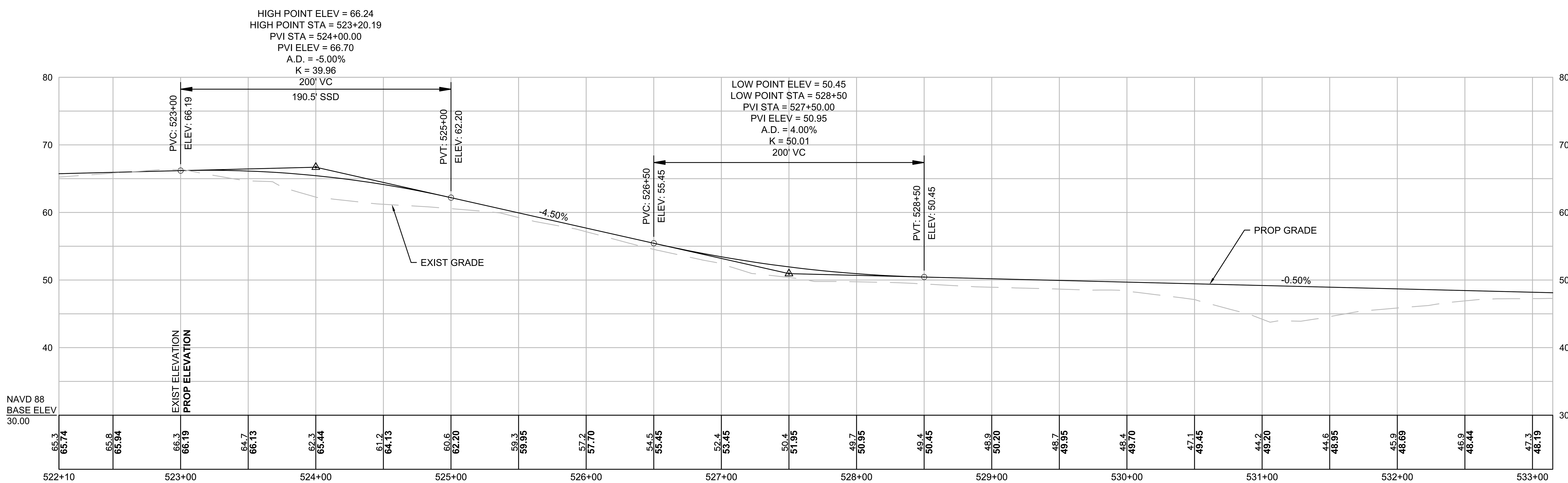
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	31	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

Plotted on 22-Nov-2021 3:32 PM
607398_HD(GEN).DWG



CCRT PHASE 3 - EAST



EXIST ELEVATION	65.3	65.8	66.3	64.7	62.3	61.2	60.6	59.3	57.2	54.5	52.4	50.4	49.7	49.4	48.9	48.7	48.4	47.1	44.2	44.6	45.9	46.9	47.3
PROP ELEVATION	**65.74**	**65.94**	**66.19**	**66.13**	**65.44**	**64.13**	**62.20**	**59.95**	**57.70**	**55.45**	**53.45**	**51.95**	**50.95**	**50.45**	**50.20**	**49.95**	**49.70**	**49.45**	**49.20**	**48.95**	**48.69**	**48.44**	**48.19**

522+10 523+00 524+00 525+00 526+00 527+00 528+00 529+00 530+00 531+00 532+00 533+00

HIGHWAY GUARD DETAILS
NONE

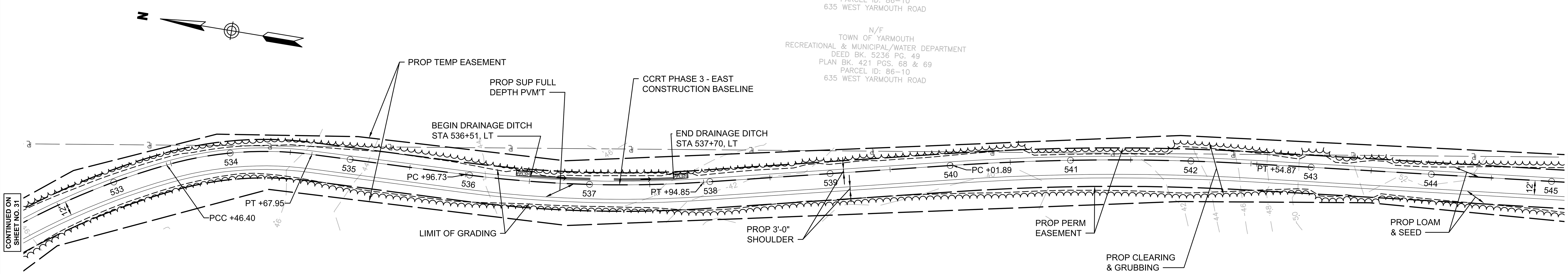
DRAINAGE DETAILS
NONE

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	32	267
PROJECT FILE NO. 607398			

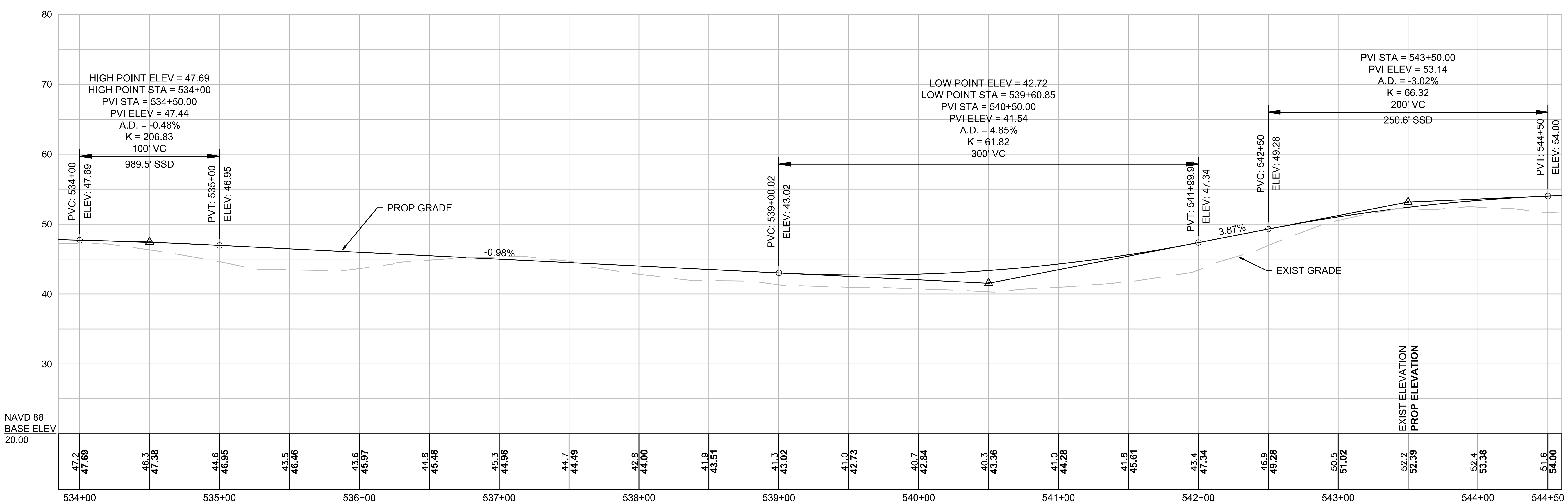
CONSTRUCTION PLANS & PROFILES

Plotted on 22-Nov-2021 3:33 PM
607398_HD(GEN).DWG



HORIZONTAL
40 0 40 80
8 0 8 16
VERTICAL
SCALE IN FEET

CCRT PHASE 3 - EAST



Station	Exist Elevation	Prop Elevation
534+00	47.2	47.69
	46.3	47.38
535+00	44.6	46.95
	43.5	46.46
536+00	43.6	45.97
	44.8	45.48
537+00	45.3	44.98
	44.7	44.49
538+00	42.8	44.00
	41.9	43.51
539+00	41.3	43.02
	41.0	42.73
540+00	40.7	42.84
	40.3	43.36
541+00	41.0	44.28
	41.8	45.61
542+00	43.4	47.34
	46.9	49.28
543+00	50.5	51.02
	52.2	52.39
544+00	52.4	53.38
544+50	51.6	54.00

HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
NONE

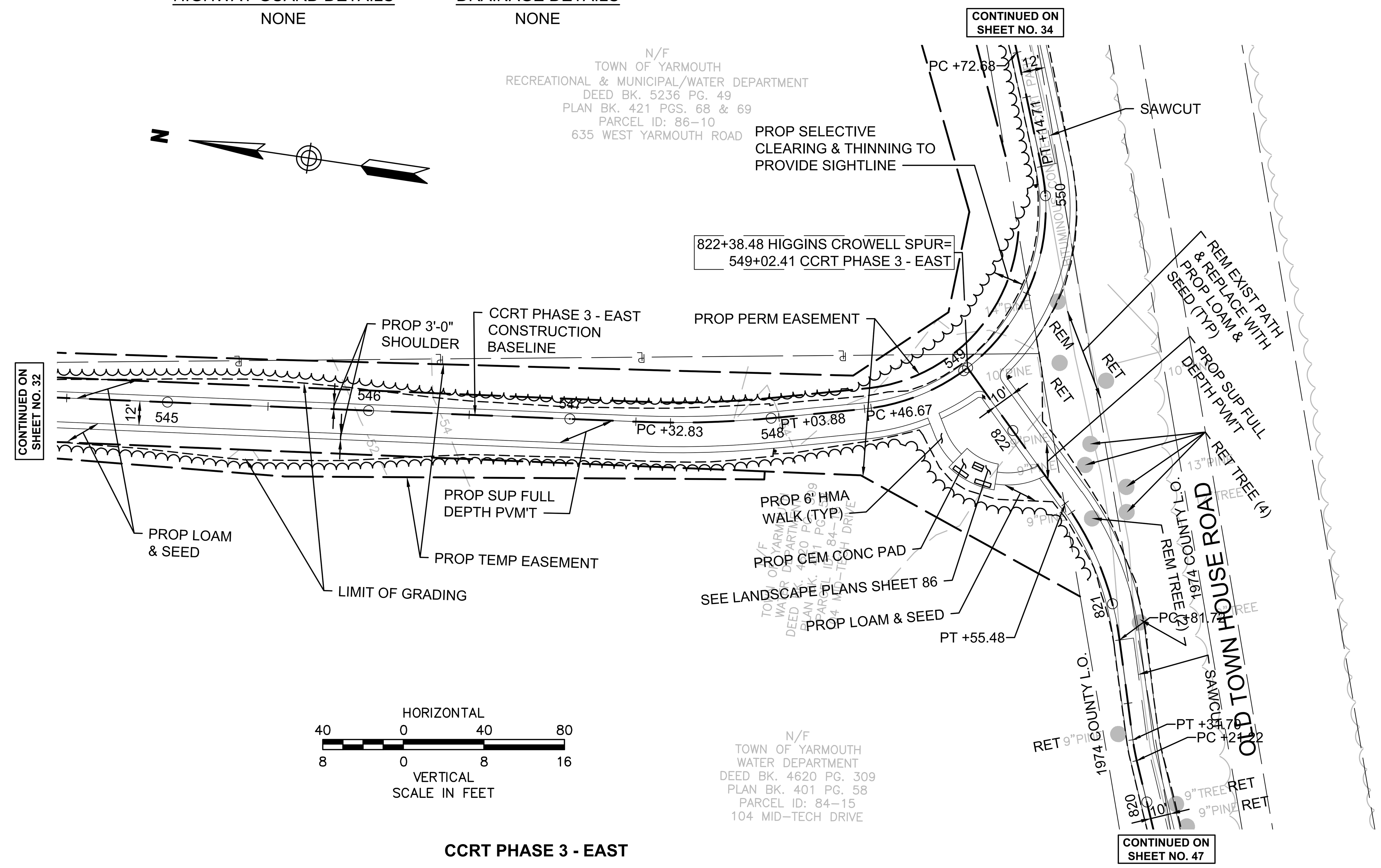
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	33	267
PROJECT FILE NO. 607398			

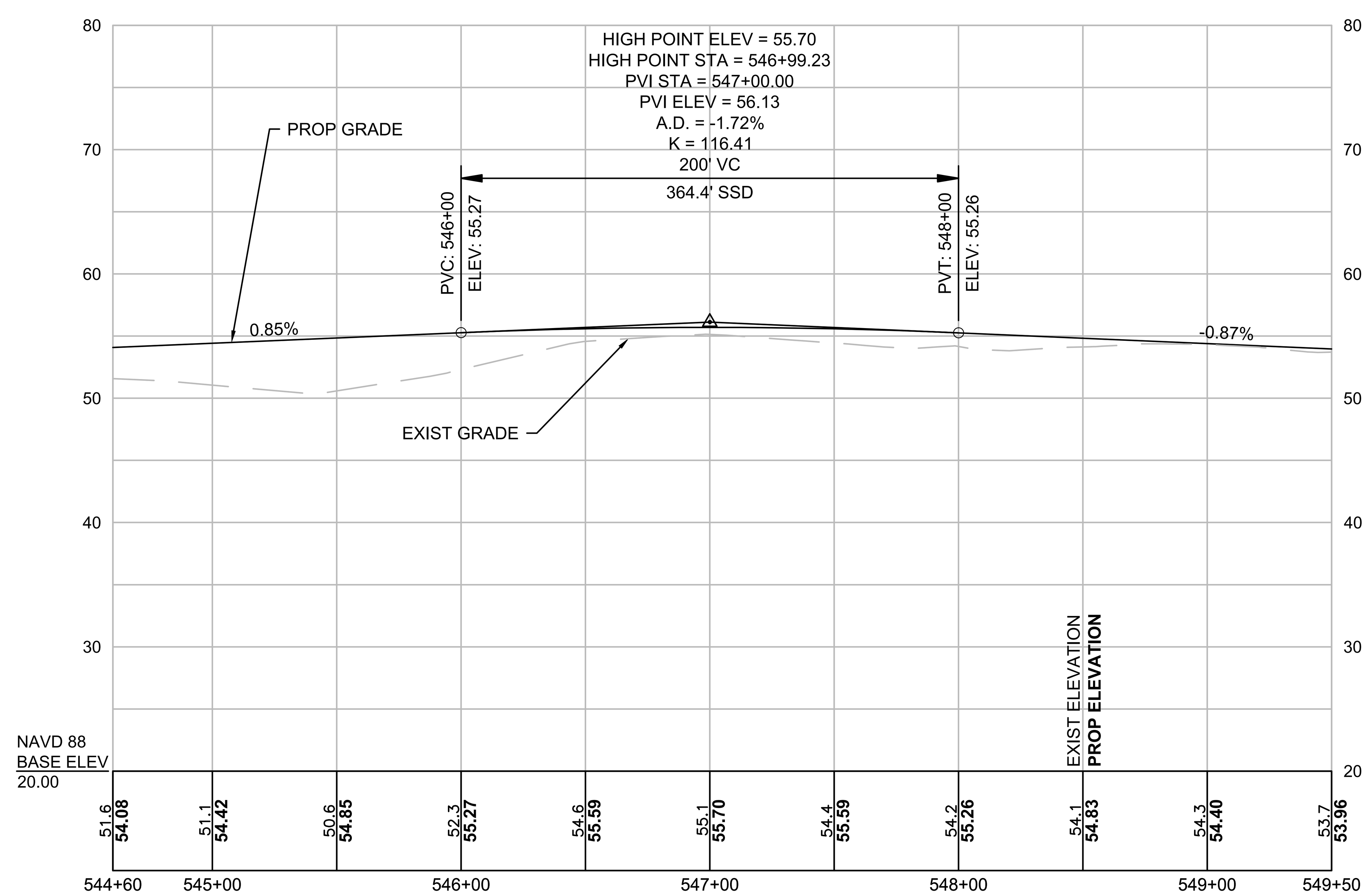
CONSTRUCTION PLANS & PROFILES

Plotted on 22-Nov-2021 3:35 PM

607398_HD(GEN).DWG



CCRT PHASE 3 - EAST



BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

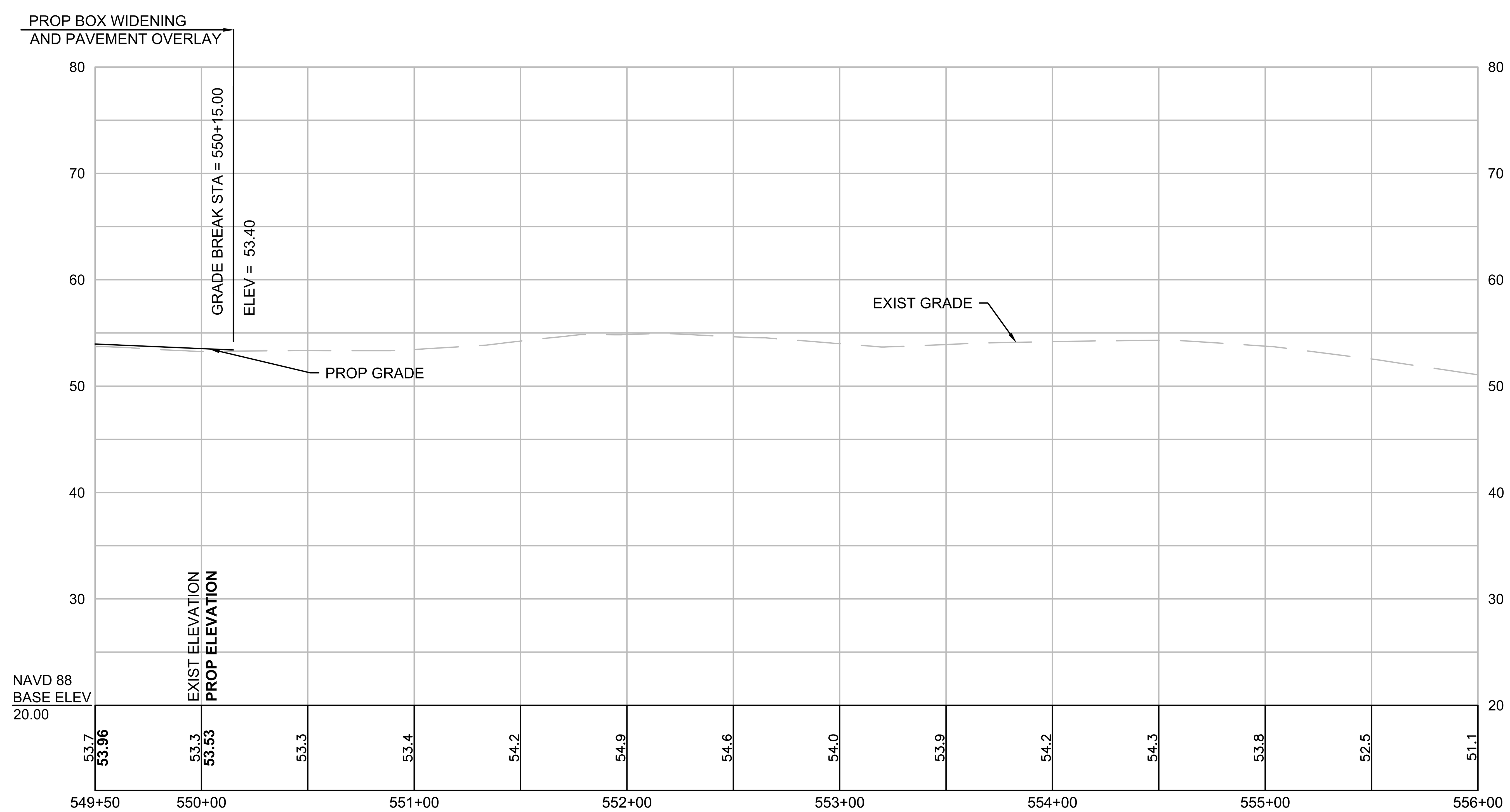
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	34	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 78

CCRT PHASE 3 - EAST



Plotted on 22-Nov-2021 3:36 PM
607398_HD(GEN).DWG

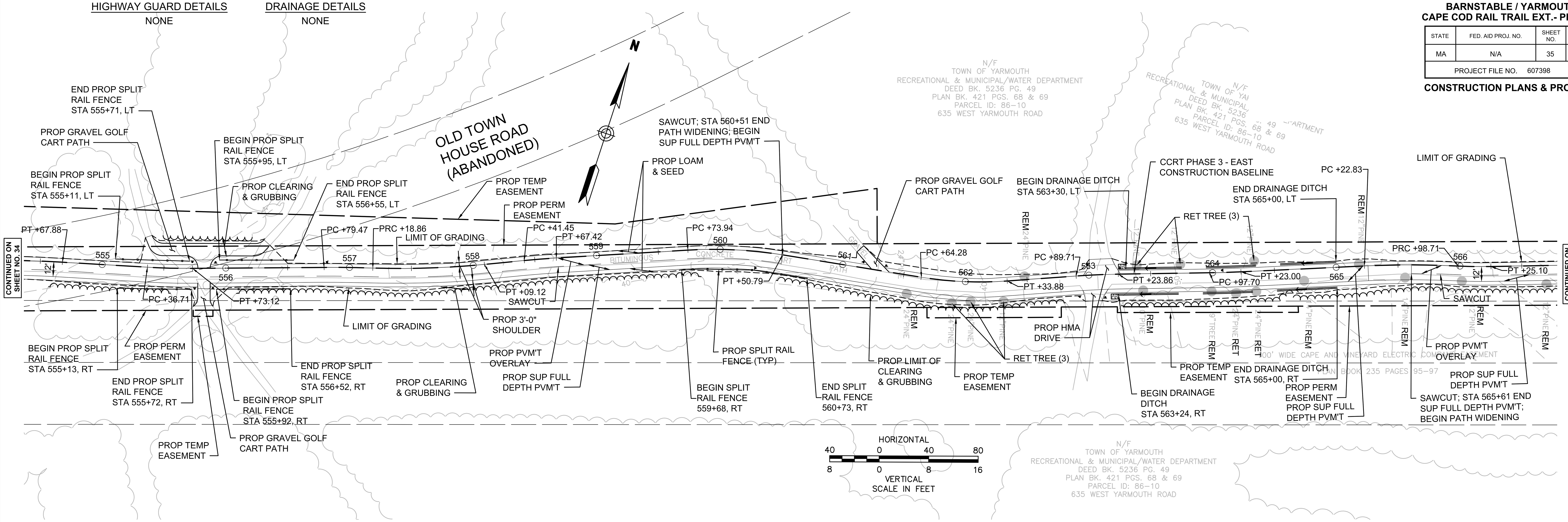
HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
NONE

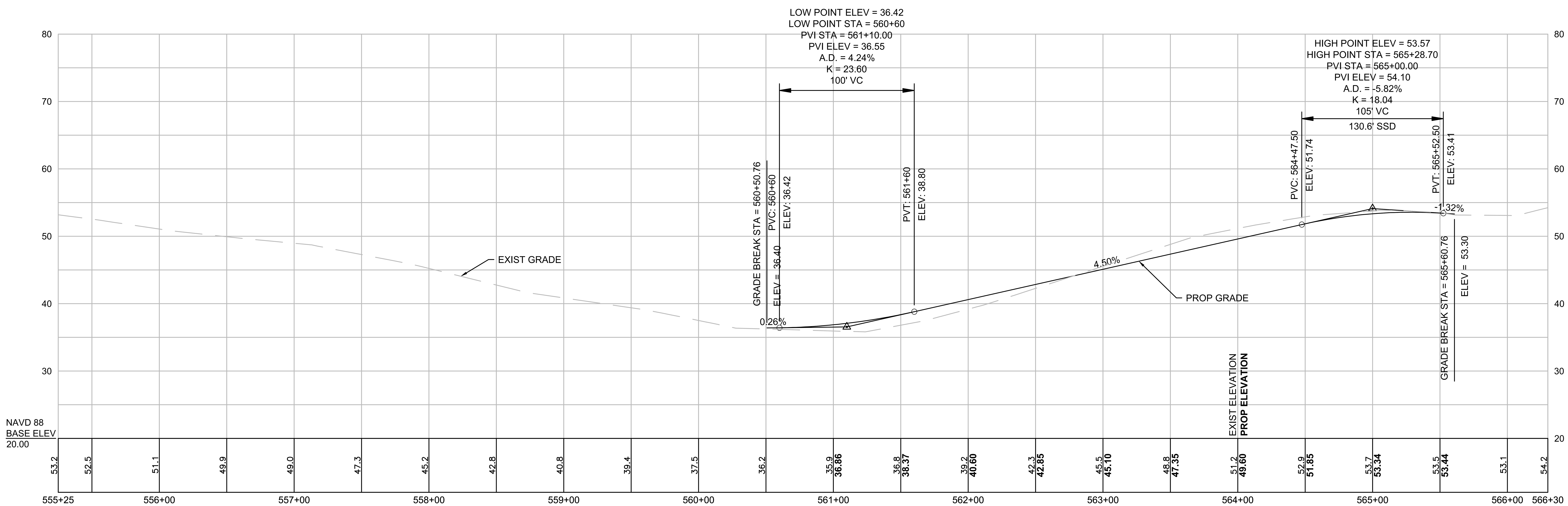
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	35	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES



CCRT PHASE 3 - EAST



Plotted on 22-Nov-2021 3:38 PM

607398_HD(GEN).DWG

HIGHWAY GUARD DETAILS
NONE

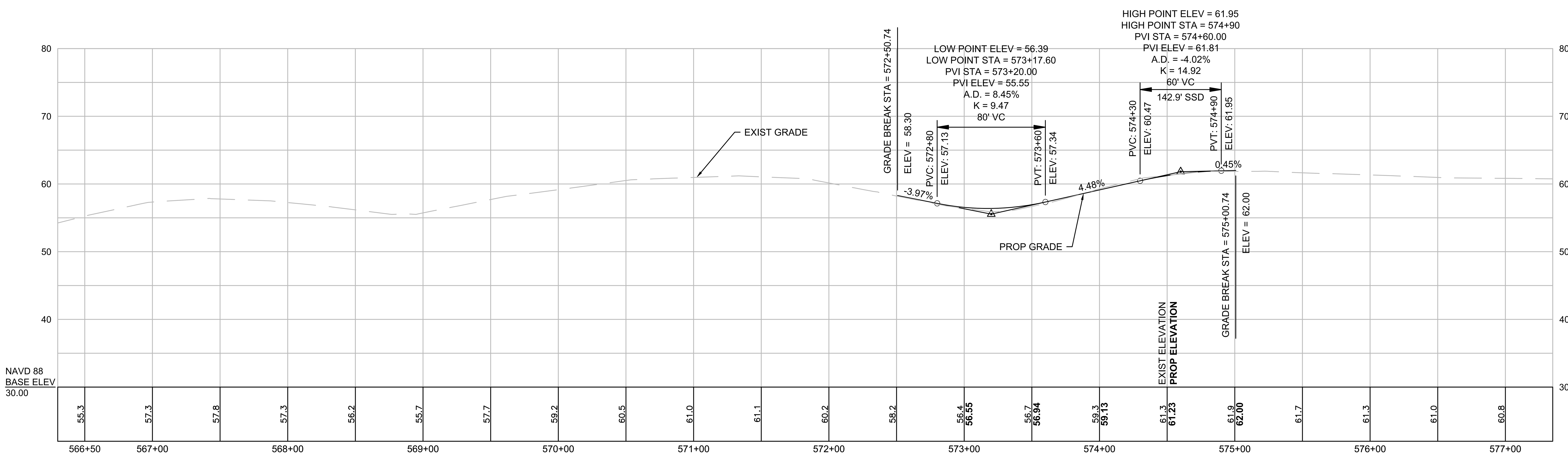
DRAINAGE DETAILS
NONE

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	36	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

CCRT PHASE 3 - EAST



Plotted on 22-Nov-2021 3:39 PM
607398_HD(GEN).DWG

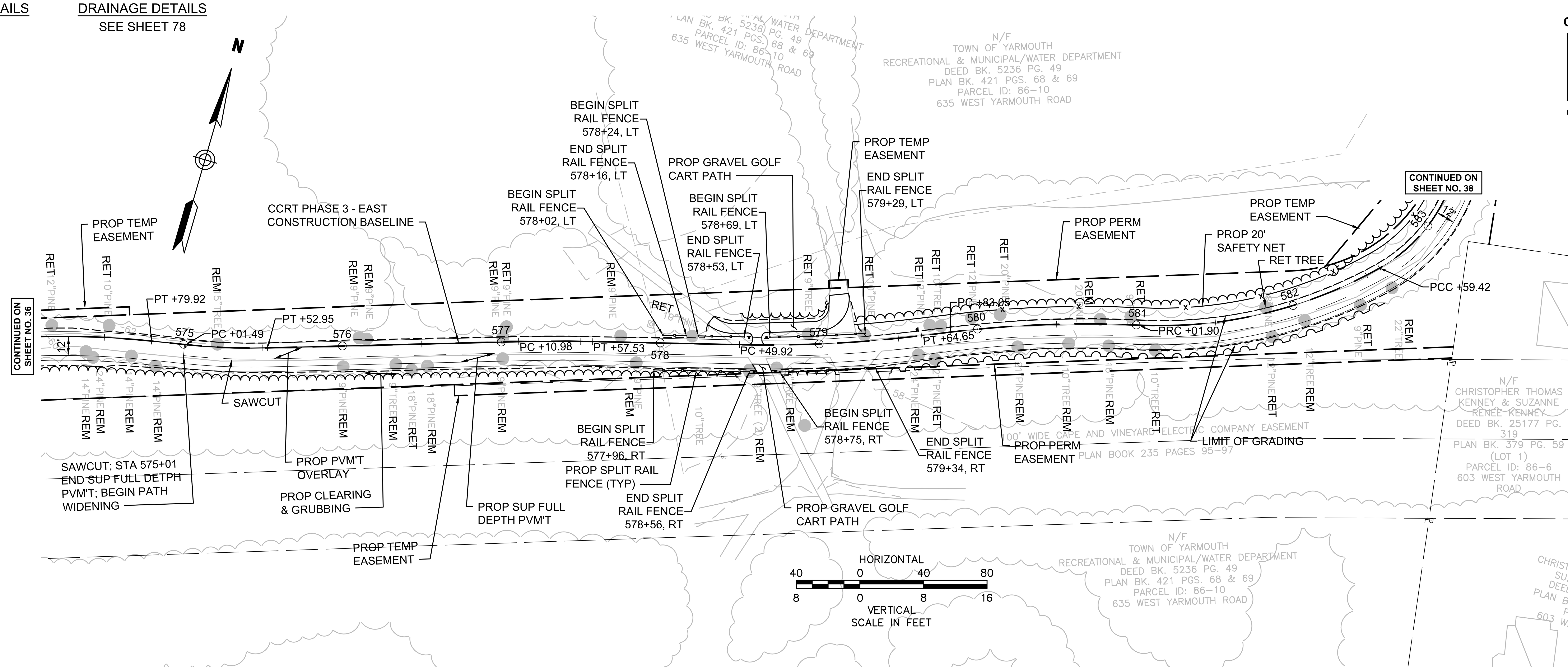
HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 78

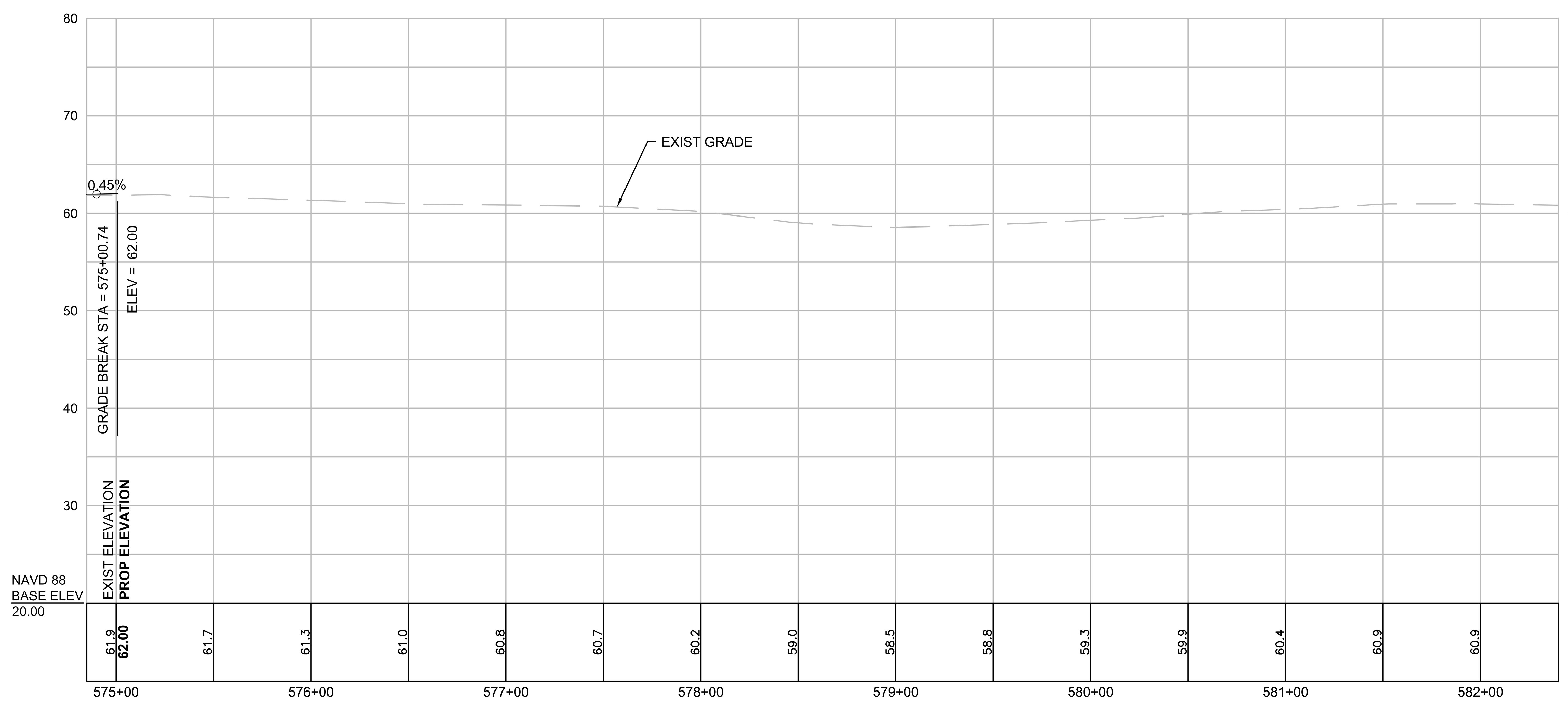
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	37	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES



CCRT PHASE 3 - EAST



607398_HD(GEN).DWG
Plotted on 22-Nov-2021 3:41 PM

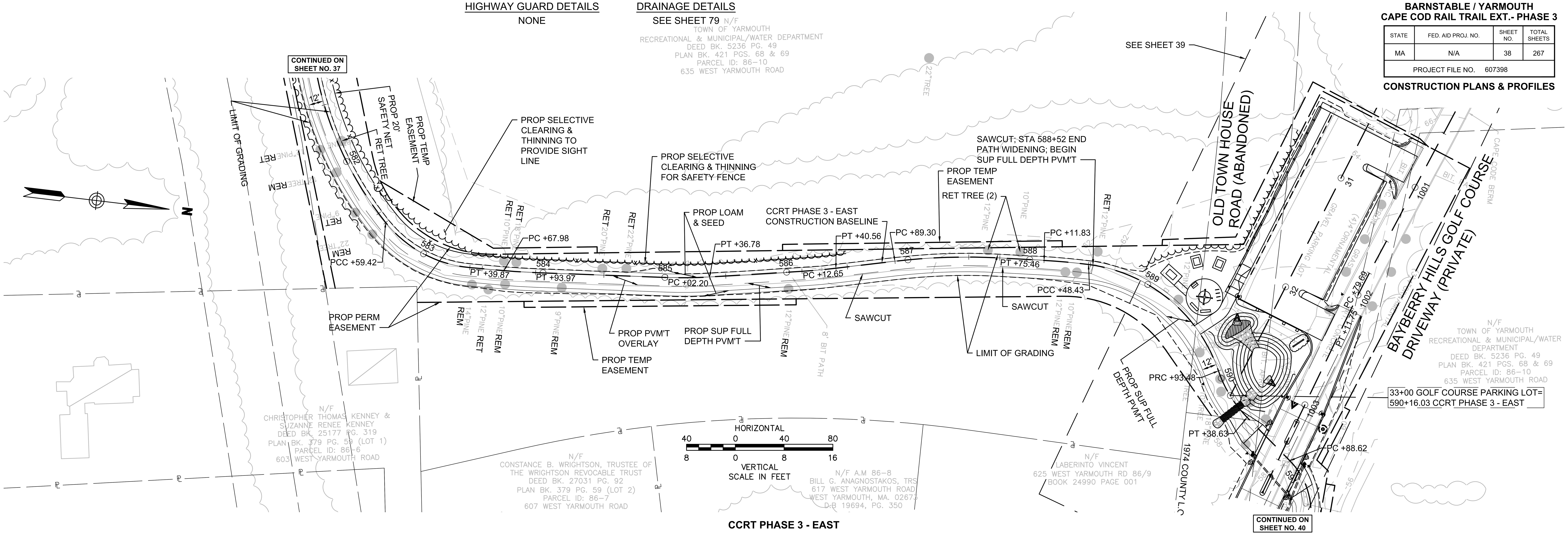
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	38	267
PROJECT FILE NO. 607398			

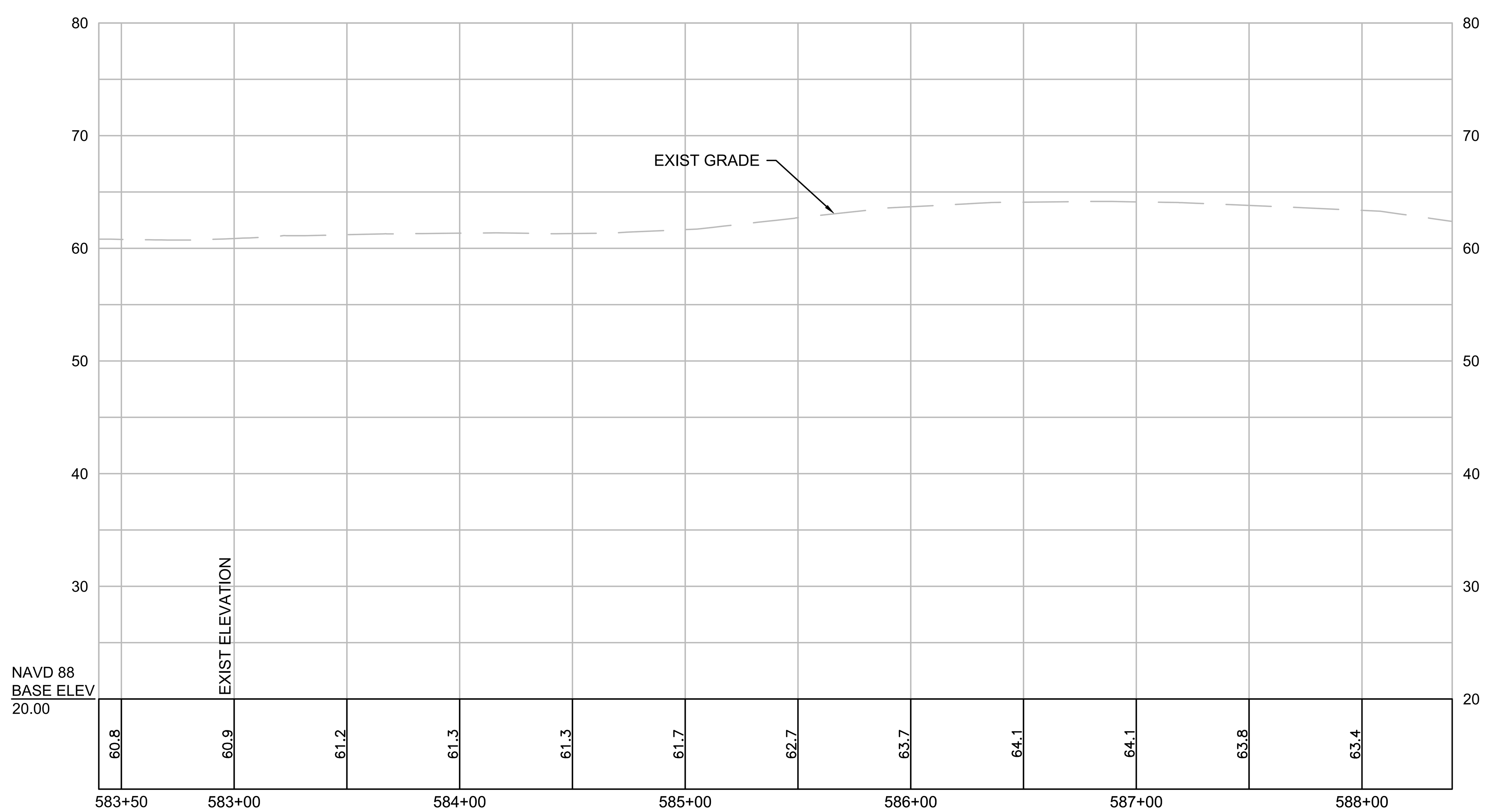
CONSTRUCTION PLANS & PROFILES

HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 79



CCRT PHASE 3 - EAST



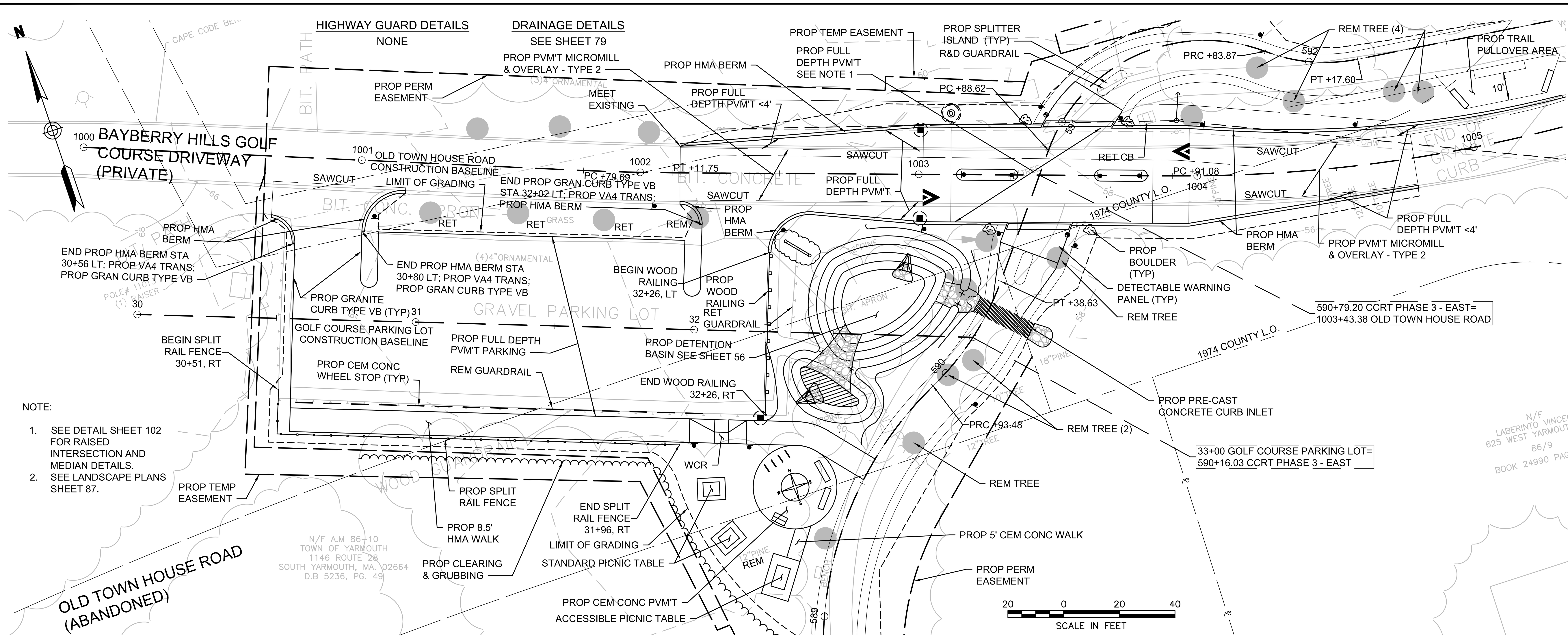
Plotted on 22-Nov-2021 3:42 PM
607398_HD(GEN).DWG

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	39	267
PROJECT FILE NO. 607398			

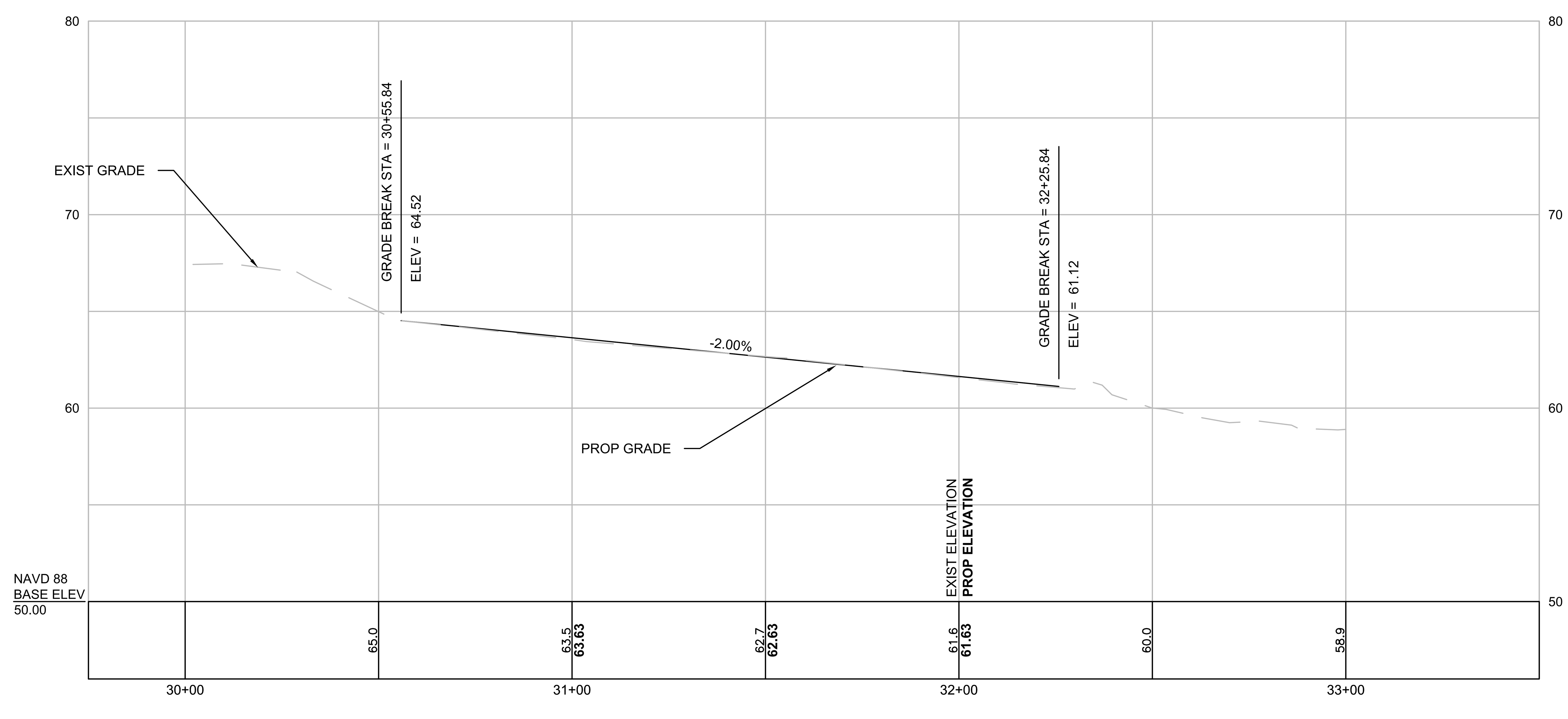
CONSTRUCTION PLANS & PROFILES

Plotted on 22-Nov-2021 3:44 PM

607398_HD(GEN).DWG



PARKING LOT NO. 3 - OLD TOWN HOUSE ROAD

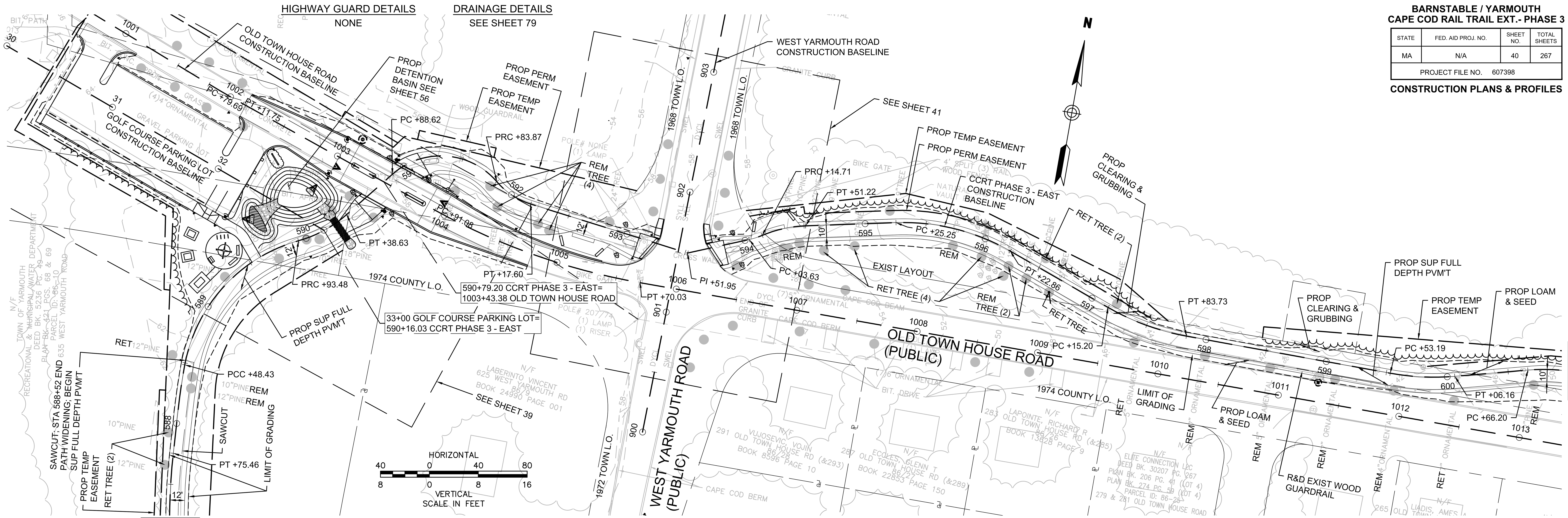


STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	40	267
PROJECT FILE NO. 607398			

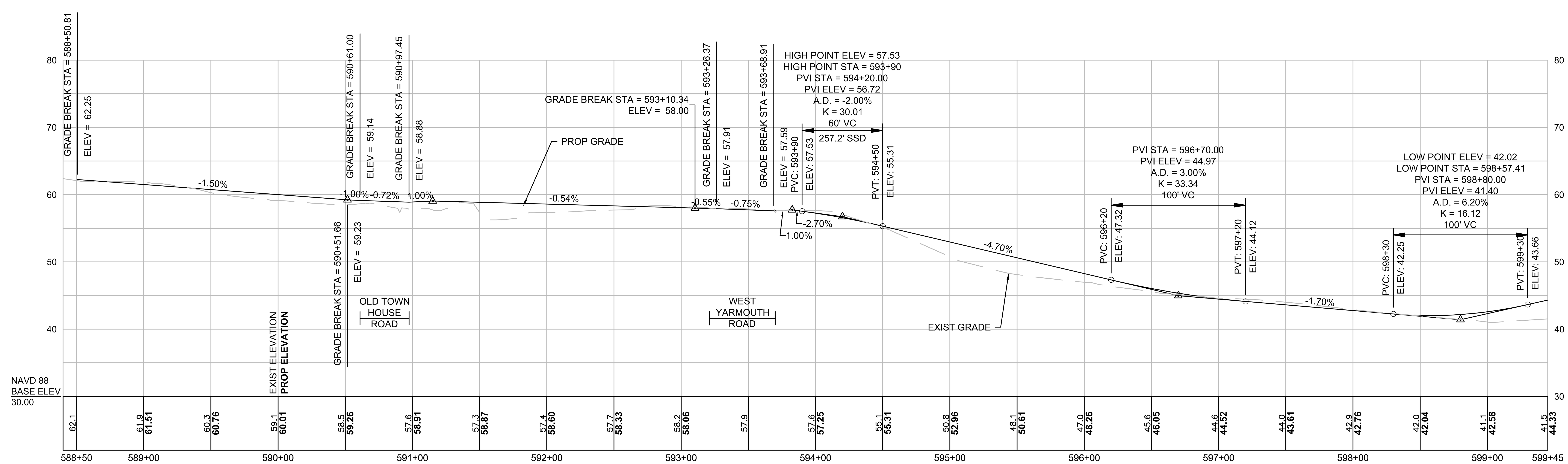
CONSTRUCTION PLANS & PROFILES

HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 79

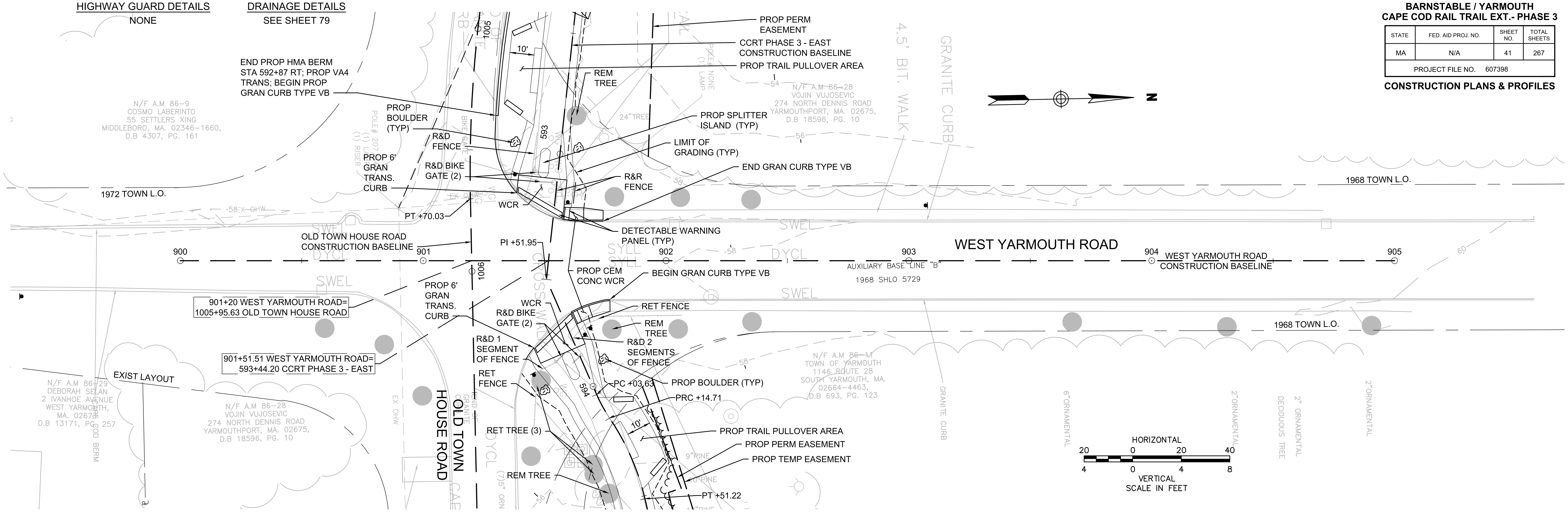


CCRT PHASE 3 - EAST

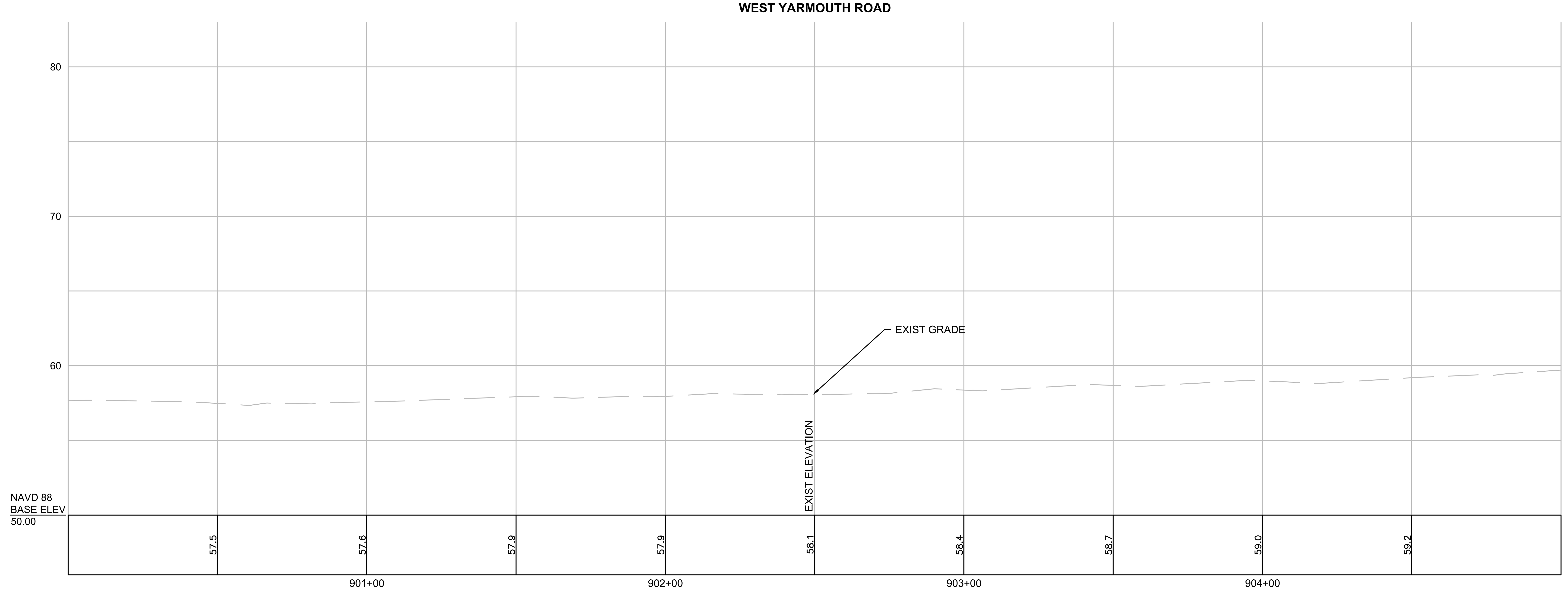


HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 79



WEST YARMOUTH ROAD



HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 80

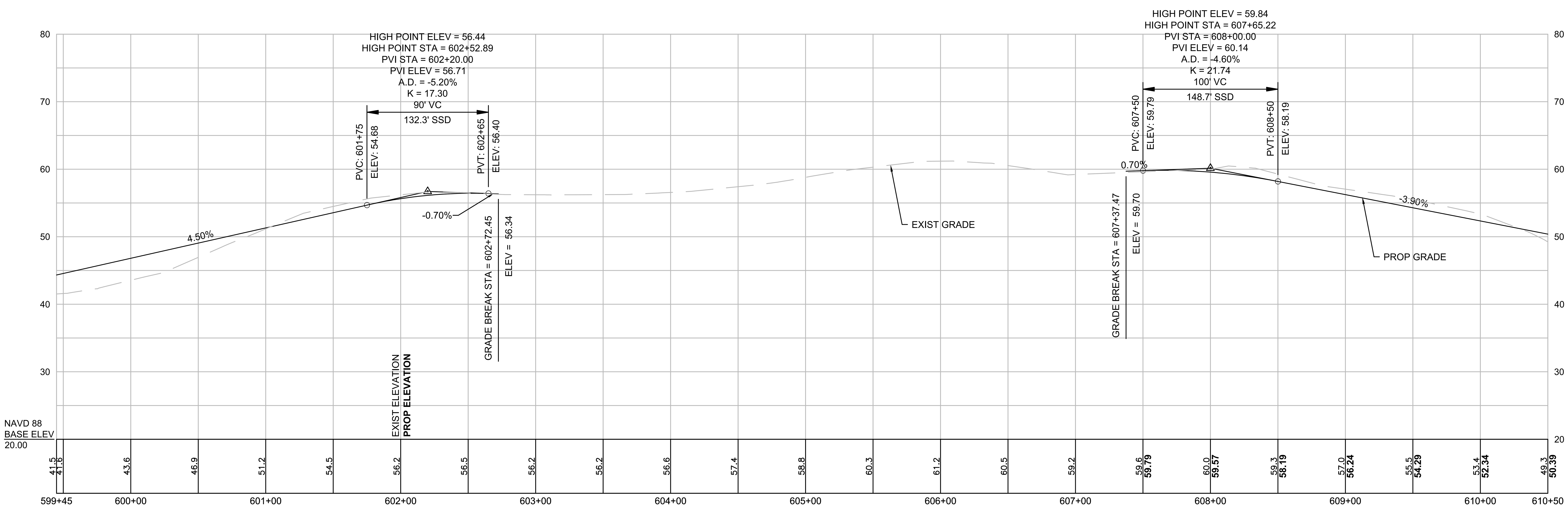
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	42	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

Plotted on 22-Nov-2021 3:48 PM
607398_HD(GEN).DWG

CCRT PHASE 3 - EAST



HIGHWAY GUARD DETAILS
NONE

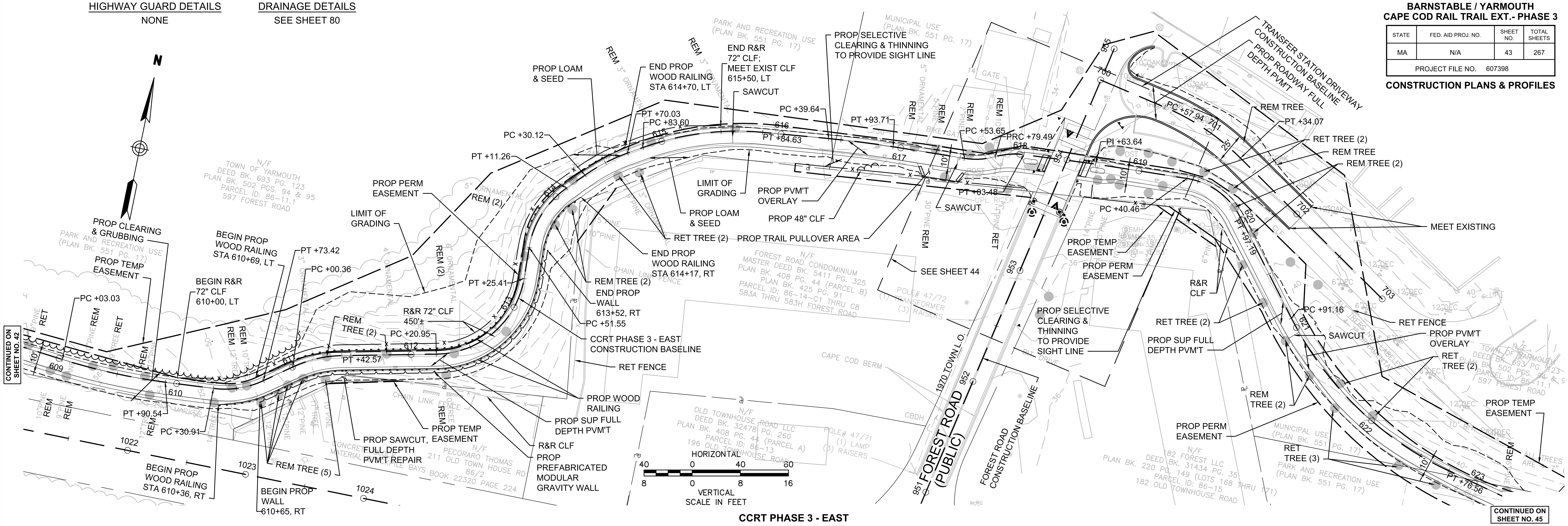
DRAINAGE DETAILS
SEE SHEET 80

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	43	267
PROJECT FILE NO. 607398			

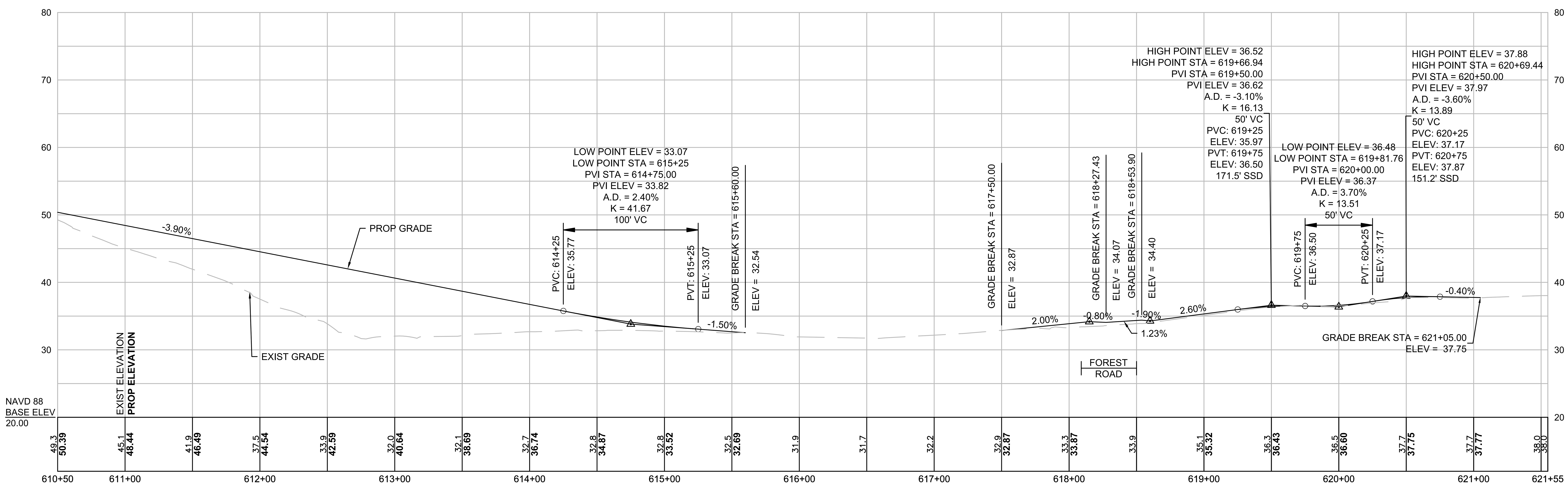
CONSTRUCTION PLANS & PROFILES

CONTINUED ON SHEET NO. 42



CCRT PHASE 3 - EAST

CONTINUED ON SHEET NO. 45



607398_HD(GEN).DWG
Plotted on 22-Nov-2021 3:50 PM

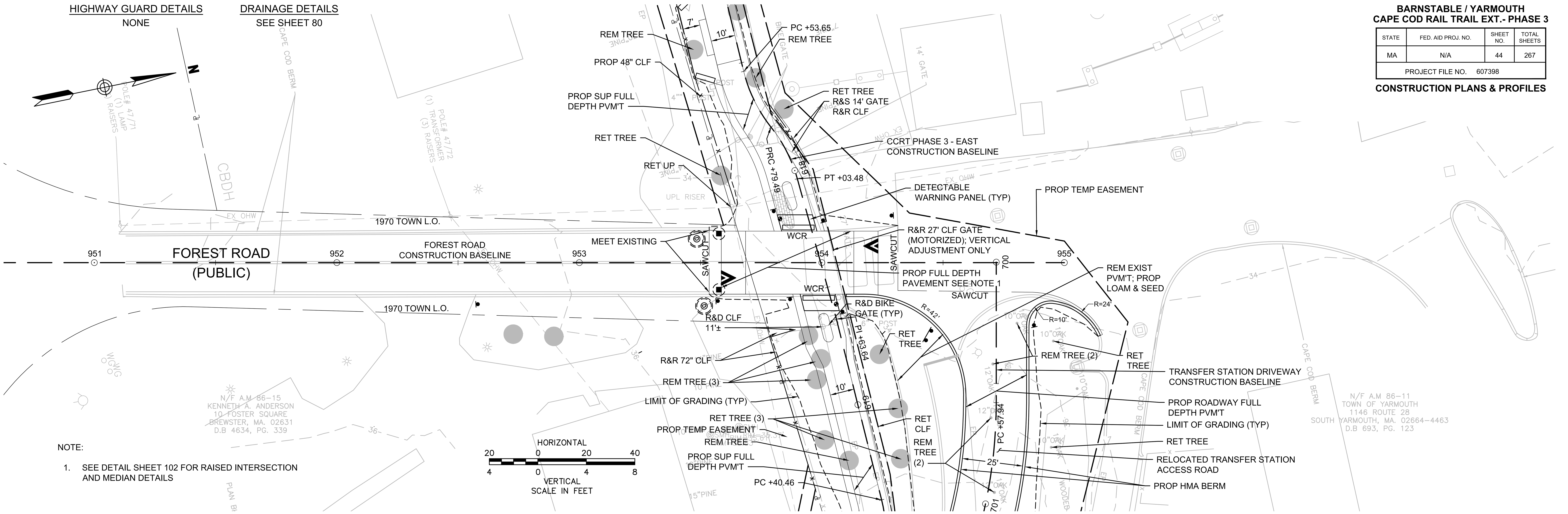
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	44	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

HIGHWAY GUARD DETAILS
NONE

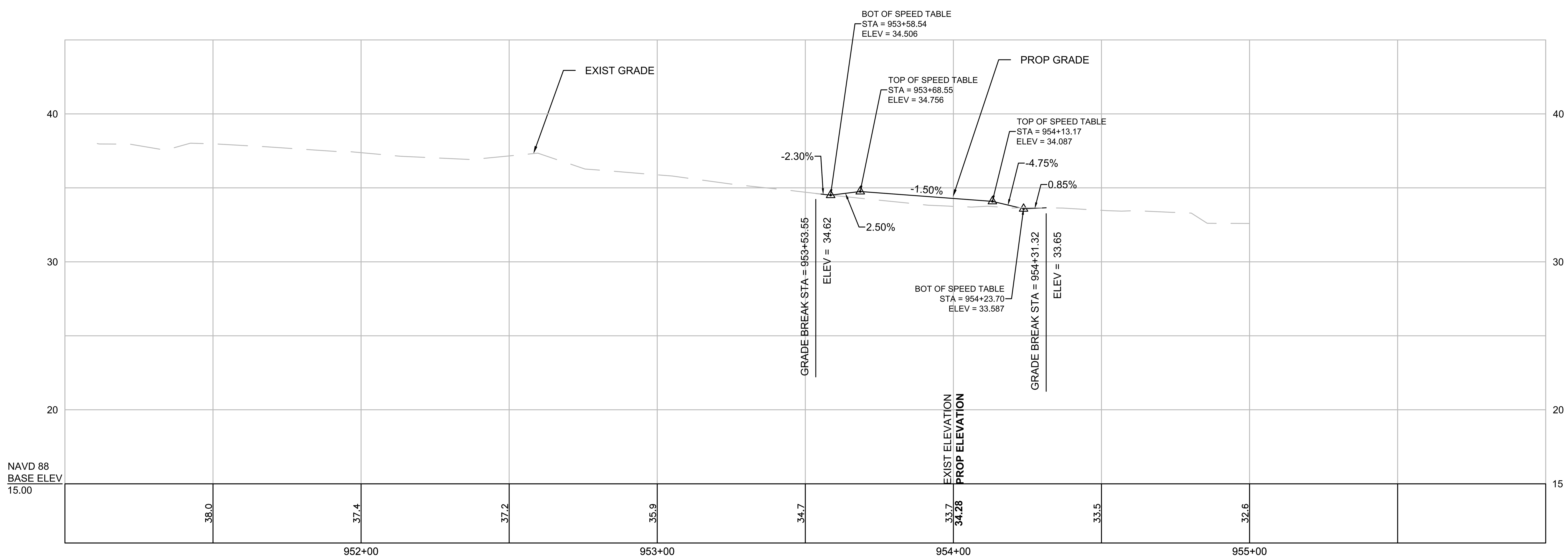
DRAINAGE DETAILS
SEE SHEET 80



NOTE:

1. SEE DETAIL SHEET 102 FOR RAISED INTERSECTION AND MEDIAN DETAILS

FOREST ROAD EXTENSION



607398_HD(GEN).DWG Plotted on 22-Nov-2021 3:51 PM

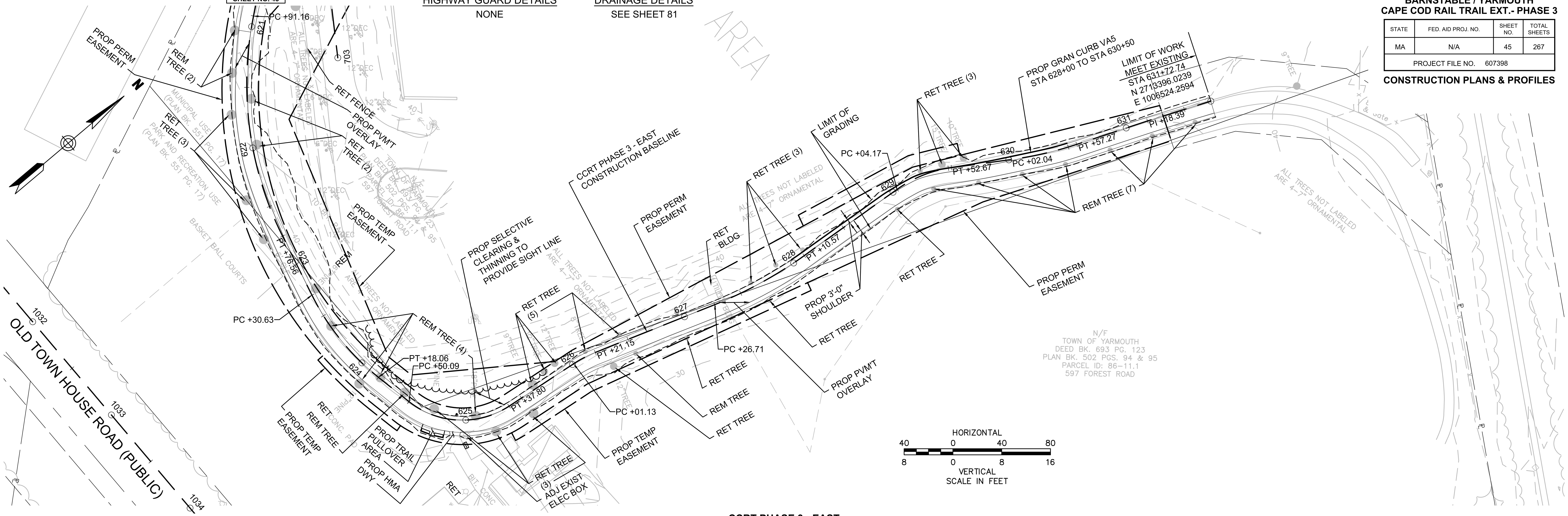
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	45	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

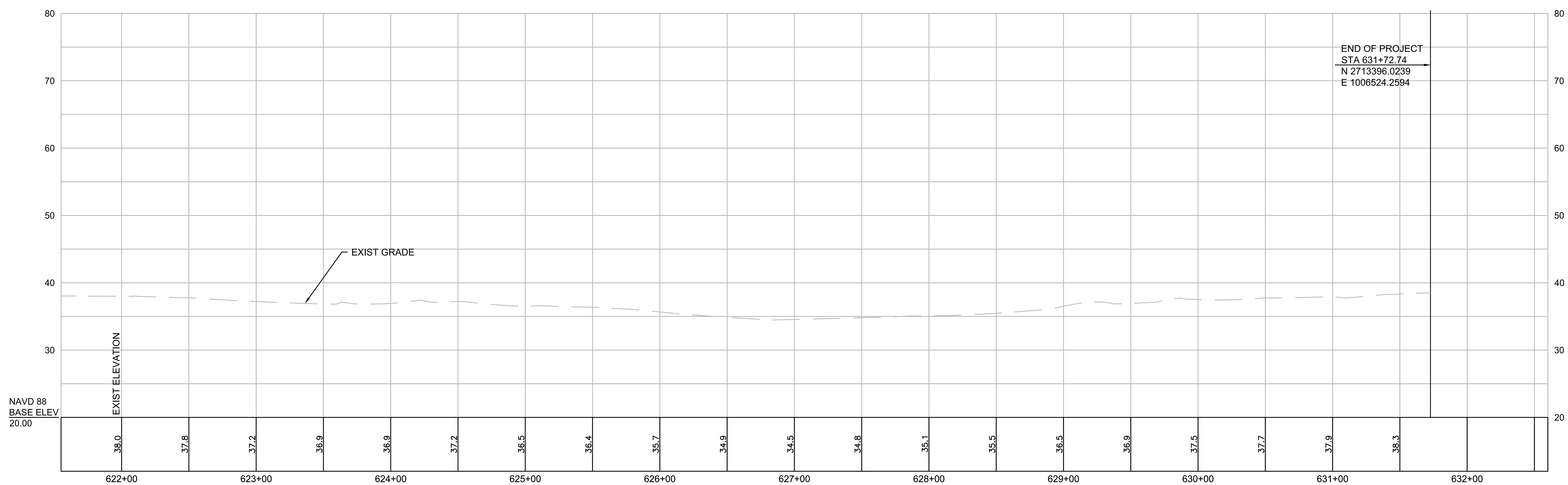
CONTINUED ON SHEET NO. 43

HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 81



CCRT PHASE 3 - EAST



Station	622+00		623+00		624+00		625+00		626+00		627+00		628+00		629+00		630+00		631+00	
EXIST ELEVATION	38.0	37.8	37.2	36.9	36.9	37.2	36.5	36.4	35.7	34.9	34.5	34.8	35.1	35.5	36.5	36.9	37.5	37.7	37.9	38.3

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

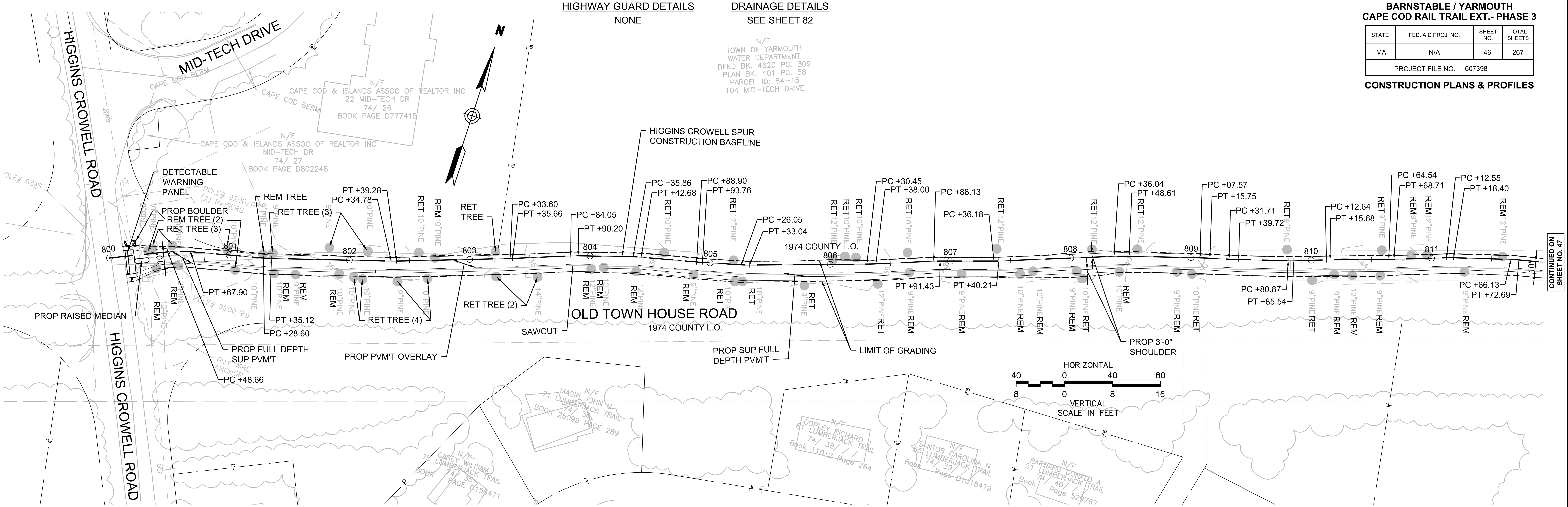
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	46	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES

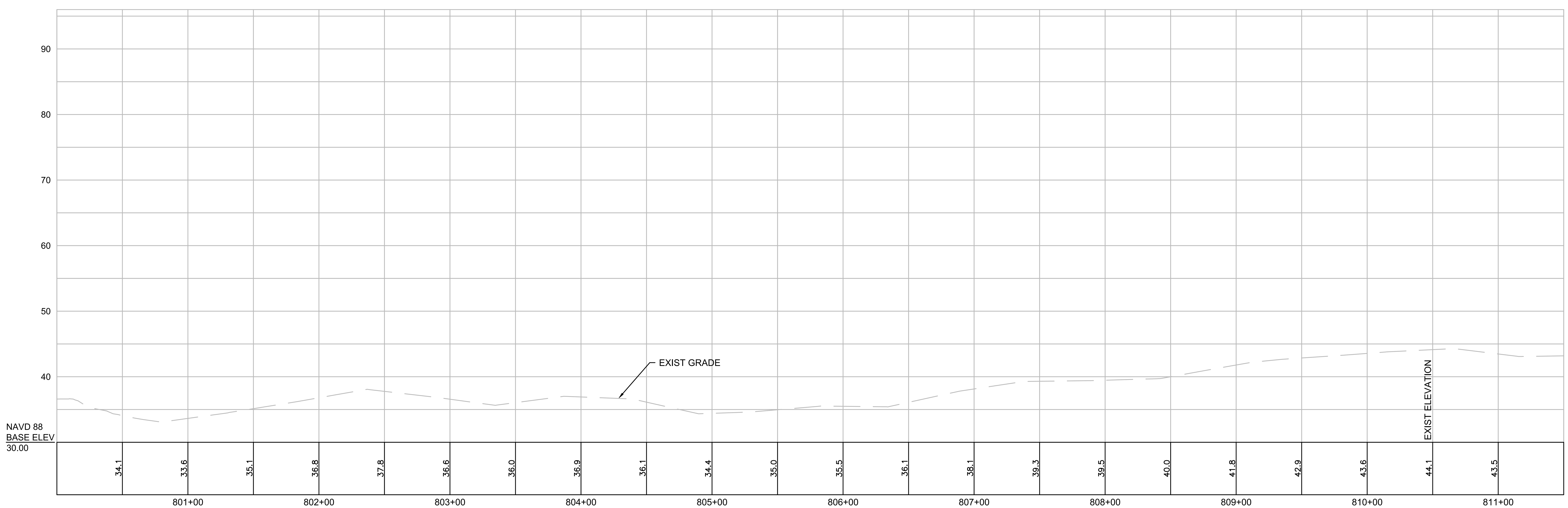
Plotted on 24-Nov-2021 4:17 PM
607398_HD(GEN).DWG

HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 82



HIGGINS CROWELL ROAD SPUR



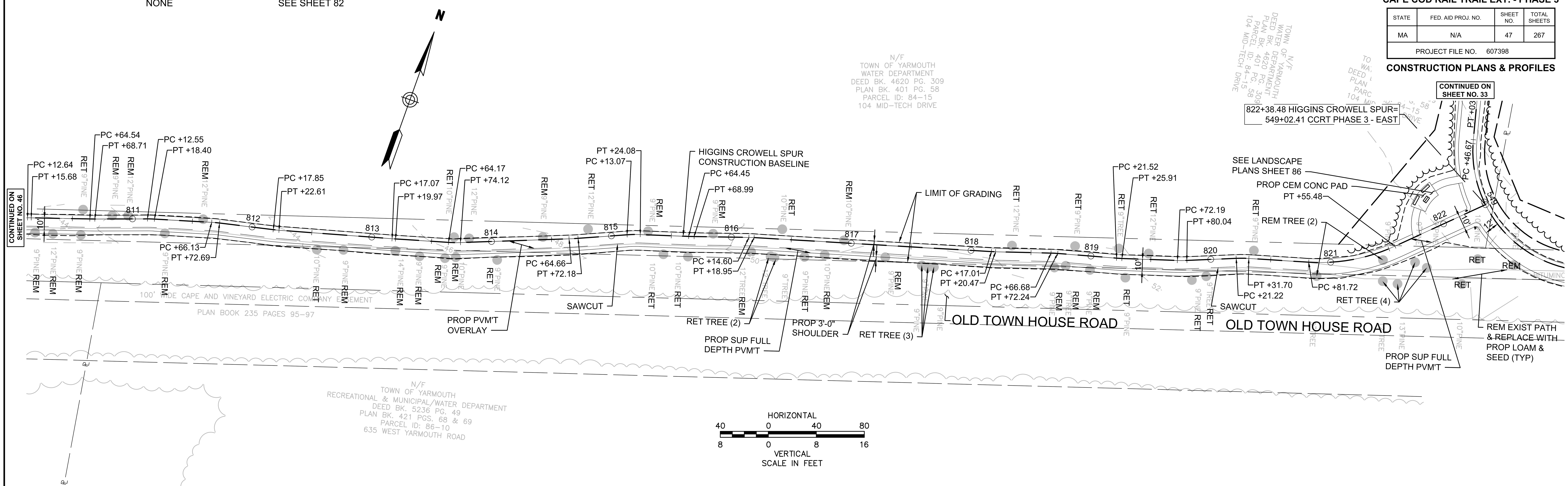
HIGHWAY GUARD DETAILS
NONE

DRAINAGE DETAILS
SEE SHEET 82

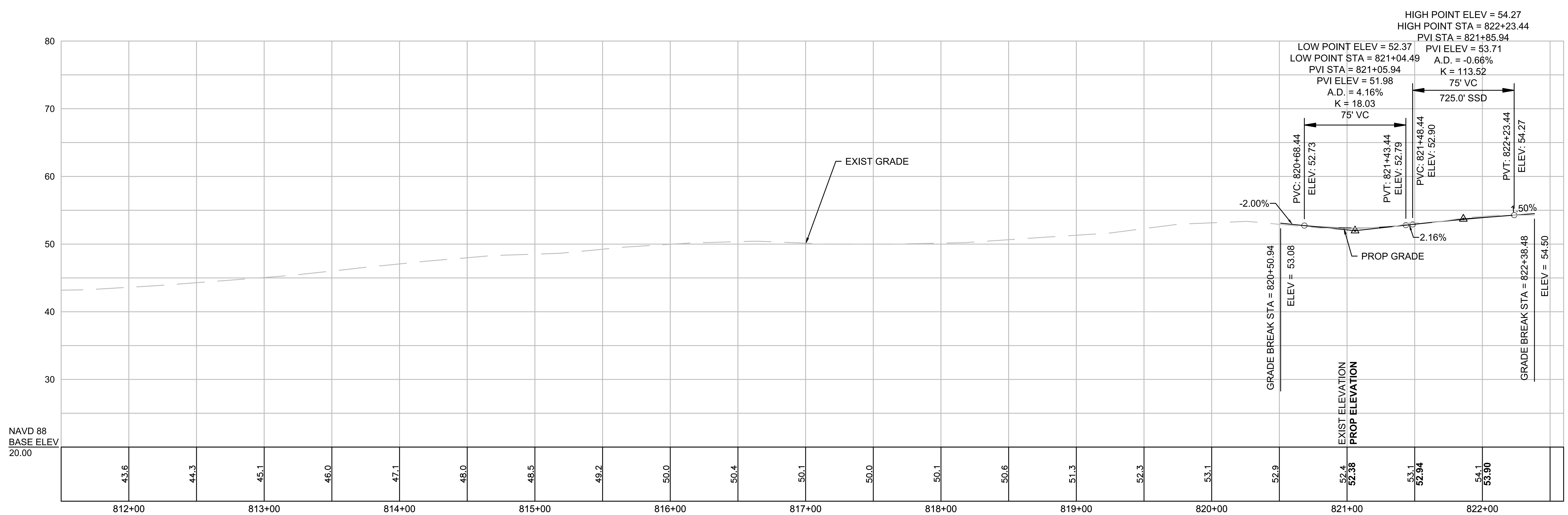
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT. - PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	47	267
PROJECT FILE NO. 607398			

CONSTRUCTION PLANS & PROFILES



HIGGINS CROWELL ROADWAY SPUR



607398_HD(GEN).DWG Plotted on 22-Nov-2021 3:56 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N/A	48	267
PROJECT FILE NO. 607398			

SURVEY CONTROL PLANS

Plotted on 24-Nov-2021 5:09 PM

607398_HD(CTG).DWG

TRAVERSE DATA				
POINT #	ELEVATION	NORTHING	EASTING	RAW DESCRIPTION
1	41.14	2711674.4287	996981.0774	MMAG
2	42.32	2711947.3911	996839.5804	MMAG
3	42.23	2712260.0325	996543.2828	MMAG
4	52.63	2712444.4947	996223.2127	MMAG
5	61.13	2712539.3213	995939.2306	MMAG
6	55.13	2712599.6885	995646.7164	MMAG
7	48.33	2712656.1137	995412.5225	MSTN
8	73.42	2712723.6174	995338.8411	MSTN
9	49.66	2712815.1105	995193.9162	MSTN
10	59.26	2712995.9035	995110.5989	MSTN
11	61.85	2713132.1622	995133.1142	MSTN
12	73.87	2713171.3357	994988.3627	MSTN
13	73.59	2713336.1626	994826.0350	MSTN
14	71.81	2713332.6482	994653.9233	MSTN
15	78.21	2713379.0954	994483.2775	MSTN
16	89.09	2713408.8955	994303.7112	MSTN
17	80.92	2713435.0679	994093.9739	MSTN
18	76.42	2713335.2376	993898.0899	MSTN
19	101.92	2713328.2967	993667.5328	MSTN
20	99.41	2713334.2719	993507.9632	MSTN
21	95.81	2713281.1613	993365.0347	MSTN
22	113.97	2713390.6868	993121.8350	MSTN
23	127.18	2713345.0788	993004.7866	MSTN
24	116.37	2713195.8114	992943.8559	MSTN

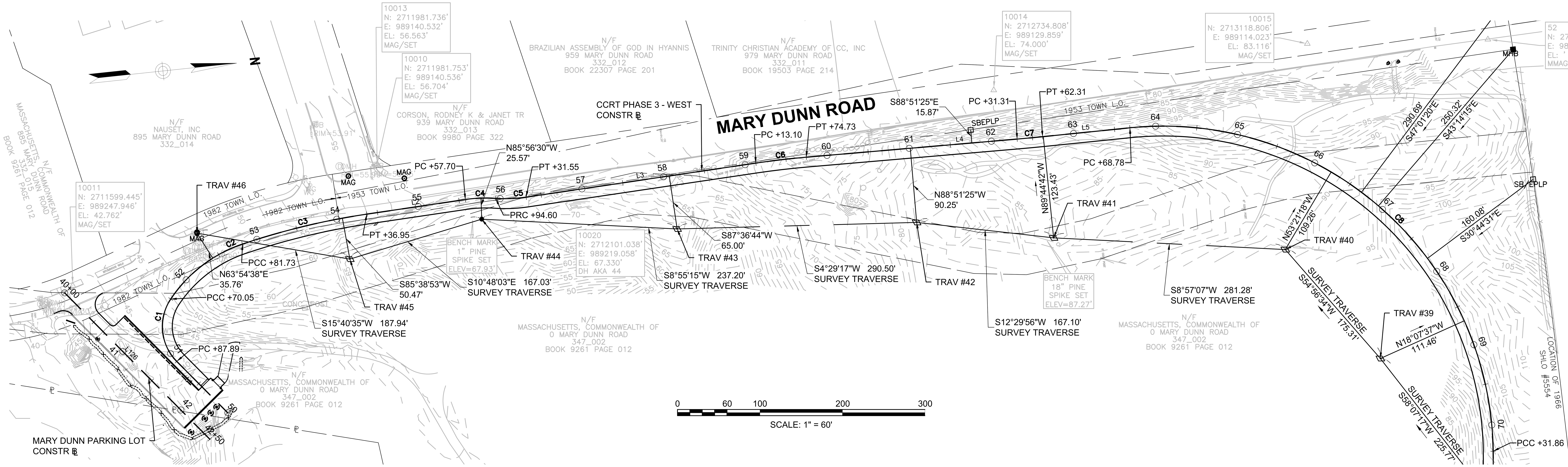
TRAVERSE DATA				
POINT #	ELEVATION	NORTHING	EASTING	RAW DESCRIPTION
25	112.25	2713234.9679	992839.2720	MSTN
26	99.87	2713294.1891	992681.0139	MSTN
27	84.80	2713398.2497	992485.3566	MTRV
28	91.68	2713420.5862	992158.8154	MTRV
29	103.14	2713420.6150	991865.3219	MTRV
30	97.15	2713355.8542	991634.0990	MSTN
31	76.70	2713333.9621	991294.3419	MSTN
32	80.59	2713356.4950	991138.9075	MSTN
33	73.88	2713359.2545	990857.5278	MSTN
34	94.79	2713273.3141	990712.8106	MSTN
35	117.52	2713324.9568	990488.7935	MSTN
36	107.87	2713294.2185	990300.1579	MDHL
37	88.70	2713213.2331	989995.8533	MSTN
38	95.70	2713285.8390	989694.6555	MSTN
39	97.46	2713166.6066	989502.9417	MSTN
40	91.28	2713065.9121	989359.4406	MSTN
41	85.64	2712788.0594	989315.6723	MSTN
42	81.90	2712624.9170	989279.5078	MSTN
43	68.35	2712335.3029	989256.7754	MSTN
44	66.48	2712100.9710	989219.9930	MDHL
45	65.00	2711936.9001	989251.2939	MSTN
46	47.12	2711755.9518	989200.5123	MMAG
48	39.32	2711453.4124	997180.1086	MTRV MSTN

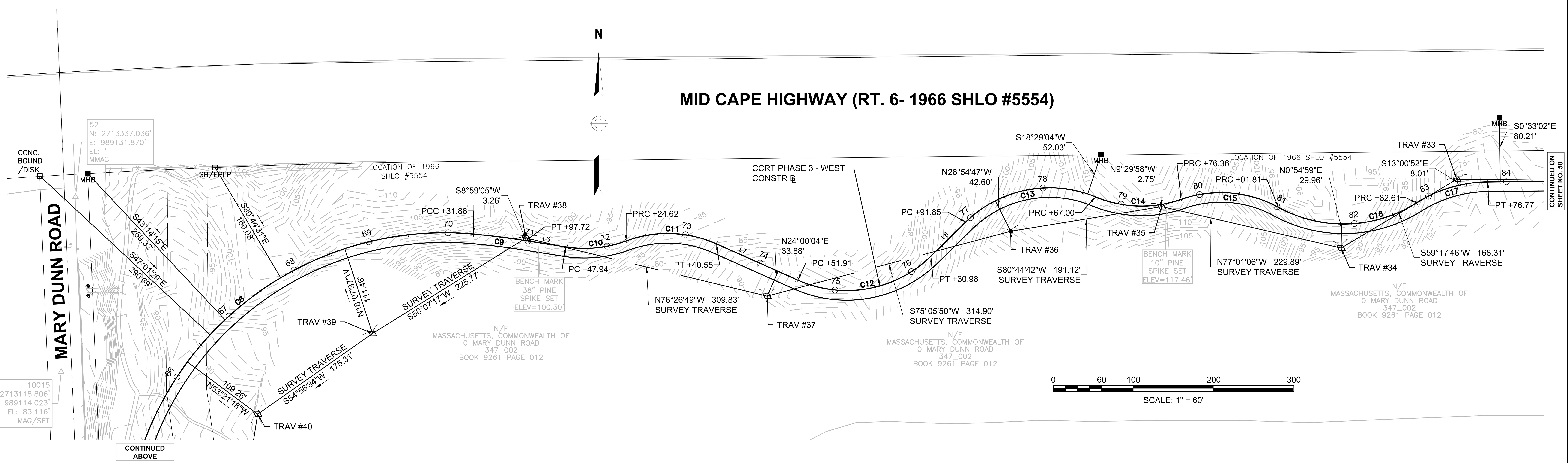
BOUND LOCATION					
ALIGNMENT	STATION	OFFSET	NORTHING	EASTING	DESCRIPTION
CCRT EXT WEST	61+76	15.9' LT	2712701.9584	989174.8979	SBEPLP
CCRT EXT WEST	66+67	290.7' LT	2713363.2358	989087.3929	CONC. BOUND/DISK
CCRT EXT WEST	66+93	250.3' LT	2713366.1535	989147.2293	MHB
CCRT EXT WEST	67+81	160.1' LT	2713373.7592	989306.4167	SB/EPLP
CCRT EXT WEST	78+56	52.0' LT	2713390.0655	990412.8241	MHB
CCRT EXT WEST	83+92	80.2' LT	2713436.1647	990910.7707	MHB
CCRT EXT WEST	101+21	42.3' LT	2713327.9178	992631.3372	MHB
CCRT EXT WEST	108+59	65.4' RT	2713320.3422	993278.7762	STONE BOUND/EPLP
CCRT EXT WEST	110+34	68.0' RT	2713321.5755	993402.7809	STONE BOUND/EPLP
CCRT EXT WEST	138+61	65.6' RT	2712532.2629	995830.1037	CONC. BOUND/DISK
WILLOW STREET	2004+75	41.44 LT	2712531.3571	995361.5739	MHB/SBEPLP
HIGGINS CROWELL PARKING LOT	201+78	30.1' RT	2711800.4422	996879.1951	CONC. BOUND
HIGGINS CROWELL PARKING LOT	201+79	29.9' LT	2711828.4133	996932.2465	CONC. BOUND #BROKEN

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N/A	49	267
PROJECT FILE NO. 607398			

SURVEY CONTROL PLANS





Plotted on 24-Nov-2021 5:10 PM
607398_HD(CTG).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N/A	50	267
PROJECT FILE NO. 607398			

SURVEY CONTROL PLANS

Plotted on 24-Nov-2021 5:11 PM

607398_HD(CTG).DWG

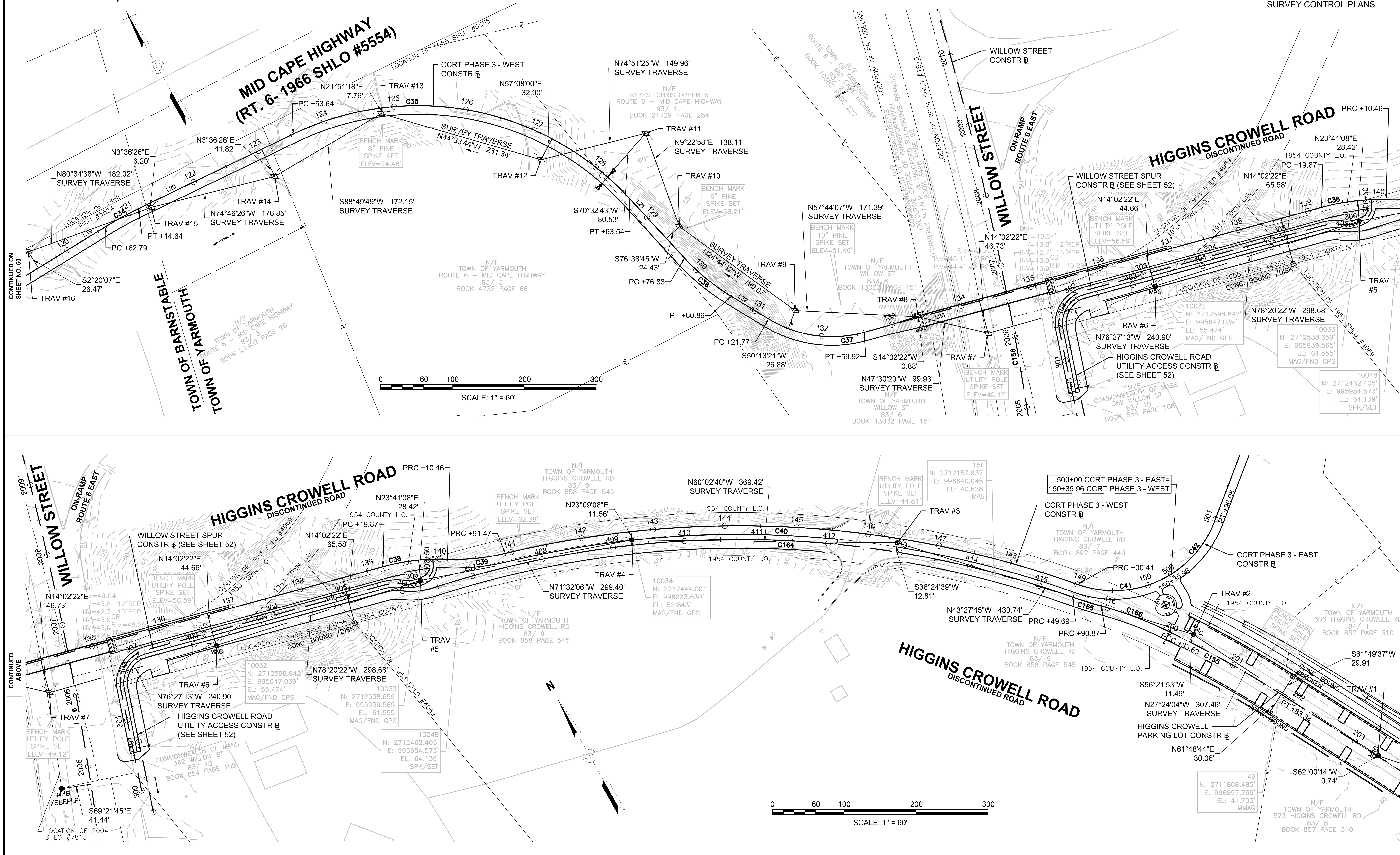
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N/A	51	267
PROJECT FILE NO. 607398			

SURVEY CONTROL PLANS

Plotted on 24-Nov-2021 5:12 PM

607398_HD(CTG).DWG

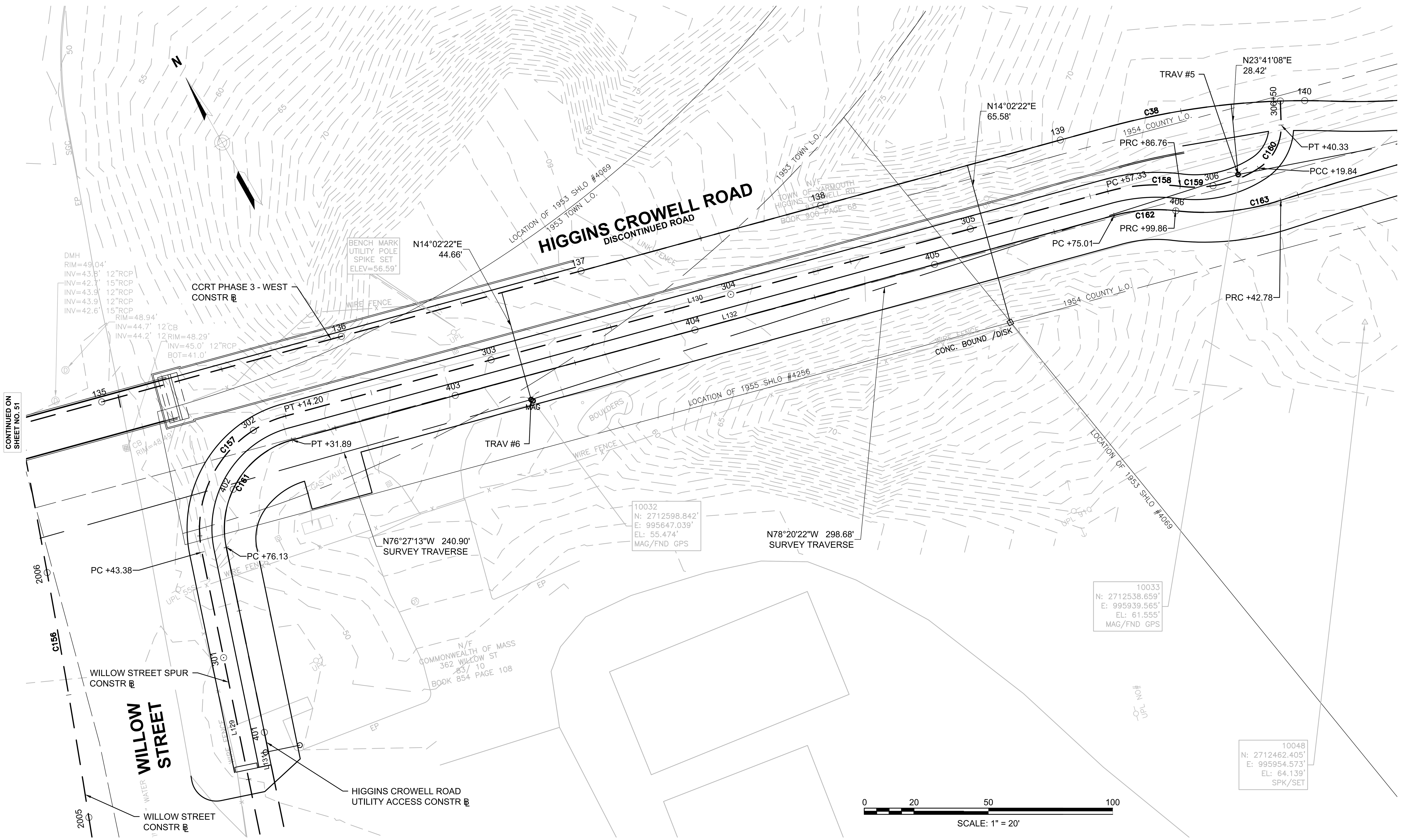


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N/A	52	267
PROJECT FILE NO. 607398			

SURVEY CONTROL PLANS

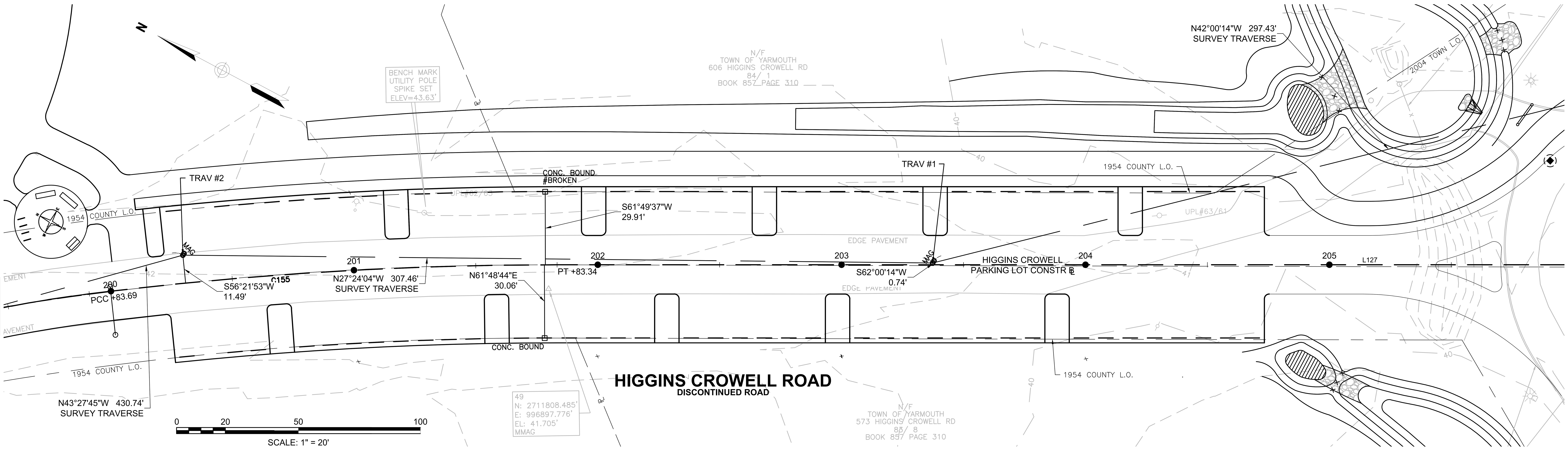
Plotted on 24-Nov-2021 5:12 PM
607398_HD(CTG).DWG

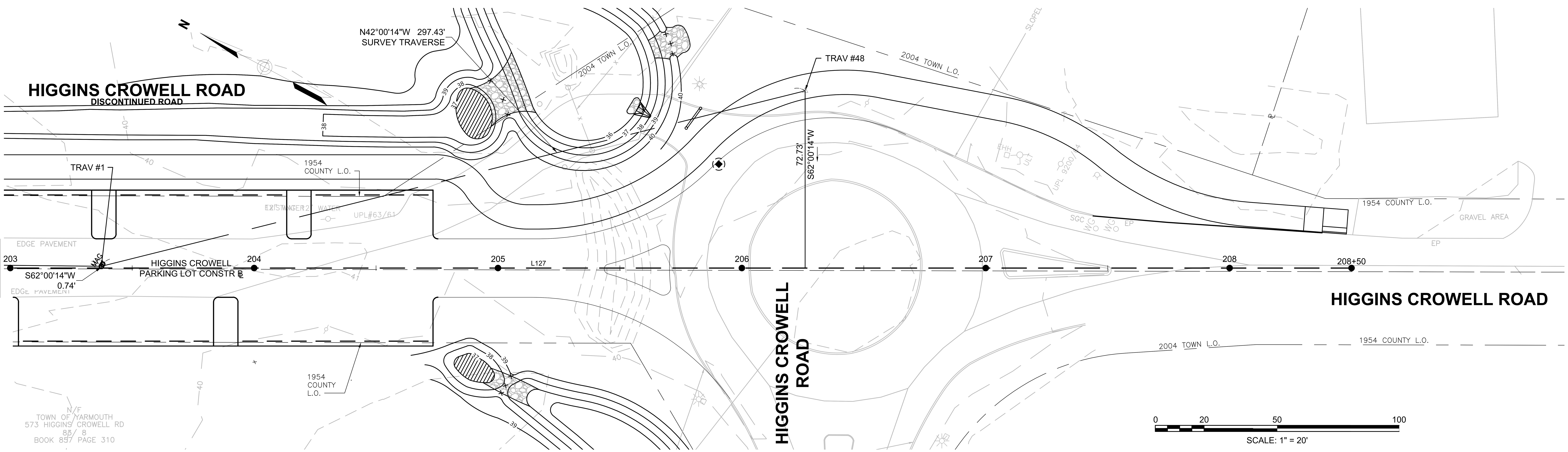


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N/A	53	267
PROJECT FILE NO. 607398			

SURVEY CONTROL PLANS





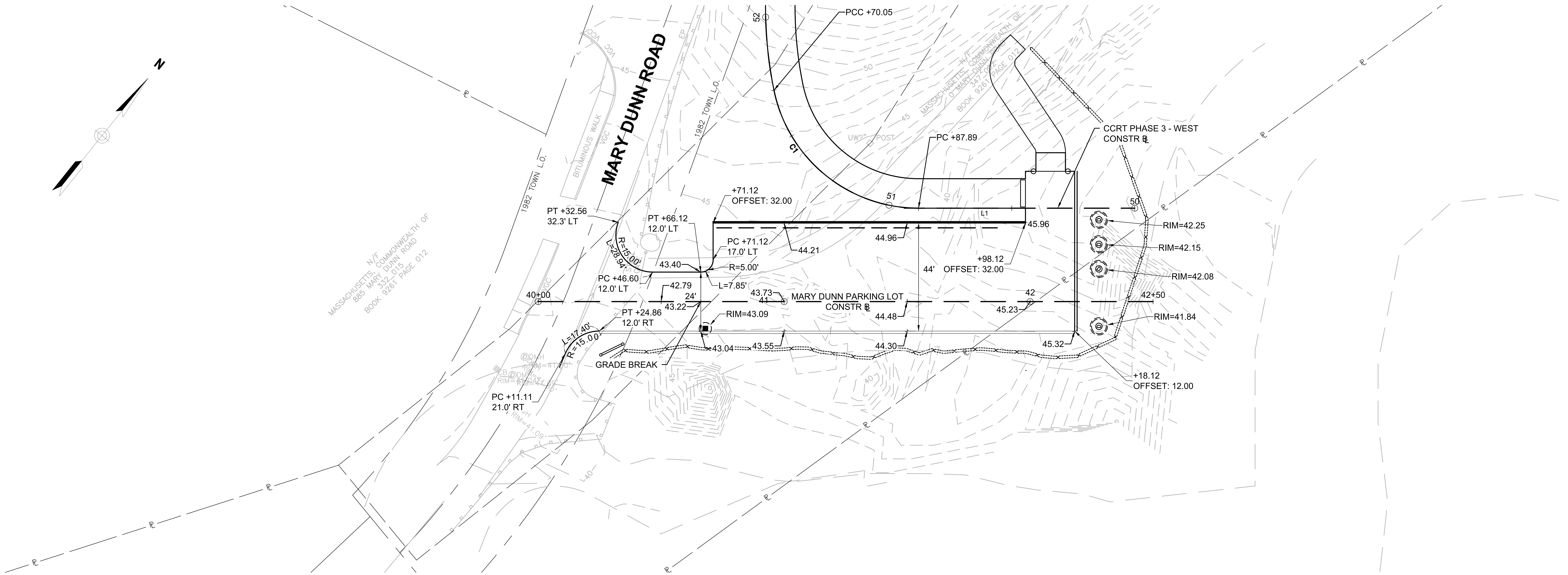
Plotted on 22-Nov-2021 4:06 PM

607398_HD(CTG).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N/A	54	267
PROJECT FILE NO. 607398			

CURB TIE & GRADING PLANS



0 20 50 100
SCALE: 1" = 20'

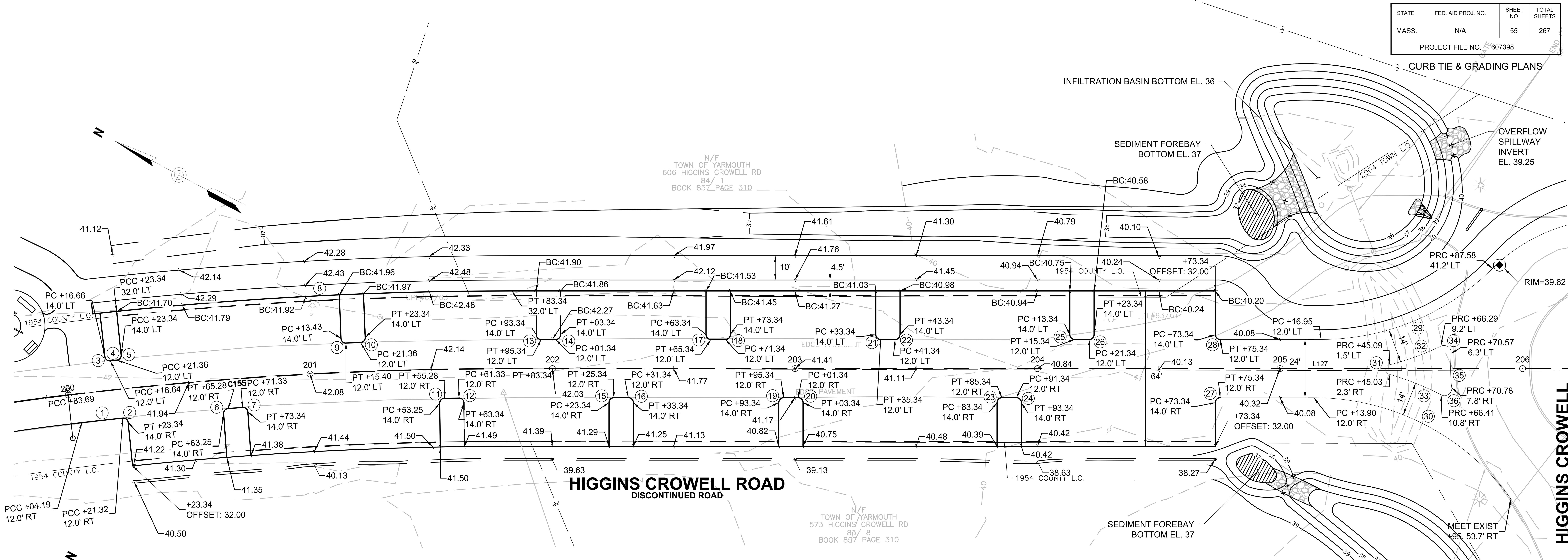
Plotted on 24-Nov-2021 5:14 PM
607398_HD(CTG).DWG

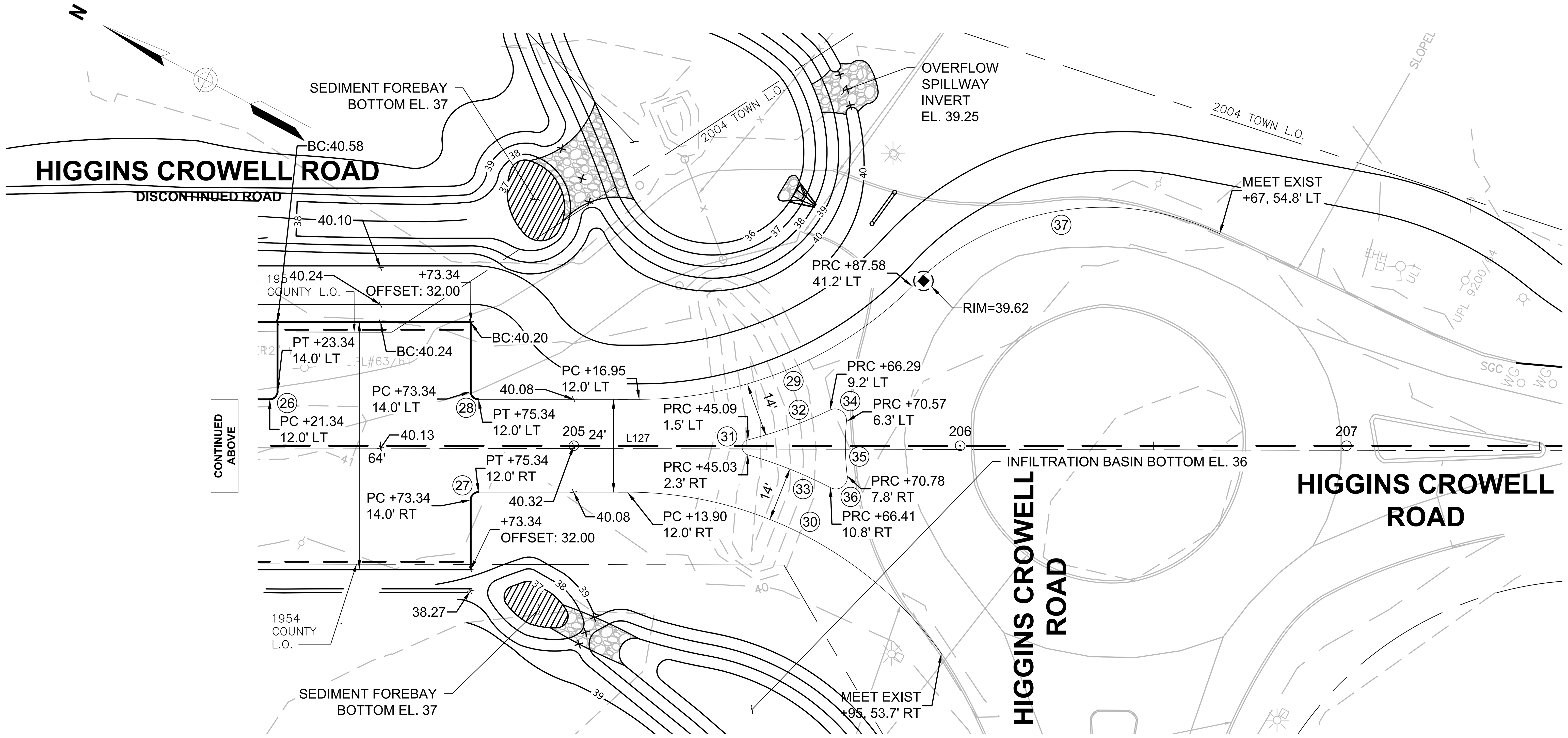
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N/A	55	267
PROJECT FILE NO. 607398			

CURB TIE & GRADING PLANS

Plotted on 24-Nov-2021 5:15 PM
607398_HD(CTG).DWG





CURVE TABLE			
CURVE #	DELTA	RADIUS	LENGTH
1	0°38'00"	1538.00	17.00
2	90°04'29"	2.00	3.14
3	89°35'49"	2.00	3.13
4	0°06'01"	1562.00	2.74
5	89°55'36"	2.00	3.14
6	90°00'00"	2.00	3.14
7	90°00'00"	2.00	3.14
8	5°54'52"	1582.00	163.31
9	90°00'00"	2.00	3.14
10	90°00'00"	2.00	3.14
11	90°00'00"	2.00	3.14
12	90°00'00"	2.00	3.14
13	90°00'00"	2.00	3.14
14	90°00'00"	2.00	3.14
15	90°00'00"	2.00	3.14
16	90°00'00"	2.00	3.14
17	90°00'00"	2.00	3.14
18	90°00'00"	2.00	3.14
19	90°00'00"	2.00	3.14

CURVE TABLE			
CURVE #	DELTA	RADIUS	LENGTH
20	90°00'00"	2.00	3.14
21	90°00'00"	2.00	3.14
22	90°00'00"	2.00	3.14
23	90°00'00"	2.00	3.14
24	90°00'00"	2.00	3.14
25	90°00'00"	2.00	3.14
26	90°00'00"	2.00	3.14
27	90°00'00"	2.00	3.14
28	90°00'00"	2.00	3.14
29	44°56'14"	100.00	78.43
30	54°20'47"	100.00	94.85
31	149°51'32"	2.00	5.23
32	11°21'16"	114.00	22.59
33	11°34'48"	114.00	23.04
34	120°45'05"	3.00	6.32
35	11°52'07"	68.00	14.09
36	124°11'33"	3.00	6.50
37	70°27'50"	70.00	86.09

0 20 50 100

SCALE: 1" = 20'

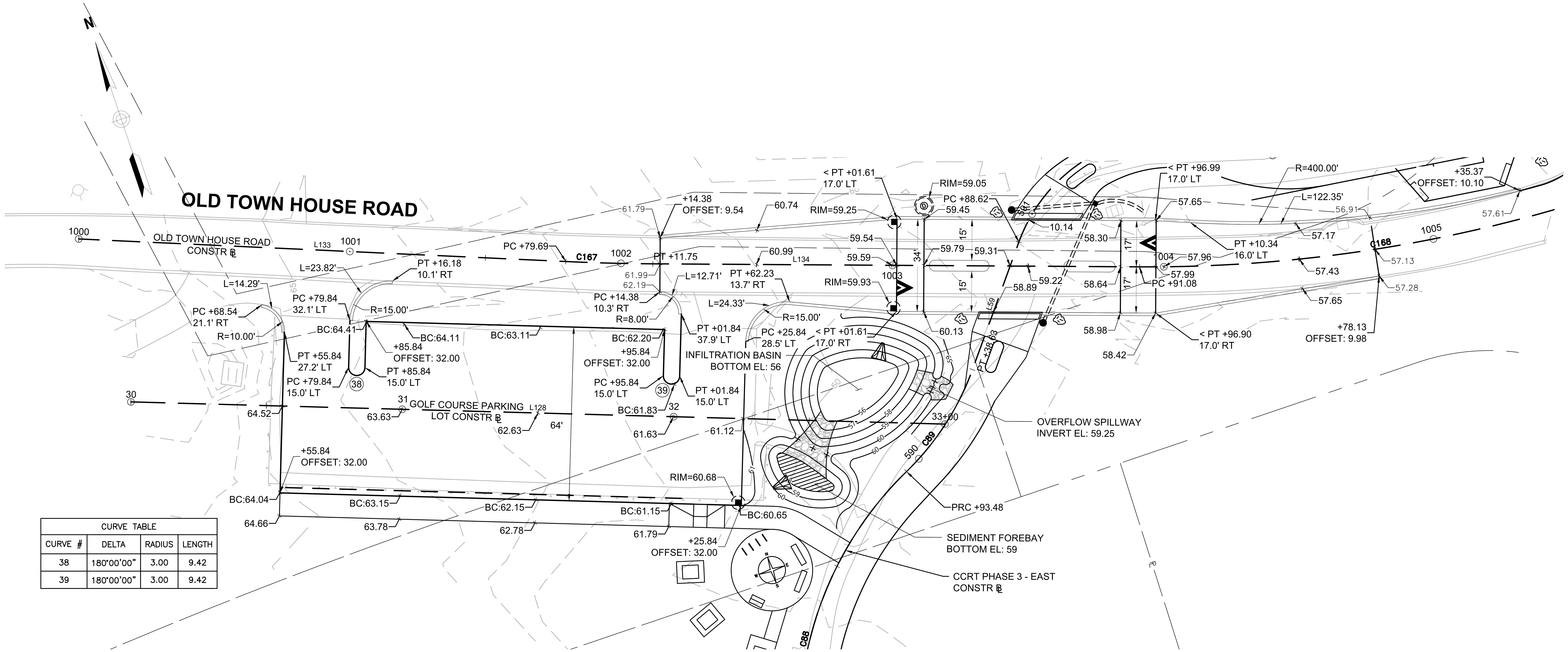
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	N/A	56	267
PROJECT FILE NO. 607398			

CURB TIE & GRADING PLANS

Plotted on 24-Nov-2021 5:16 PM

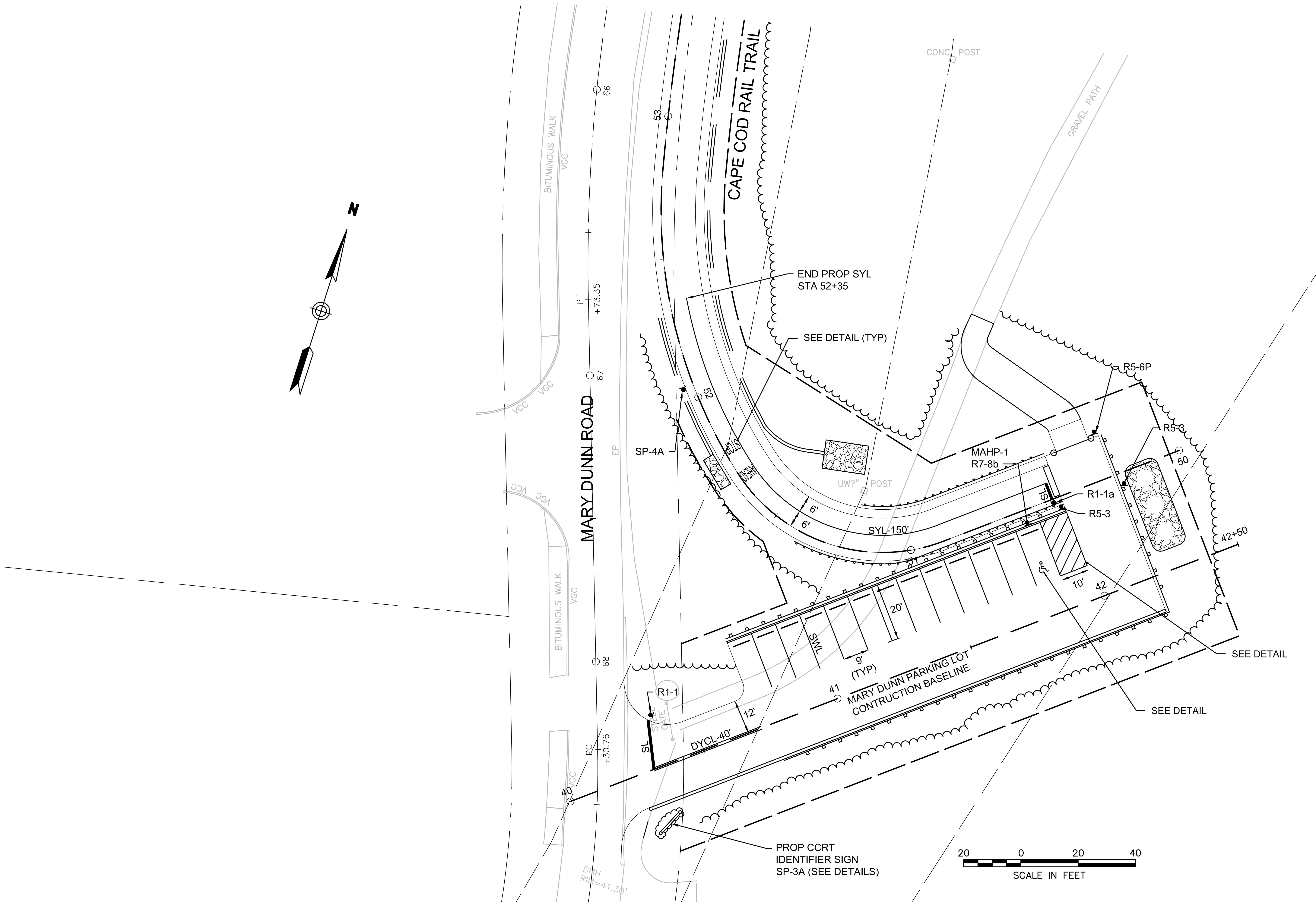
607398_HD(CTG).DWG



CURVE TABLE			
CURVE #	DELTA	RADIUS	LENGTH
38	180°00'00"	3.00	9.42
39	180°00'00"	3.00	9.42

0 20 50 100
SCALE: 1" = 20'

SIGNING & STRIPING PLANS
PARKING LOT NO. 1 - MARY DUNN ROAD



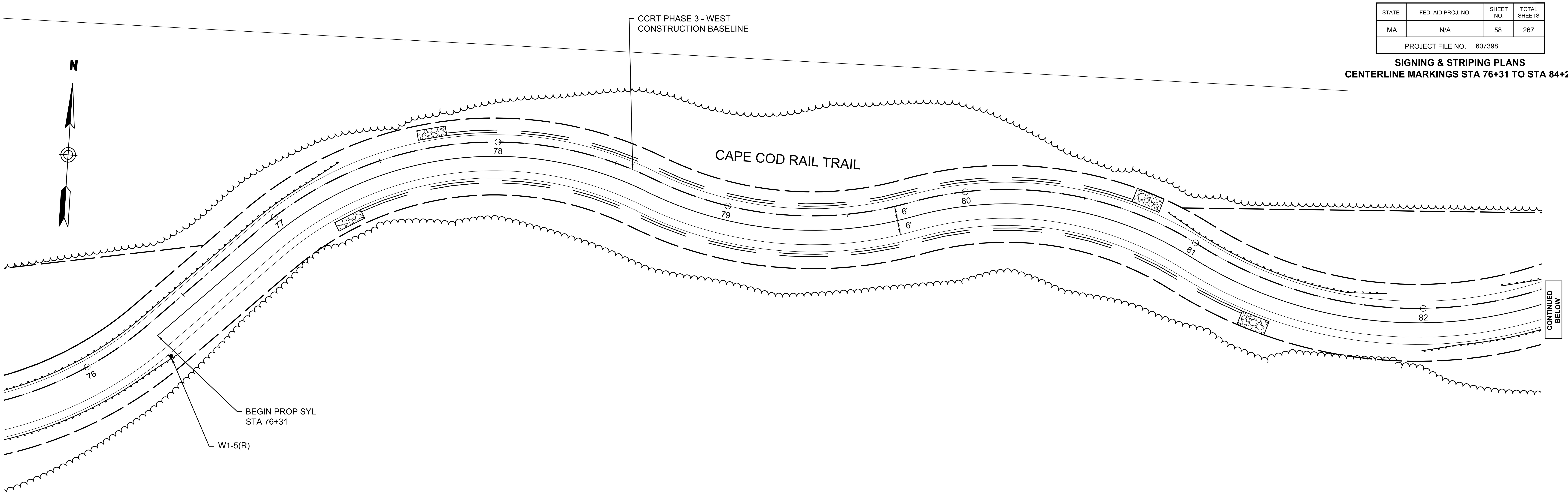
CONSTRUCTION NOTES

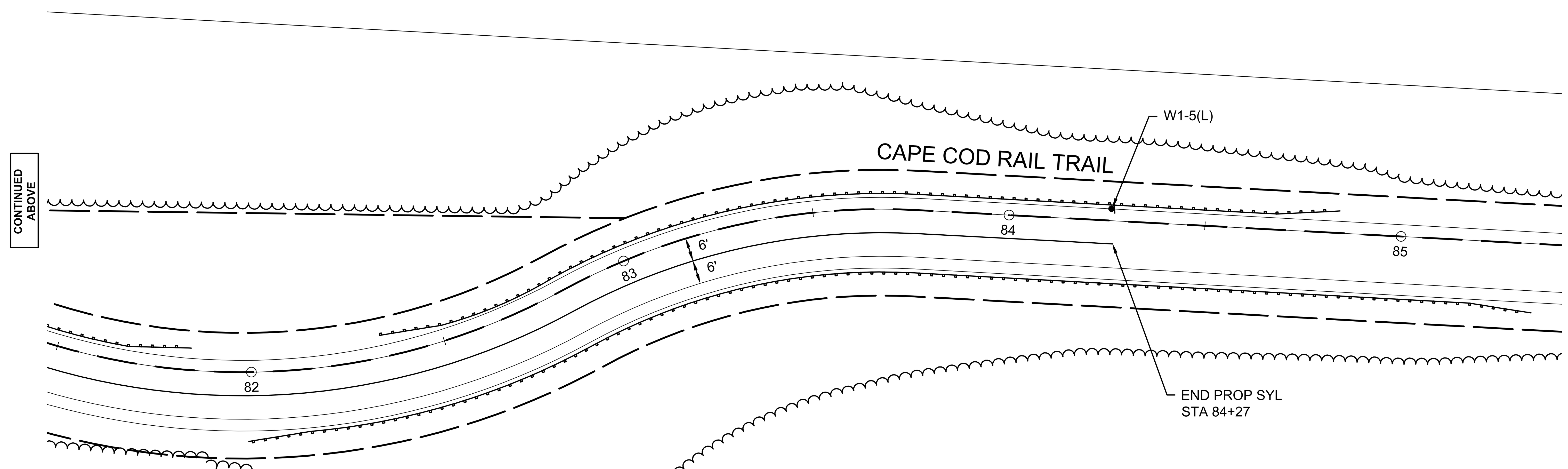
1. ALL PAVEMENT MARKINGS ON ROADWAYS SHALL BE REFLECTORIZED THERMOPLASTIC. ALL PAVEMENT MARKINGS ON THE CAPE COD RAIL TRAIL & PARKING LOTS SHALL BE REFLECTORIZED PAINT.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
3. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	58	267
PROJECT FILE NO. 607398			

SIGNING & STRIPING PLANS
CENTERLINE MARKINGS STA 76+31 TO STA 84+27





CONSTRUCTION NOTES

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3. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.

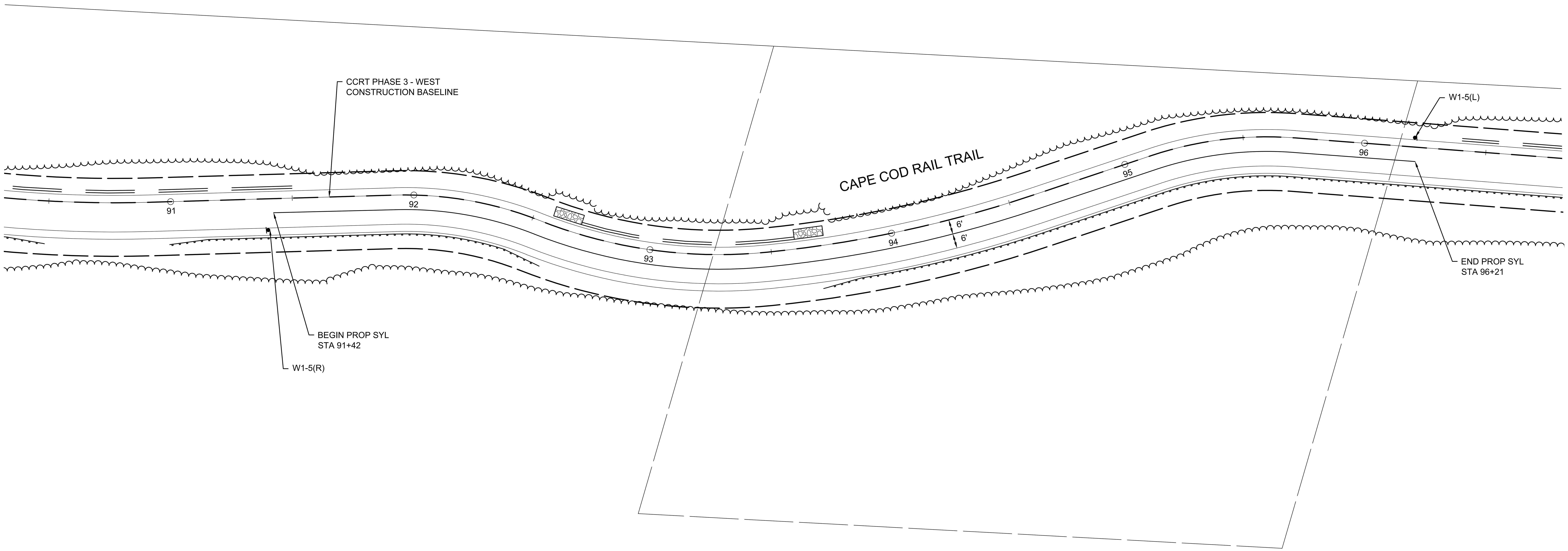
Plotted on 22-Nov-2021 4:14 PM
607398_HD(STRP).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	59	267
PROJECT FILE NO. 607398			

SIGNING & STRIPING PLANS
CENTERLINE MARKINGS STA 91+42 TO STA 96+21

607398_HD(STRP).DWG Plotted on 22-Nov-2021 4:15 PM



CONSTRUCTION NOTES

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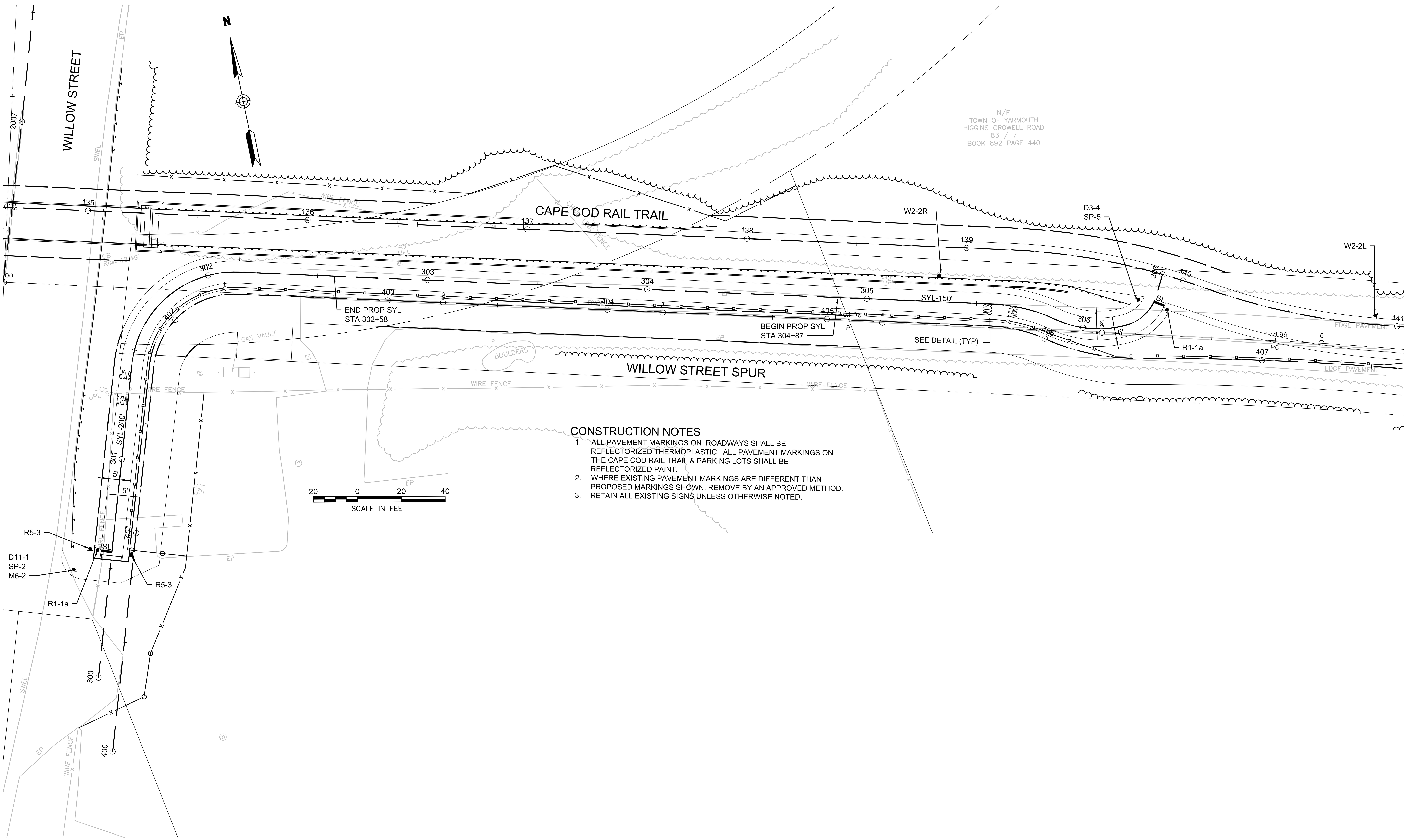
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	60	267
PROJECT FILE NO. 607398			

SIGNING & STRIPING PLANS
WILLOW STREET SPUR



CONSTRUCTION NOTES

1. ALL PAVEMENT MARKINGS ON ROADWAYS SHALL BE REFLECTORIZED THERMOPLASTIC. ALL PAVEMENT MARKINGS ON THE CAPE COD RAIL TRAIL & PARKING LOTS SHALL BE REFLECTORIZED PAINT.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
3. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.

607398_HD(STRP).DWG Plotted on 22-Nov-2021 4:16 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	61	267
PROJECT FILE NO. 607398			

SIGNING & STRIPING PLANS
PARKING LOT NO. 2 - HIGGINS CROWELL ROAD

Plotted on 22-Nov-2021 4:18 PM

607398_HD(STRP).DWG

CONSTRUCTION NOTES

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2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
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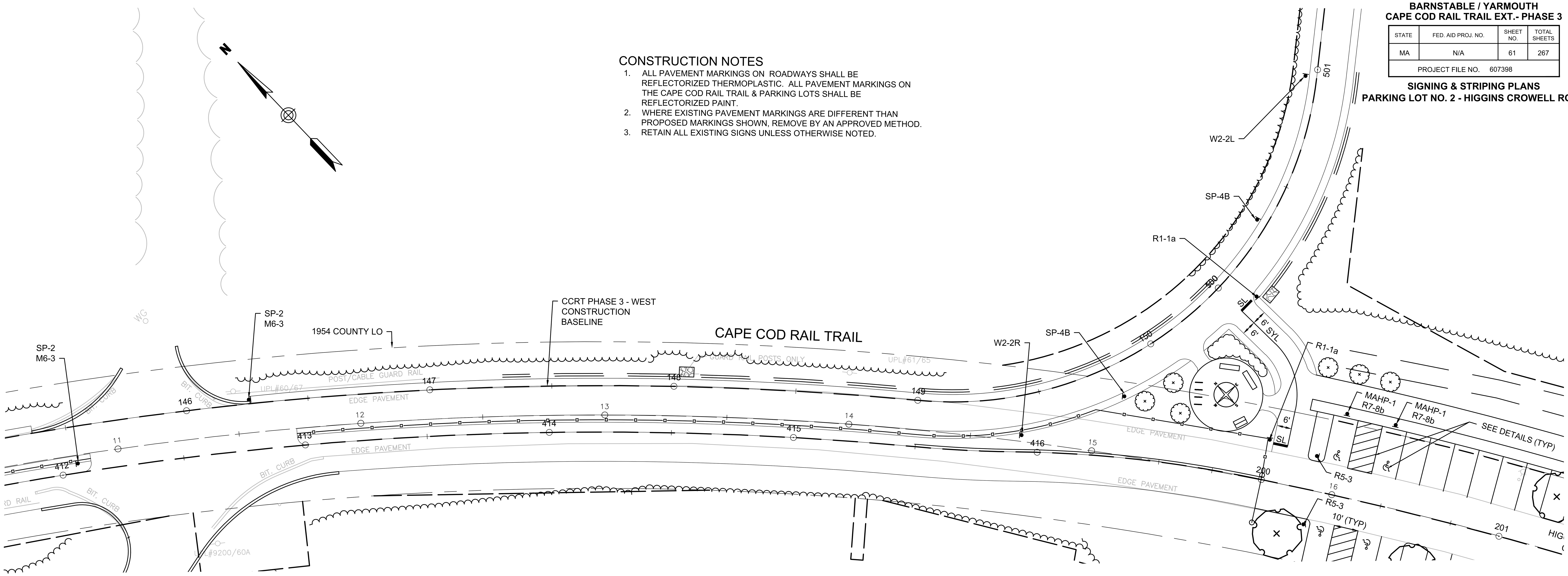
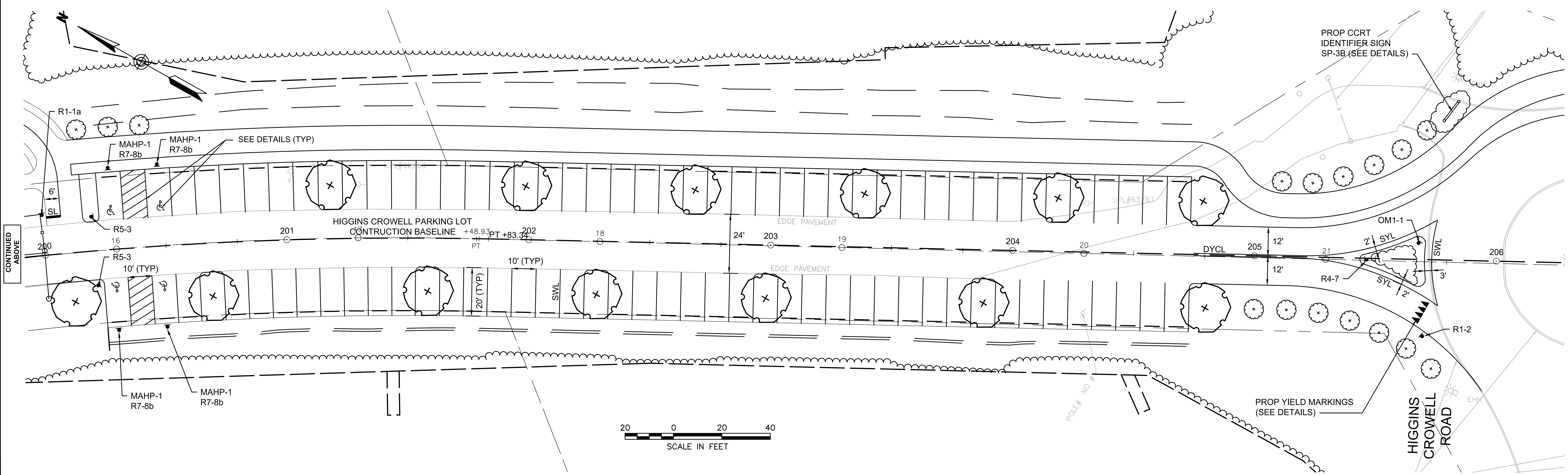




20 0 20 40
SCALE IN FEET

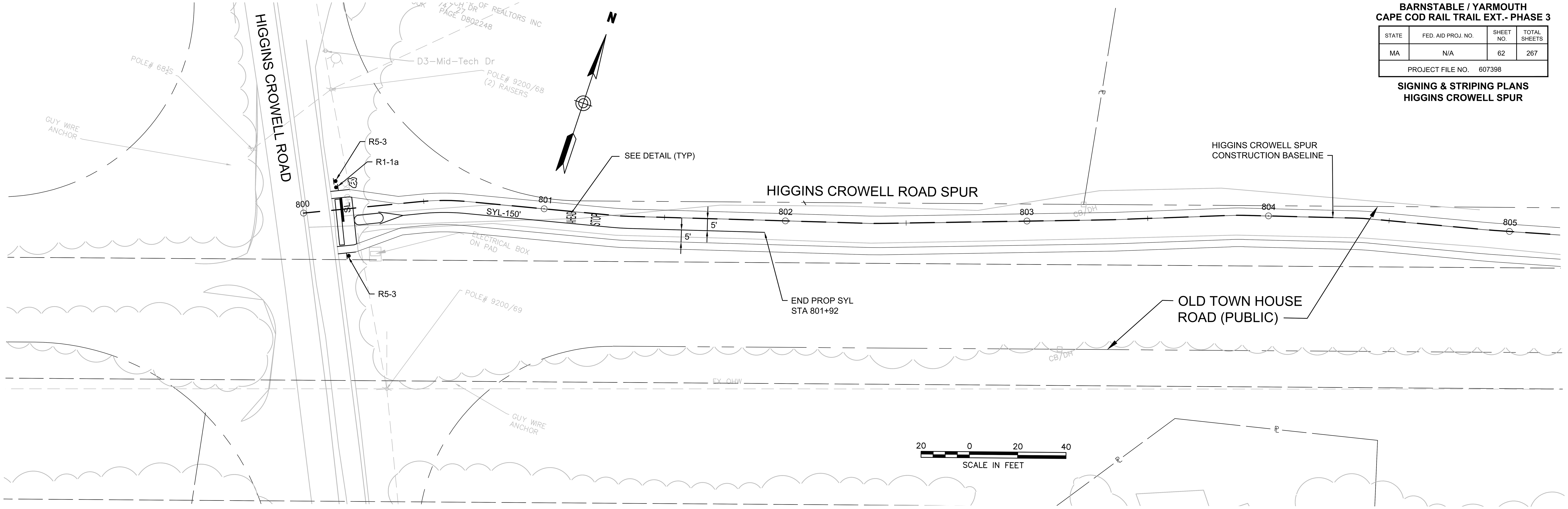
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

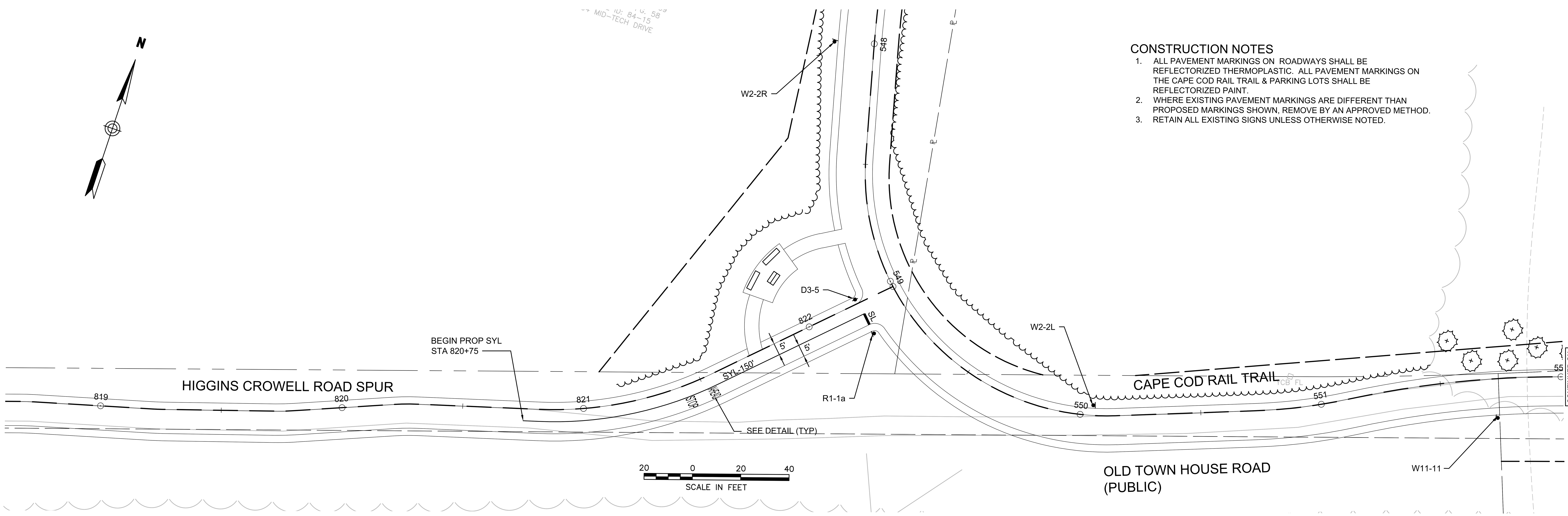
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	62	267
PROJECT FILE NO. 607398			

SIGNING & STRIPING PLANS
HIGGINS CROWELL SPUR

Plotted on 22-Nov-2021 4:20 PM

607398_HD(STRP).DWG





CONSTRUCTION NOTES

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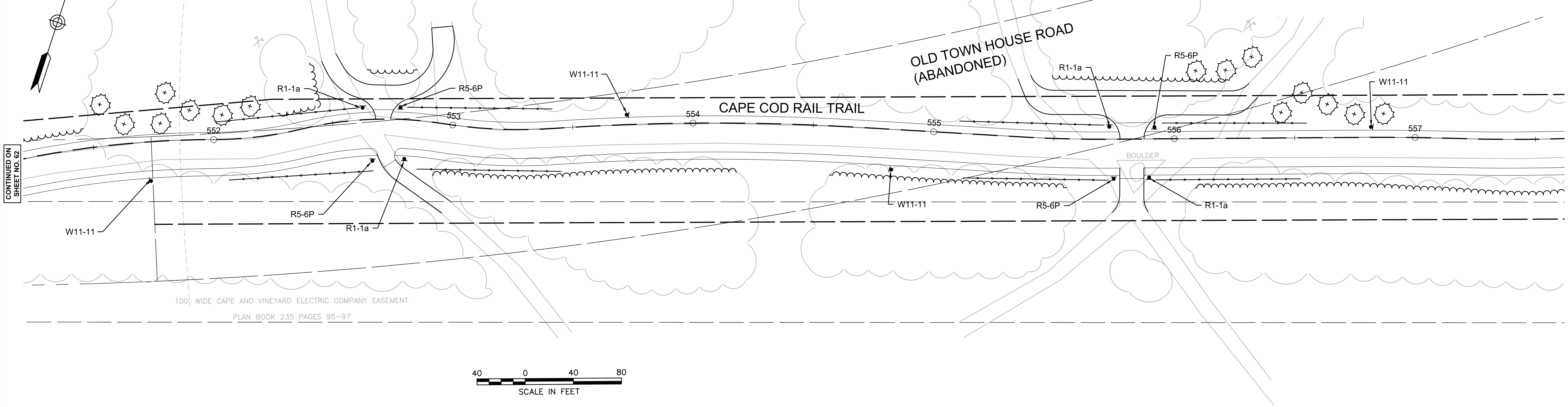
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	63	267
PROJECT FILE NO. 607398			

SIGNING & STRIPING PLANS
BAYBERRY HILLS GOLF COURSE 1 OF 2



CONSTRUCTION NOTES

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2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
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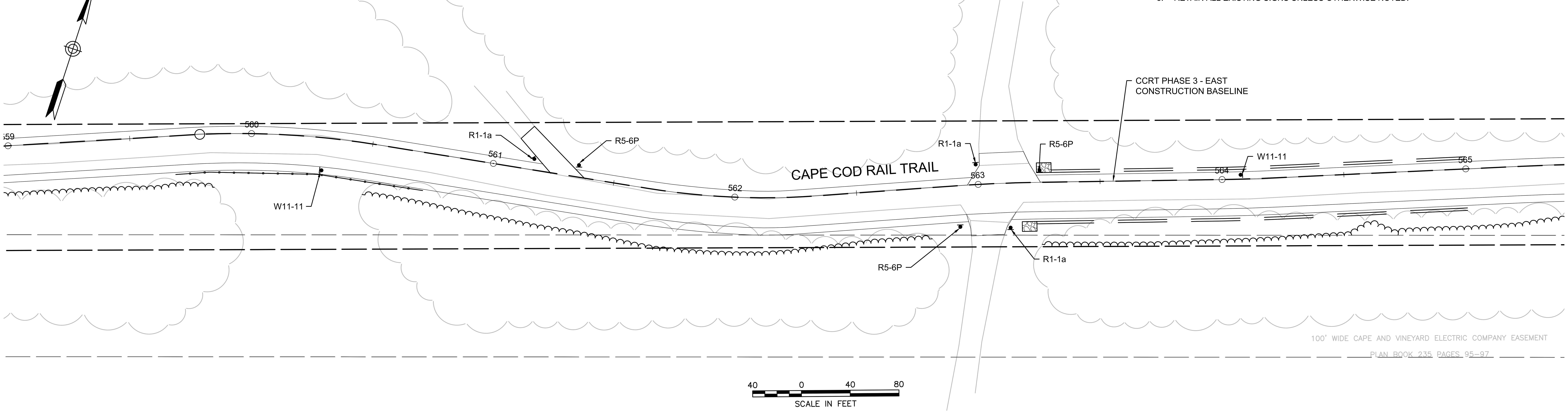


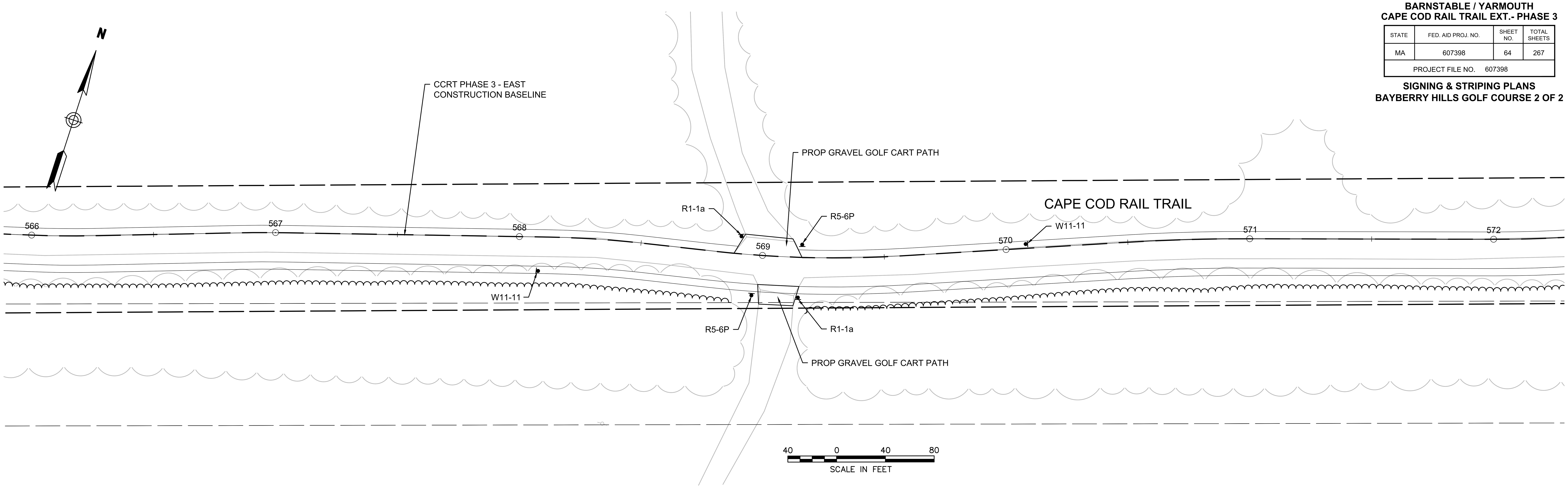
Plotted on 22-Nov-2021 4:22 PM

607398_HD(STRP).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	607398	64	267
PROJECT FILE NO. 607398			

SIGNING & STRIPING PLANS
BAYBERRY HILLS GOLF COURSE 2 OF 2



CONSTRUCTION NOTES

1. ALL PAVEMENT MARKINGS ON ROADWAYS SHALL BE REFLECTORIZED THERMOPLASTIC. ALL PAVEMENT MARKINGS ON THE CAPE COD RAIL TRAIL & PARKING LOTS SHALL BE REFLECTORIZED PAINT.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
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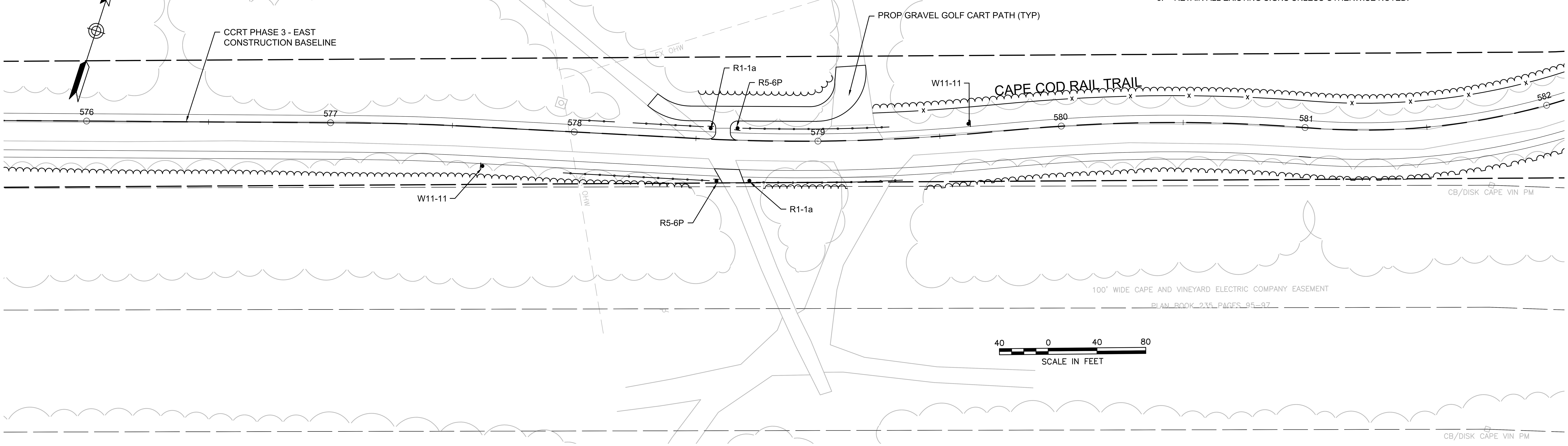


Plotted on 22-Nov-2021 4:25 PM
607398_HD(STRP).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	65	267
PROJECT FILE NO. 607398			

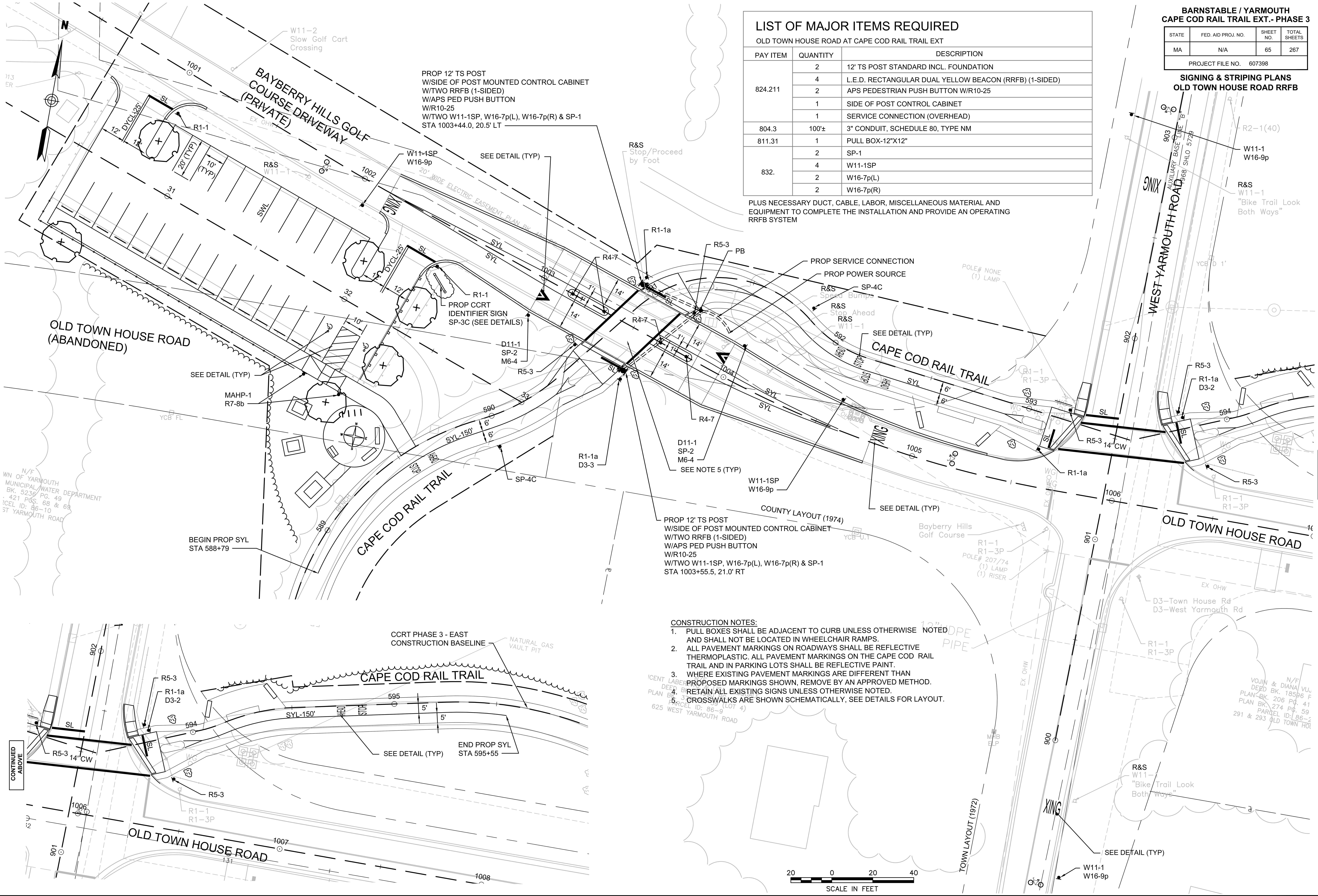
SIGNING & STRIPING PLANS
OLD TOWN HOUSE ROAD RRFB

LIST OF MAJOR ITEMS REQUIRED

OLD TOWN HOUSE ROAD AT CAPE COD RAIL TRAIL EXT

PAY ITEM	QUANTITY	DESCRIPTION
824.211	2	12' TS POST STANDARD INCL. FOUNDATION
	4	L.E.D. RECTANGULAR DUAL YELLOW BEACON (RRFB) (1-SIDED)
	2	APS PEDESTRIAN PUSH BUTTON W/R10-25
	1	SIDE OF POST CONTROL CABINET
	1	SERVICE CONNECTION (OVERHEAD)
804.3	100'±	3" CONDUIT, SCHEDULE 80, TYPE NM
811.31	1	PULL BOX-12"X12"
832.	2	SP-1
	4	W11-1SP
	2	W16-7p(L)
	2	W16-7p(R)

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING RRFB SYSTEM



CONSTRUCTION NOTES:

1. PULL BOXES SHALL BE ADJACENT TO CURB UNLESS OTHERWISE NOTED AND SHALL NOT BE LOCATED IN WHEELCHAIR RAMPS.
2. ALL PAVEMENT MARKINGS ON ROADWAYS SHALL BE REFLECTIVE THERMOPLASTIC. ALL PAVEMENT MARKINGS ON THE CAPE COD RAIL TRAIL AND IN PARKING LOTS SHALL BE REFLECTIVE PAINT.
3. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
4. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.
5. CROSSWALKS ARE SHOWN SCHEMATICALLY, SEE DETAILS FOR LAYOUT.

607398_HD(STRP).DWG Plotted on 22-Nov-2021 4:27 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

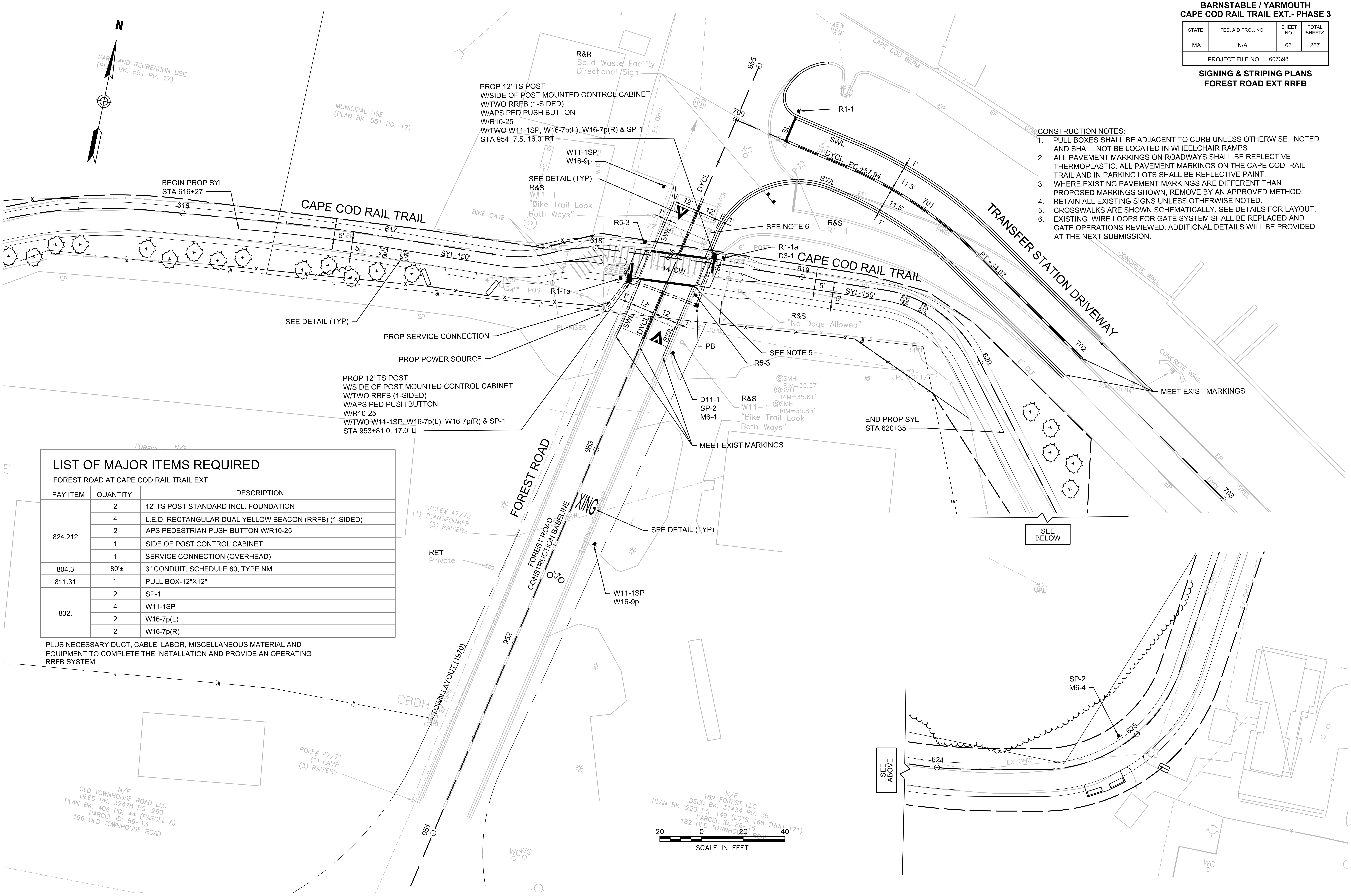
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	66	267
PROJECT FILE NO. 607398			

SIGNING & STRIPING PLANS
FOREST ROAD EXT RRFB

Plotted on 22-Nov-2021 4:29 PM
607398_HD(STRP).DWG

CONSTRUCTION NOTES:

1. PULL BOXES SHALL BE ADJACENT TO CURB UNLESS OTHERWISE NOTED AND SHALL NOT BE LOCATED IN WHEELCHAIR RAMPS.
2. ALL PAVEMENT MARKINGS ON ROADWAYS SHALL BE REFLECTIVE THERMOPLASTIC. ALL PAVEMENT MARKINGS ON THE CAPE COD RAIL TRAIL AND IN PARKING LOTS SHALL BE REFLECTIVE PAINT.
3. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
4. RETAIN ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.
5. CROSSWALKS ARE SHOWN SCHEMATICALLY, SEE DETAILS FOR LAYOUT.
6. EXISTING WIRE LOOPS FOR GATE SYSTEM SHALL BE REPLACED AND GATE OPERATIONS REVIEWED. ADDITIONAL DETAILS WILL BE PROVIDED AT THE NEXT SUBMISSION.



LIST OF MAJOR ITEMS REQUIRED

FOREST ROAD AT CAPE COD RAIL TRAIL EXT

PAY ITEM	QUANTITY	DESCRIPTION
824.212	2	12' TS POST STANDARD INCL. FOUNDATION
	4	L.E.D. RECTANGULAR DUAL YELLOW BEACON (RRFB) (1-SIDED)
	2	APS PEDESTRIAN PUSH BUTTON W/R10-25
	1	SIDE OF POST CONTROL CABINET
	1	SERVICE CONNECTION (OVERHEAD)
804.3	80'±	3" CONDUIT, SCHEDULE 80, TYPE NM
811.31	1	PULL BOX-12"X12"
832.	2	SP-1
	4	W11-1SP
	2	W16-7p(L)
	2	W16-7p(R)

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING RRFB SYSTEM

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK–GROUND	LEGEND	BORDER			
R1-1	30"	30"	STOP	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			4	RED	WHITE	WHITE	P5-4	6.25	25.00
R1-1a	18"	18"	STOP				19	RED	WHITE	WHITE	P5-19	1.86	35.34
R1-2	36"X36"X36"		YIELD				1	WHITE	RED	WHITE	P5-1	4.50	4.50
R4-7	24"	30"					5	WHITE	BLACK	BLACK	P5-5	5.00	25.00
R5-3	24"	24"	NO MOTOR VEHICLES				13	WHITE	BLACK	BLACK	P5-13	4.00	52.00
R5-6P	18"	18"	NO BIKES				12	WHITE	BLACK	BLACK	P5-12	2.25	27.00
R7-8b	18"	9"	VAN ACCESSIBLE				7	BLUE	WHITE	WHITE	7 MTD W/OTHERS	1.13	7.88
R10-25	9"	12"	PUSH BUTTON TO TURN ON WARNING LIGHTS				4	WHITE	BLACK	BLACK	4 MTD ON TS POST	PAID UNDER ITEMS 824.211 & 824.212	
M6-2	21"	15"					1	GREEN	WHITE	WHITE	1 MTD W/OTHERS	2.19	2.19
M6-3	21"	15"					2	GREEN	WHITE	WHITE	2 MTD W/OTHERS	2.19	4.38
M6-4	21"	15"					3	GREEN	WHITE	WHITE	3 MTD W/OTHERS	2.19	6.57
W11-1	30"	30"					2	FLUORESCENT YELLOW/ GREEN	BLACK	BLACK	P5-2	6.25	12.50
W11-1SP	30"	30"					12	FLUORESCENT YELLOW/ GREEN	BLACK	BLACK	P5-4 8 MTD ON TS POST	6.25	75.00
W11-11	24"	24"					10	YELLOW	BLACK	BLACK	P5-10	4.00	40.00
W1-5L	18"	18"					2	YELLOW	BLACK	BLACK	P5-2	2.25	5.00
W1-5R	18"	18"					2	YELLOW	BLACK	BLACK	P5-2	2.25	5.00
W2-2R	18"	18"					3	YELLOW	BLACK	BLACK	P5-3	2.25	6.75
W2-2L	18"	18"					3	YELLOW	BLACK	BLACK	P5-3	2.25	6.75
W16-7p(L)	24"	12"					4	FLUORESCENT YELLOW/ GREEN	BLACK	BLACK	4 MTD ON TS POST	2.00	8.00
W16-7p(R)	24"	12"					4	FLUORESCENT YELLOW/ GREEN	BLACK	BLACK	4 MTD ON TS POST	2.00	8.00
W16-9p	24"	12"	AHEAD				6	FLUORESCENT YELLOW/ GREEN	BLACK	BLACK	6 MTD W/OTHERS	2.00	12.00
D11-1	24"	18"	BIKE ROUTE				4	GREEN	WHITE	WHITE	P5-4	3.00	12.00
OM1-1	24"	24"					1	YELLOW	YELLOW CLUSTER	- - -	P5-5	4.00	28.00

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	67	267

PROJECT FILE NO. 607398

TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK–GROUND	LEGEND	BORDER			
MAHP-1	12"	18"	HANDICAPPED PARKING	PER MASSDOT STANDARDS			7	BLUE	WHITE	WHITE	P5-7	1.50	10.50
SP-1	9"	12"	WAIT FOR VEHICLES TO STOP BEFORE CROSSING	1"C 1"C 1"C 1"C 1"C	1.5" 1" 1" 1" 1" 1.5"	N/A	4	YELLOW	BLACK	BLACK	4 MTD ON TS POLE	0.75	2.25
SP-2	18"	12"	CCRT	4"D	4" 4"	N/A	4	GREEN	WHITE	WHITE	4 MTD W/OTHERS	1.50	6.00
SP-3A	5'-4"	6'-0"	Cape Cod Rail Trail Mary Dunn Road Parking Area Town of Barnstable	SEE CONSTRUCTION DETAILS			1	SAGE	BLACK	-	SEE CONSTRUCTION DETAILS	PAID UNDER ITEM 707.41	
SP-3B	5'-4"	6'-0"	Cape Cod Rail Trail Higgins Crowell Road Parking Area Town of Yarmouth				1	SAGE	BLACK	-		PAID UNDER ITEM 707.41	
SP-3C	5'-4"	6'-0"	Cape Cod Rail Trail Old Town House Road Parking Area Town of West Yarmouth				1	SAGE	BLACK	-		PAID UNDER ITEM 707.41	
SP-4A	5'-2"	2'-0"	Mary Dunn Road Parking Area				1	SAGE	BLACK	-		PAID UNDER ITEM 707.43	
SP-4B	5'-2"	2'-0"	Higgins Crowell Road Parking Area				2	SAGE	BLACK	-		PAID UNDER ITEM 707.43	
SP-4C	5'-2"	2'-0"	Old Town House Road Parking Area				2	SAGE	BLACK	-		PAID UNDER ITEM 707.43	
SP-5	12"	18"	NO TRAIL BEYOND THIS POINT	3"C 3"C 2"B 2"B 2"B	1.75" 0.875" 0.625" 0.625" 0.625" 1.5"	N/A	1	GREEN	WHITE	WHITE	1 MTD W/OTHERS	0.75	0.75
D3-1	30"	12"	Forest Rd	6B	3 3	N/A	1	GREEN	WHITE	WHITE	1 MTD W/OTHERS	PAID UNDER ITEM 874	
D3-2	54"	12"	West Yarmouth Rd	6B	3 3	N/A	1	GREEN	WHITE	WHITE	1 MTD W/OTHERS	PAID UNDER ITEM 874	
D3-3	60"	12"	Old Town House Rd	6B	3 3	N/A	1	GREEN	WHITE	WHITE	1 MTD W/OTHERS	PAID UNDER ITEM 874	
D3-4	30"	9"	← Willow St	6B	3 3	3" @ 180°	1	GREEN	WHITE	WHITE	P5-1	PAID UNDER ITEM 874	
D3-5	42"	9"	← Higgins Crowell Rd	6B	3 3	3" @ 180°	1	GREEN	WHITE	WHITE	P5-1	PAID UNDER ITEM 874	

NOTES:
1. HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS.
2. SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, FOR VERTICAL & LATERAL CLEARANCES.

Plotted on 22-Nov-2021 4:29 PM
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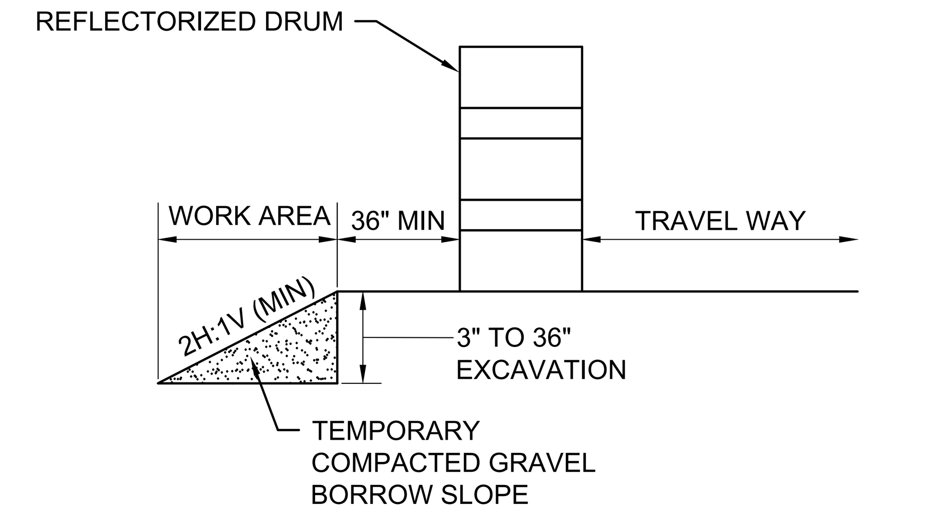
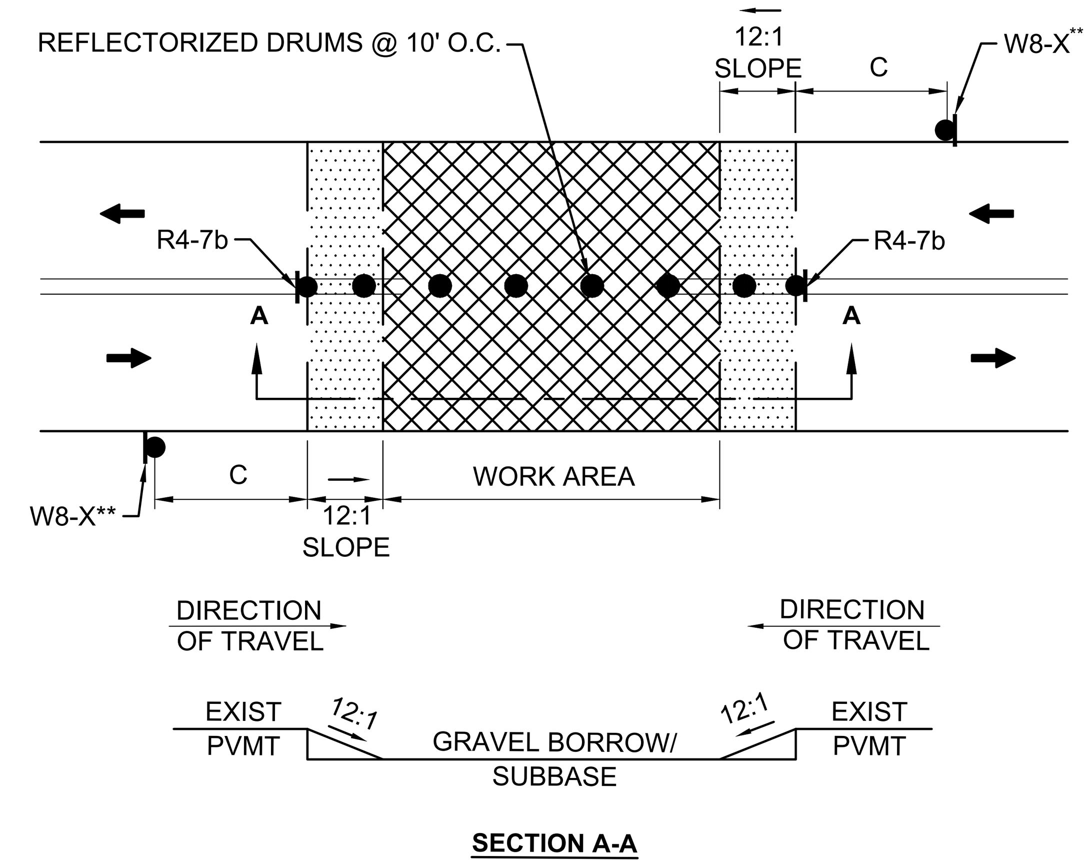
GENERAL NOTES

1. ALL CONSTRUCTION SIGNING, TEMPORARY TRAFFIC CONTROL DEVICES, AND ROADSIDE ELEMENTS SHALL CONFORM WITH THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AS AMENDED, THE MASSDOT STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TEMPORARY TRAFFIC CONTROL PLANS, THE LATEST REVISIONS OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, (AASHTO) ROADSIDE DESIGN GUIDE, AASHTO POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, AND NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR THE AASHTO MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. WORK HOURS THAT IMPACT THE PUBLIC WAY SHALL BE 7:00AM TO 3:00PM MONDAY THRU FRIDAY UNLESS OTHERWISE APPROVED BY MASSDOT, THE TOWN OF BARNSTABLE AND THE TOWN OF YARMOUTH. NO WORK IMPACTING THE TRAVEL WAY WILL BE ALLOWED DURING PEAK TRAFFIC PERIODS. PEAK PERIODS ARE DEFINED AS MONDAY THRU FRIDAY, 6:00AM TO 9:00AM AND 3:00PM TO 7:00PM.
3. NO WORK SHALL OCCUR WITHIN THE PUBLIC WAY THE DAY BEFORE, AFTER OR ON A STATE RECOGNIZED HOLIDAY UNLESS OTHERWISE APPROVED BY THE ENGINEER.
4. ALL TEMPORARY PEDESTRIAN PATHWAYS SHALL COMPLY FULLY WITH ALL REQUIREMENTS OF THE MUTCD AND ALL APPLICABLE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (MAAB) AND AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) REQUIREMENTS AND PUBLIC RIGHTS-OF WAY ACCESSIBILITY GUIDELINES (PROWAG).
5. ALL DRUMS OUTSIDE TAPERS SHALL BE SET AT 20' ON CENTER MAX. UNLESS OTHERWISE NOTED OR ADJUSTED BY THE ENGINEER.
6. ALL DRUMS SHALL BE APPROXIMATELY PLACED AND MOVED AS NECESSARY TO MAINTAIN SAFE AND REASONABLE ABUTTER ACCESS. WORK MAY REQUIRE ADDITIONAL SIGNS, DRUMS AND OTHER TRAFFIC CONTROL DEVICES, GRADING AND TEMPORARY PAVEMENT FOR PASSAGE OF PEDESTRIAN, VEHICULAR AND EMERGENCY TRAFFIC THROUGH THE WORK AREAS, BOTH DURING AND AFTER WORKING HOURS, TO MAINTAIN SUCH ACCESS.
7. THE FIRST 10 DRUMS ON TAPERS SHALL BE REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS AND SHALL BE OPERATING, AT A MINIMUM, BETWEEN DUSK AND DAWN, WHEN TAPER IS DEPLOYED.
8. REFLECTORIZED CONES SHALL BE A MINIMUM OF 36 INCHES IN HEIGHT.
9. CONES MAY BE USED IN LIEU OF DRUMS OUTSIDE OF TAPER AREAS.
10. THE CONTRACTOR SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OR RESTRICTION OF ACCESS.
11. FOR DROP-OFFS 3" OR LESS WITHIN THE CLEAR ZONE, CONDITION MAY BE MITIGATED WITH W8-9 (LOW SHOULDER) SIGN OR TEMPORARY CHANNELIZATION DEVICES. FOR DROP-OFFS GREATER THAN 3" BUT NO MORE THAN 36", DETERMINE WHETHER IT IS MORE COST EFFECTIVE TO INSTALL BOTH W8-9 SIGN AND TEMPORARY CHANNELIZATION DEVICES IN ACCORDANCE WITH MASSDOT WORK ZONE SAFETY GUIDE OR W8-9 SIGN WITH A 2H:1V (MIN) WEDGE OR TO REMOVE THE HAZARD.
12. CONTRACTOR SHALL STAGE WORK SUCH THAT A DROP-OFF OF NO MORE THAN 3" AT THE END OF EACH WORK DAY EXISTS WITHIN THE CLEAR ZONE AT ANY TIME AND ENSURE DROP-OFF IS MITIGATED WITHOUT BARRIER PER NOTE 11.
13. CONSTRUCTION CLEAR ZONE SHALL BE IN ACCORDANCE WITH MASSDOT BOSTON TRAFFIC GUIDELINES AS FOLLOWS:
    4' IF POSTED SPEED IS LESS THAN 35 MPH
14. 11' MINIMUM LANE WIDTHS SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.
15. TEMPORARY TRAFFIC CONTROL DEVICES AND SIGNS SHALL BE COVERED OR REMOVED DURING NON-WORKING HOURS WHEN NOT IN USE.
16. SIGNS INSTALLED ON PORTABLE STANDS REQUIRE 12 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.
17. SIGNS INSTALLED ON PORTABLE STANDS PLACED AMONG CHANNELIZATION DEVICES REQUIRE A 36 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.
18. SIGNS MOUNTED ON POSTS REQUIRE A MINIMUM 84 INCH MOUNTING HEIGHT FROM THE ROADWAY OR SIDEWALK SURFACE TO THE BOTTOM OF THE SIGN. CONTRACTOR SHALL MAINTAIN A MINIMUM SIDEWALK HORIZONTAL CLEAR WIDTH OF 36" AT ALL TIMES.
19. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN NCHRP 350 AND/OR MASH CRASH TESTED SIGN SUPPORTS AND INSTALLED IN ACCORDANCE WITH THE MUTCD.SIGNS SHALL NOT BE MOUNTED TO OR LEANED AGAINST DRUMS OR CONES.
20. W21-7 SIGNS SHALL BE INSTALLED IN ADVANCE (100' MIN) OF AREAS WHERE UTILITY CASTINGS HAVE BEEN RAISED IN ADVANCE OF PAVING OPERATIONS OR AS REQUESTED BY THE ENGINEER.
21. W8-15 SIGNS SHALL BE INSTALLED IN ADVANCE (100' MIN) OF PAVEMENT MILLING AREAS OR AS REQUESTED BY THE ENGINEER.
22. W20-1c, MA-R2-10a OR MA-R2-10e SIGNS SHOWN ON ADVANCE SIGN SCHEMATIC MAY BE USED IN LIEU OF THOSE SIGNS SHOWN ON TYPICAL DETAILS ON THE TEMPORARY TRAFFIC CONTROL PLANS IF MINIMUM SIGN SPACING IS MET.
23. CONTRACTOR SHALL SECURE WORK AREAS BY APPROPRIATE MEANS, TO PREVENT UNAUTHORIZED ACCESS AT ALL TIMES.
24. THERE IS NO DESIGNATED BICYCLE LANE ON THE ROADWAY WITHIN THE PROJECT LIMITS. BICYCLES ARE EXPECTED TO SHARE THE ROAD WITH GENERAL VEHICULAR TRAFFIC.
25. NIGHTTIME WORK SHALL REQUIRE PRIOR APPROVAL FROM MASSDOT.
26. ILLUMINATION REQUIRED FOR NIGHTTIME WORK APPROVED BY THE ENGINEER SHALL BE DIFFUSED OR ANTI-GLARE LIGHTING AND IN ACCORDANCE WITH MASSDOT STANDARDS.
27. CONTRACTOR SHALL PROVIDE 4 PORTABLE CHANGE MESSAGE SIGN (PCMS) A MINIMUM OF 14 DAYS PRIOR TO START OF CLOSURE AND DURING THE CLOSURE. REFER TO THE WILLOW STREET DETOUR PLAN ON SHEET 68 FOR PCMS LOCATION AND MESSAGING.
28. CONTRACTOR SHALL SETUP DAILY WORK ZONES AS NECESSARY FOR FULL DEPTH PAVEMENT CONSTRUCTION. AT THE END OF EACH WORK SHIFT, UNTIL INTERMEDIATE PAVING COURSE IS INSTALLED, CONTRACTOR TO FOLLOW THE BELOW GUIDELINES OR AS DIRECTED BY THE ENGINEER.
    A. GRAVEL PAVEMENT COURSE SHALL REMAIN OPEN TO TRAVEL FOR A MAXIMUM OF 10 CALENDAR DAYS PRIOR TO PAVING
    B. BASE AND BINDER PAVING COURSES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND PAVEMENT NOTES. IN LOCATIONS WHERE THE ROADWAY IS NARROWED, PAVED ACCESS SHALL BE PROVIDED AT ALL ABUTTING DRIVEWAYS AND PARKING AREAS
    C. MAINTAIN ADEQUATE ROADWAY DRAINAGE AT ALL TIMES



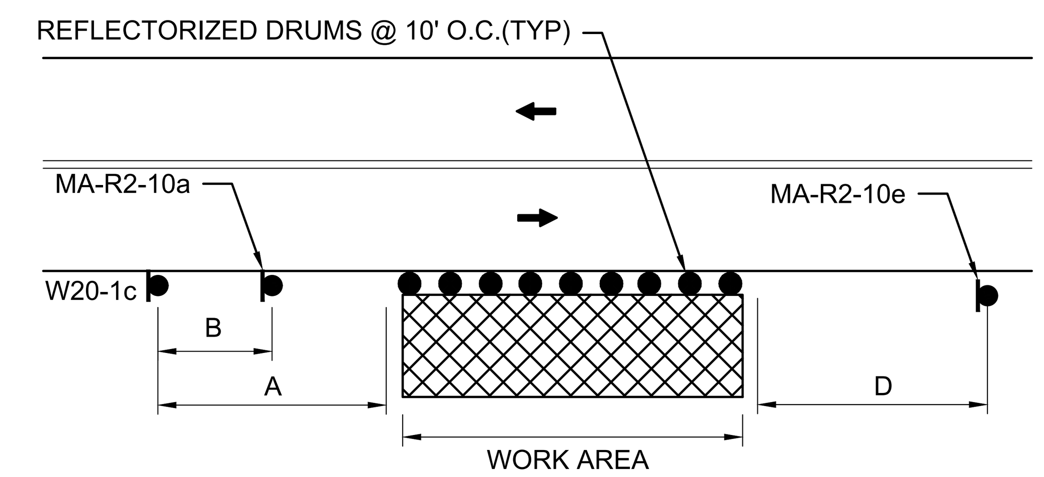
NOTE:
1. CONTRACTOR SHALL INSTALL W8-9 SIGN ON ALL ROADWAYS 350 FT IN ADVANCE OF THE START OF DROP-OFF CONDITION.

TYPICAL ROADWAY DROP-OFF PROTECTION
SCALE: NTS

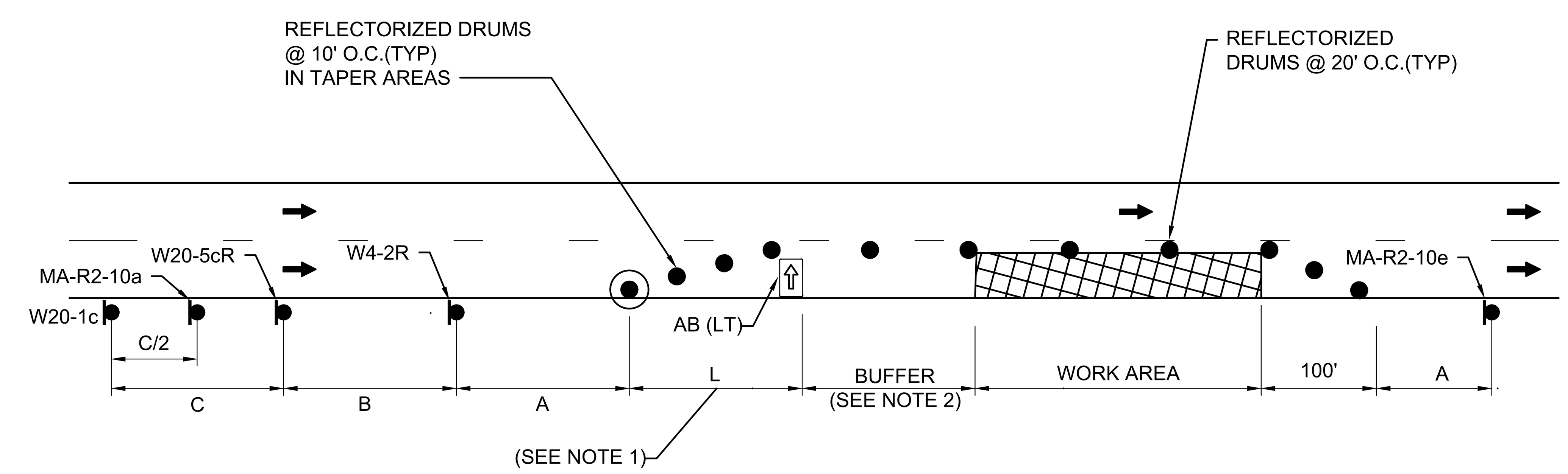


NOTES:
1. SQUARE OFF THE FULL WIDTH OF THE ROADWAY AT THE END OF WORK DAY.
2. ** CONTRACTOR SHALL INSTALL W8-1 AT LIMIT OF EXCAVATION OR W8-3, W8-8, OR W8-15 SIGN, AS APPROPRIATE, ON ALL ROADWAYS IN ADVANCE OF THE TRANSITION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

TEMPORARY PAVEMENT TRANSITION
SCALE: NTS



OFF ROADWAY WORK - RIGHT
SCALE: NTS



NOTES:
1. SEE TAPER LENGTH FORMULA.
2. SEE BUFFER SPACING CHART.
3. SEE ADVANCE SIGN SPACING TABLE.

ONE LANE CLOSURE - RIGHT
SCALE: NTS

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	68	267
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TEMPORARY TRAFFIC CONTROL PLANS
GENERAL NOTES & LEGEND

Plotted on 22-Nov-2021 4:30 PM

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LEGEND	
P	POLICE OFFICER
S	TRAFFIC SIGNAL
	REFLECTORIZED DRUM
	REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS (SEE NOTE 7)
	TEMPORARY CONSTRUCTION SIGN
	TRAFFIC CONE
	TYPE III BARRICADE
	ARROW BOARD (AB) (RIGHT OR LEFT)
	PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
	WORK AREA (PUBLIC ACCESS RESTRICTED)
	TRANSITION/BUFFER AREAS
	TRAFFIC FLOW
	PEDESTRIAN ROUTE
	TEMPORARY PEDESTRIAN BARRICADE
NTS	NOT TO SCALE

ADVANCE SIGN SPACING

	DISTANCE BETWEEN SIGNS (FEET)		
ROADWAY	A	B	C
ALL OTHER ROADWAYS	100	100	100
FOREST RD, HIGGINS CROWELL RD	350	350	350
WILLOW ST, WEST YARMOUTH RD	500	500	500

LANE TAPER LENGTH FORMULAS

L= TAPER LENGTH IN FEET

W= WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED IN FEET

S= POSTED SPEED LIMIT IN MPH

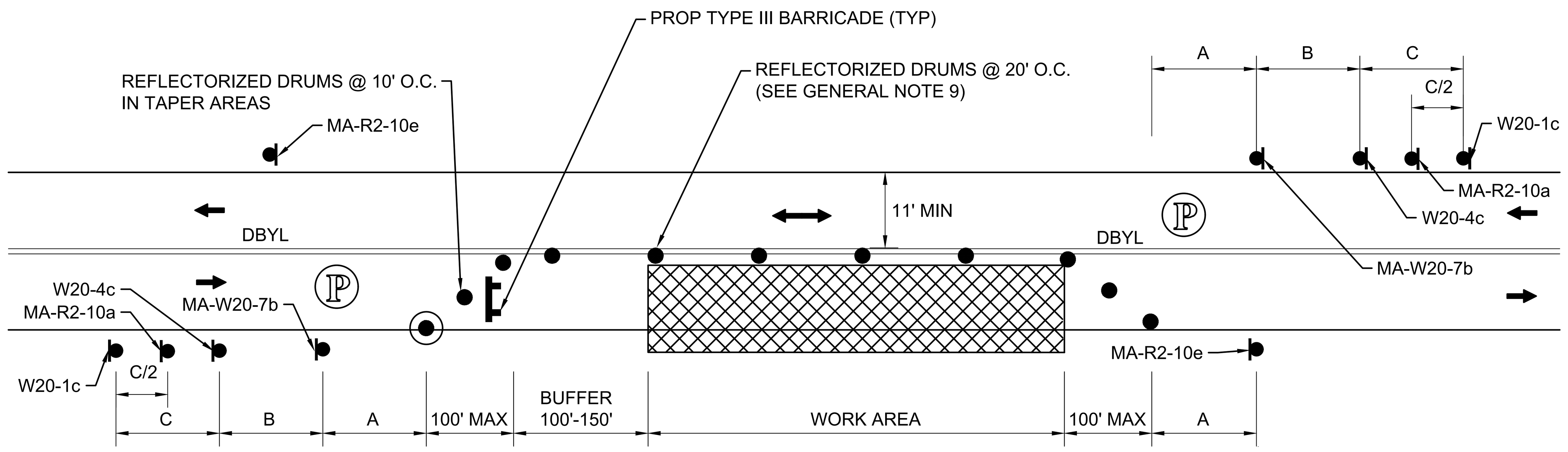
POSTED SPEED

40 MPH OR LESS

$$L = \frac{WS^2}{60}$$

BUFFER SPACING

SPEED (MPH)	DISTANCE (FEET)
15	80
20	115
25	155
30	200



NOTE:

1. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 68.

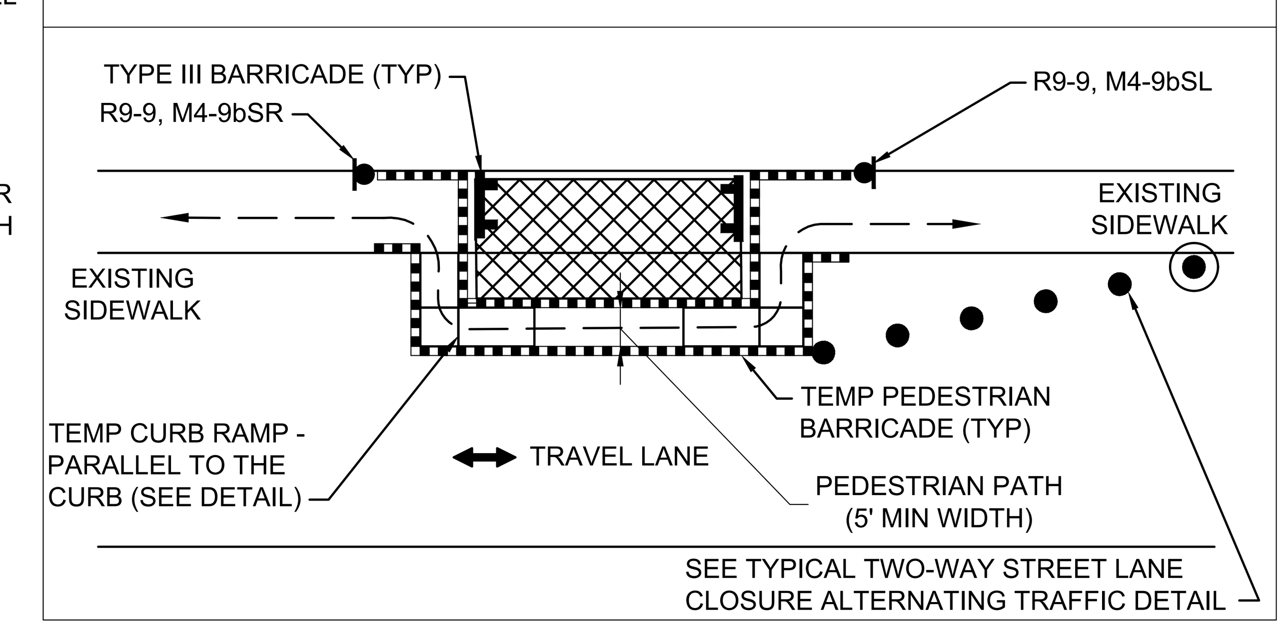
TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC

SCALE: NTS

NOTES:

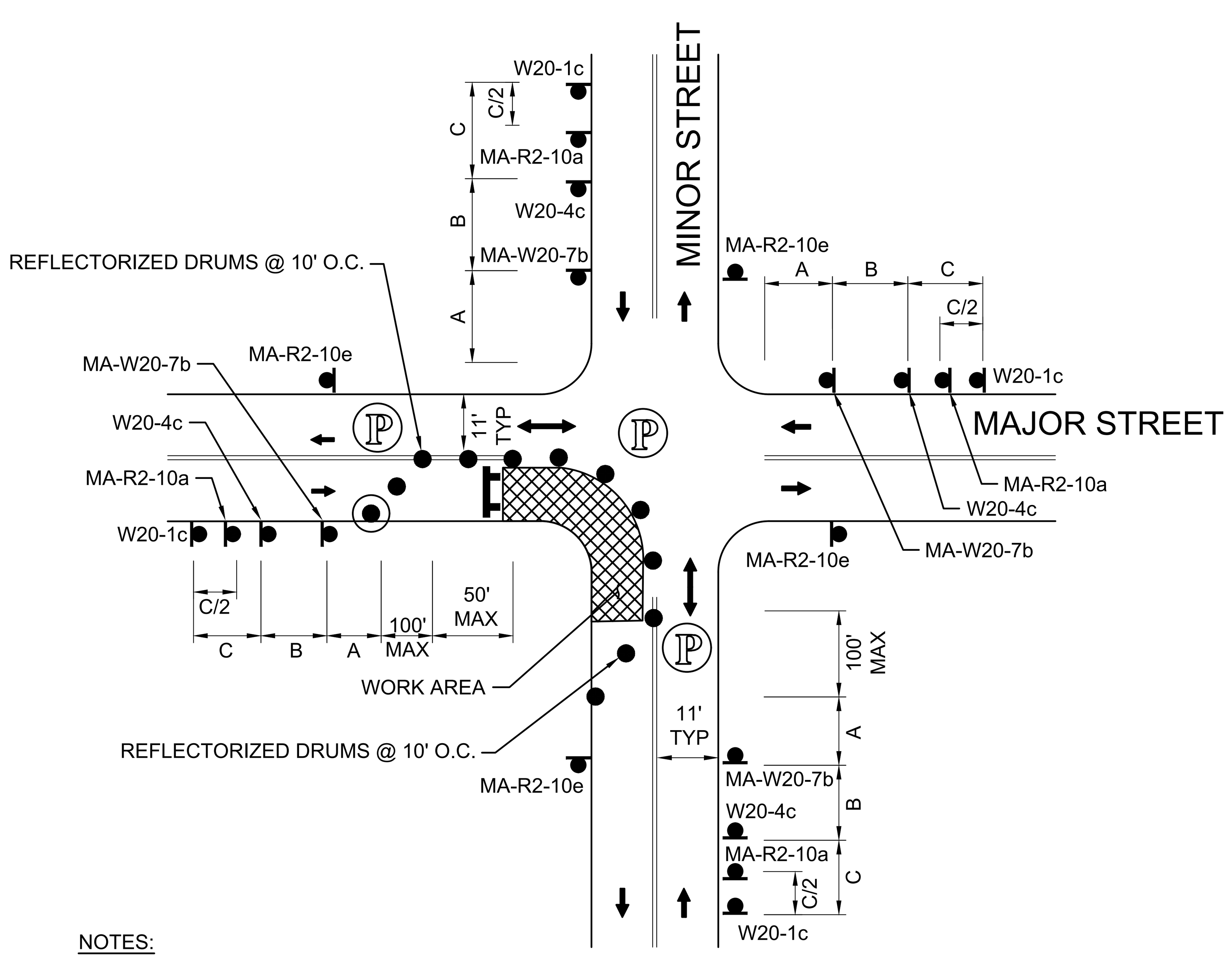
1. ADDITIONAL ADVANCE WARNING SIGNS MAY BE NECESSARY AS DETERMINED BY THE ENGINEER.
2. CONTROLS FOR PEDESTRIAN TRAFFIC ONLY, ARE SHOWN. VEHICULAR TRAFFIC SHALL BE MAINTAINED AS SHOWN ELSEWHERE.
3. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
4. — — — INDICATES DIRECTION OF PEDESTRIAN TRAVEL.
5. ALL TEMPORARY PEDESTRIAN PATHWAYS SHALL COMPLY FULLY WITH ALL REQUIREMENTS OF THE MUTCD AND ALL APPLICABLE MAAB AND ADAAG REQUIREMENTS AND INCLUDE THE USE OF A COMPLIANT TEMPORARY PEDESTRIAN MANAGEMENT GUIDANCE SYSTEM AT ALL TIMES.
6. CONTRACTOR SHALL MAINTAIN AS WIDE OF A PEDESTRIAN ACCESS AS POSSIBLE AT ALL TIMES. EXCEPT WHERE NECESSARY, THE CONTRACTOR MAY TEMPORARILY REDUCE PEDESTRIAN PATHWAYS TO 4 FEET IN WIDTH (EXCLUDING CURB) FOR NO MORE THAN 200 LINEAR FEET AT A TIME IN ACCORDANCE WITH ALL STANDARDS. A 5' x 5' PASSING AREA SHALL BE PROVIDED IN INTERVALS NOT EXCEEDING 200 FEET.
7. TEMPORARY WHEELCHAIR RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH MASSDOT, MAAB, AND ADAAG REQUIREMENTS.
8. TEMPORARY PEDESTRIAN BARRICADE SHALL BE PAID FOR UNDER ITEM 852.11 TEMPORARY PEDESTRIAN BARRICADE.
9. TEMPORARY PEDESTRIAN CURB RAMPS SHALL BE PAID FOR UNDER ITEM 852.12 TEMPORARY PEDESTRIAN CURB RAMP.

PEDESTRIAN BYPASS TYPE I



PEDESTRIAN BYPASS DETAIL

SCALE: NTS

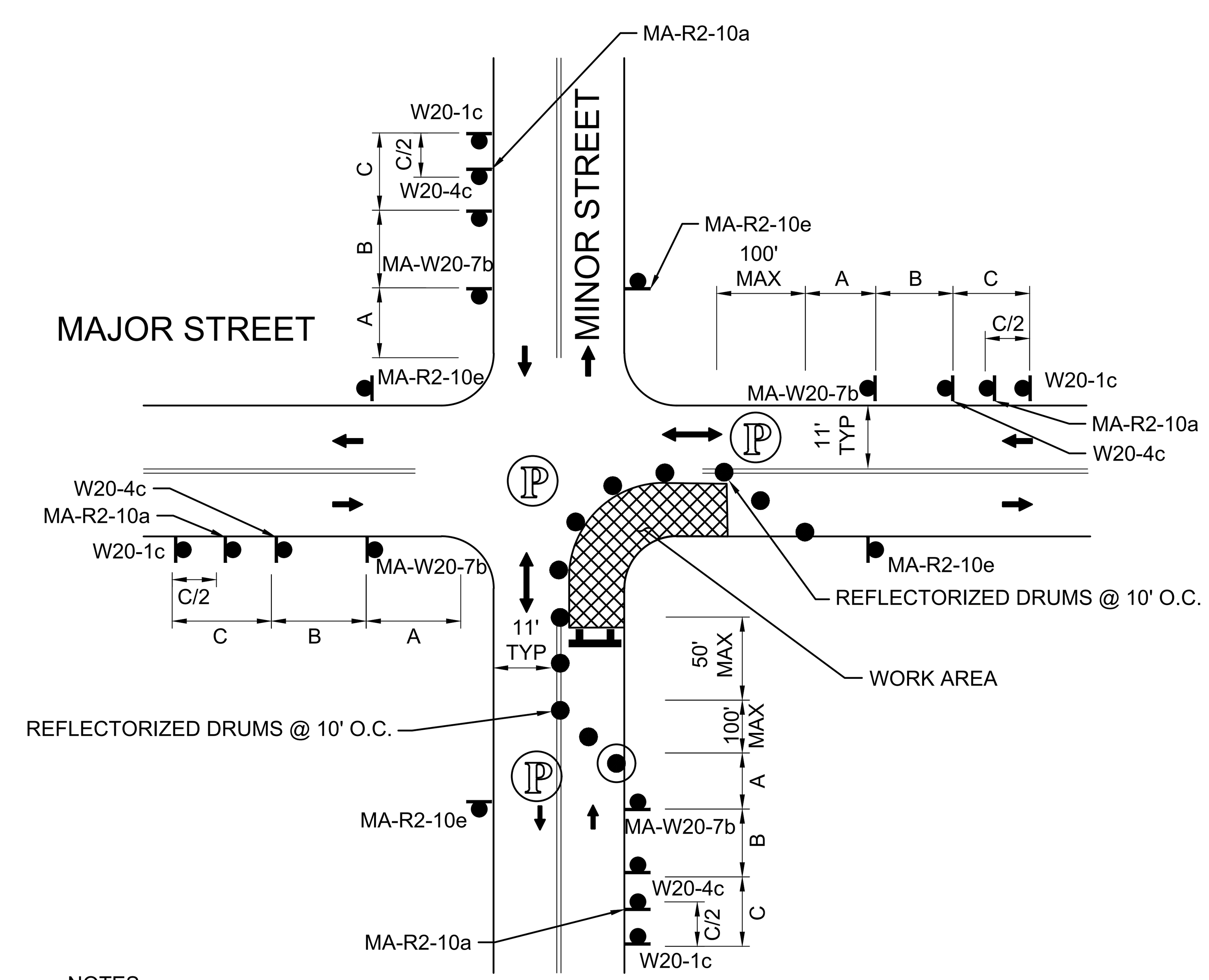


NOTES:

1. ADVANCE WARNING SIGN PLACEMENT TO BE ADJUSTED AS NECESSARY.
2. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 68.

ONE LANE BI-DIRECTIONAL TRAFFIC AT-INTERSECTIONS - NEAR SIDE

SCALE: NTS



NOTES:

1. ADVANCE WARNING SIGN PLACEMENT TO BE ADJUSTED AS NECESSARY.
2. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 68.

ONE LANE BI-DIRECTIONAL TRAFFIC AT INTERSECTIONS - FAR SIDE

SCALE: NTS

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

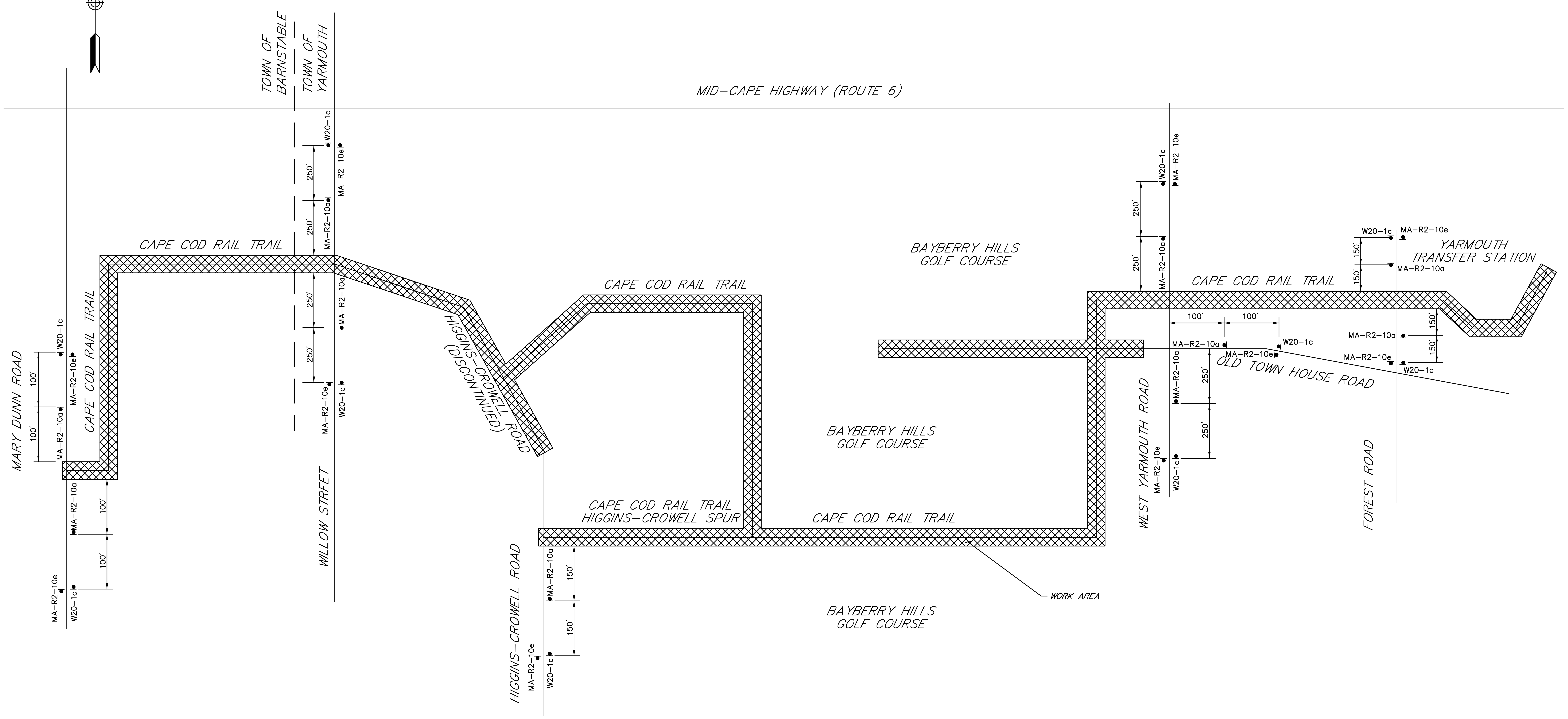
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	70	267
PROJECT FILE NO. 607398			

TEMPORARY TRAFFIC CONTROL PLANS
ADVANCE SIGN SCHEMATIC

ADVANCE SIGN SCHEMATIC

NTS

SIGNS TO BE INSTALLED AT THE PROJECT LIMITS AS SHOWN.
ALL ADVANCE SIGNS TO BE IN PLACE FOR THE DURATION OF THE PROJECT.



BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	71	267

PROJECT FILE NO. 607398

TEMPORARY TRAFFIC CONTROL PLANS SIGN SUMMARY

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			COLOR			UNIT AREA (S.F.)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACKGROUND	LEGEND	BORDER	
MA-R2-10a	48"	36"	WORK ZONE SPEEDING FINES DOUBLED	AS PER MASSDOT STANDARD			FLUORESCENT ORANGE / WHITE	BLACK	BLACK	12.00
MA-R2-10e	36"	48"	END ROAD WORK DOUBLE FINES END				FLUORESCENT ORANGE / WHITE	BLACK	BLACK	12.00
R4-7b	24"	30"	KEEP RIGHT	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			WHITE	BLACK	BLACK	5.00
R9-9	24"	12"	SIDEWALK CLOSED				WHITE	BLACK	BLACK	2.00
R11-2	48"	30"	ROAD CLOSED				WHITE	BLACK	BLACK	10.00
R11-3a	60"	30"	ROAD CLOSED AHEAD LOCAL TRAFFIC ONLY				WHITE	BLACK	BLACK	12.50
W4-2R	36"	36"					FLUORESCENT ORANGE	BLACK	BLACK	9.00
W8-1	36"	36"	BUMP				FLUORESCENT ORANGE	BLACK	BLACK	9.00
W8-3	36"	36"	PAVEMENT ENDS				FLUORESCENT ORANGE	BLACK	BLACK	9.00
W8-8	36"	36"	ROUGH ROAD				FLUORESCENT ORANGE	BLACK	BLACK	9.00
W8-9	36"	36"	LOW SHOULDER				FLUORESCENT ORANGE	BLACK	BLACK	9.00
W8-15	36"	36"	GROOVED PAVEMENT				FLUORESCENT ORANGE	BLACK	BLACK	9.00
W20-1c	36"	36"	ROAD WORK AHEAD				FLUORESCENT ORANGE	BLACK	BLACK	9.00
W20-2c	36"	36"	DETOUR AHEAD				FLUORESCENT ORANGE	BLACK	BLACK	9.00
W20-3c	36"	36"	ROAD CLOSED AHEAD				FLUORESCENT ORANGE	BLACK	BLACK	9.00
W20-4c	36"	36"	ONE LANE ROAD AHEAD				FLUORESCENT ORANGE	BLACK	BLACK	9.00
W20-5cR	36"	36"	RIGHT LANE CLOSED AHEAD				FLUORESCENT ORANGE	BLACK	BLACK	9.00

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			COLOR			UNIT AREA (S.F.)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACKGROUND	LEGEND	BORDER	
W16-8P(1)	30"	8"	WILLOW ST NB	4"B	2" 2"	N/A	FLUORESCENT ORANGE	BLACK	BLACK	1.67
W16-8P(2)	30"	8"	WILLOW ST SB	4"B	2" 2"	N/A	FLUORESCENT ORANGE	BLACK	BLACK	1.67
MA-W20-7b	36"	36"	POLICE OFFICER AHEAD	AS PER MASSDOT STANDARD			FLUORESCENT ORANGE	BLACK	BLACK	9.00
W21-7	36"	36"	UTILITY WORK AHEAD	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			FLUORESCENT ORANGE	BLACK	BLACK	9.00
MA-M1-5(6)	24"	24"	6	AS PER MASSDOT STANDARD			WHITE	BLACK	WHITE	4.00
M4-8a	24"	18"	END DETOUR	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			FLUORESCENT ORANGE	BLACK	BLACK	3.00
M4-9L	30"	24"	DETOUR				FLUORESCENT ORANGE	BLACK	BLACK	5.00
M4-9R	30"	24"	DETOUR				FLUORESCENT ORANGE	BLACK	BLACK	5.00
M4-9V	30"	24"	DETOUR				FLUORESCENT ORANGE	BLACK	BLACK	5.00
M4-9bsL	30"	24"	DETOUR				FLUORESCENT ORANGE	BLACK	BLACK	5.00
M4-9bsR	30"	24"	DETOUR				FLUORESCENT ORANGE	BLACK	BLACK	5.00
M4-10L	48"	18"	DETOUR				FLUORESCENT ORANGE	BLACK	- - -	6.00
M4-10R	48"	18"	DETOUR				FLUORESCENT ORANGE	BLACK	- - -	6.00

NOTES:

1. HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE 1977 MASSHIGHWAY DEPARTMENT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AS AMENDED, FOR SIGNS AND SUPPORTS; THE MASSHIGHWAY DEPARTMENT SIGN LISTINGS 1993 EDITION, AS AMENDED; THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR MOUNTING REQUIREMENTS; AND THE 2017 MassDOT STANDARD SIGNS BOOK, AS AMENDED.
2. ALL SIGNS SHOWN GRAPHICALLY FOR INFORMATION ONLY. SIGN VENDOR SHALL FABRICATE ALL SIGNS IN ACCORDANCE WITH THE APPLICABLE STANDARDS.

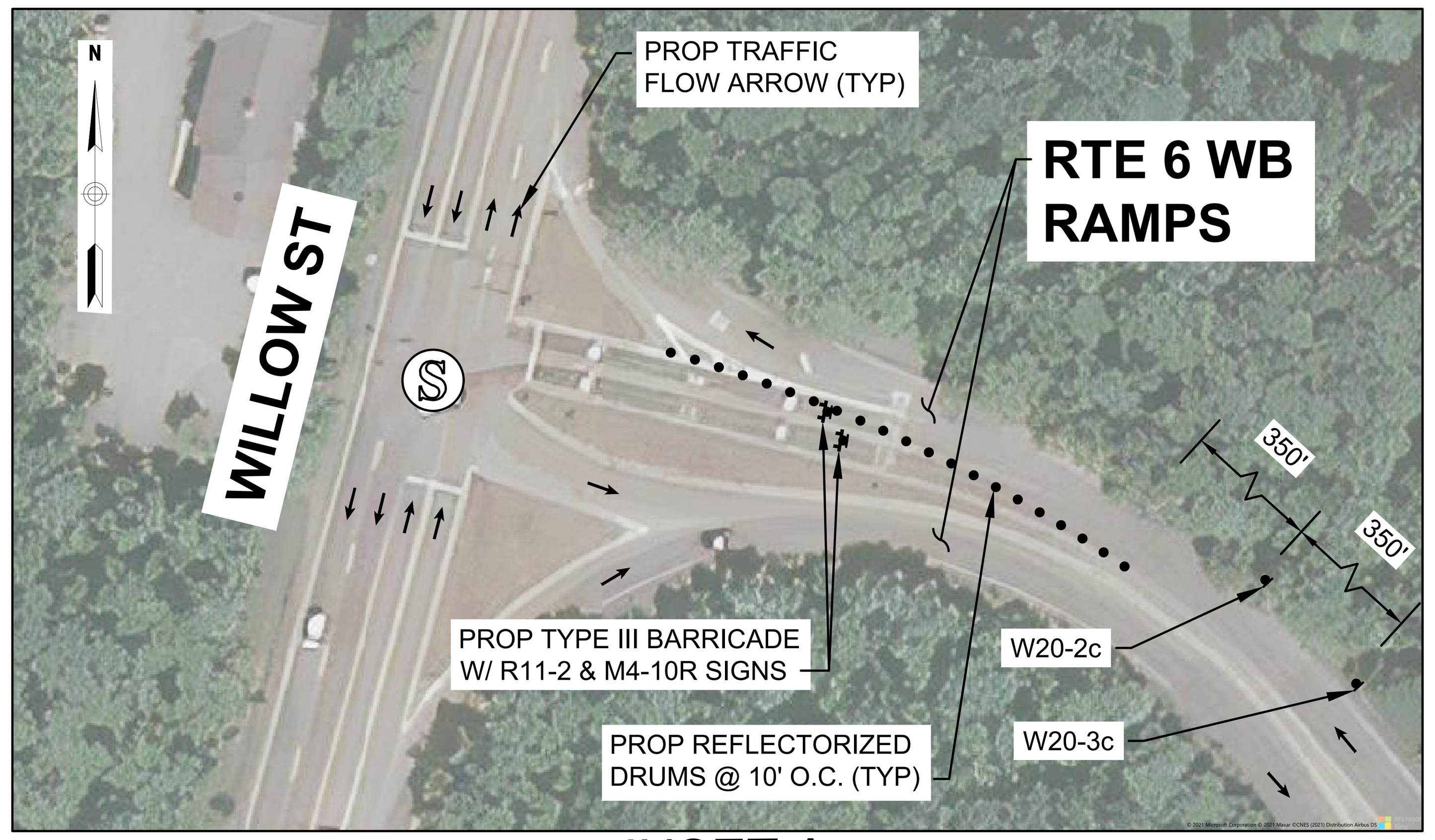
607398_HD(TTCP).DWG Plotted on 22-Nov-2021 4:30 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

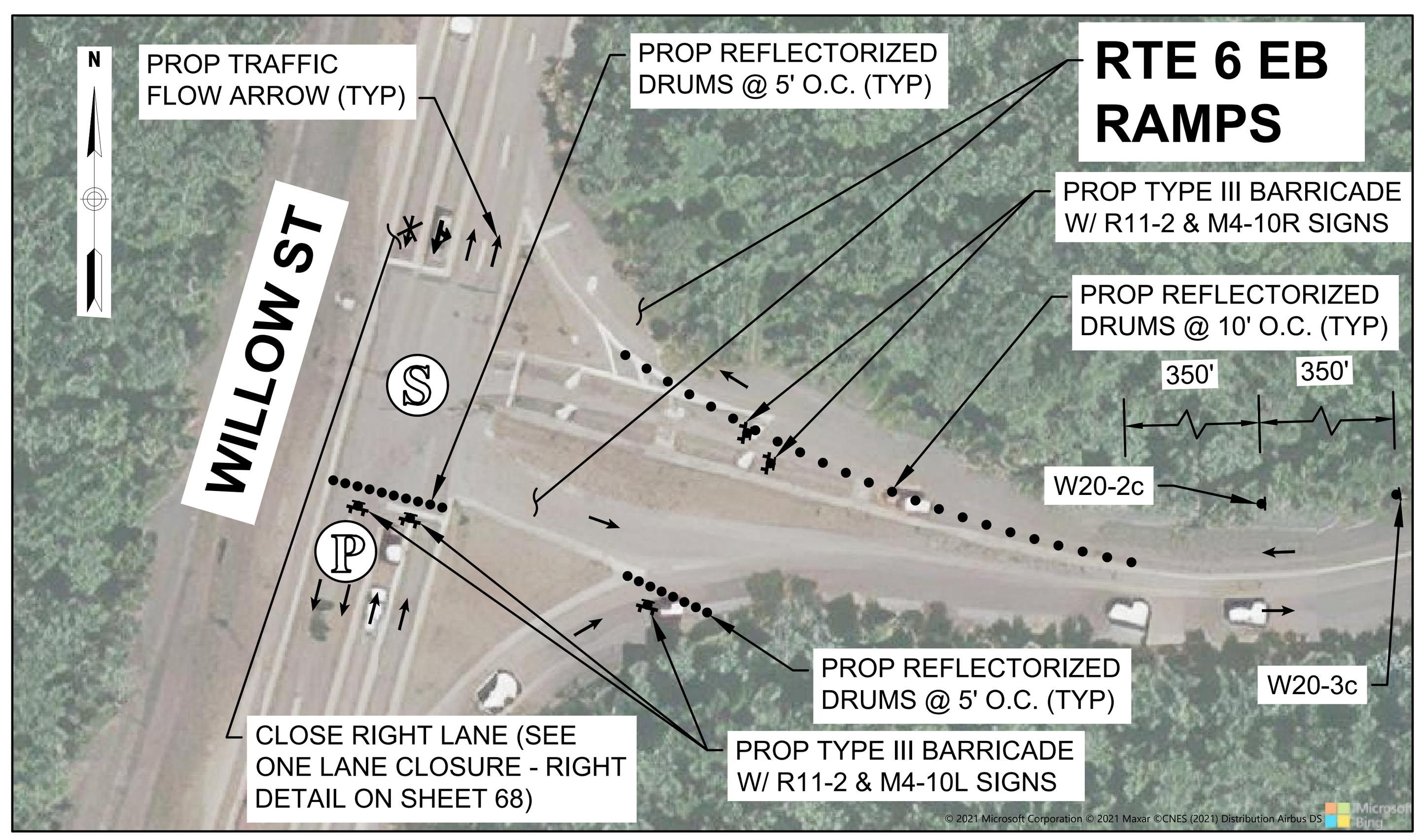
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	72	267
PROJECT FILE NO. 607398			

DETOUR PLAN
WILLOW STREET

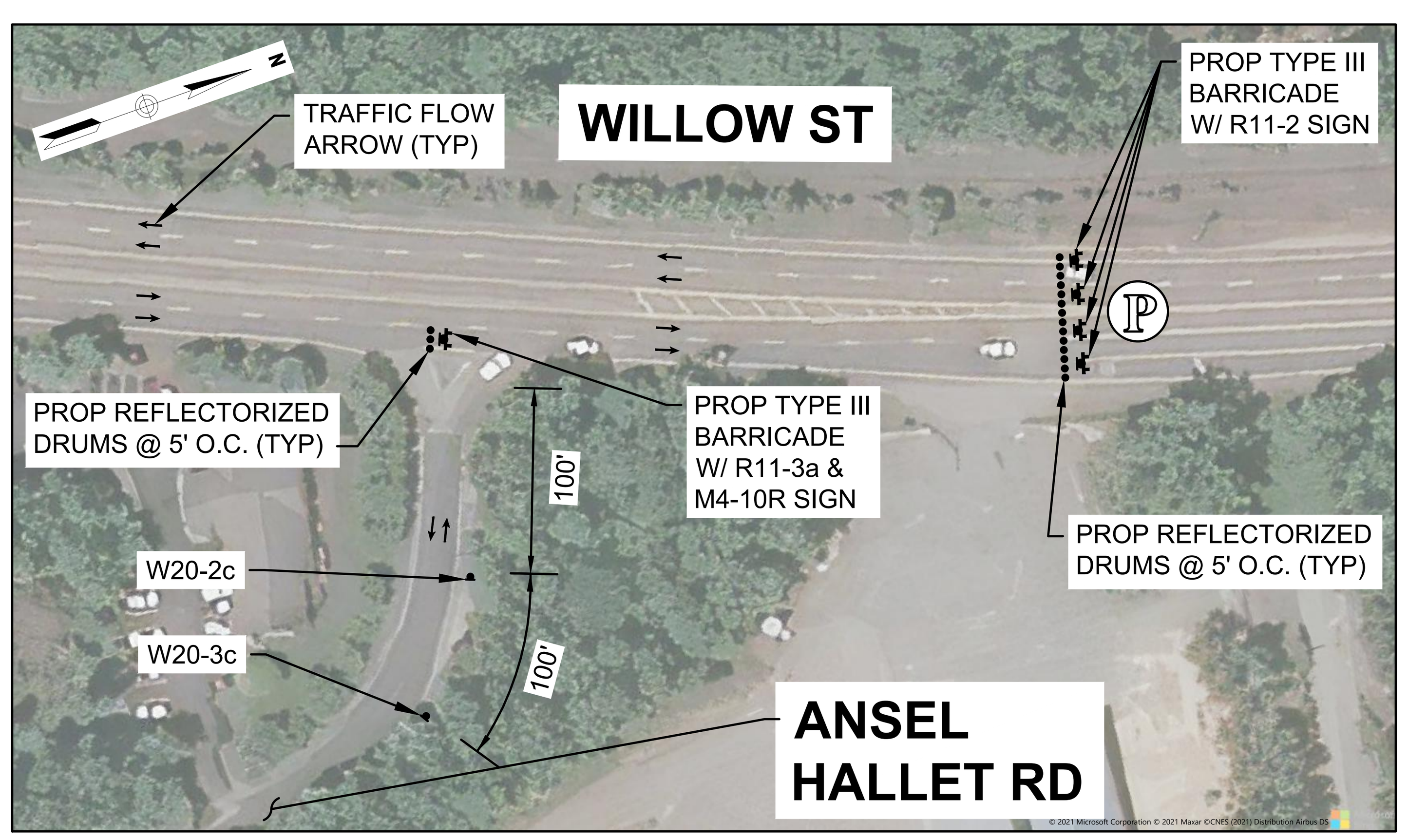
22-Nov-2021
607398_HD(DETOUR).DWG



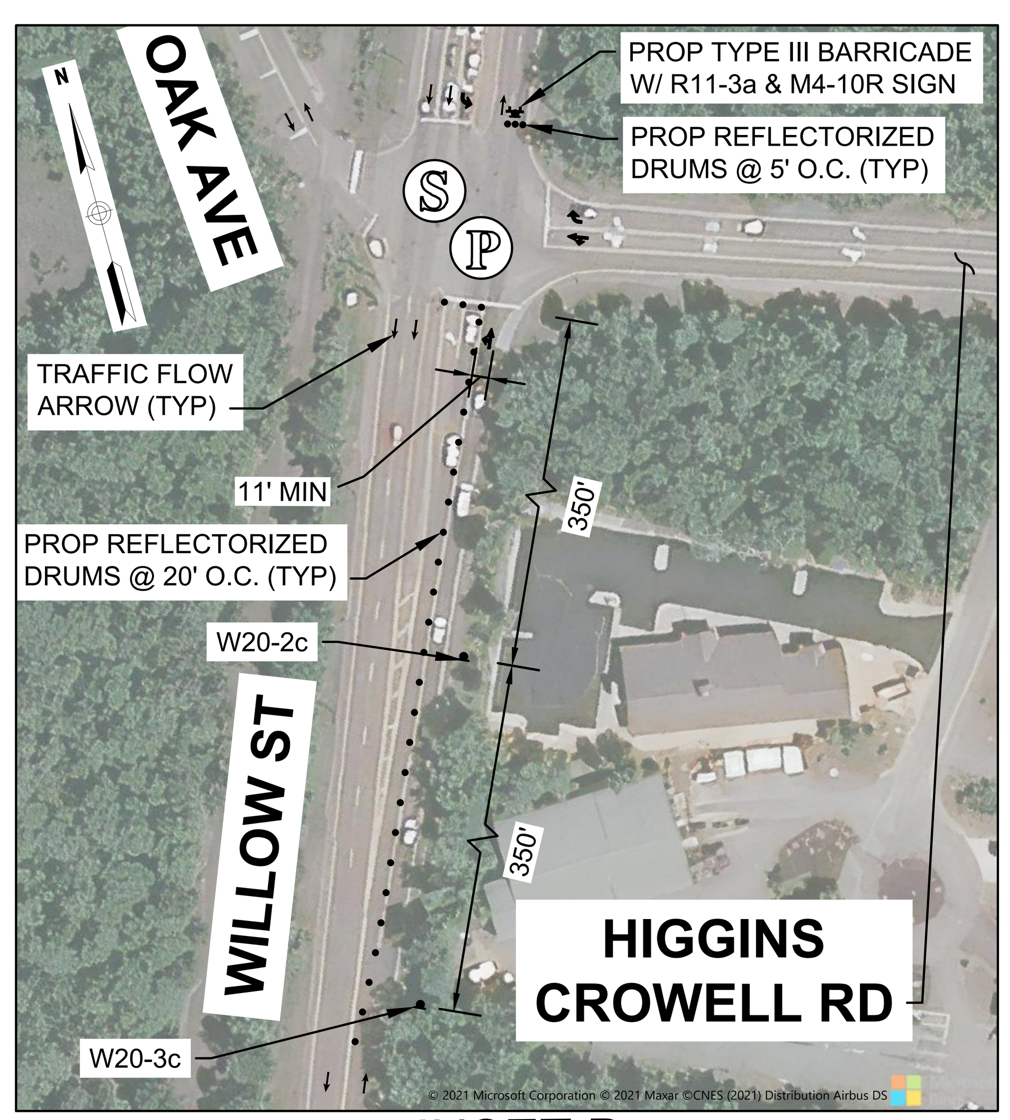
INSET A
SCALE: 1" = 60'



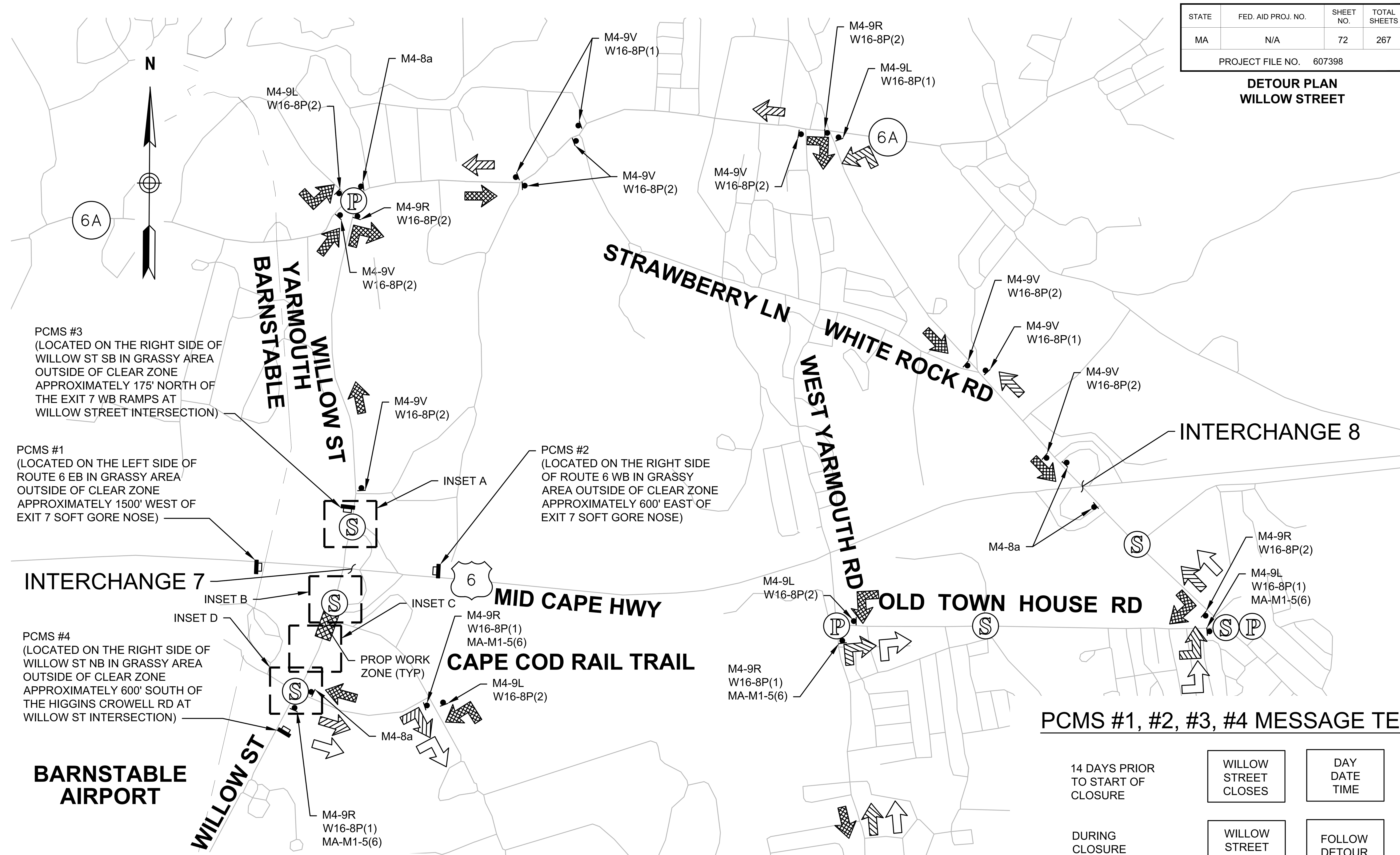
INSET B
SCALE: 1" = 60'

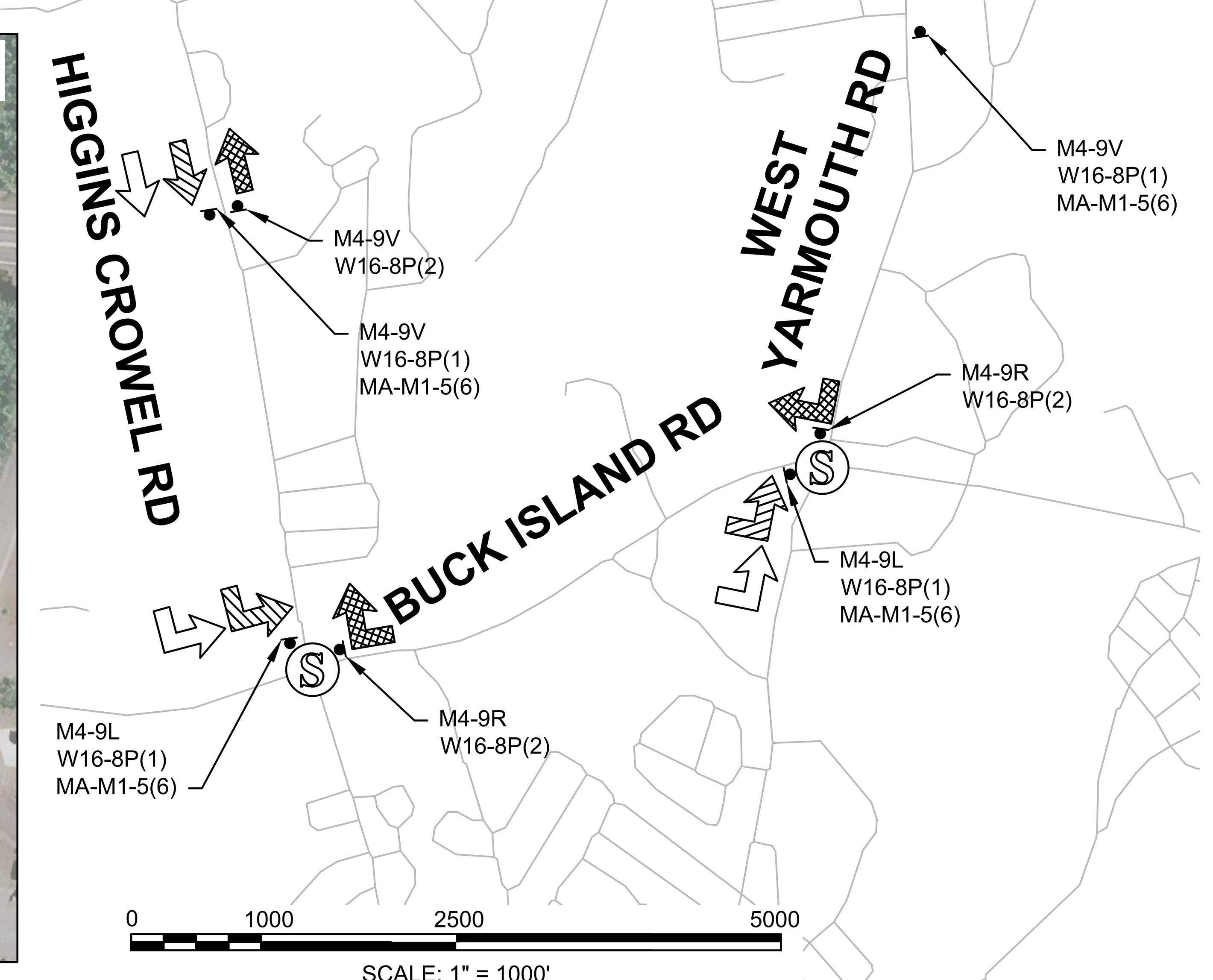


INSET C
SCALE: 1" = 80'



INSET D
SCALE: 1" = 100'





PCMS #1, #2, #3, #4 MESSAGE TEXT

14 DAYS PRIOR TO START OF CLOSURE	WILLOW STREET CLOSES	DAY DATE TIME
DURING CLOSURE	WILLOW STREET CLOSED	FOLLOW DETOUR

PCMS NOTES:

1. PCMS SHALL BE INSTALLED WITHIN THE EXISTING RIGHT-OF-WAY (ROW) OFF THE ROADWAY AT APPROX. LOCATIONS SHOWN OR AS DIRECTED BY MASSDOT AND THE APPROPRIATE TOWNS. PCMS SHALL NOT BLOCK EXIST SIDEWALK.
2. DATE AND TIMES ON PCMS MESSAGING SHALL BE COORDINATED WITH THE APPROPRIATE TOWNS, MASSDOT HOC AND DISTRICT 5.
3. CONTRACTOR SHALL PROVIDE PCMS A MINIMUM OF 14 DAYS PRIOR TO START OF CONSTRUCTION OR AS DIRECTED BY MASSDOT.
4. CONTRACTOR SHALL REMOVE ALL PCMS SHOWN AT THE COMPLETION OF CONSTRUCTION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

LEGEND
WILLOW ST NB DETOUR FLOW ARROW
WILLOW ST NB TO ROUTE 6 DETOUR FLOW ARROW
WILLOW ST SB DETOUR FLOW ARROW
WORK AREA (PUBLIC ACCESS RESTRICTED)
TRAFFIC SIGNAL
POLICE OFFICER

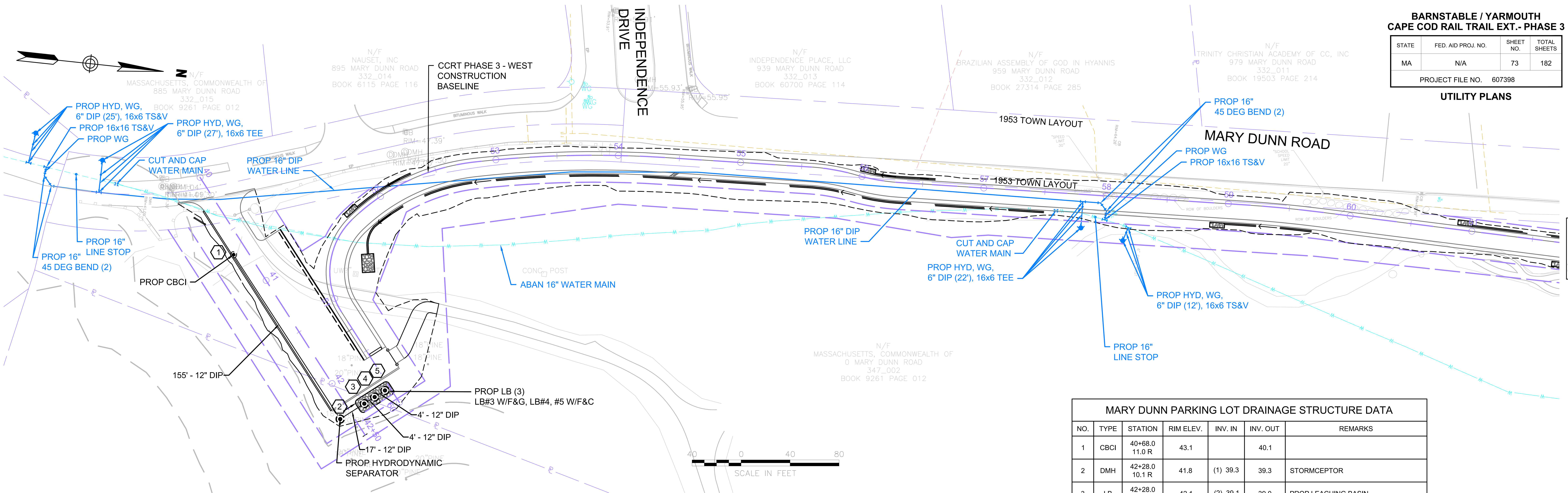
NOTES:

1. SEE GENERAL NOTES & LEGEND ON SHEET 68 FOR ADDITIONAL INFORMATION.
2. REFER TO ADVANCE SIGN SCHEMATIC PLAN ON SHEET 70.
3. CONTRACTOR TO COORDINATE WITH THE YARMOUTH FIRE/EMS/POLICE DEPARTMENTS AT LEAST 14 DAYS IN ADVANCE OF CLOSURE AND DETOUR OF WILLOW STREET.

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

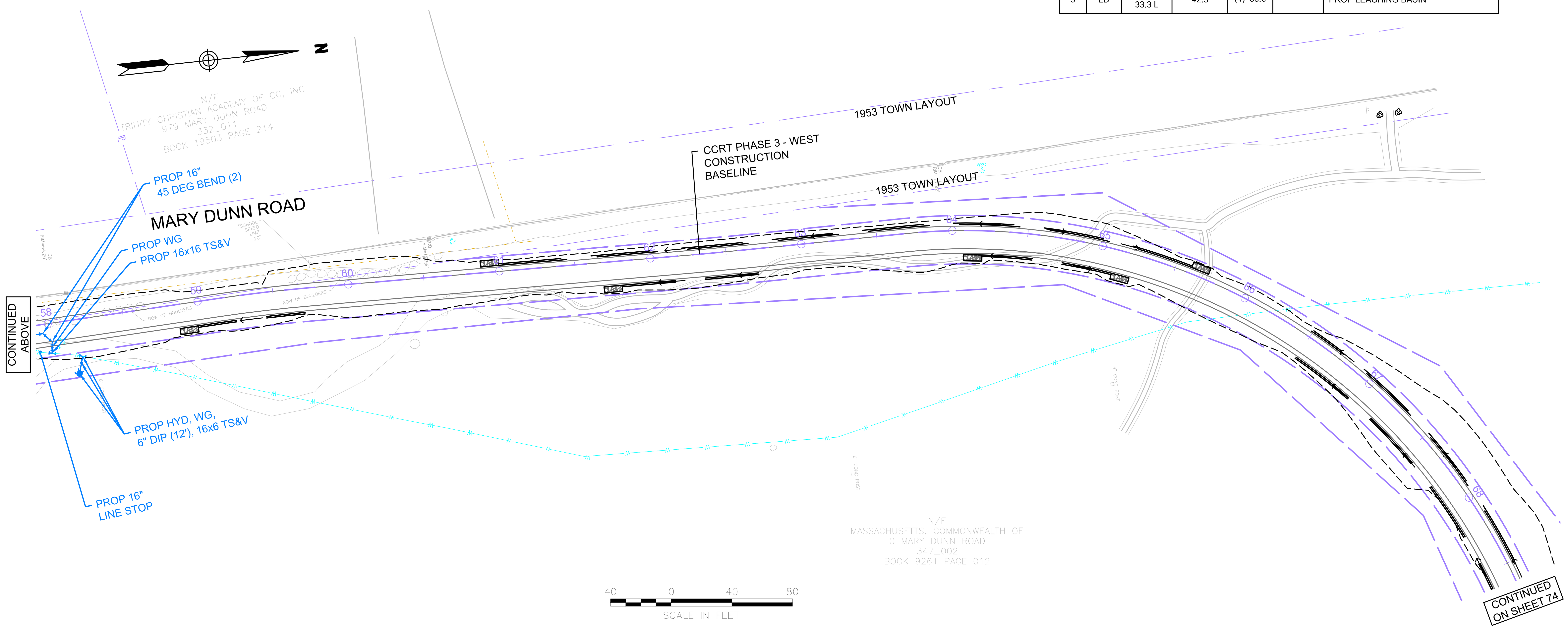
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	73	182
PROJECT FILE NO. 607398			

UTILITY PLANS



MARY DUNN PARKING LOT DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
1	CBCI	40+68.0 11.0 R	43.1		40.1	
2	DMH	42+28.0 10.1 R	41.8	(1) 39.3	39.3	STORMCEPTOR
3	LB	42+28.0 13.3 L	42.1	(2) 39.1	39.0	PROP LEACHING BASIN
4	LB	42+28.0 23.3 L	42.2	(3) 38.7	38.7	PROP LEACHING BASIN
5	LB	42+28.0 33.3 L	42.3	(4) 38.6	—	PROP LEACHING BASIN



607398_HD(UTIL).DWG Plotted on 22-Nov-2021 4:39 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT. - PHASE 3

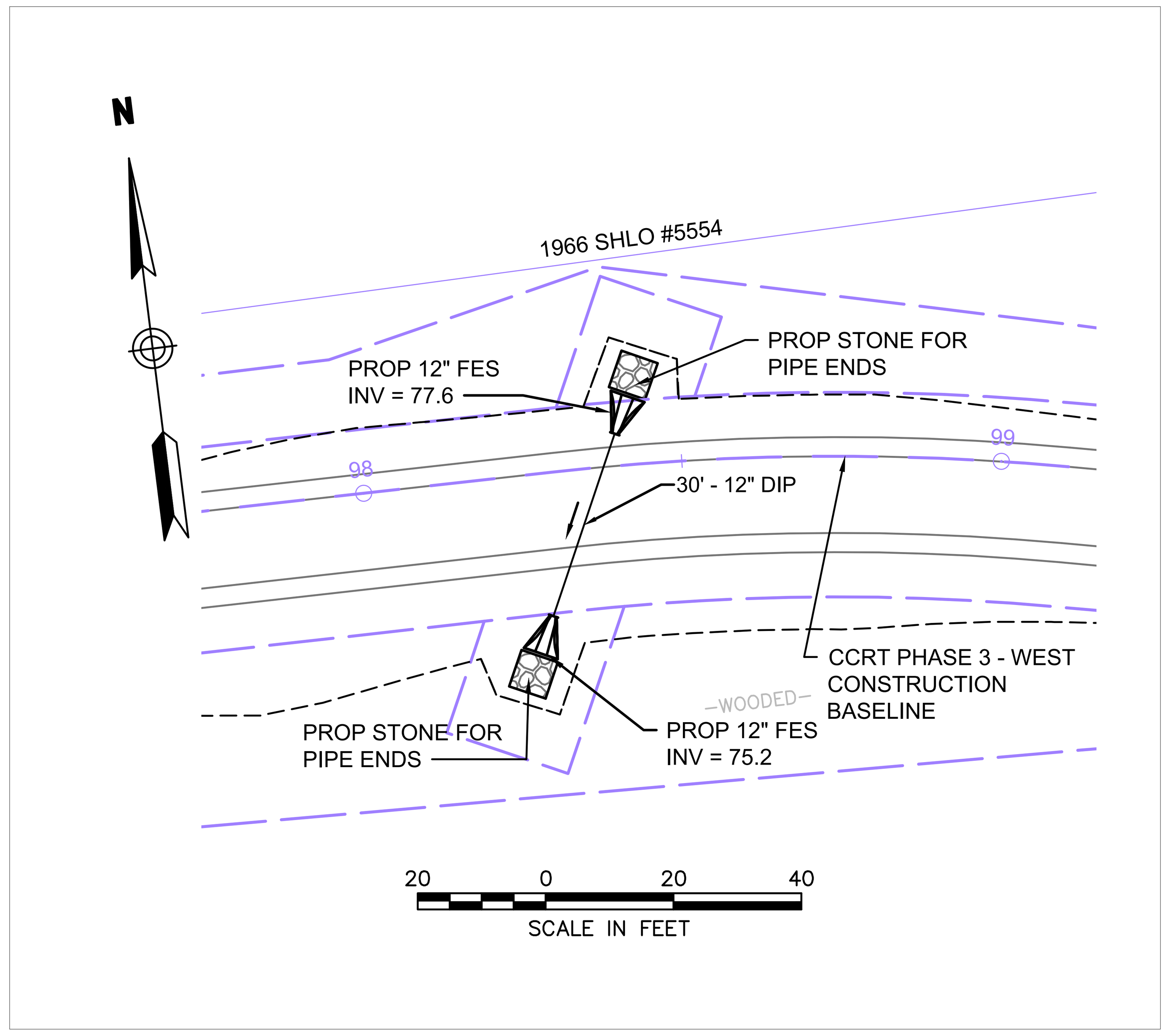
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	74	267
PROJECT FILE NO. 607398			

UTILITY PLANS

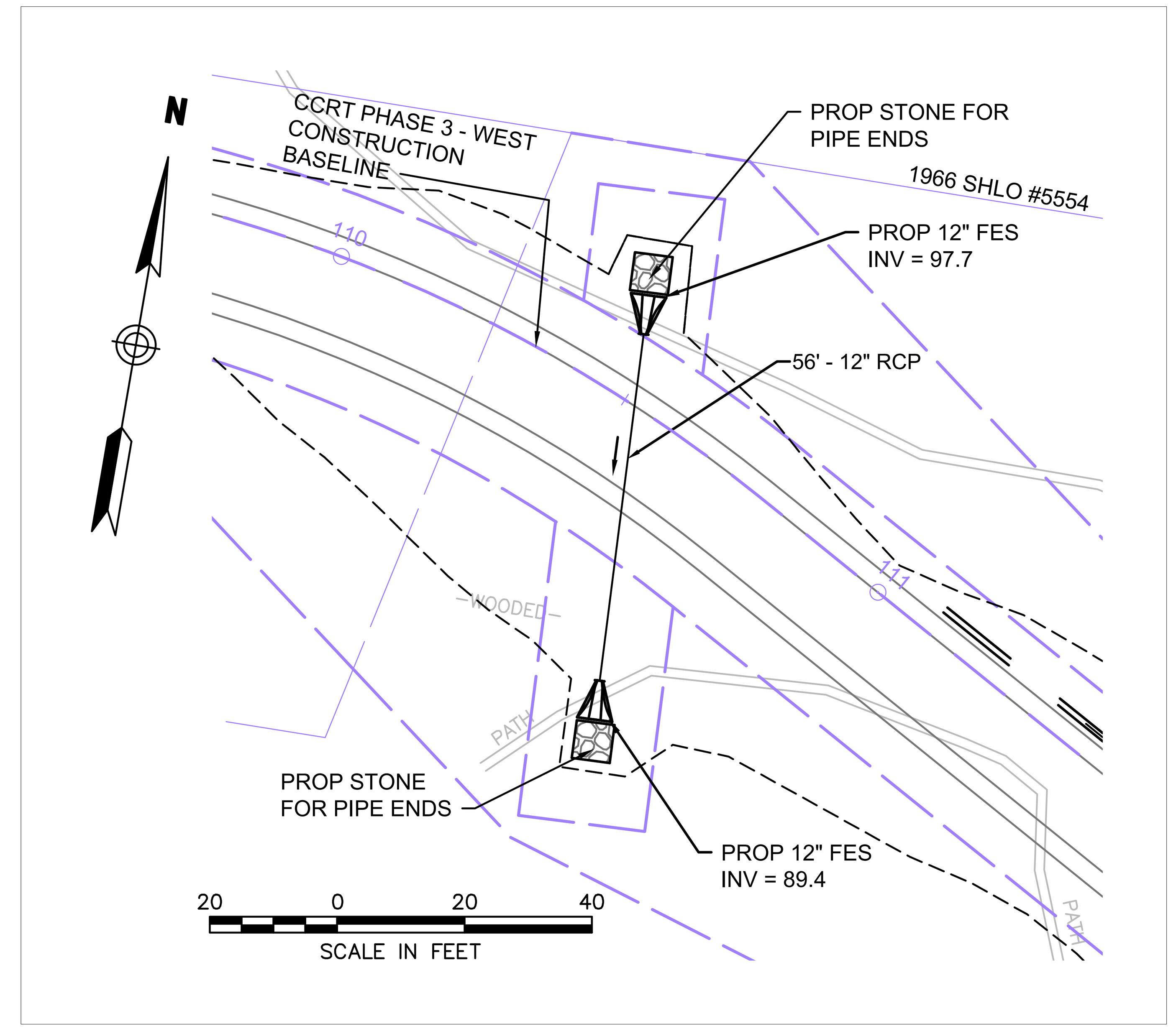
NOTE:

NO UTILITY INFORMATION FROM STA 68+00 - 134+00 OTHER THAN CROSS CULVERTS

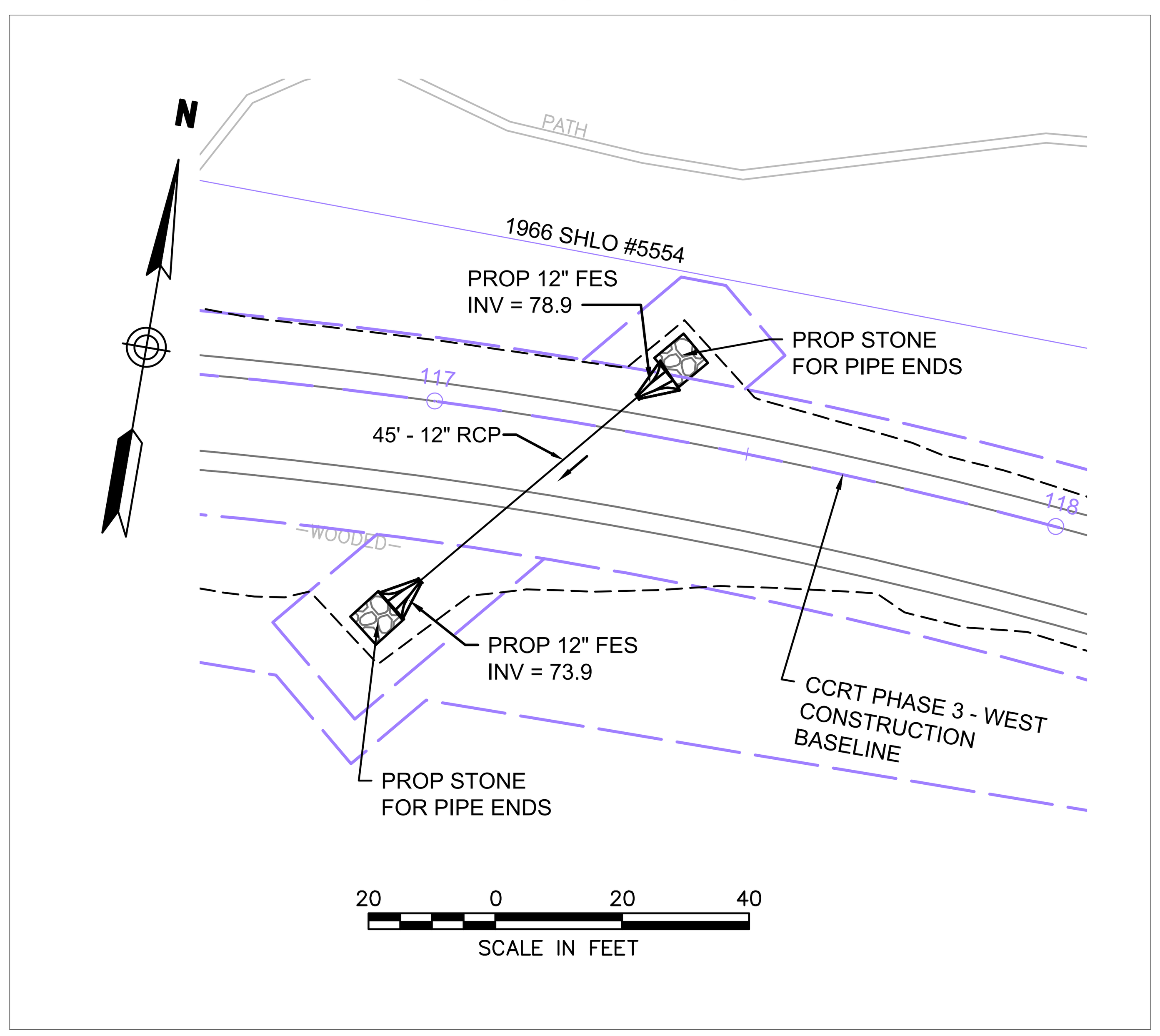
CROSS CULVERT 1



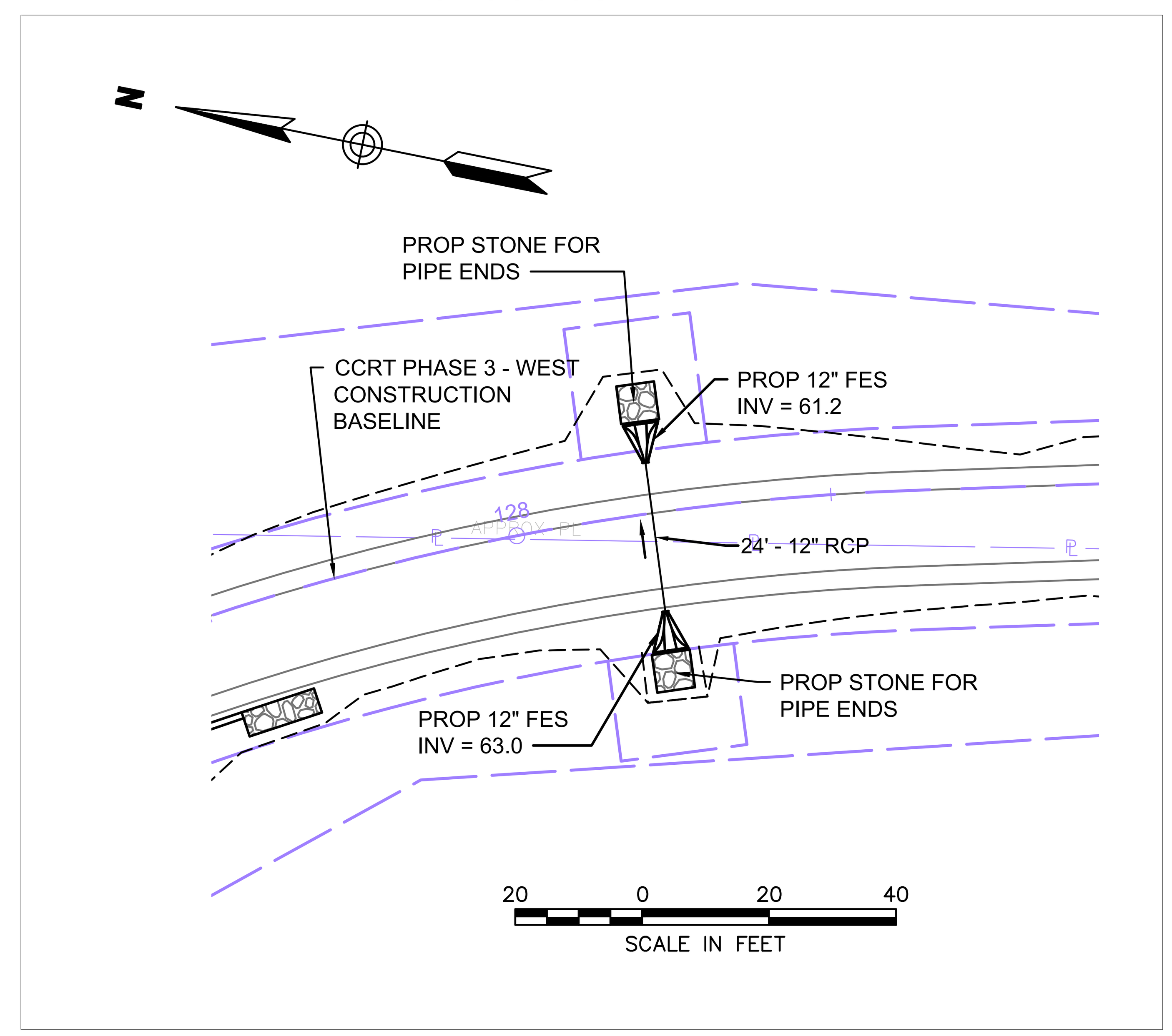
CROSS CULVERT 2



CROSS CULVERT 3



CROSS CULVERT 4



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607398_HD(UTIL).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	75	267

PROJECT FILE NO. 607398

UTILITY PLANS

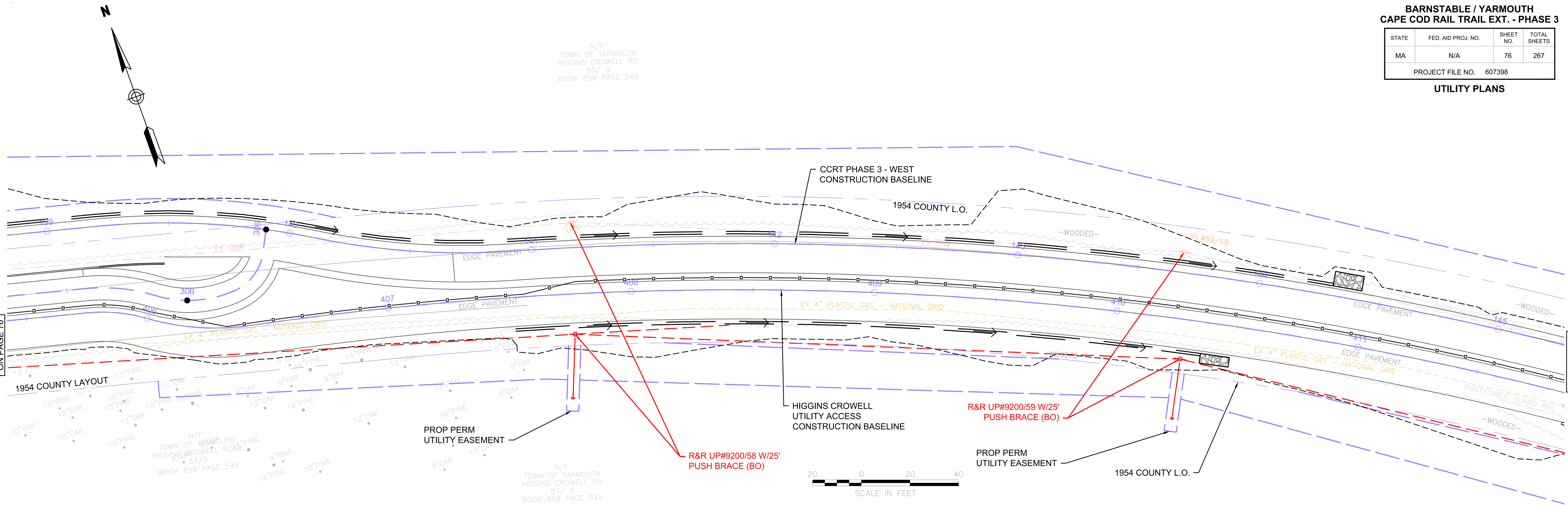
Plotted on 22-Nov-2021 4:49 PM

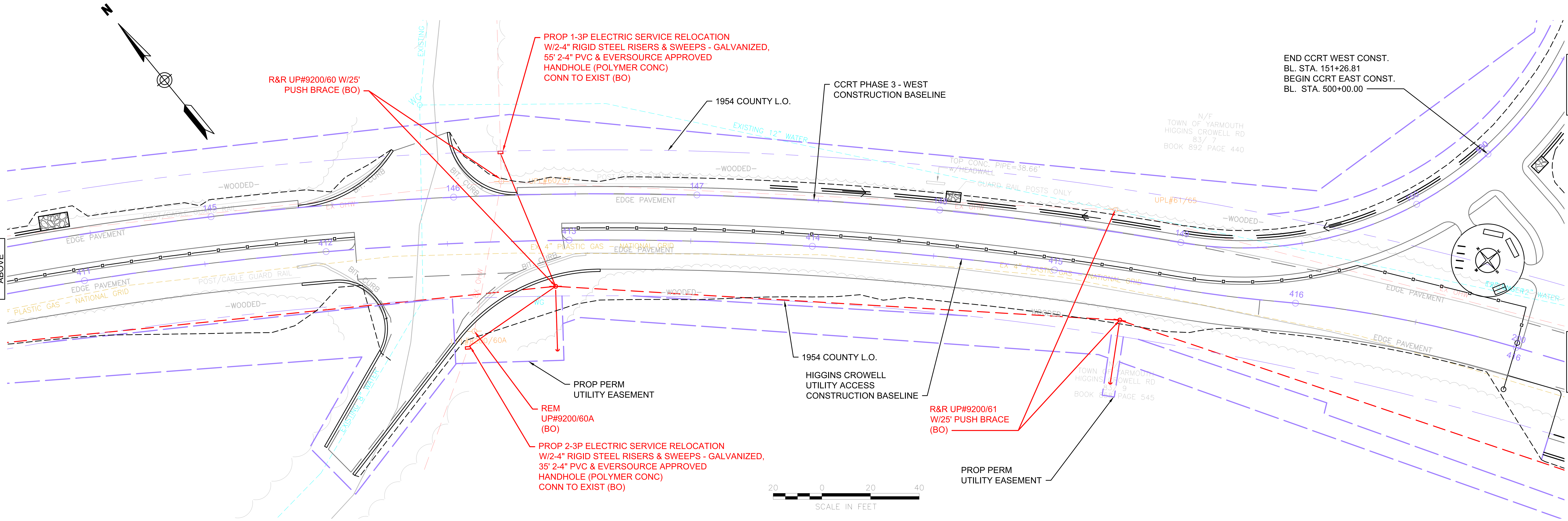
607398_HD(UTIL).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT. - PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	76	267
PROJECT FILE NO. 607398			

UTILITY PLANS





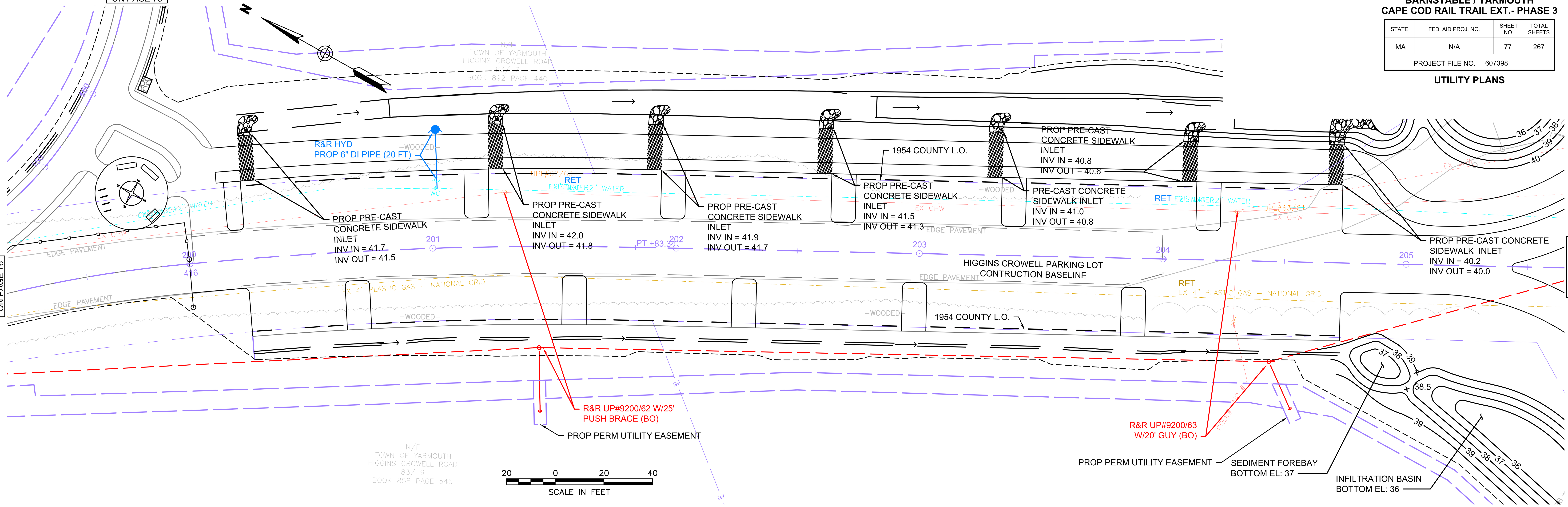
607398_HD(UTIL).DWG Plotted on 22-Nov-2021 4:51 PM

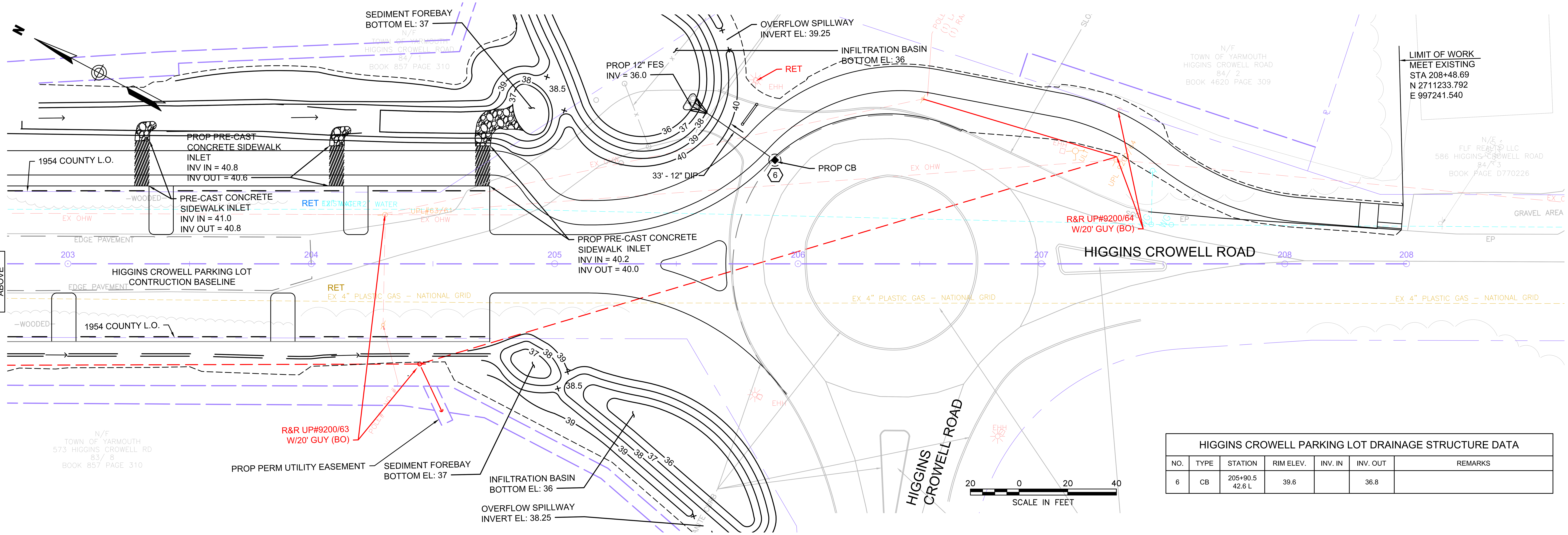
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	77	267
PROJECT FILE NO. 607398			

UTILITY PLANS

Plotted on 22-Nov-2021 4:54 PM
607398_HD(UTIL).DWG





HIGGINS CROWELL PARKING LOT DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
6	CB	205+90.5 42.6 L	39.6		36.8	

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	78	267
PROJECT FILE NO. 607398			

UTILITY PLANS

Plotted on 22-Nov-2021 4:57 PM

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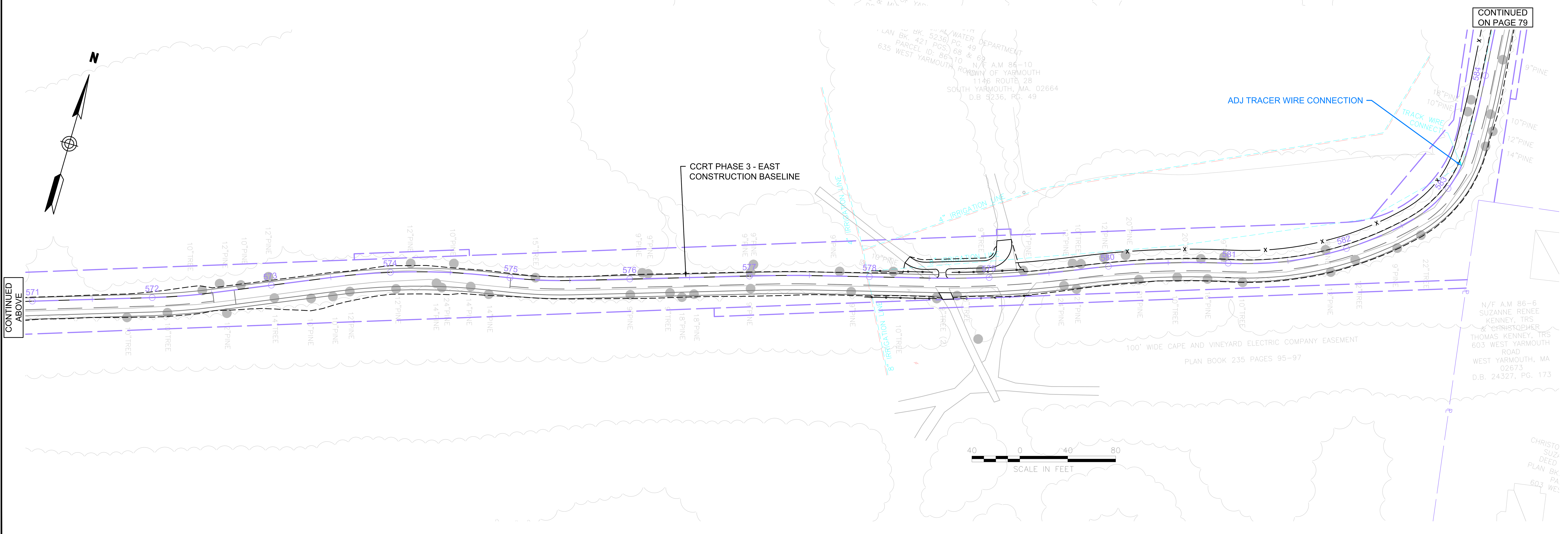

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	79	267
PROJECT FILE NO. 607398			

UTILITY PLANS

Plotted on 22-Nov-2021 5:00 PM

607398_HD(UTIL).DWG

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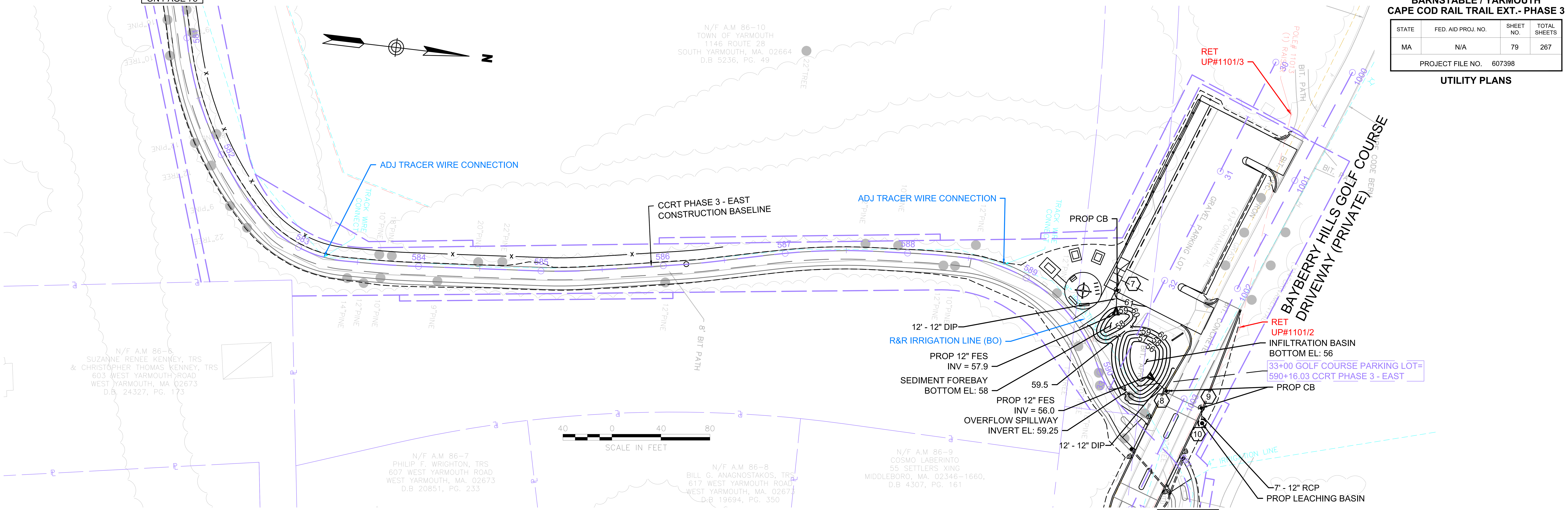
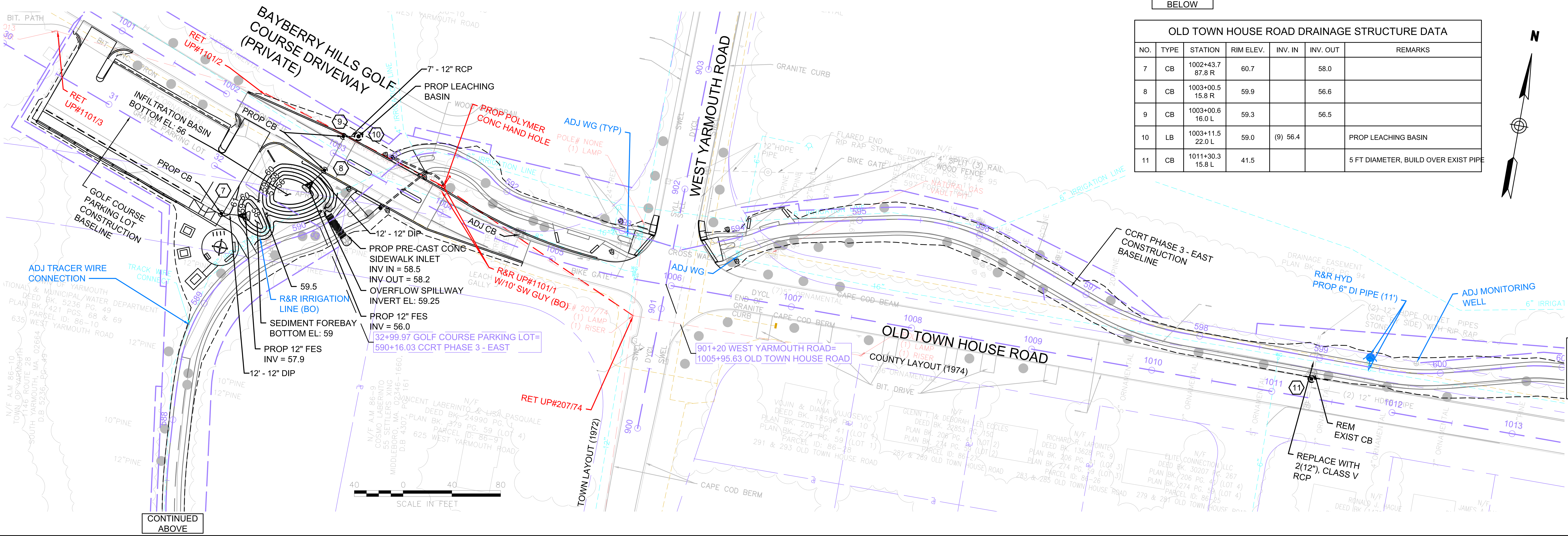


CONTINUED BELOW

OLD TOWN HOUSE ROAD DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
7	CB	1002+43.7 87.8 R	60.7		58.0	
8	CB	1003+00.5 15.8 R	59.9		56.6	
9	CB	1003+00.6 16.0 L	59.3		56.5	
10	LB	1003+11.5 22.0 L	59.0	(9) 56.4		PROP LEACHING BASIN
11	CB	1011+30.3 15.8 L	41.5			5 FT DIAMETER, BUILD OVER EXIST PIPE



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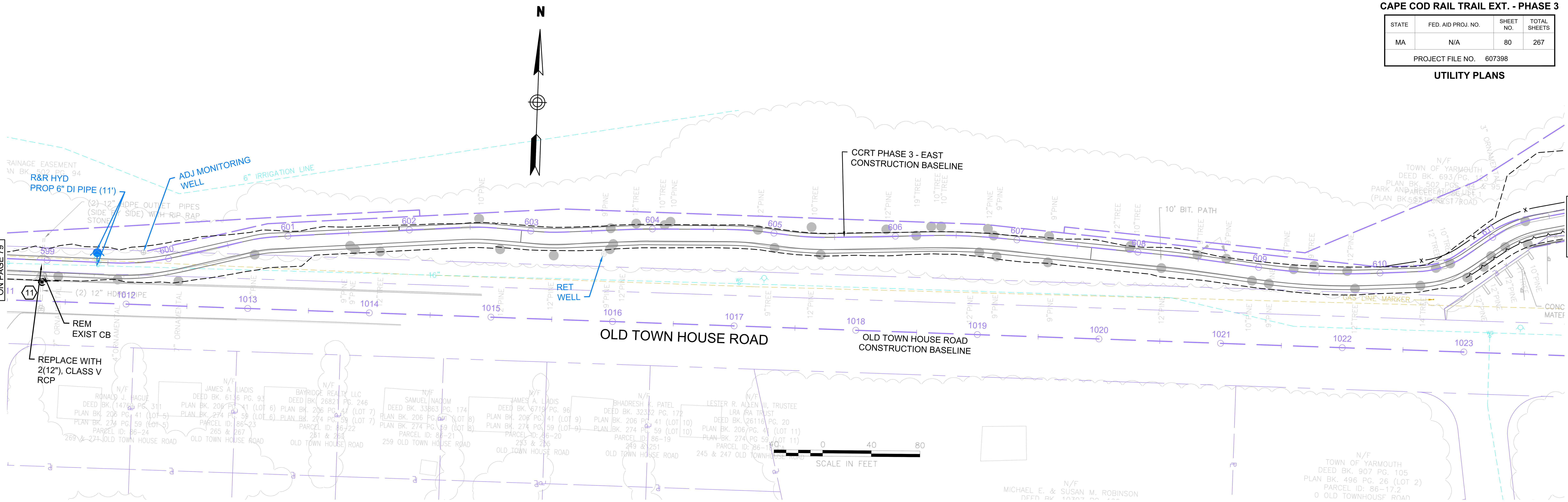
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT. - PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	80	267

PROJECT FILE NO. 607398

UTILITY PLANS



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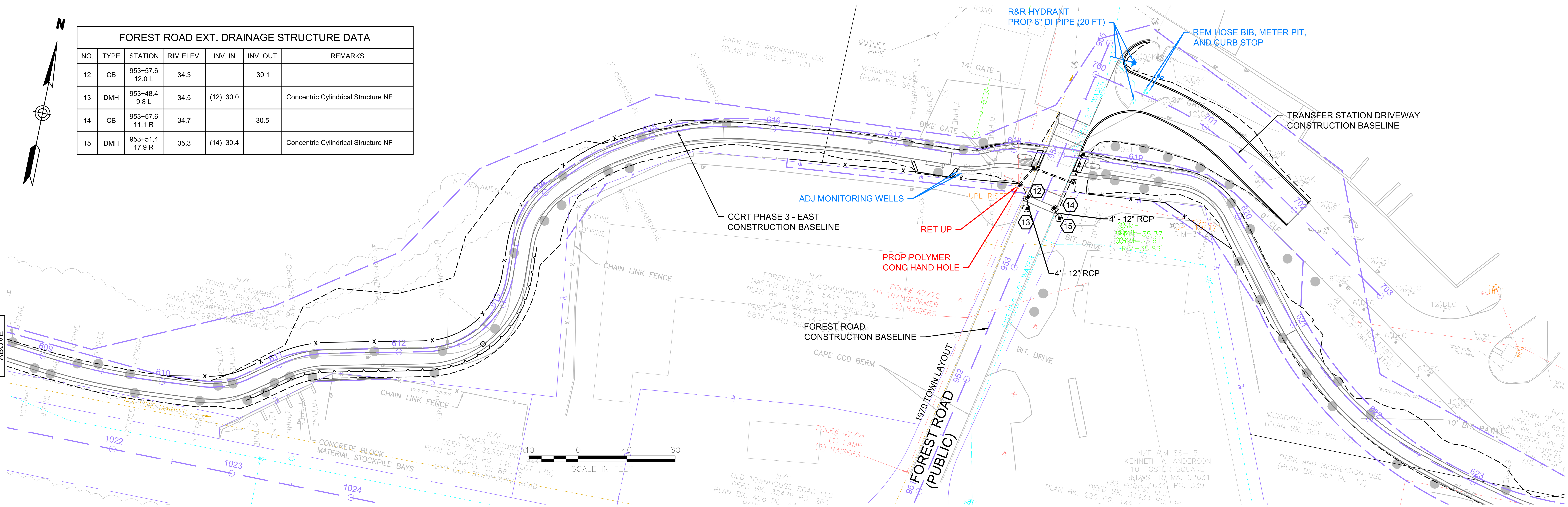
CONTINUED BELOW

FOREST ROAD EXT. DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
12	CB	953+57.6 12.0 L	34.3		30.1	
13	DMH	953+48.4 9.8 L	34.5	(12) 30.0		Concentric Cylindrical Structure NF
14	CB	953+57.6 11.1 R	34.7		30.5	
15	DMH	953+51.4 17.9 R	35.3	(14) 30.4		Concentric Cylindrical Structure NF



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Plotted on 22-Nov-2021 5:02 PM
607398_HD(UTIL).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT. - PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	81	267
PROJECT FILE NO. 607398			

UTILITY PLANS

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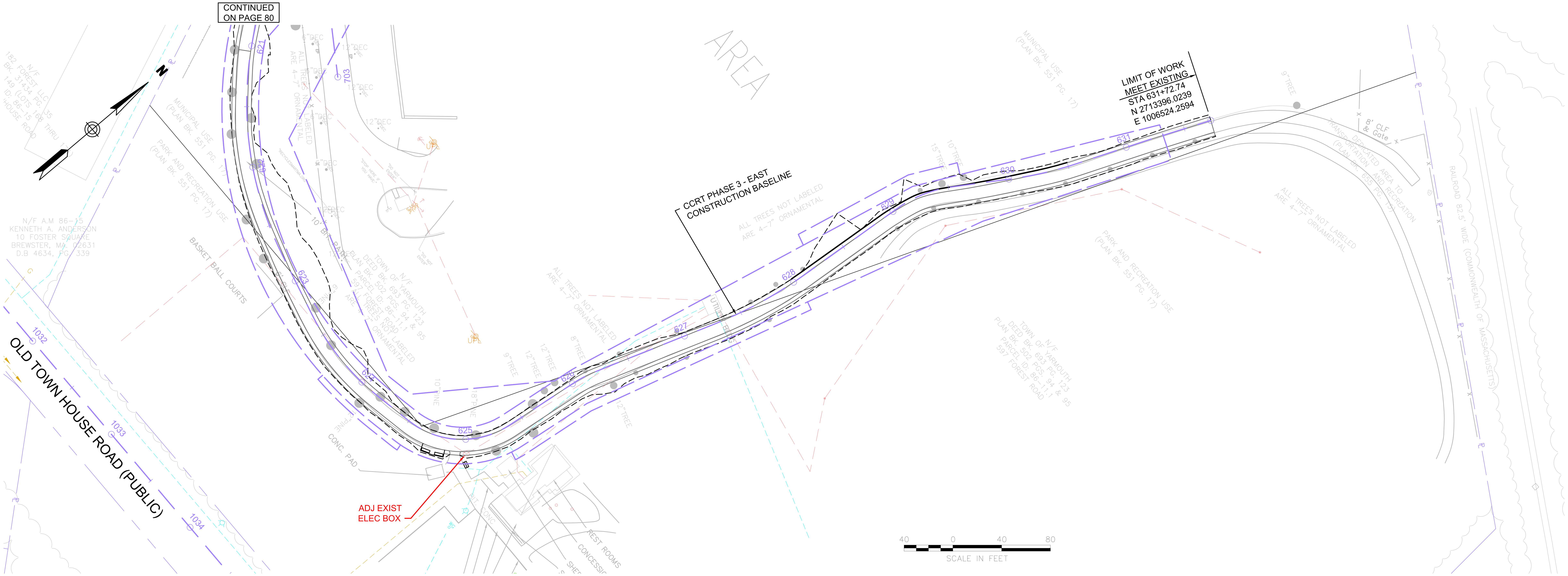

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607398_HD(UTIL).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT. - PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	82	267
PROJECT FILE NO. 607398			

UTILITY PLANS

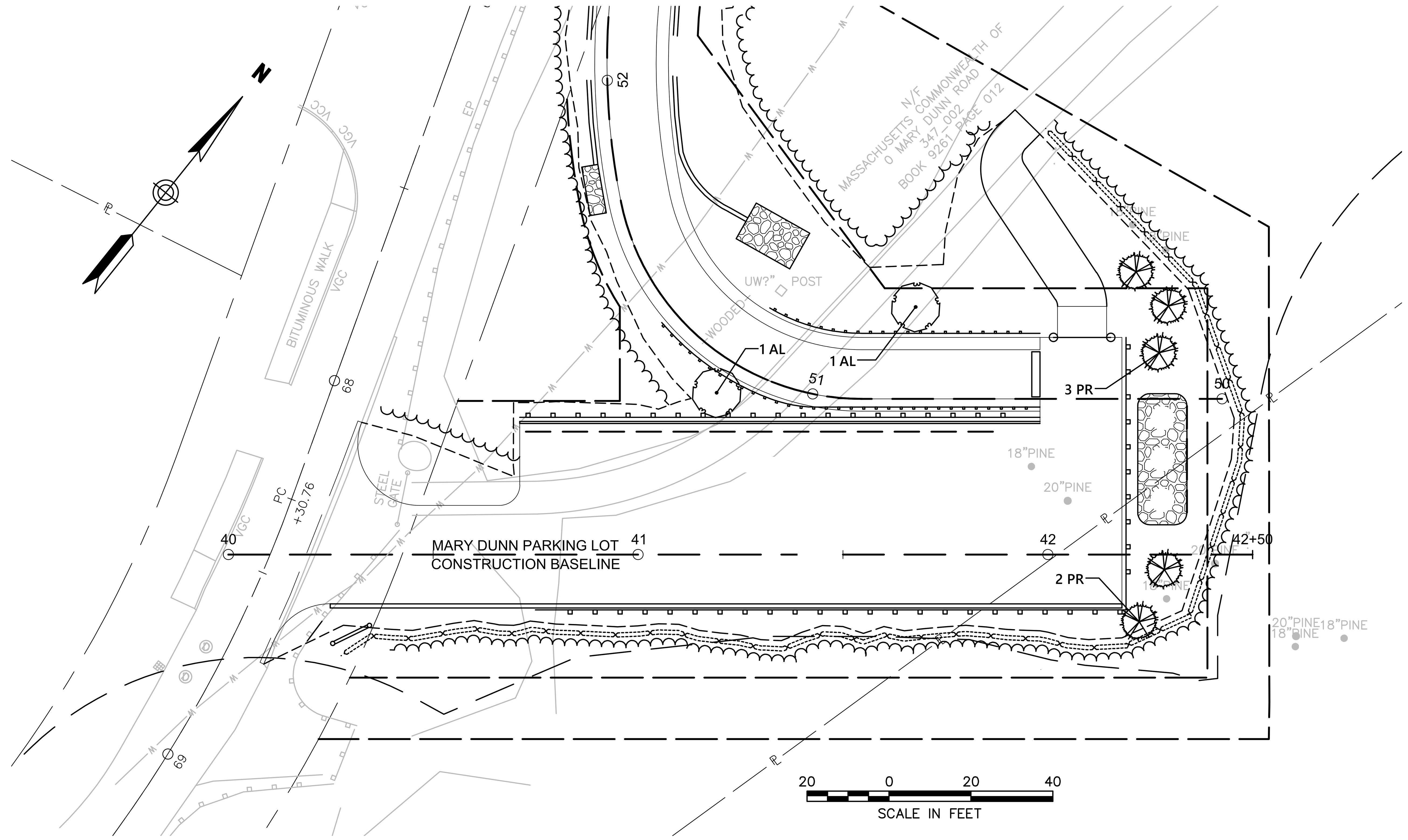
CONTINUED BELOW
CONTINUED ABOVE
CONTINUED ON PAGE 76
CONTINUED ON PAGE 78

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	83	267
PROJECT FILE NO. 607398			

LANDSCAPE PLANS

Plotted on 22-Nov-2021 5:10 PM
607398_HD(LA).DWG



PARKING LOT NO. 1 - MARY DUNN ROAD

PLANT SCHEDULE SHEET 1

EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
PR	5	Pinus rigida	Pine - Pitch	7 - 8' HT.
ORNAMENTAL TREES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
AL	2	Amelanchier laevis	Shad Tree - Downy	2 - 2 1/2" CAL.

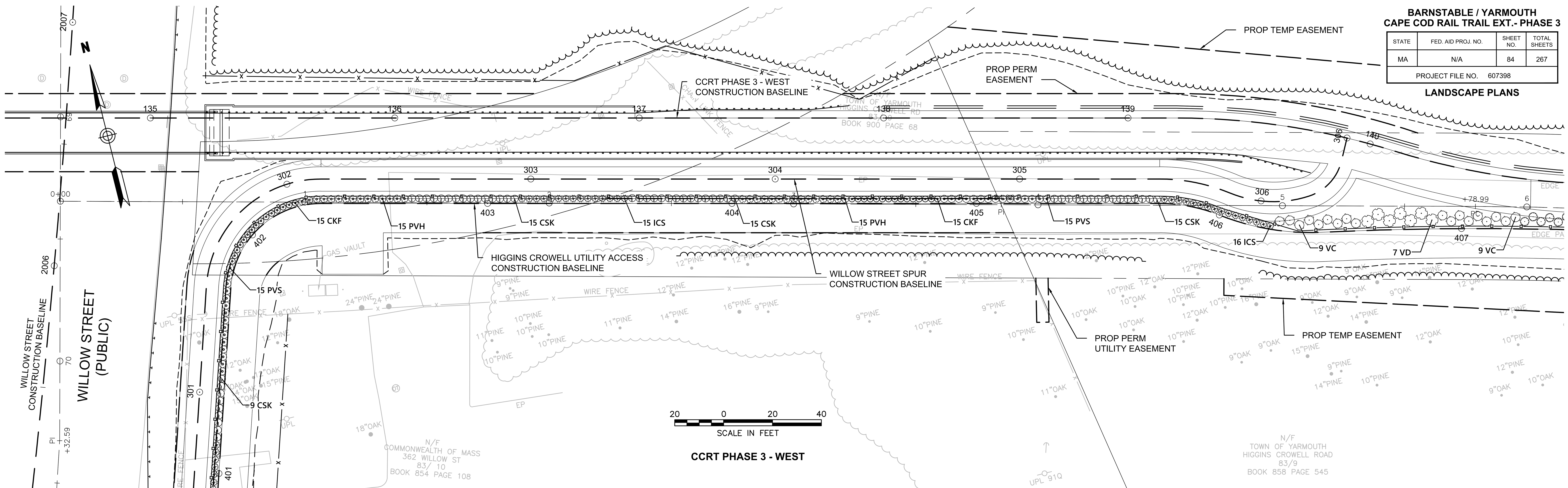
NOTE:

SEE CONSTRUCTION PLANS FOR DISPOSITION OF EXISTING TREES

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	84	267
PROJECT FILE NO. 607398			

LANDSCAPE PLANS



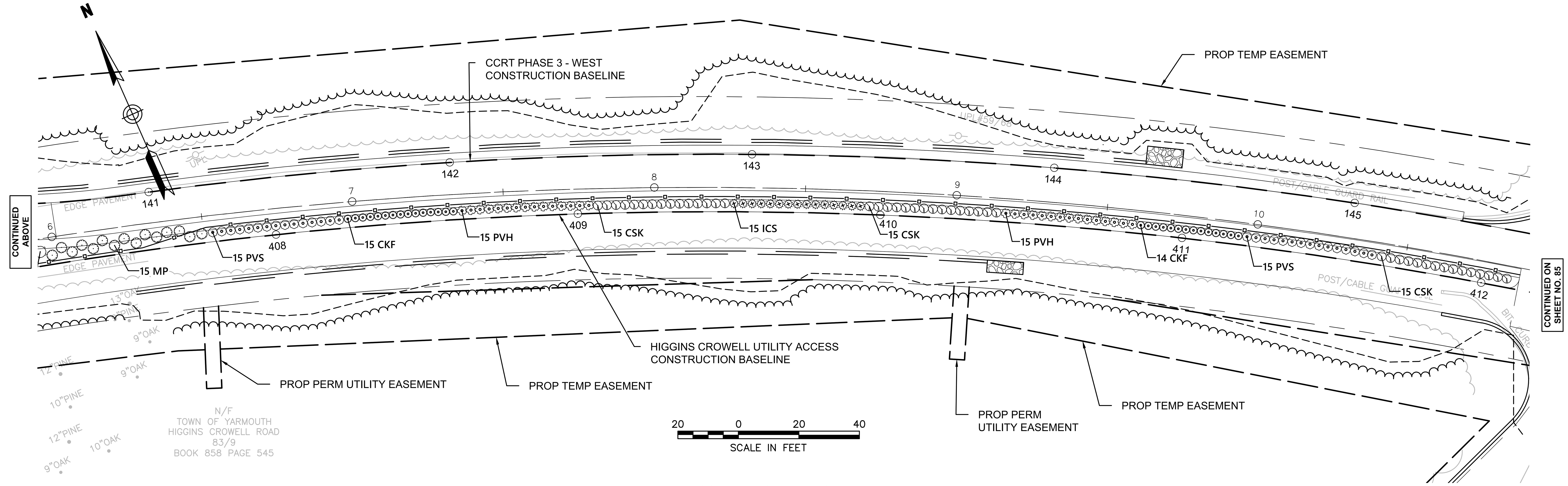
CCRT PHASE 3 - WEST

PLANT SCHEDULE SHEET 2

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE
CSK	84	Cornus sericea `Redosier'	Dogwood - Redosier	18 - 24" HT.
ICS	54	Ilex crenata `Convexa'	Holly - Japanese Convexa	18 - 24" SPD
MP	15	Myrica pensylvanica	Northern Bayberry	18 - 24" HT.
VC	18	Vaccinium corymbosum	Highbush Blueberry	2 - 3` HT.
VD	7	Viburnum dentatum	Viburnum - Arrowood	24"-30" HT.
GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
CKF	59	Calamagrostis x acutiflora `Karl Foerster`	Feather Reed Grass `Karl Foerster`	2 GAL.
PVH	60	Panicum virgatum `Heavy Metal`	Switch Grass - `Heavy Metal`	2 GAL.
PVS	60	Panicum virgatum `Shenandoah`	Switch Grass - `Shenandoah`	2 GAL.

NOTE:

SEE CONSTRUCTION PLANS FOR DISPOSITION OF EXISTING TREES



CCRT PHASE 3 - WEST

607398_HD(LA).DWG Plotted on 22-Nov-2021 5:12 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

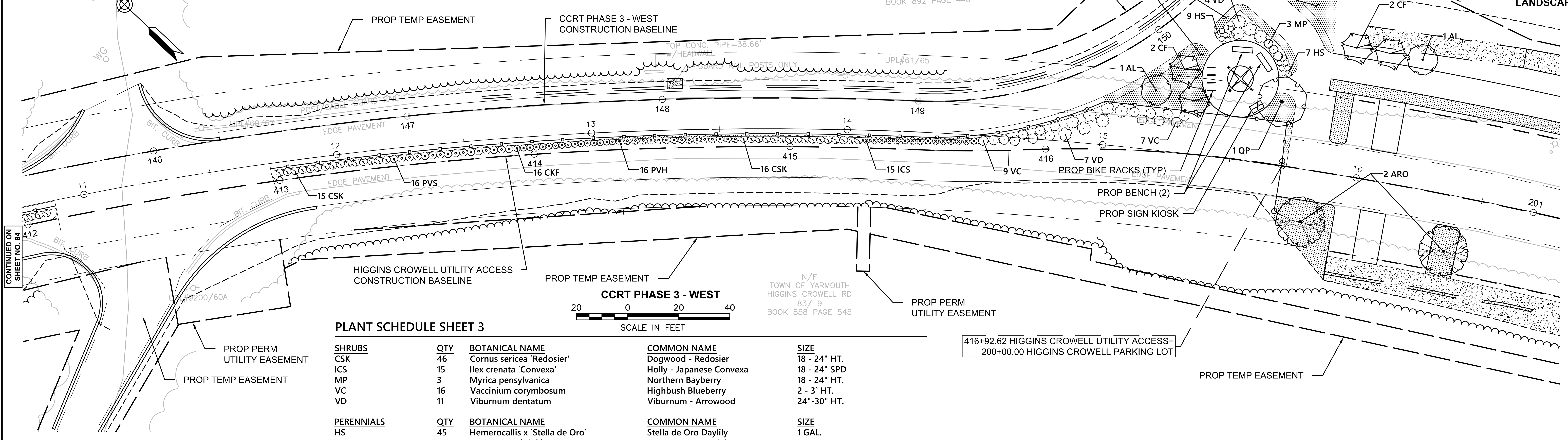
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	85	267
PROJECT FILE NO. 607398			

LANDSCAPE PLANS

PLANT SCHEDULE SHEET 3

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
ARO	8	Acer rubrum `October Glory`	Maple - `October Glory`	2 1/2 - 3" CAL.
QP	6	Quercus palustris	Oak - Pin	2 - 2 1/2" CAL.

ORNAMENTAL TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
AL	9	Amelanchier laevis	Shad Tree - Downy	2 - 2 1/2" CAL.
CF	10	Cornus florida `Cherokee Princess`	Dogwood - `Cherokee Princess`	2 - 2 1/2" CAL.



CCRT PHASE 3 - WEST

20 0 20 40
SCALE IN FEET

PLANT SCHEDULE SHEET 3

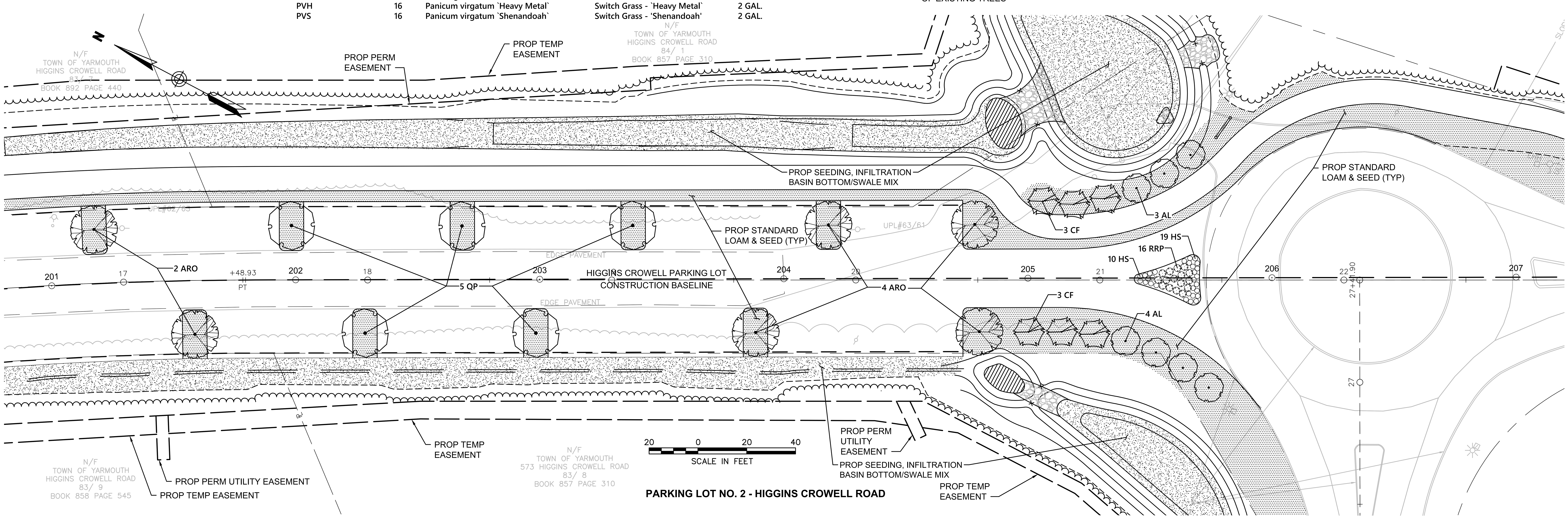
SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE
CSK	46	Cornus sericea `Redosier`	Dogwood - Redosier	18 - 24" HT.
ICS	15	Ilex crenata `Convexa'	Holly - Japanese Convexa	18 - 24" SPD
MP	3	Myrica pensylvanica	Northern Bayberry	18 - 24" HT.
VC	16	Vaccinium corymbosum	Highbush Blueberry	2 - 3` HT.
VD	11	Viburnum dentatum	Viburnum - Arrowood	24"-30" HT.

PERENNIALS	QTY	BOTANICAL NAME	COMMON NAME	SIZE
HS	45	Hemerocallis x `Stella de Oro`	Stella de Oro Daylily	1 GAL.
RRP	16	Rosa rugosa `Pink`	Rose - Rugosa - Pink	2 GAL.

GRASSES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
CKF	16	Calamagrostis x acutiflora `Karl Foerster`	Feather Reed Grass `Karl Foerster`	2 GAL.
PVH	16	Panicum virgatum `Heavy Metal`	Switch Grass - `Heavy Metal`	2 GAL.
PVS	16	Panicum virgatum `Shenandoah`	Switch Grass - 'Shenandoah'	2 GAL.

NOTE:

SEE CONSTRUCTION PLANS FOR DISPOSITION OF EXISTING TREES



20 0 20 40
SCALE IN FEET

PARKING LOT NO. 2 - HIGGINS CROWELL ROAD

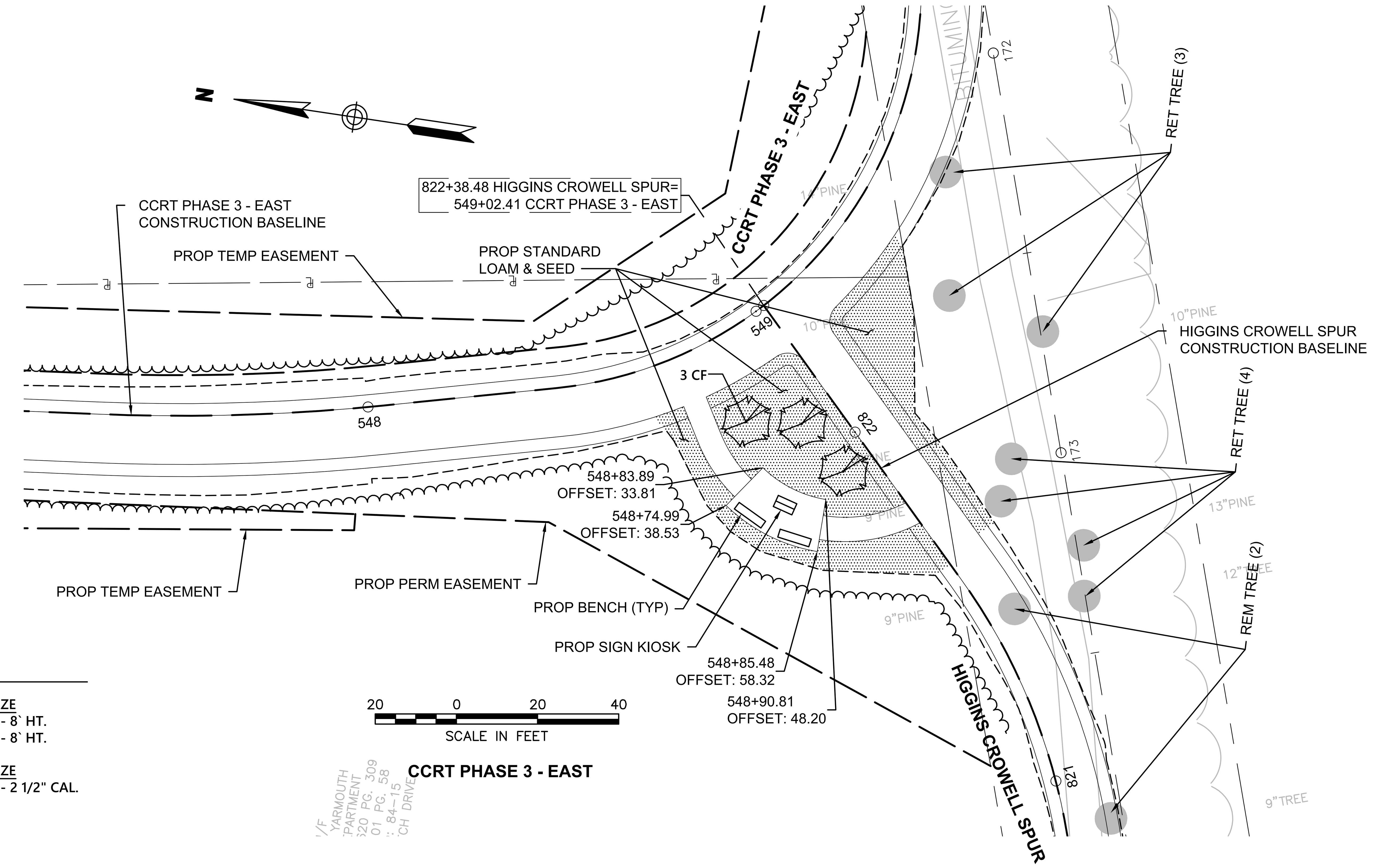
607398_HD(LA).DWG Plotted on 22-Nov-2021 5:15 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT. - PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	86	267
PROJECT FILE NO. 607398			

LANDSCAPE PLANS

607398_HD(LA).DWG Plotted on 22-Nov-2021 5:18 PM



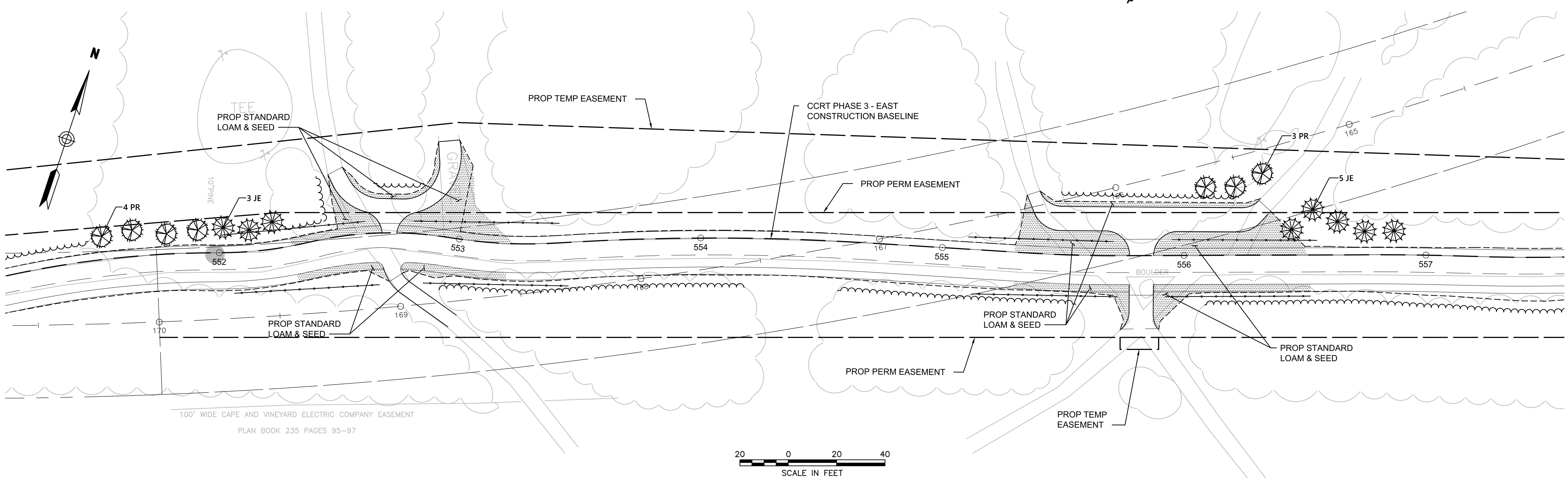
CCRT PHASE 3 - EAST

NOTE:

SEE CONSTRUCTION PLANS FOR DISPOSITION OF EXISTING TREES

PLANT SCHEDULE SHEET 4

EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
JE	8	Juniperus virginiana	Cedar - Red	7 - 8` HT.
PR	7	Pinus rigida	Pine - Pitch	7 - 8` HT.
ORNAMENTAL TREES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
CF	3	Cornus florida `Cherokee Princess`	Dogwood - `Cherokee Princess`	2 - 2 1/2" CAL.



CCRT PHASE 3 - EAST

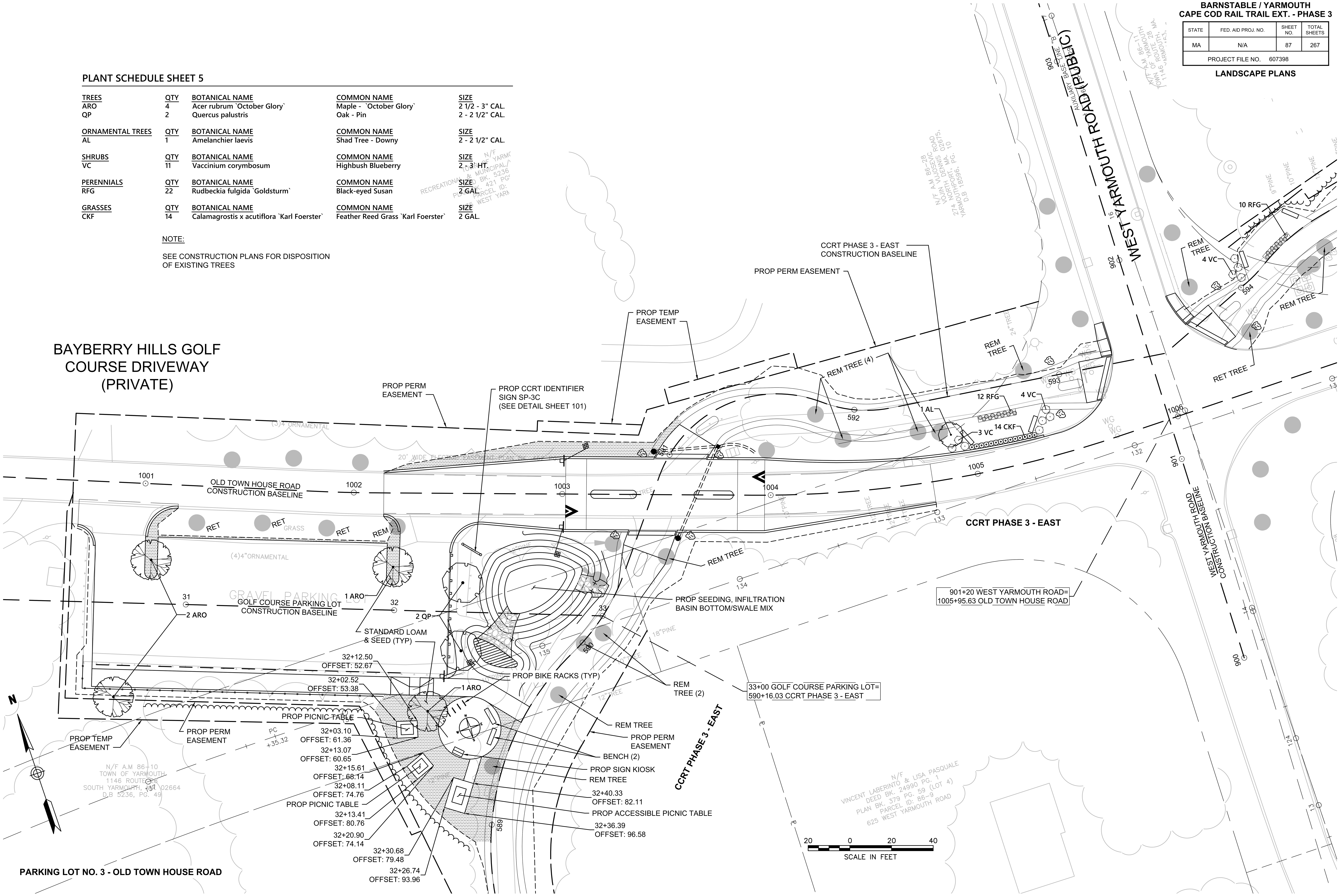
Plotted on 22-Nov-2021 5:18 PM
607398_HD(LA).DWG

PLANT SCHEDULE SHEET 5

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
ARO	4	Acer rubrum `October Glory`	Maple - `October Glory`	2 1/2 - 3" CAL.
QP	2	Quercus palustris	Oak - Pin	2 - 2 1/2" CAL.
ORNAMENTAL TREES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
AL	1	Amelanchier laevis	Shad Tree - Downy	2 - 2 1/2" CAL.
SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
VC	11	Vaccinium corymbosum	Highbush Blueberry	2 - 3' HT.
PERENNIALS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
RFG	22	Rudbeckia fulgida `Goldsturm`	Black-eyed Susan	2 GAL.
GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
CKF	14	Calamagrostis x acutiflora `Karl Foerster`	Feather Reed Grass `Karl Foerster`	2 GAL.

NOTE:

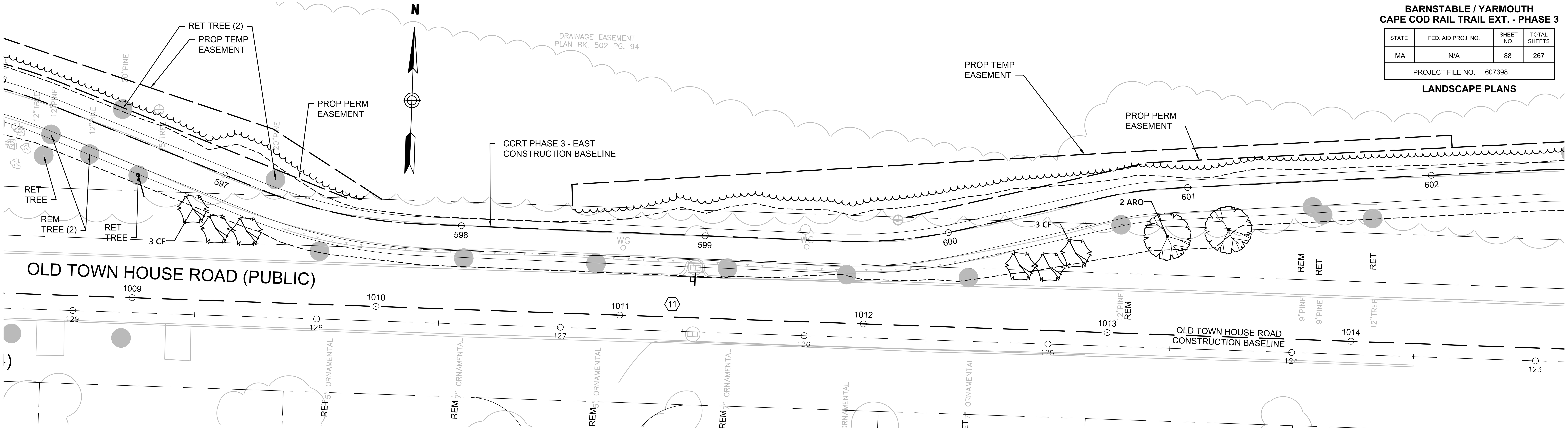
SEE CONSTRUCTION PLANS FOR DISPOSITION OF EXISTING TREES



BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT. - PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	88	267
PROJECT FILE NO. 607398			

LANDSCAPE PLANS



20 0 20 40
SCALE IN FEET

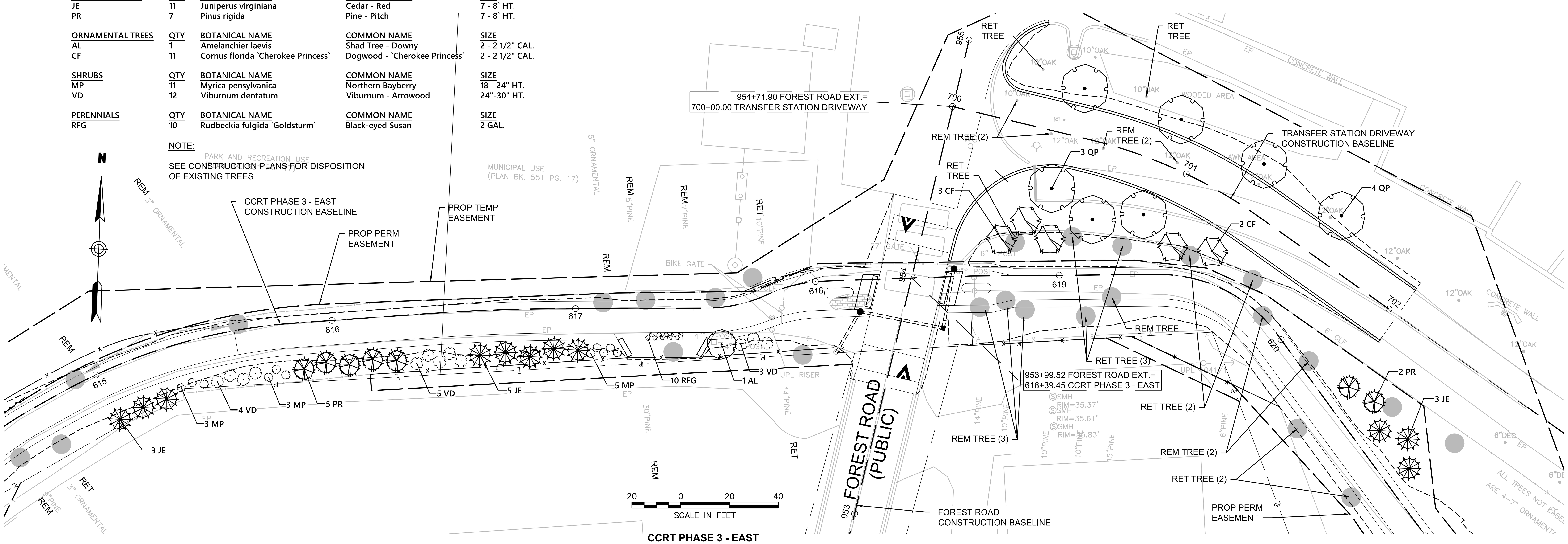
CCRT PHASE 3 - EAST

PLANT SCHEDULE SHEET 6

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
ARO	2	Acer rubrum `October Glory`	Maple - `October Glory`	2 1/2 - 3" CAL.
QP	7	Quercus palustris	Oak - Pin	2 - 2 1/2" CAL.
EVERGREEN TREES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
JE	11	Juniperus virginiana	Cedar - Red	7 - 8' HT.
PR	7	Pinus rigida	Pine - Pitch	7 - 8' HT.
ORNAMENTAL TREES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
AL	1	Amelanchier laevis	Shad Tree - Downy	2 - 2 1/2" CAL.
CF	11	Cornus florida `Cherokee Princess`	Dogwood - `Cherokee Princess`	2 - 2 1/2" CAL.
SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
MP	11	Myrica pensylvanica	Northern Bayberry	18 - 24" HT.
VD	12	Viburnum dentatum	Viburnum - Arrowood	24"-30" HT.
PERENNIALS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
RFG	10	Rudbeckia fulgida `Goldsturm`	Black-eyed Susan	2 GAL.

NOTE:

SEE CONSTRUCTION PLANS FOR DISPOSITION OF EXISTING TREES



20 0 20 40
SCALE IN FEET

CCRT PHASE 3 - EAST

607398_HD(LA).DWG Plotted on 22-Nov-2021 5:21 PM

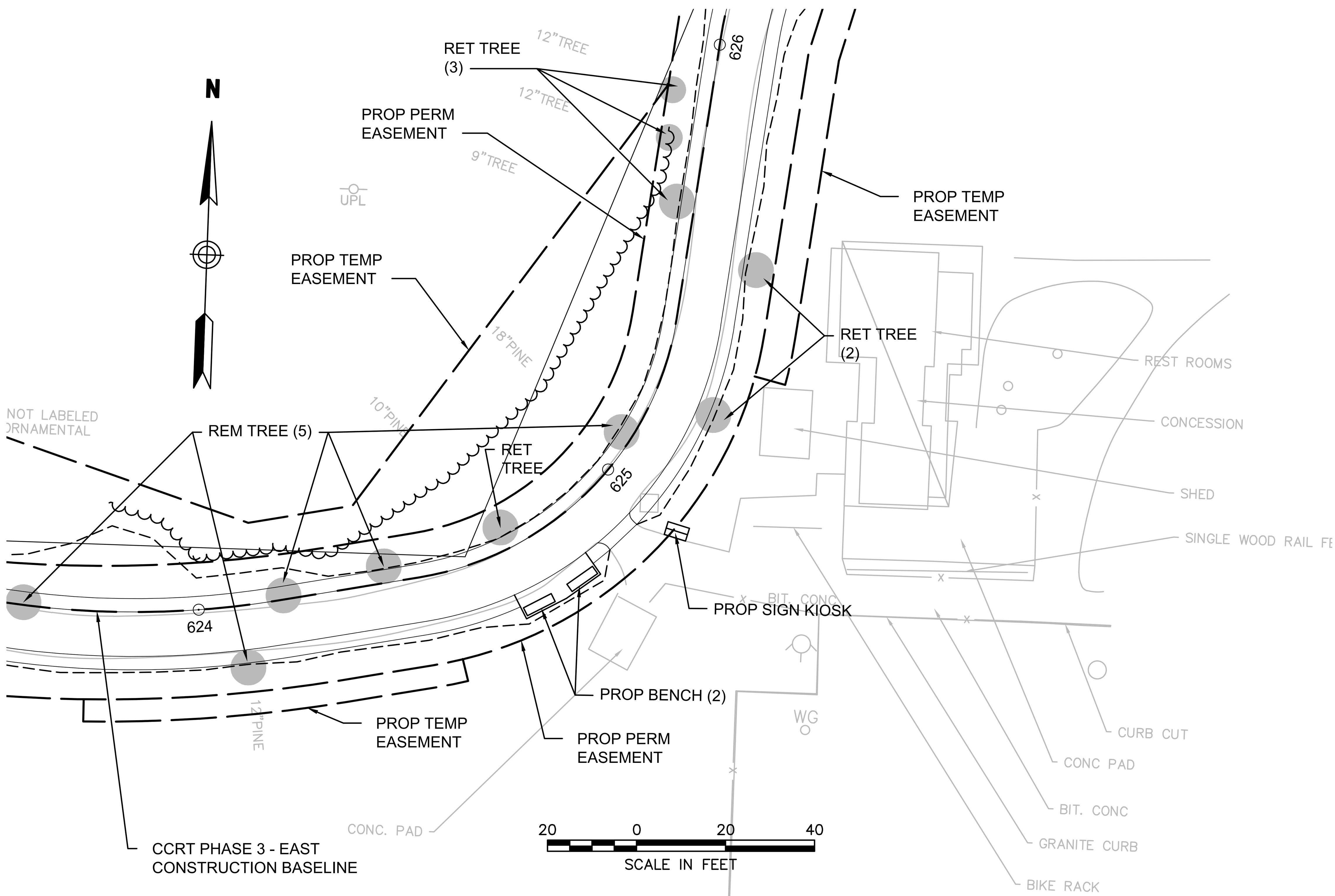
607398_HD(LA).DWG Plotted on 22-Nov-2021 5:23 PM

NOTE:

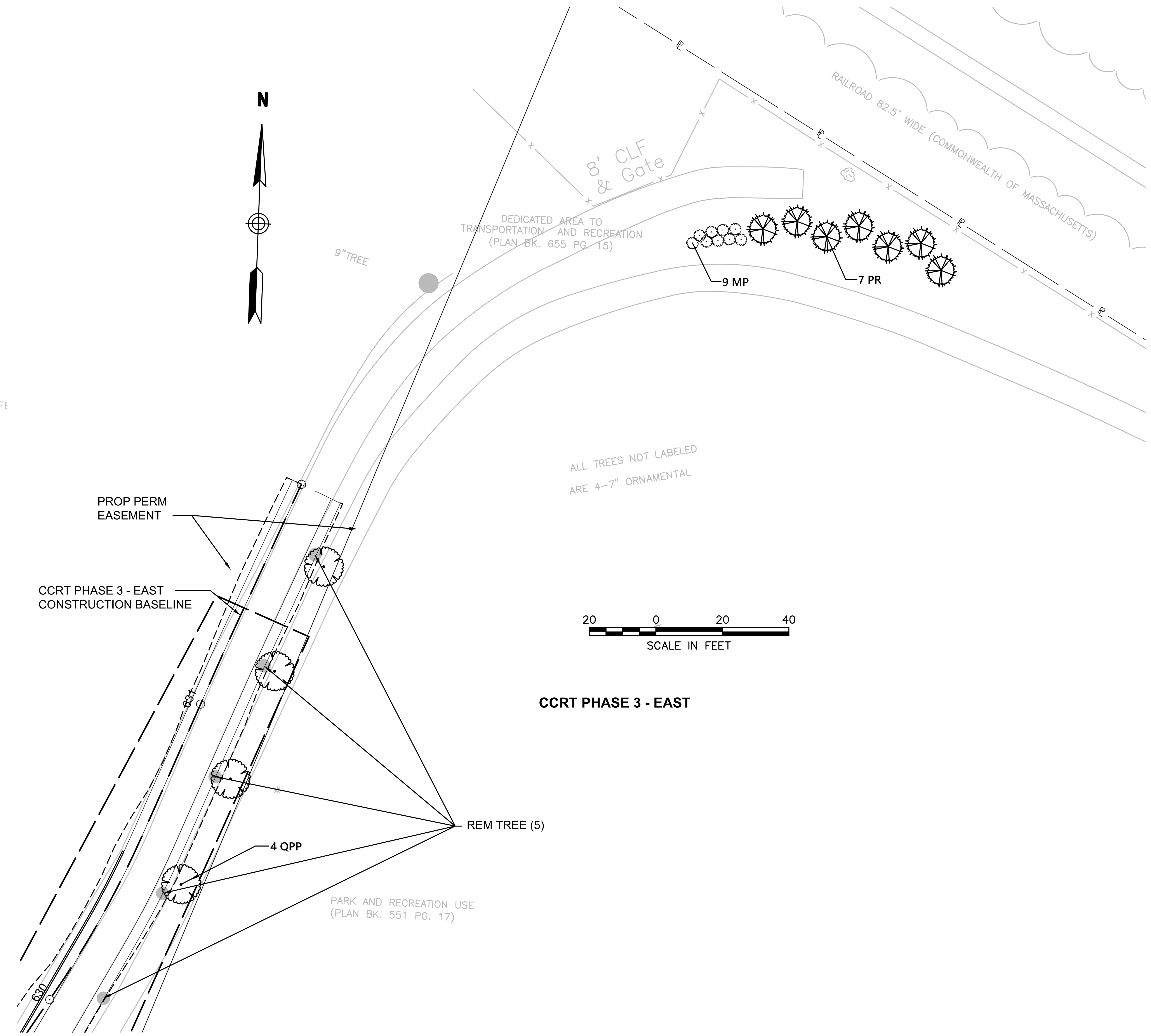
SEE CONSTRUCTION PLANS FOR DISPOSITION OF EXISTING TREES

PLANT SCHEDULE SHEET 7

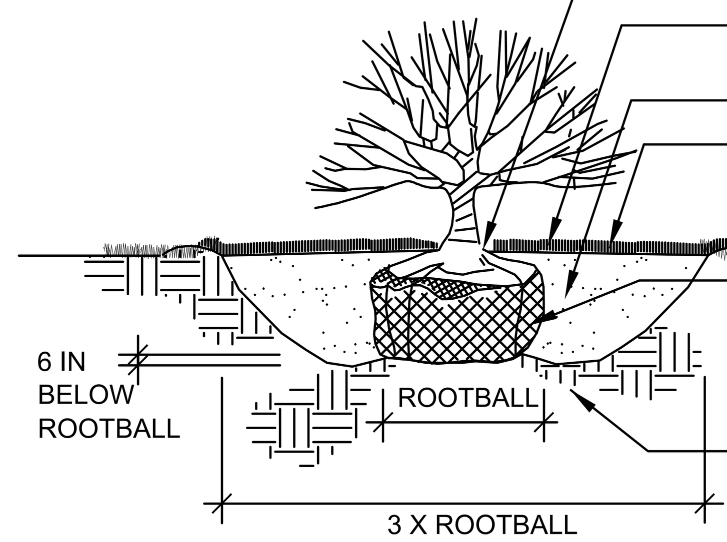
TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
QPP	4	Quercus palustris 'Pringreen' TM	Oak - Pin - Greenpillar	3 - 3 1/2" CAL.
EVERGREEN TREES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
PR	7	Pinus rigida	Pine - Pitch	7 - 8` HT.
SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**
MP	9	Myrica pensylvanica	Northern Bayberry	18 - 24" HT.



CCRT PHASE 3 - EAST

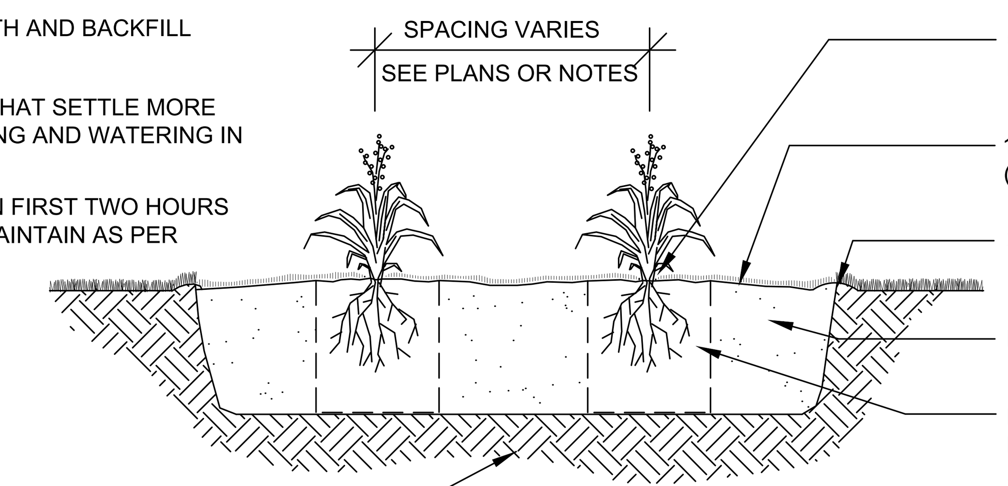


CCRT PHASE 3 - EAST



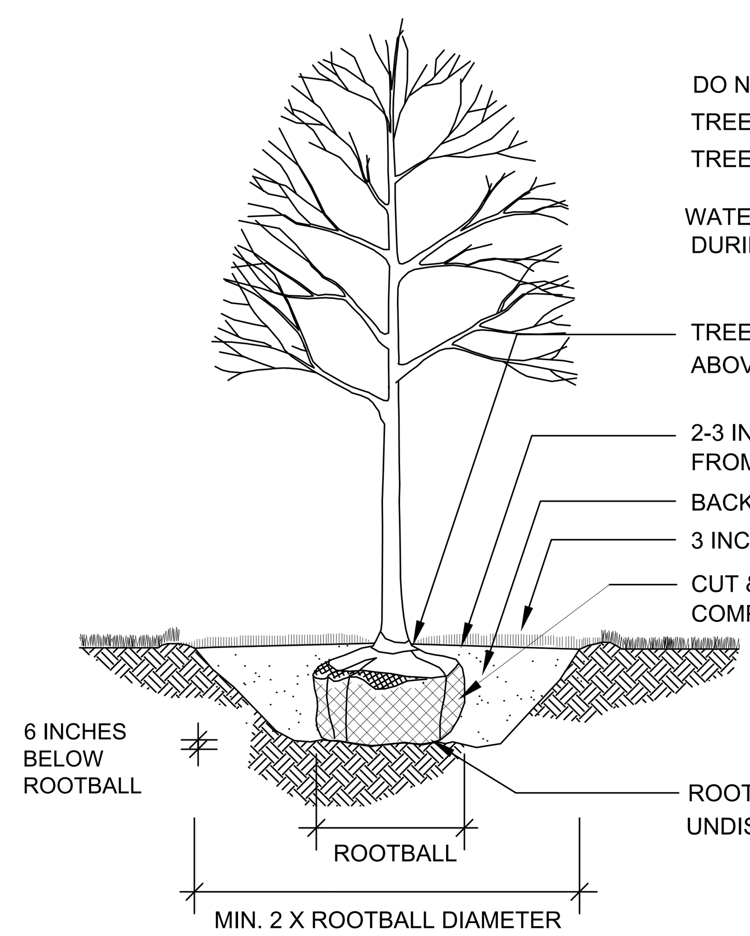
SHRUB PLANTING

NOT TO SCALE FEB 28, 2013



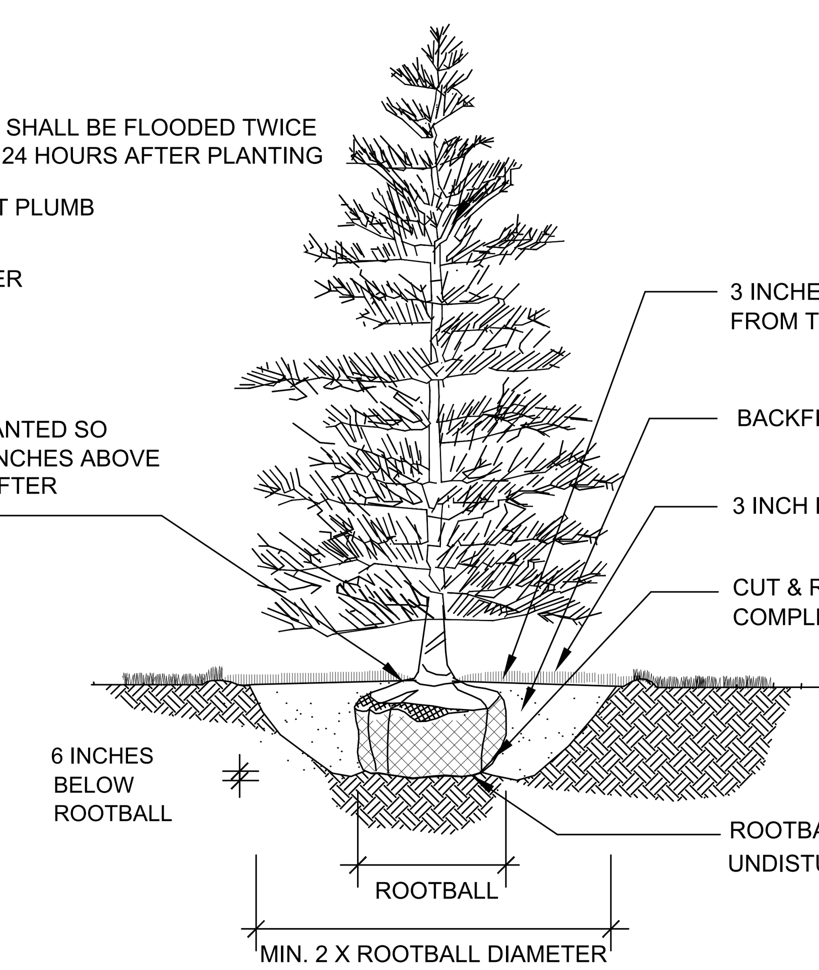
PERENNIAL PLANTING

NOT TO SCALE



DECIDUOUS TREE PLANTING

NOT TO SCALE



EVERGREEN TREE PLANTING

NOT TO SCALE

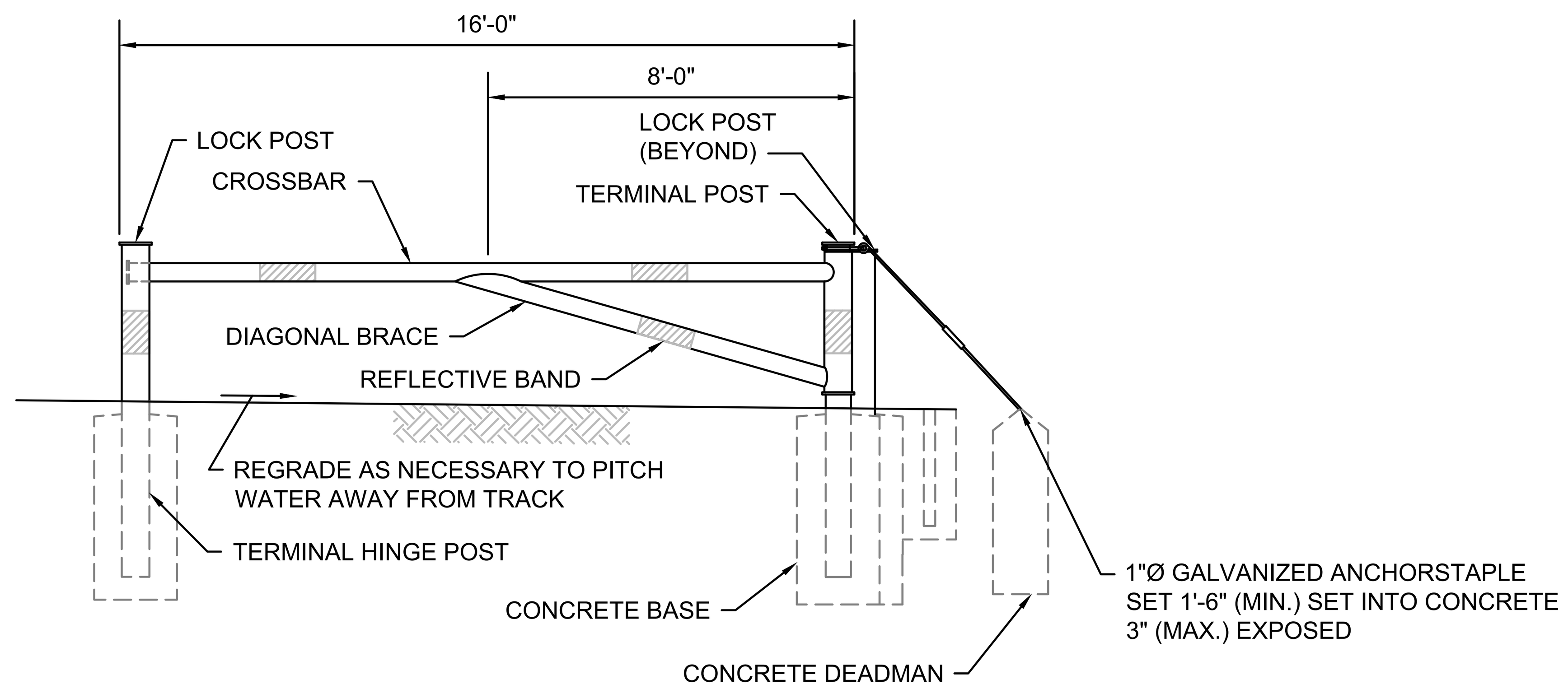
607398_HD(LA).DWG Plotted on 22-Nov-2021 5:23 PM

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	91	267
PROJECT FILE NO. 607398			

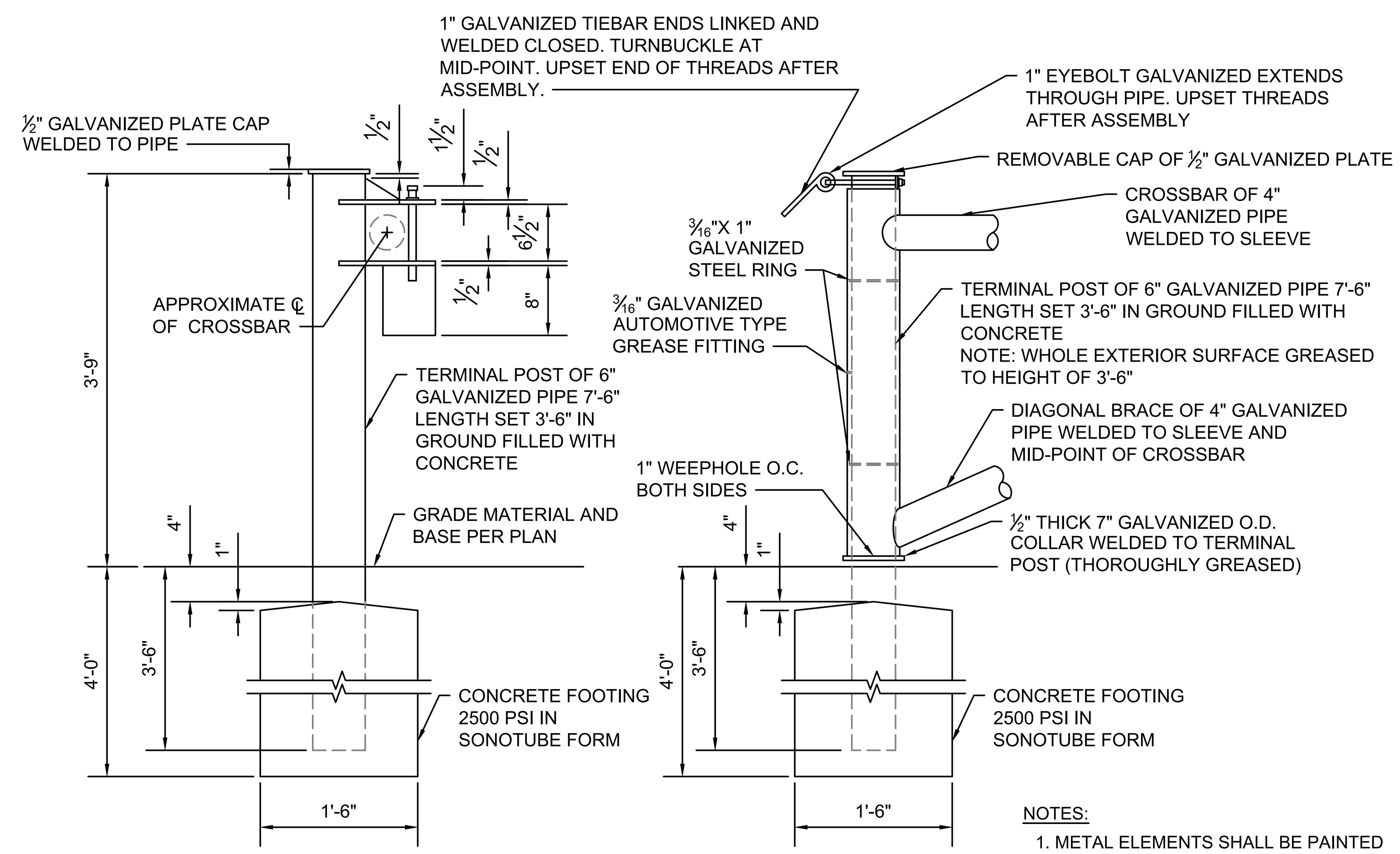
CONSTRUCTION DETAILS

NOTE:

1. ALL FABRIC TO BE ON FIELD SIDE OF CABLES AND POSTS.
2. CONTRACTOR TO SUBMIT SHOP DWGS FOR SAFETY SCREENING TO OWNER'S REPRESENTATIVE FOR APPROVAL.
3. PVC COATING AS SPECIFIED.



ELEVATION



LOCK POST

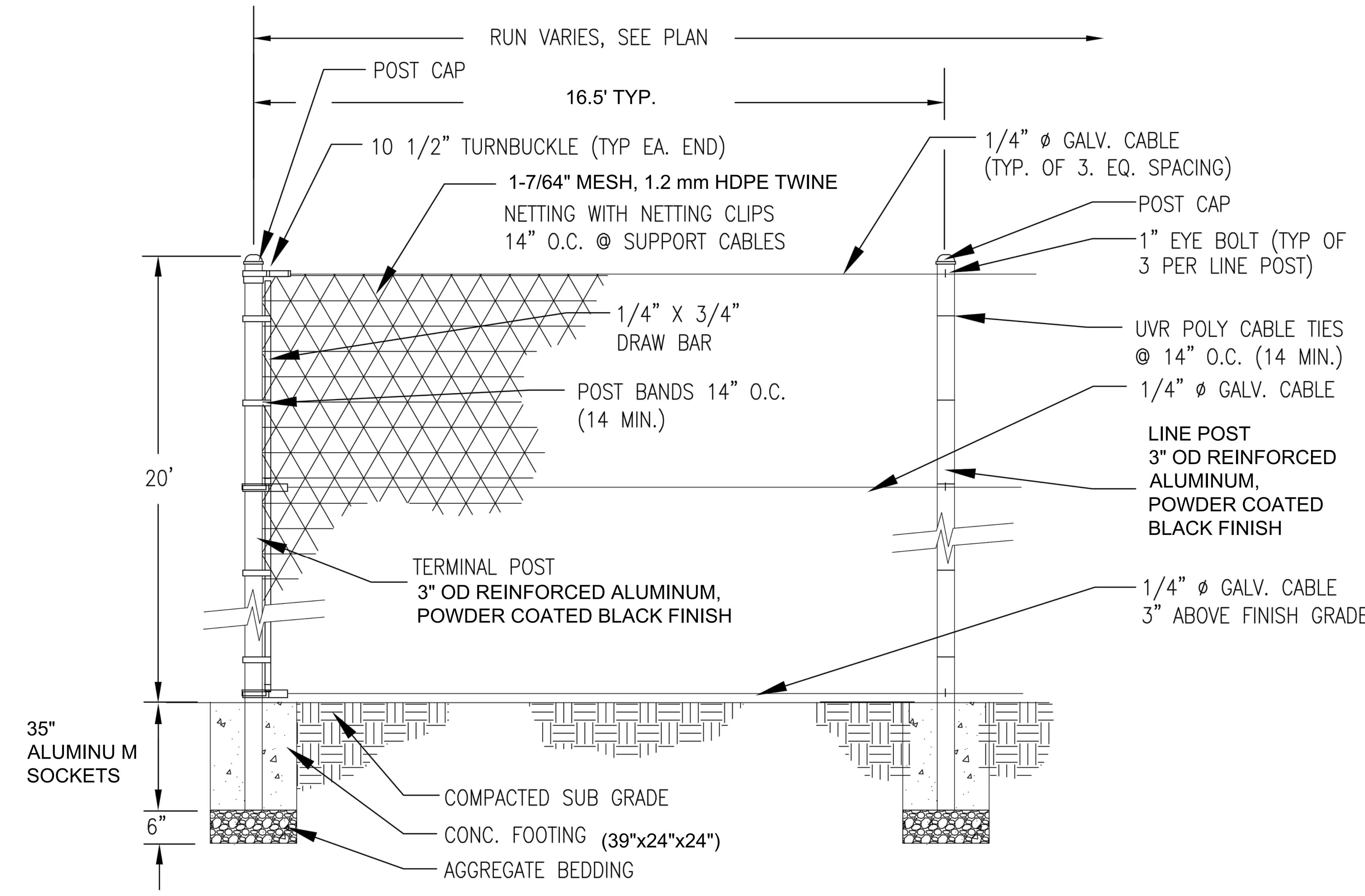
TERMINAL POST

NOTES:

1. METAL ELEMENTS SHALL BE PAINTED BLACK.

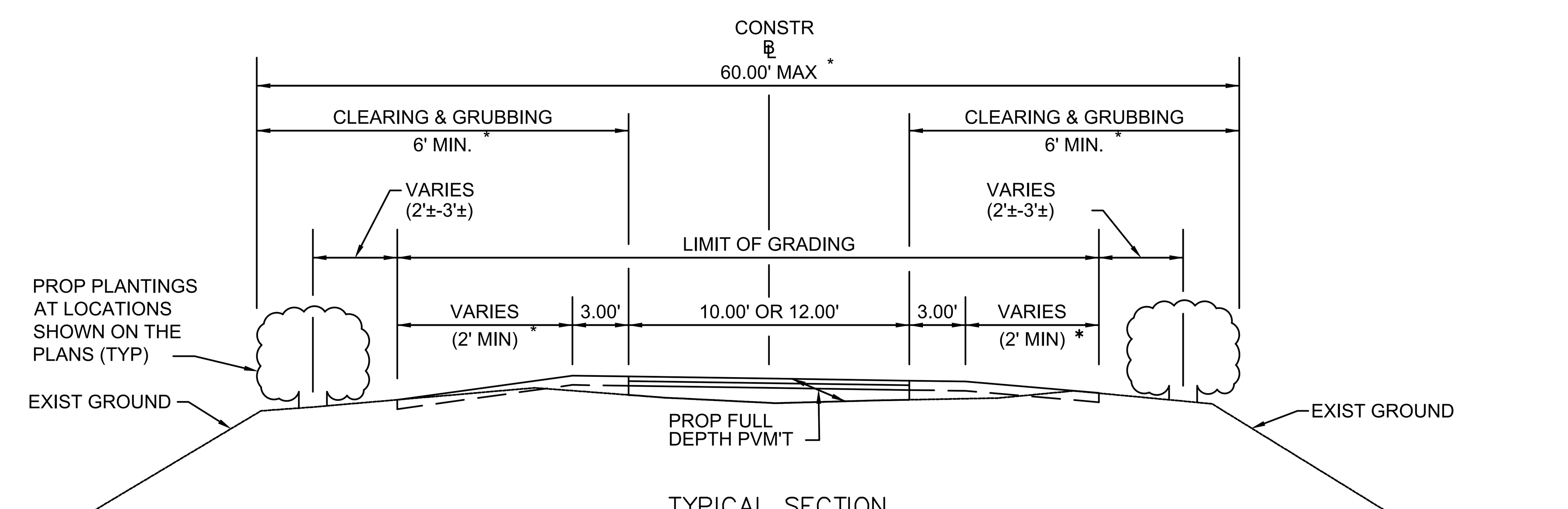
PIPE GATE AND POST DETAILS

SCALE: N.T.S.



SAFETY NET

SCALE: N.T.S.



TYPICAL SECTION
NTS

* THE LIMITS OF GRADING AND CLEARING ADJACENT TO BRIDGES, WALLS, LEDGE, WETLANDS, OR OTHER OBSTRUCTIONS WILL VARY AND CAN BE LESS THAN THE DIMENSIONS SHOWN. SEE PLANS AND CROSS SECTIONS FOR MORE INFORMATION.

NOTES:

1. IF LIMIT OF CLEARING & GRUBBING FALLS OUTSIDE OF RIGHT OF WAY, CLEAR ONLY TO RIGHT OF WAY. IF THE LIMIT OF GRADING FALLS OUTSIDE OF THE RIGHT OF WAY, CLEAR TO THE LIMIT OF GRADING.

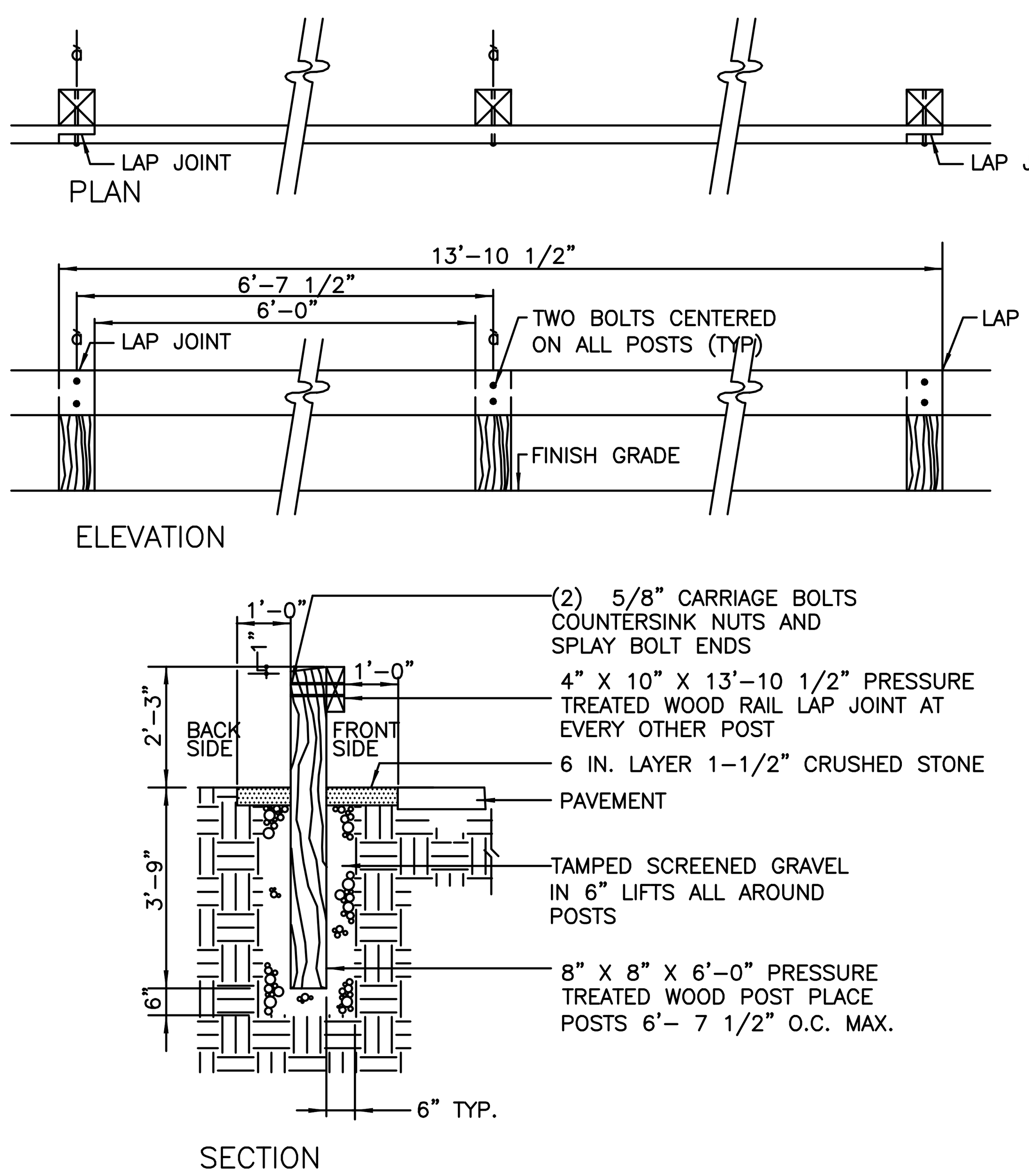
CLEARING & GRUBBING LIMITS

SCALE: N.T.S.

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

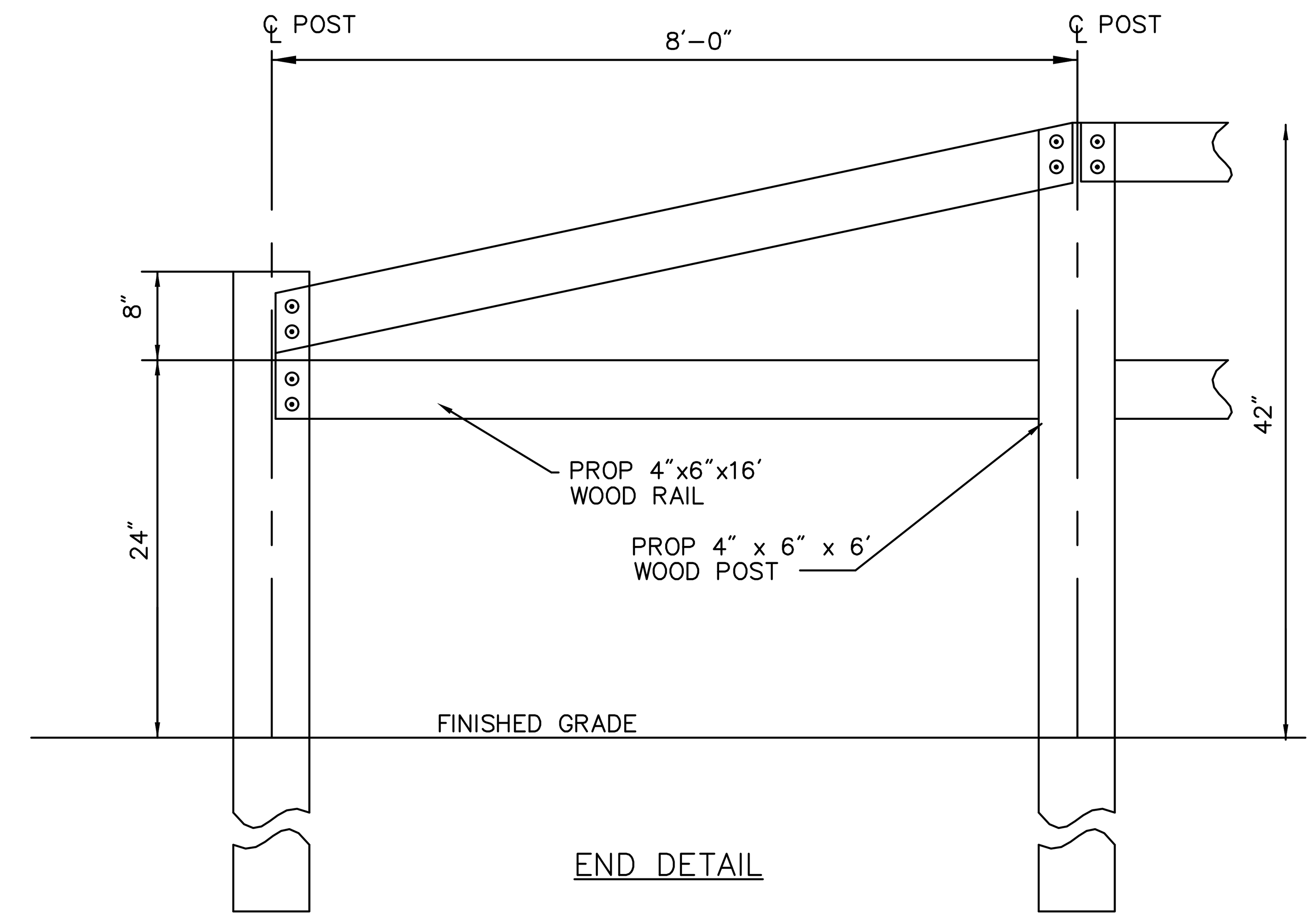
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	92	267
PROJECT FILE NO. 607398			

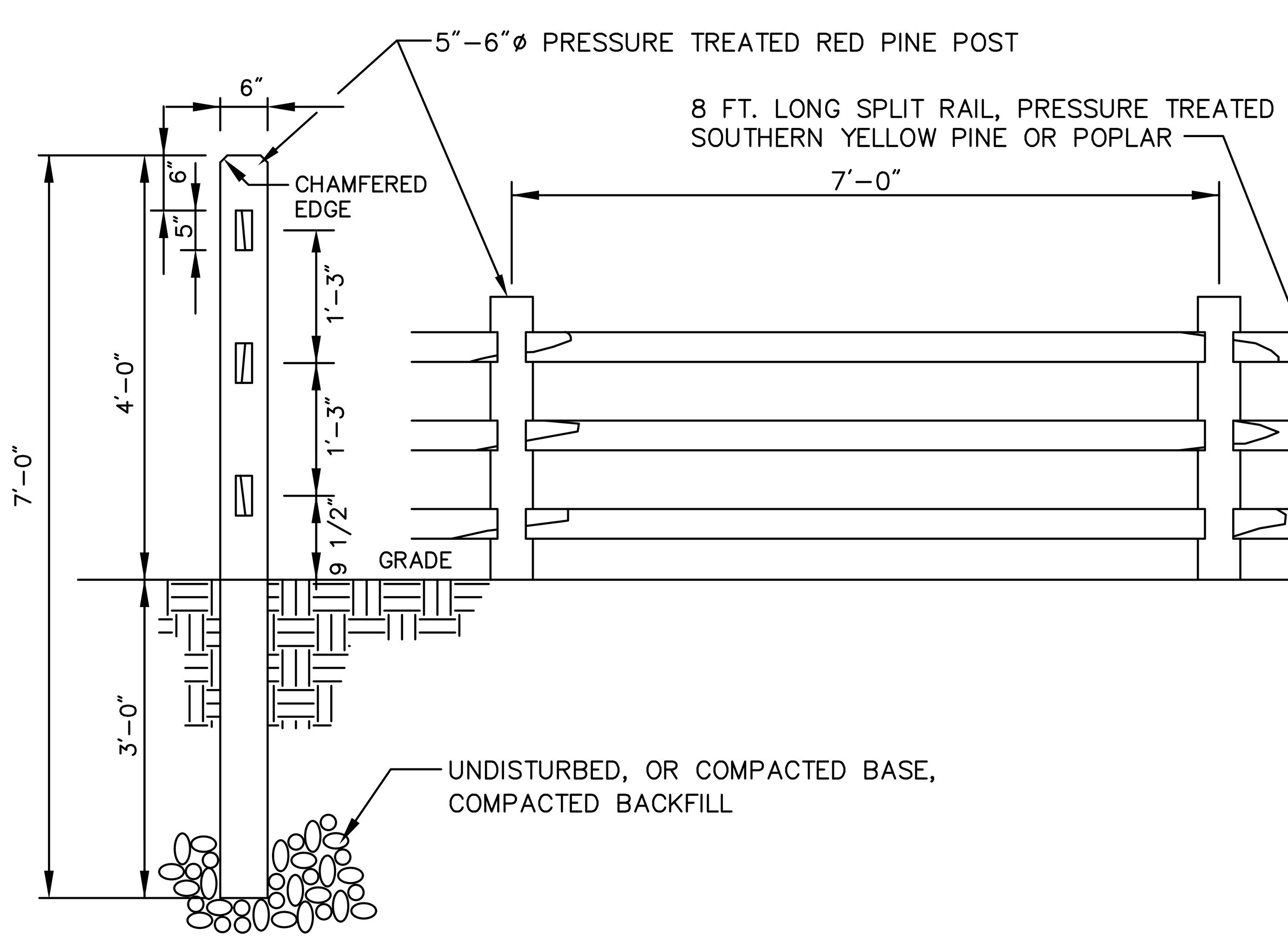
CONSTRUCTION DETAILS



WOOD GUARDRAIL

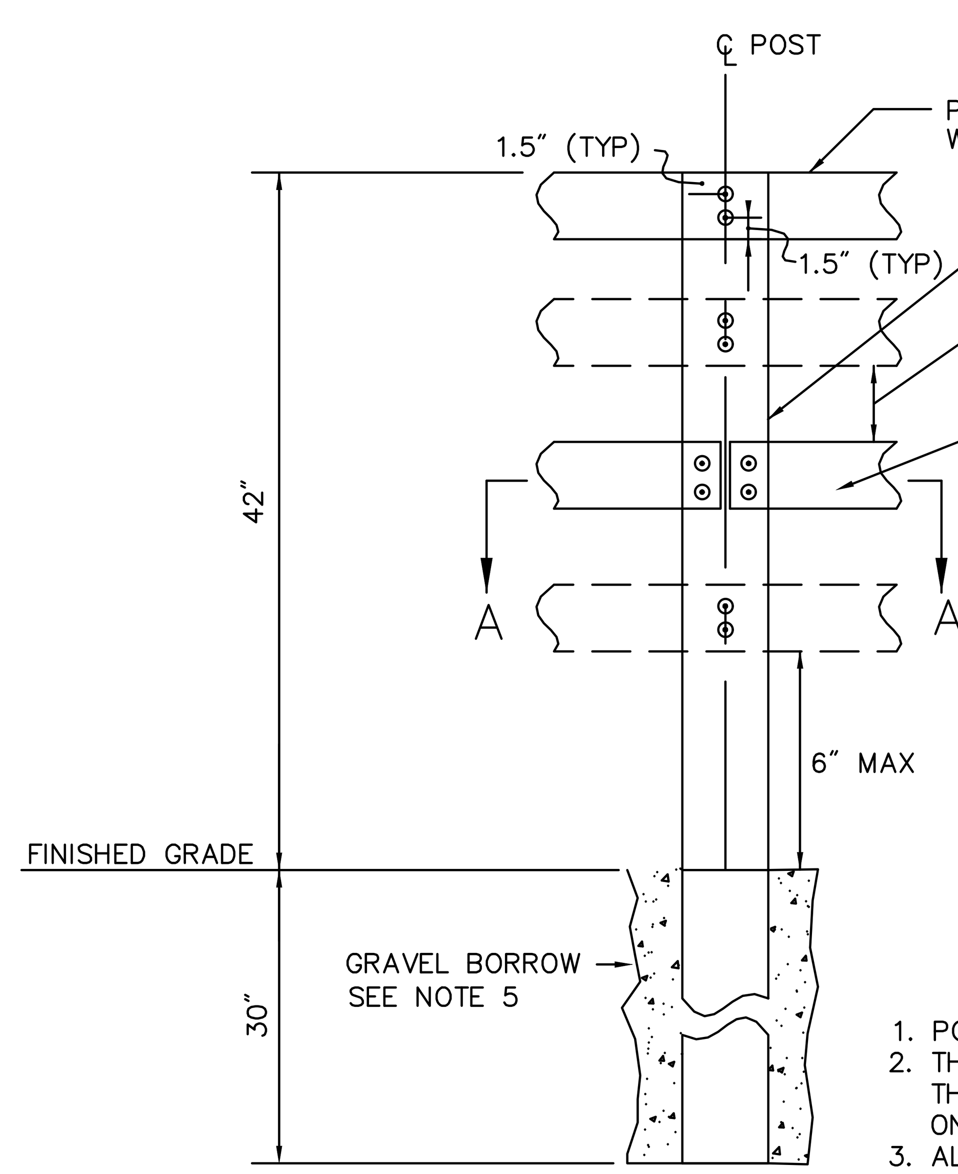
SCALE: N.T.S.

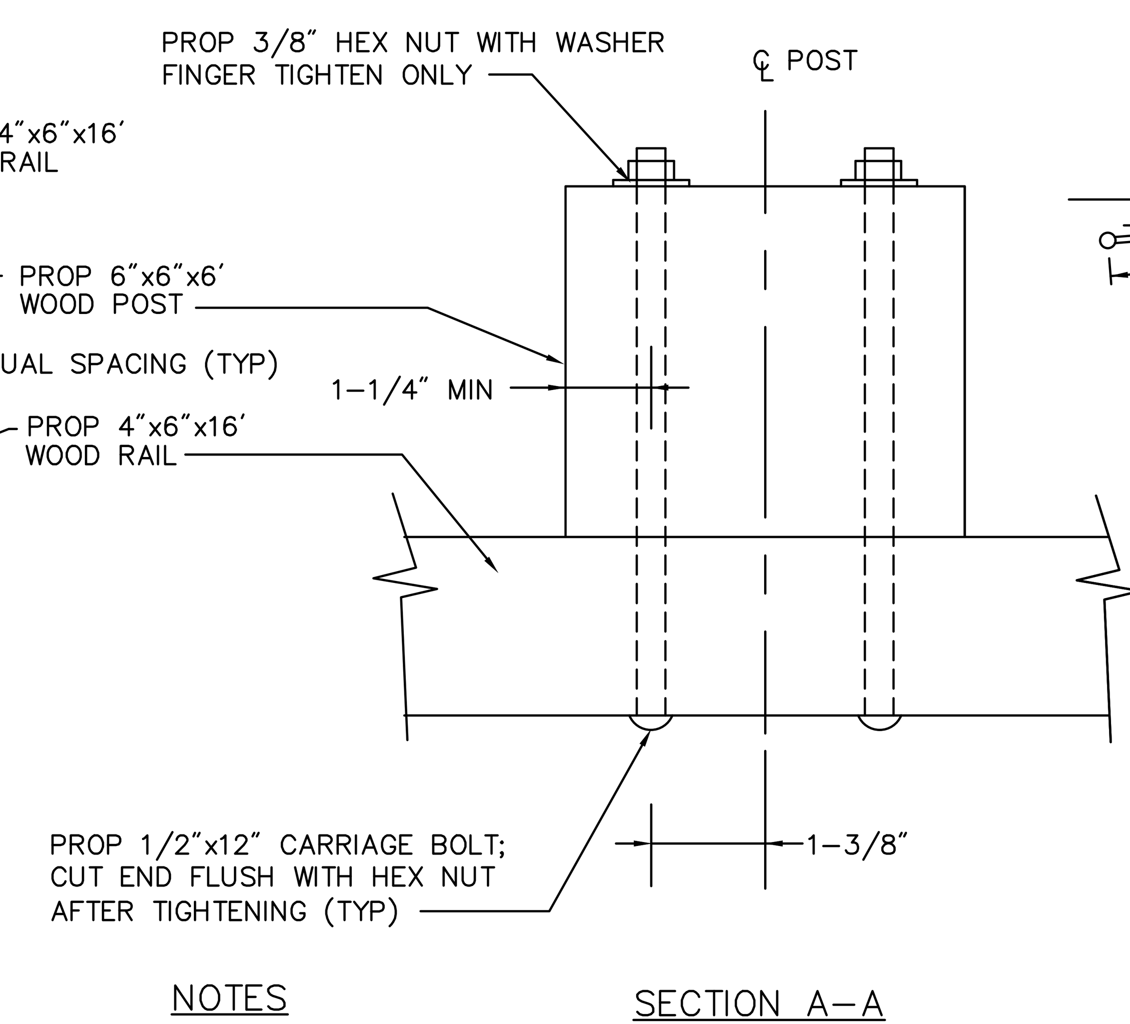


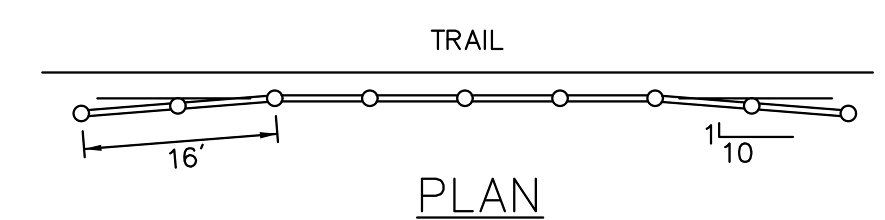


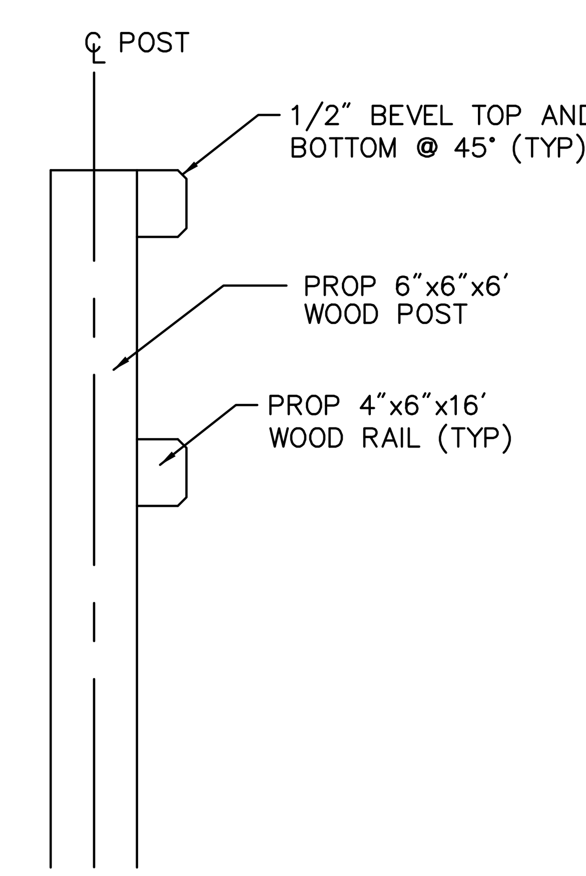
SPLIT RAIL WOOD FENCE

SCALE: N.T.S.









NOTES

1. POSTS SHALL BE PLACED 8'-0" ON CENTER.
2. THE FACE OF RAIL SHALL BE SET OFF THE EDGE OF SHARED USE PATH PAVEMENT, AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER.
3. ALL HARDWARE SHALL BE GALVANIZED.
4. ALTERNATE JOINTS IN RAILING BETWEEN POSTS.
5. CONTRACTOR SHALL SET POST IN 4,000 PSI, 1-1/2IN, 565 CEMENT CONCRETE FOR ALL POSTS UNABLE TO BE SET AT REQUIRED DEPTH.
6. BOLTS SHALL BE SIZED AND INSTALLED SO THAT THEY EXTEND NO MORE THAN ONE ADDITIONAL NUT LENGTH BEYOND THE SECURED SURFACE.
7. PRESSURE TREATED LUMBER SHALL BE USED ON ALL SEGMENTS.
8. TWO RAIL SECTIONS TO BE USED ON THE PATH, FOUR RAIL SECTIONS TO BE USED AT WALLS AND BRIDGE SECTIONS.

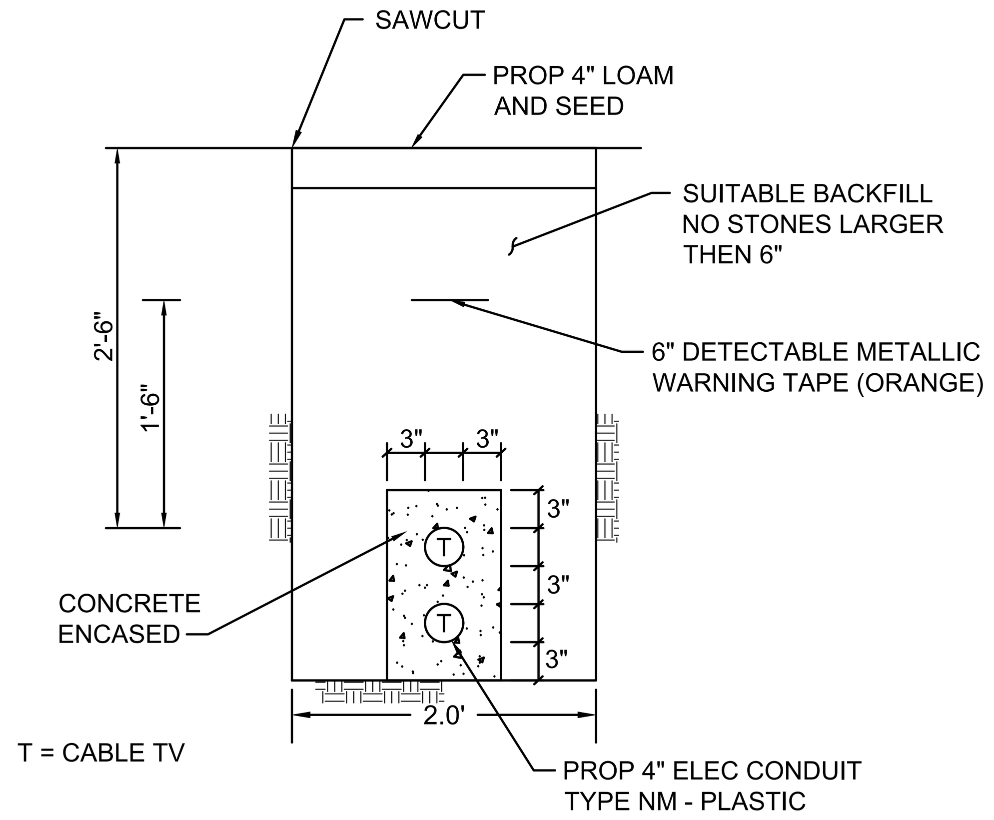
WOOD RAILING

SCALE: N.T.S. DWG: GRD-06 DATE: APRIL 2003

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

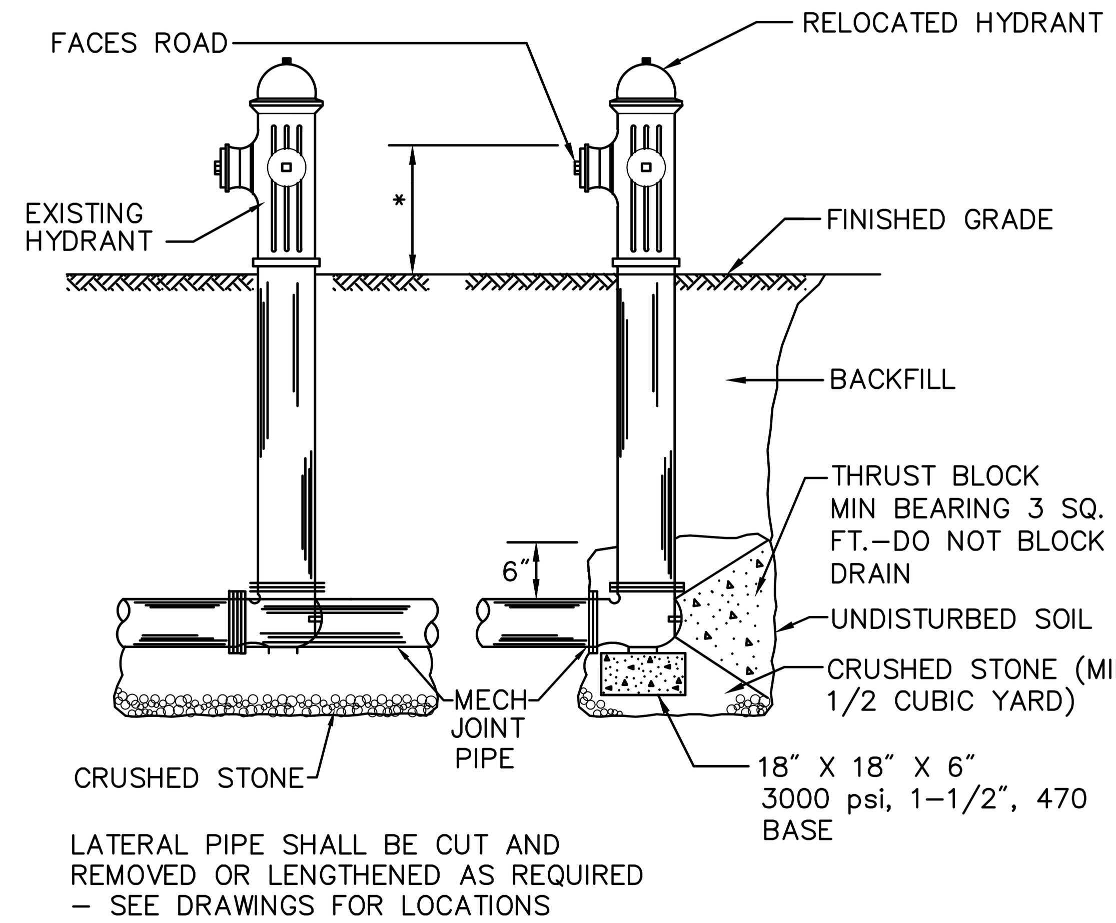
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	93	267
PROJECT FILE NO. 607398			

CONSTRUCTION DETAILS



4" ELECTRICAL CONDUIT - TYPE NM (DOUBLE)

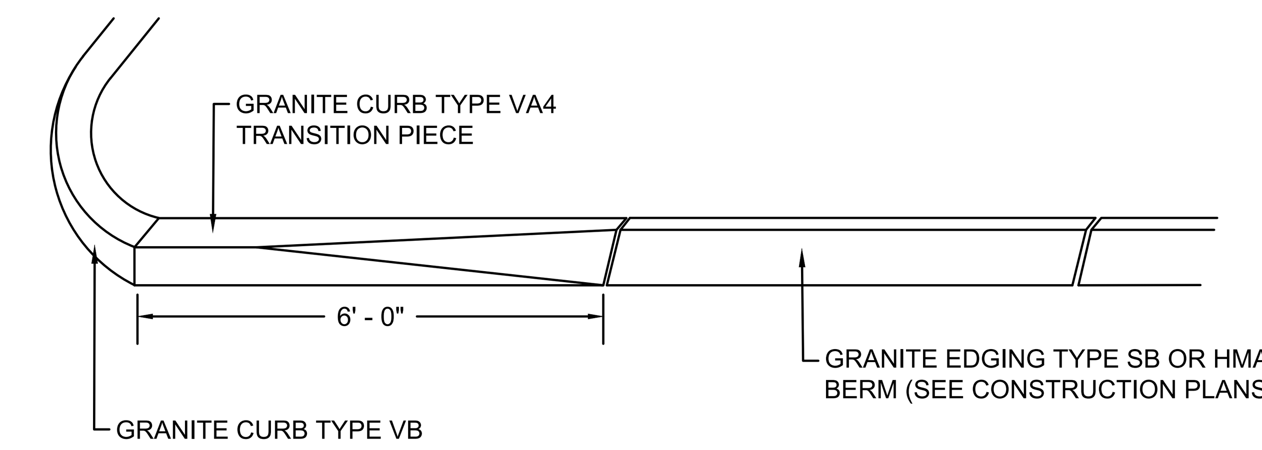
SCALE: N.T.S. S-STD. H-STD.



LATERAL PIPE SHALL BE CUT AND REMOVED OR LENGTHENED AS REQUIRED – SEE DRAWINGS FOR LOCATIONS

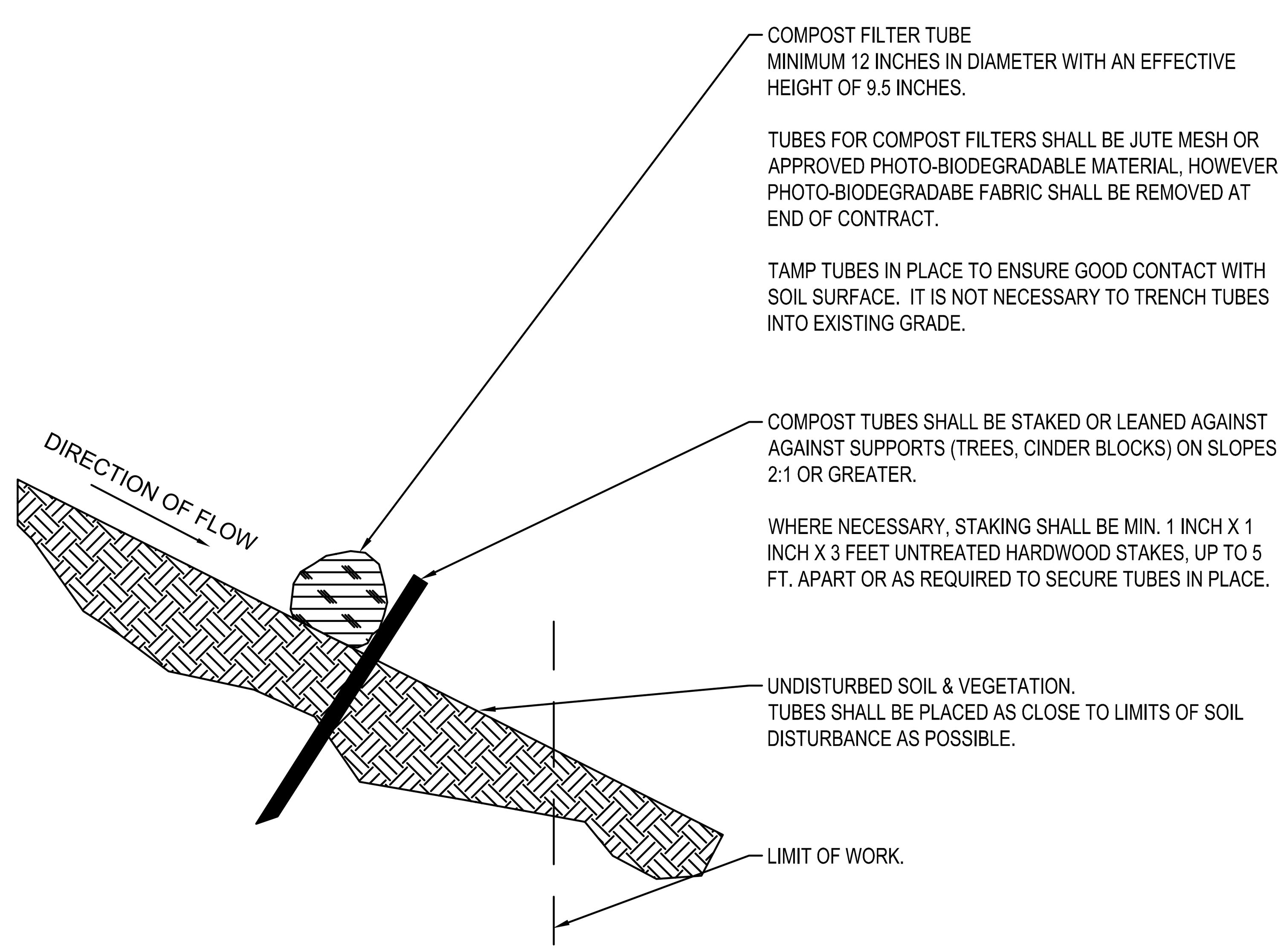
HYDRANT RELOCATION

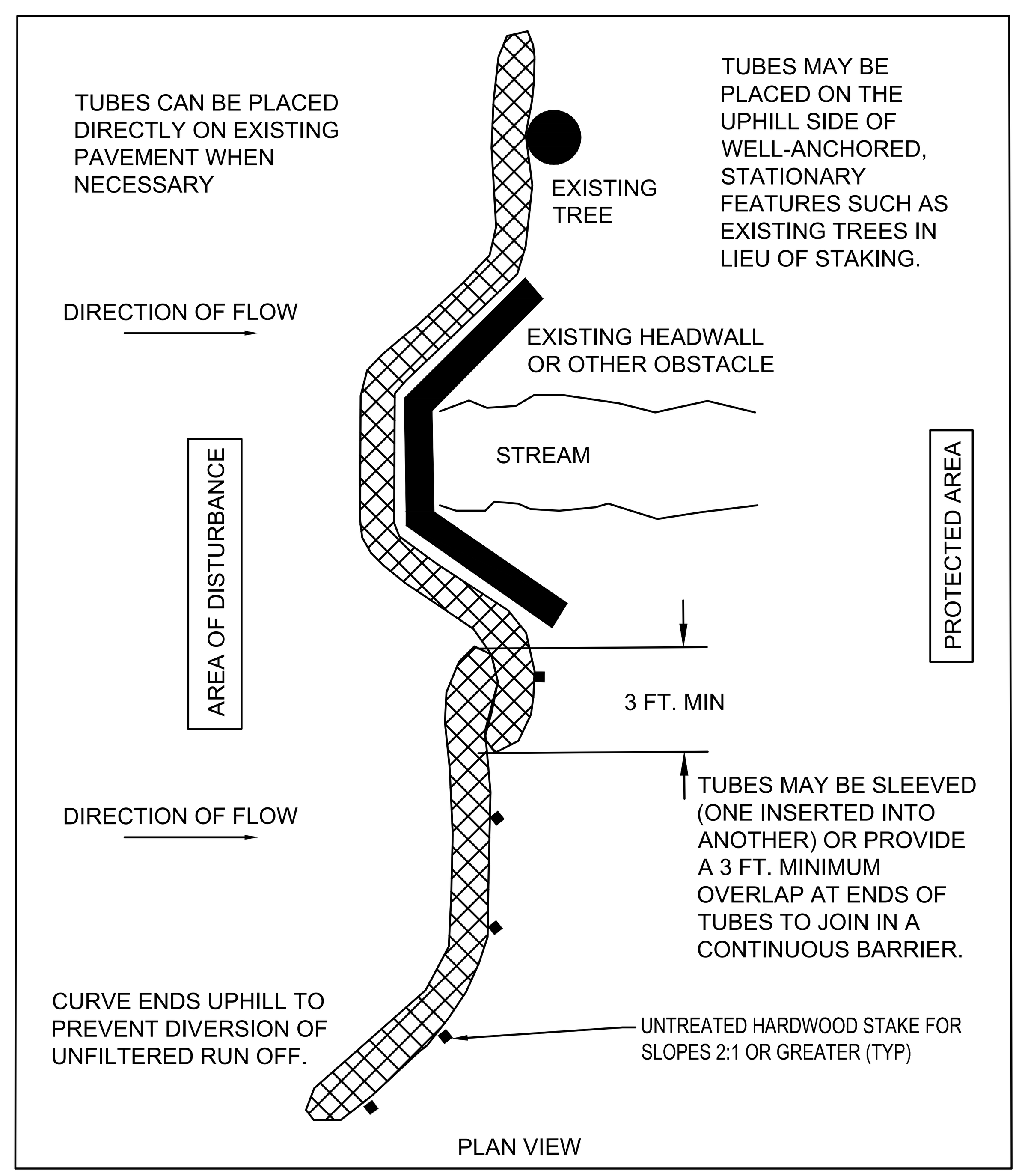
SCALE: N.T.S. DWG: WS-03 DATE: APRIL 2003



GRANITE CURB TYPE VA-4 - SPLAYED END

SCALE: N.T.S.





GENERAL NOTES:

1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES FOR SLOPES UP TO 50 FEET IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. TUBE LOCATION MAY BE SHIFTED TO ADJUST TO LANDSCAPE FEATURES, BUT SHALL PROTECT UNDISTURBED AREA AND VEGETATION TO MAXIMUM EXTENT POSSIBLE.
4. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
5. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
6. ADDITIONAL STAKING SHALL BE USED AT THE DIRECTION OF THE ENGINEER.

COMPOST FILTER TUBE

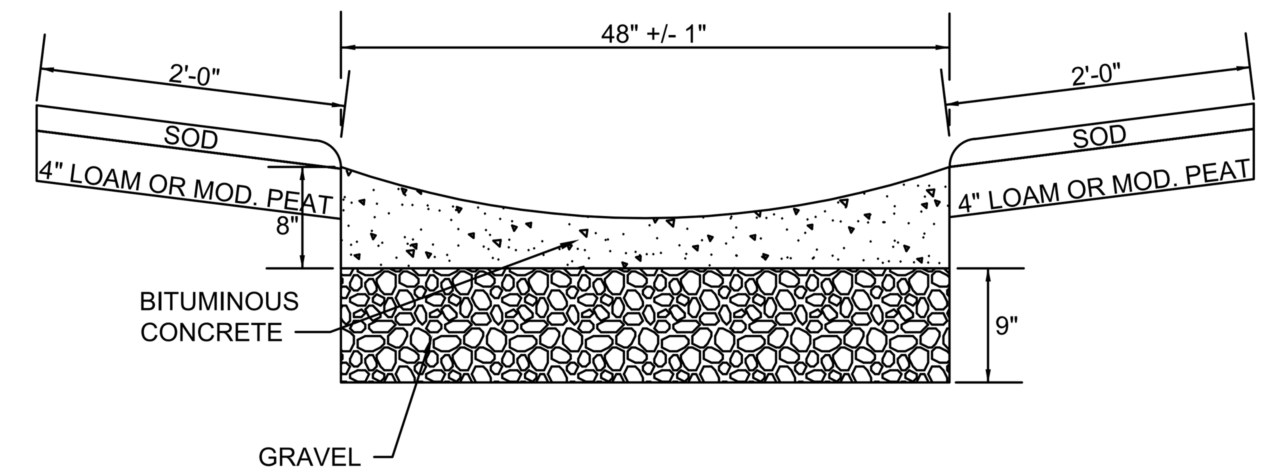
SCALE: N.T.S. SOURCE: MASSDOT DATE: JUNE 13, 2014

Plotted on 22-Nov-2021 5:23 PM
607398_HD(DET).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

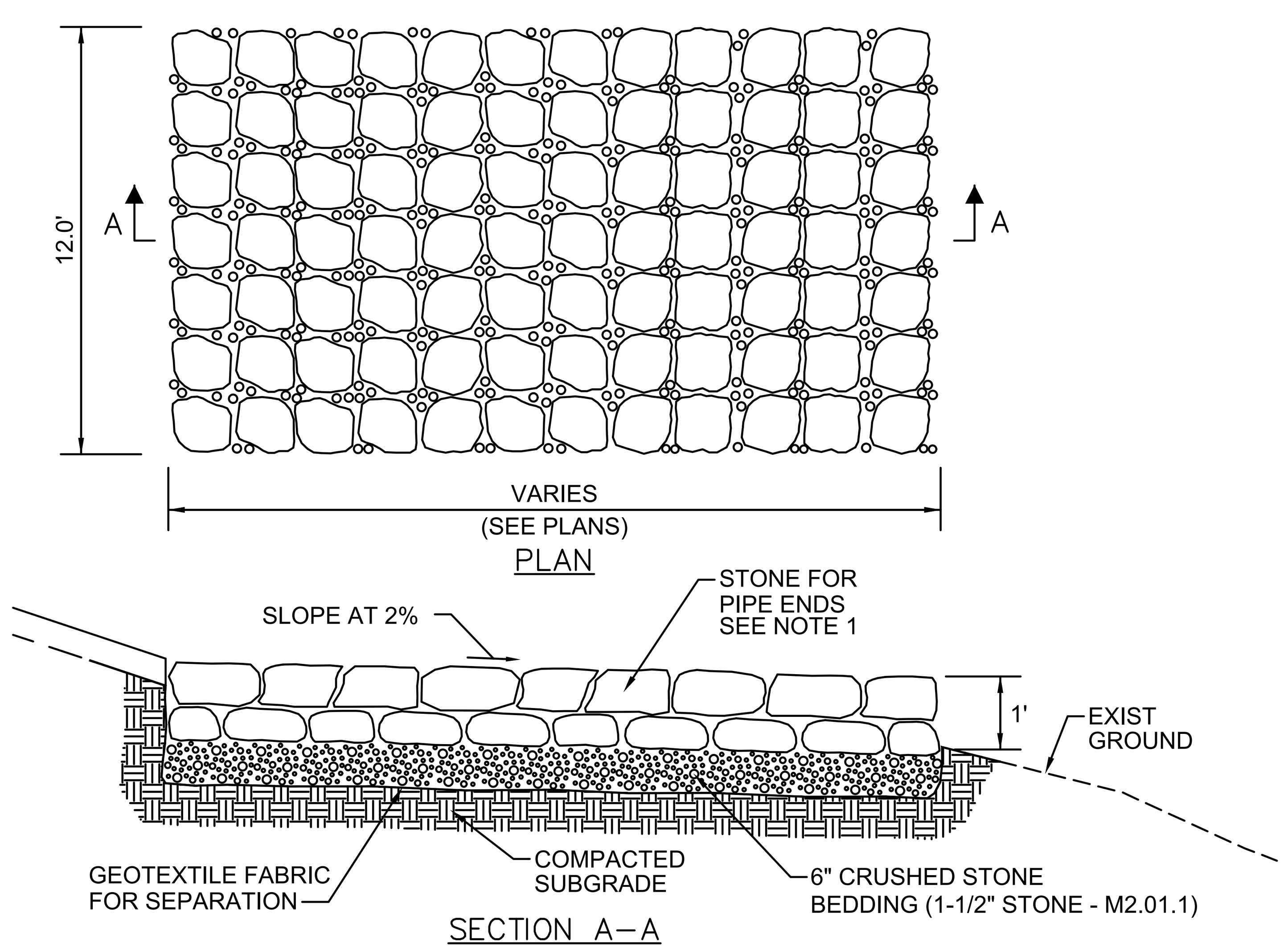
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	94	267
PROJECT FILE NO. 607398			

CONSTRUCTION DETAILS



PAVED WATERWAY

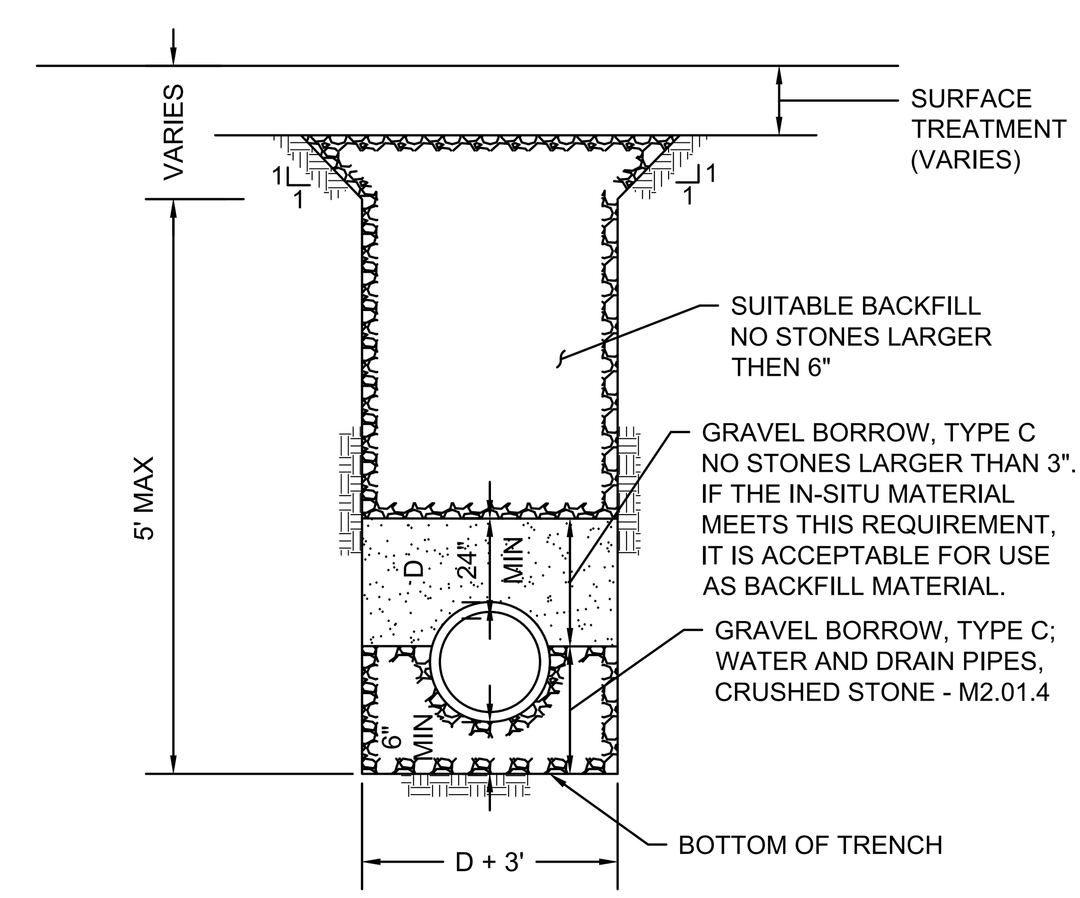
SCALE: N.T.S.



NOTES:
1. STONE SHALL BE ANGULAR, IN ACCORDANCE WITH SECTION M2.02.3.

STONE FOR PIPE ENDS AT DRAINAGE DITCH OUTLET

SCALE: N.T.S.



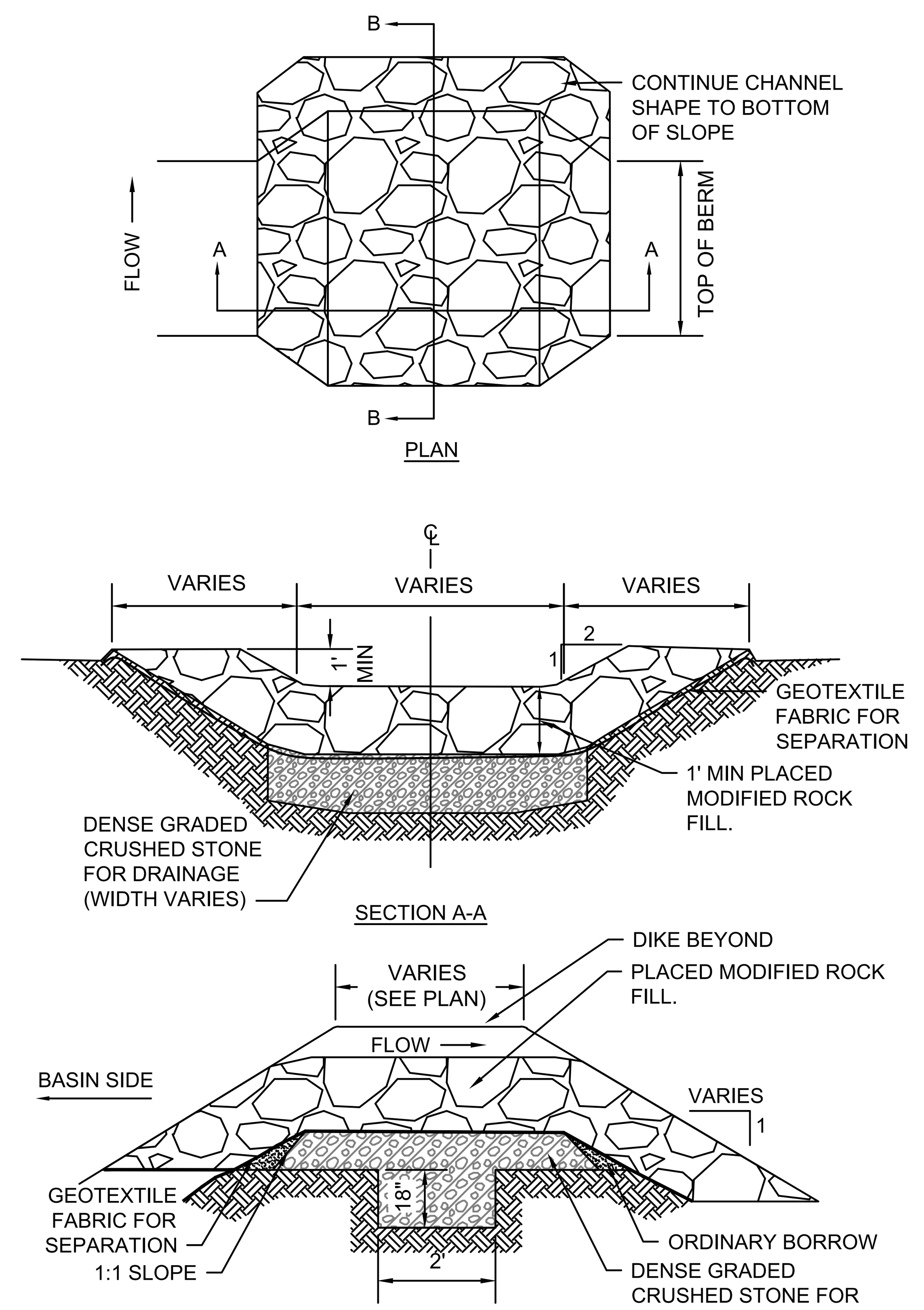
TRENCH DETAIL

SCALE: N.T.S. DWG: TRENCH-05 DATE: MARCH 2013

607398_HD(DET).DWG Plotted on 22-Nov-2021 5:23 PM

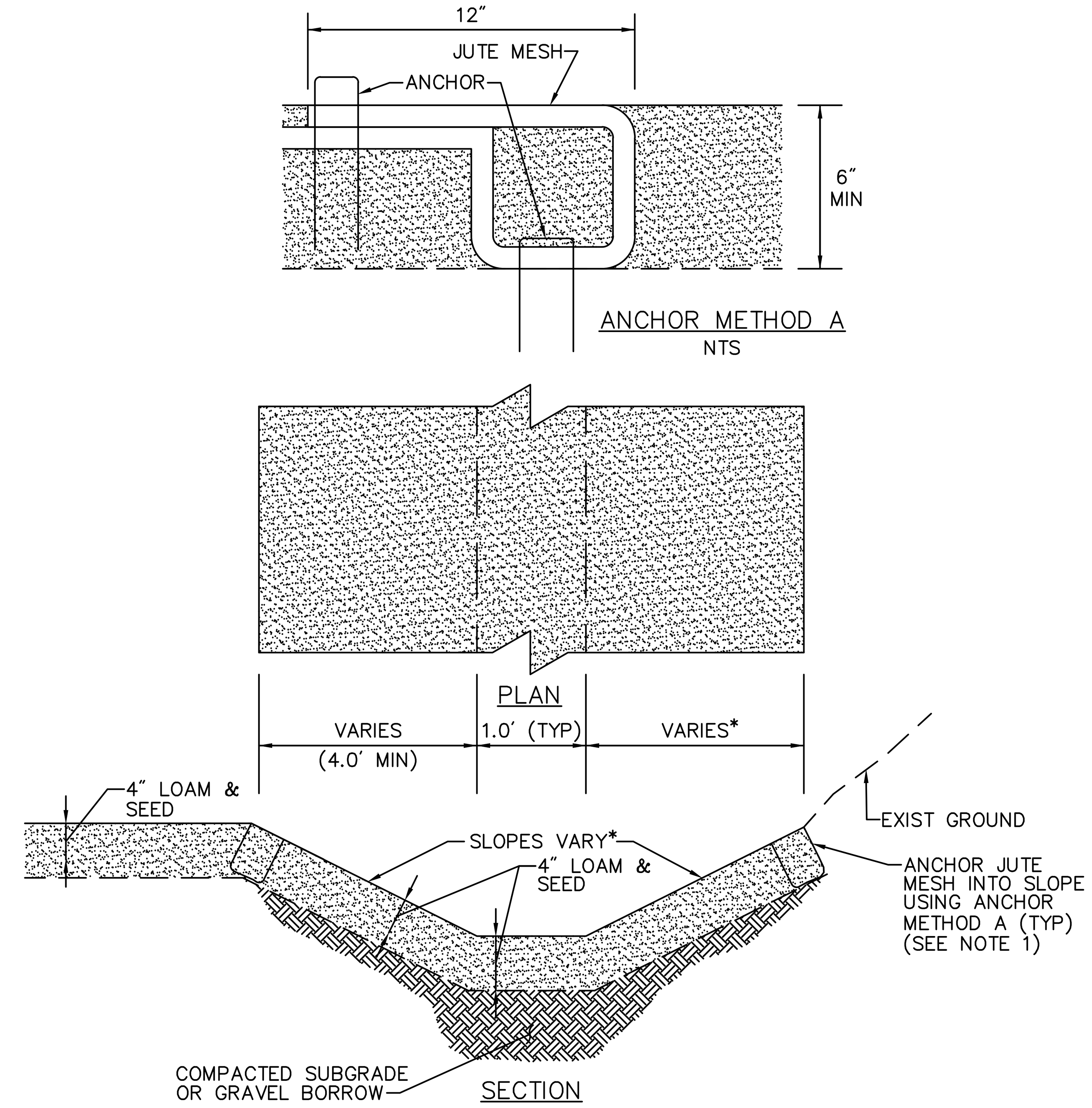
BARNSTABLE / YARMOUTH CAPE COD RAIL TRAIL EXT.- PHASE 3			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	95	267
PROJECT FILE NO. 607398			

CONSTRUCTION DETAILS



OVERFLOW STONE SPILLWAY

SCALE: N.T.S. SOURCE: VHB DATE: AUGUST 5 2015

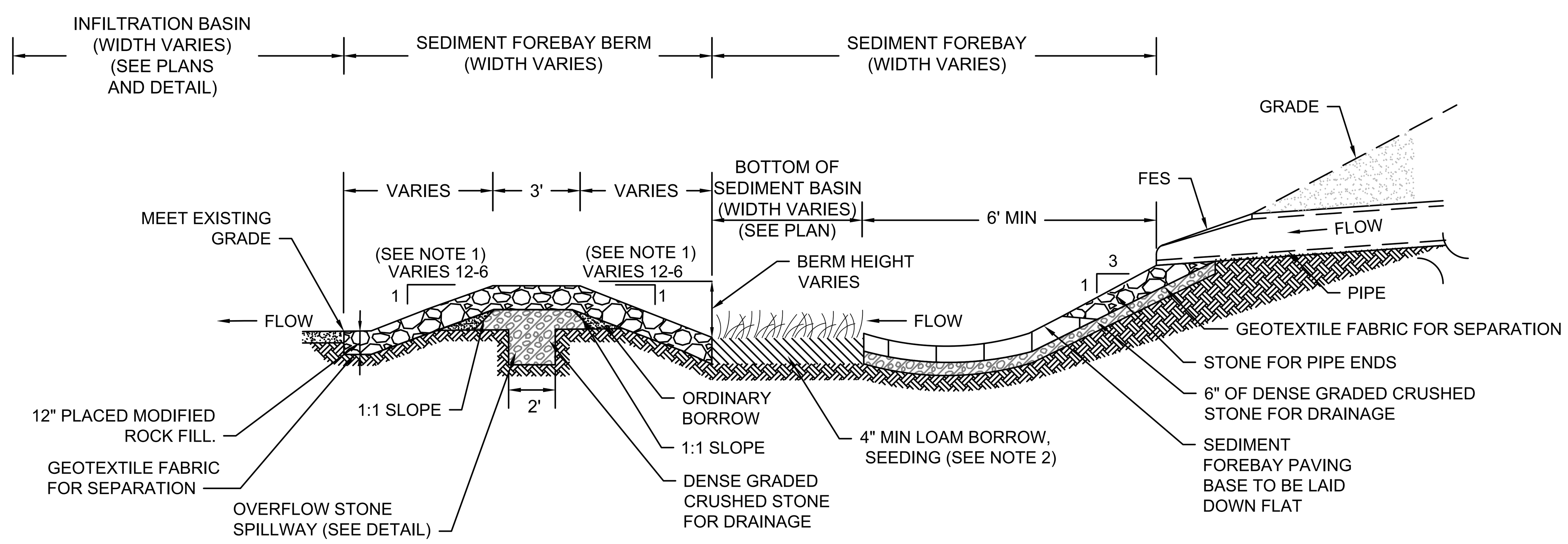


NOTE:

1. JUTE MESH SHALL BE INSTALLED WHERE SLOPES EXCEED 3:1.

LOAM & SEED SWALE

SCALE: N.T.S.

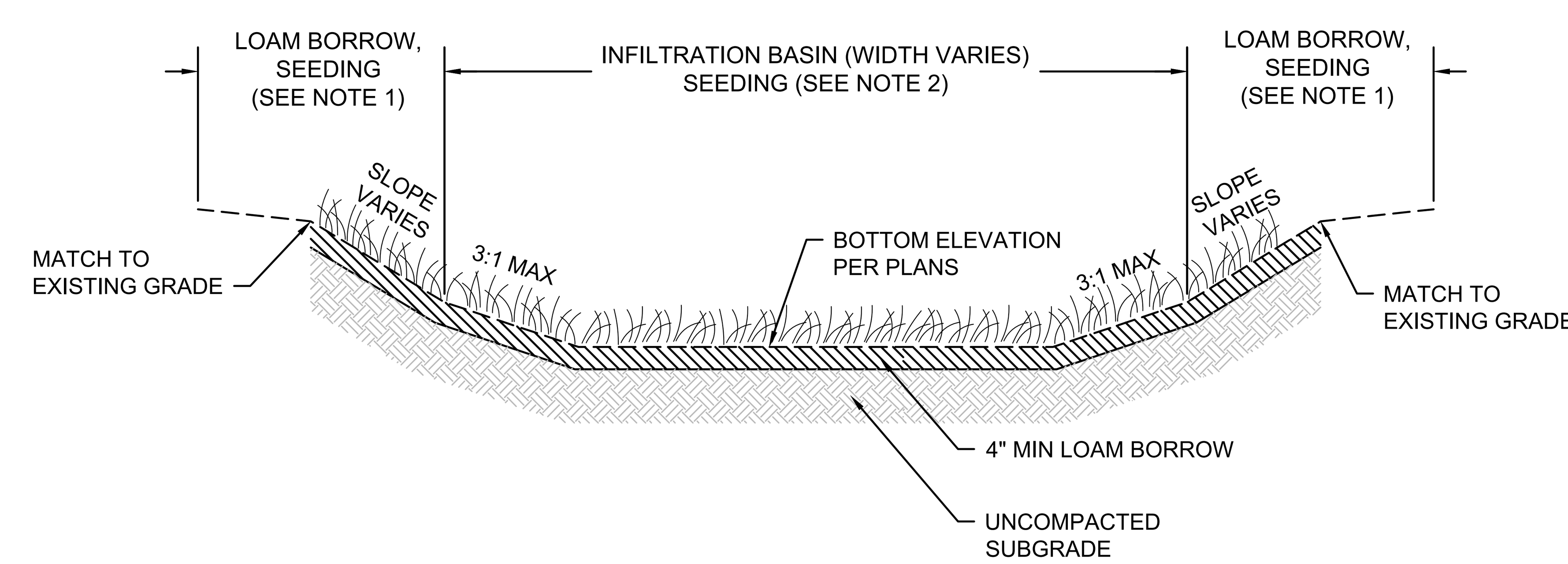


NOTES:

1. STEEPER TRAVERSE SLOPES ARE PERMISSIBLE (3:1 MAXIMUM) WITH LONGITUDINAL ROADSIDE BARRIERS, OR AREAS OUTSIDE THE CLEAR ZONE, OR ON LOW SPEED FACILITIES.
2. PLACE LOAM BORROW TO A MINIMUM DEPTH OF 4". SEEDED WITH ITEM 765.457 INFILTRATION BASIN BOTTOM/SWALE MIX.

SEDIMENT FOREBAY WITH GRANITE EDGING BASE

SCALE: N.T.S. SOURCE: VHB DATE: AUGUST 7 2015



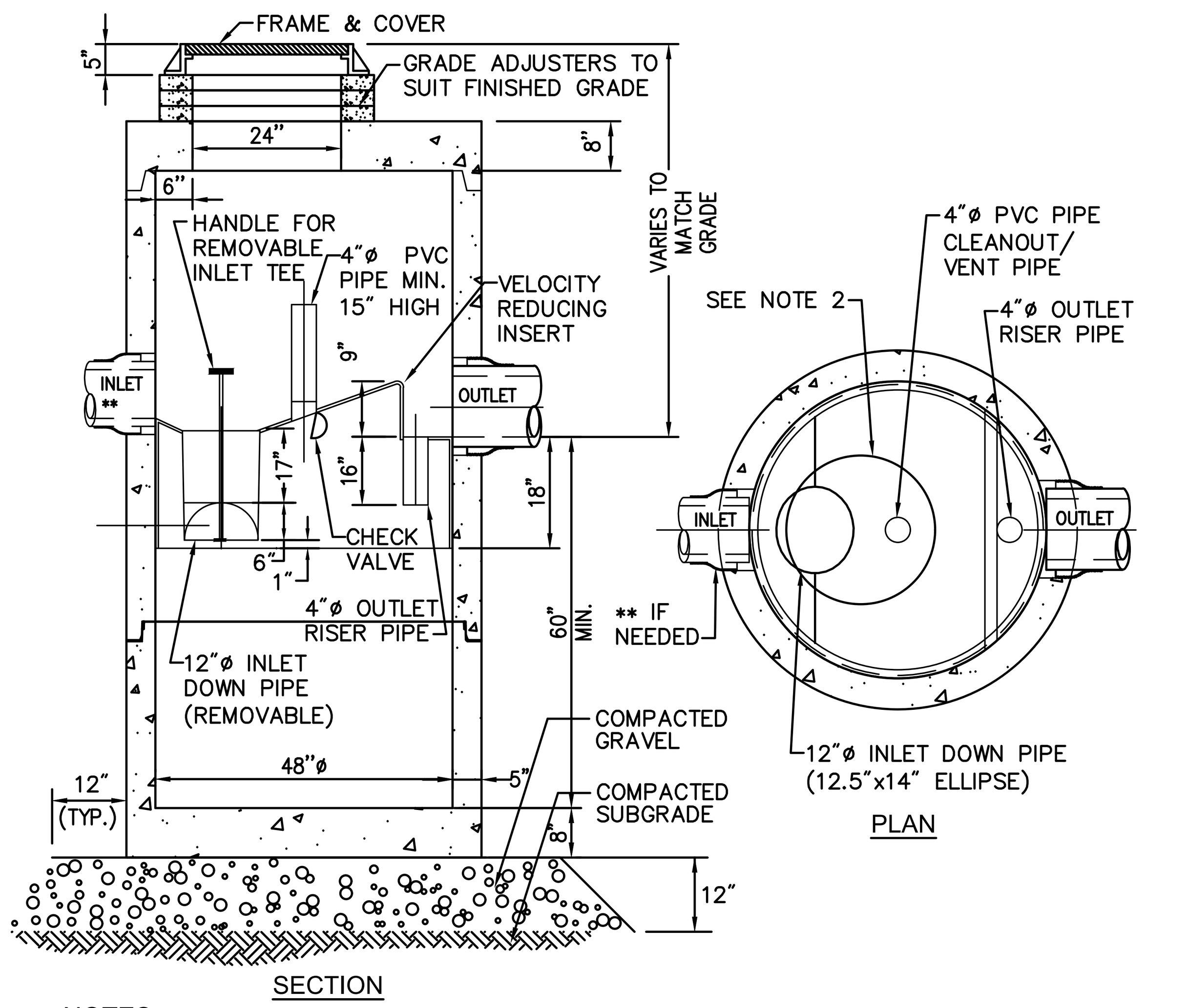
NOTES:

1. SIDES OF BASIN SHALL BE SEEDED.
2. BOTTOM OF BASIN SHALL BE SEEDED PER LANDSCAPE PLANS.

INFILTRATION BASIN TYPICAL SECTION

SCALE: N.T.S. SOURCE: VHB DATE: AUGUST 6 2015

607398_HD(DET).DWG Plotted on 22-Nov-2021 5:24 PM

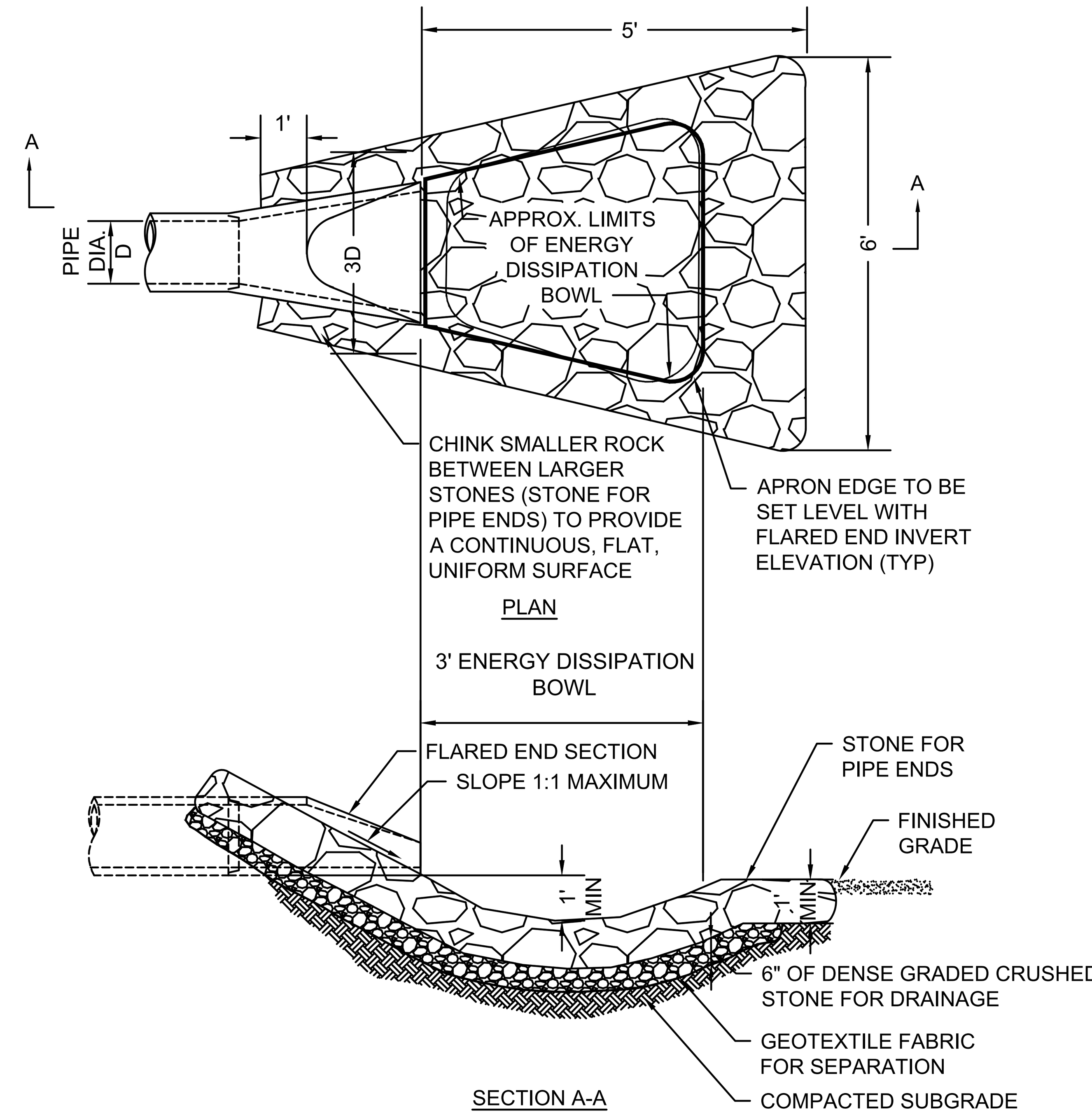


NOTES:

1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
2. THE GRATE SHALL BE POSITIONED OVER THE INLET PIPE AND THE OIL PORT.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
4. MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICKS TYPICALLY, 5 BRICK COURSES MAXIMUM).
5. PROVIDE OPENINGS FOR PIPES WITH 2" MAX CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL CONNECTIONS.

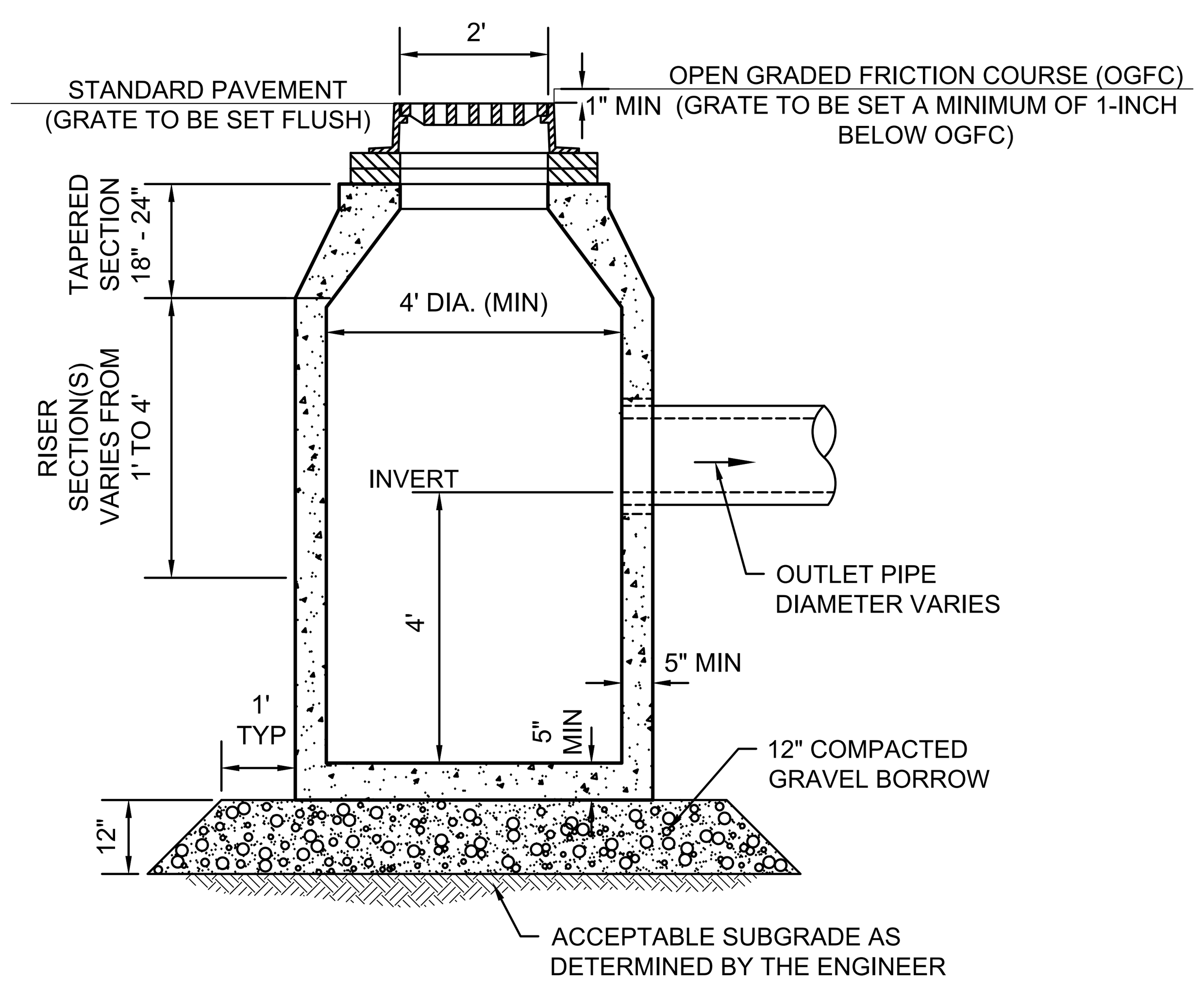
WATER QUALITY UNIT

SCALE: N.T.S. SOURCE: VHB DATE: AUGUST 6 2015



FLARED END SECTION (FES) WITH STONE FOR PIPE ENDS (STORMWATER FEATURES)

SCALE: N.T.S. SOURCE: VHB DATE: AUGUST 7 2015

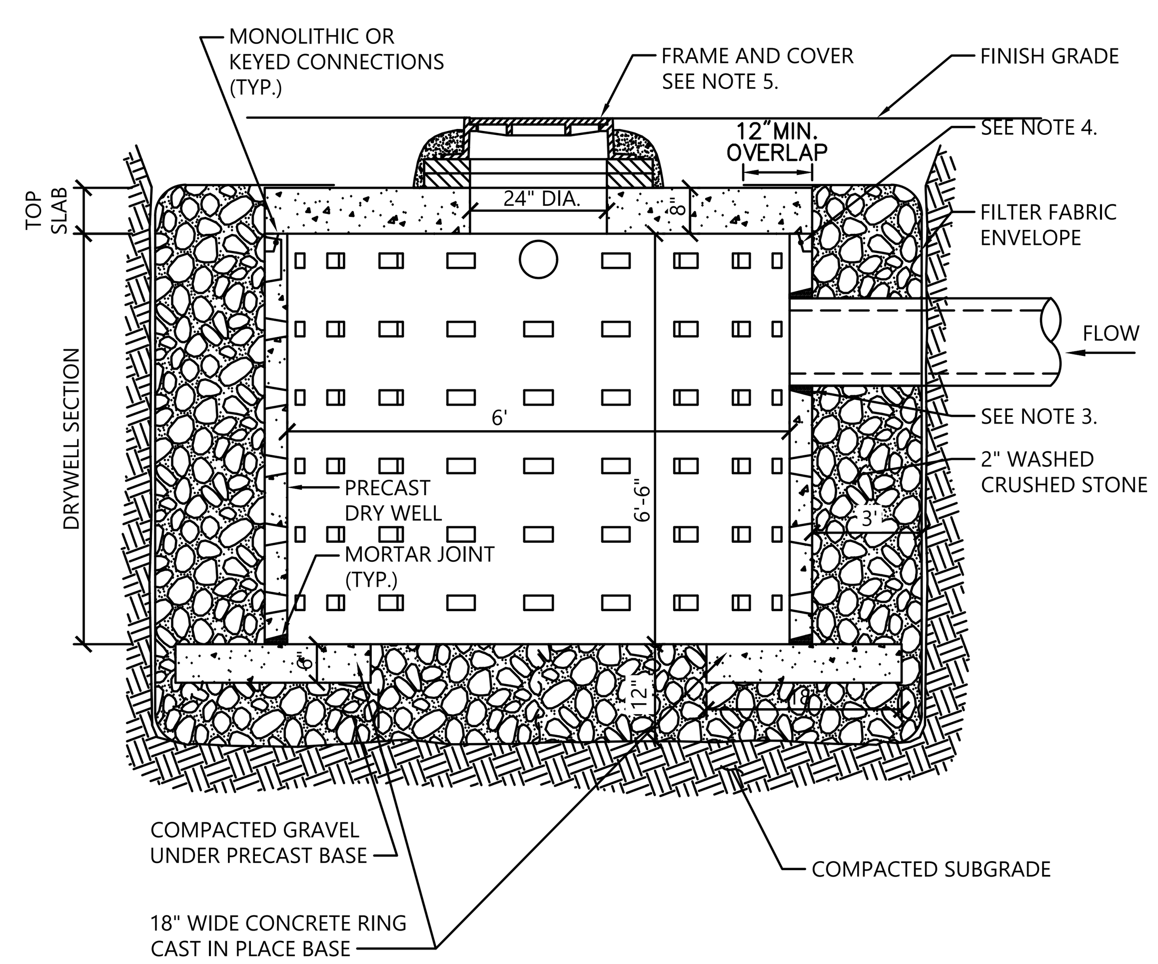


NOTES:

1. TOP SLAB OPENINGS FOR CBCI SHALL BE 24" x 27".
2. 6" MINIMUM SPACE FROM TOP OF KNOCKOUT TO BOTTOM OF ROOF SLAB JOINT REQUIRED WHEN USING HOODS.

DEEP SUMP CATCH BASIN

SCALE: N.T.S. SOURCE: VHB DATE: AUGUST 6 2015



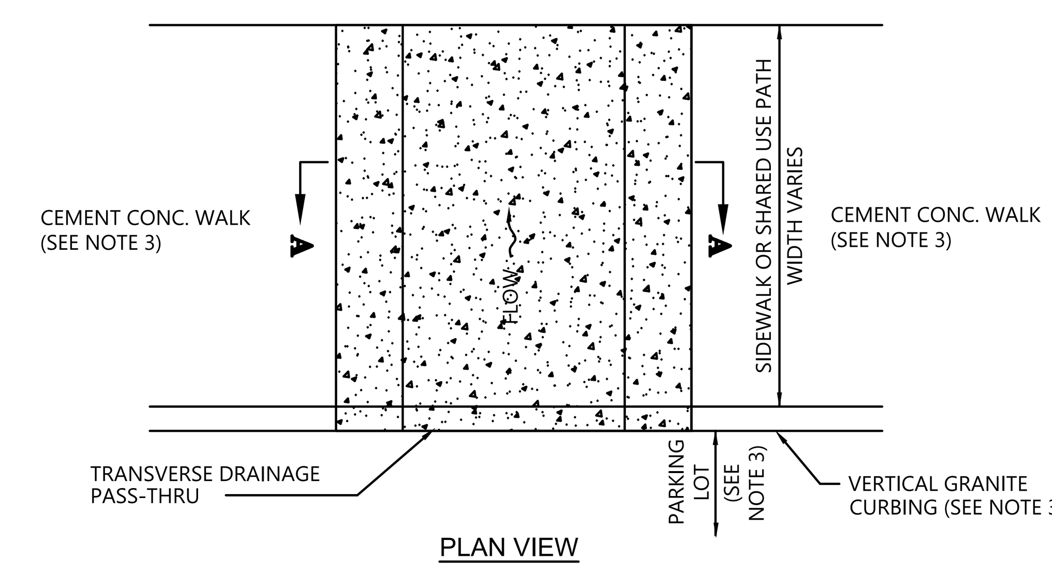
NOTES

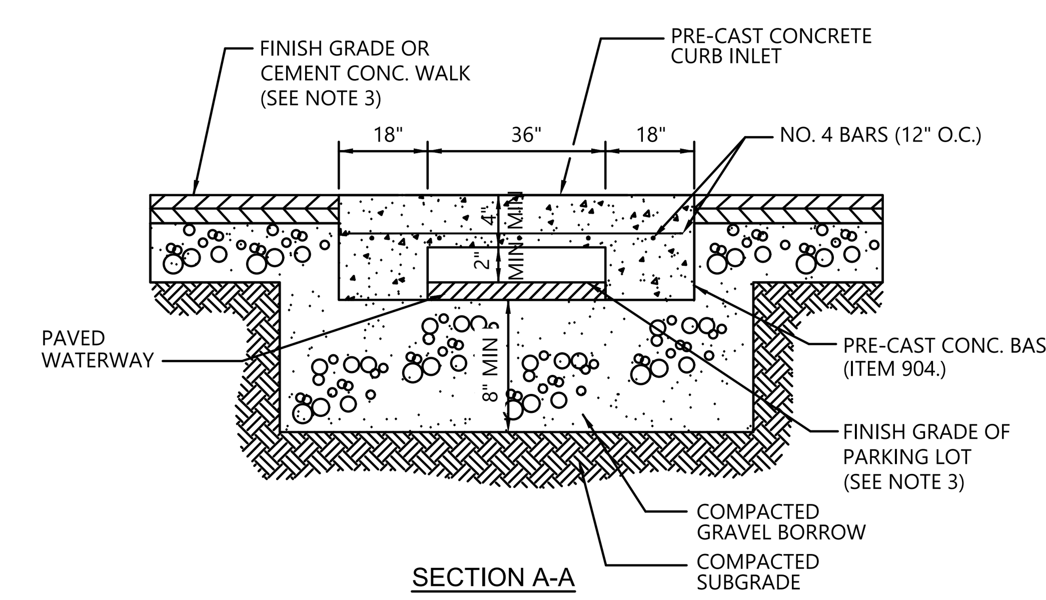
1. BASE SECTION SHALL BE PRECAST CONCRETE WITH MORTARED JOINTS OR CAST IN PLACE.
2. ALL COMPONENTS SHALL BE DESIGNED FOR HS-20 LOADING.
3. PROVIDE PRECAST OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSE MINIMUM, 5 BRICK COURSE MAXIMUM)

LEACHING BASIN

1/16

SCALE: N.T.S. SOURCE: VHB REV LD_180





NOTES

1. STEEL REINFORCEMENT SHALL BE INCLUDED UNDER PRECAST SIDEWALK PANEL UNIT COST
2. PAVED WATERWAY SHALL BE SET TO SLOPE AT 1% AWAY FROM PARKING LOT
3. AT CCRT EXT EAST STA 590+30: NO CURBING OR PARKING LOT. PAVED WATERWAY MEETS EXISTING GRADE. TOP OF INLET STRUCTURE MEETS FINISH GRADE OF PROP SUP PVM'T

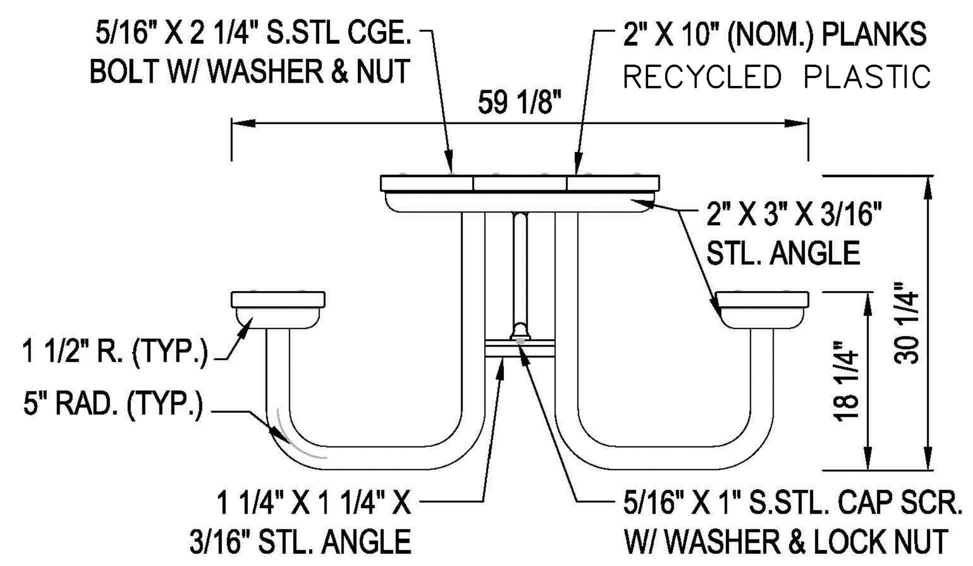
PRECAST CEMENT CONCRETE SIDEWALK INLET

SCALE: N.T.S. DWG: LADET-02 DATE: JULY 2021

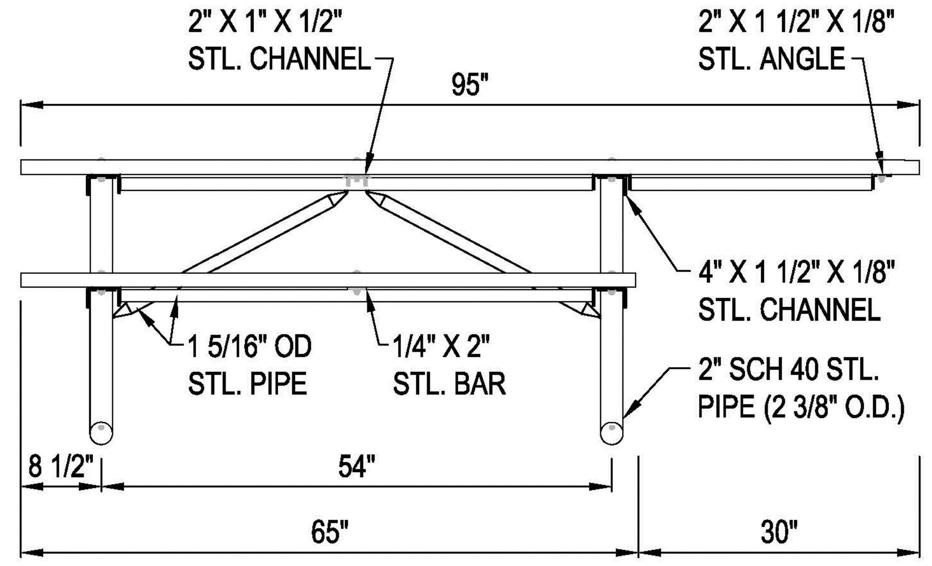
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	97	267
PROJECT FILE NO. 607398			

CONSTRUCTION DETAILS



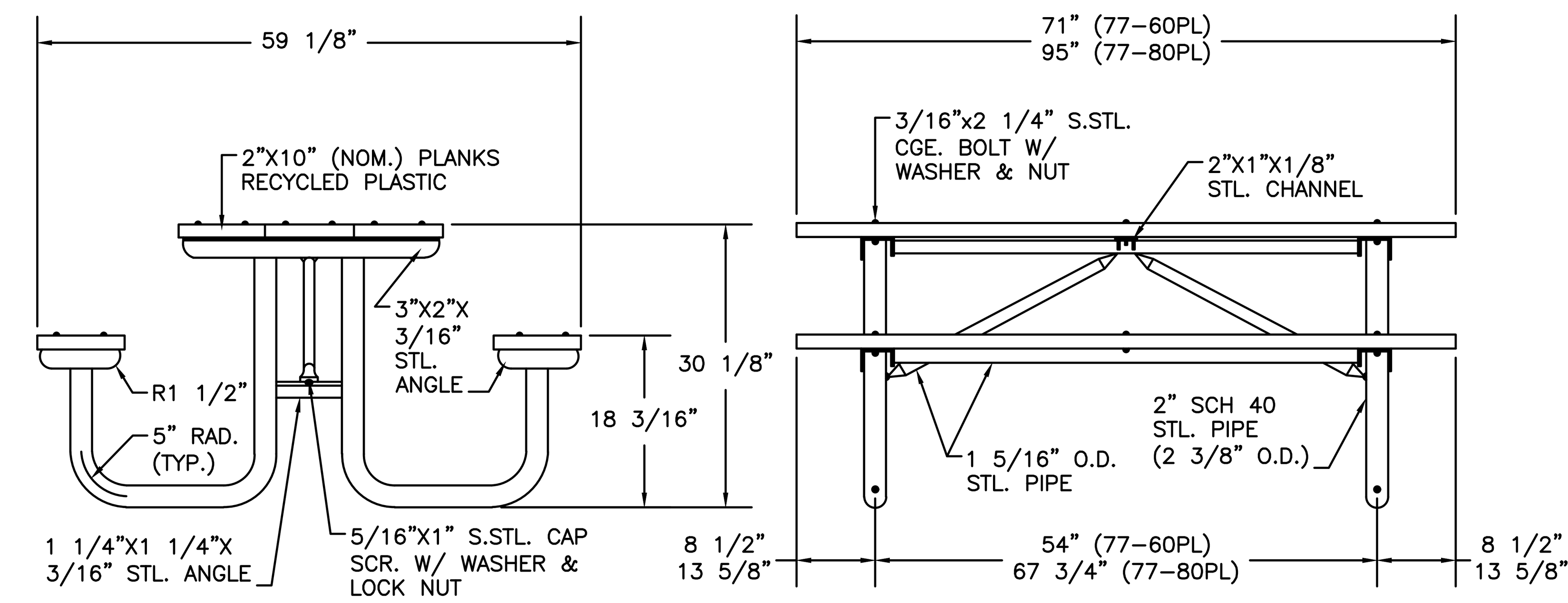
PICNIC TABLE SIDE VIEW
NOT TO SCALE



PICNIC TABLE SIDE VIEW
NOT TO SCALE

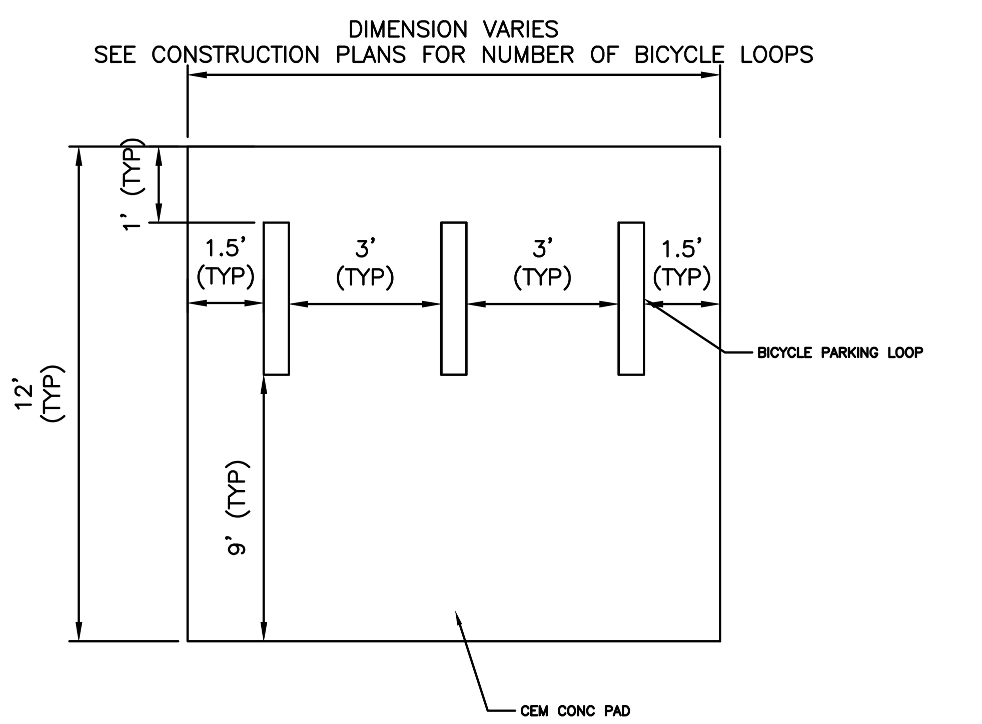
PICNIC TABLE - ACCESSIBLE

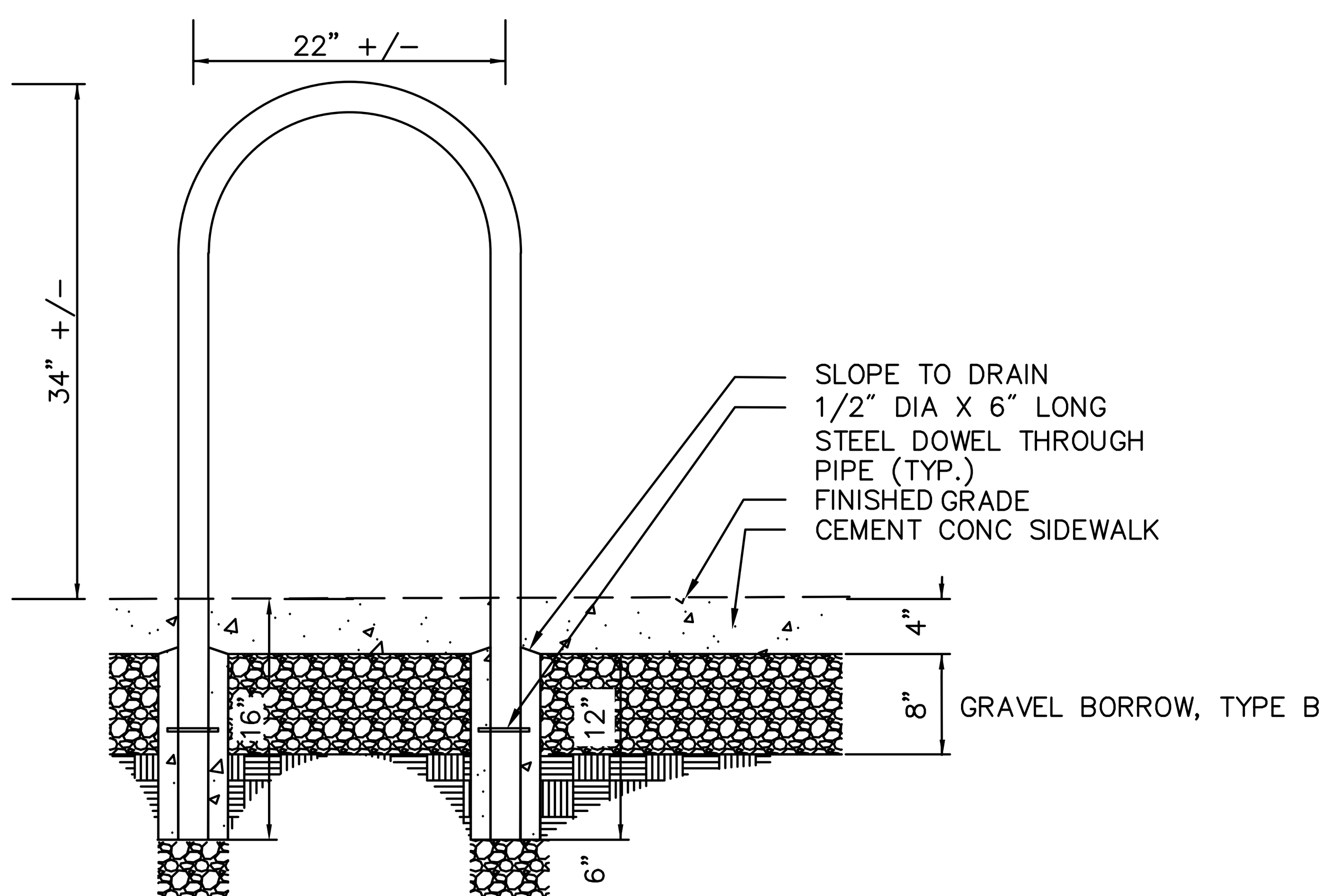
SCALE: N.T.S.



PICNIC TABLE

SCALE: N.T.S.



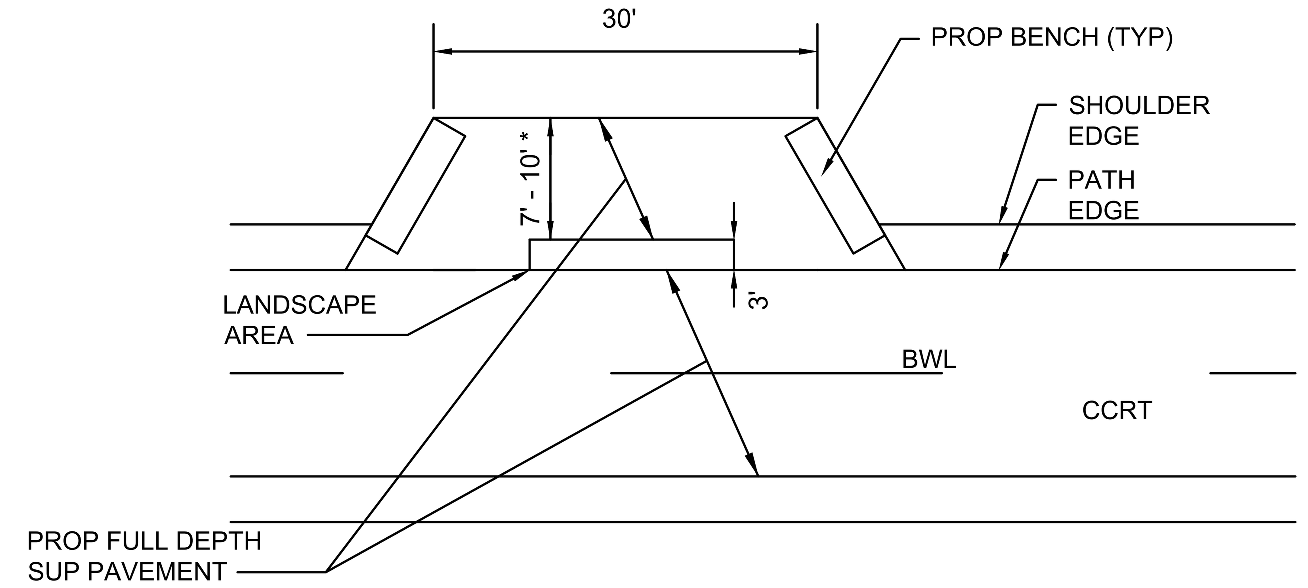


NOTES:

1. BICYCLE RACK UNITS SHALL CONSIST OF INVERTED "U" PIPES
2. 2IN NOM SCHED 40, ASTMA 500 WELDED SEAMLESS STEEL PIPE CONSTRUCTION
3. INVERTED "U" PIPES SHALL BE PLACED PARALLEL TO EACH OTHER 36–INCHES
4. CONCRETE SHALL BE 4000 PSI, 3/4IN, 565 CEMENT CONCRETE

BICYCLE RACK

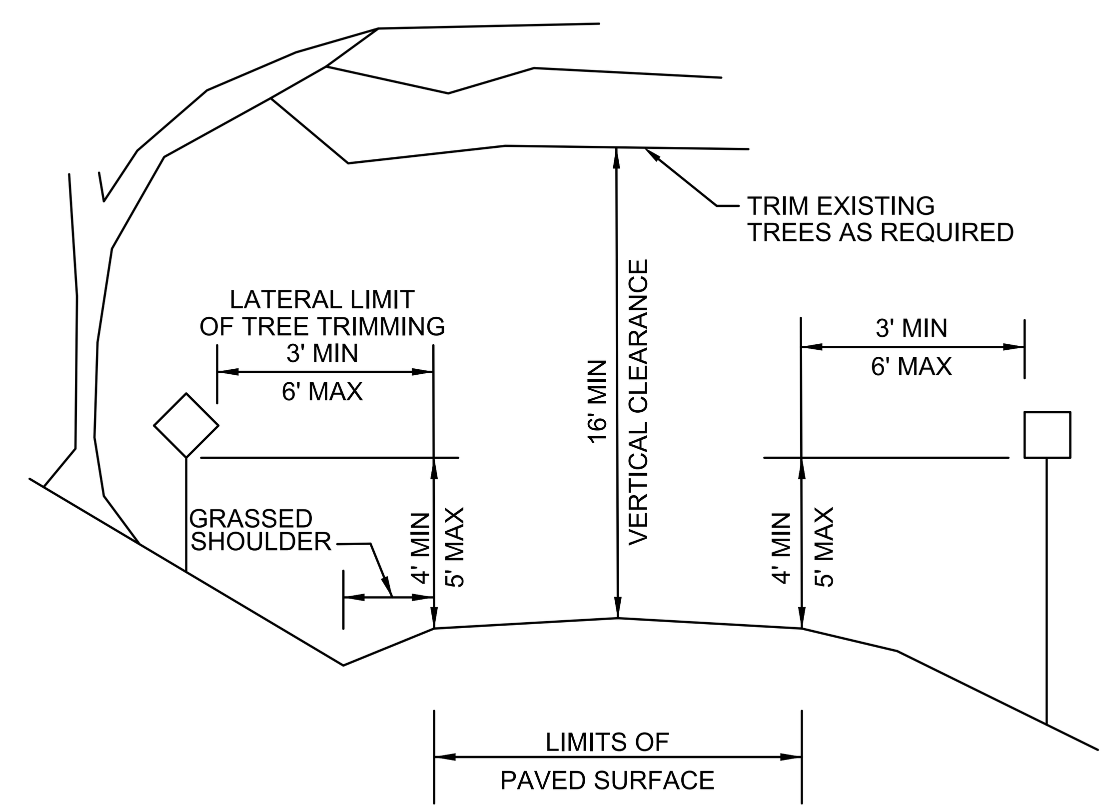
SCALE: N.T.S.



NOTE:
* WIDTH VARIES, SEE CONSTRUCTION PLANS.

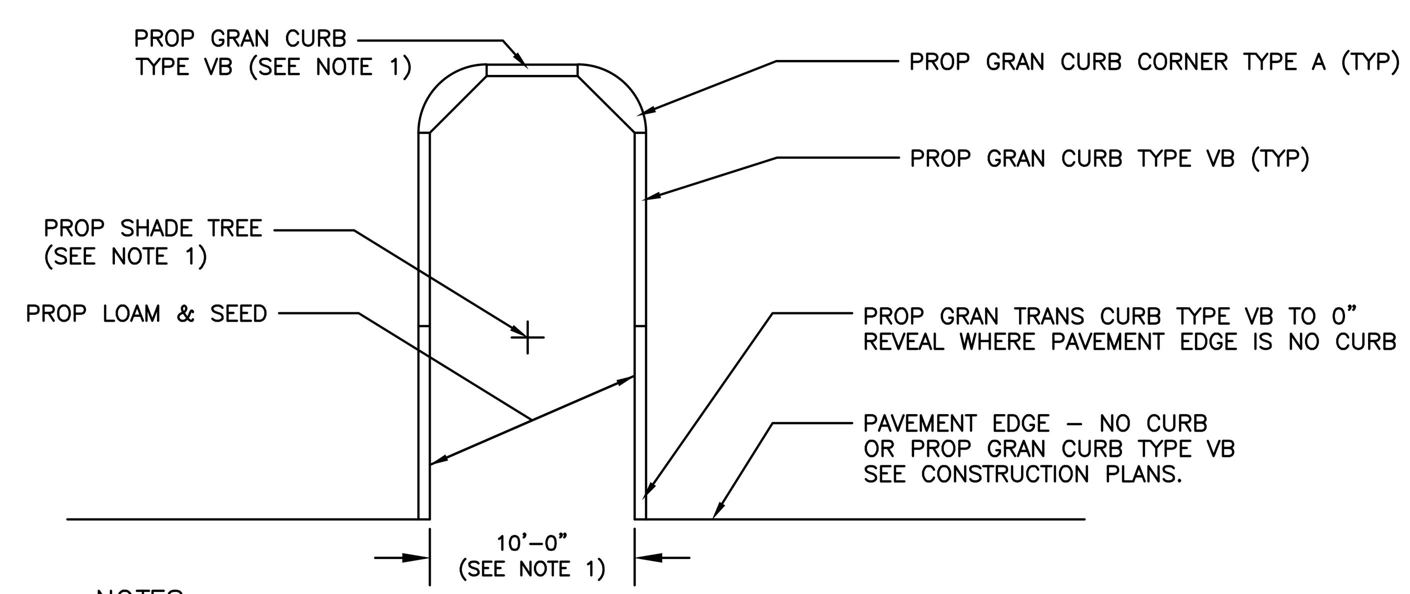
TRAIL PULLOVER AREA - STA 592+65± & STA 594+25±

SCALE: N.T.S.



HORIZONTAL AND VERTICAL CLEARANCES

SCALE: N.T.S.

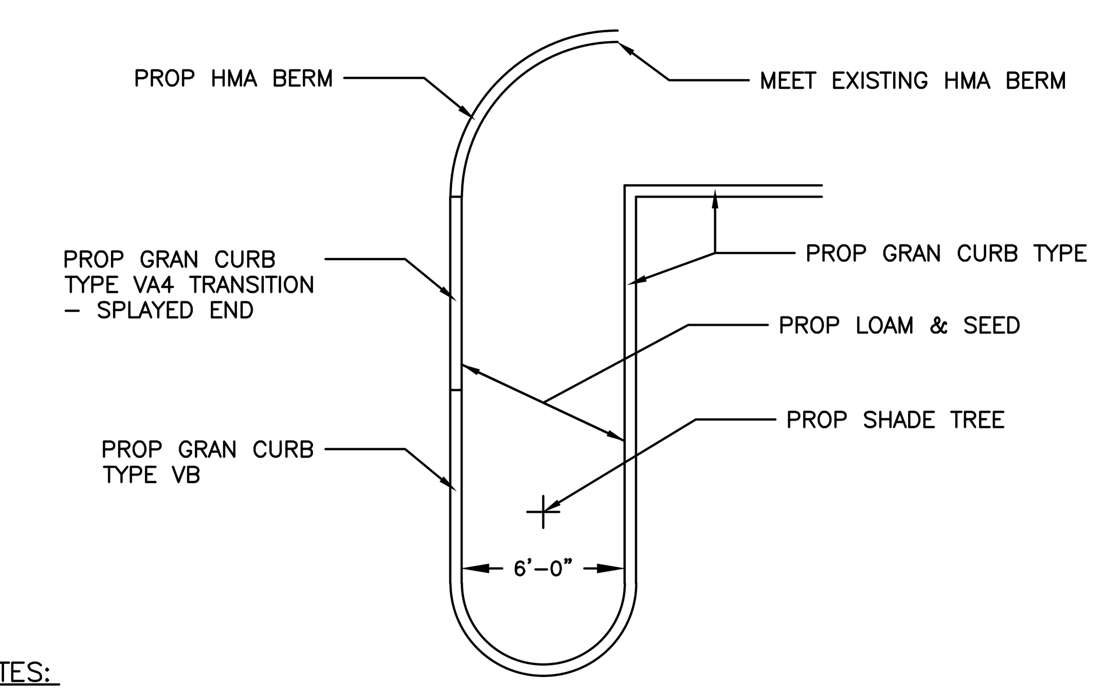


NOTES:

1. STA 200+20 LT CURBED ISLAND – NO PROPOSED SHADE TREE. WIDTH VARIES FROM TYPICAL, SEE CURB TIE & GRADING PLANS FOR LENGTH OF STRAIGHT CURBING BETWEEN CURB CORNERS.

CURBED ISLAND - HIGGINS CROWELL PARKING LOT

SCALE: N.T.S.



NOTES:

1. SIDE OF GRAN CURB TO HMA BERM VARIES, SEE CONSTRUCTION PLANS.

CURBED ISLAND - GOLF COURSE PARKING LOT

SCALE: N.T.S.

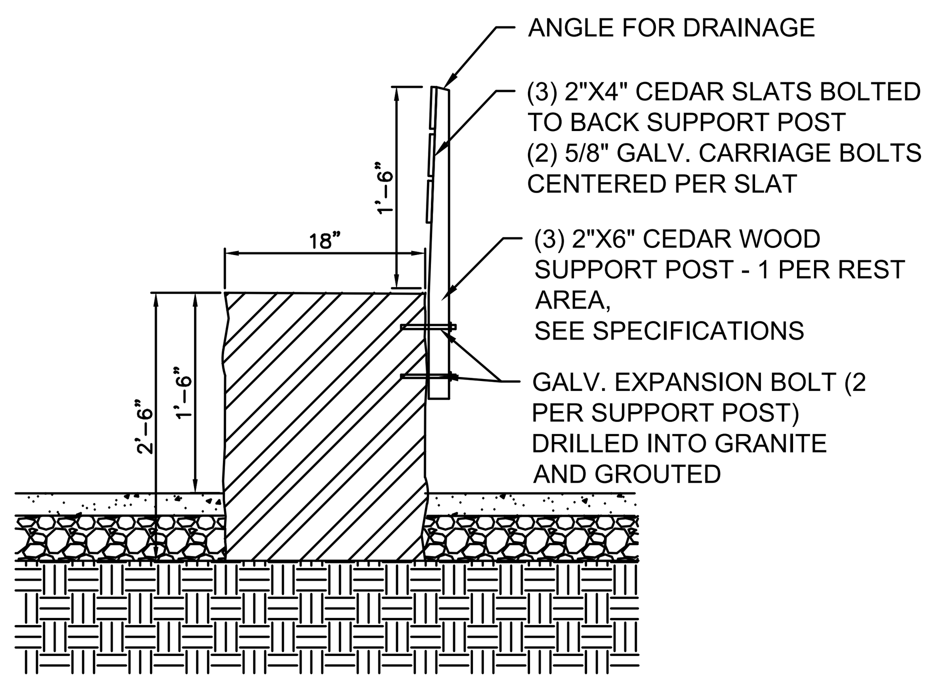
Plotted on 22-Nov-2021 5:24 PM
607398_HD(DET).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	98	267
PROJECT FILE NO. 607398			

CONSTRUCTION DETAILS

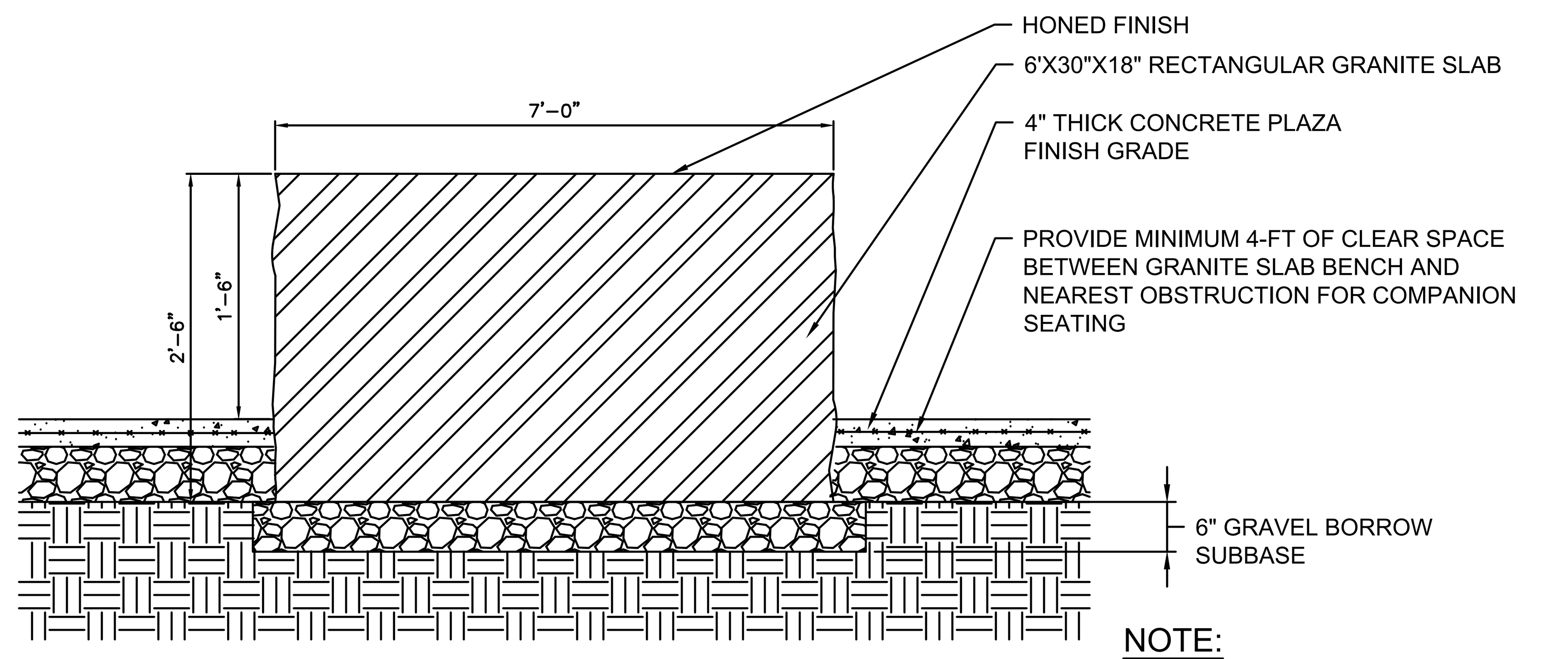
607398_HD(DET).DWG Plotted on 22-Nov-2021 5:24 PM



GRANITE SLAB BENCH WITH BACKREST
NOT TO SCALE

GRANITE BENCH WITH BACKREST

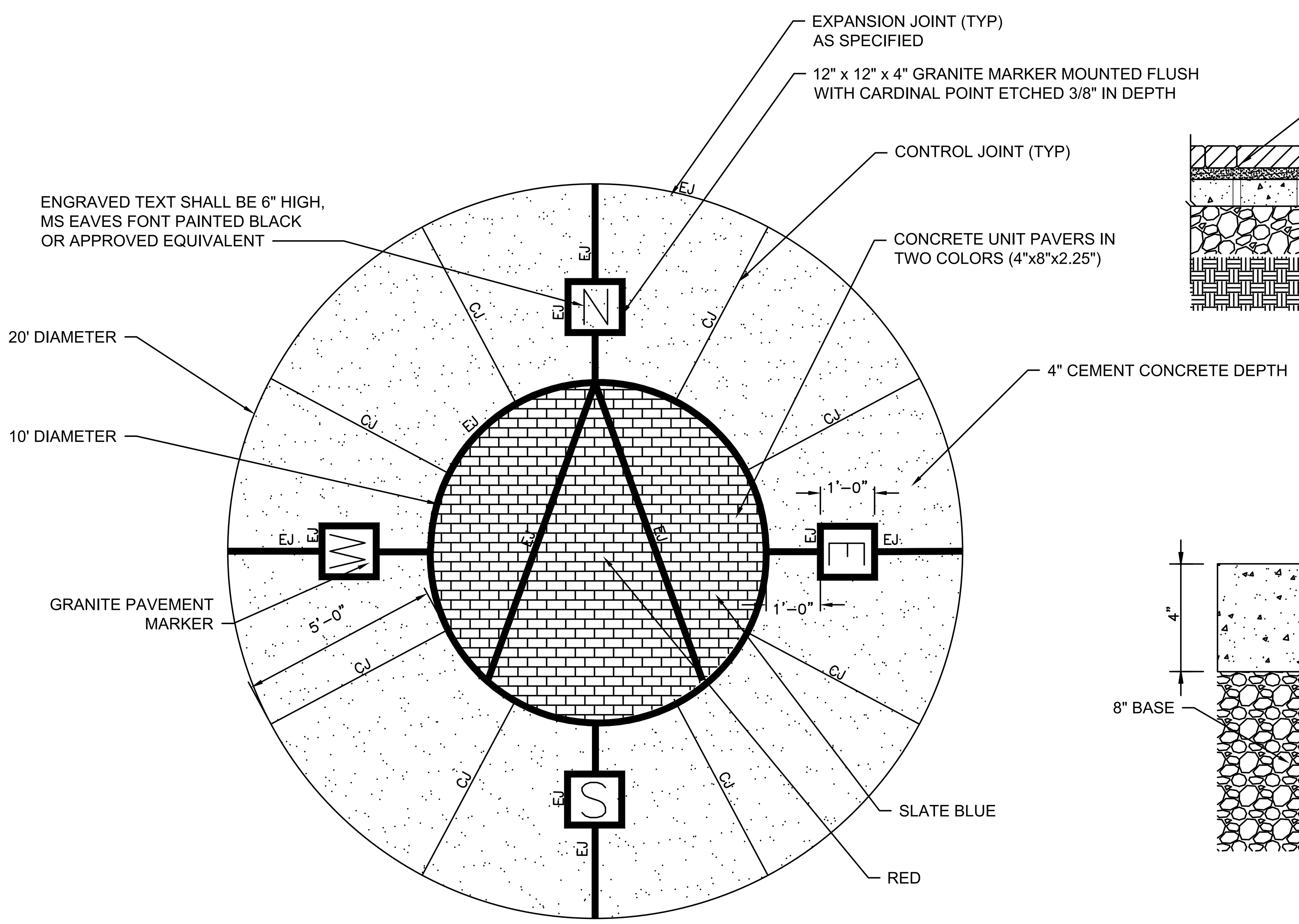
SCALE: N.T.S.



NOTE:
EACH BENCH SHALL INCORPORATE 2.5 FT x 4 FT CLEARANCE ADJACENT TO NARROW END AS SHOWN ON DRAWINGS TO ACCOMMODATE ACCESSIBLE COMPANION SEATING.

GRANITE BENCH

SCALE: N.T.S.

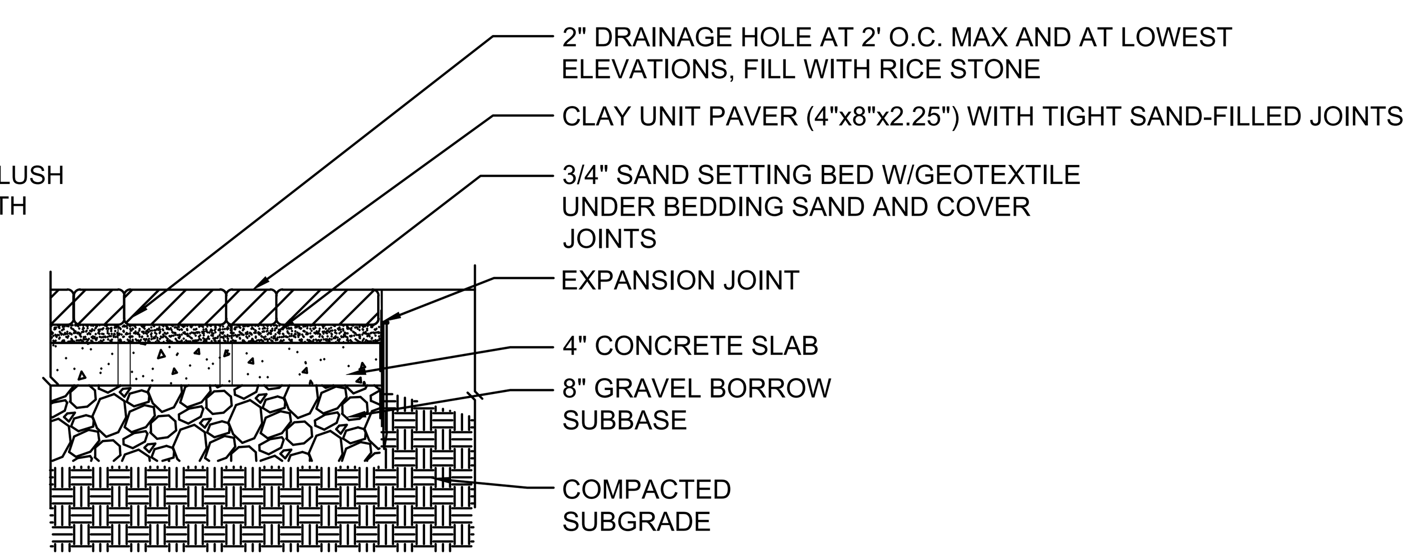


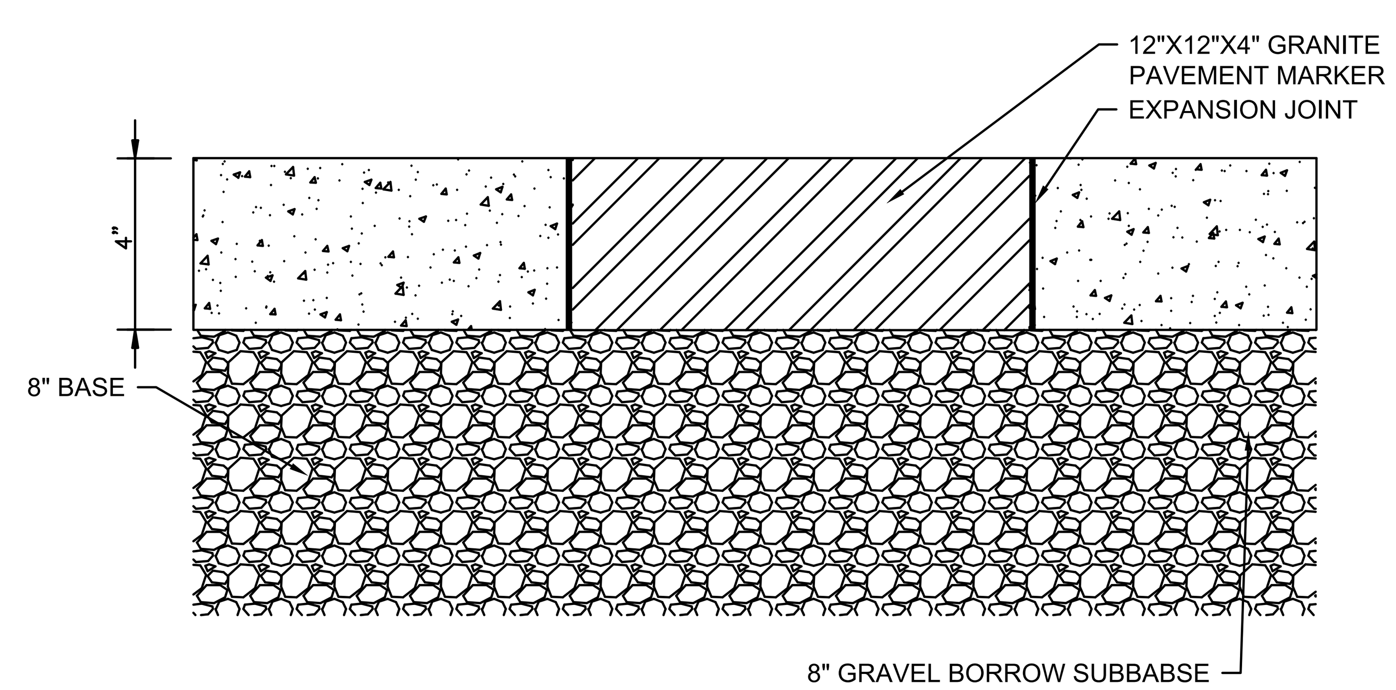
REST AREA CEMENT CONCRETE PLAZA AND BRICK PAVER NORTH ARROW MEDALLION
NOT TO SCALE

NOTES:
1. COMPASS POINTS SHALL BE SURVEYED AND STAKED IN THE FIELD FOR APPROVAL BY ENGINEER.

2. COMPASS POINTS SHALL BE ORIENTED TO MAGNETIC NORTH.

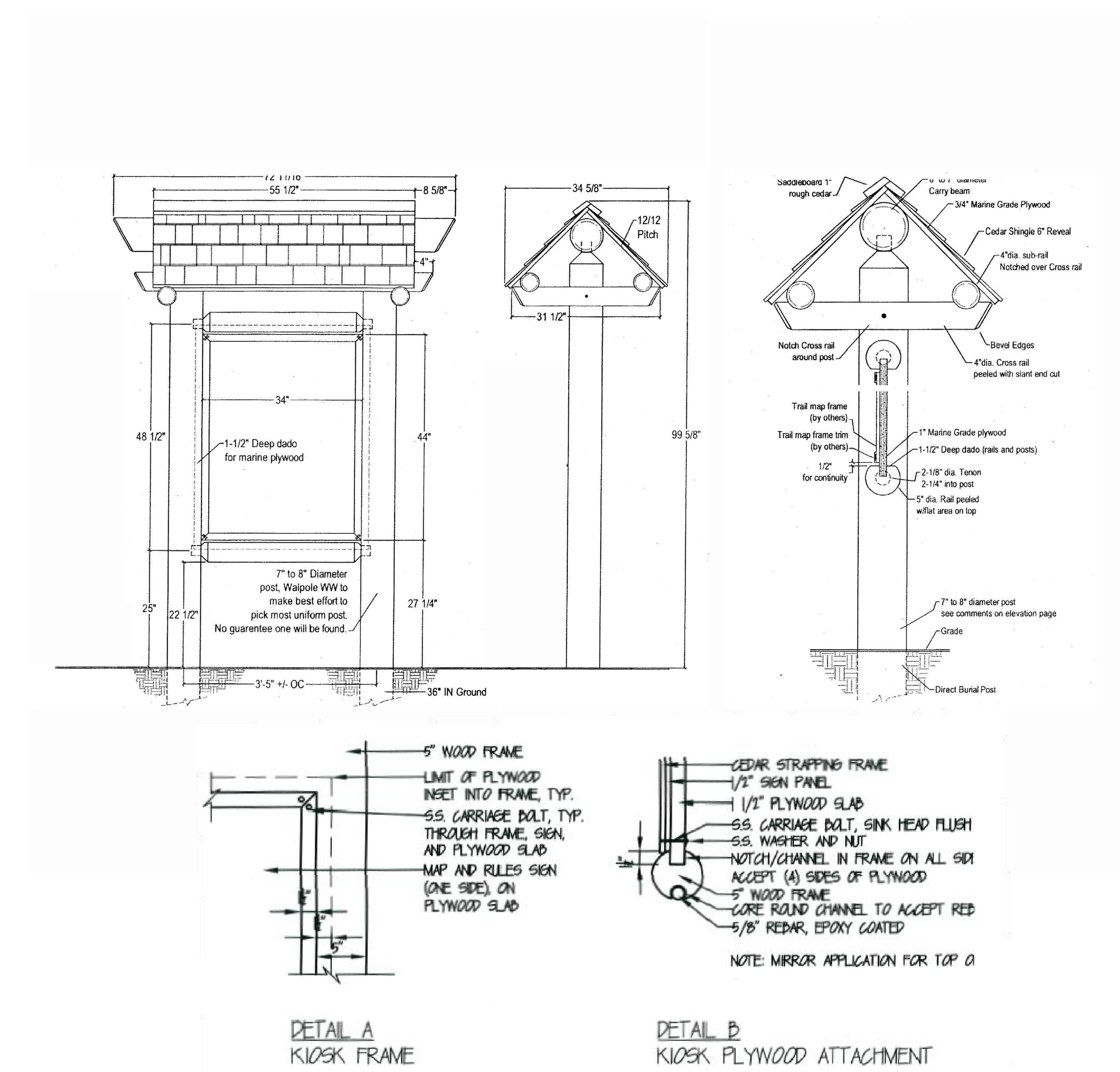
3. BRICKS SHALL BE BELDEN BRICK - SIENNA BLEND OR EQUAL AND BELDEN BRICK - NUTMEG OR EQUAL





GRANITE PAVEMENT MARKER

SCALE: N.T.S.

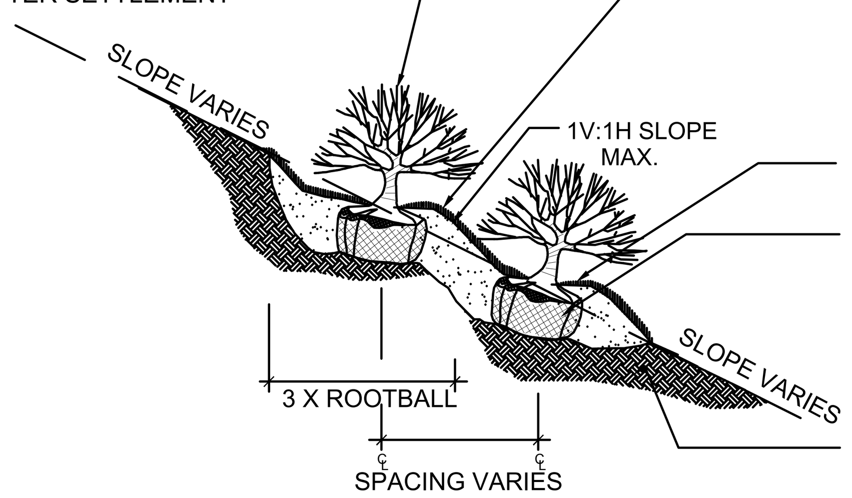


NOTE: MESSAGE BOARD MAP SIGN TO BE PRINTED DOUBLE SIDED

MESSAGE BOARD KIOSK

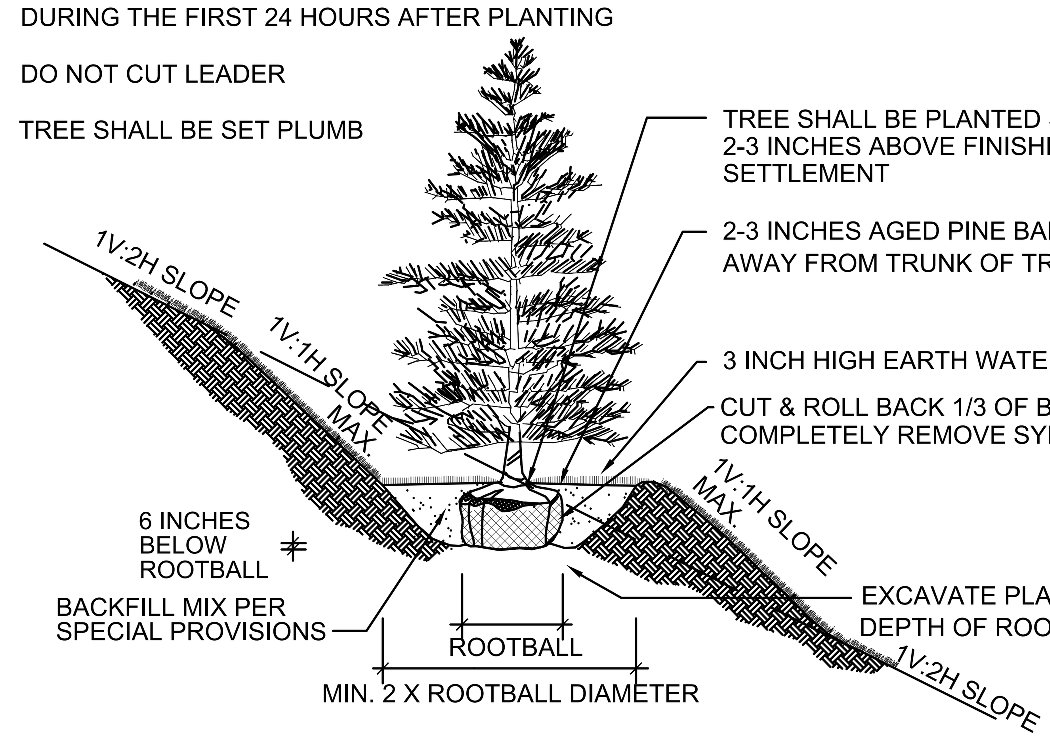
SCALE: N.T.S.

Plotted on 22-Nov-2021 5:24 PM
607398_HD(DET).DWG



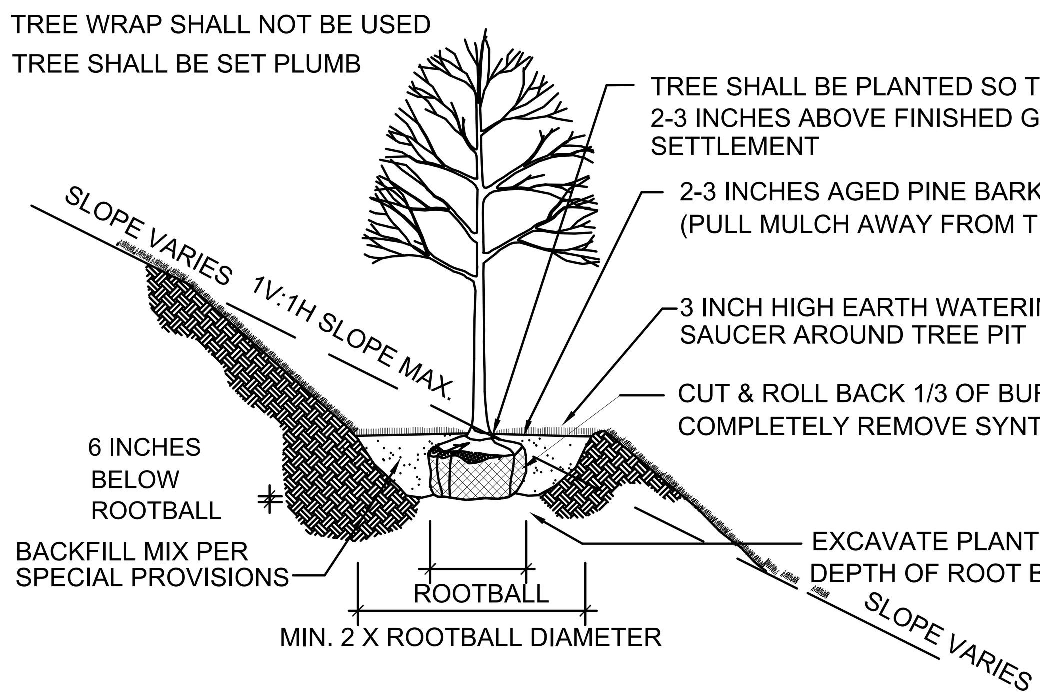
CONTAINERIZED SHRUB PLANTING (SLOPE)

SCALE: N.T.S.



EVERGREEN TREE PLANTING (SLOPE)

SCALE: N.T.S.



DECIDUOUS TREE PLANTING (SLOPE)

SCALE: N.T.S.

PLANT KEY	
	SHADE TREES
	EVERGREEN TREES
	ORNAMENTAL TREES
	SHRUBS
	HEMEROCALLIS/NARCISSUS
	PT OR PQ VINES

*NARCISSUS VARIETIES (DAFFODIL)			
VARIETY	COLOR	SEASON	SIZE
MARIEKE	YELLOW	EARLY	18"
THALIA	WHITE	MID	14"
ICE FOLLIES	WHITE/YELLOW	EARLY	18"
BARRETT BROWNING	WHITE/YELLOW	EARLY	16"
PROFESSOR EINSTEIN	WHITE/PUMPKIN	EARLY	16 "
*HEMEROCALLIS VARIETIES (DAYLILY)			
VARIETY	COLOR	SEASON	SIZE
CATHERINE WOODBURY	PINK	EXTENDED	30"
HAPPY RETURNS	YELLOW	JULY-FROST	18"
ICE CARNIVAL	WHITE/LIME	REBLOOM	28"
PARDON ME	RED	REBLOOM	18"
ROSY RETURNS	PINK/ROSE	JULY-FROST	18 "

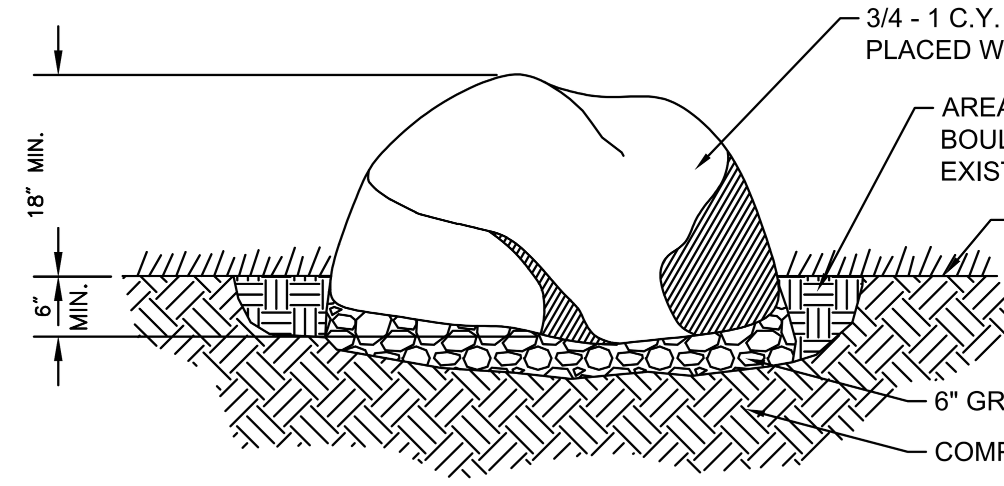
* PLANT DAYLILYS AND DAFFODILS IN RANDOM CLUMPS OF 3 AND 7 BULBS EACH, MIXED COLORS.
* PLANT DAFFODIL BULBS IN MIN 3X BULB DIAMETER DEPTH.
* PLANT DAYLILY CROWN MAX 1 INCH BELOW SOIL SURFACE AND SPREAD ROOTS.

SEED MIXES (SHALL CONTAIN SOME OR ALL OF THE FOLLOWING SPECIES)

GENERAL SEED MIX (A1)	
APPLICATION RATE: 35 LBS/ACRE	
CANADA WILDE RYE	ELYMUS CANADENSIS
CREEPING RED FESCUE	FESTUCA RUBRA
BIG BLUESTEM	ANDROPOGON GERARDII
LITTLE BLUESTEM	SCHIZACHYRIUM SCOPARIUM
INDIAN GRASS	SORGHASTRUM NUTANS
SIDE OATS GRASS	BOUTELOUA CURTIPENDULA
SWITCH GRASS	PANICUM VIRGATUM
SAND LOVEGRASS	ERAGROSTIS TRICHODES

SLOPE SEED MIX (B1)	
APPLICATION RATE: 25 LBS/ACRE	
VIRGINIA WILDE RYE	ELYMUS VIRGINICUS
LITTLE BLUESTEM	SCHIZACHYRIUM SCOPARIUM
BIG BLUE STEM	ANDROPOGON GERARDII
CREEPING RED FESCUE	FESTUCA RUBRA
SWITCH GRASS	PANICUM VIRGATUM
PARTRIDGE PEA	CHAMAECRISTA FASCICULATA
DEER TONGUE	PANICUM CLANDESTINUM
INDIAN GRASS	SORGHASTRUM NUTANS
OX EYE SUNFLOWER	HELIOPSIS HELIANTHOIDES
COMMON MILKWEED	ASCLEPIAS SYRIACA
SPOTTED JOE PYE WEED	EUPATORIUM MACULATUM
GRASS LEAVED GOLDENROD	EUTHAMIA GRAMINIFOLIA
BLUE VERVAIN	VERBENA HASTATA
NEW ENGLAND ASTER	ASTER NOVAE-ANGLIAE
EARLY GOLDENROD	SOLIDAGO JUNCEA

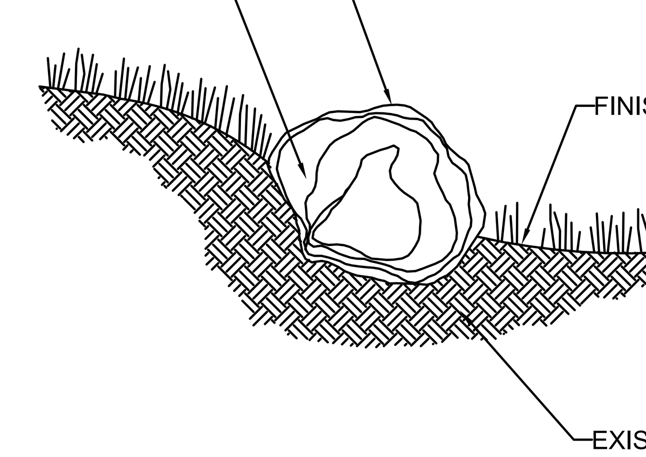
* SEED MIX B1 TO BE USED ON ALL SLOPES 3:1 OR GREATER , AND WITHIN ALL DETENSION BASINS AND SWALES.
* SEED MIX A1 TO BE USED ON ALL OTHER DISTURBED AREAS.



NOTES:
1. LOCATION AND FACING TO BE APPROVED BY LANDSCAPE ARCHITECT IN THE FIELD.
2. TO BE SPACED 6' O.C. WHEN MORE THAN ONE

BOULDER BARRIER

SCALE: N.T.S.

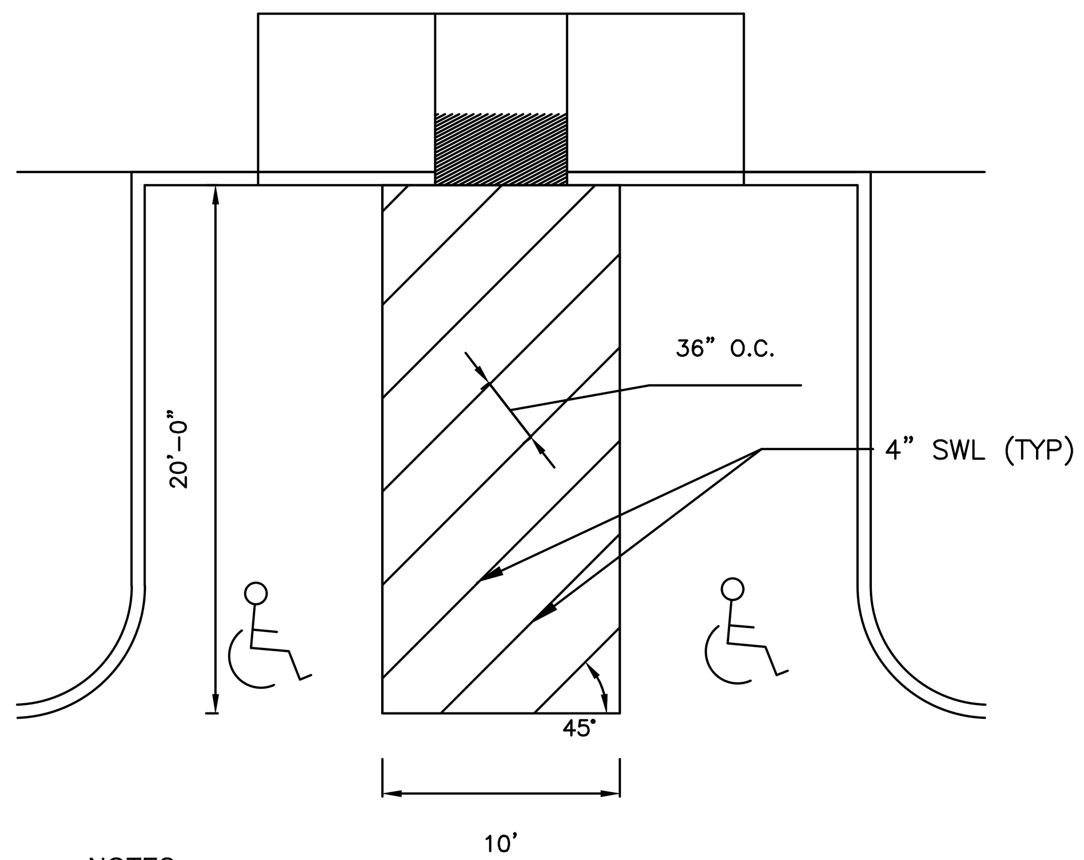


NOTES

1. GRANITE BOULDERS TO BE PLACED AT ADDITIONAL LOCATIONS NOT SHOWN ON PLANS AS DIRECTED BY THE ENGINEER OR TOWN/

PLACED BOULDER INSTALLATION

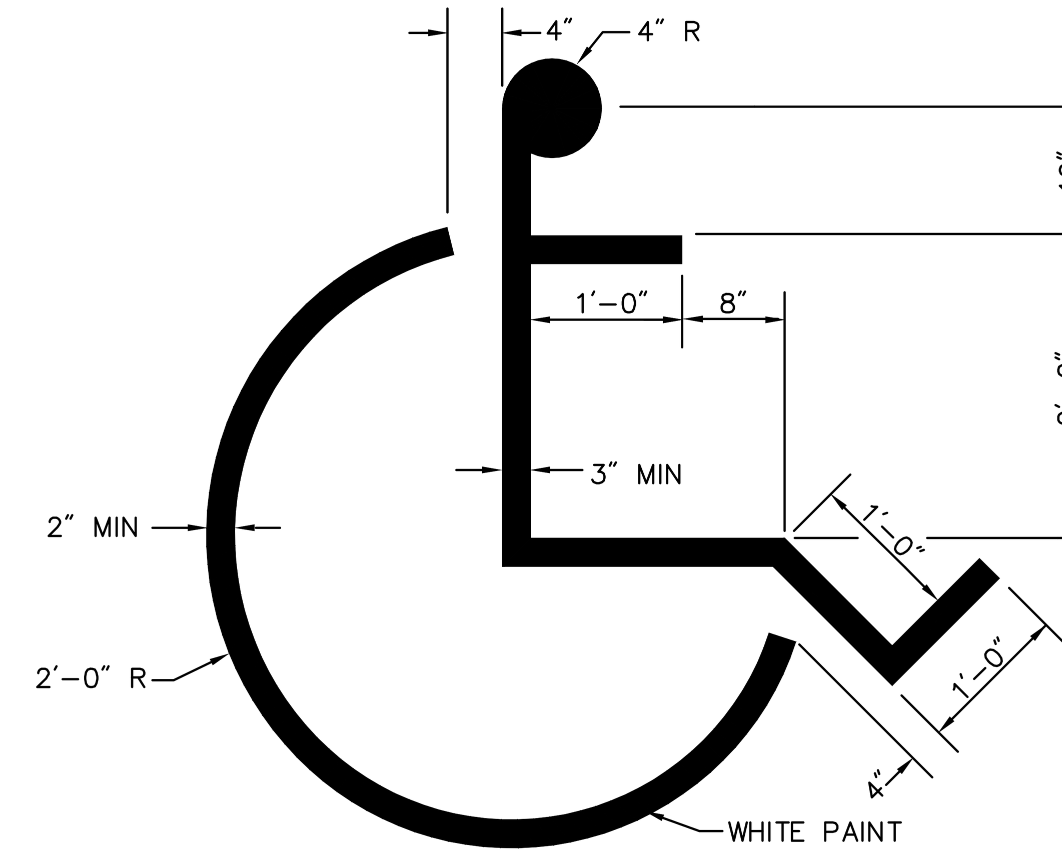
SCALE: N.T.S.



NOTES:
1. ALL DIMENSIONS TO EDGES OF 4" PAVEMENT STRIPING.
2. ALL PAVEMENT MARKINGS SHALL BE REFLECTORIZED PAINT.

ACCESSIBLE PAVEMENT MARKINGS

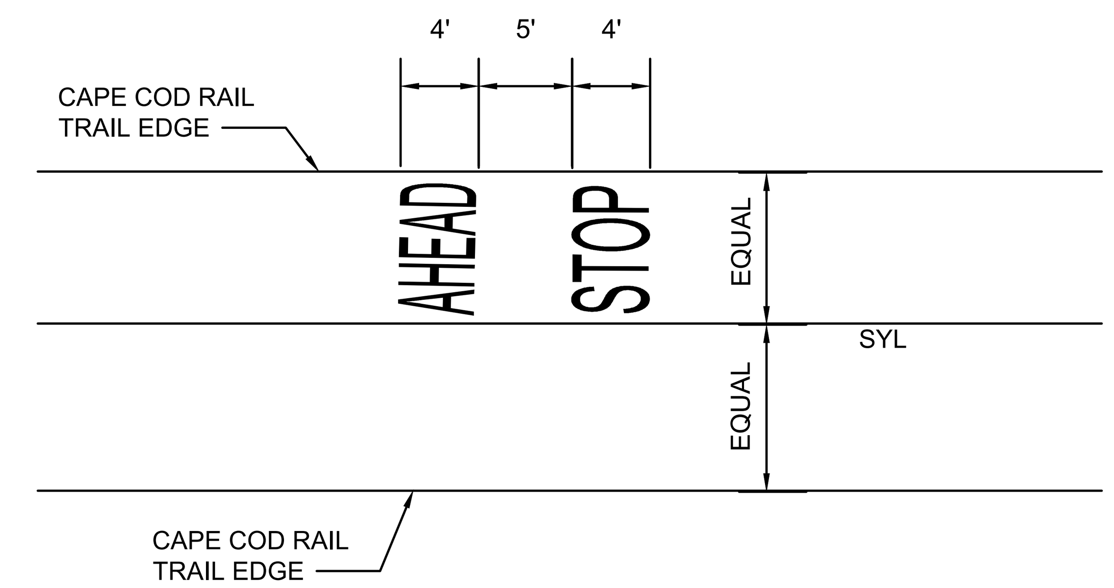
SCALE: N.T.S.



NOTE: SYMBOL SHALL BE CENTERED IN THE PARKING STALL

HANDICAPPED PARKING PAVEMENT MARKINGS

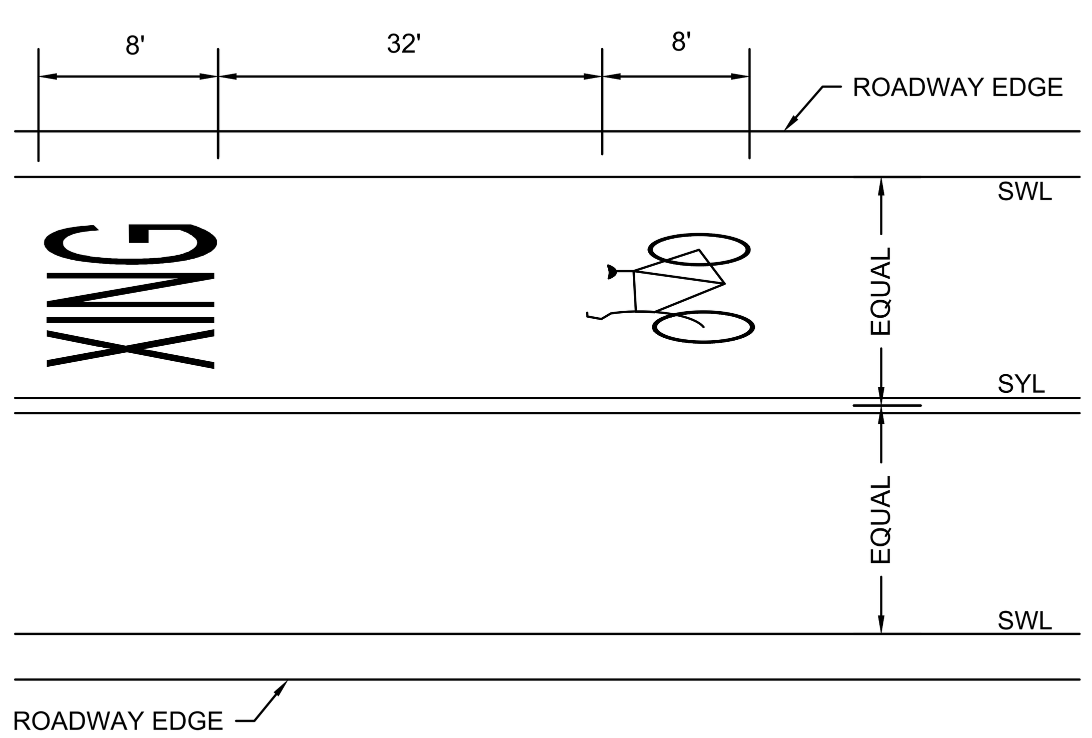
SCALE: N.T.S.



NOTES:
1. PAVEMENT MARKINGS AS PER MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. PAVEMENT MARKINGS SHALL BE REFLECTIVE PAINT.

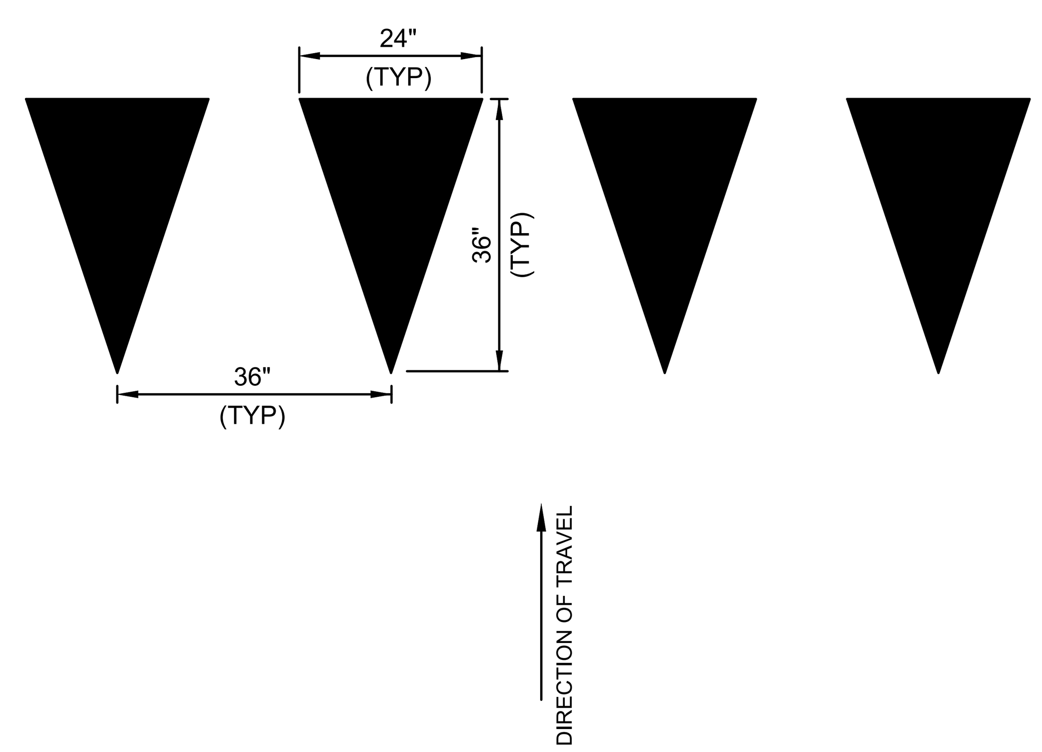
SHARED-USE PATH PAVEMENT MARKINGS

SCALE: N.T.S.



ROADWAY PAVEMENT MARKINGS

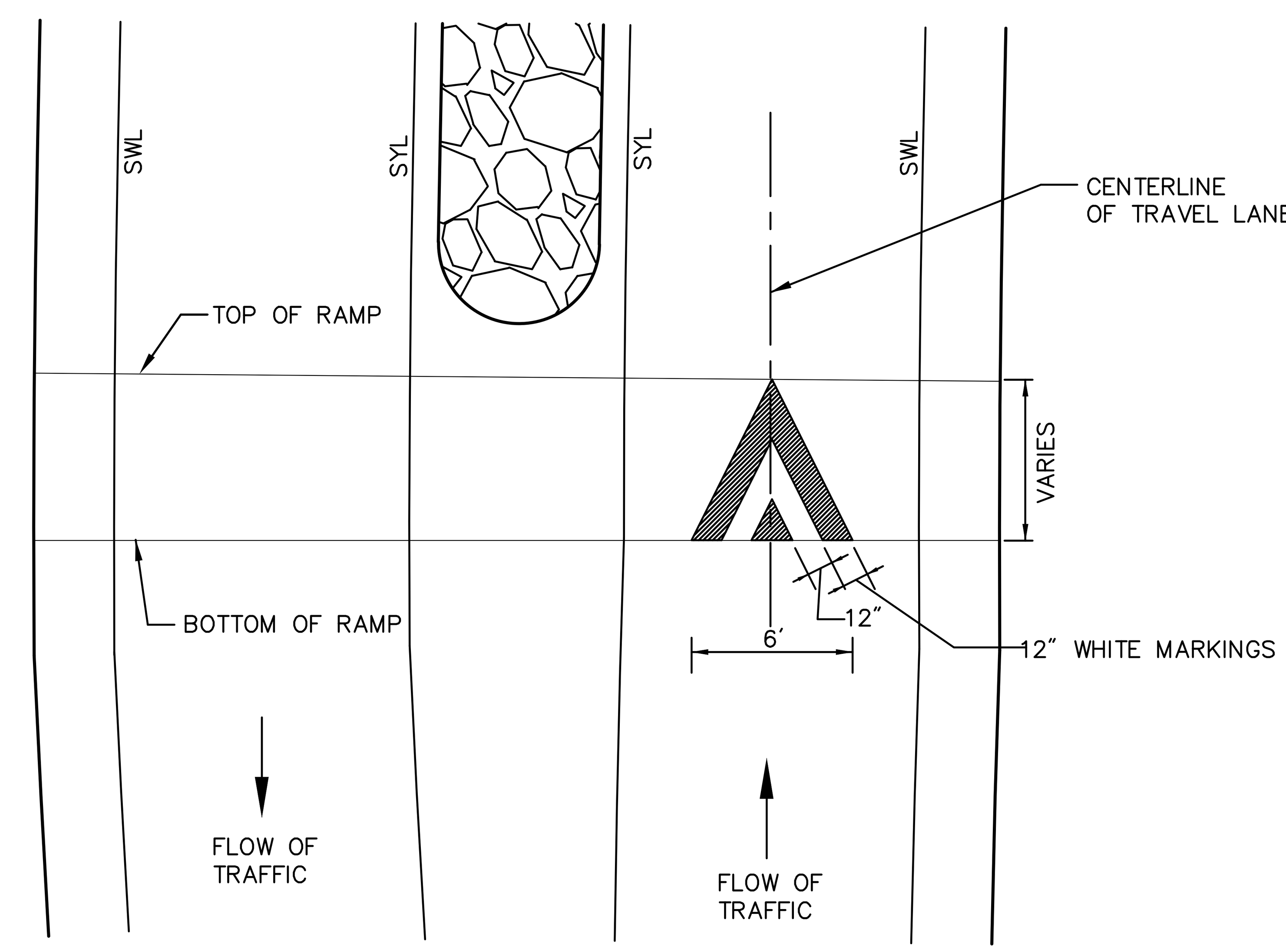
SCALE: N.T.S.



NOTES:
1. YIELD LINES SHALL CONSIST OF A ROW OF SOLID WHITE TRIANGLES.
2. IF APPLICABLE, YIELD LINES SHALL BE PLACED 4-FEET IN ADVANCE OF THE NEAREST CROSSWALK LINE.
3. IN THE ABSENCE OF A MARKED CROSSWALK, YIELD LINES SHALL BE PLACED AS SHOWN ON THE PLANS.

YIELD LINE TRIANGLES

SCALE: N.T.S.



NOTES:
1. RAMP MARKINGS SHALL BE REFLECTIVE THERMOPLASTIC.
2. SEE TRAFFIC PLANS FOR RAMP MARKING LAYOUT
3. SEE FIGURE 3B-29 IN THE MUTCD FOR MORE DETAIL.

SPEED TABLE PAVEMENT MARKINGS

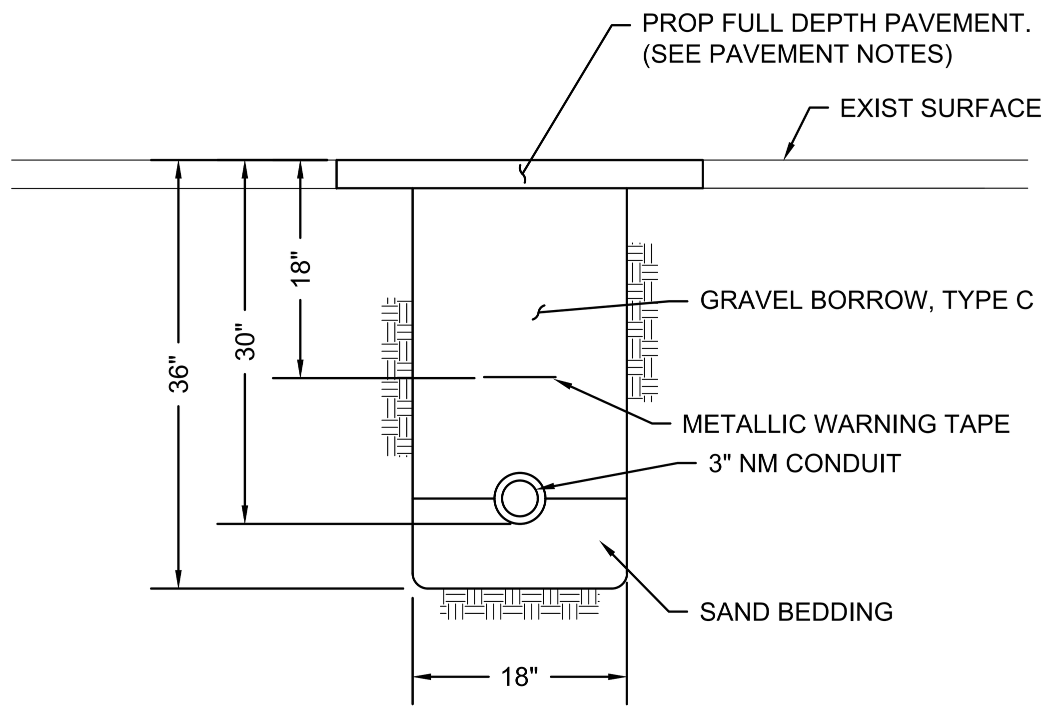
SCALE: N.T.S.

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	101	267
PROJECT FILE NO. 607398			

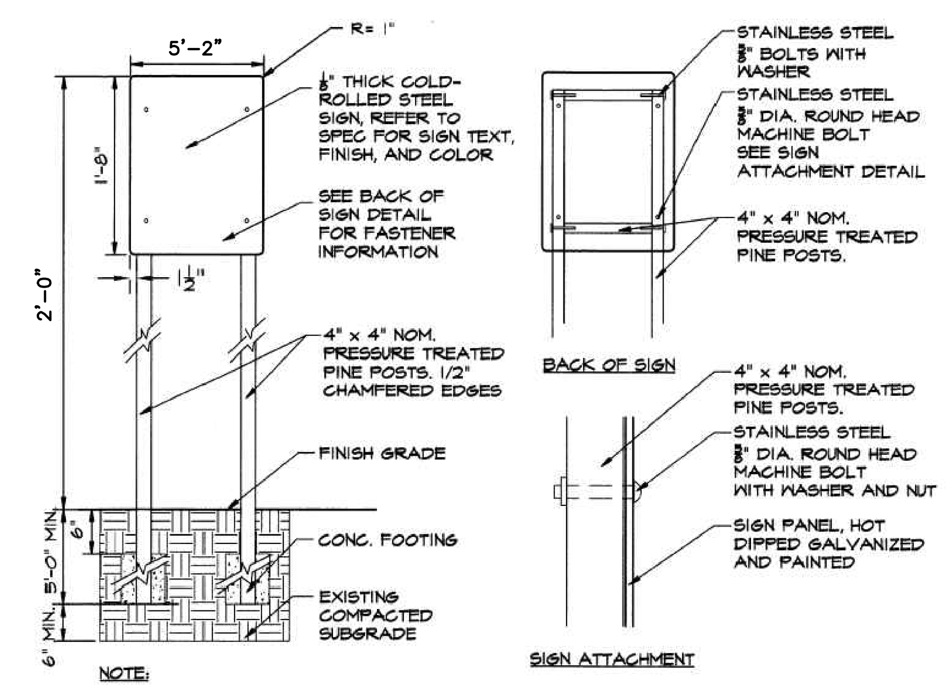
CONSTRUCTION DETAILS

Plotted on 22-Nov-2021 5:24 PM
607398_HD(DET).DWG



CONDUIT CROSSING ROADWAY/DRIVEWAY

SCALE: N.T.S.

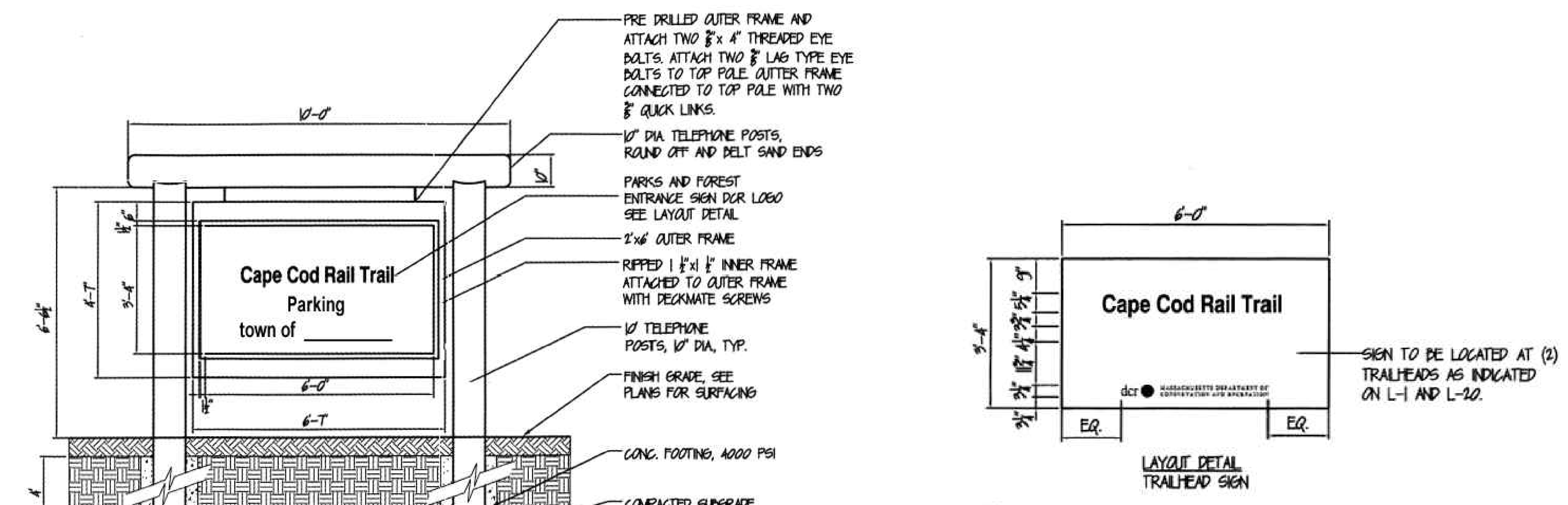


NOTE:

1. ARROW ON SIGN NEEDS TO CHANGE ACCORDING TO THE INTERSECTION AND THE DIRECTION OF TOWN CENTER FROM THAT INTESECTION.

PARKING LOT IDENTIFIER SIGN (SP-4x)

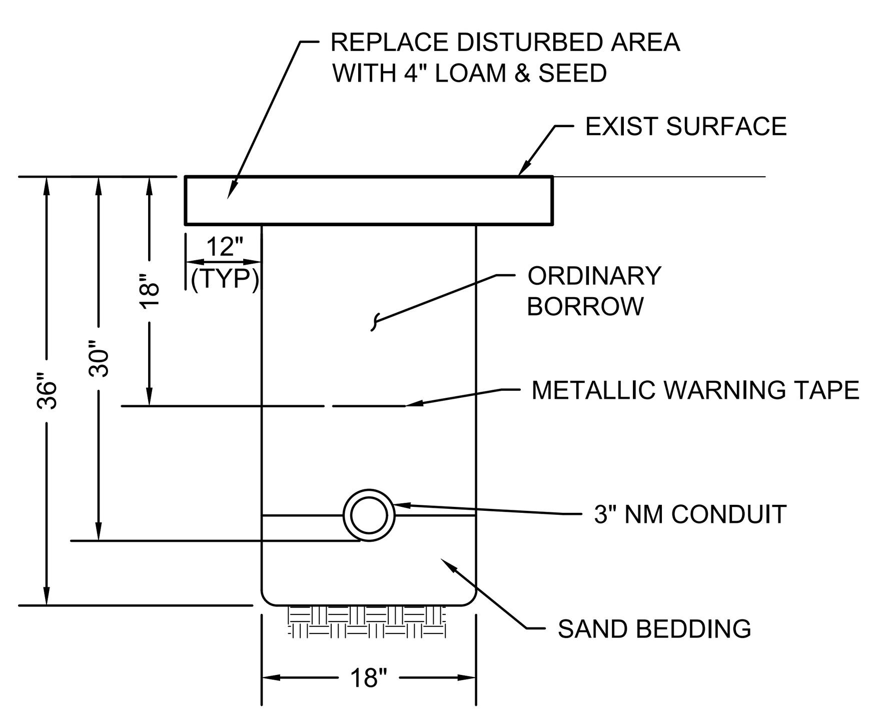
SCALE: N.T.S.



NOTES:
1. THE SIGN MESSAGE IS BLACK ON A 'SAGE' BACKGROUND. LOGOTYPE IS DCR BURGUNDY.
2. MESSAGE ON THE SIGN IS FRUTIGER 65 BOLD AND FRUTIGER 55 ROMAN.
3. STAIN FRAME AND POLES DARK BROWN.
4. USE DETAIL FOR INSTALLATION OF SP1–C.

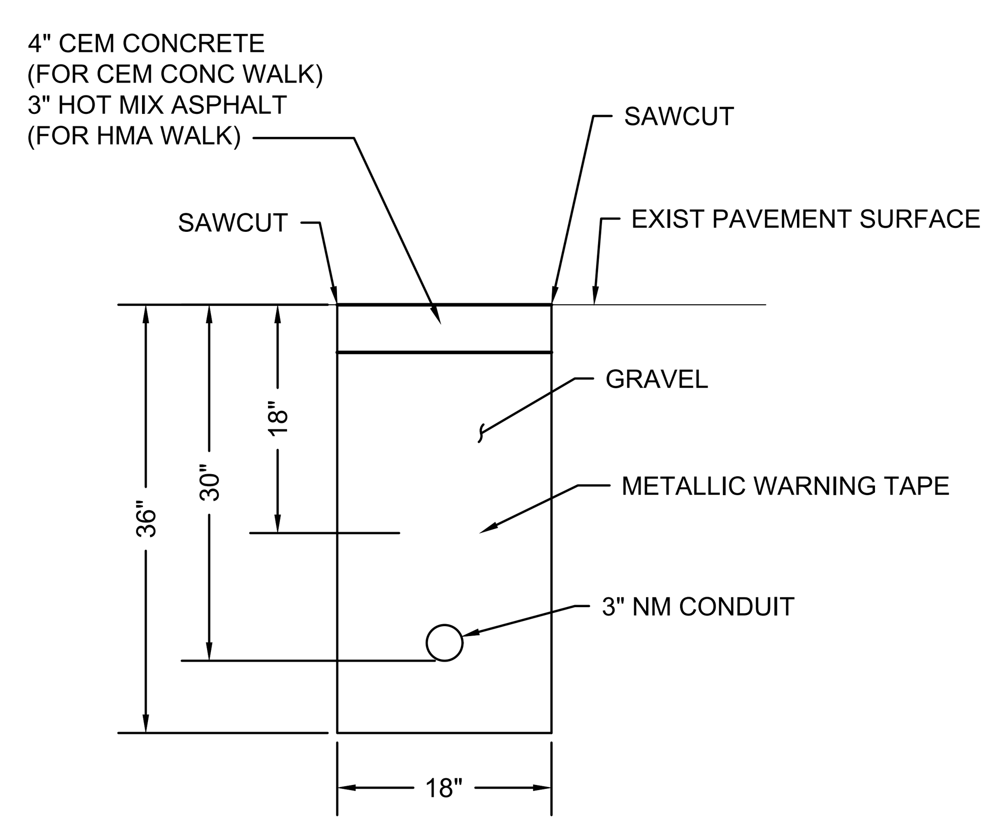
CCRT IDENTIFIER SIGN (SP-3x)

SCALE: N.T.S.



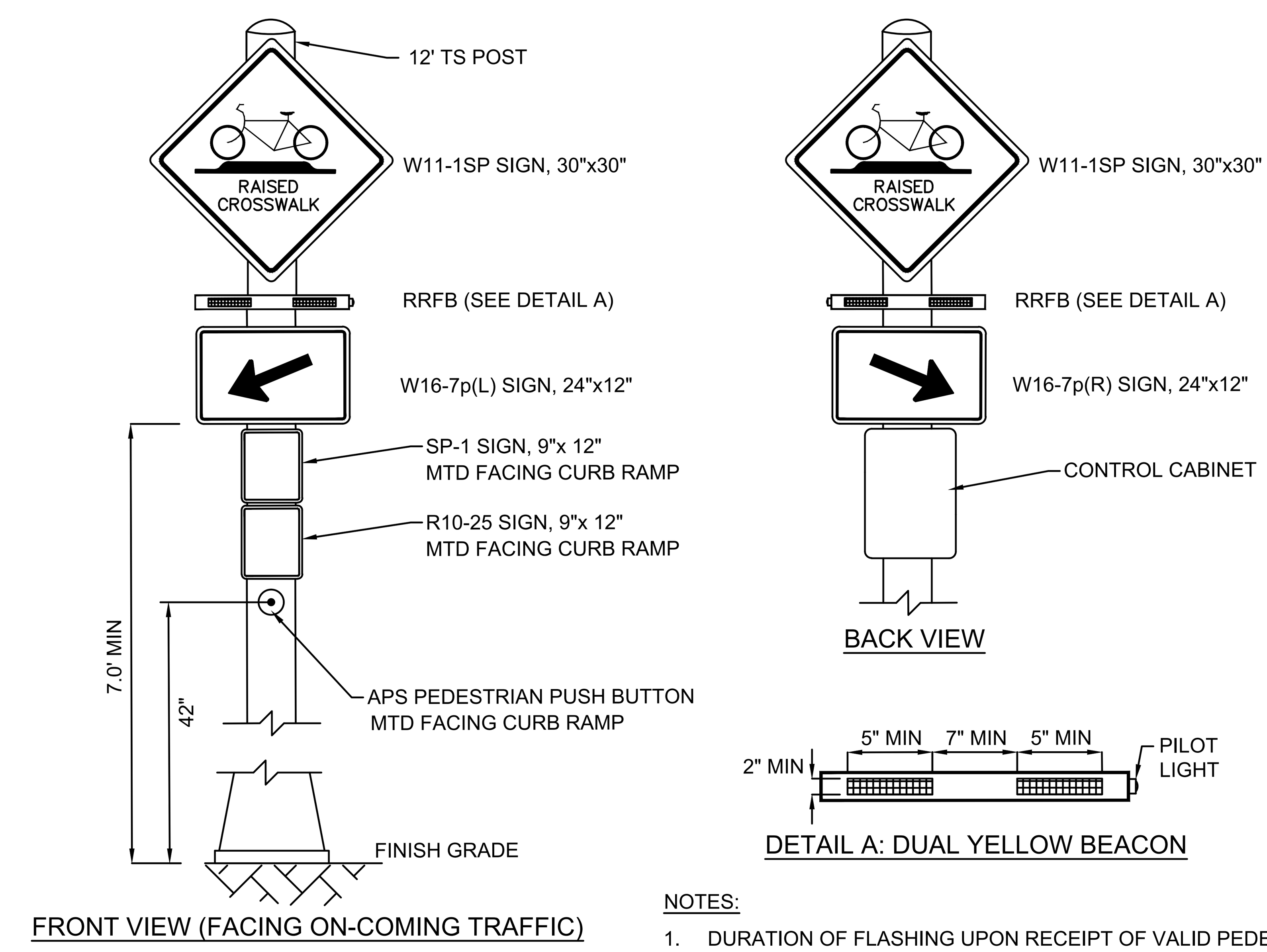
CONDUIT IN GRASS

SCALE: N.T.S.



CONDUIT IN SIDEWALK

SCALE: N.T.S.



NOTES:

1. DURATION OF FLASHING UPON RECEIPT OF VALID PEDESTRIAN PUSHBUTTON ACTUATION SHALL BE INITIALLY SET FOR 15 SECONDS.
2. SEE SPECIAL PROVISIONS ITEMS 824.211 & 824.212 FOR MORE DETAILS.

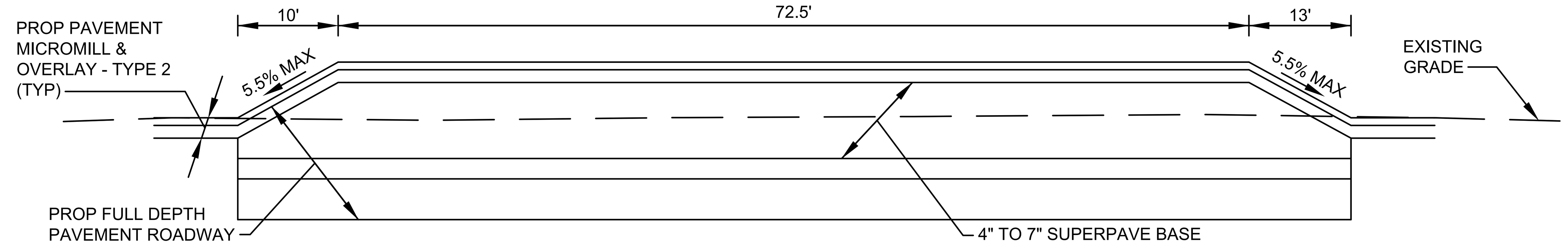
RECTANGULAR RAPID FLASHING BEACON (AC POWER) (BI-DIRECTIONAL)

SCALE: N.T.S.

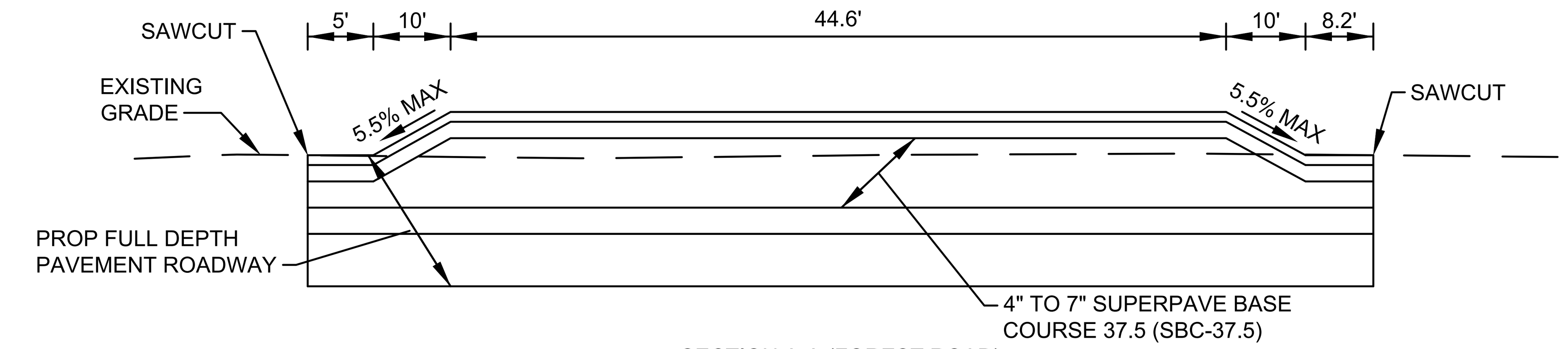
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	102	267
PROJECT FILE NO. 607398			

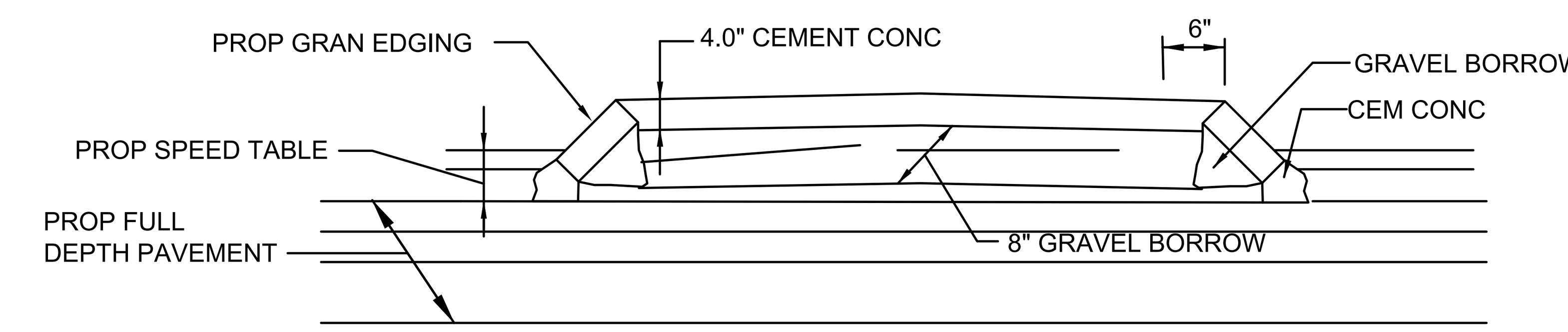
CONSTRUCTION DETAILS



SECTION A-A (OLD TOWN HOUSE ROAD)



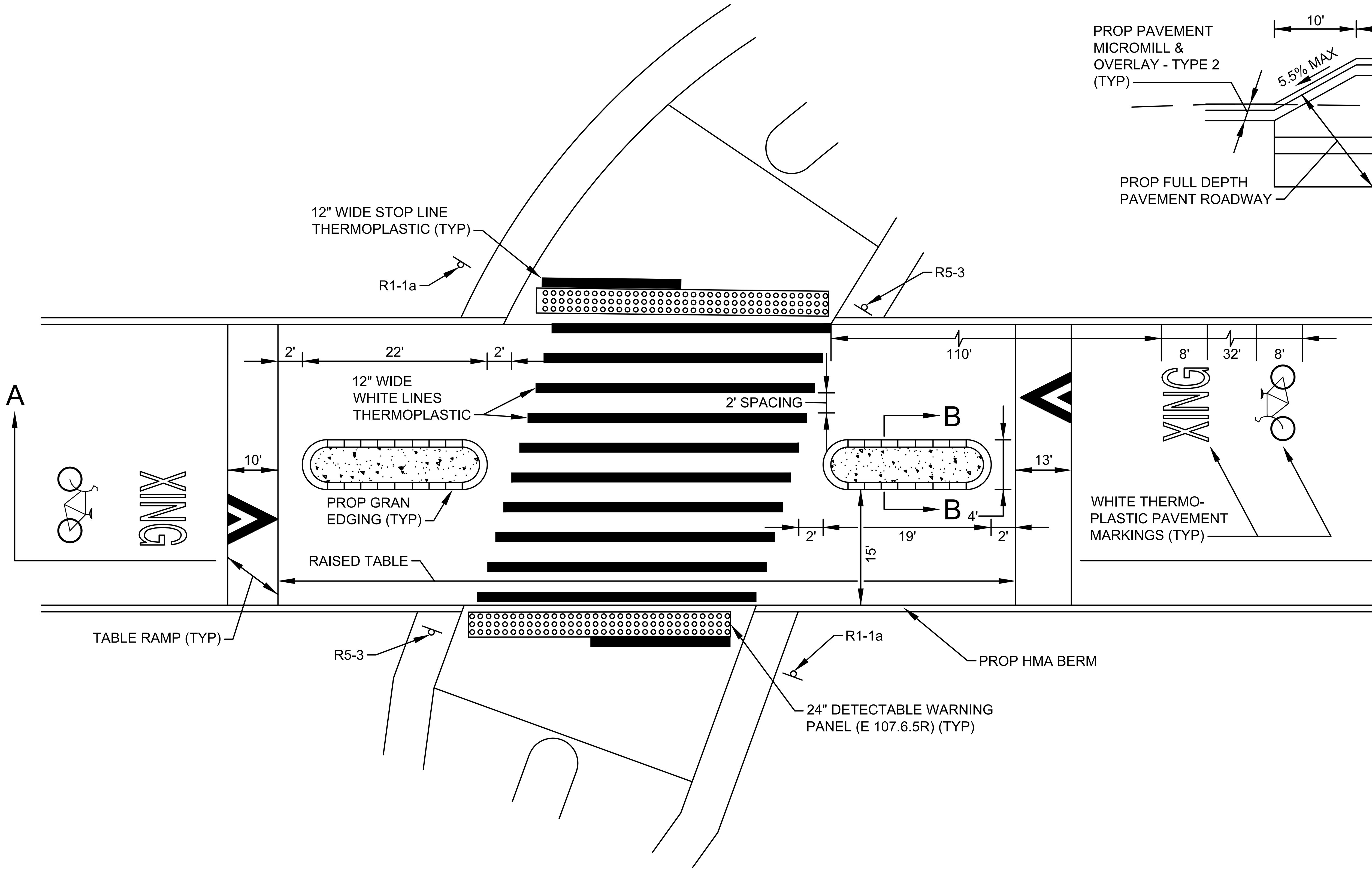
SECTION A-A (FOREST ROAD)



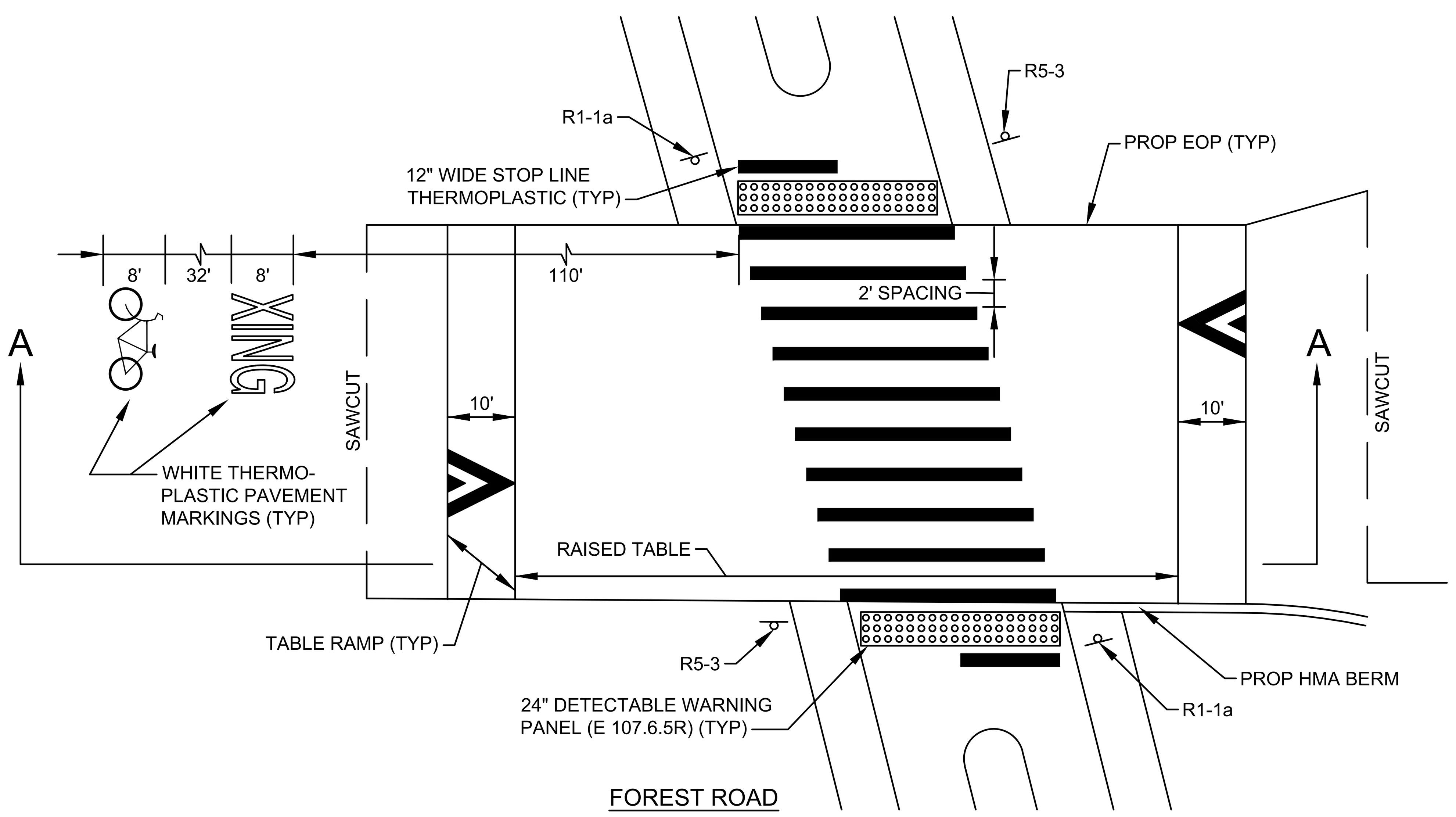
SECTION B-B

NOTE:

1. SEE PROFILE AT FOREST ROAD AND CURB TIE & GRADING PLAN AT OLD TOWN HOUSE ROAD FOR VERTICAL GEOMETRY OF SPEED TABLES.
2. PAYMENT FOR CEMENT CONCRETE FOR EDGING INSTALLATION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR GRANITE EDGING.



OLD TOWN HOUSE ROAD



FOREST ROAD

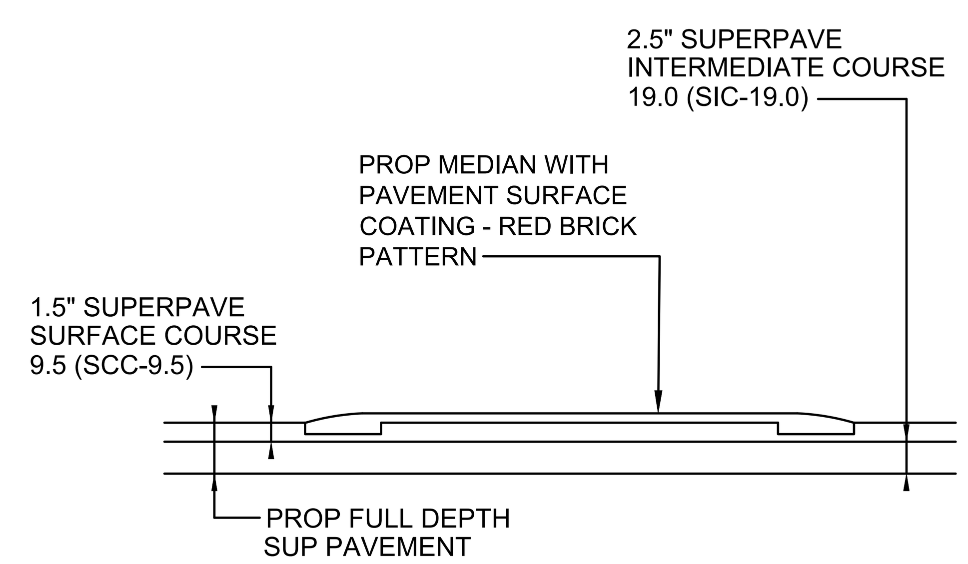
ROADWAY SIGNAGE AND MARKINGS AT INTERSECTIONS

NOTE:

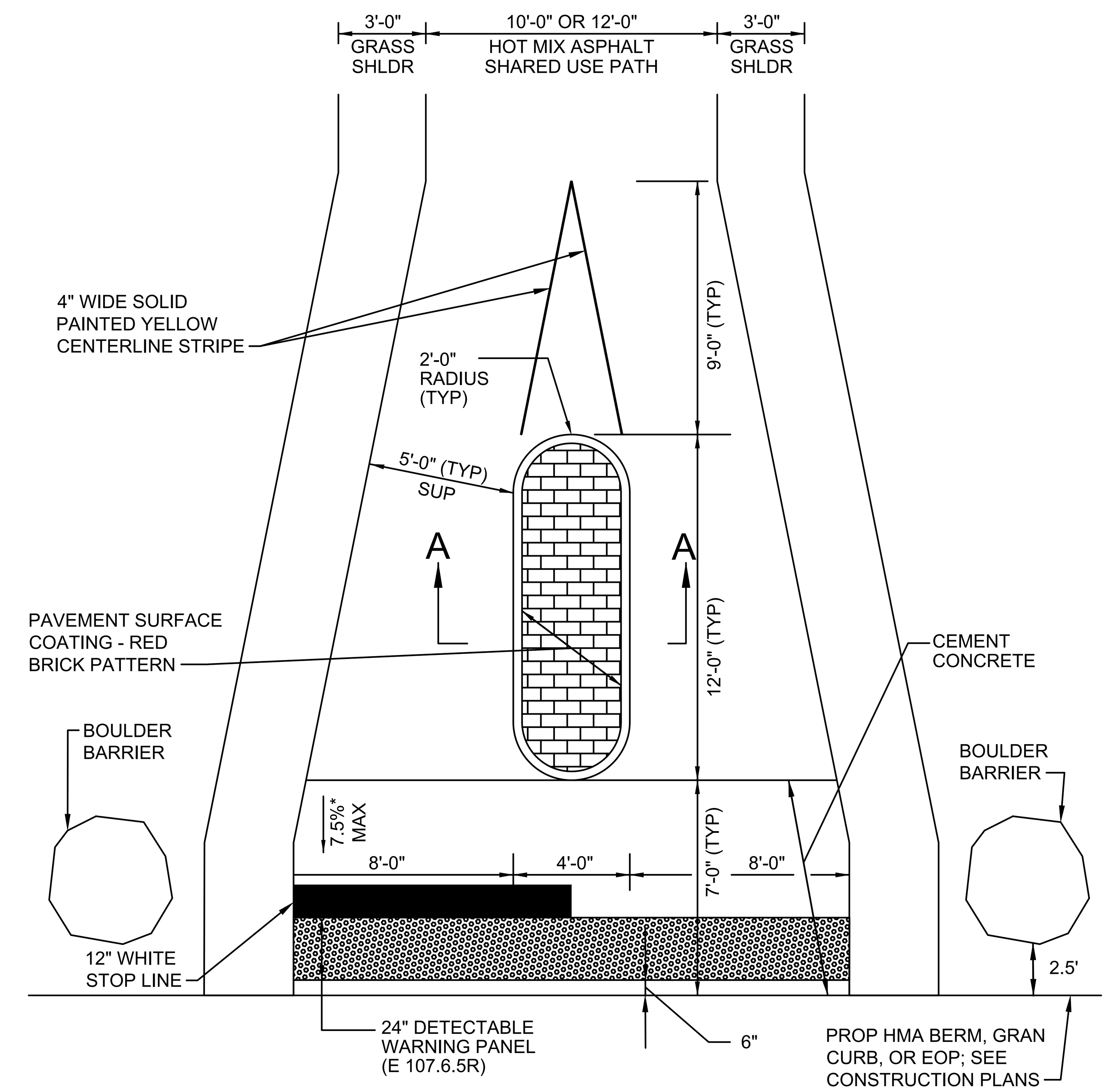
FOR ADDITIONAL ROADWAY SIGNAGE SEE TRAFFIC SIGN & PAVEMENT MARKINGS PLANS - CCRT

TYPICAL AT-GRADE INTERSECTION WITH RAISED TABLE

SCALE: N.T.S.



SECTION A-A



NOTE:

PAYMENT FOR SUPERPAVE INTERMEDIATE COURSE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PAVEMENT SURFACE COATING.

*0.5% CONSTRUCTION TOLERANCE

SPLITTER ISLAND AND SHARED USE PATH PEDESTRIAN CURB RAMP

SCALE: N.T.S.

DATE: DECEMBER 2005

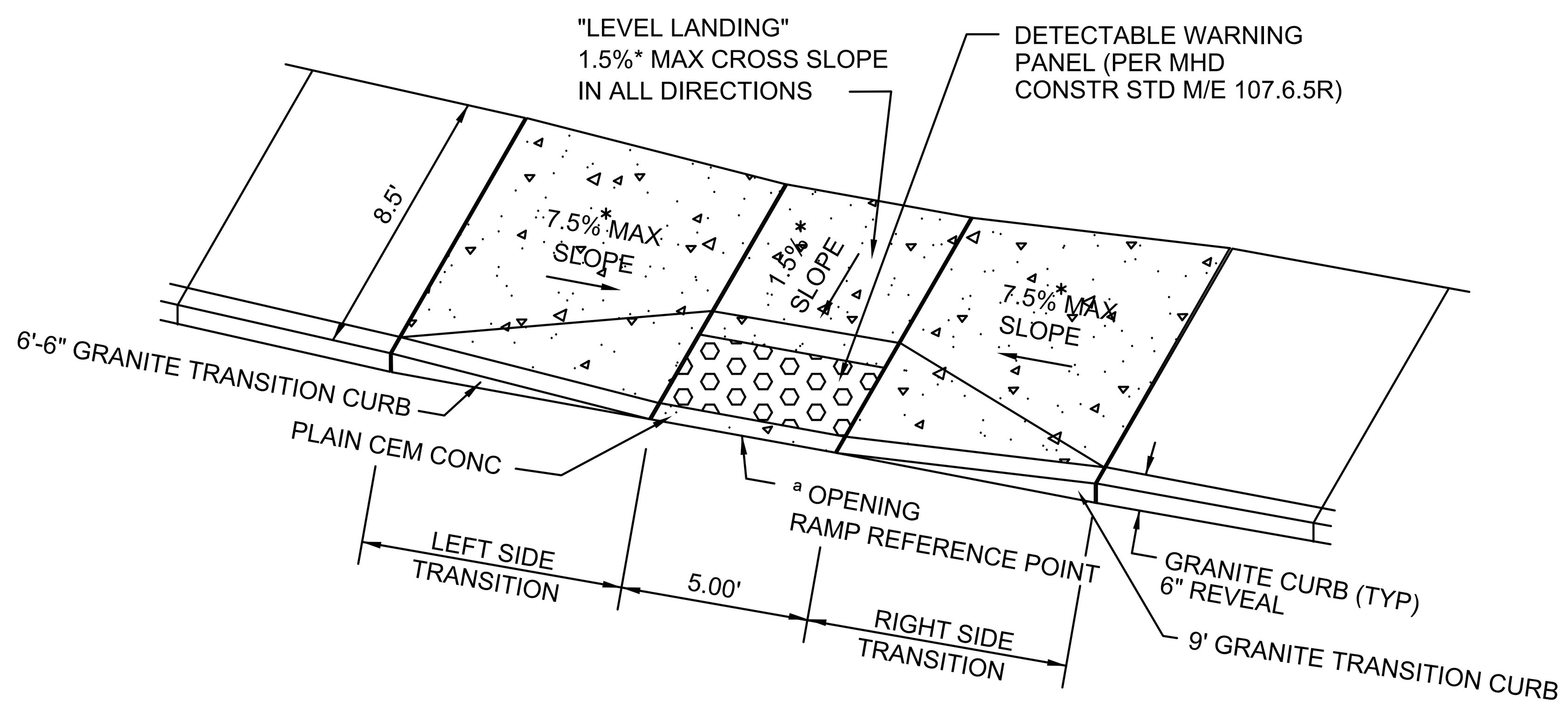
607398_HD(DET).DWG

Plotted on 22-Nov-2021 5:24 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

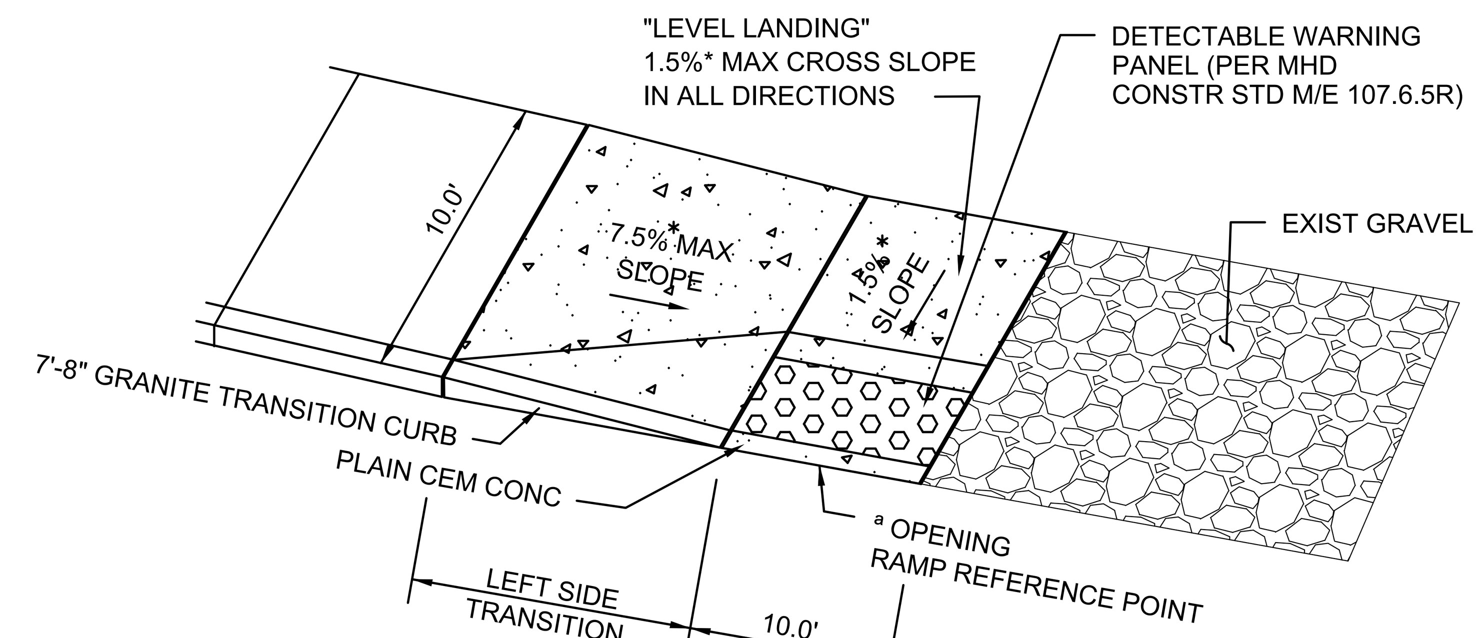
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	103	267
PROJECT FILE NO. 607398			

CONSTRUCTION DETAILS



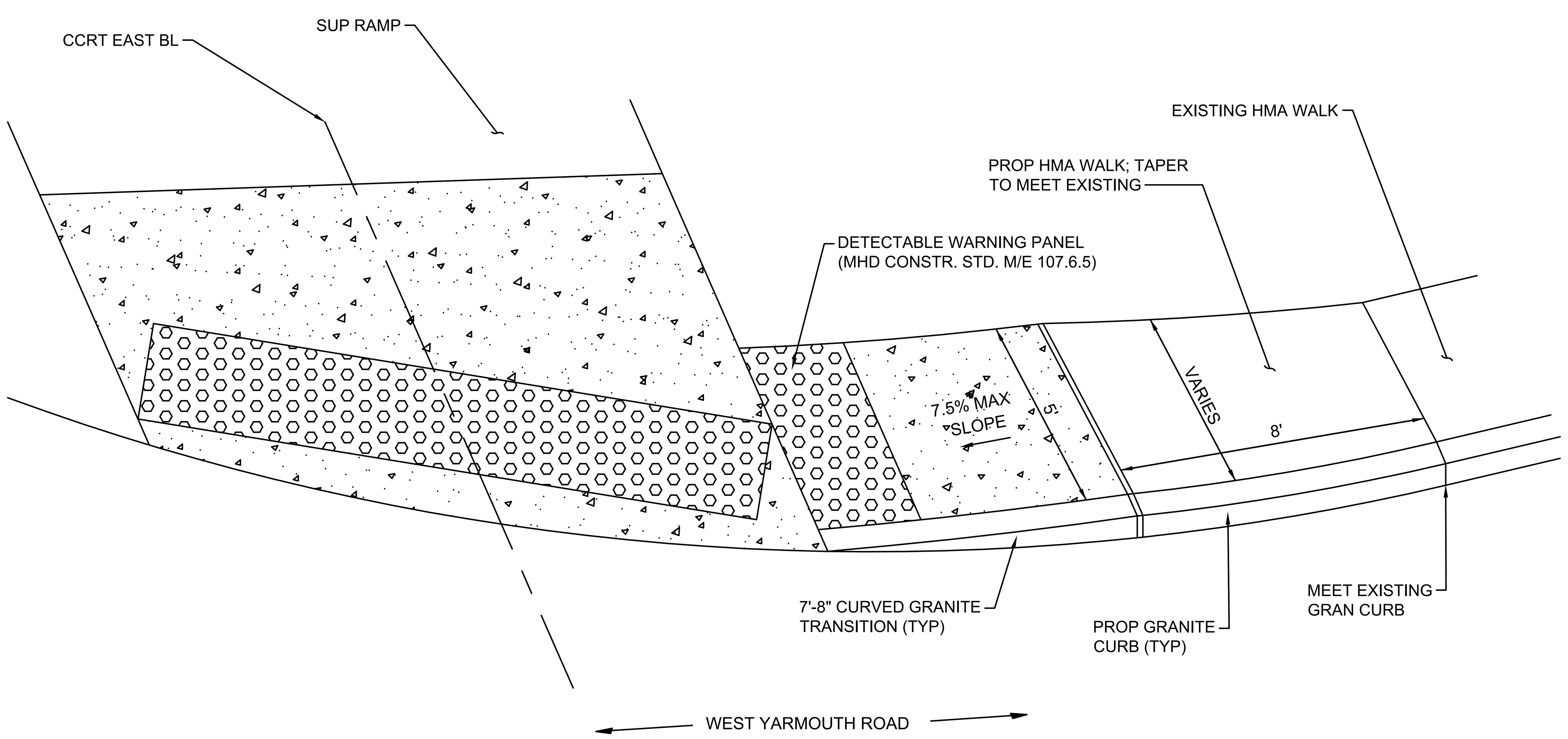
GOLF COURSE PARKING LOT PEDESTRIAN CURB RAMP (STA 32+10 RT)

SCALE: N.T.S.



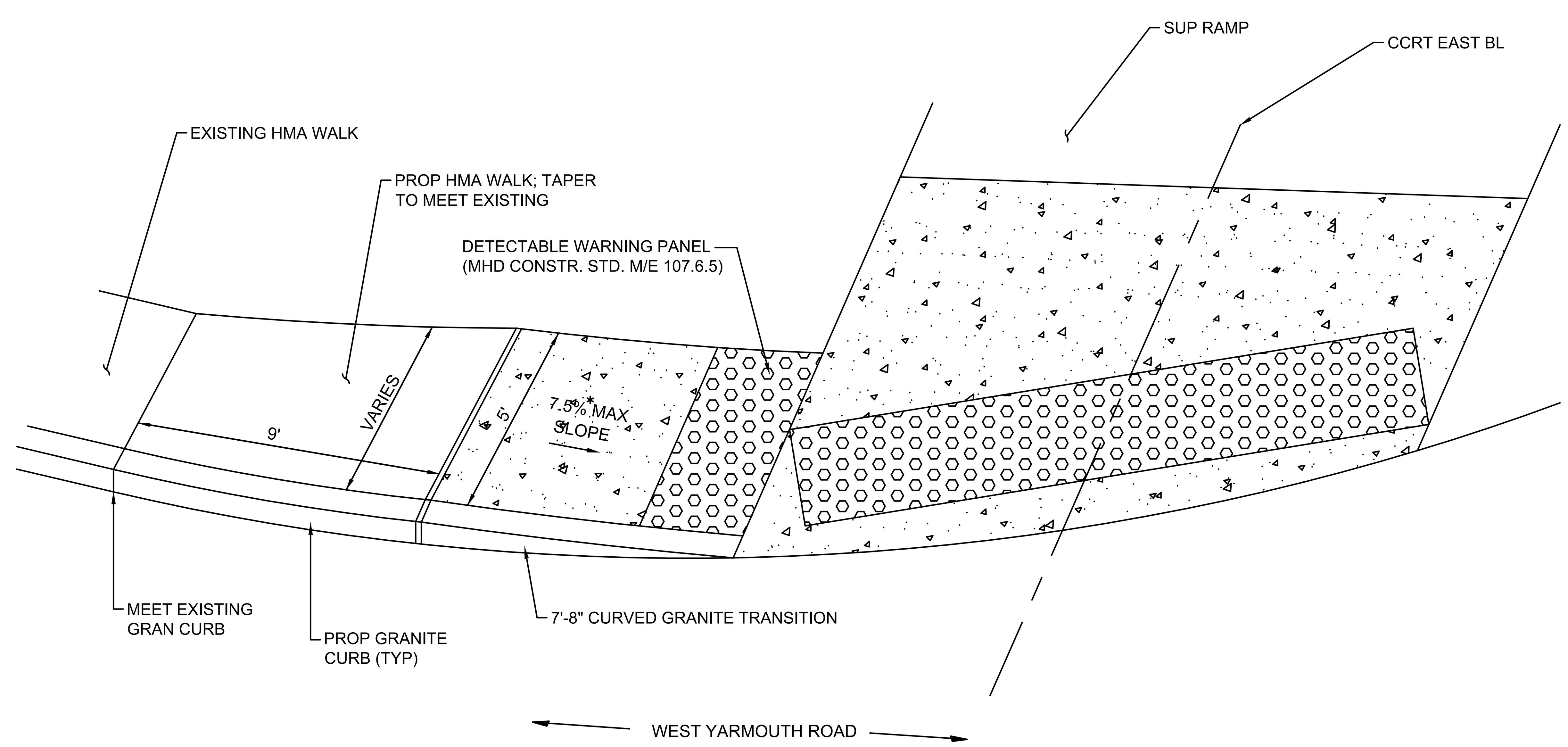
HIGGINS CROWELL PARKING LOT PEDESTRIAN CURB RAMP (STA 208+43 LT)

SCALE: N.T.S.



ONE DIRECTIONAL PEDESTRIAN CURB RAMP (STA 593+24 LT)

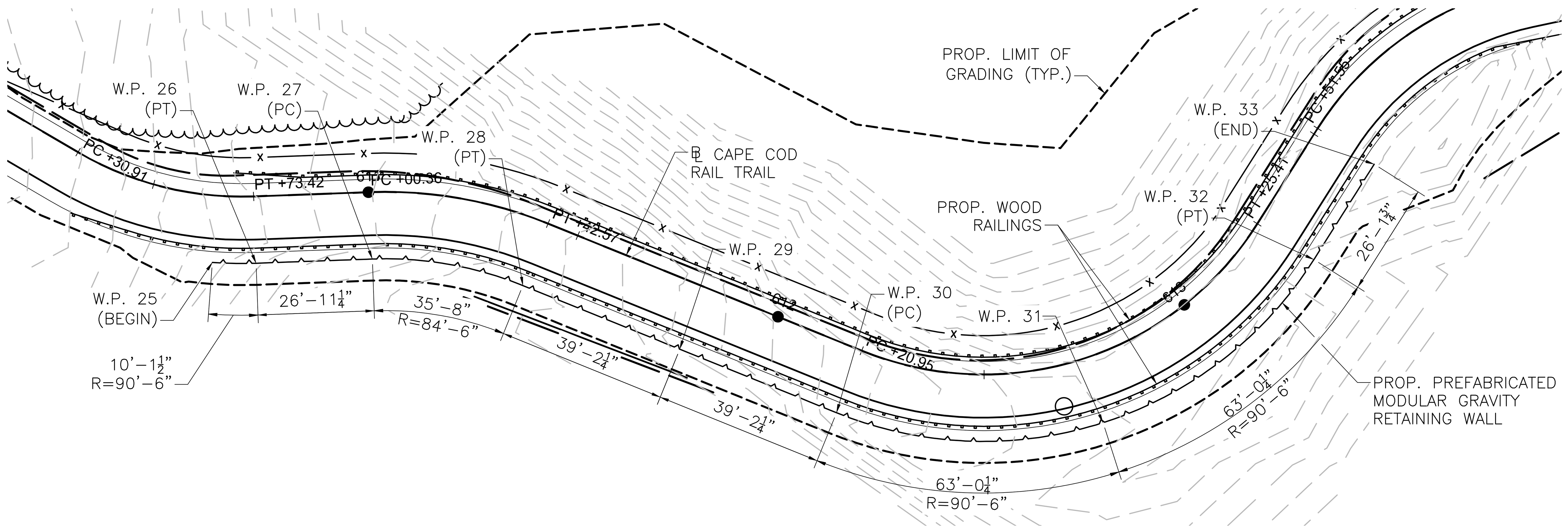
SCALE: N.T.S.



ONE DIRECTIONAL PEDESTRIAN CURB RAMP (STA 593+70 LT)

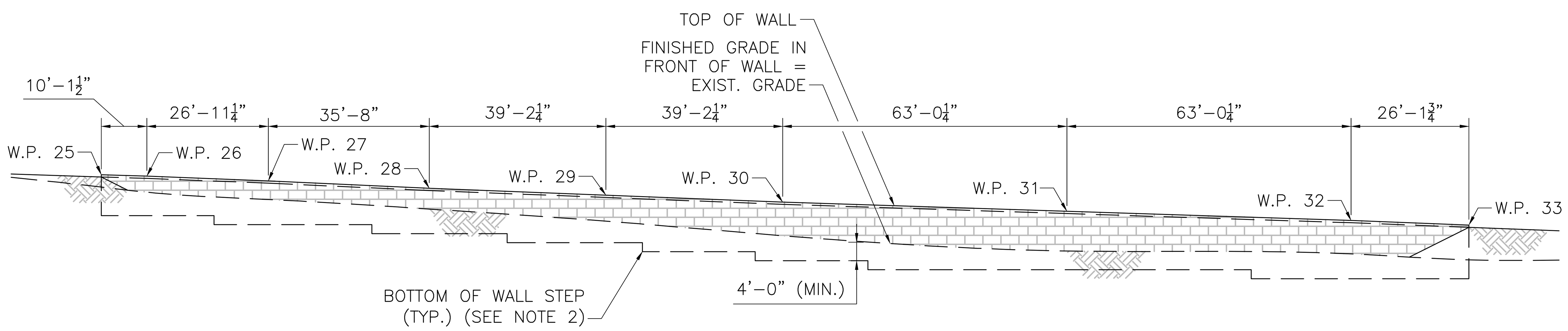
SCALE: N.T.S.

Plotted on 22-Nov-2021 5:24 PM
607398_HD(DET).DWG



RETAINING WALL PLAN

SCALE: 1" = 20'



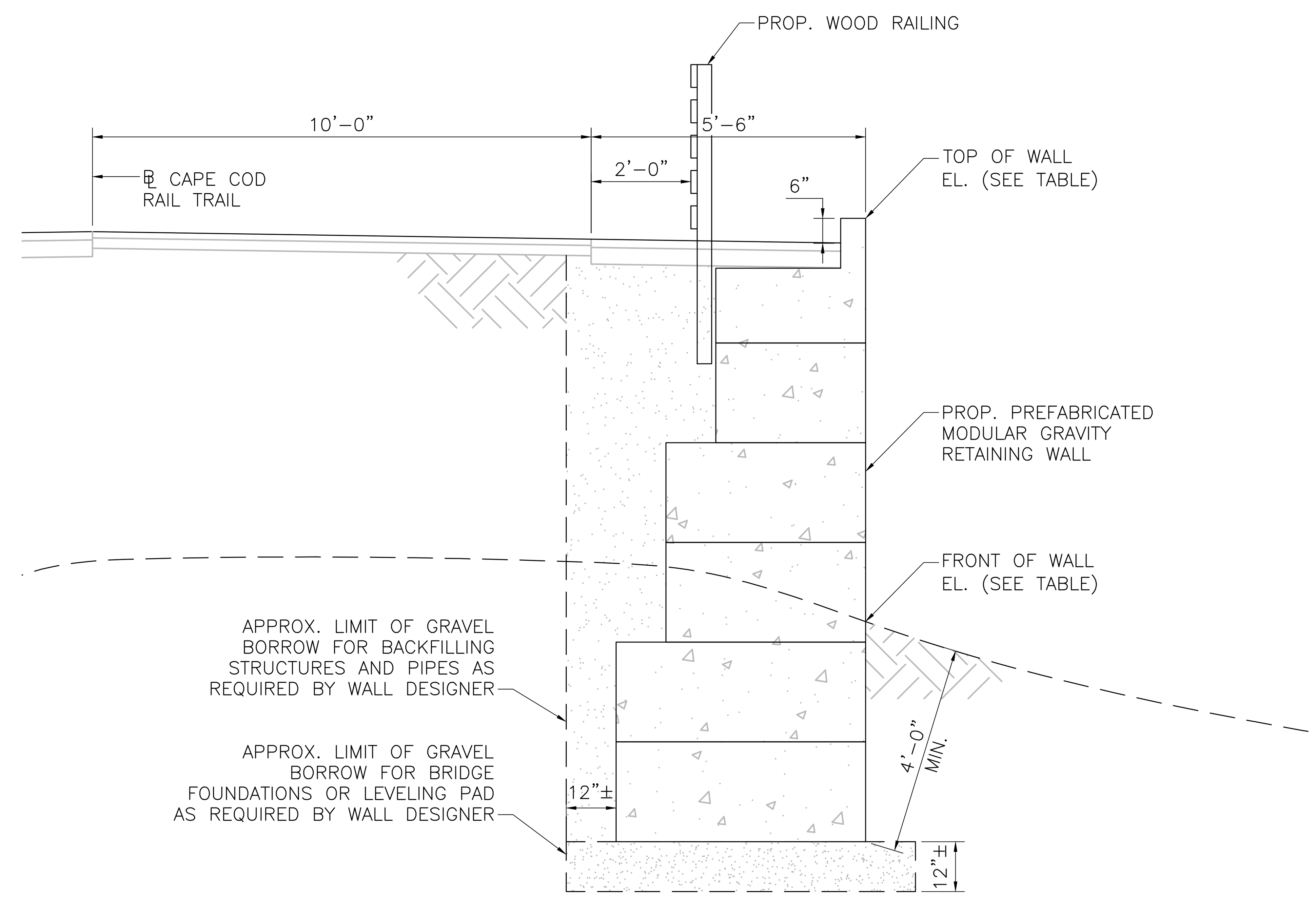
RETAINING DEVELOPED WALL ELEVATION

SCALE: 1" = 20'

RETAINING WALL GEOMETRY				
WORKING POINT	STATION	OFFSET	TOP OF WALL EL.	FRONT OF WALL EL.
W.P. 25	610+65.03	15.50' RT	50.07'	47.33'
W.P. 26	610+73.42	15.50' RT	49.74'	46.17'
W.P. 27	611+00.36	15.50' RT	48.69'	44.57'
W.P. 28	611+42.57	15.50' RT	47.05'	42.45'
W.P. 29	611+81.76	15.50' RT	45.52'	39.76'
W.P. 30	612+20.95	15.50' RT	43.99'	36.53'
W.P. 31	612+73.18	15.50' RT	41.95'	33.14'
W.P. 32	613+25.40	15.50' RT	39.92'	32.51'
W.P. 33	613+51.55	15.50' RT	38.90'	31.17'

NOTES:

1. RETAINING WALL TYPE SHOWN IS PRELIMINARY ONLY. PREFABRICATED MODULAR GRAVITY RETAINING WALL SHALL BE DESIGNED BY THE CONTRACTOR.
2. BOTTOM OF WALL STEPS ARE SHOWN APPROXIMATELY. STEP LOCATIONS SHALL BE DETERMINED BY CONTRACTOR. 4'-0" MIN. EMBEDMENT SHALL BE MAINTAINED.
3. THE CONTRACTOR SHALL DETERMINE THE FACTORED BEARING PRESSURE PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
4. FACTORED BEARING RESISTANCE = XX.X KSF FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE XX.X KSF AND A RESISTANCE FACTOR OF 0.XX.



RETAINING WALL SECTION

SCALE: ½" = 1'-0"

607398_HD(WALL).DWG Plotted on 22-Nov-2021 5:29 PM

THIS SHEET INTENTIONALLY LEFT BLANK

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THIS SHEET INTENTIONALLY LEFT BLANK

THIS SHEET INTENTIONALLY LEFT BLANK

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	113	267
PROJECT FILE NO. 607398			

BRIDGE PLANS

Plotted on 24-Nov-2021 5:49 PM

607398_HD(BR-BLANK).DWG

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THIS SHEET INTENTIONALLY LEFT BLANK

Plotted on 24-Nov-2021 5:49 PM
607398_HD(BR-BLANK).DWG

THIS SHEET INTENTIONALLY LEFT BLANK

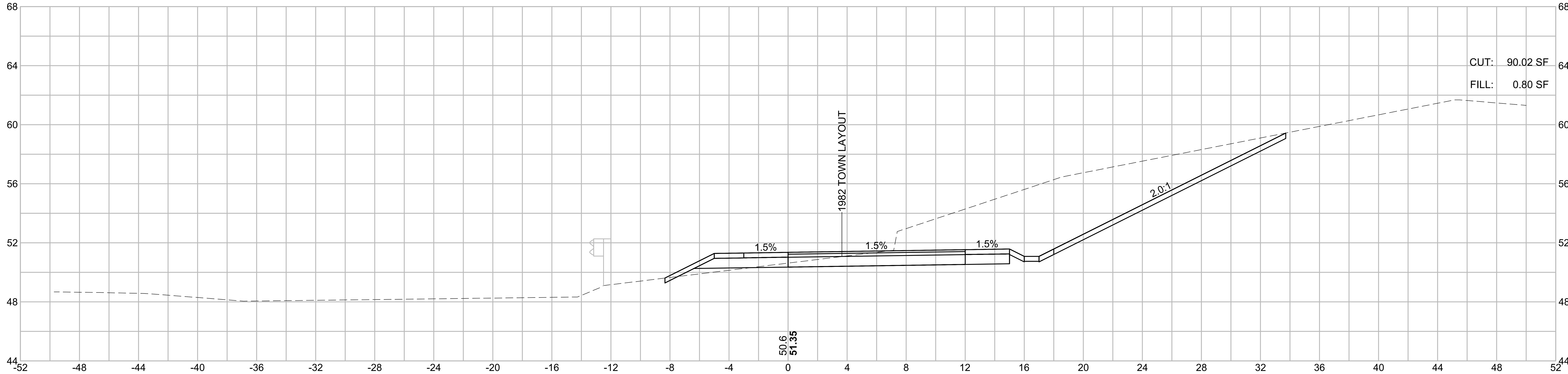
THIS SHEET INTENTIONALLY LEFT BLANK

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	117	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

52+50



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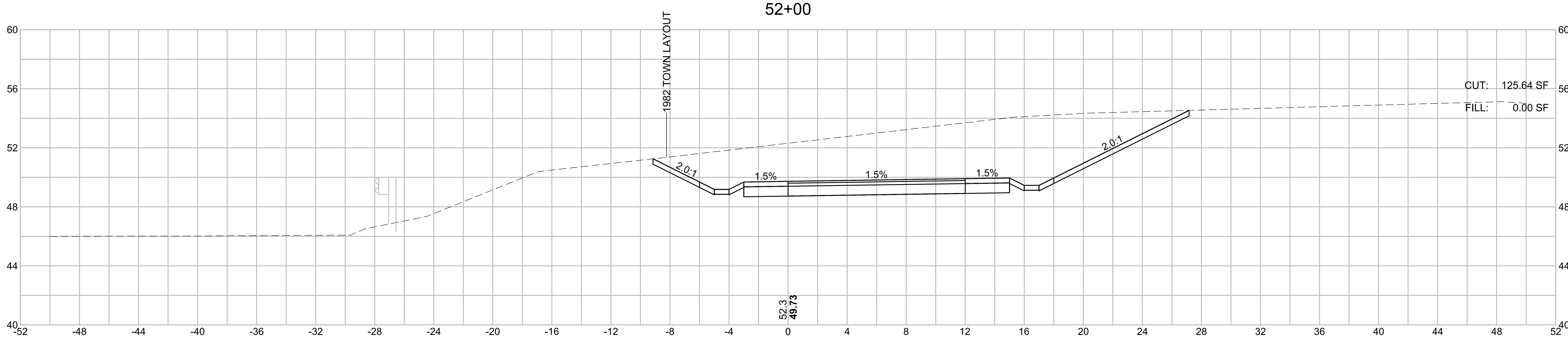
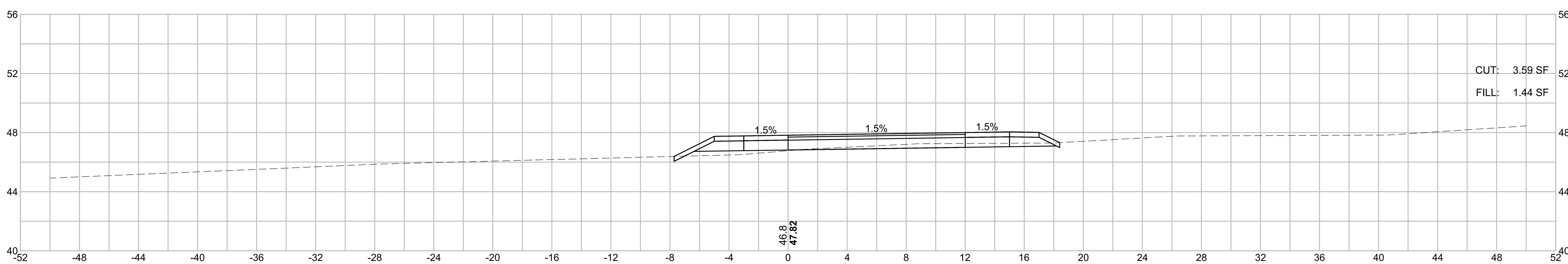


51+50



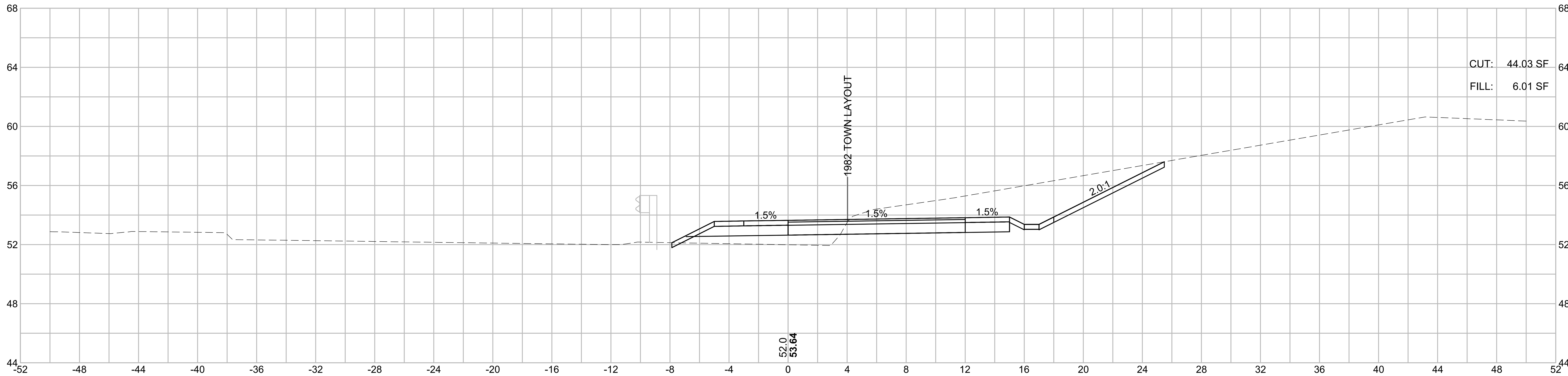
607398_HD(XSEC-WEST-1).DWG Plotted on 21-Oct-2021 8:13 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	118	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

53+50



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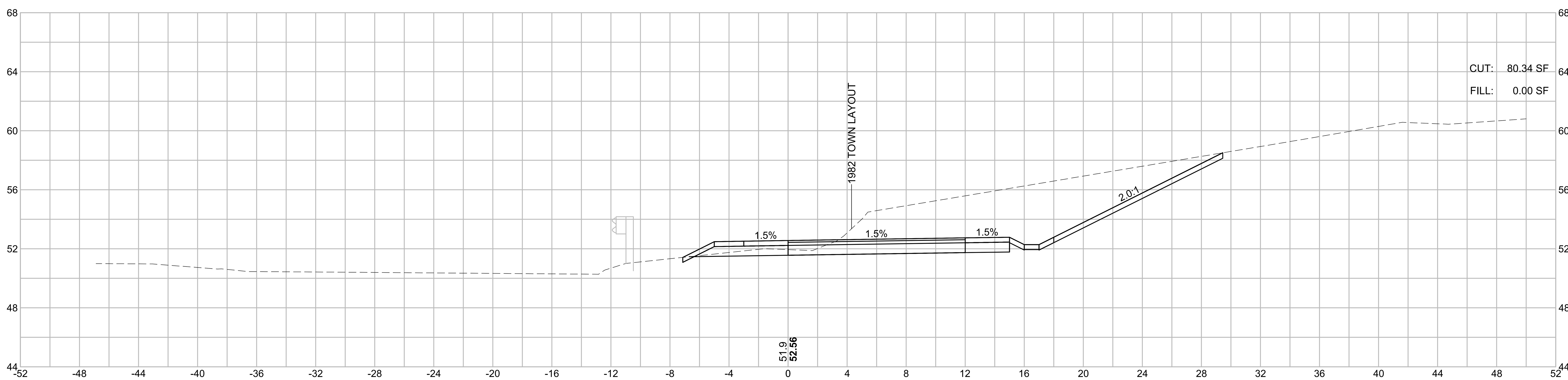


HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

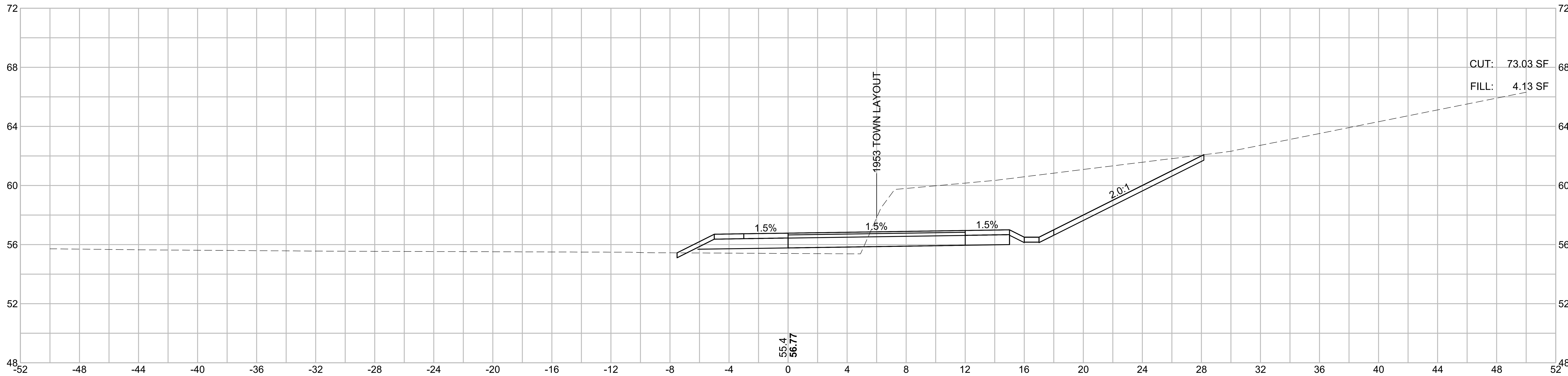
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	119	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:14 AM

607398_HD(XSEC-WEST-1).DWG

54+50



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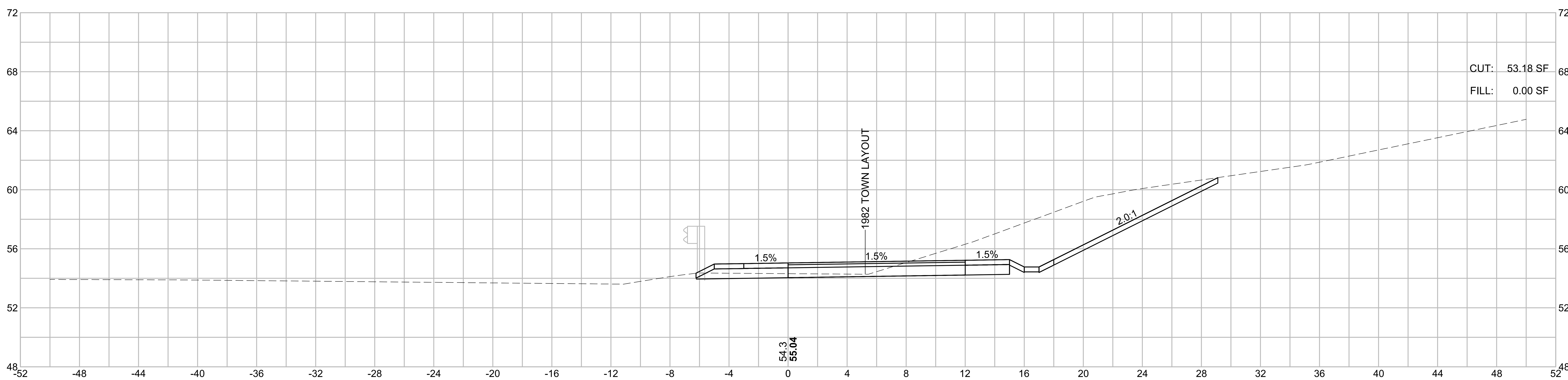


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

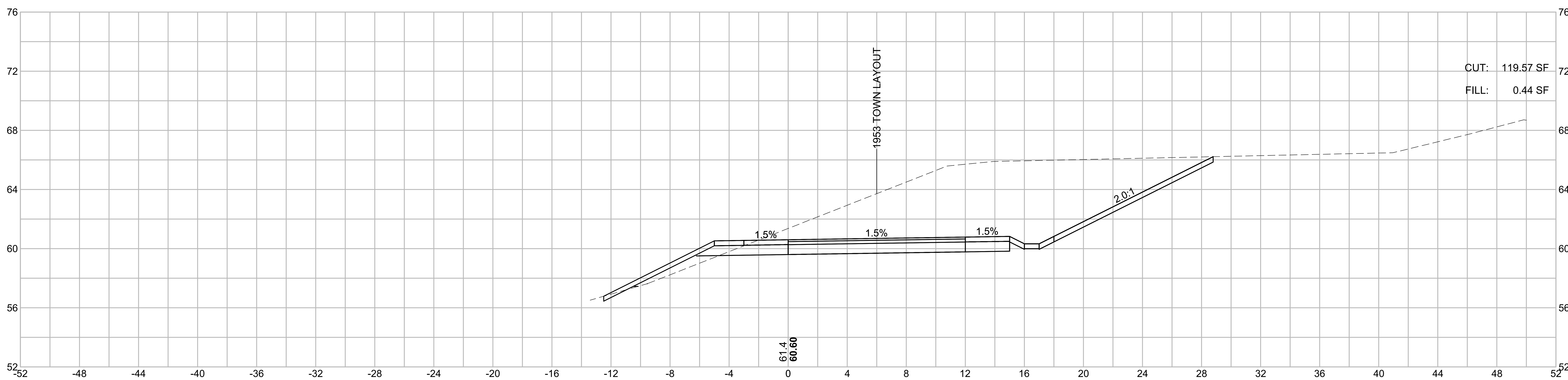
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	120	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:14 AM

607398_HD(XSEC-WEST-1).DWG

55+50



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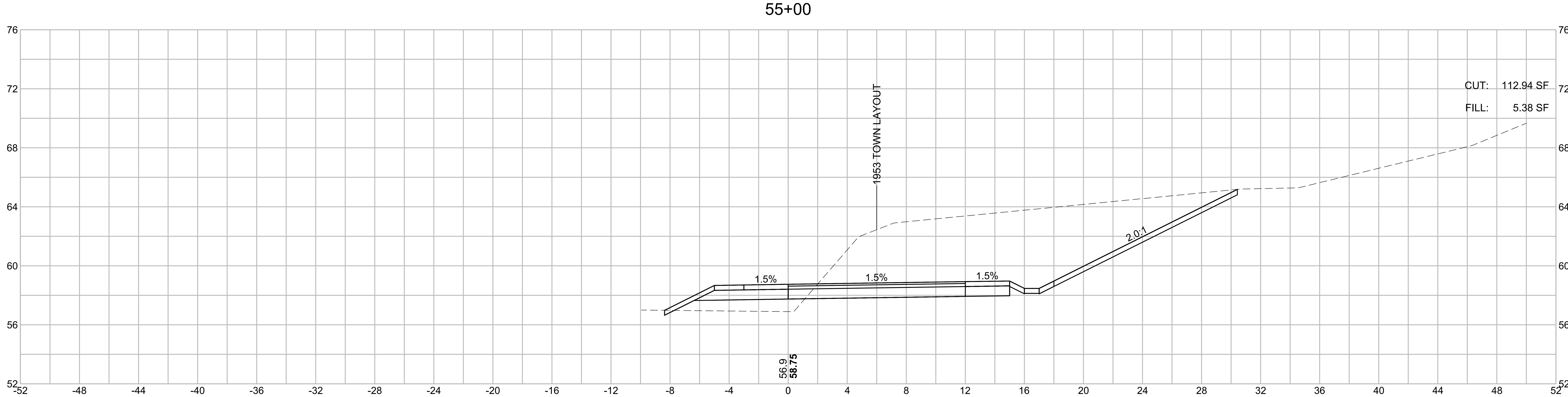


HOR. SCALE IN FEET

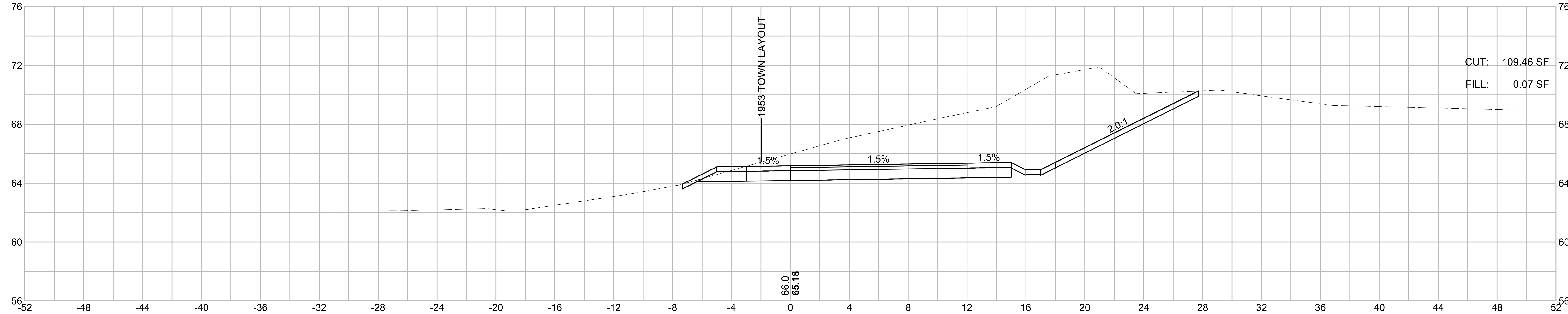
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

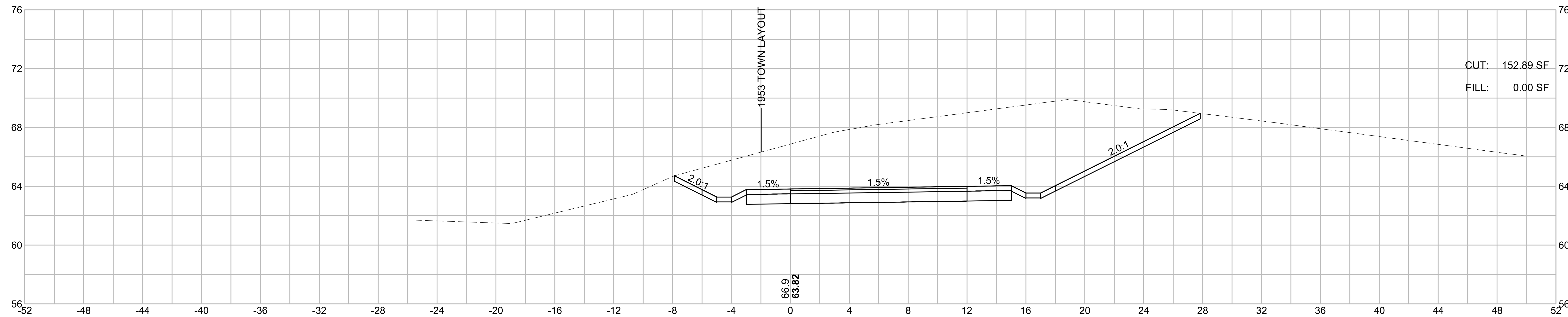
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	121	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

57+00



56+50



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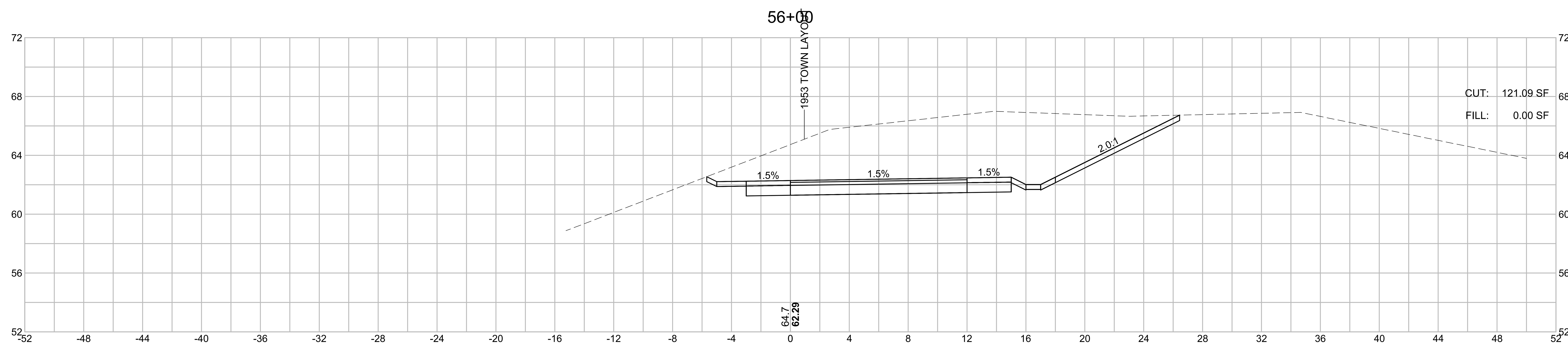


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

Plotted on 21-Oct-2021 8:14 AM

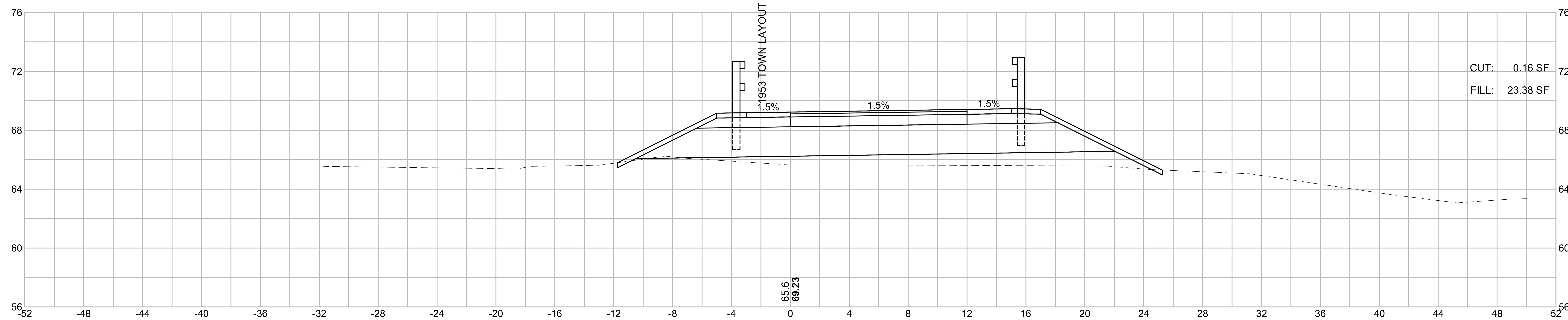
607398_HD(XSEC-WEST-1).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	122	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

58+50



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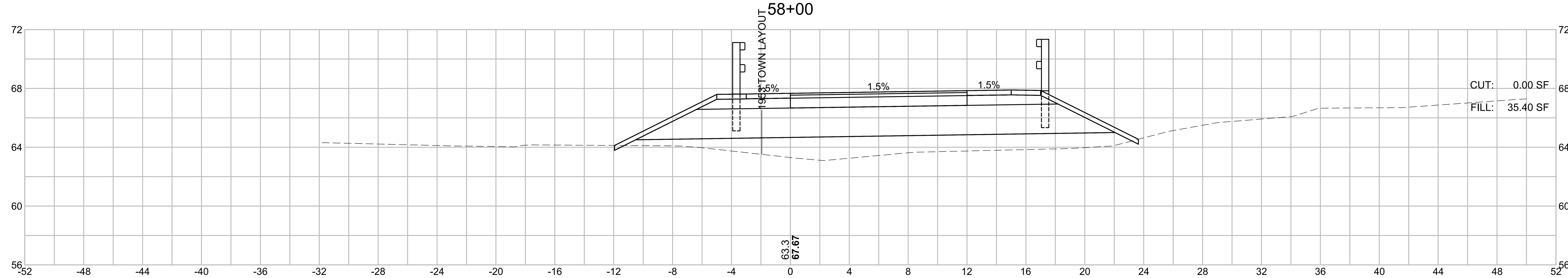

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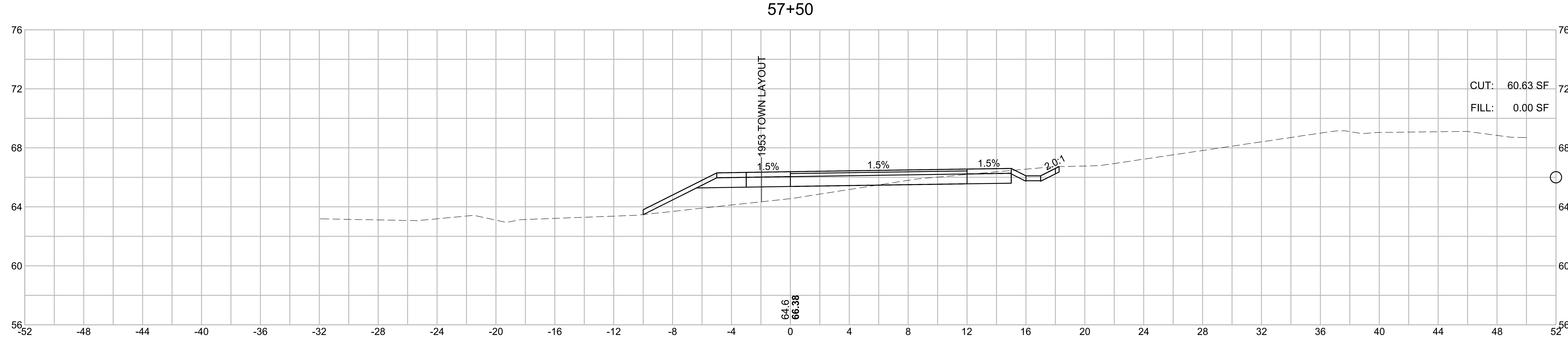


HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

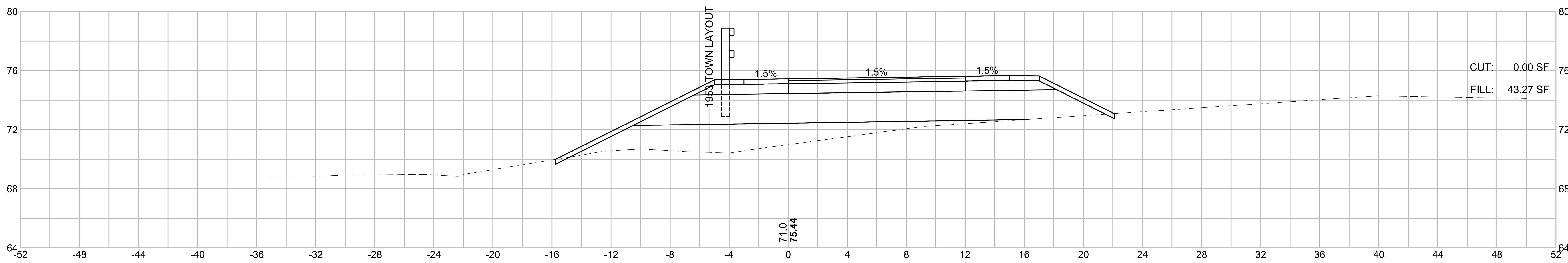
607398_HD(XSEC-WEST-1).DWG Plotted on 23-Nov-2021 3:22 PM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

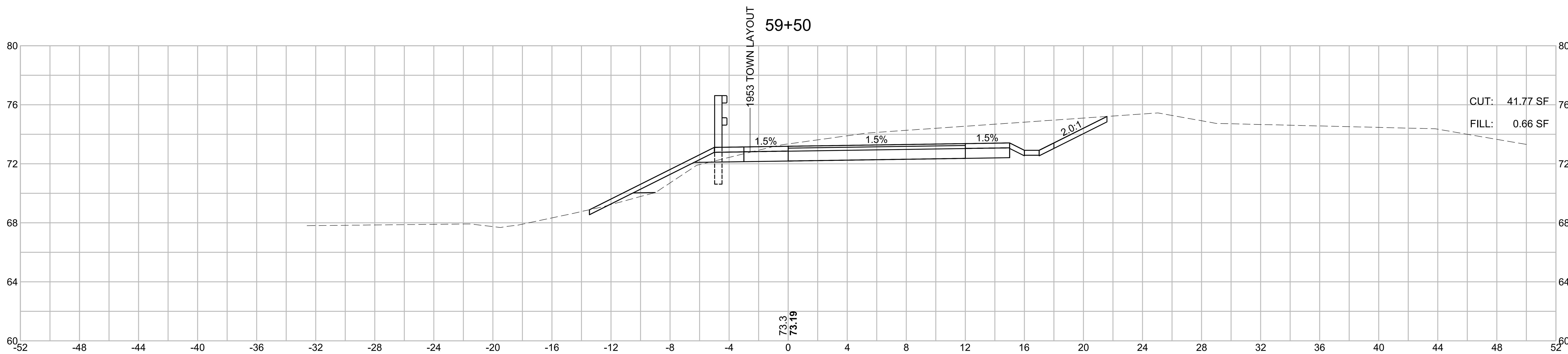
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	123	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

60+00



59+50



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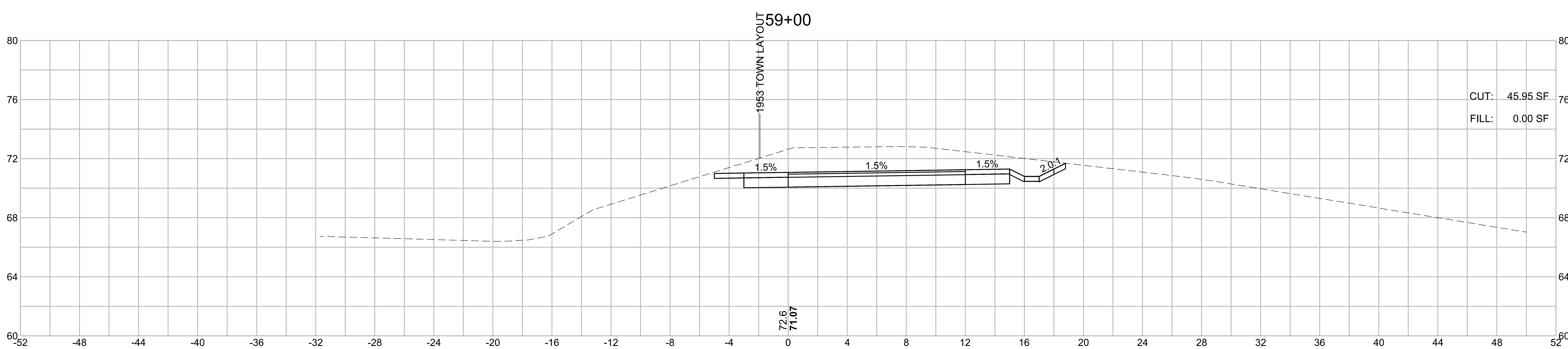


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

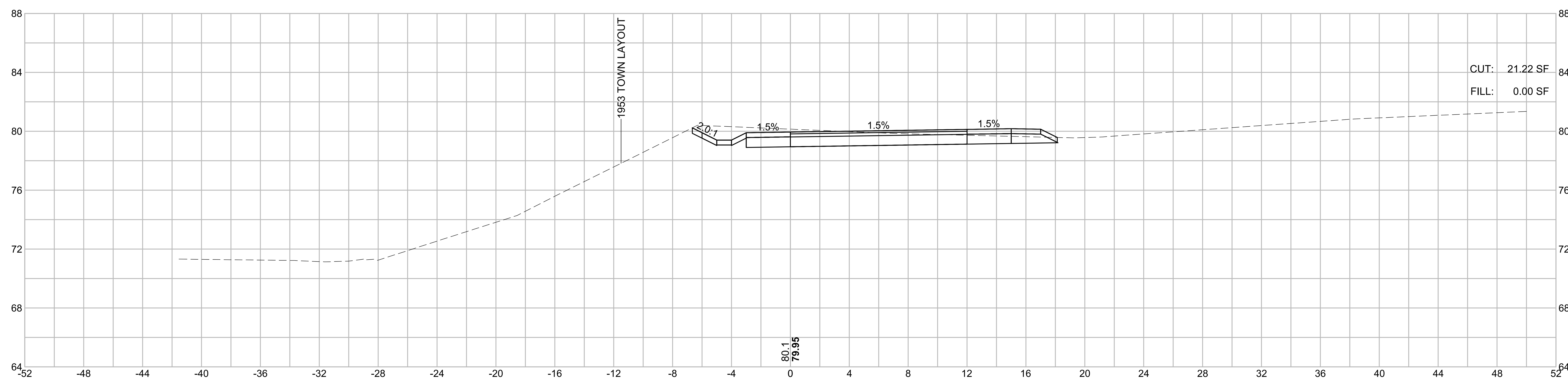
607398_HD(XSEC-WEST-1).DWG
Plotted on 21-Oct-2021 8:14 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	124	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

61+00



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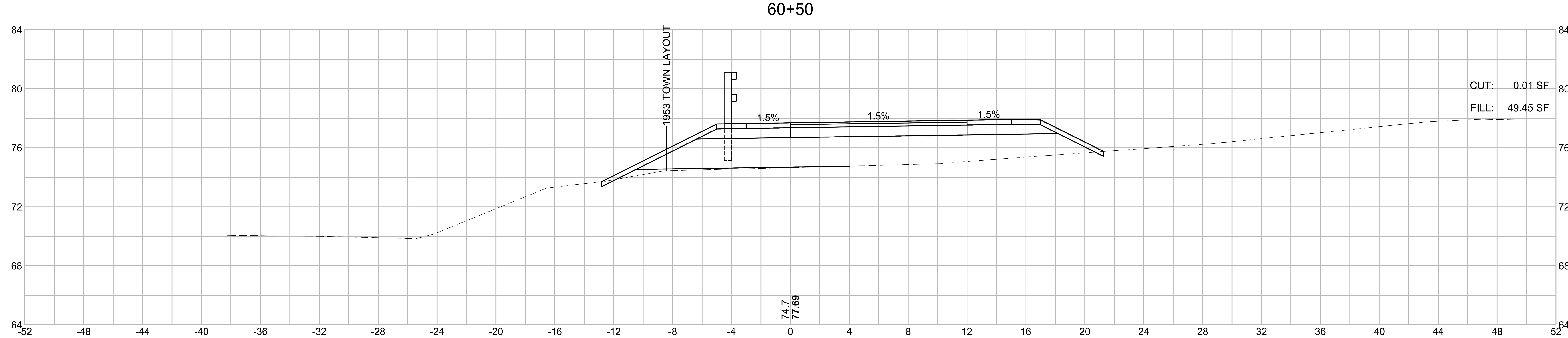
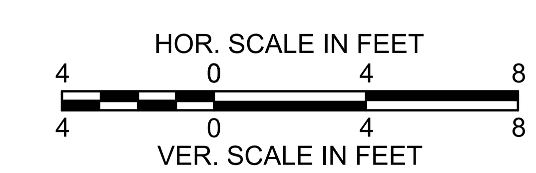




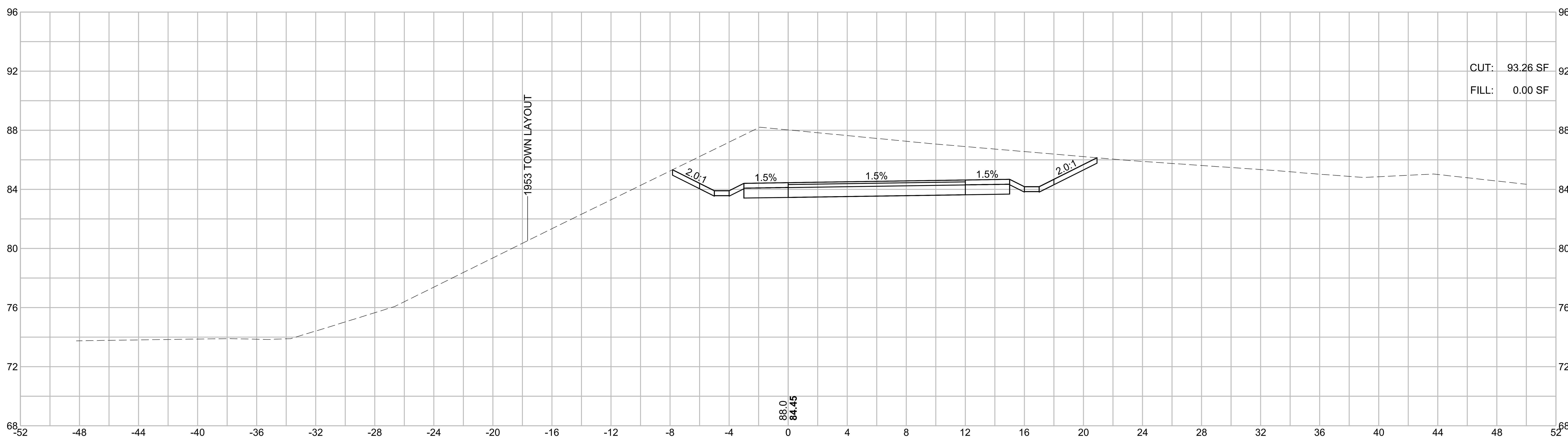
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	125	267
PROJECT FILE NO. 607398			

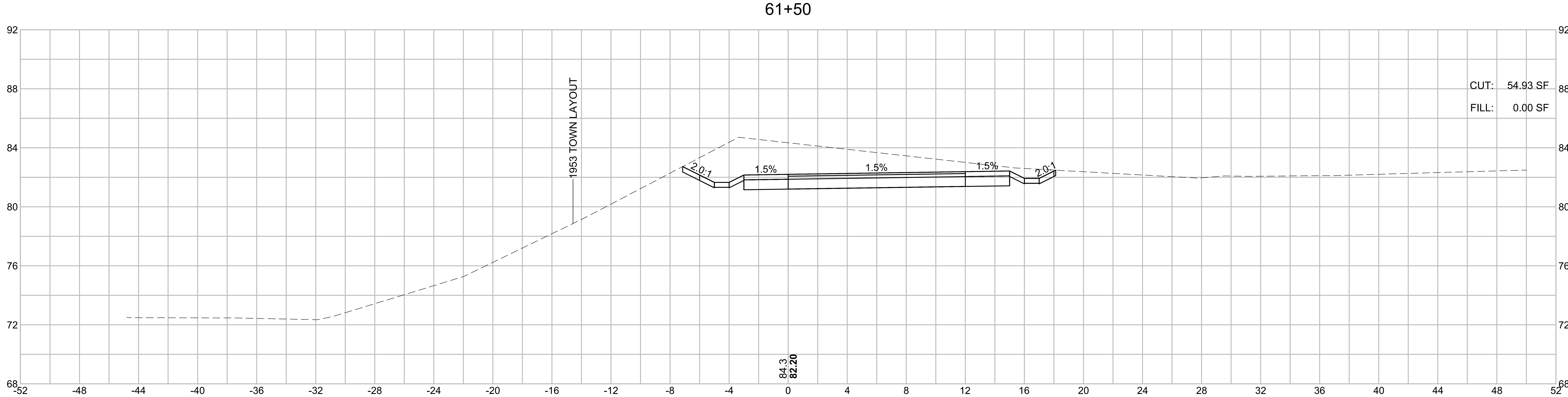
WEST CROSS SECTIONS

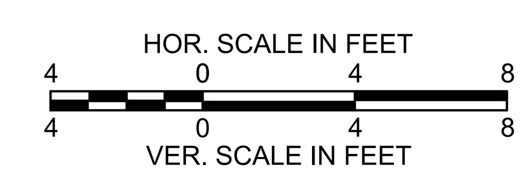
607398_HD(XSEC-WEST-1).DWG Plotted on 21-Oct-2021 8:14 AM

62+00



61+50



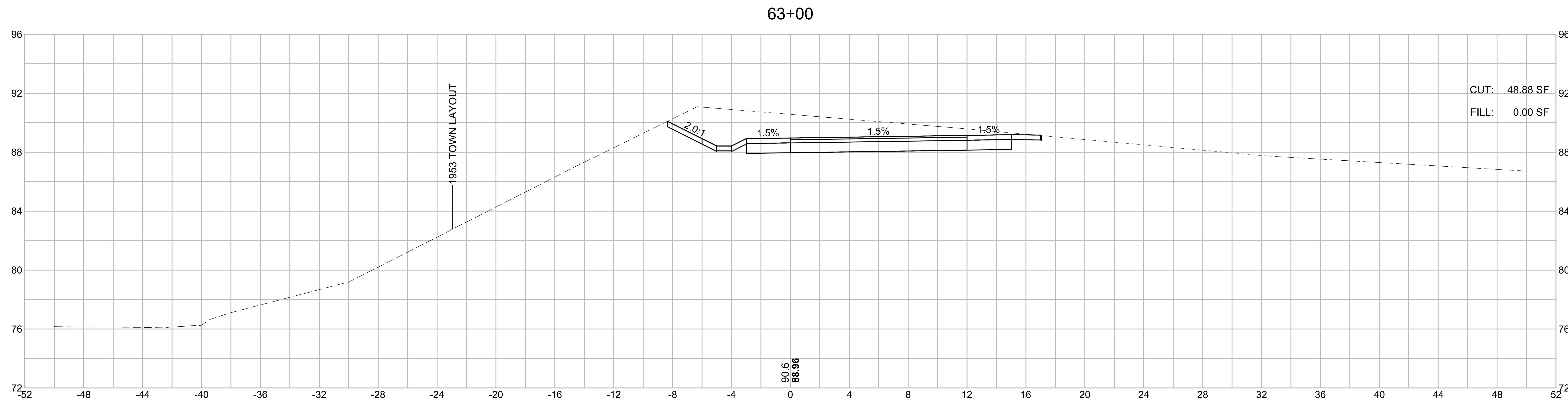


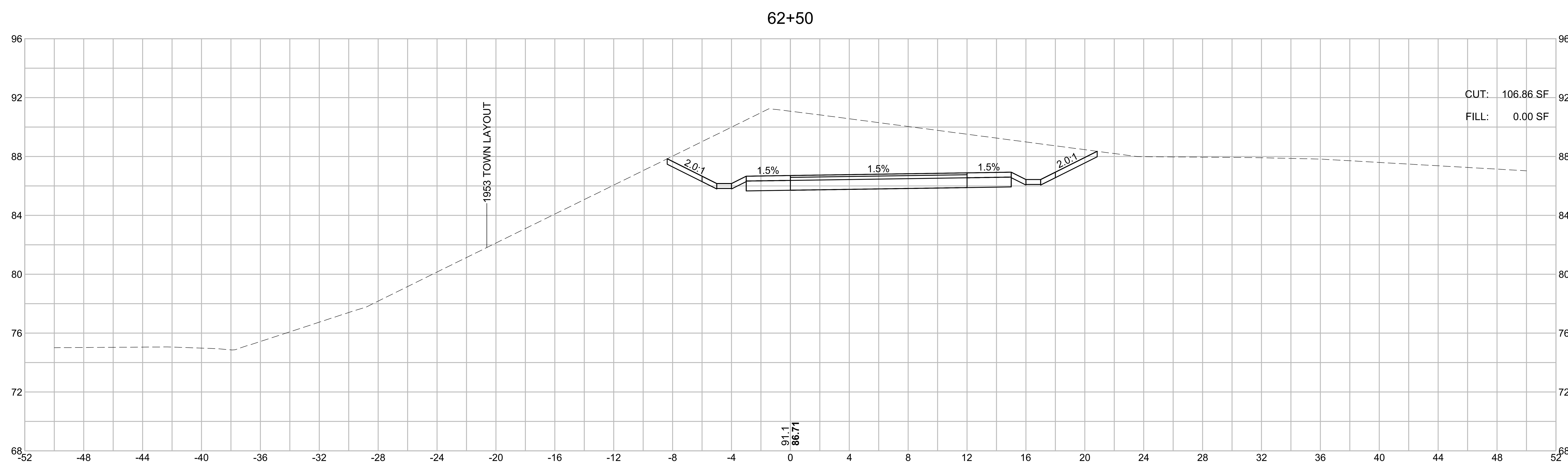
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	126	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

607398_HD(XSEC-WEST-1).DWG   Plotted on 21-Oct-2021 8:14 AM





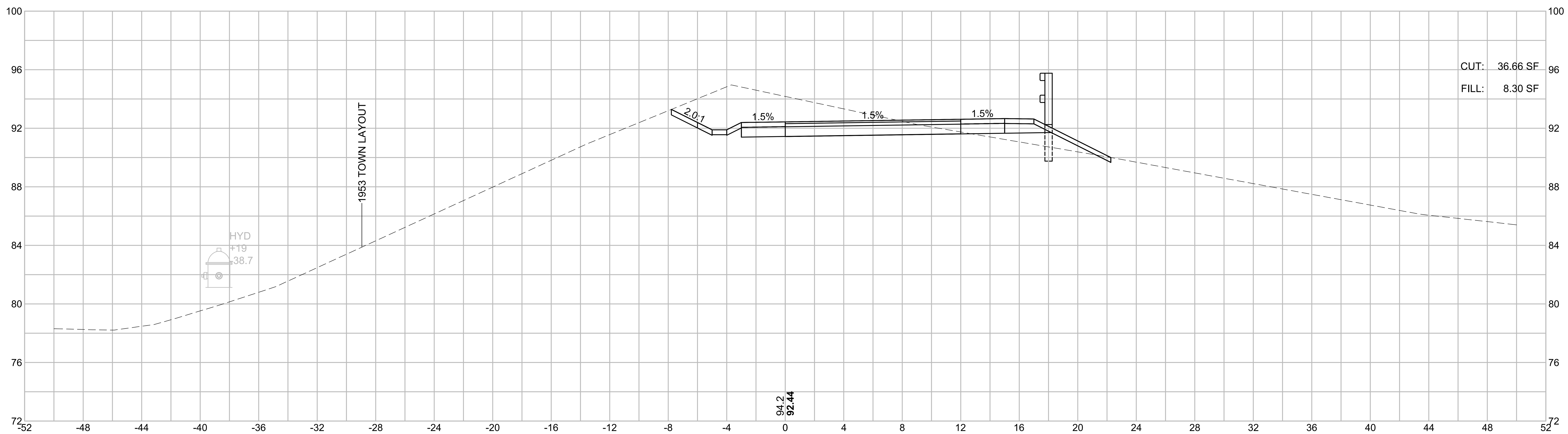
HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

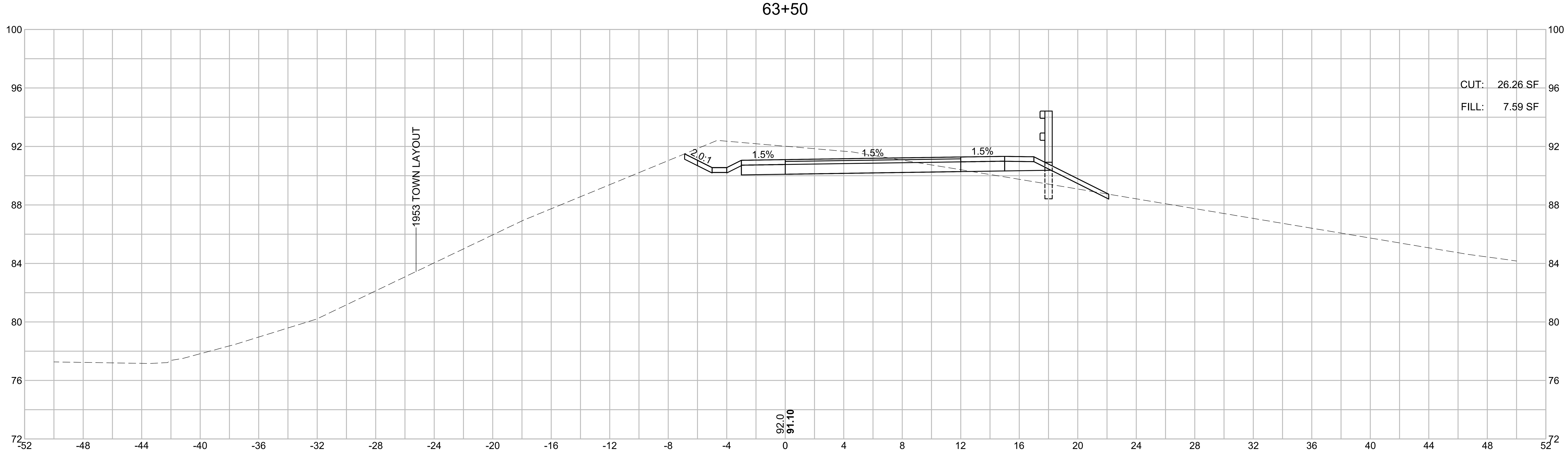
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	127	267
PROJECT FILE NO. 607398			

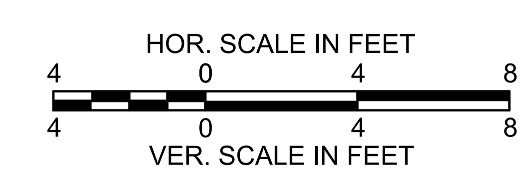
WEST CROSS SECTIONS

64+00



63+50





Plotted on 21-Oct-2021 8:14 AM

607398_HD(XSEC-WEST-1).DWG

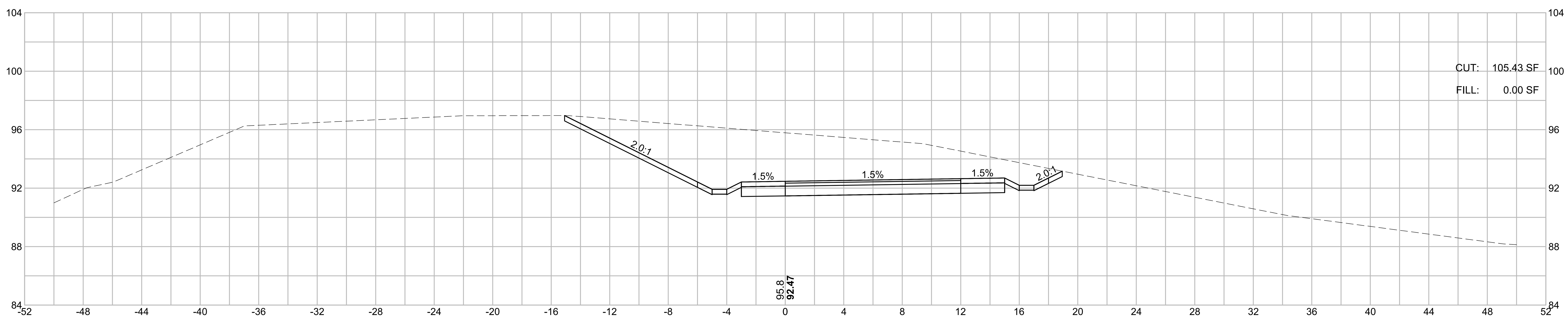
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	128	267
PROJECT FILE NO. 607398			

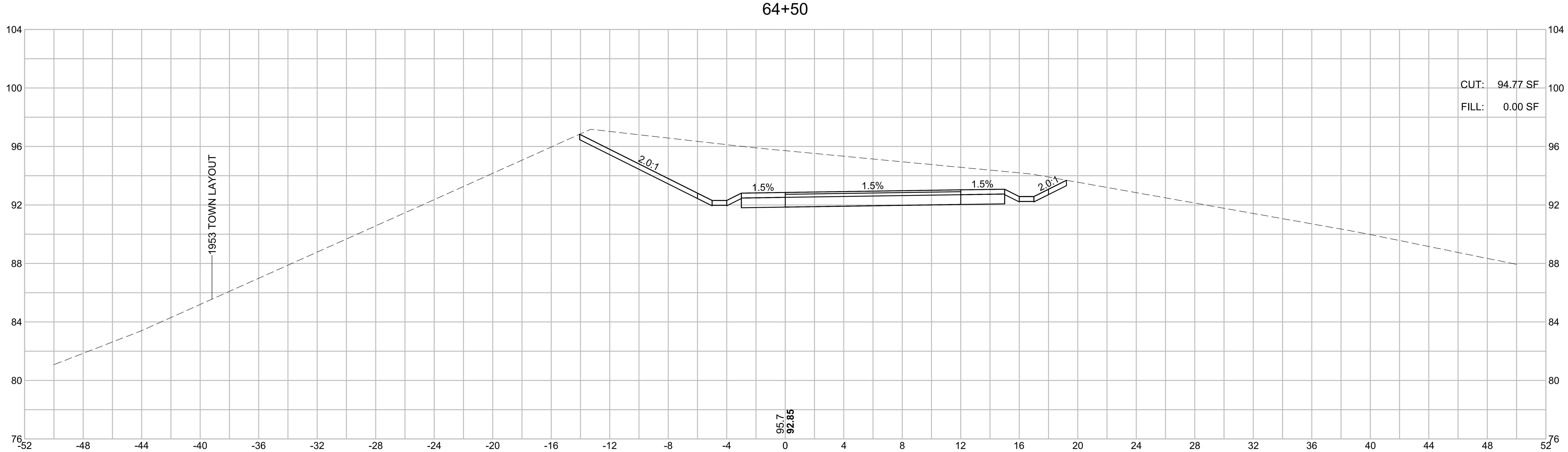
WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:14 AM
607398_HD(XSEC-WEST-1).DWG

65+00



64+50



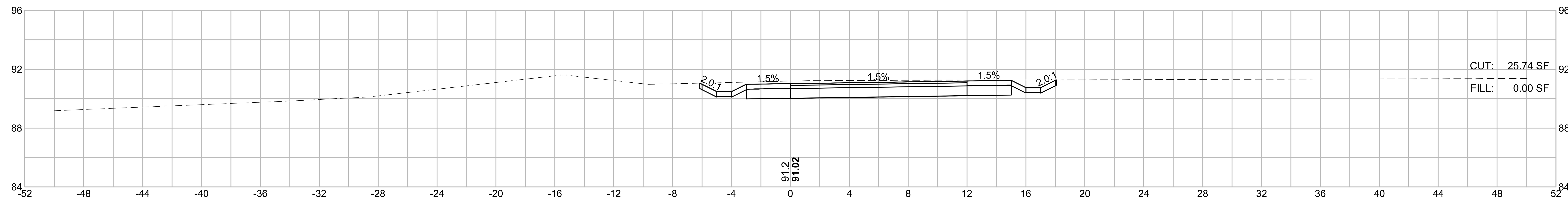
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

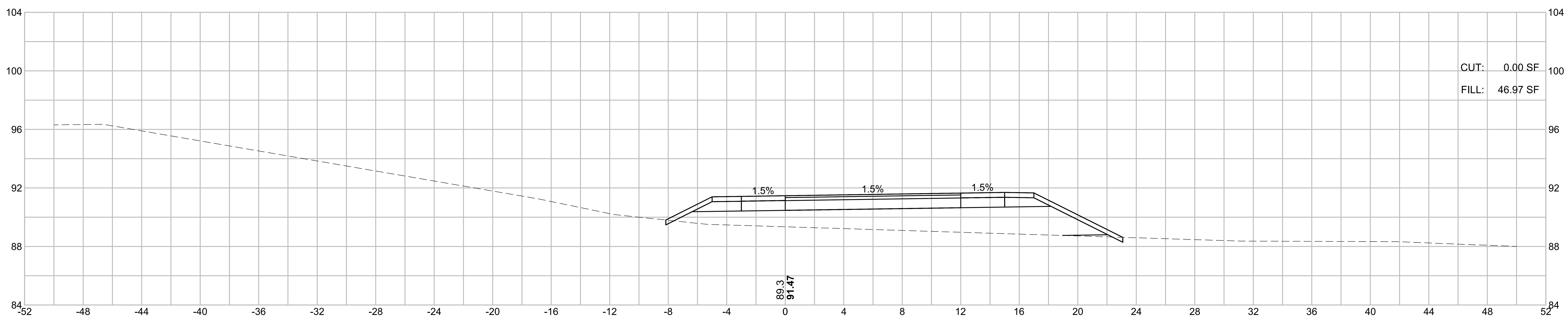
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	129	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

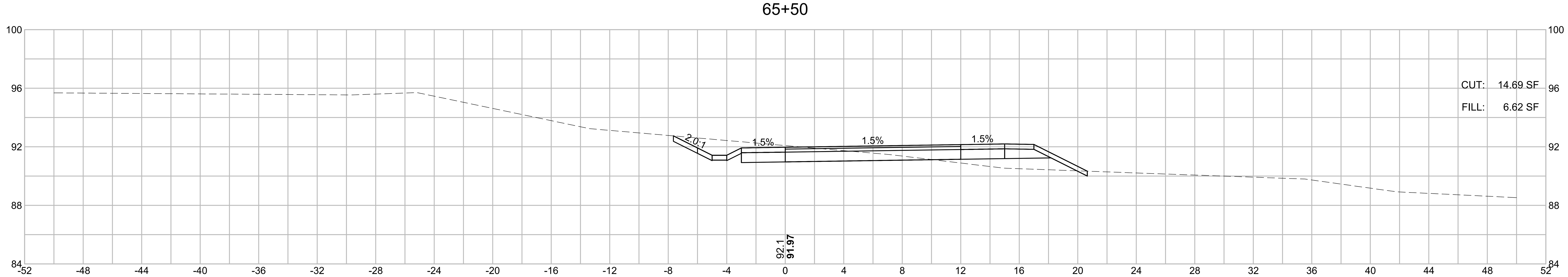
66+50



66+00



65+50



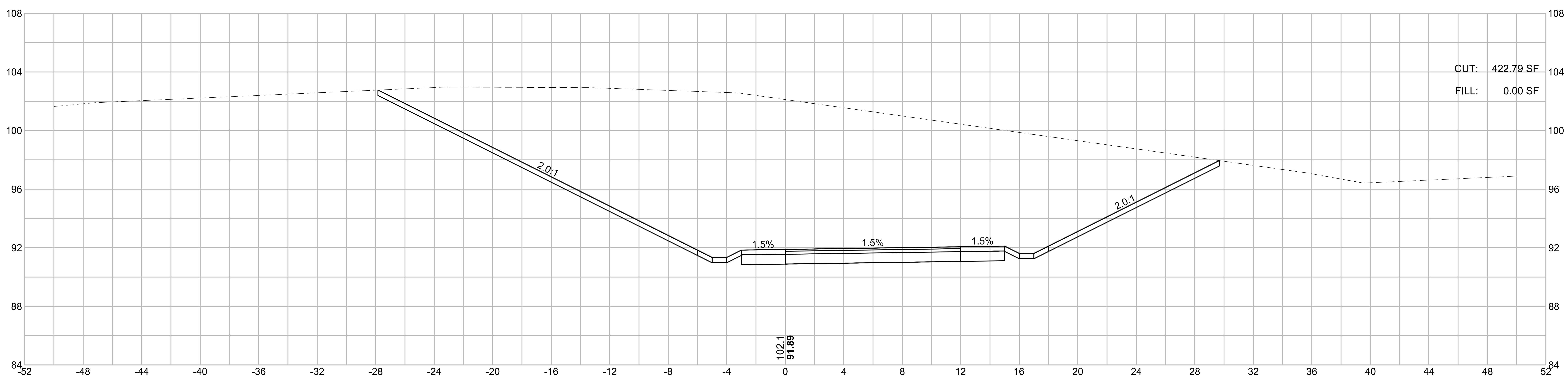
607398_HD(XSEC-WEST-1).DWG Plotted on 21-Oct-2021 8:14 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

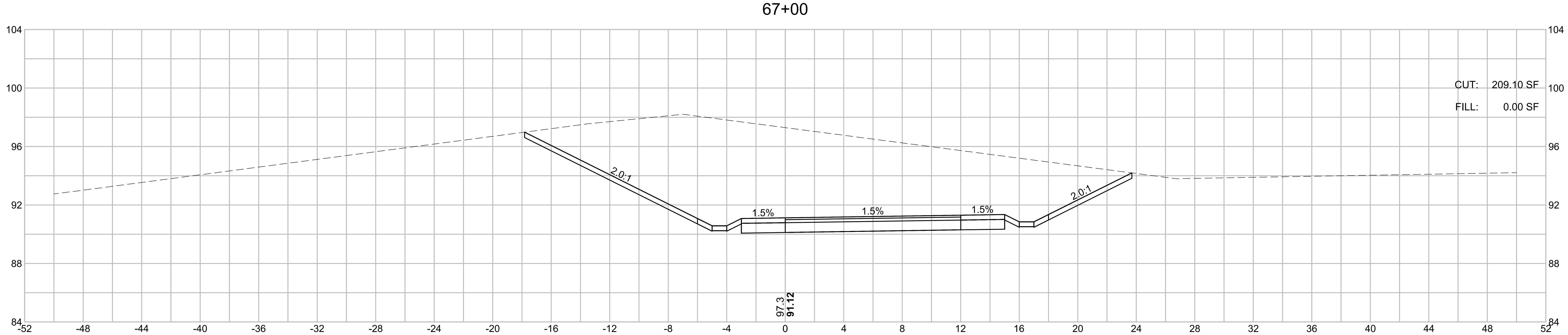
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	130	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

67+50



67+00



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

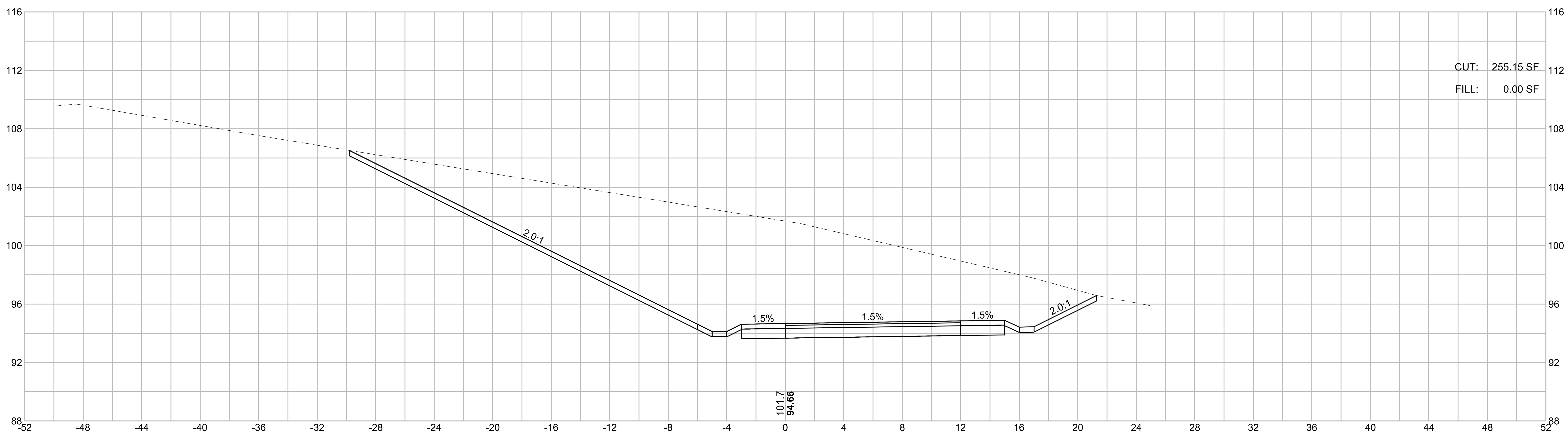
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	131	267
PROJECT FILE NO. 607398			

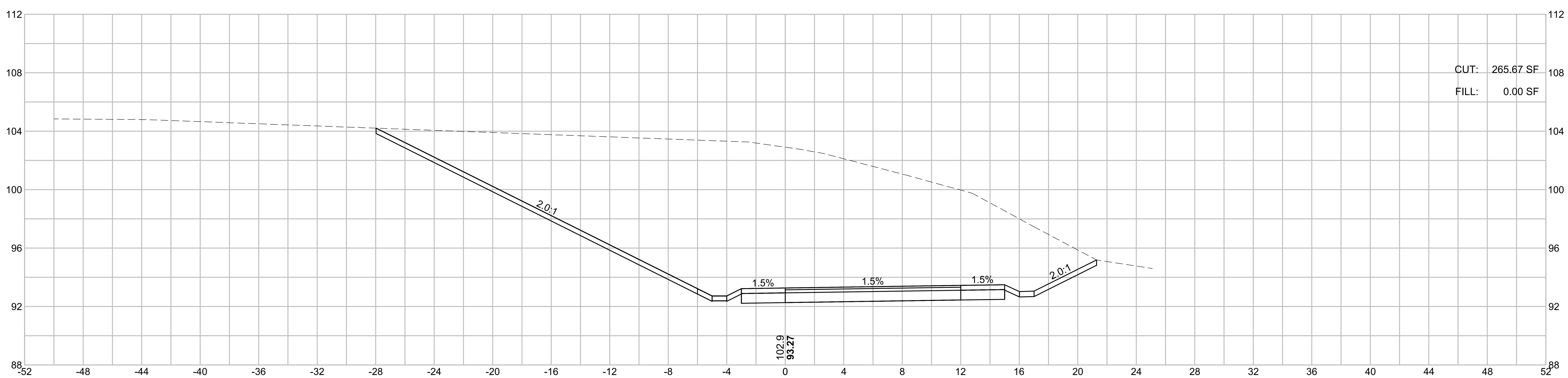
WEST CROSS SECTIONS

607398_HD(XSEC-WEST-1).DWG Plotted on 21-Oct-2021 8:15 AM

68+50



68+00



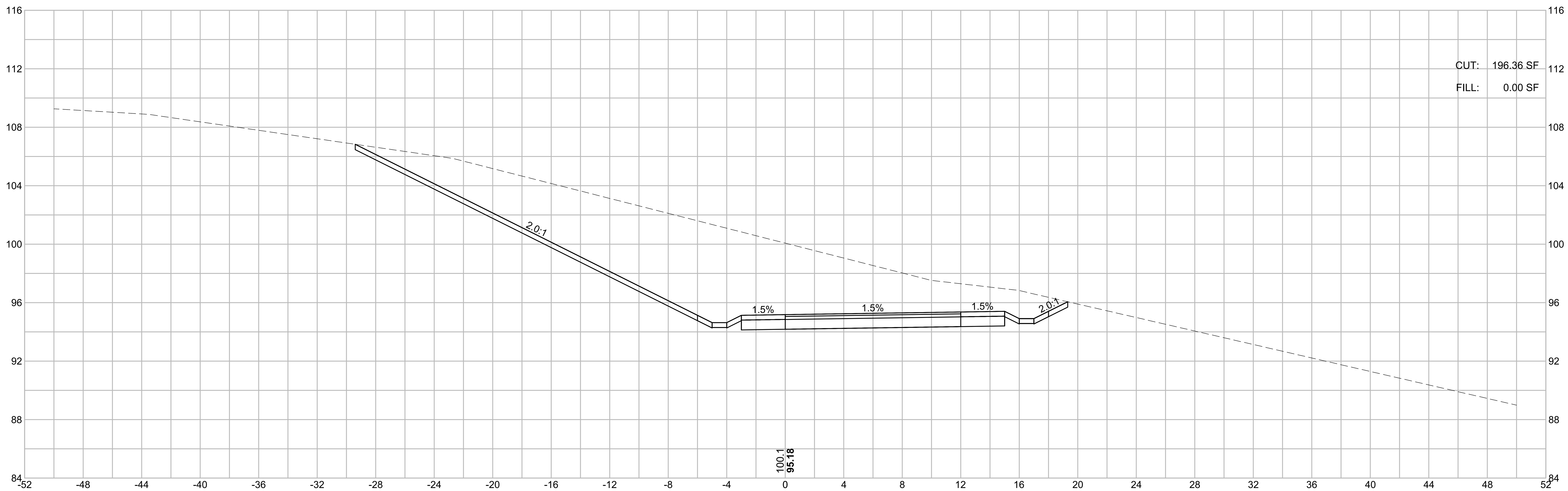
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

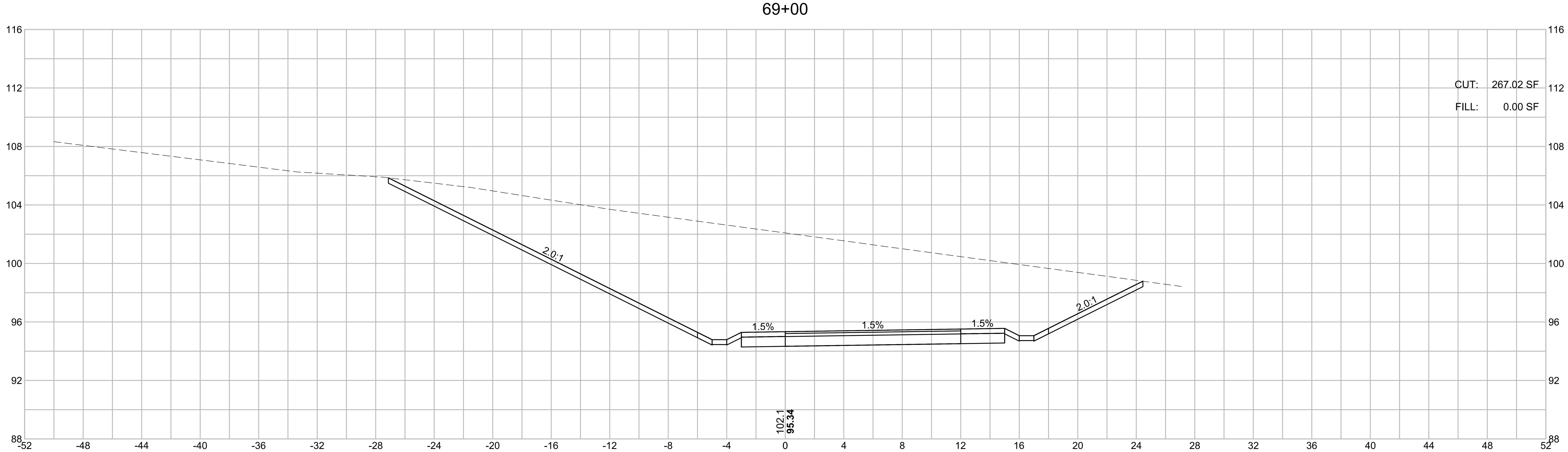
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	132	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

69+50



69+00



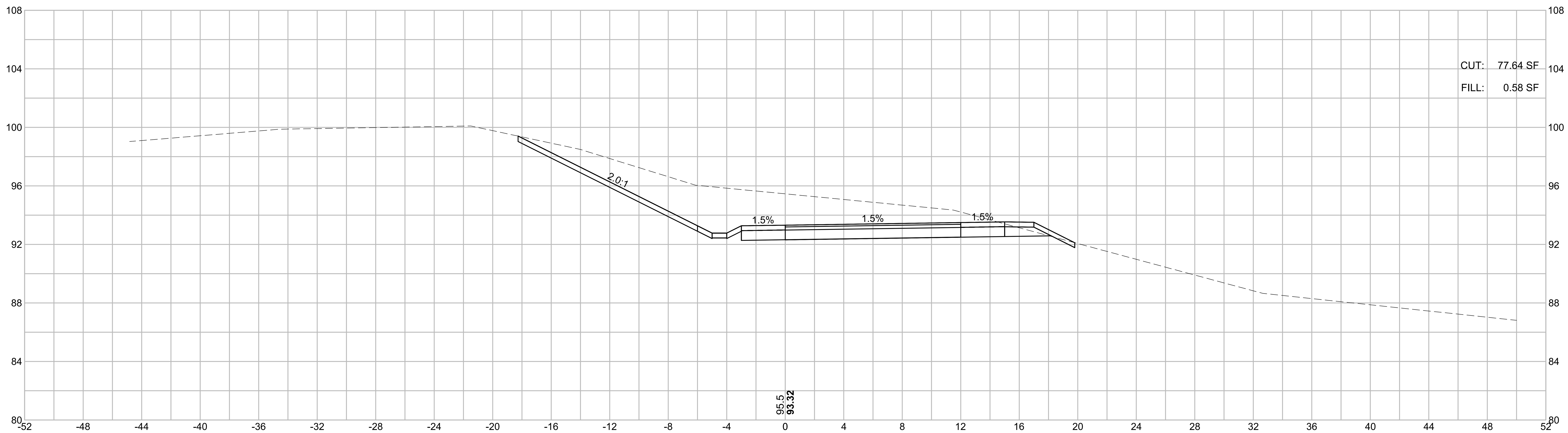
HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

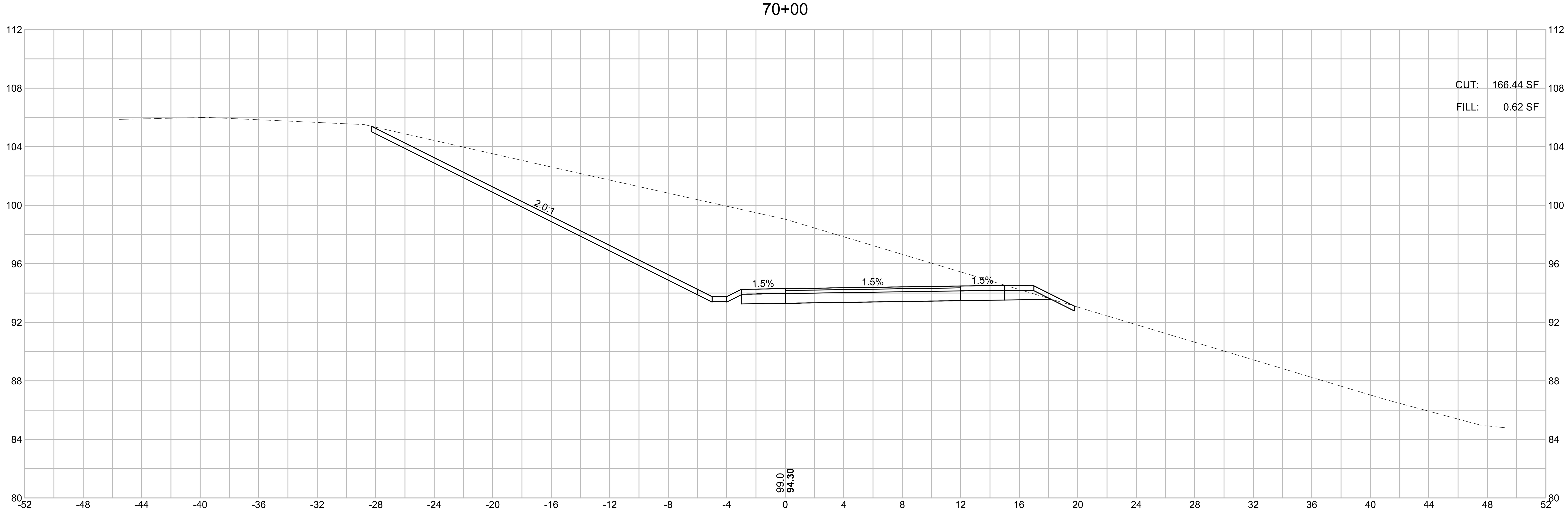
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	133	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

70+50



70+00



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

Plotted on 21-Oct-2021 8:15 AM

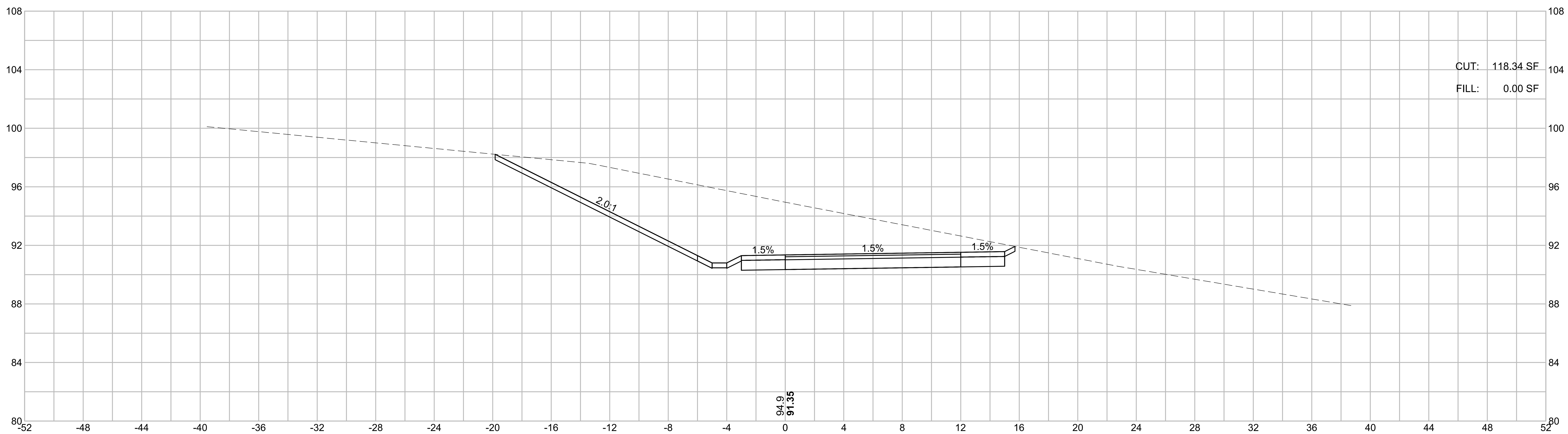
607398_HD(XSEC-WEST-1).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

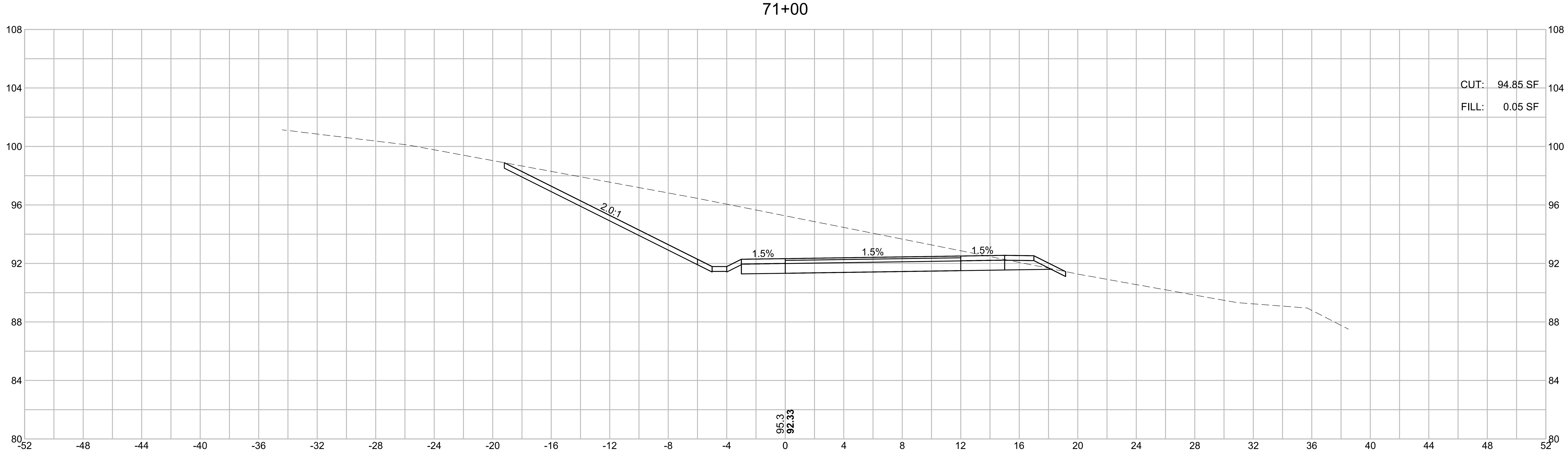
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	134	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

71+50



71+00



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

607398_HD(XSEC-WEST-1).DWG Plotted on 21-Oct-2021 8:15 AM

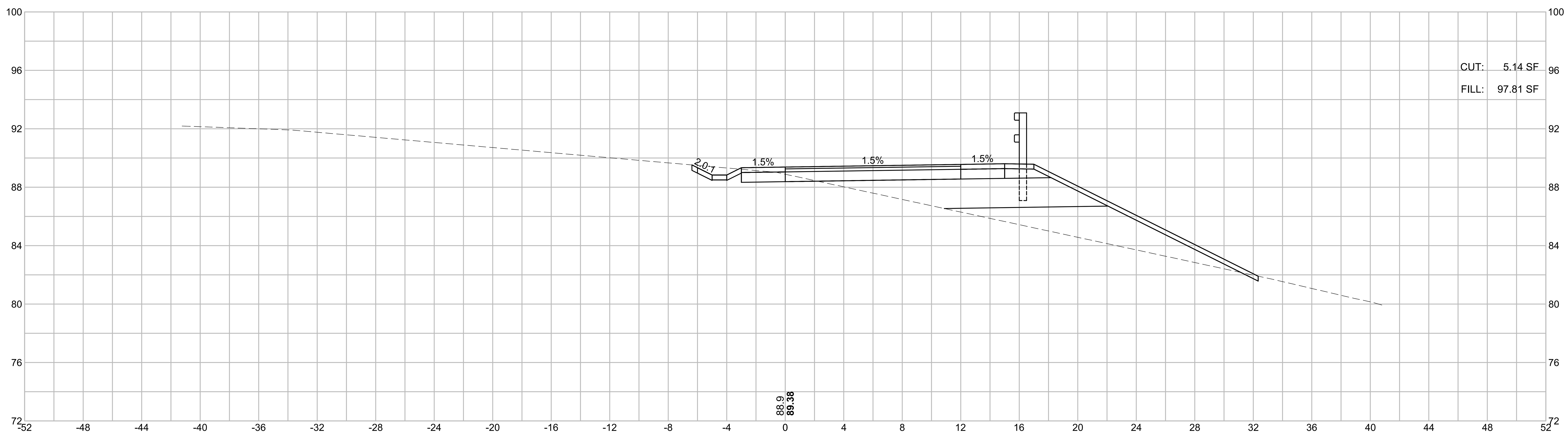
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	135	267
PROJECT FILE NO. 607398			

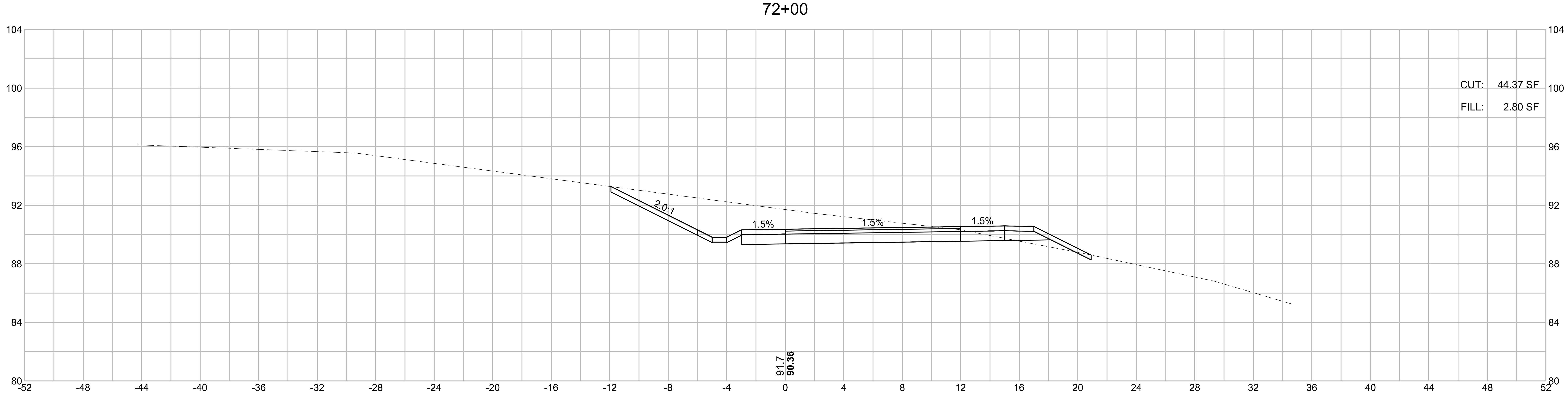
WEST CROSS SECTIONS

607398_HD(XSEC-WEST-1).DWG Plotted on 21-Oct-2021 8:15 AM

72+50



72+00



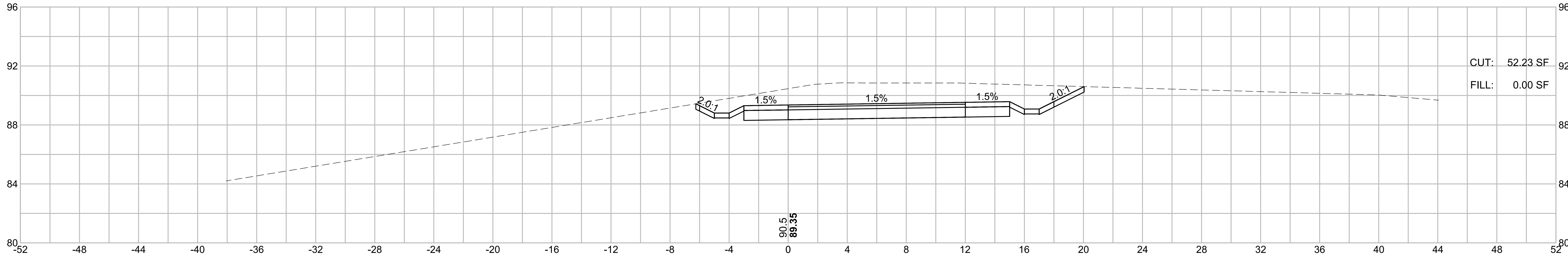
HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

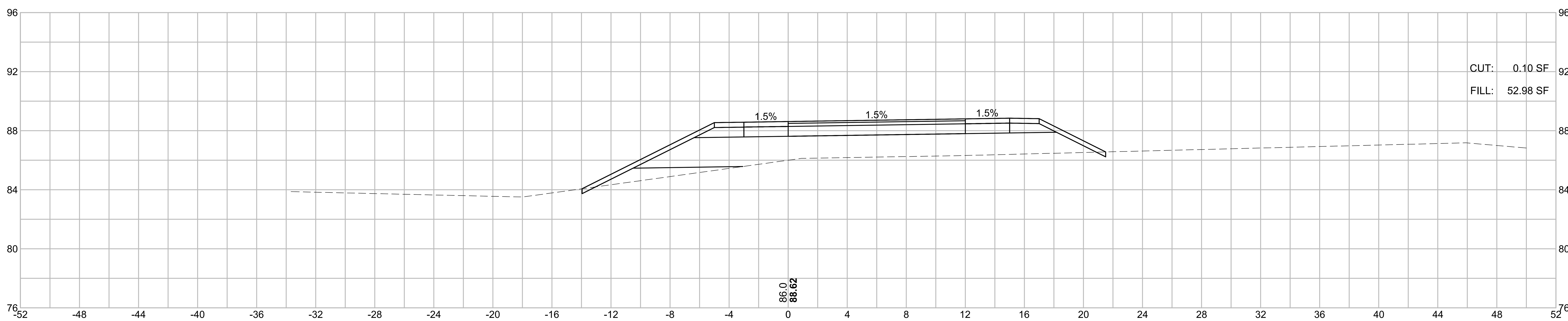
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	136	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

74+00



73+50



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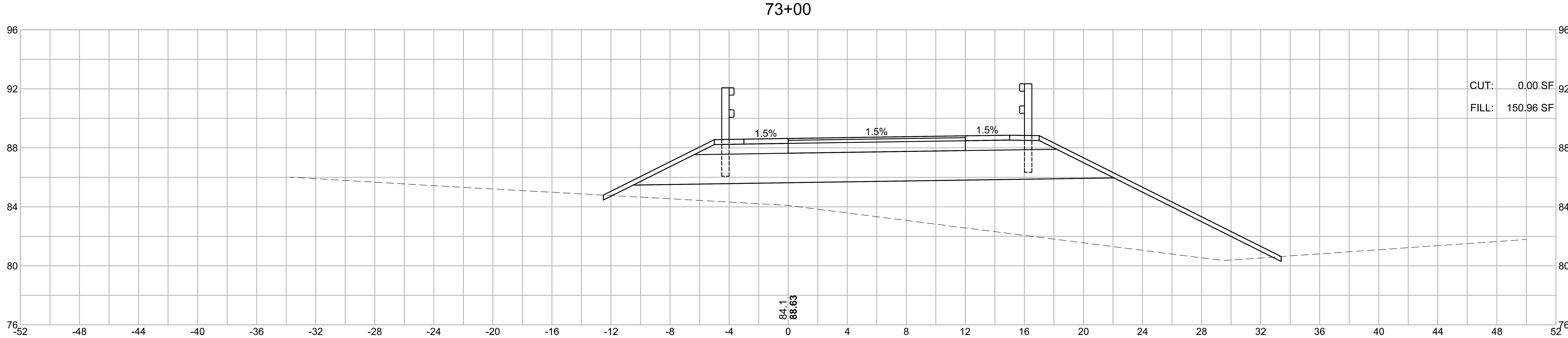


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

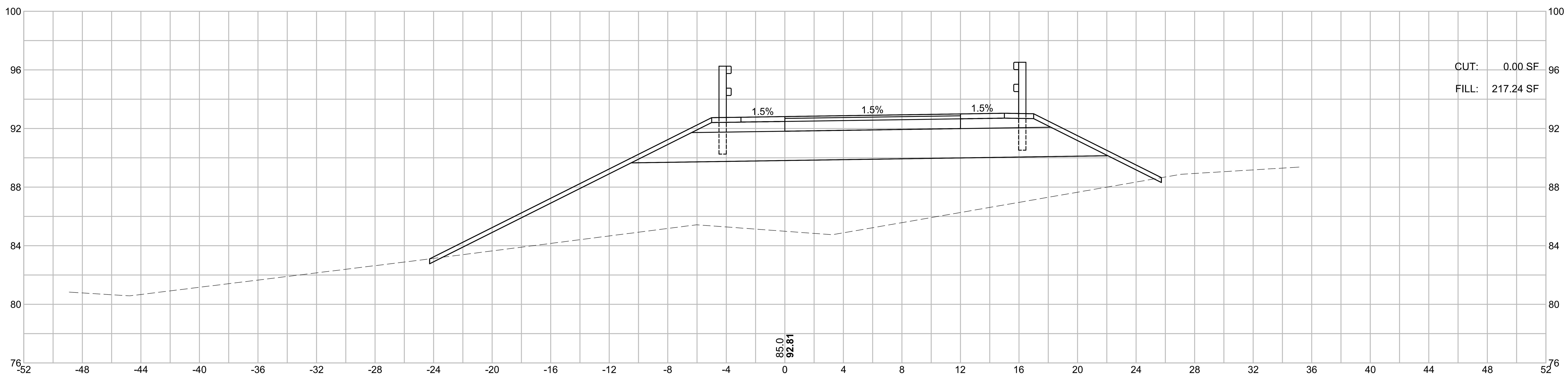
607398_HD(XSEC-WEST-1).DWG Plotted on 21-Oct-2021 8:15 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	137	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

75+00



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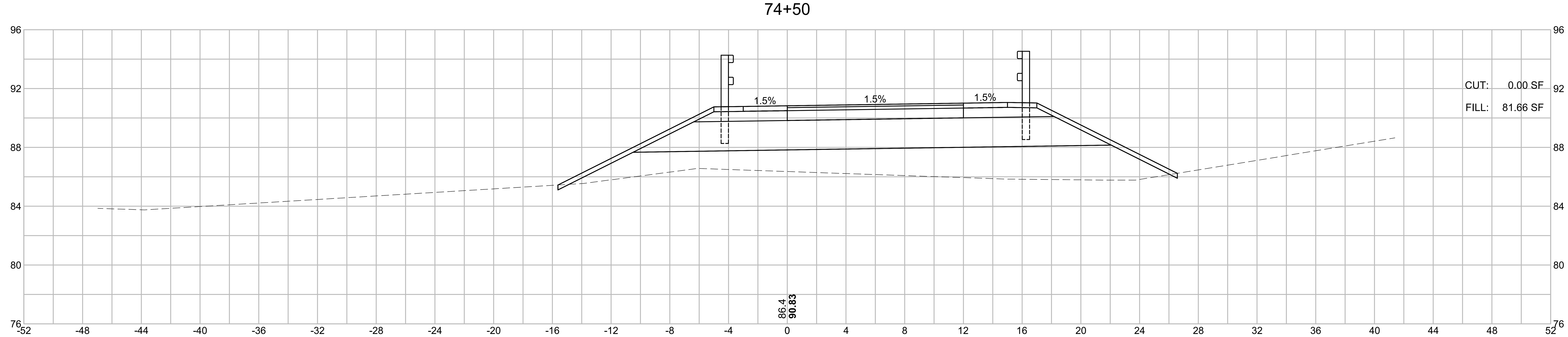


HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

Plotted on 21-Oct-2021 8:16 AM

607398_HD(XSEC-WEST-2).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

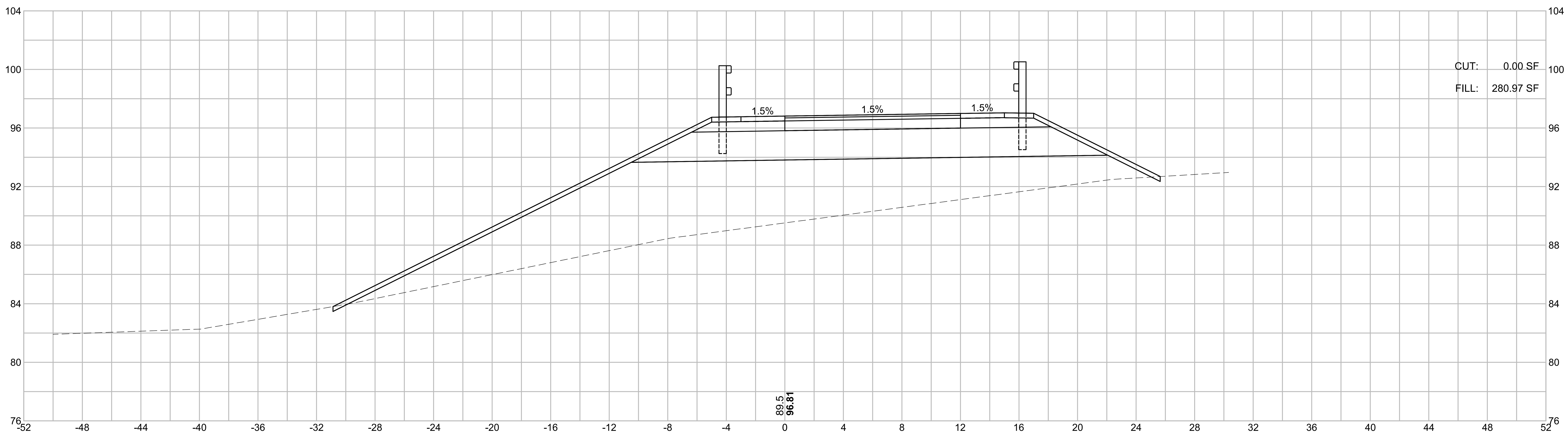
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	138	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:16 AM

607398_HD(XSEC-WEST-2).DWG

76+00



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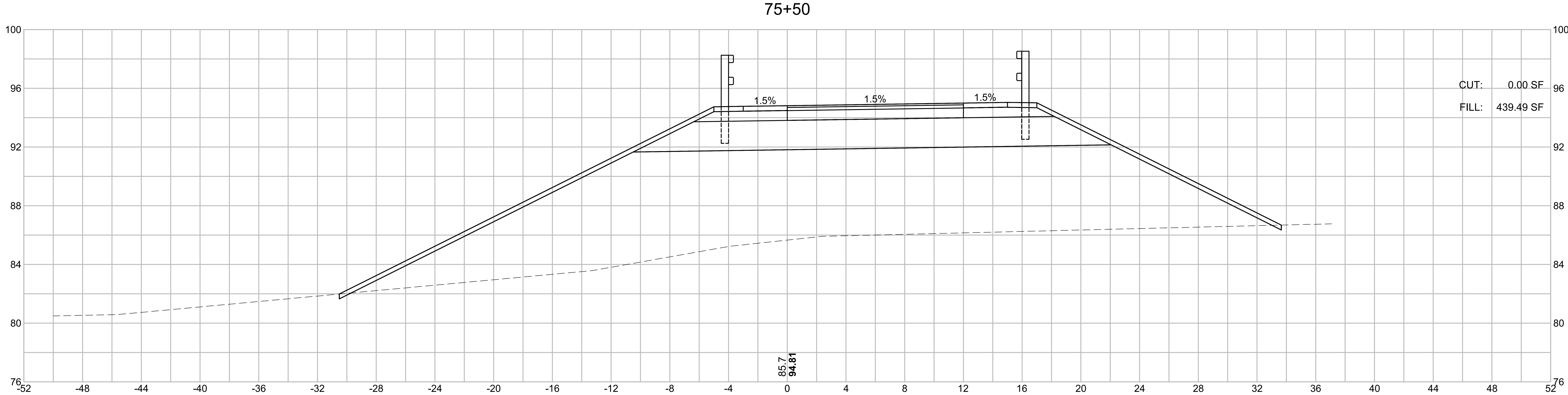


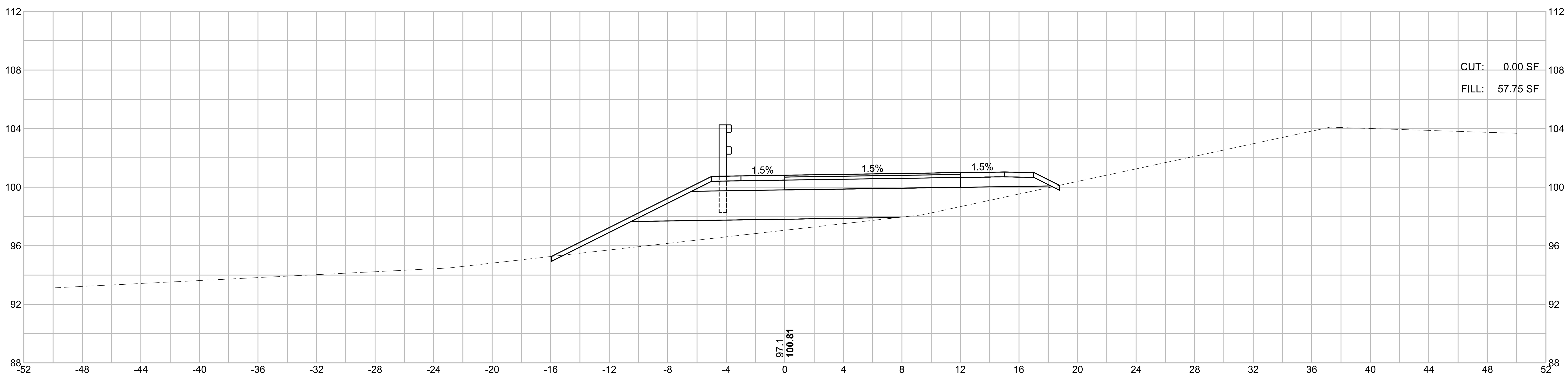
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	139	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

77+00



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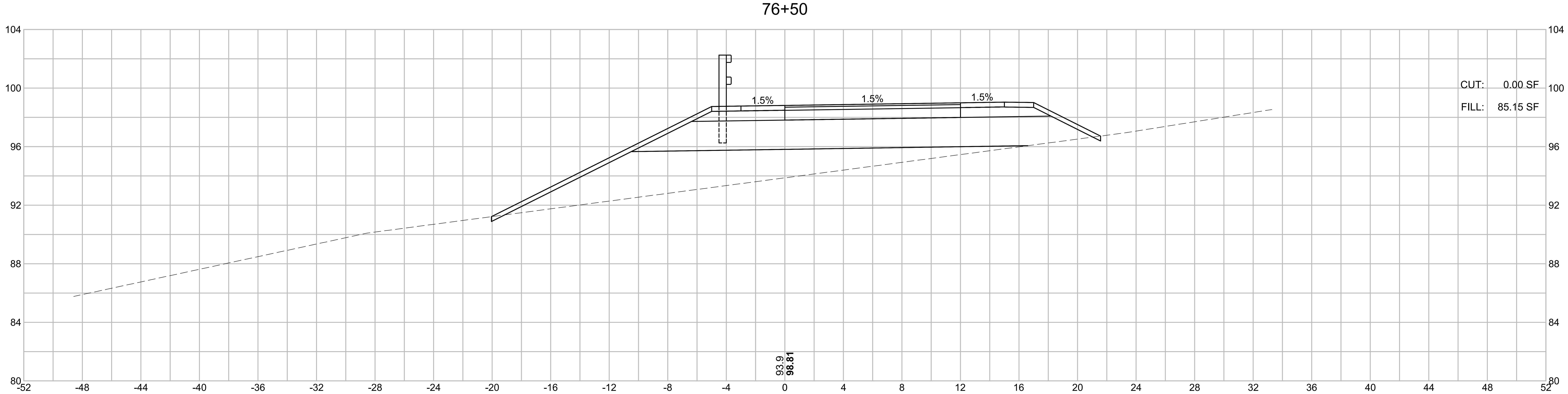


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

607398_HD(XSEC-WEST-2).DWG Plotted on 21-Oct-2021 8:16 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

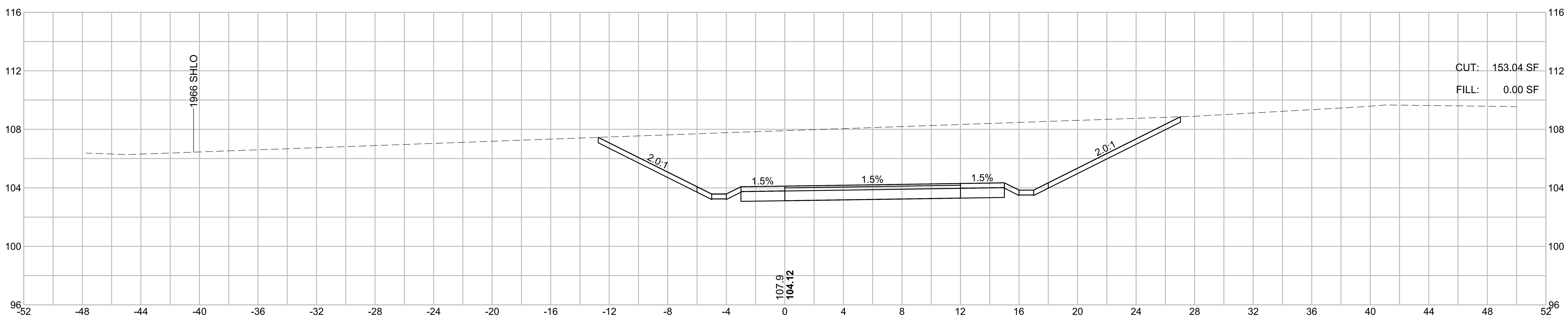
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	140	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:16 AM

607398_HD(XSEC-WEST-2).DWG

78+00



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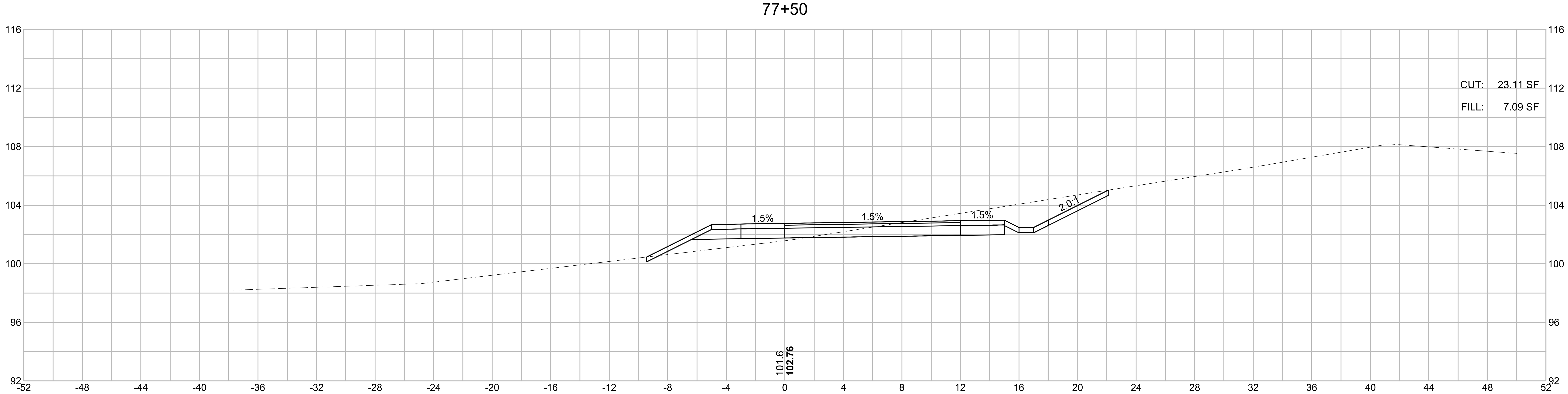


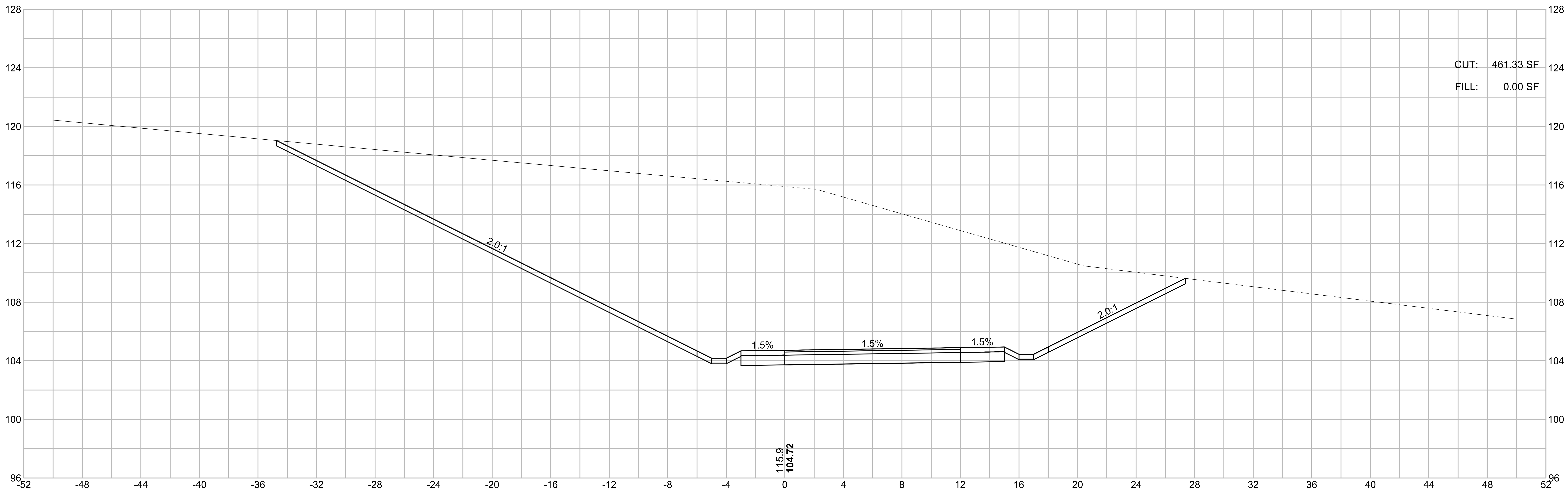
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	141	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

79+00



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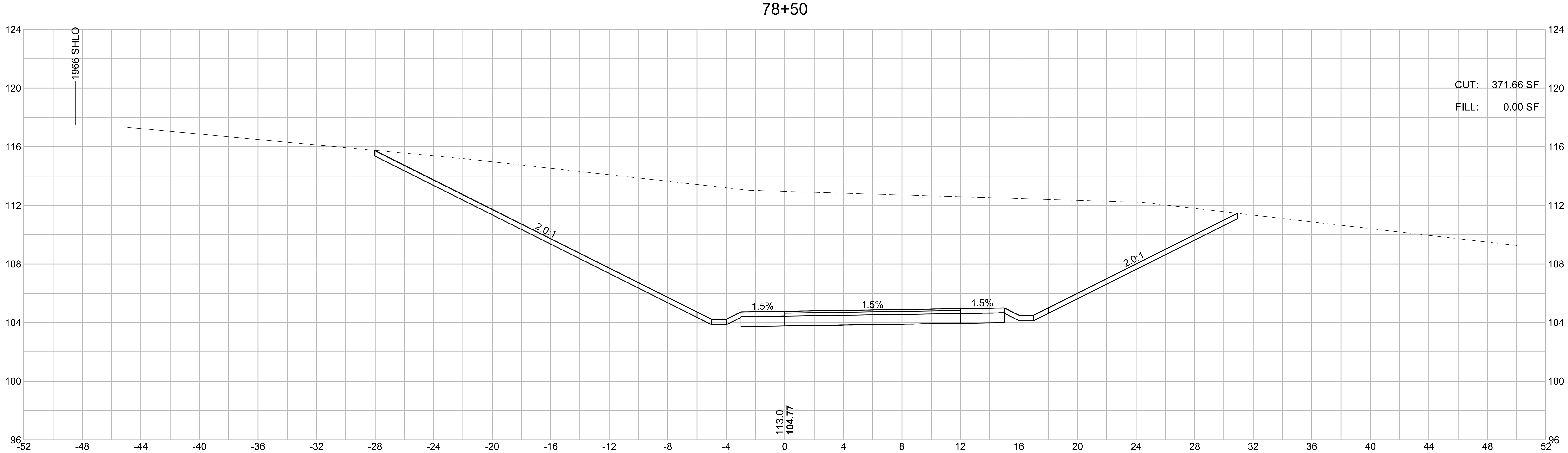


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

607398_HD(XSEC-WEST-2).DWG Plotted on 21-Oct-2021 8:16 AM

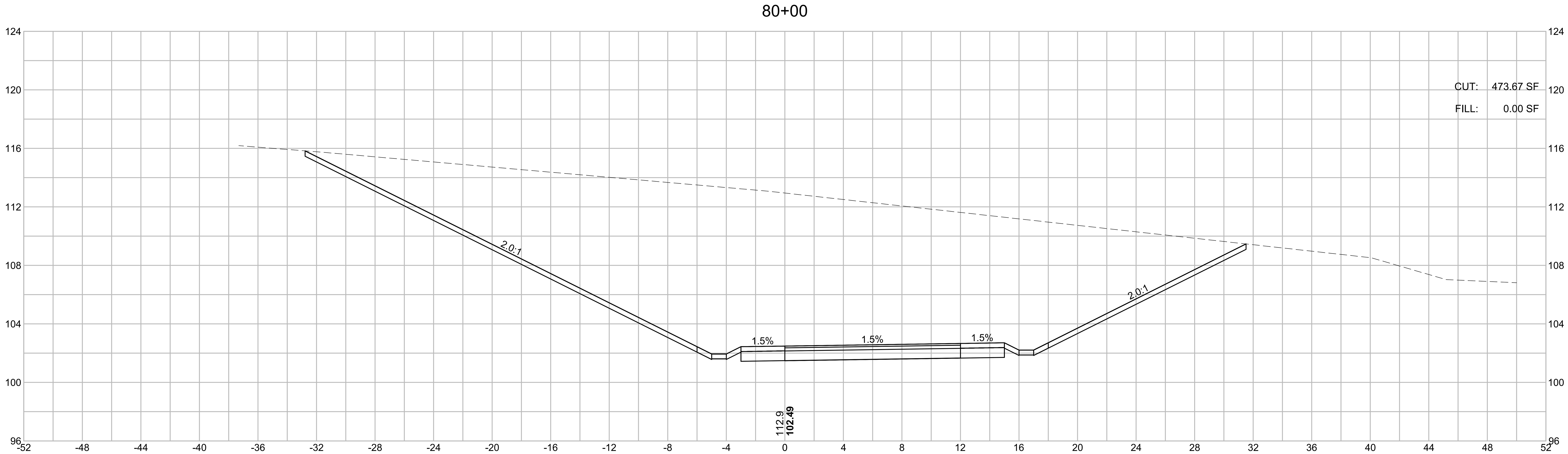
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

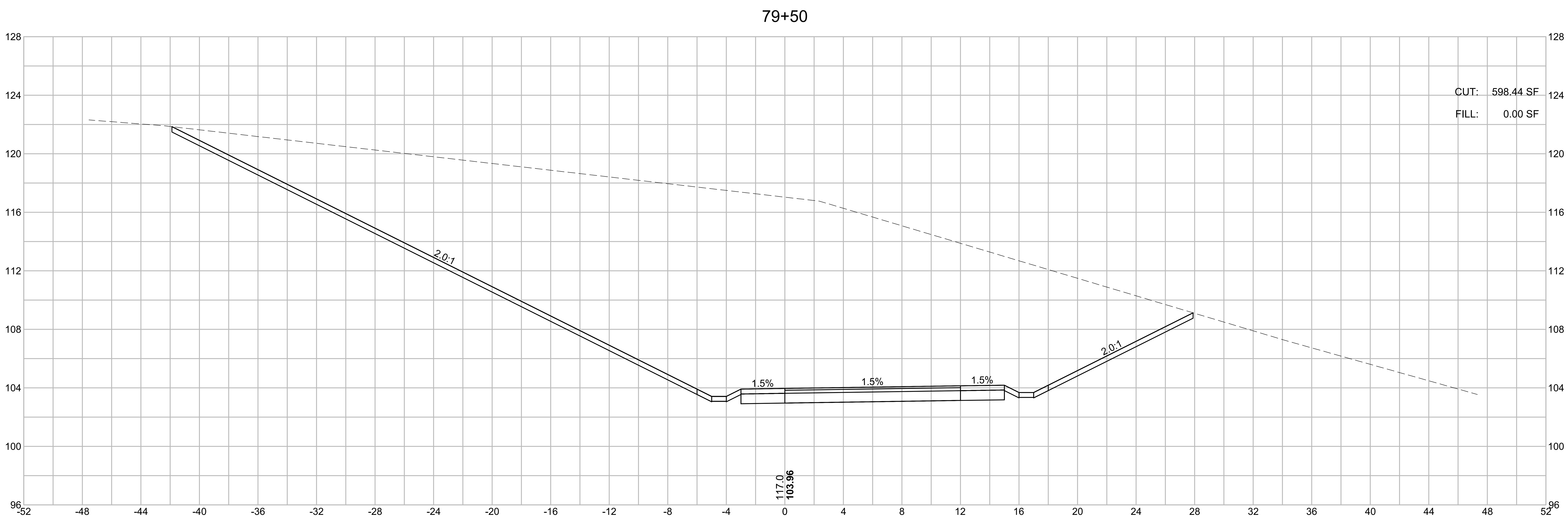
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	142	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:16 AM

607398_HD(XSEC-WEST-2).DWG





HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

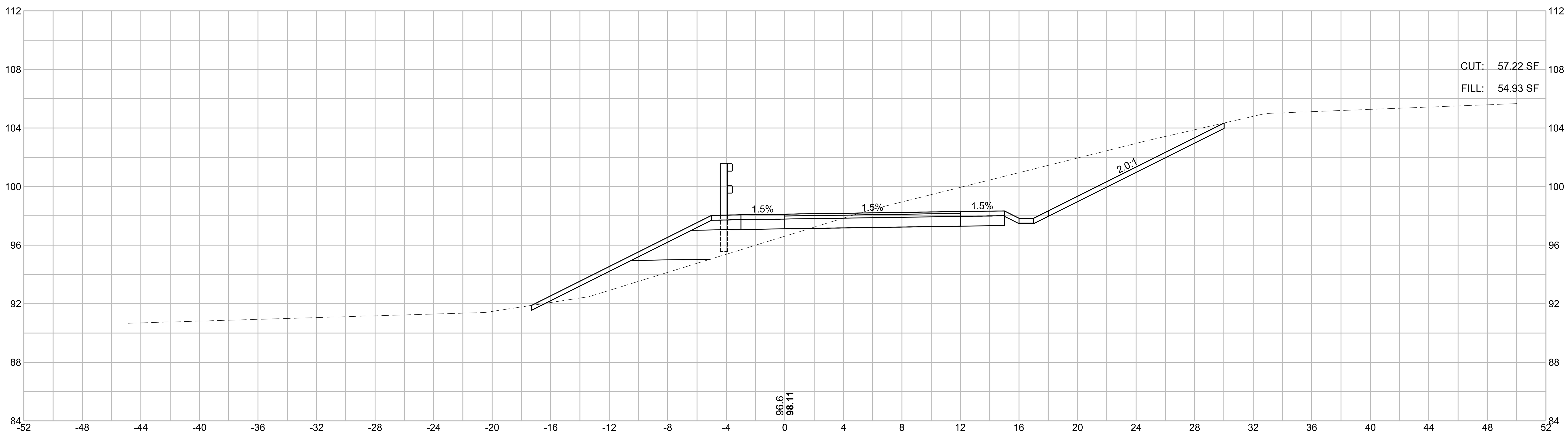
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	143	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:16 AM

607398_HD(XSEC-WEST-2).DWG

81+00



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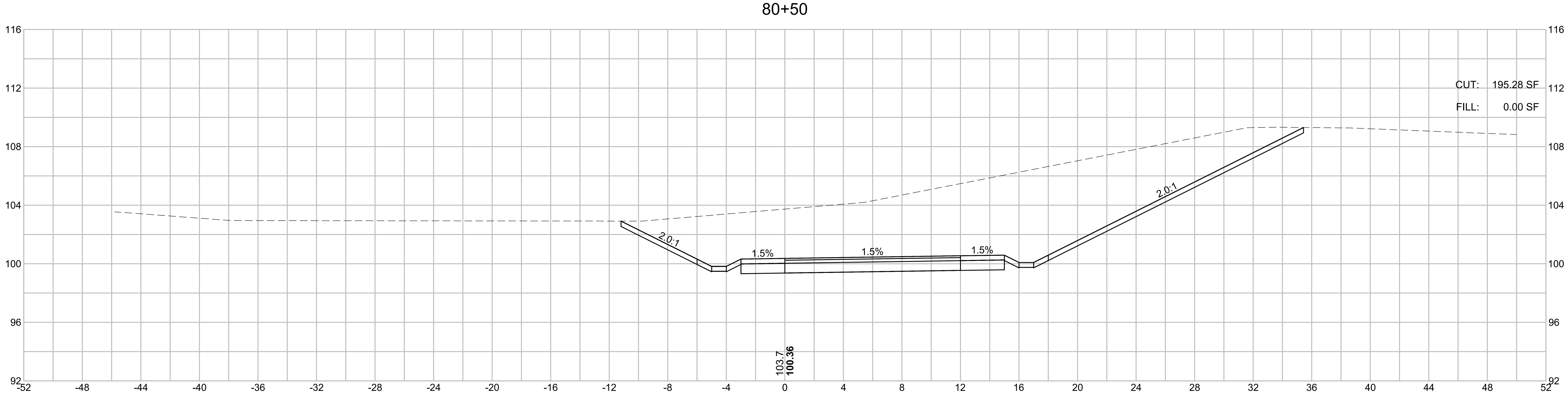

HOR. SCALE IN FEET
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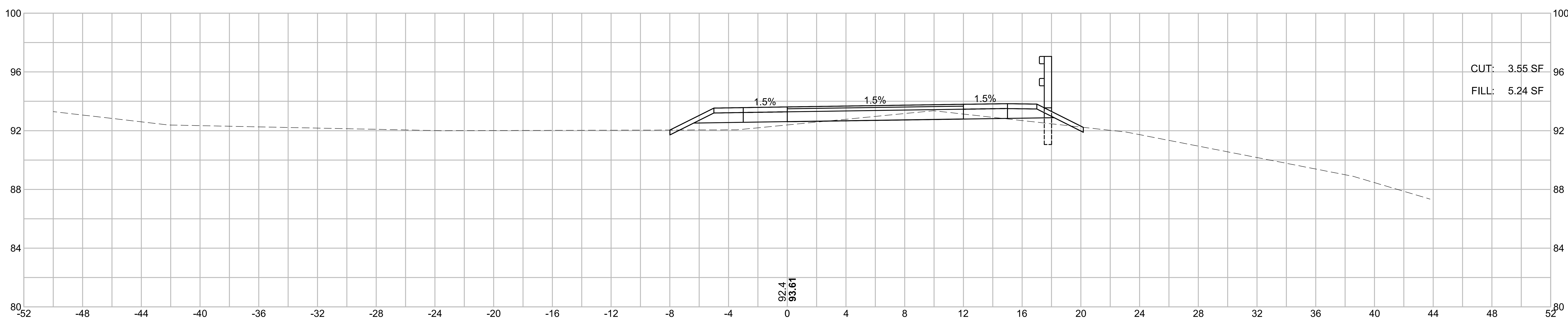
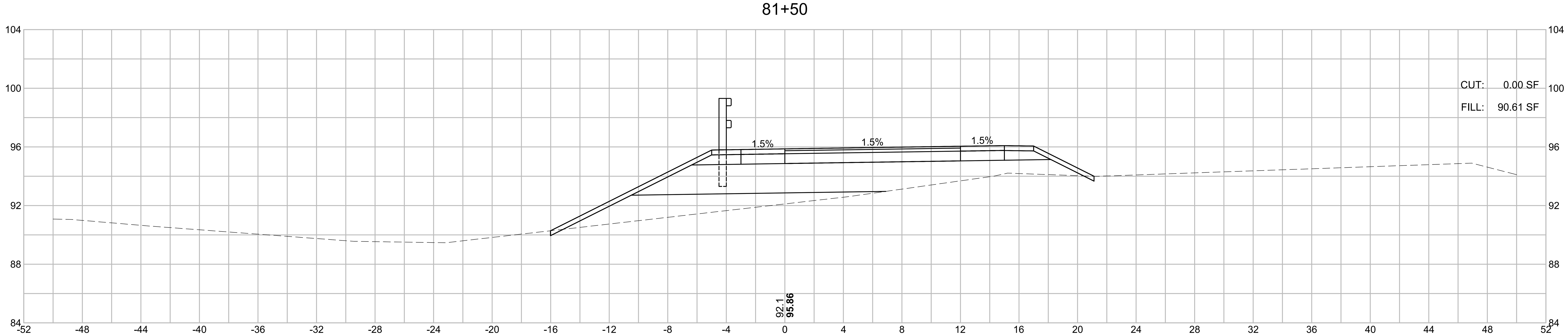
4 0 4 8
VER. SCALE IN FEET

82+00



81+50



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

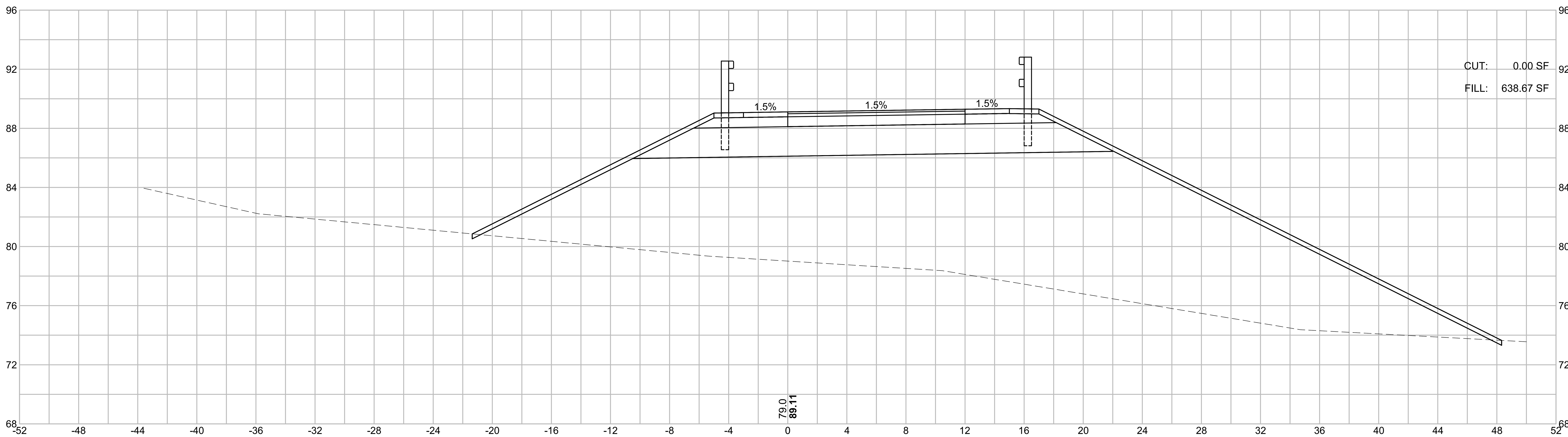
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	145	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:17 AM

607398_HD(XSEC-WEST-2).DWG

83+00



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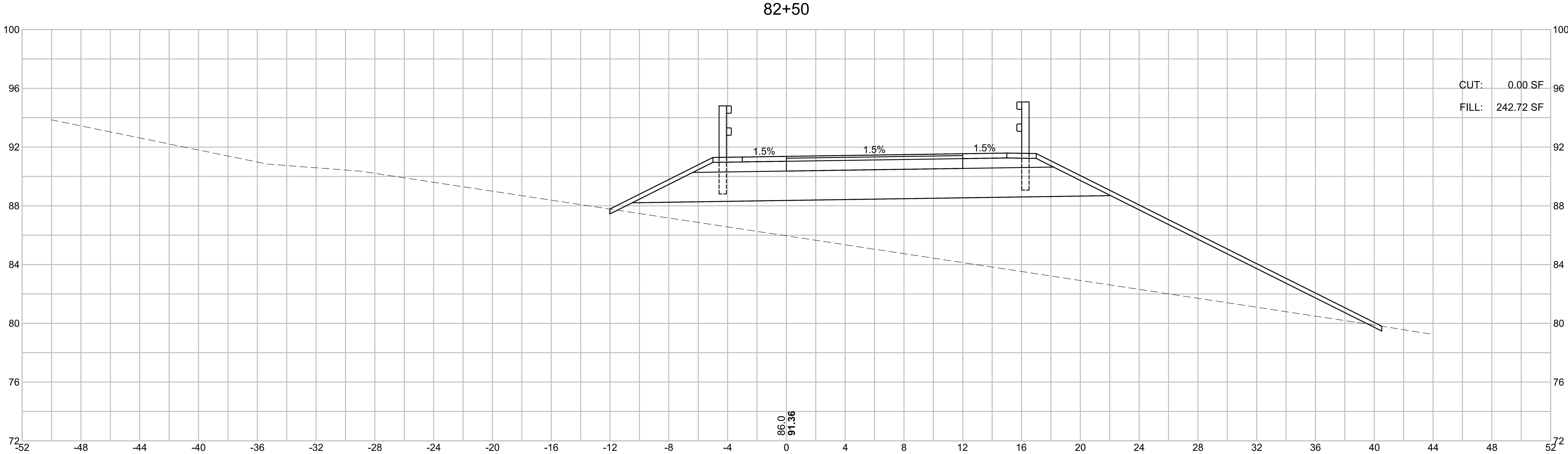


HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

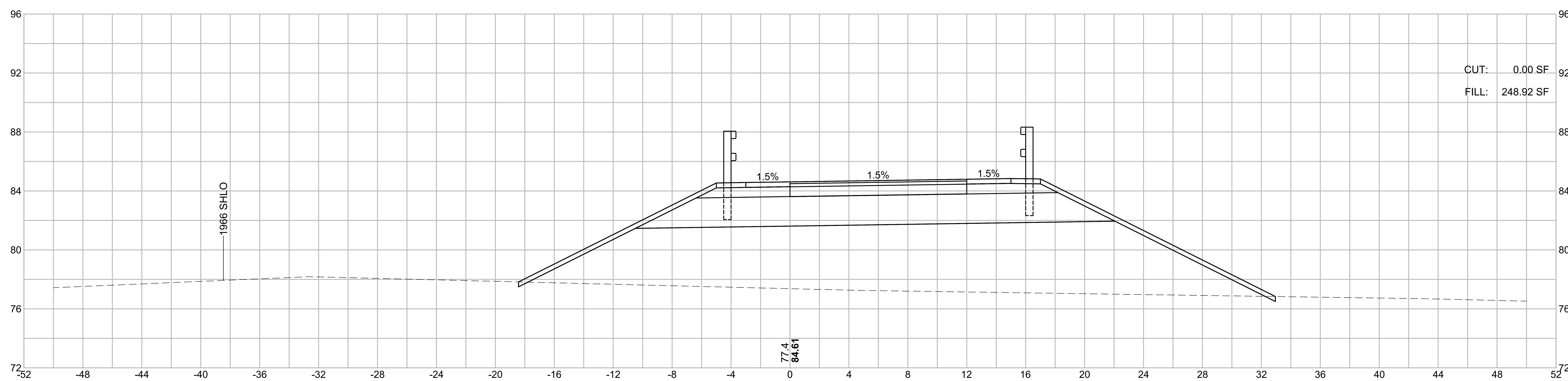
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	146	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

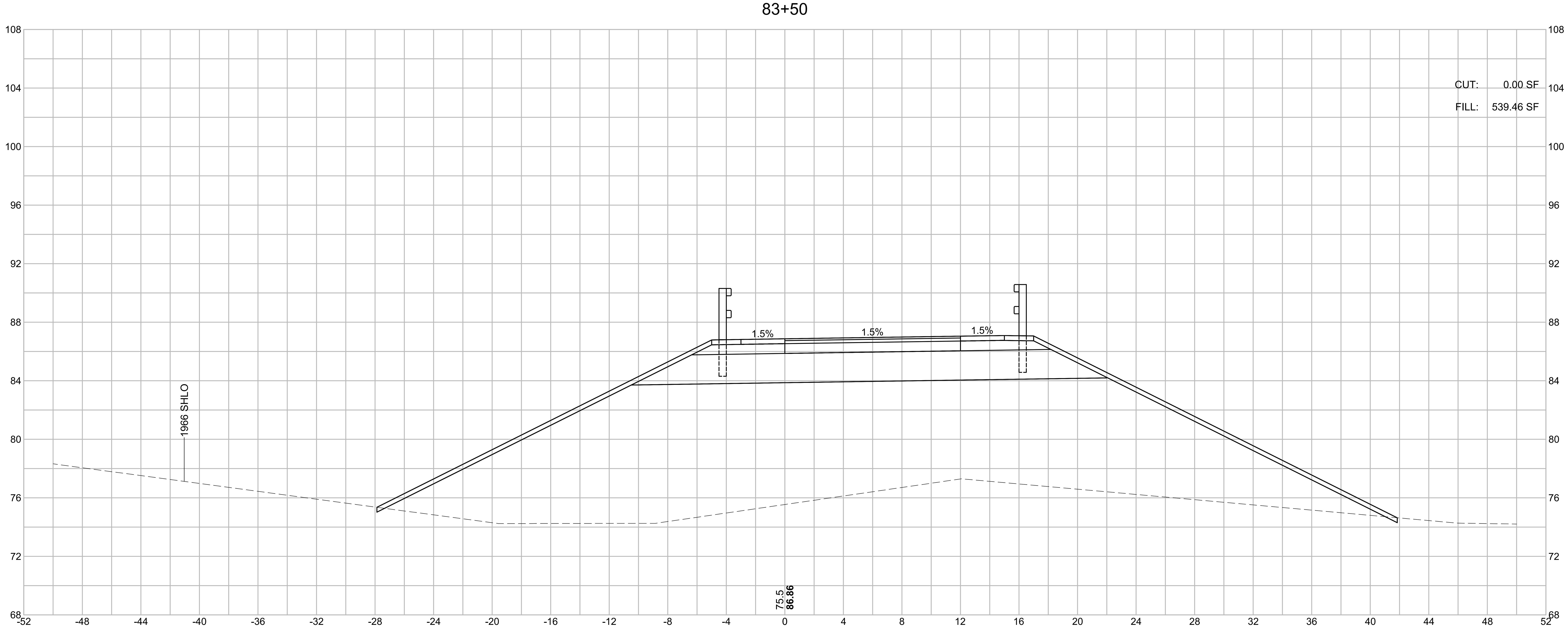
Plotted on 21-Oct-2021 8:17 AM

607398_HD(XSEC-WEST-2).DWG

84+00



83+50



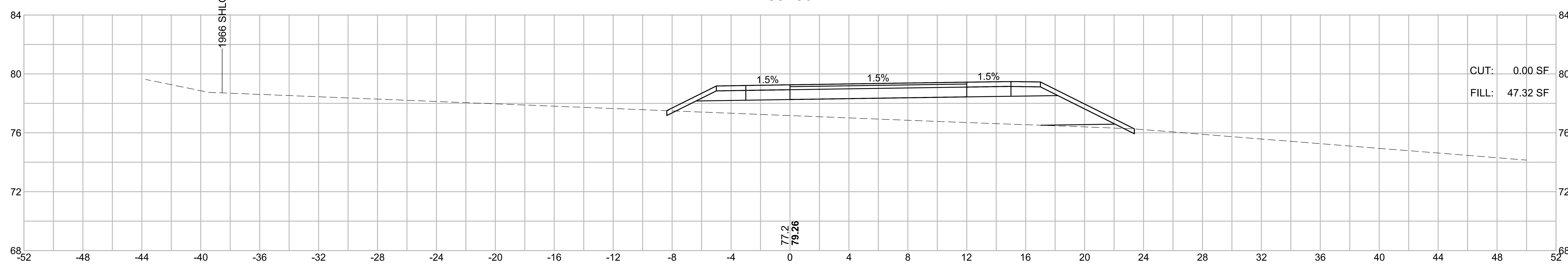
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	147	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

85+50



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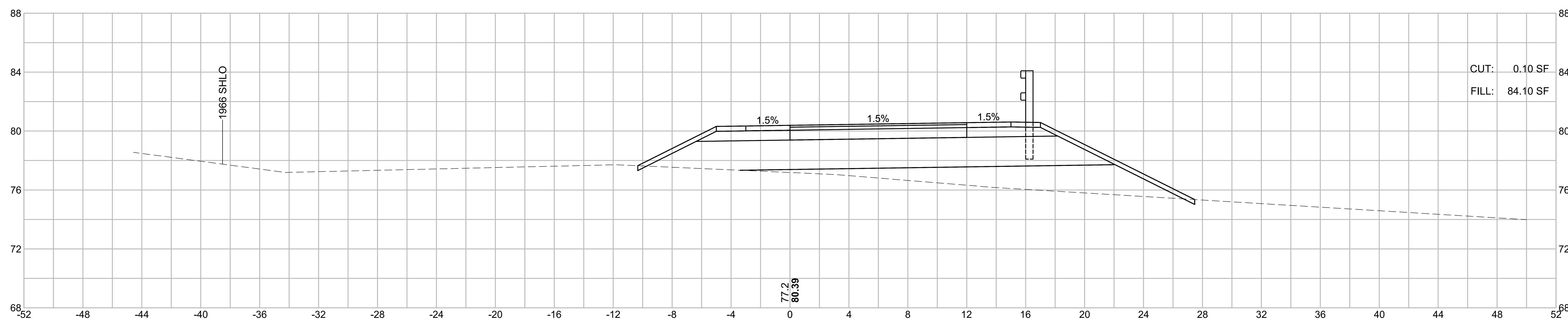
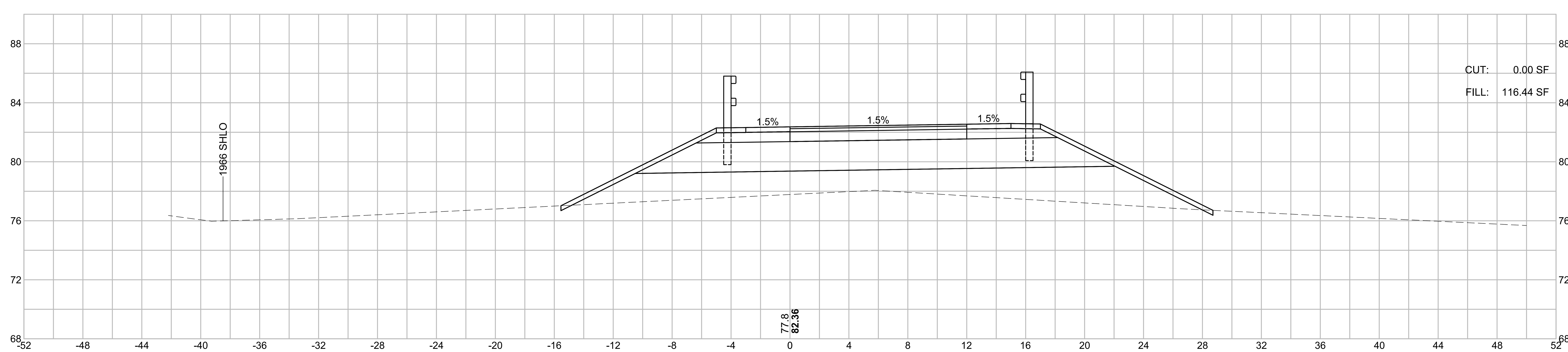
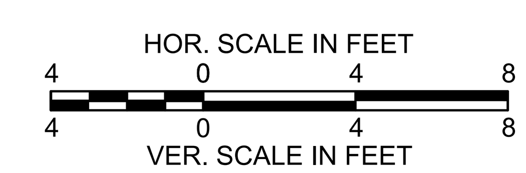


84+50





Plotted on 21-Oct-2021 8:17 AM

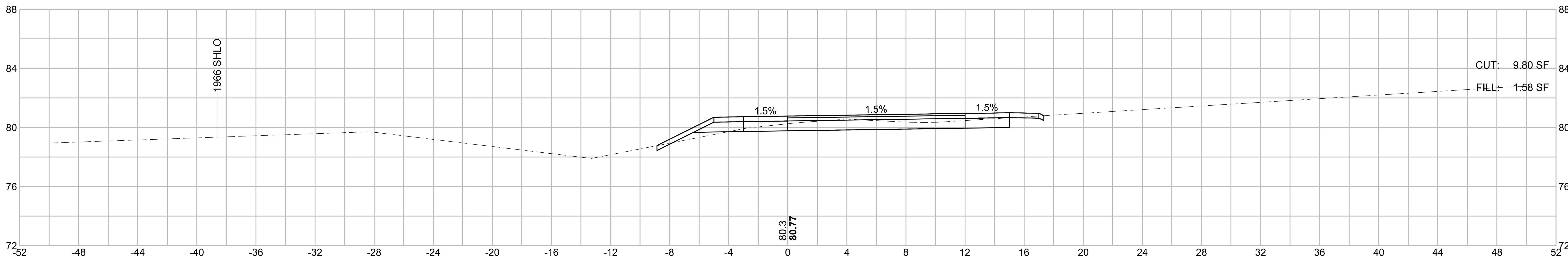
607398_HD(XSEC-WEST-2).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

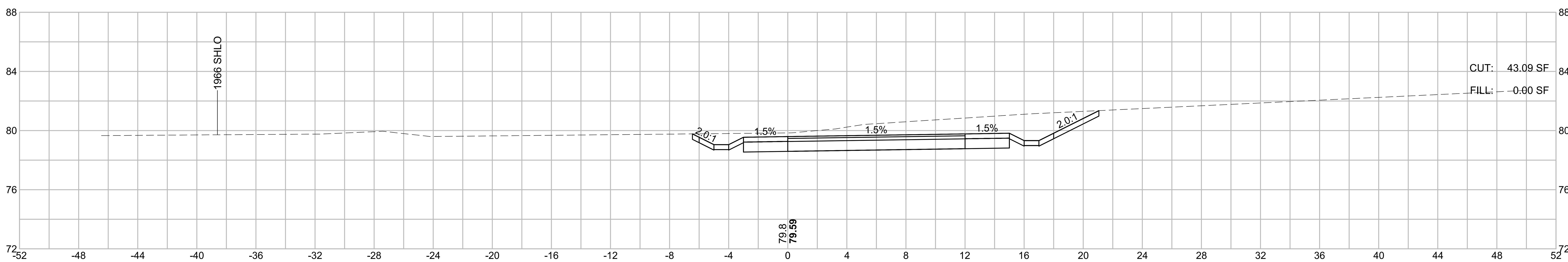
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	148	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

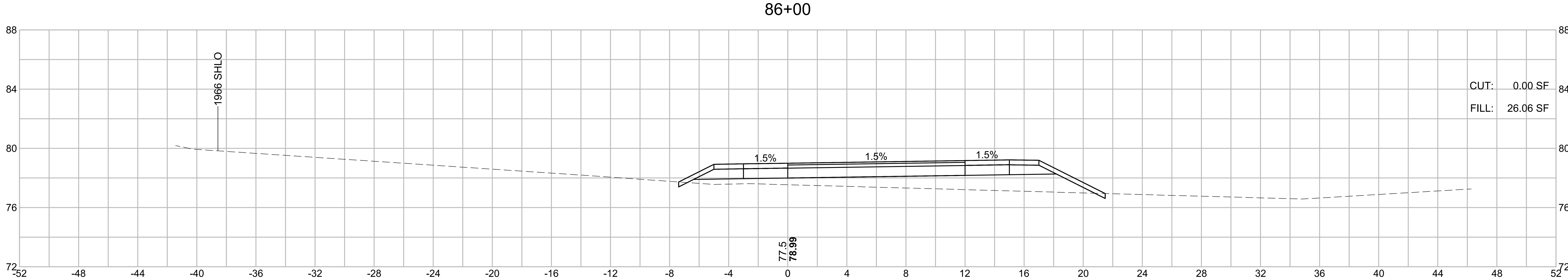
87+00

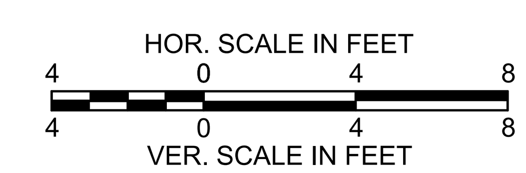


86+50



86+00





Plotted on 21-Oct-2021 8:17 AM

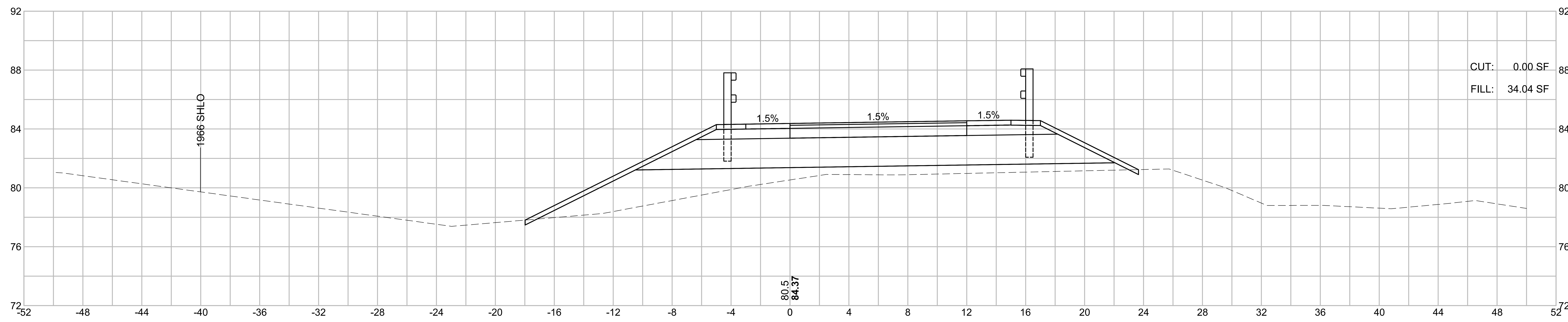
607398_HD(XSEC-WEST-2).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

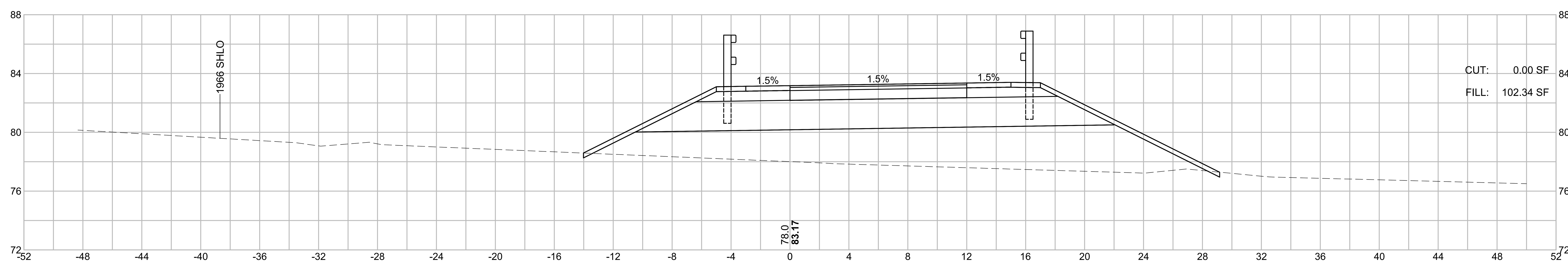
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	149	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

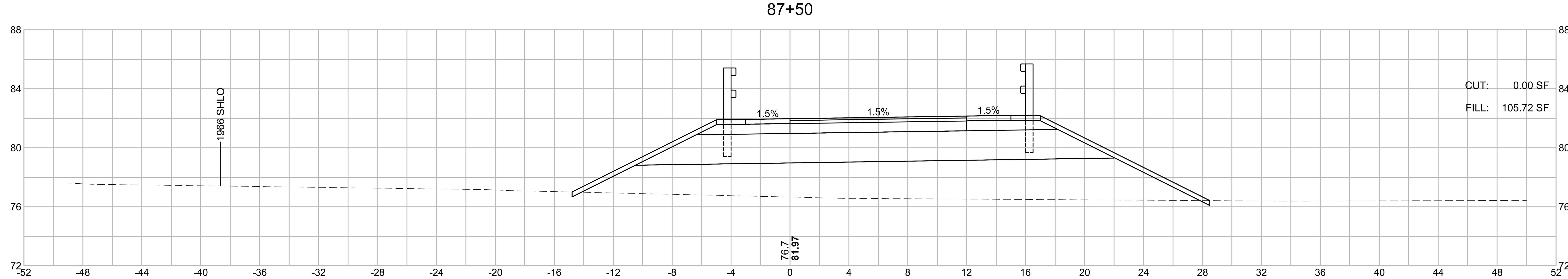
88+50



88+00



87+50



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

Plotted on 21-Oct-2021 8:17 AM

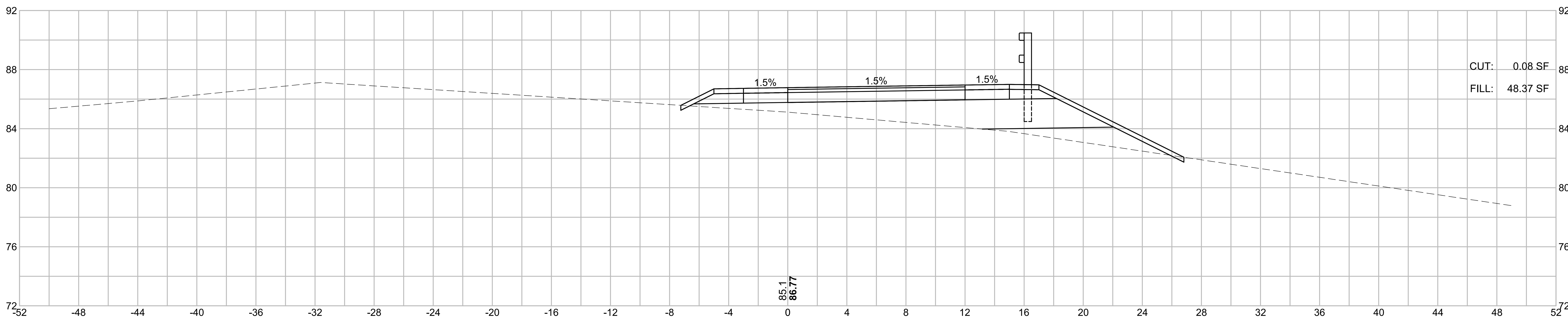
607398_HD(XSEC-WEST-2).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

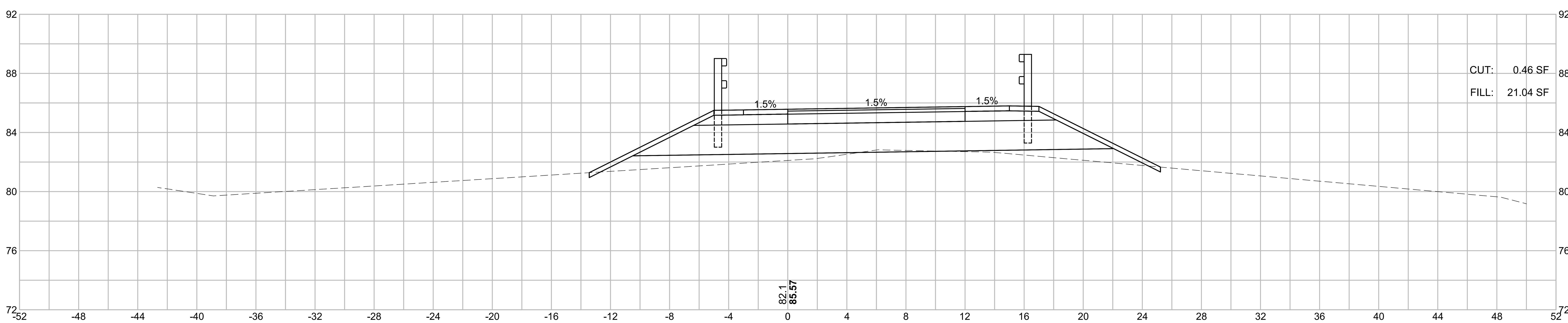
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	150	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

89+50



89+00



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

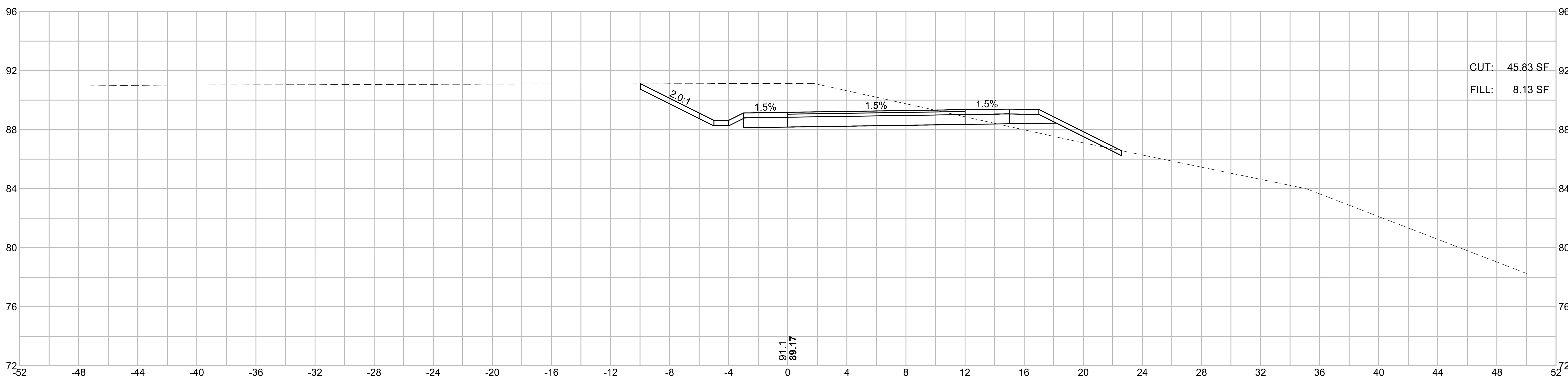
607398_HD(XSEC-WEST-2).DWG Plotted on 21-Oct-2021 8:17 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

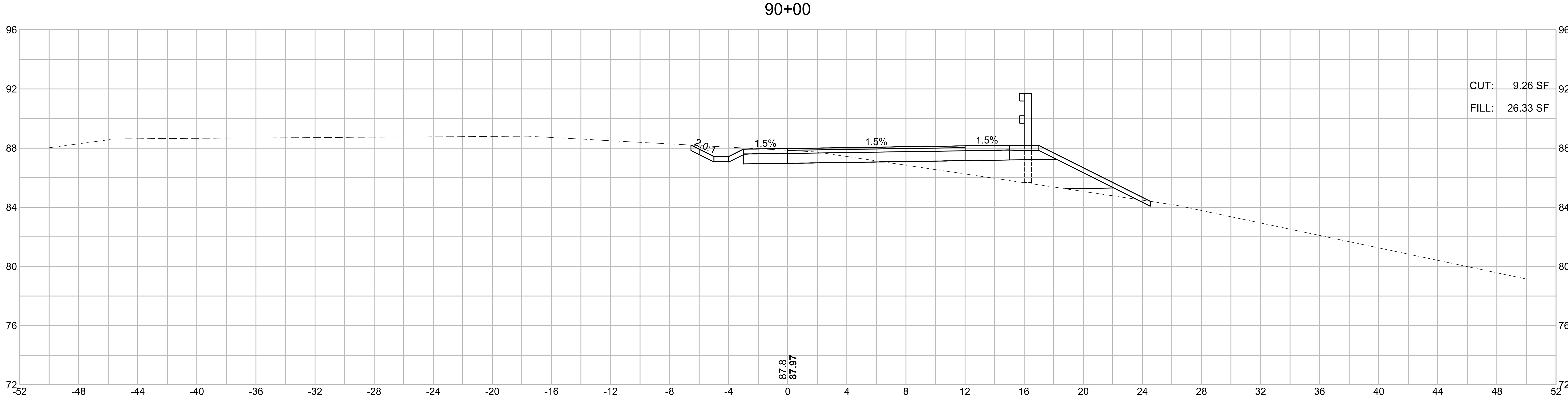
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	151	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

90+50



90+00



HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

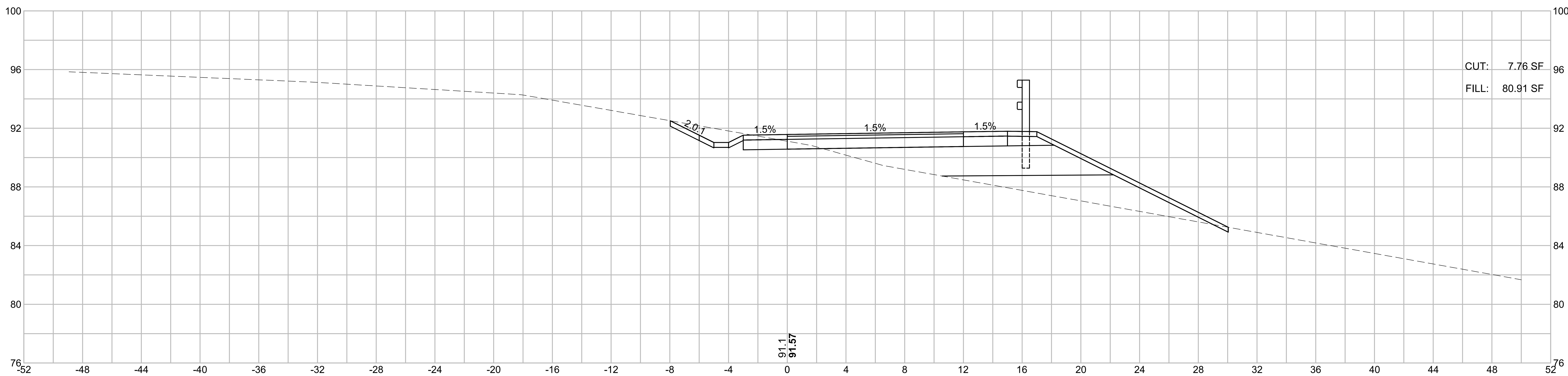
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	152	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

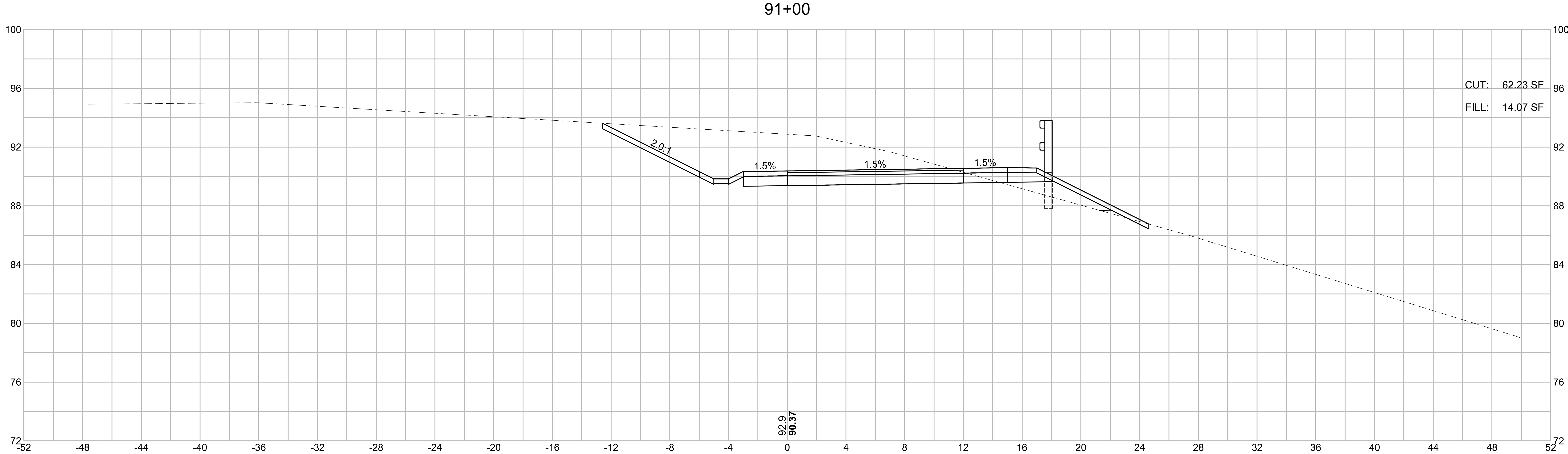
Plotted on 21-Oct-2021 8:17 AM

607398_HD(XSEC-WEST-2).DWG

91+50



91+00



HOR. SCALE IN FEET

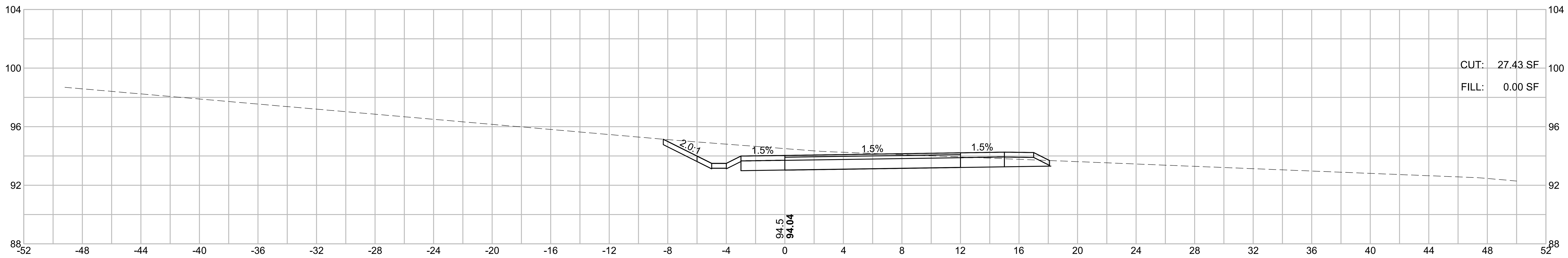
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

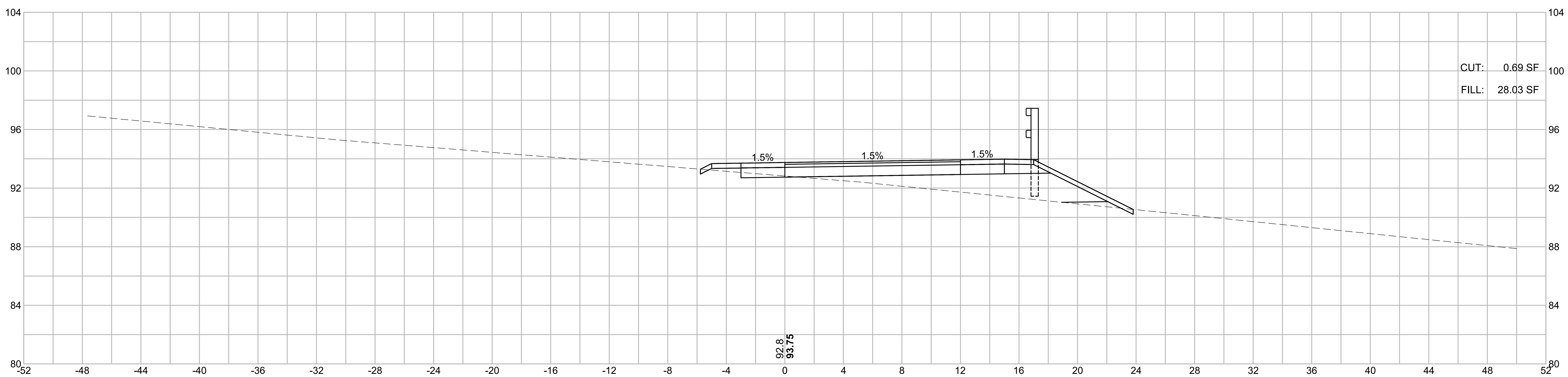
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	153	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

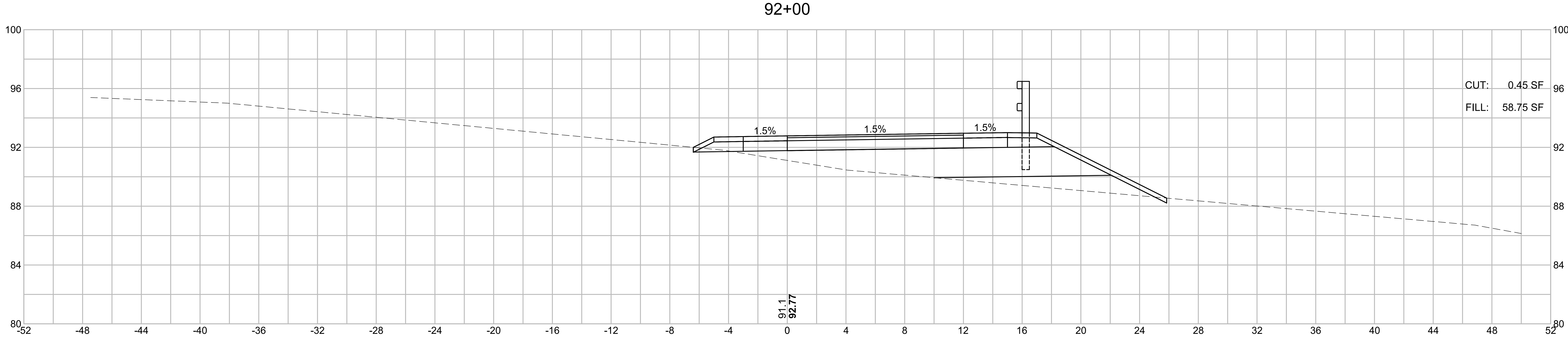
93+00



92+50



92+00



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

607398_HD(XSEC-WEST-2).DWG Plotted on 21-Oct-2021 8:17 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

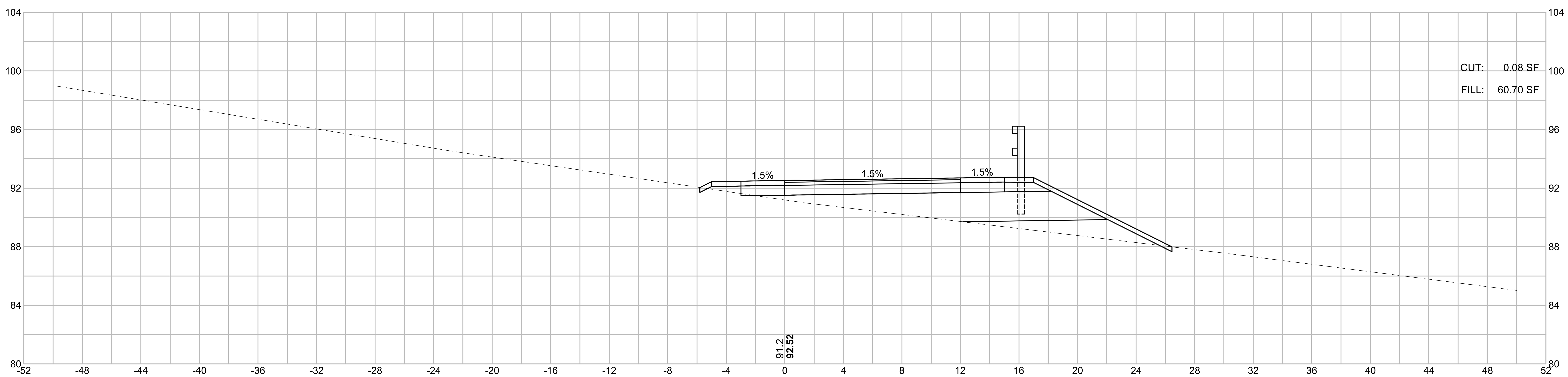
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	154	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

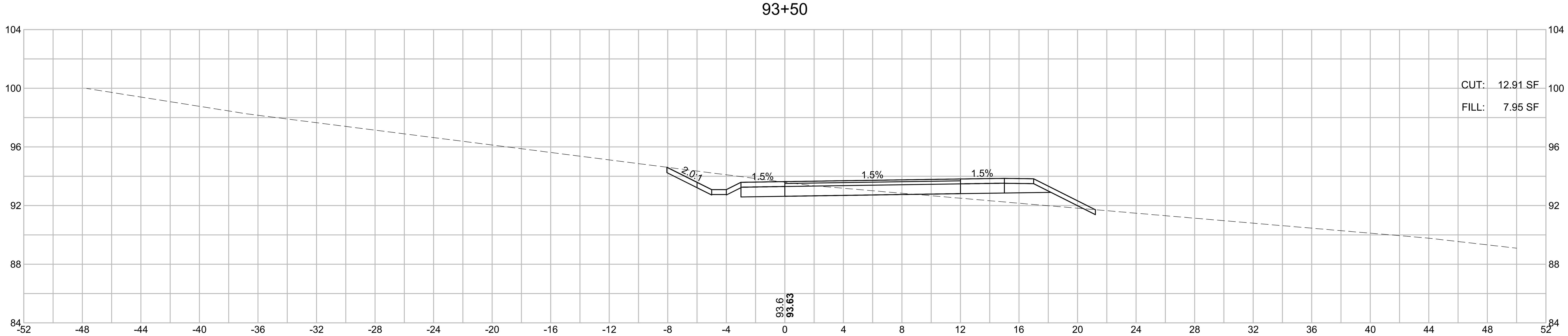
Plotted on 21-Oct-2021 8:17 AM

607398_HD(XSEC-WEST-2).DWG

94+00



93+50



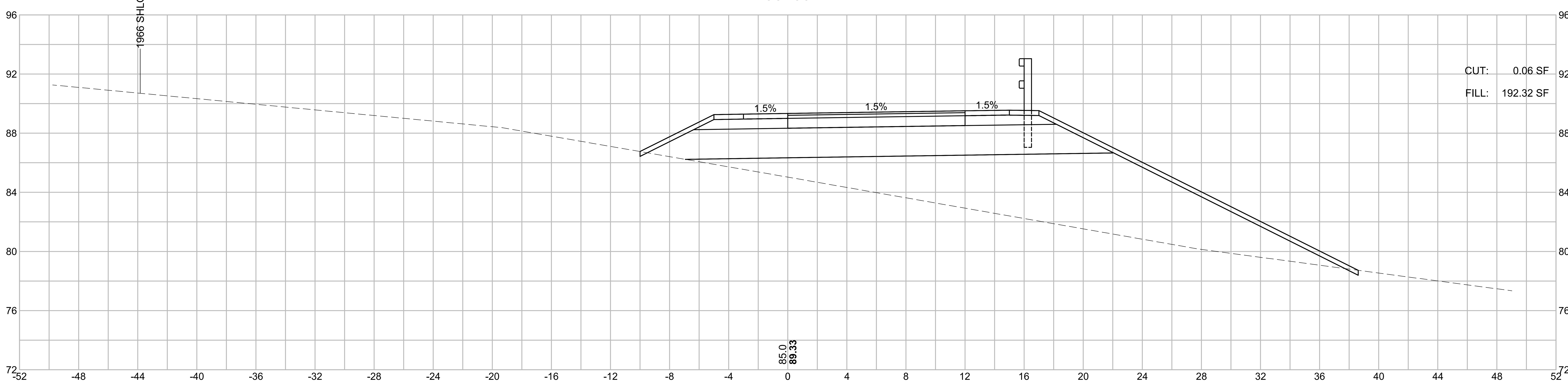
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

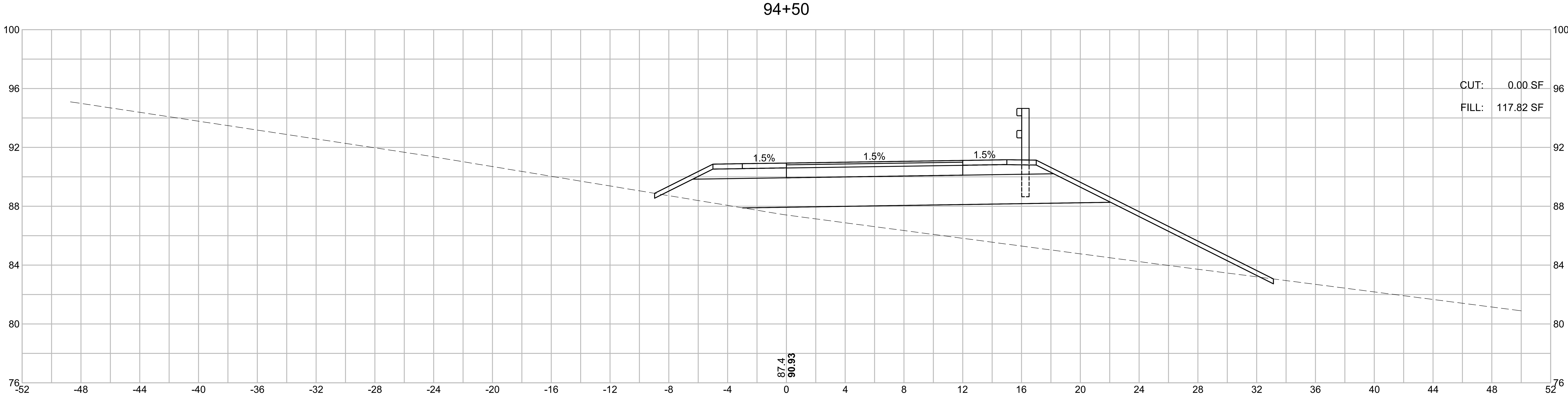
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	155	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

95+00



94+50



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

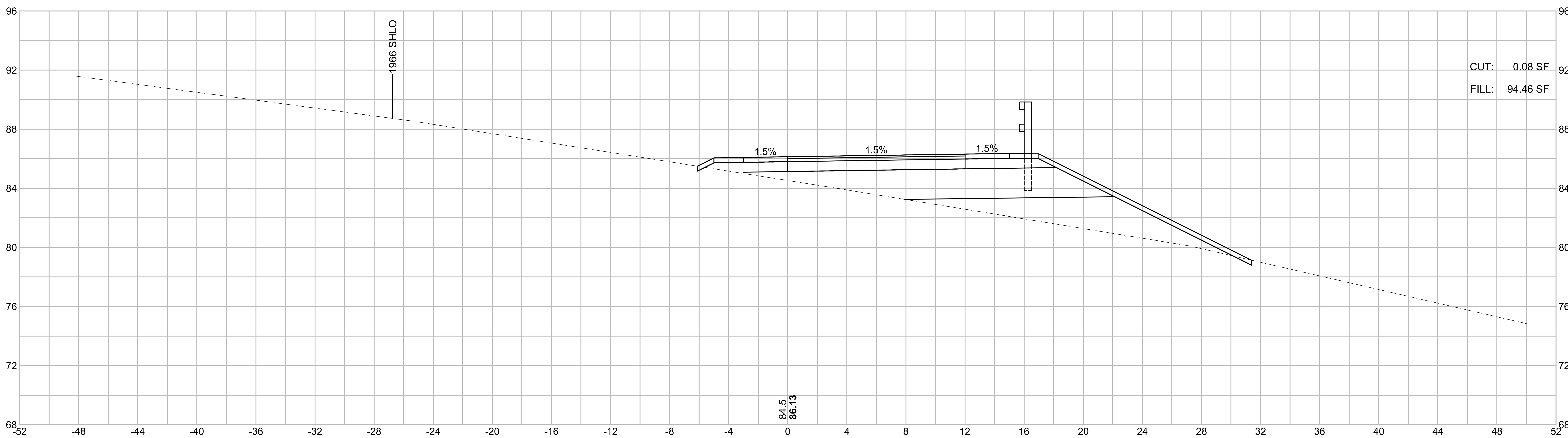
607398_HD(XSEC-WEST-2).DWG Plotted on 21-Oct-2021 8:17 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

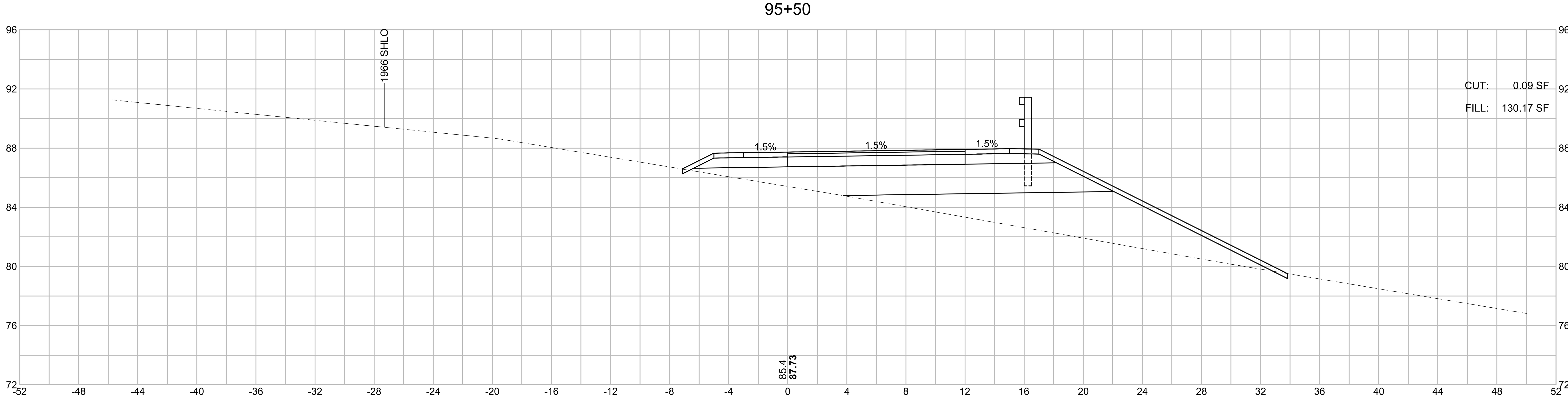
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	156	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

96+00



95+50



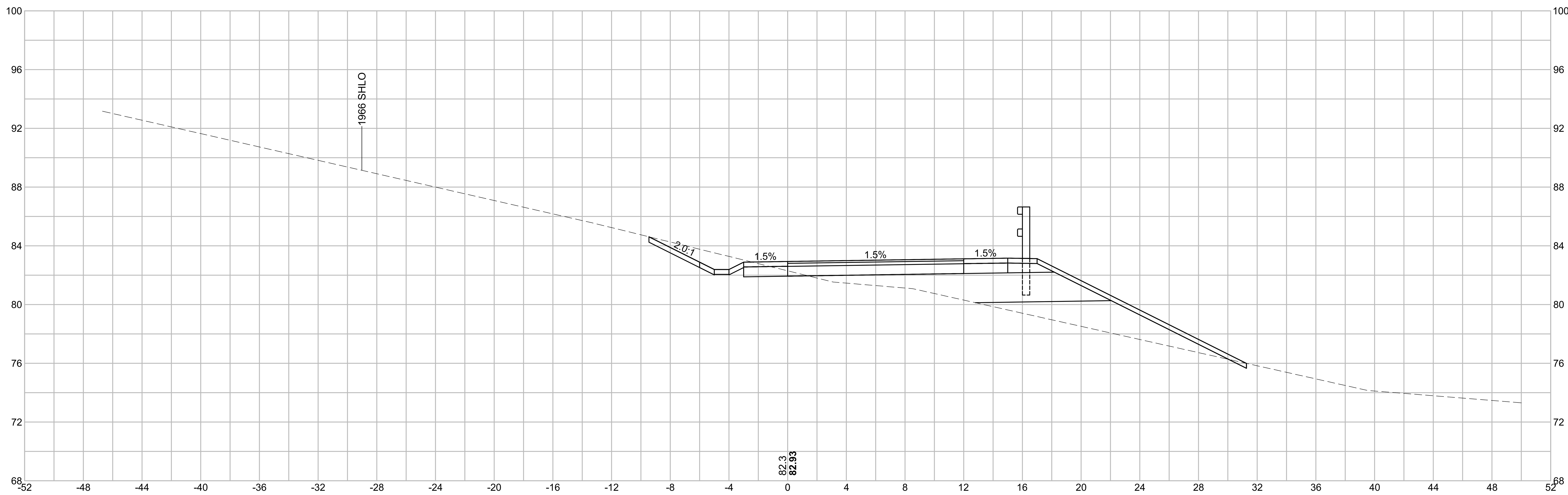
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	157	267
PROJECT FILE NO. 607398			

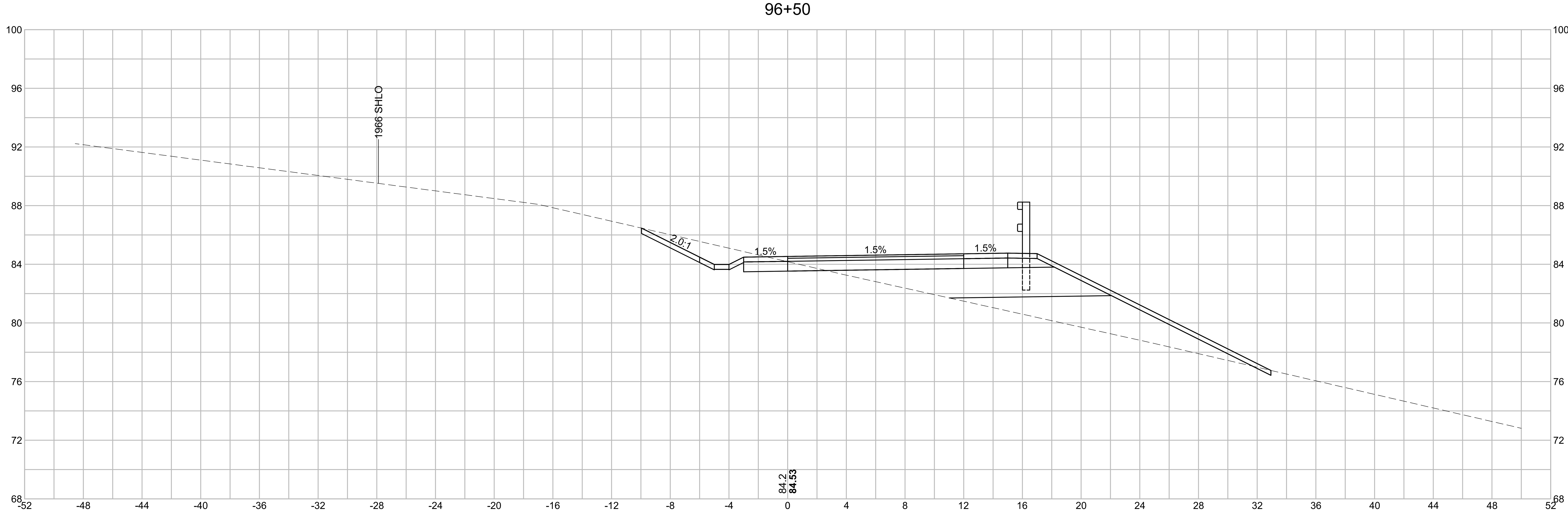
WEST CROSS SECTIONS

97+00



CUT: 8.91 SF
FILL: 70.88 SF

96+50



CUT: 11.70 SF
FILL: 98.19 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

607398_HD(XSEC-WEST-3).DWG
Plotted on 21-Oct-2021 8:19 AM

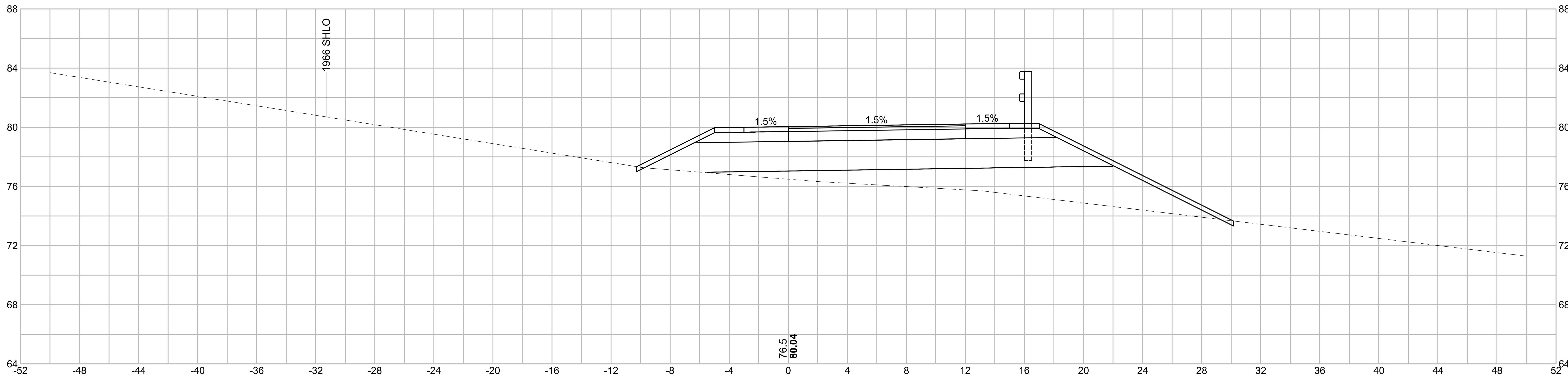
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	158	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

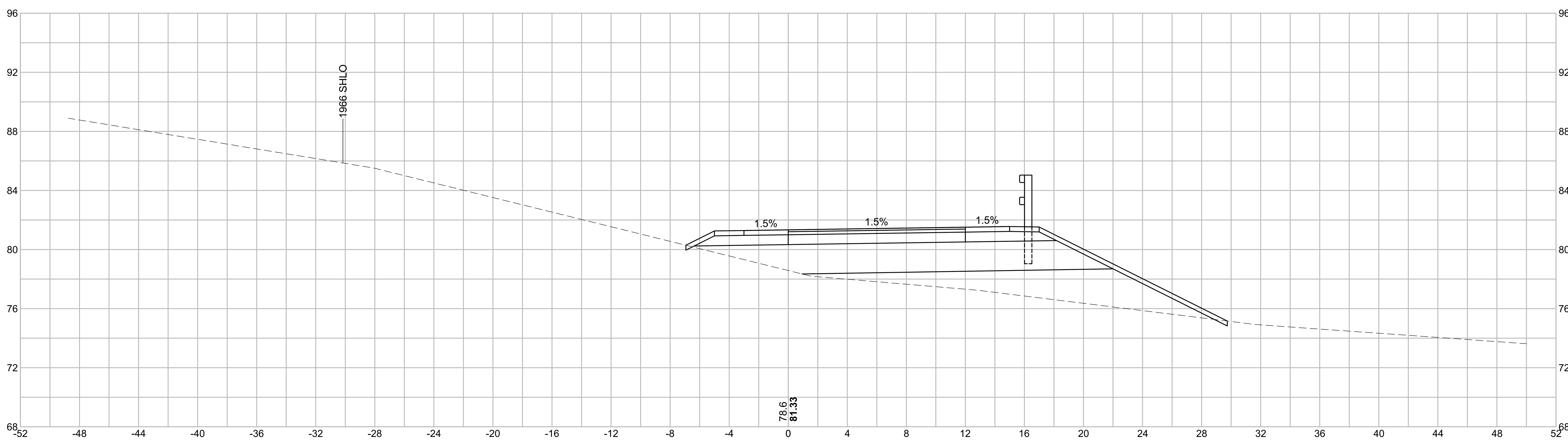
Plotted on 21-Oct-2021 8:19 AM
607398_HD(XSEC-WEST-3).DWG

98+00



CUT: 0.00 SF
FILL: 84.70 SF

97+50



CUT: 1.13 SF
FILL: 56.94 SF

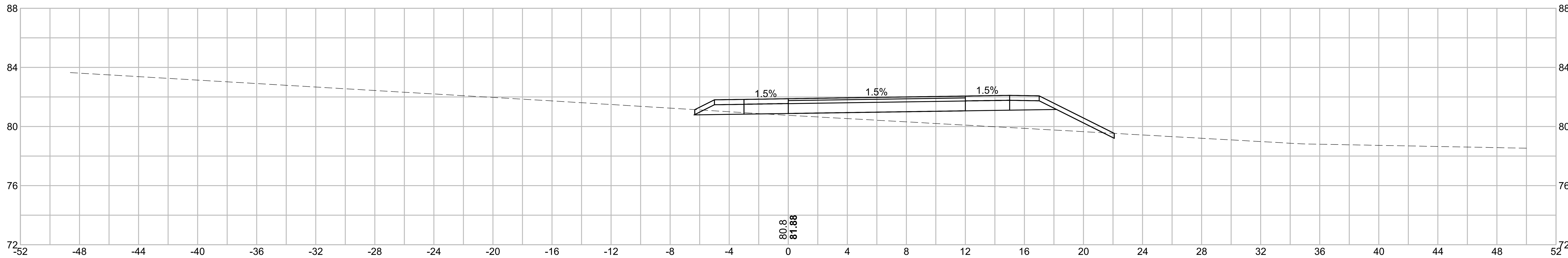
HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	159	267
PROJECT FILE NO. 607398			

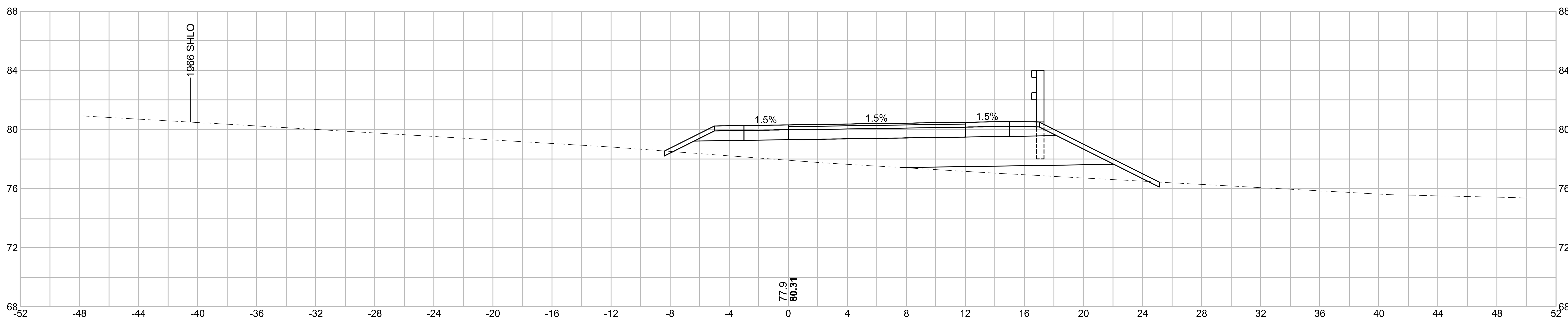
WEST CROSS SECTIONS

99+50



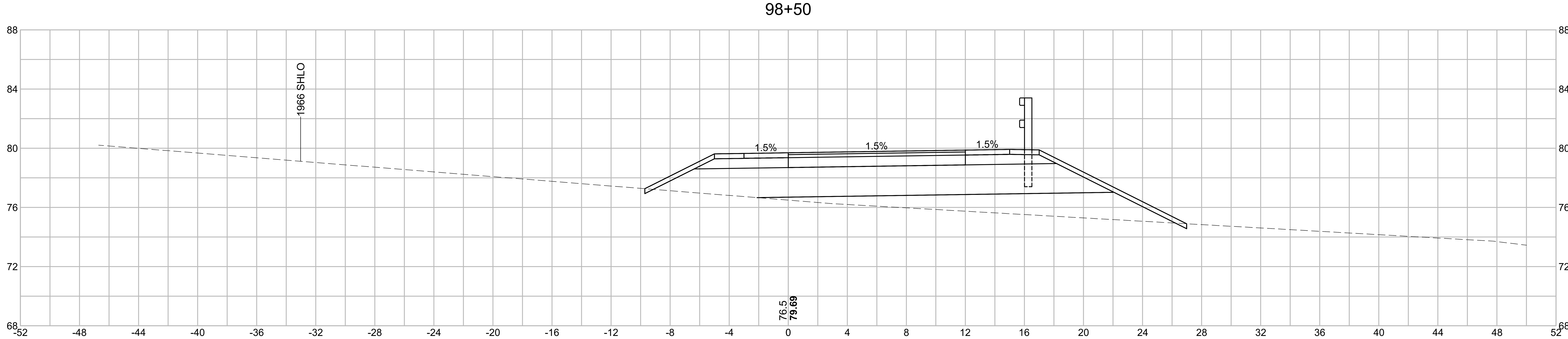
CUT: 0.85 SF
FILL: 19.80 SF

99+00



CUT: 0.00 SF
FILL: 64.59 SF

98+50



CUT: 0.00 SF
FILL: 52.29 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

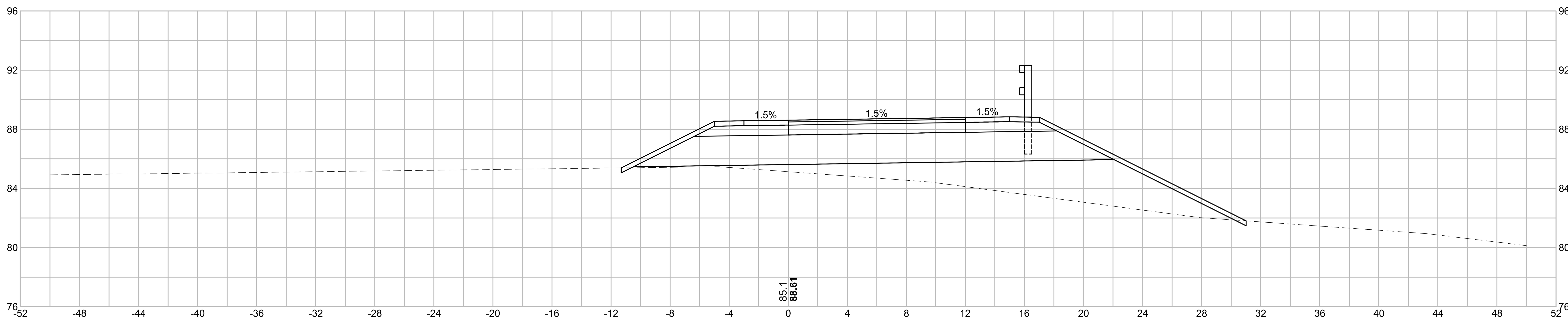
607398_HD(XSEC-WEST-3).DWG Plotted on 21-Oct-2021 8:19 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	160	267
PROJECT FILE NO. 607398			

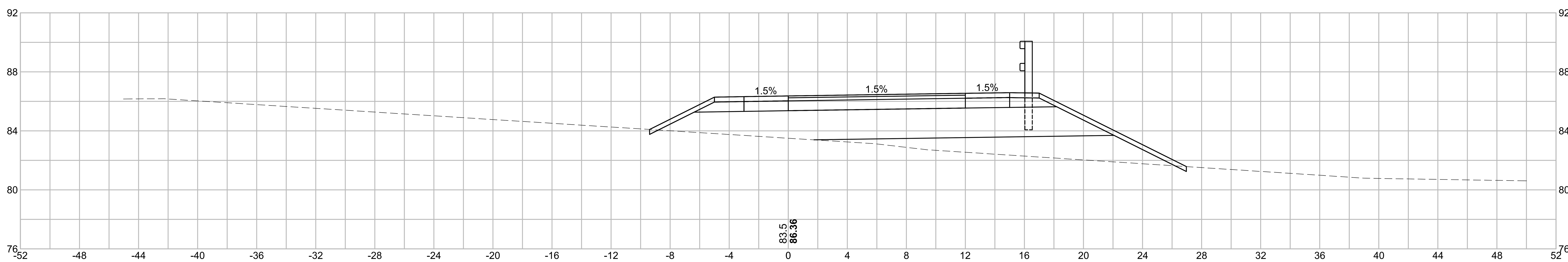
WEST CROSS SECTIONS

101+00



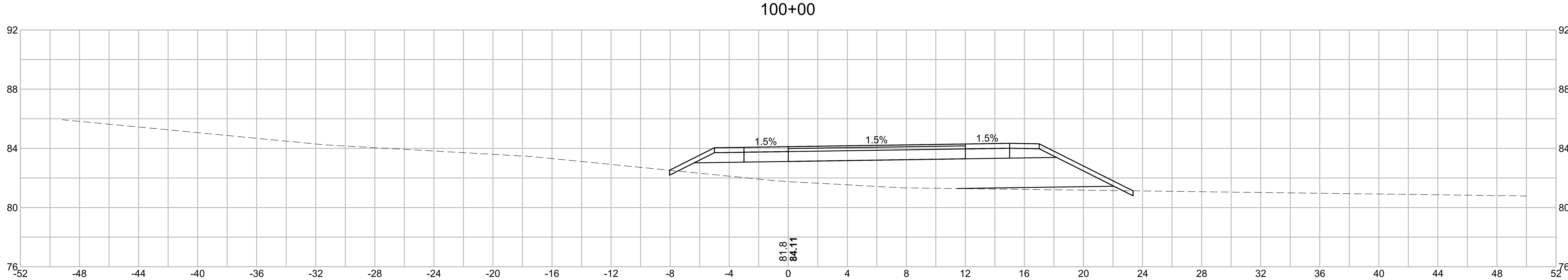
CUT: 0.00 SF
FILL: 73.19 SF

100+50

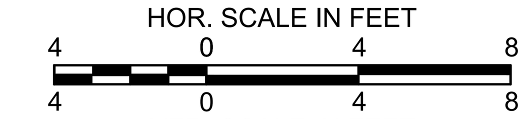


CUT: 0.00 SF
FILL: 90.61 SF

100+00



CUT: 0.00 SF
FILL: 52.14 SF

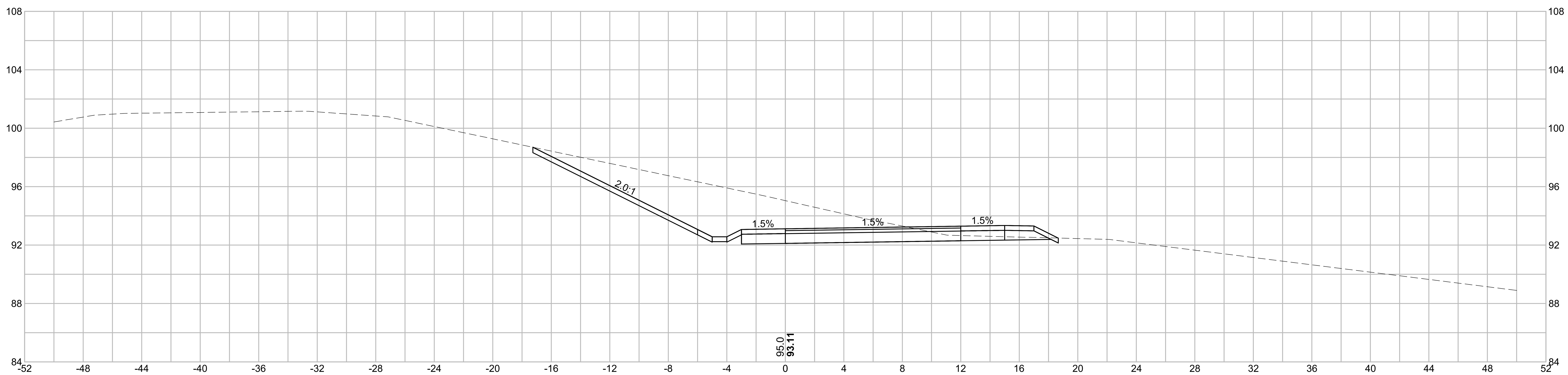


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	161	267
PROJECT FILE NO. 607398			

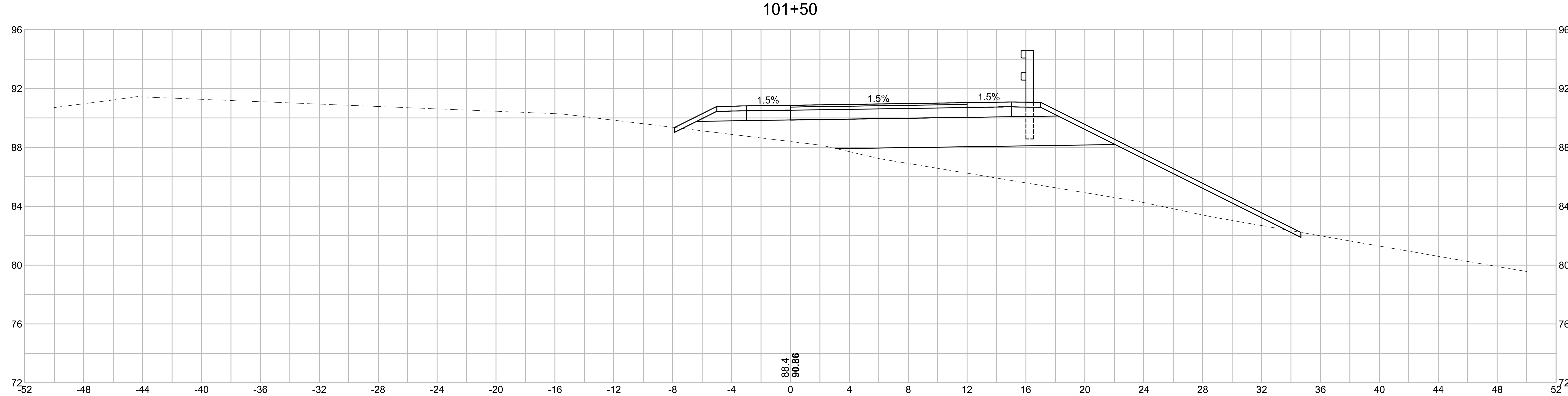
WEST CROSS SECTIONS

102+00



CUT: 63.13 SF
FILL: 0.00 SF

101+50



CUT: 0.09 SF
FILL: 155.74 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

607398_HD(XSEC-WEST-3).DWG Plotted on 21-Oct-2021 8:19 AM

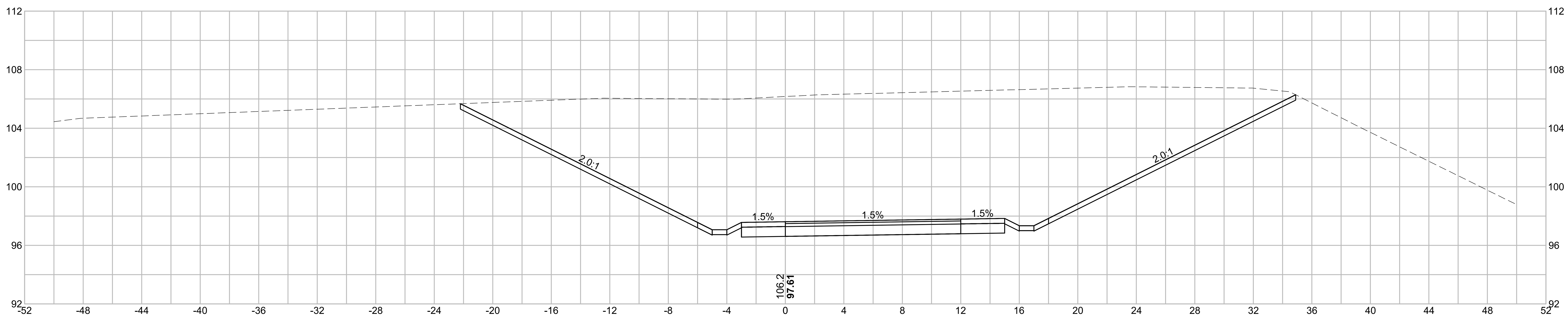
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	162	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

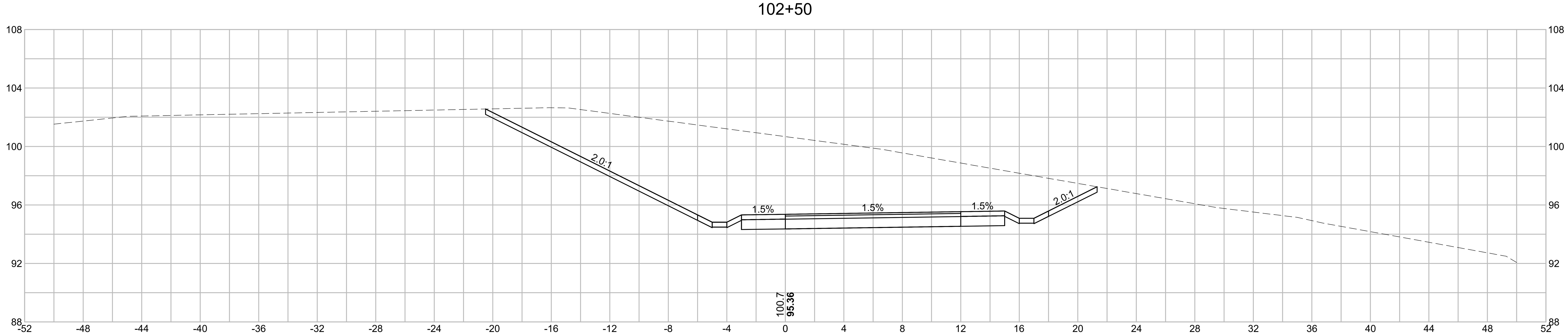
607398_HD(XSEC-WEST-3).DWG   Plotted on 21-Oct-2021 8:20 AM

103+00



CUT: 390.73 SF
FILL: 0.00 SF

102+50



CUT: 184.36 SF
FILL: 0.00 SF

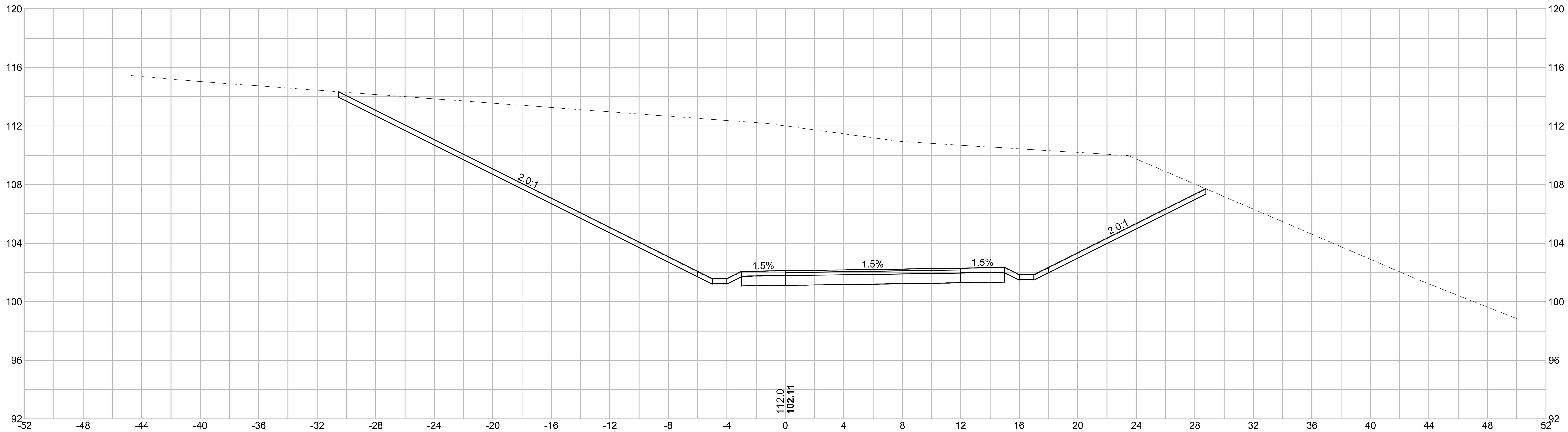
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	163	267
PROJECT FILE NO. 607398			

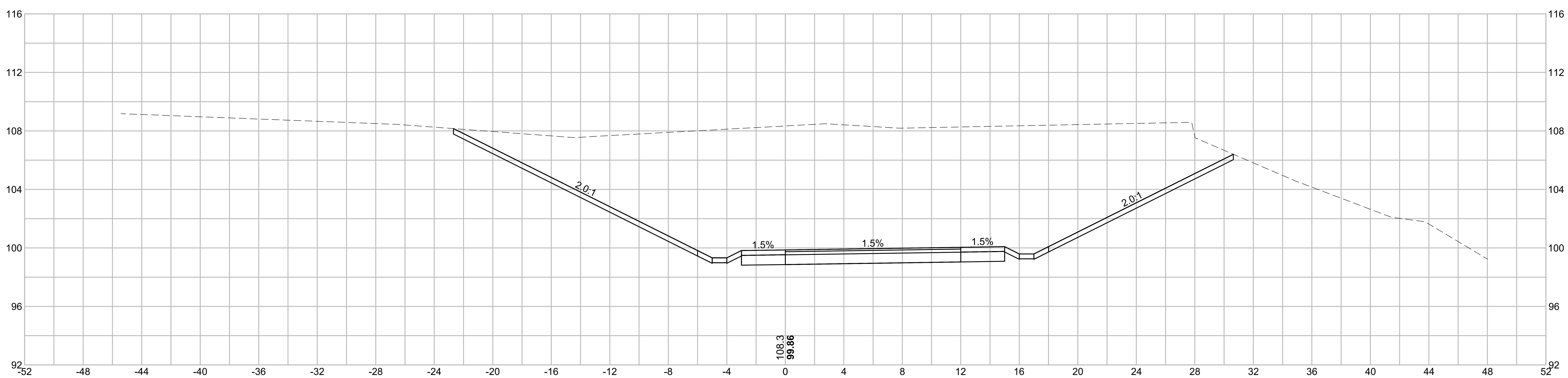
WEST CROSS SECTIONS

104+00



CUT: 430.48 SF
FILL: 0.00 SF

103+50



CUT: 358.90 SF
FILL: 0.00 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

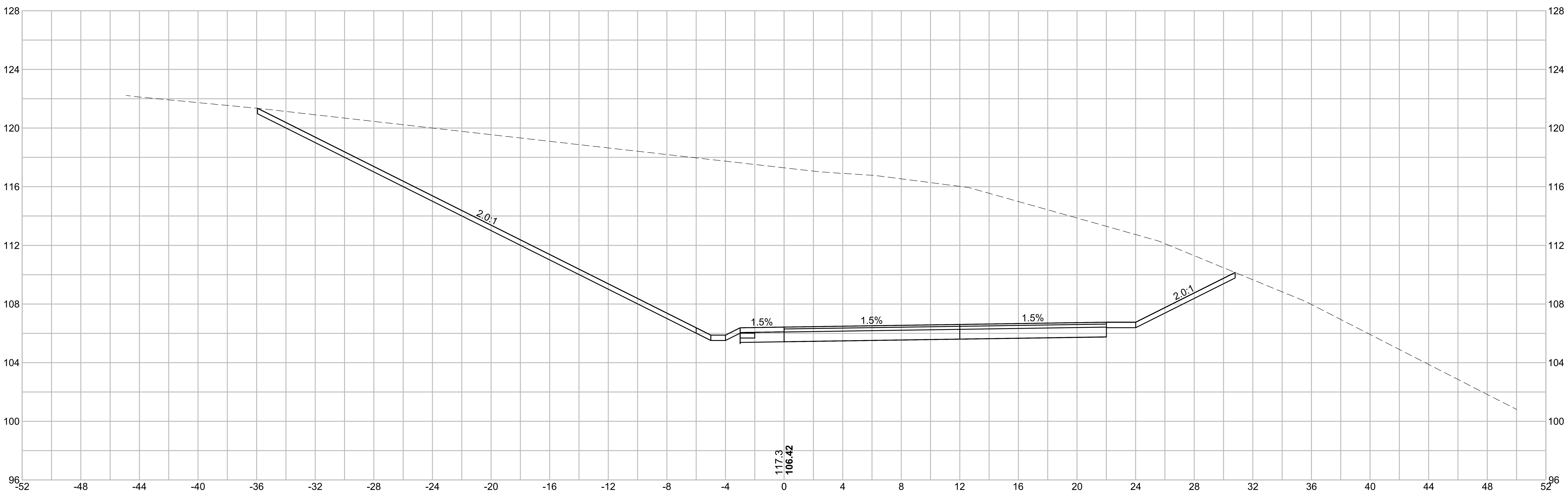
607398_HD(XSEC-WEST-3).DWG Plotted on 21-Oct-2021 8:20 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	164	267
PROJECT FILE NO. 607398			

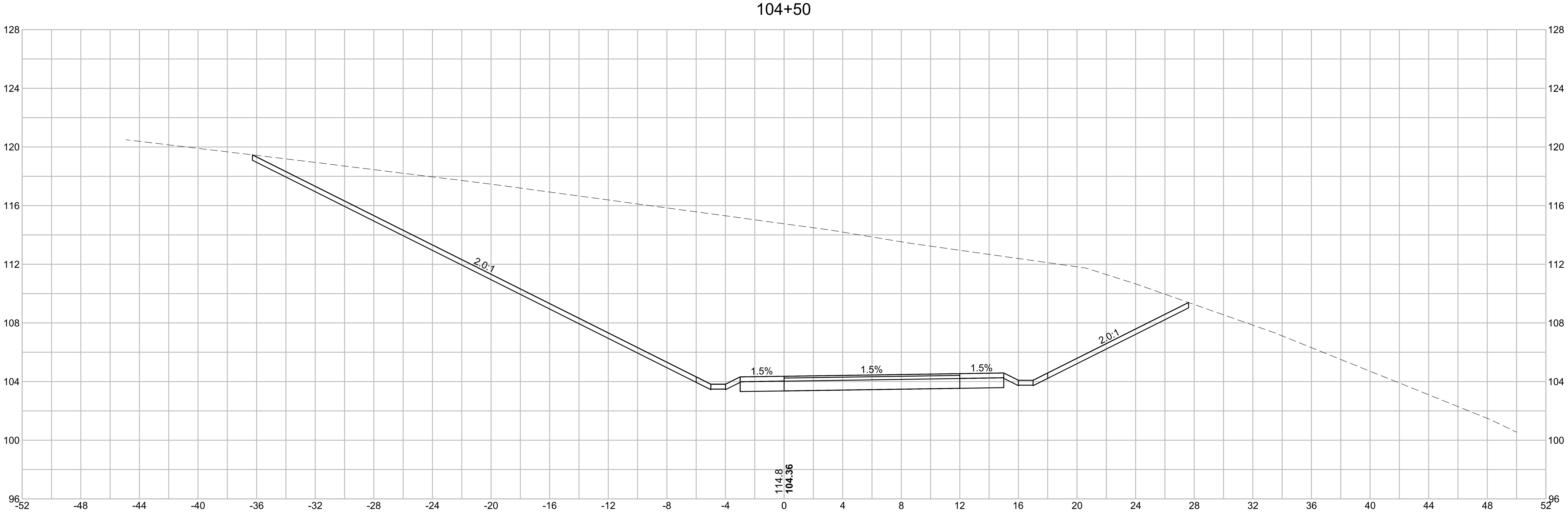
WEST CROSS SECTIONS

105+00



CUT: 517.15 SF
FILL: 0.00 SF

104+50



CUT: 472.66 SF
FILL: 0.00 SF

HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

607398_HD(XSEC-WEST-3).DWG Plotted on 21-Oct-2021 8:20 AM

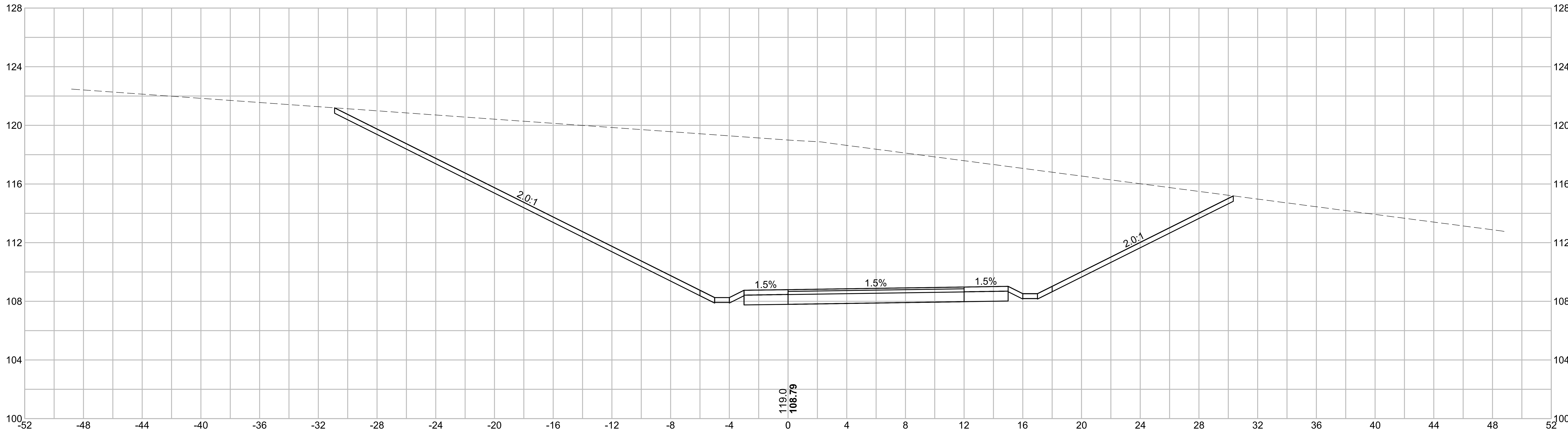
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	165	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

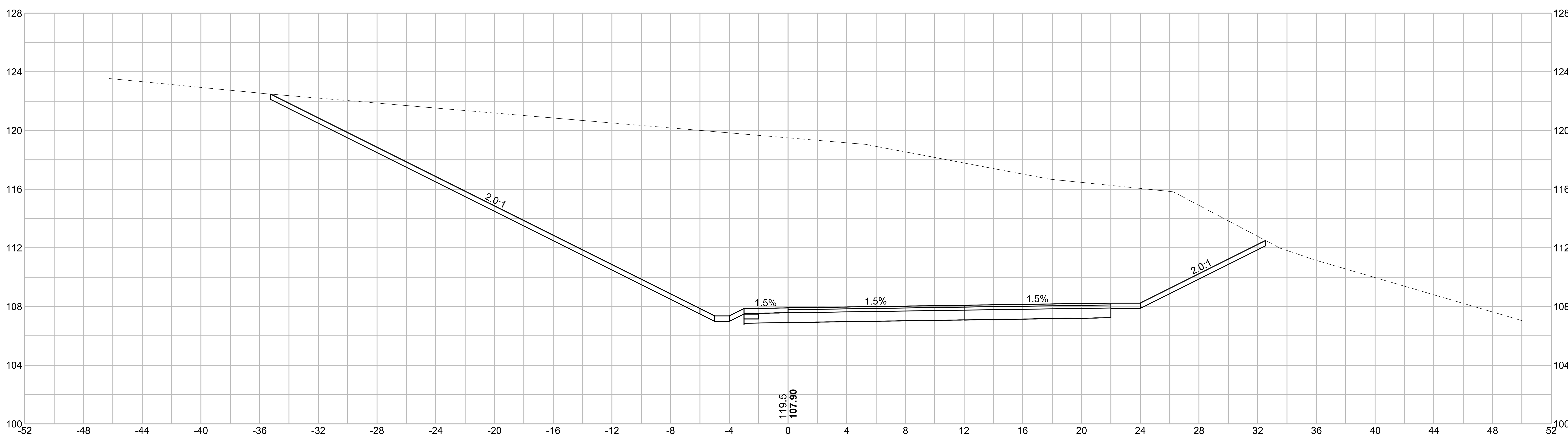
607398_HD(XSEC-WEST-3).DWG Plotted on 21-Oct-2021 8:20 AM

106+00



CUT: 442.25 SF
FILL: 0.00 SF

105+50



CUT: 558.95 SF
FILL: 0.00 SF

HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

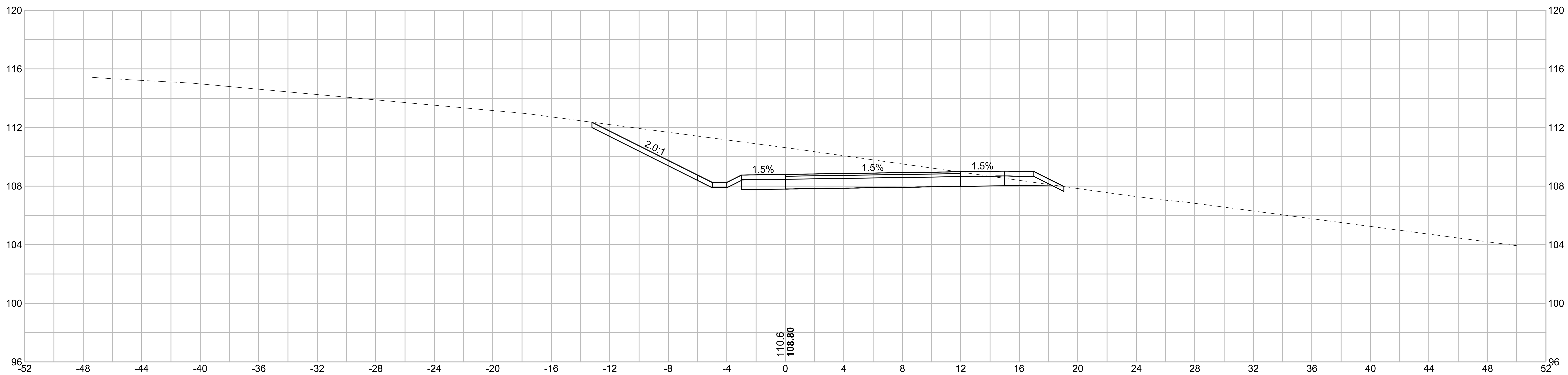
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	166	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:20 AM

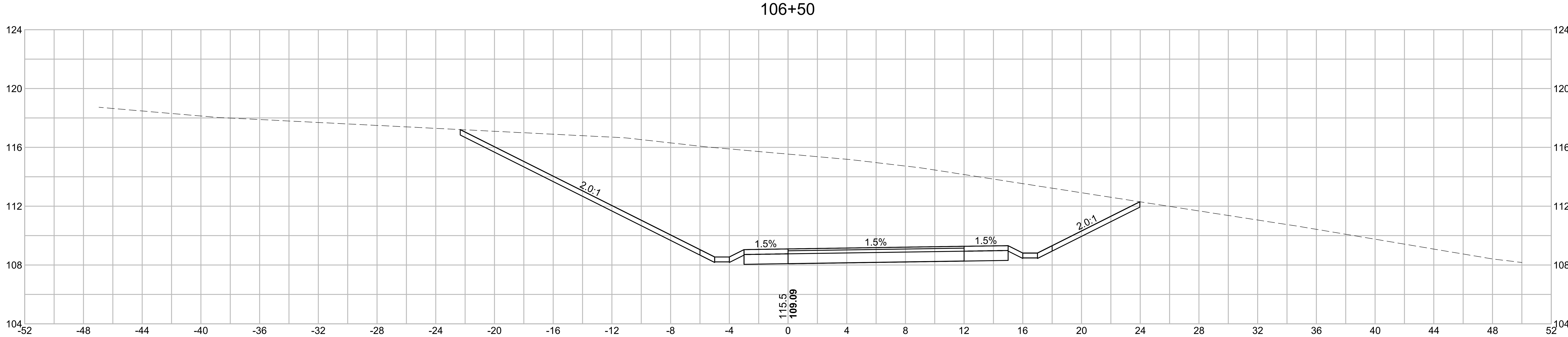
607398_HD(XSEC-WEST-3).DWG

107+00



CUT: 56.79 SF
FILL: 0.05 SF

106+50



CUT: 236.99 SF
FILL: 0.00 SF

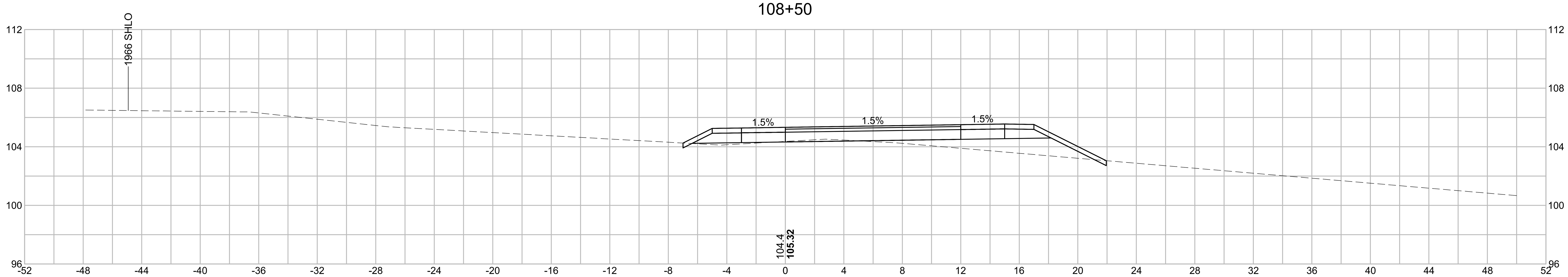
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	167	267
PROJECT FILE NO. 607398			

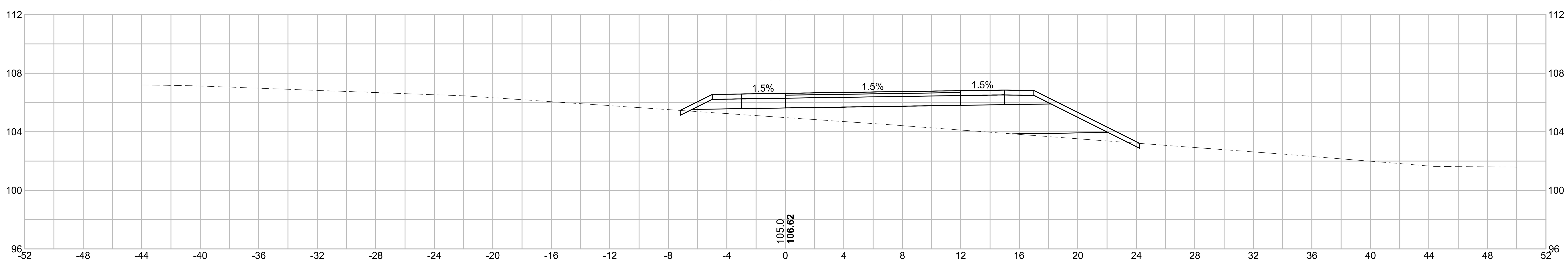
WEST CROSS SECTIONS

108+50



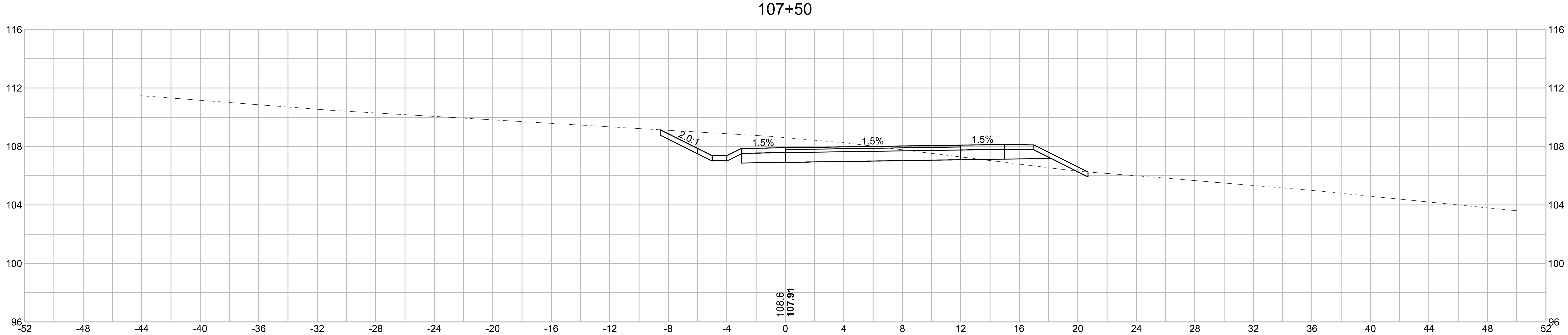
CUT: 0.49 SF
FILL: 12.92 SF

108+00



CUT: 0.00 SF
FILL: 42.90 SF

107+50



CUT: 25.09 SF
FILL: 3.49 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

607398_HD(XSEC-WEST-3).DWG Plotted on 21-Oct-2021 8:20 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

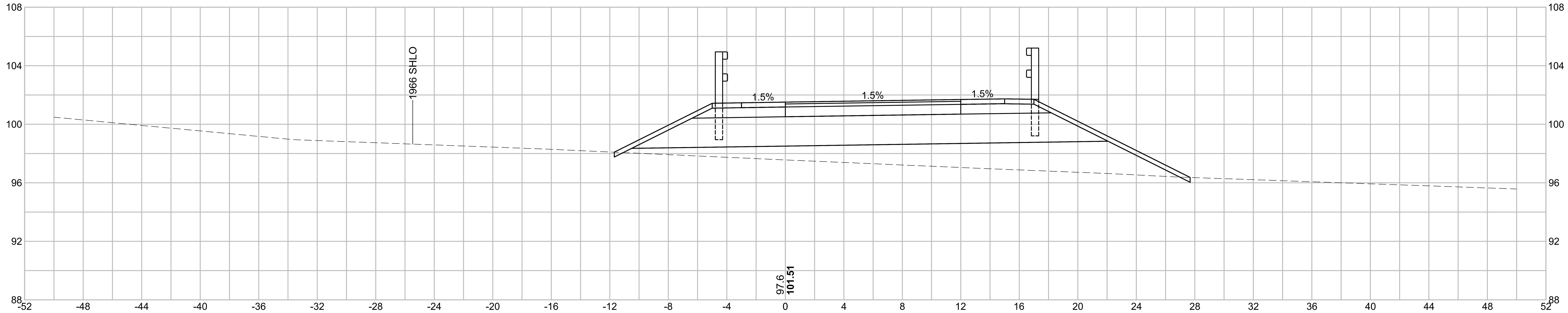
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	168	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

607398_HD(XSEC-WEST-3).DWG

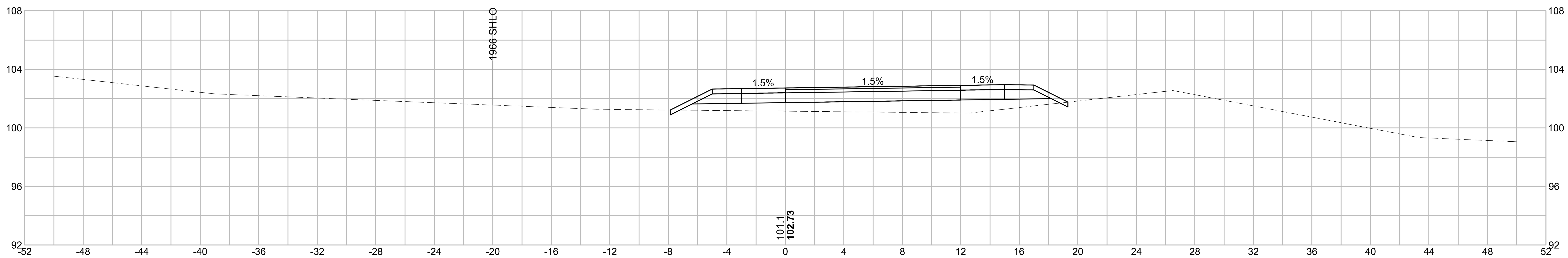
Plotted on 21-Oct-2021 8:20 AM

110+00



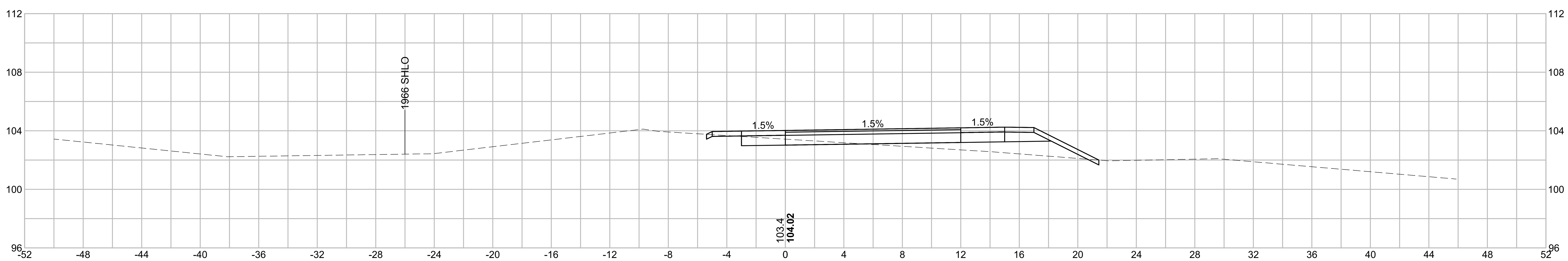
CUT: 0.00 SF
FILL: 55.35 SF

109+50

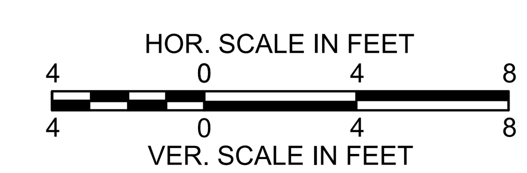


CUT: 0.00 SF
FILL: 17.03 SF

109+00



CUT: 2.82 SF
FILL: 9.81 SF

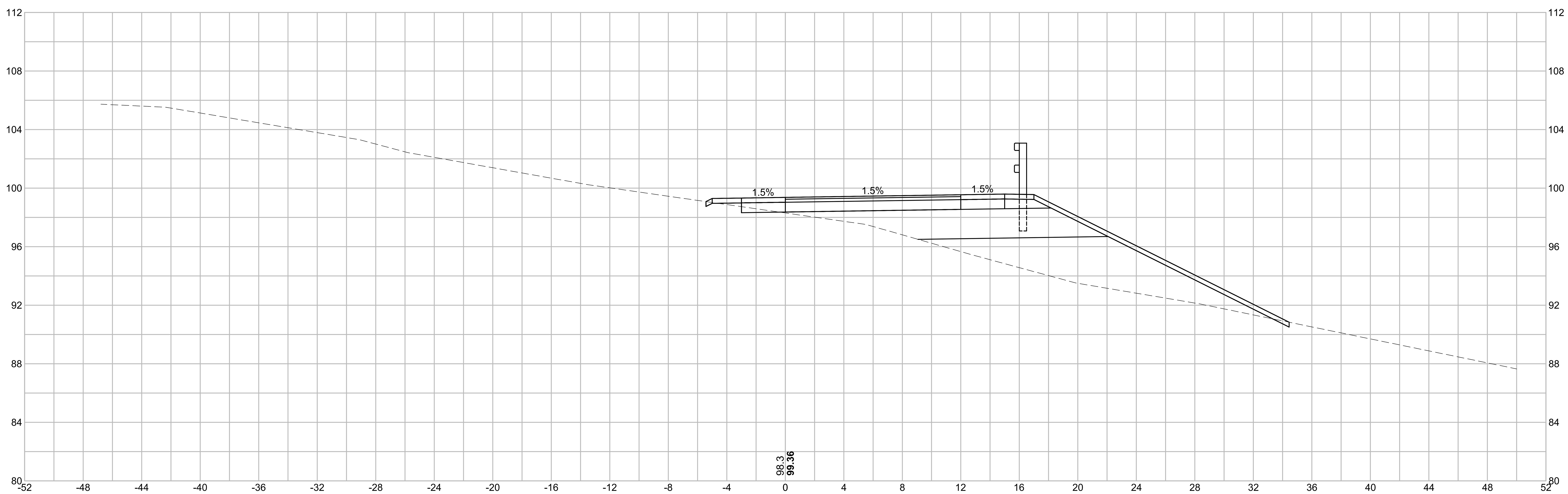


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	169	267
PROJECT FILE NO. 607398			

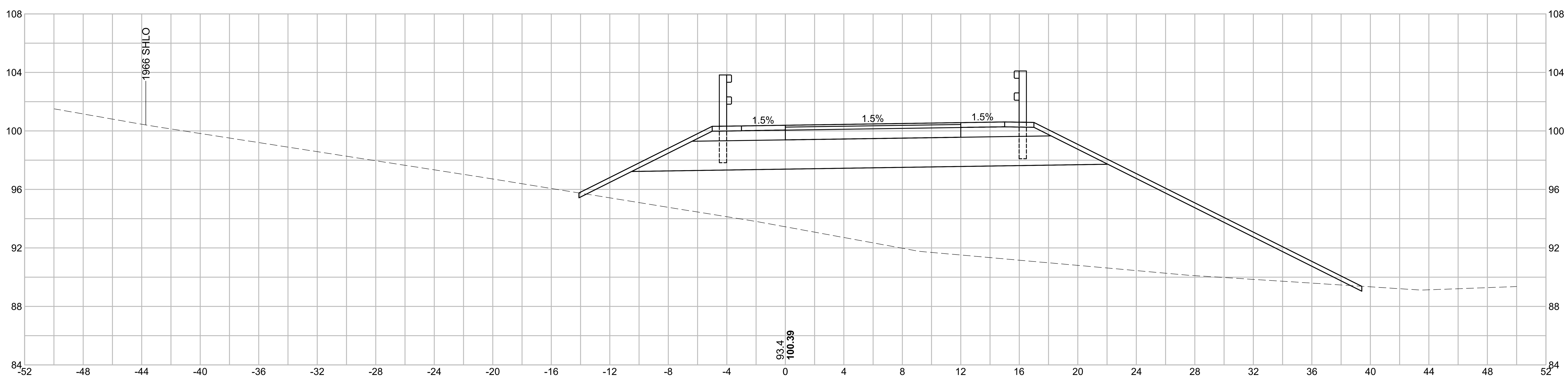
WEST CROSS SECTIONS

111+00



CUT: 0.62 SF
FILL: 119.29 SF

110+50



CUT: 0.00 SF
FILL: 304.64 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

Plotted on 21-Oct-2021 8:21 AM
607398_HD(XSEC-WEST-3).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

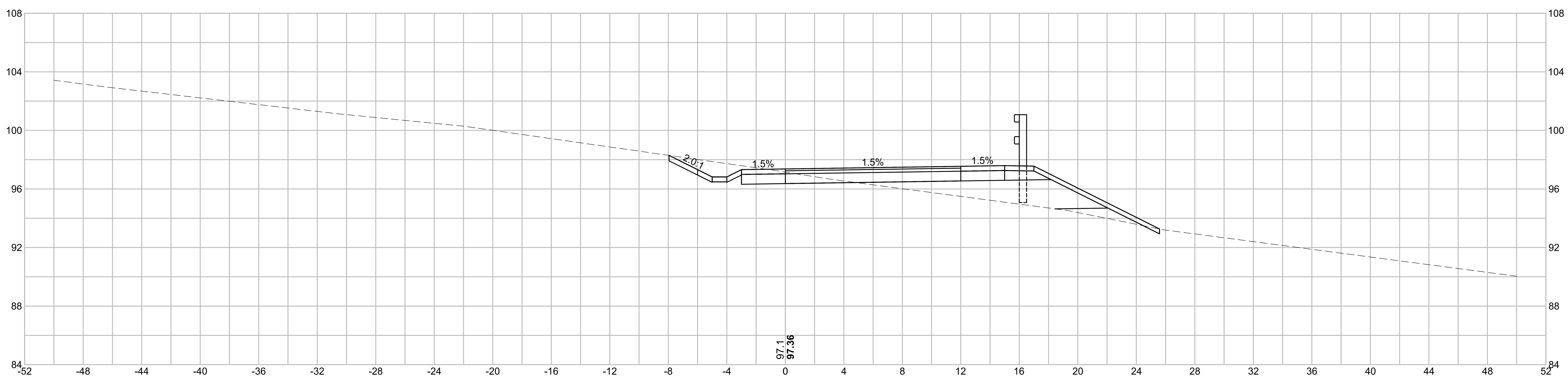
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	170	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:21 AM

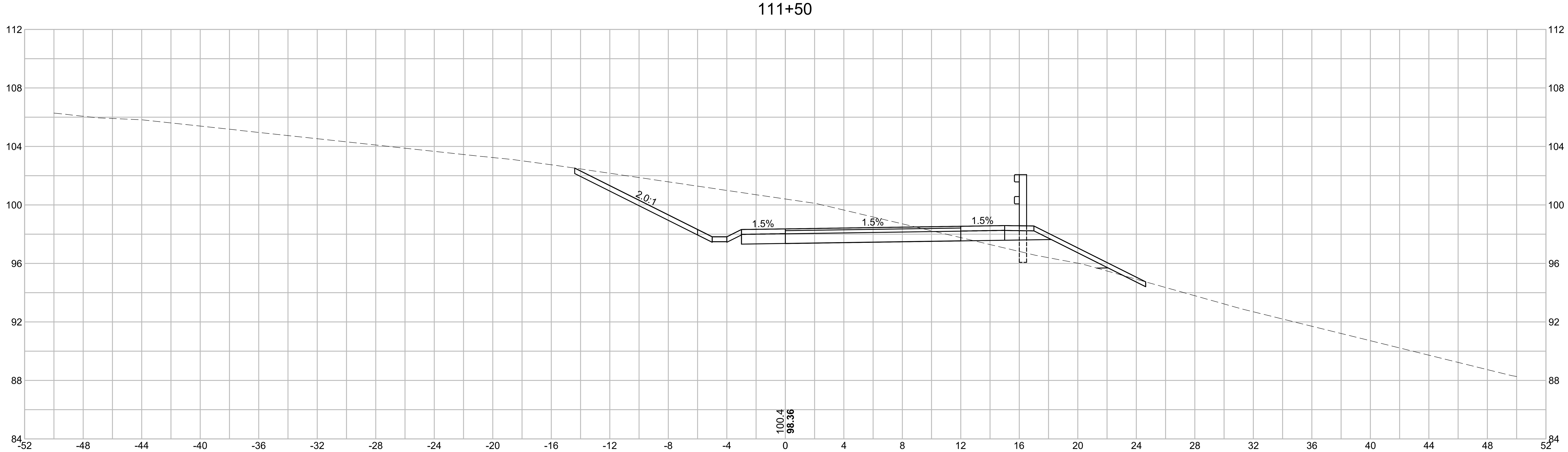
607398_HD(XSEC-WEST-3).DWG

112+00



CUT: 9.83 SF
FILL: 33.58 SF

111+50



CUT: 56.33 SF
FILL: 17.08 SF

HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

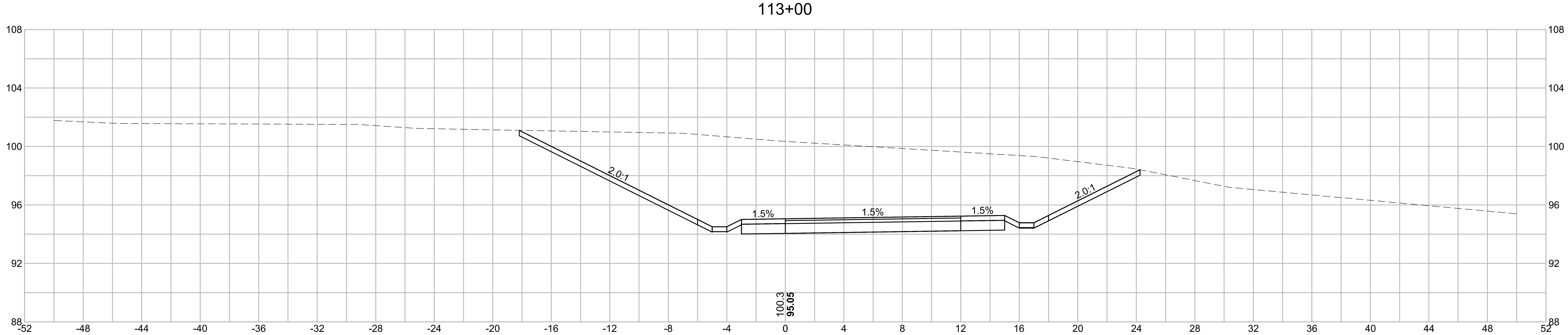
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	171	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:21 AM

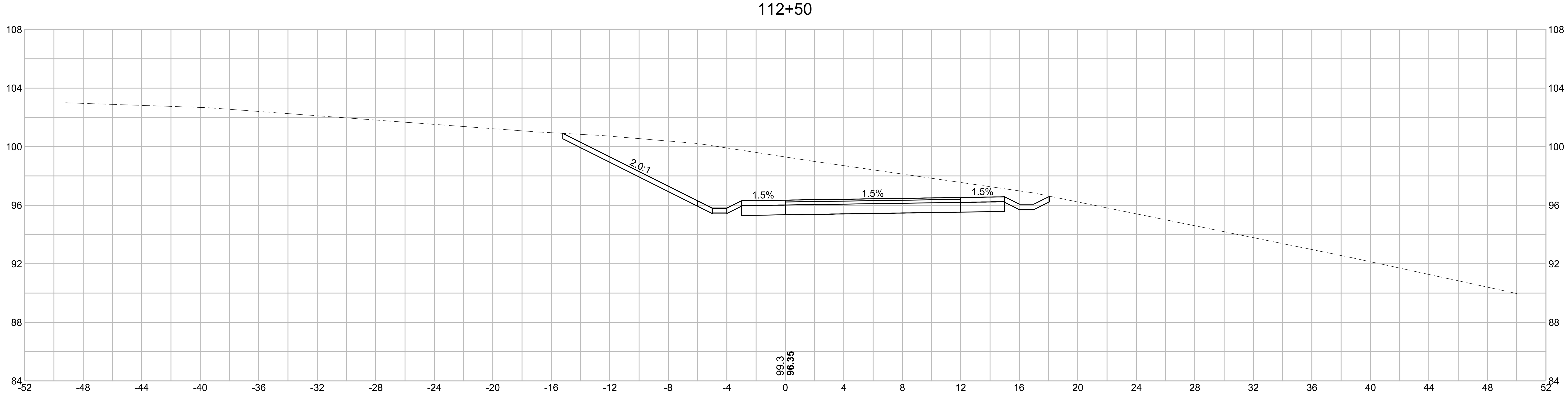
607398_HD(XSEC-WEST-3).DWG

113+00



CUT: 193.48 SF
FILL: 0.00 SF

112+50



CUT: 91.71 SF
FILL: 0.00 SF

HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

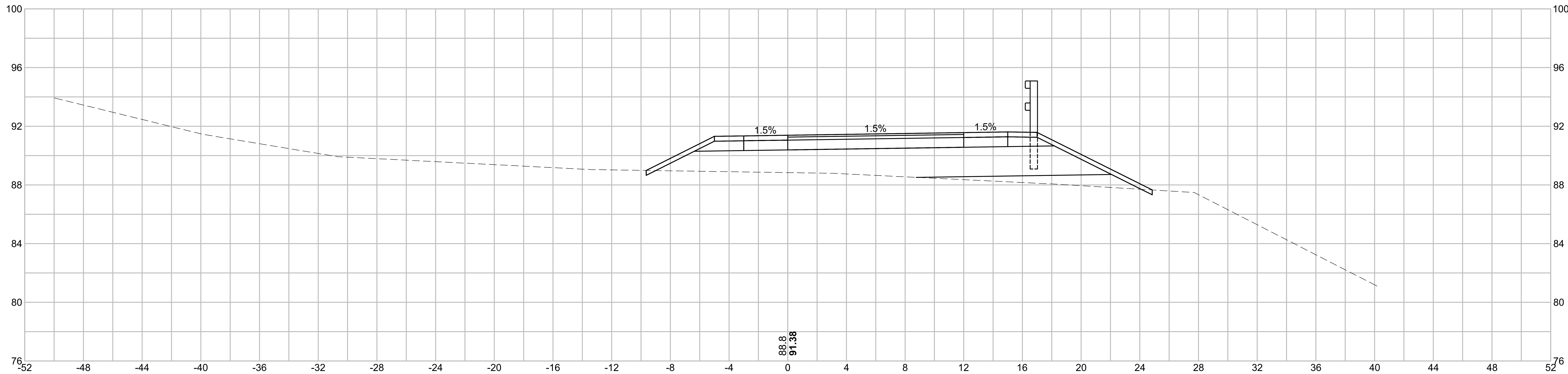
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	172	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:21 AM

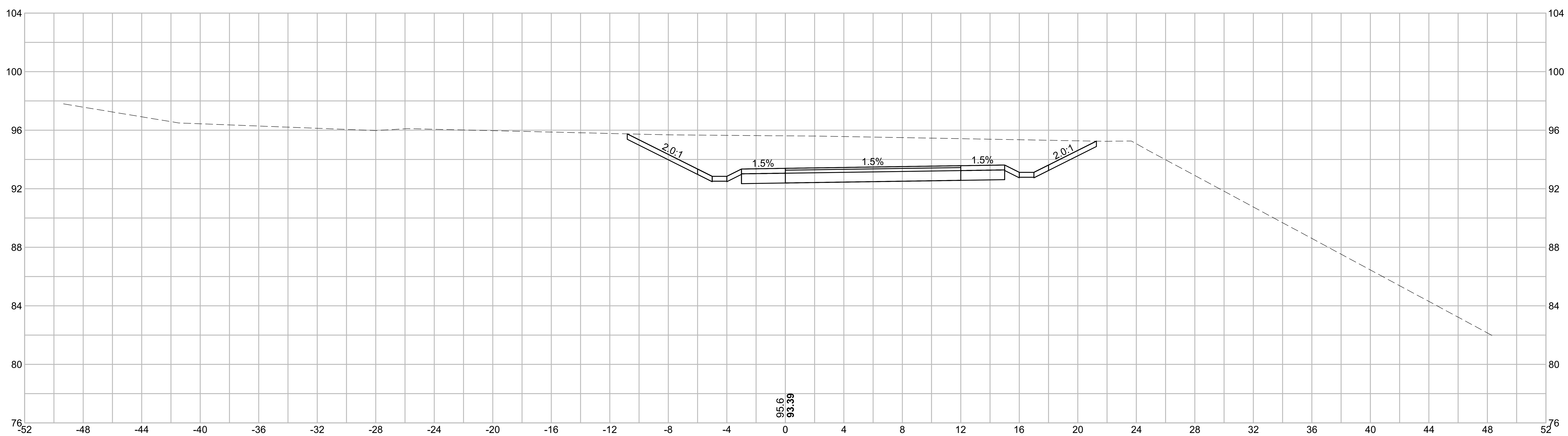
607398_HD(XSEC-WEST-3).DWG

114+00



CUT: 0.11 SF
FILL: 58.76 SF

113+50



CUT: 82.19 SF
FILL: 0.00 SF

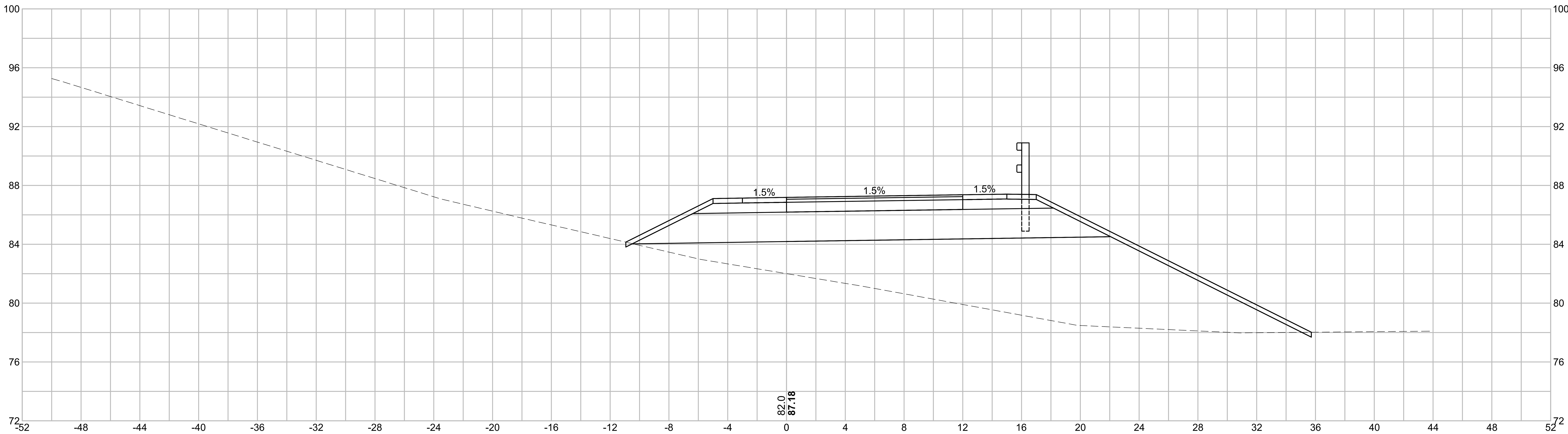
HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	173	267
PROJECT FILE NO. 607398			

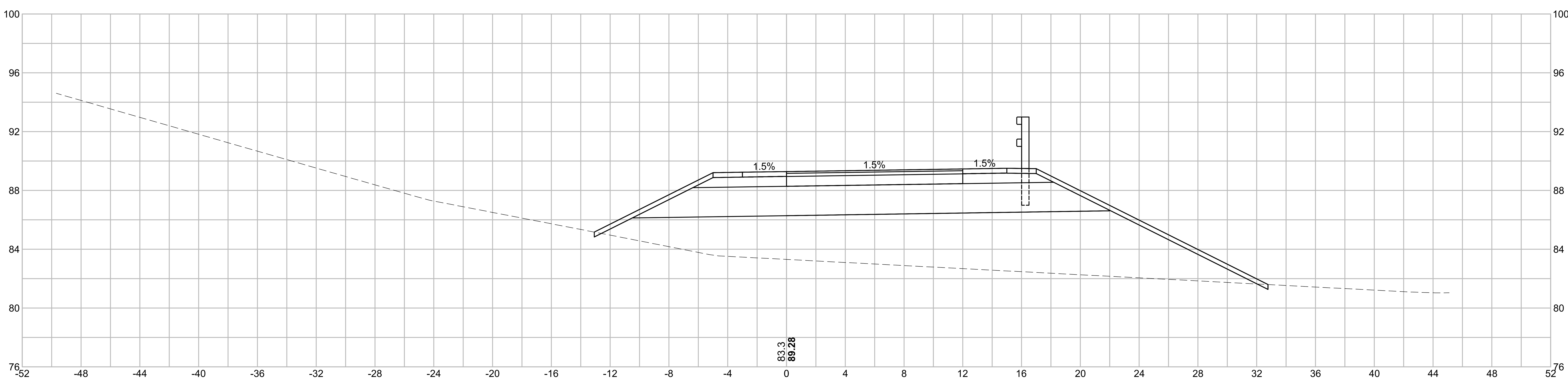
WEST CROSS SECTIONS

115+00



CUT: 0.10 SF
FILL: 216.09 SF

114+50



CUT: 0.00 SF
FILL: 183.42 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

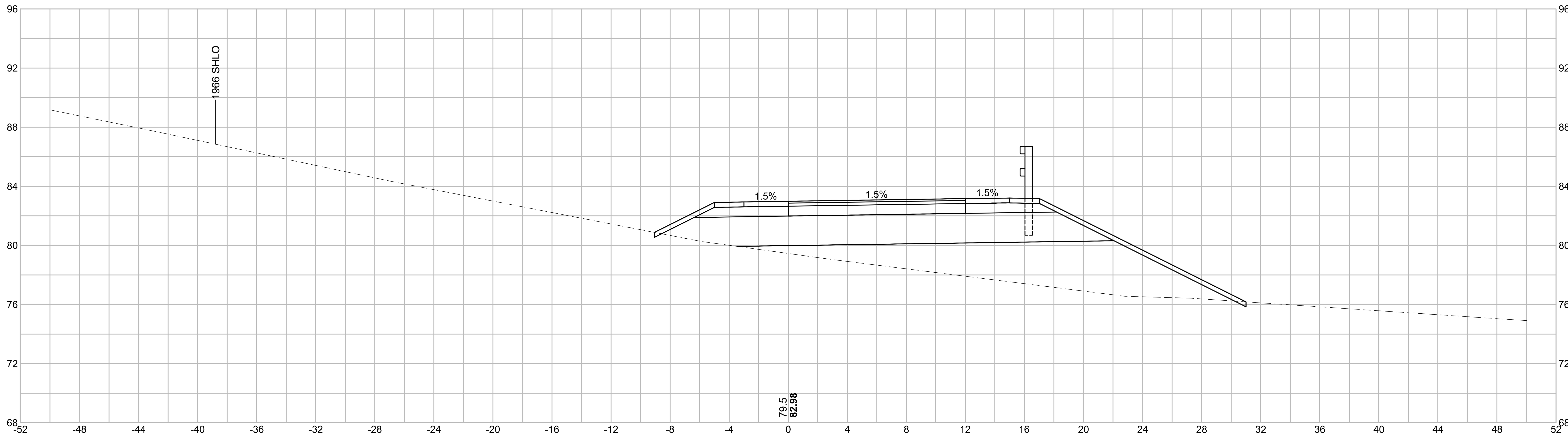
Plotted on 21-Oct-2021 8:21 AM
607398_HD(XSEC-WEST-3).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	174	267
PROJECT FILE NO. 607398			

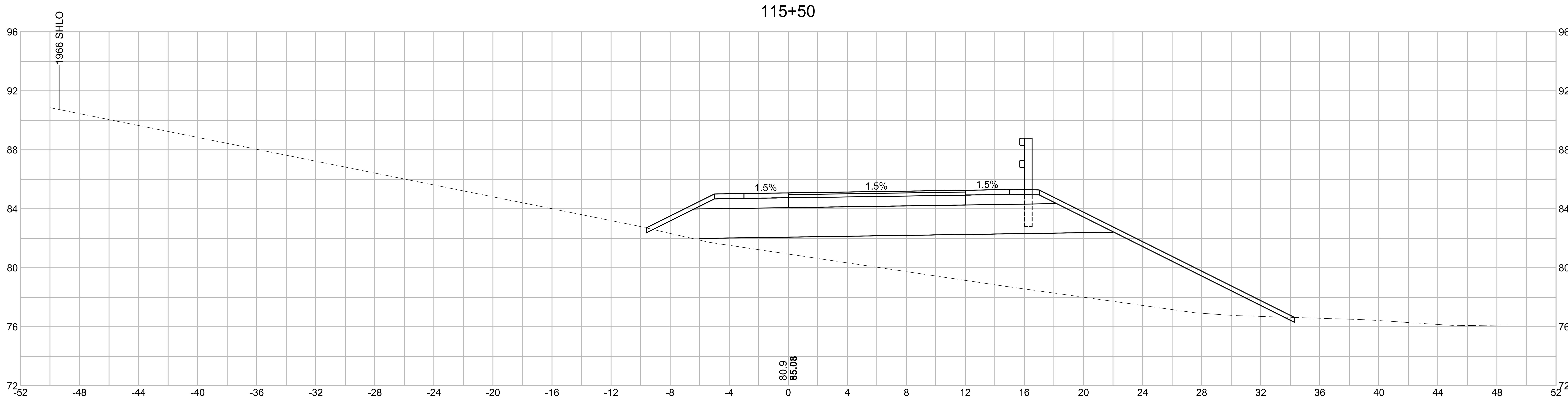
WEST CROSS SECTIONS

116+00



CUT: 0.00 SF
FILL: 94.58 SF

115+50



CUT: 0.00 SF
FILL: 142.32 SF

Plotted on 21-Oct-2021 8:21 AM

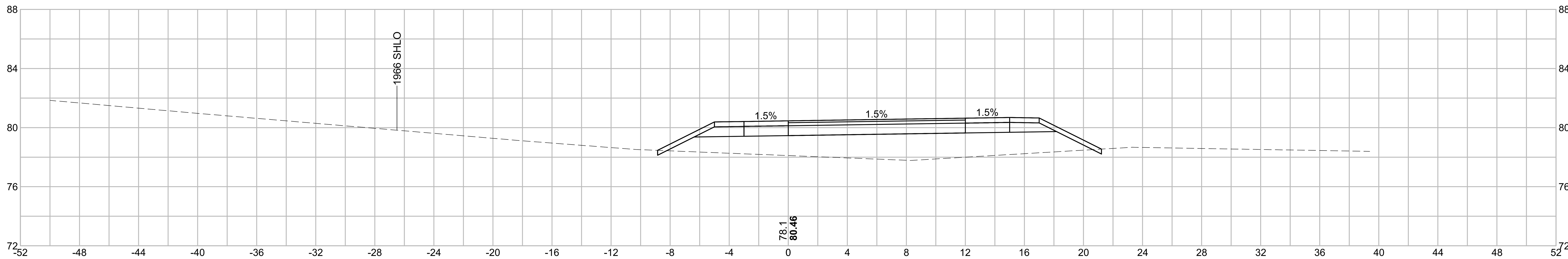
607398_HD(XSEC-WEST-3).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	175	267
PROJECT FILE NO. 607398			

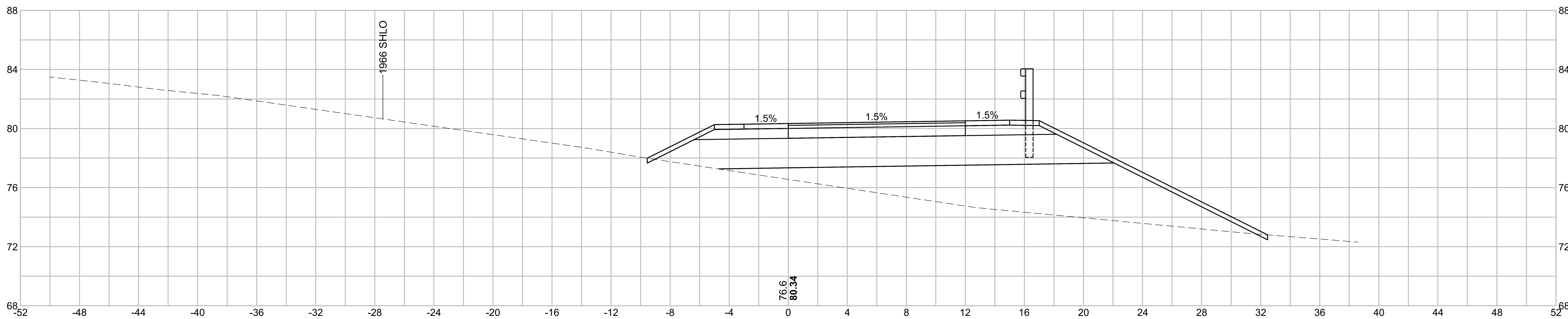
WEST CROSS SECTIONS

117+50



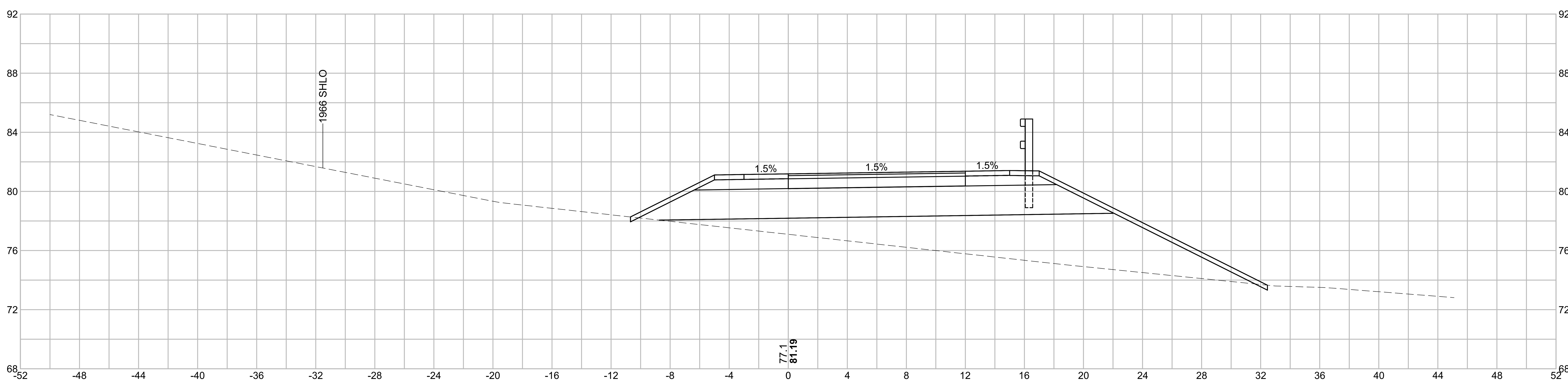
CUT: 0.02 SF
FILL: 37.95 SF

117+00

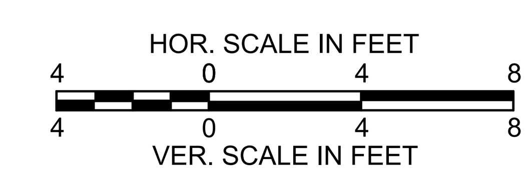


CUT: 0.00 SF
FILL: 118.24 SF

116+50



CUT: 0.00 SF
FILL: 118.32 SF



Plotted on 21-Oct-2021 8:21 AM
607398_HD(XSEC-WEST-3).DWG

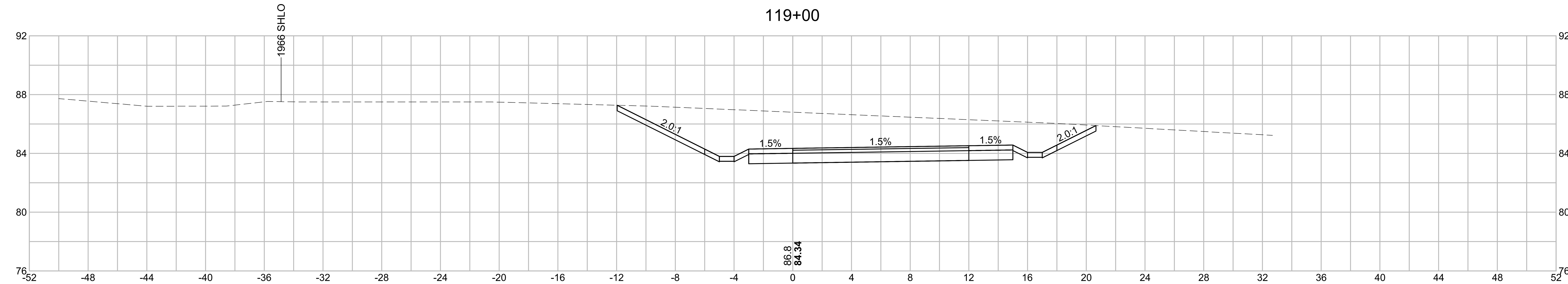
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	176	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

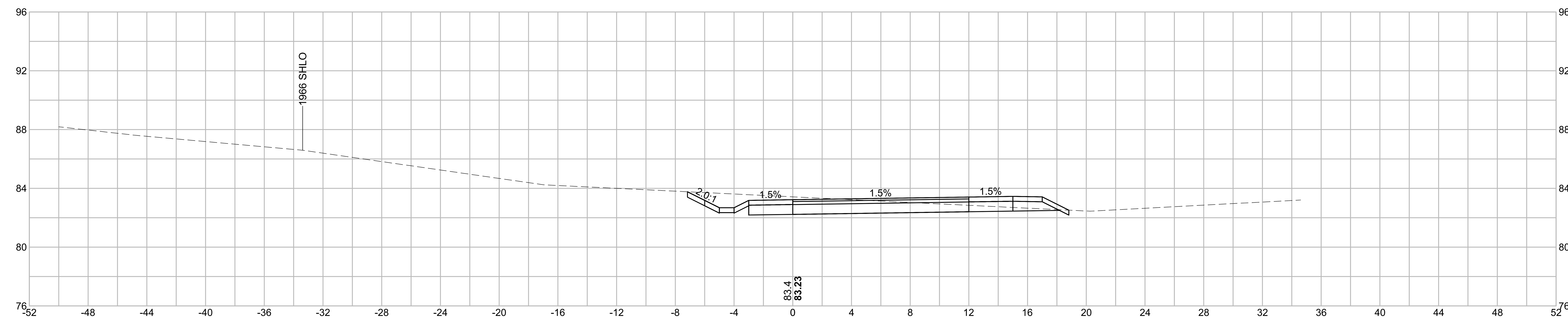
607398_HD(XSEC-WEST-3).DWG Plotted on 21-Oct-2021 8:21 AM

119+00



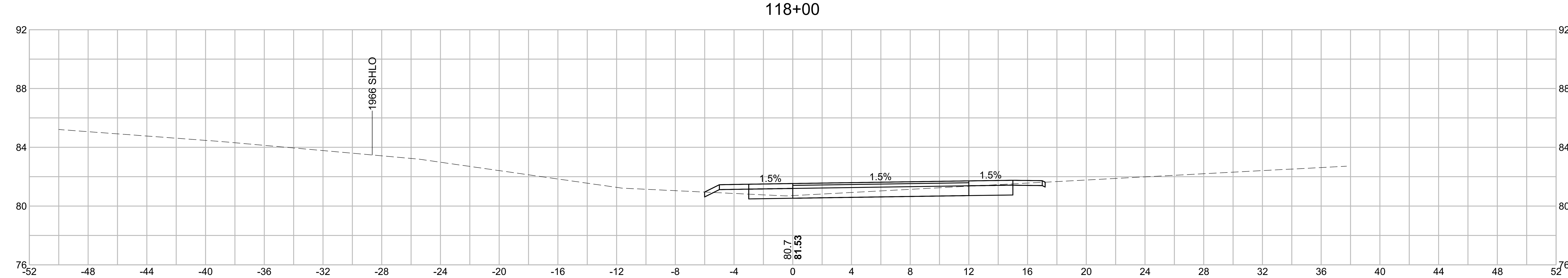
CUT: 86.39 SF
FILL: 0.00 SF

118+50



CUT: 19.34 SF
FILL: 0.03 SF

118+00



CUT: 8.20 SF
FILL: 0.60 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

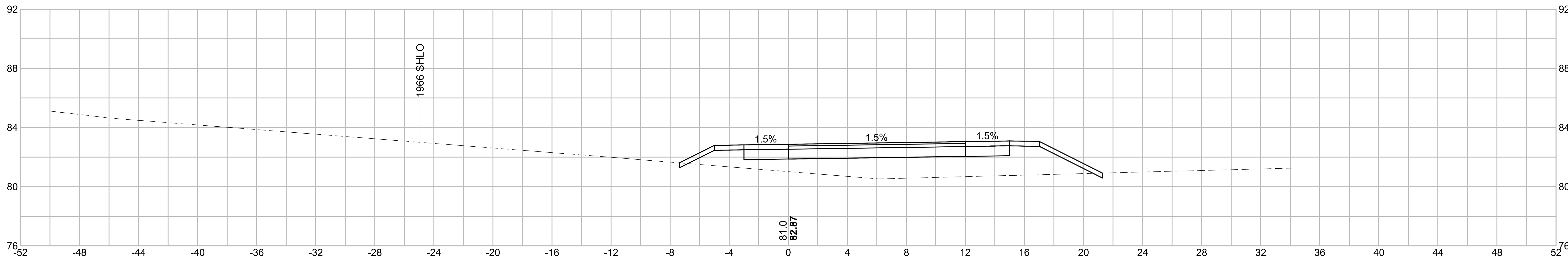
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	177	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:22 AM

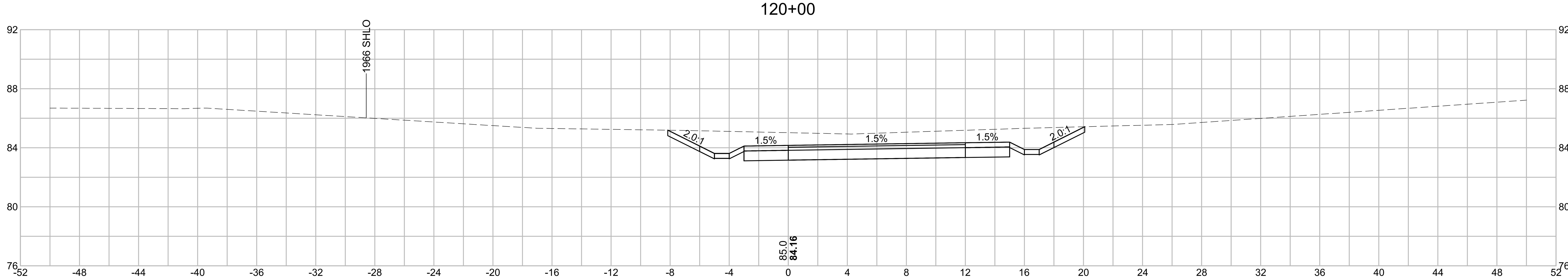
607398_HD(XSEC-WEST-3).DWG

120+50



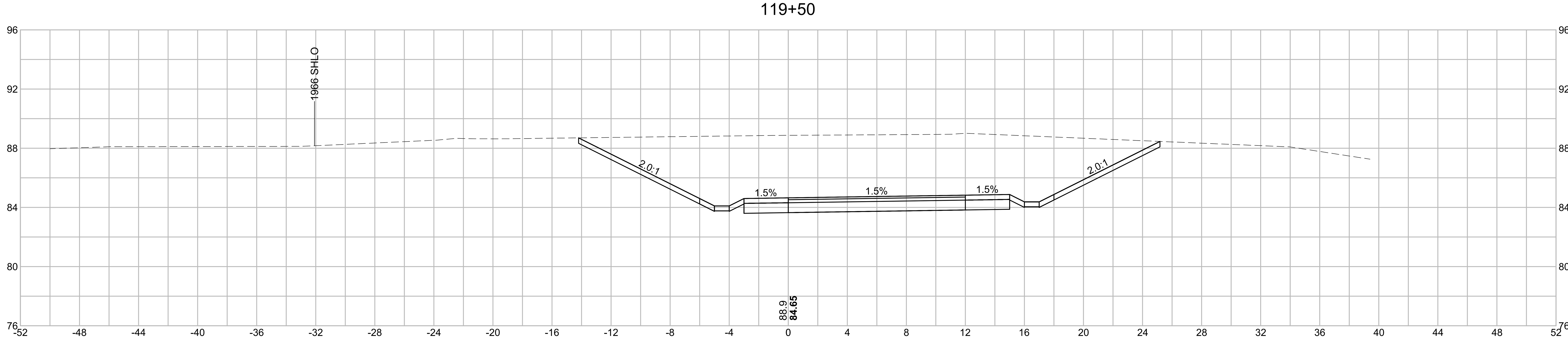
CUT: 0.00 SF
FILL: 40.70 SF

120+00



CUT: 46.44 SF
FILL: 0.00 SF

119+50



CUT: 158.61 SF
FILL: 0.00 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

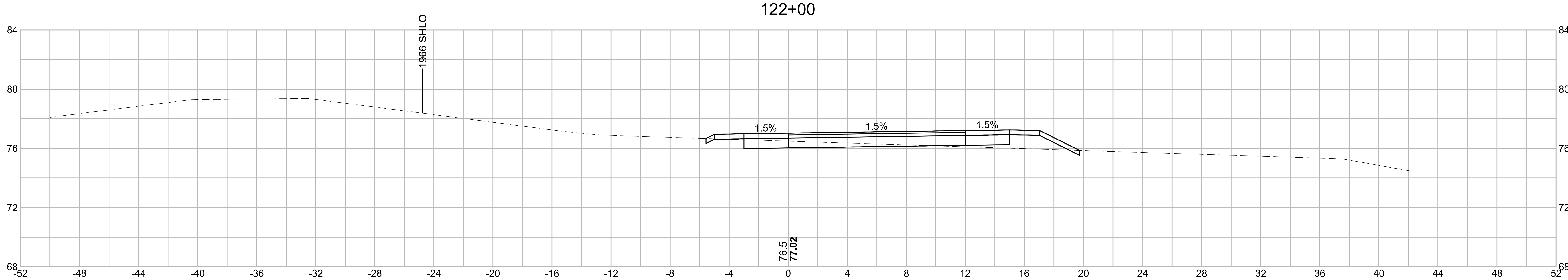
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	178	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:22 AM

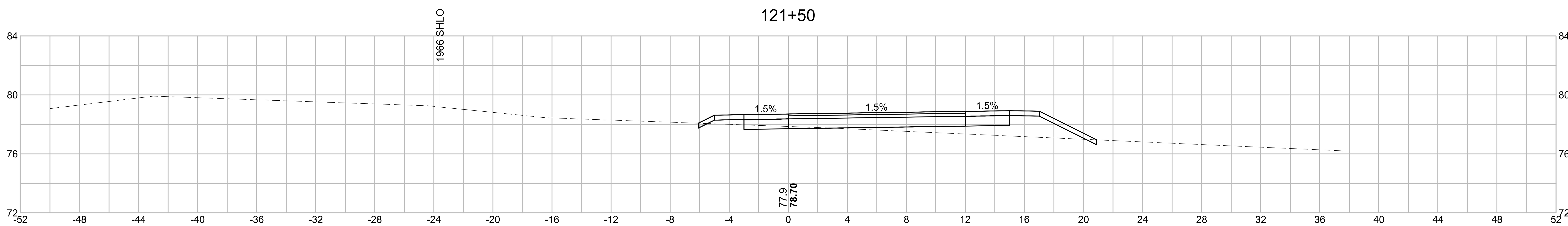
607398_HD(XSEC-WEST-3).DWG

122+00



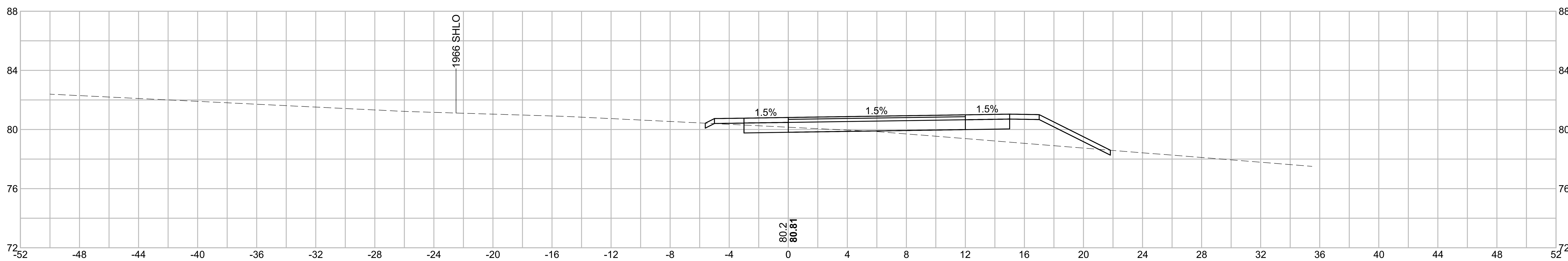
CUT: 3.89 SF
FILL: 5.36 SF

121+50



CUT: 0.94 SF
FILL: 14.57 SF

121+00



CUT: 2.25 SF
FILL: 17.83 SF

HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

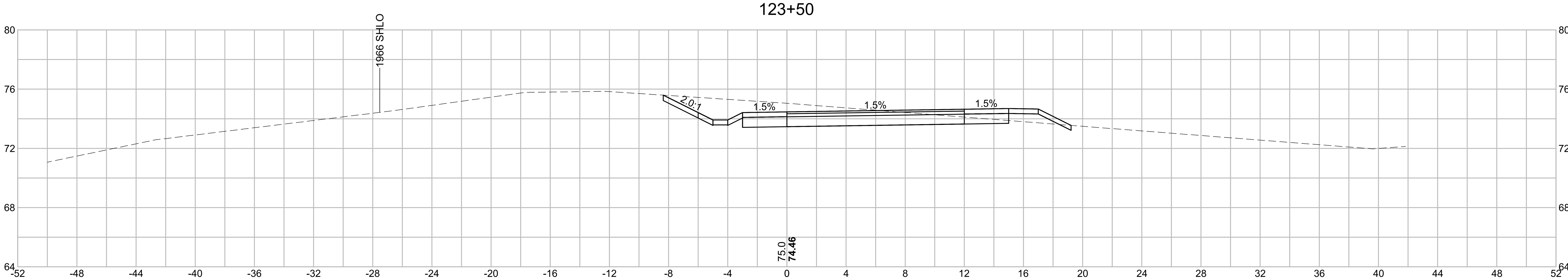
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	179	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:22 AM

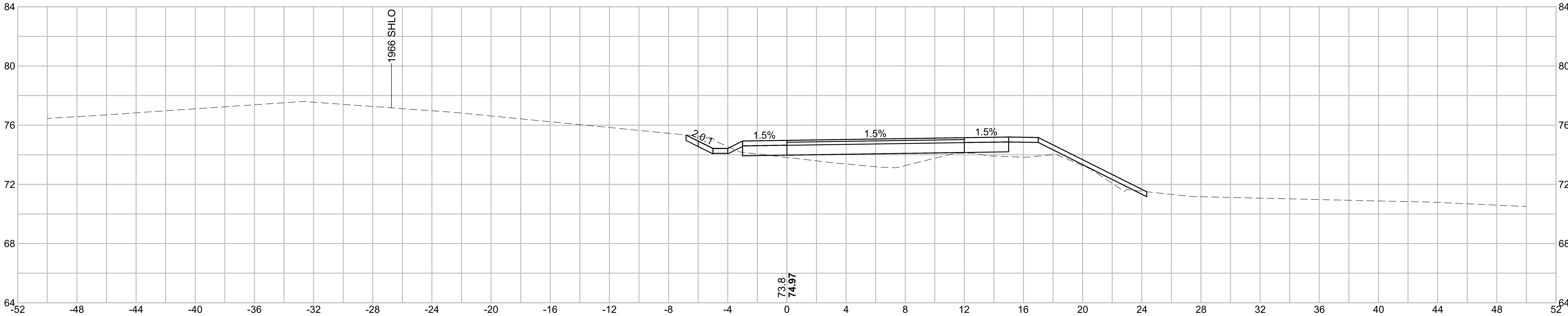
607398_HD(XSEC-WEST-3).DWG

123+50



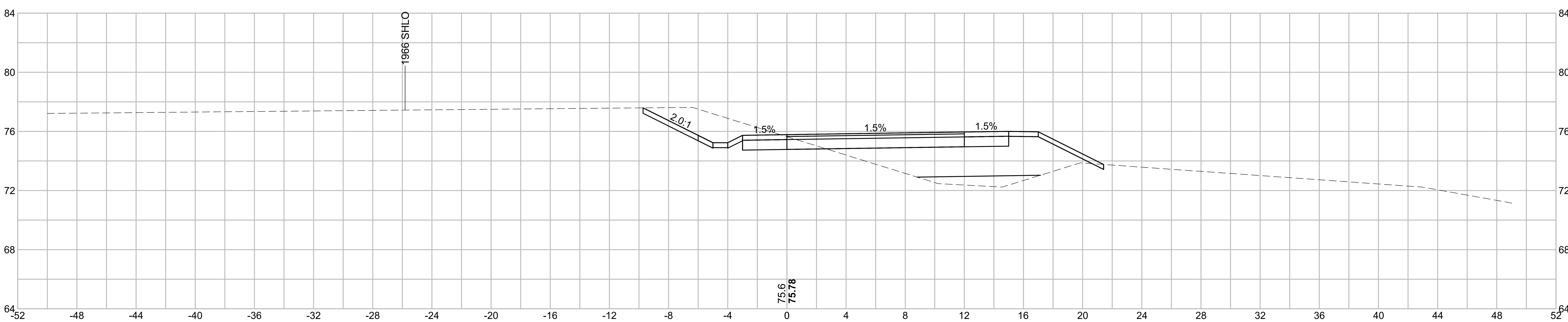
CUT: 25.34 SF
FILL: 2.62 SF

123+00



CUT: 2.44 SF
FILL: 24.18 SF

122+50



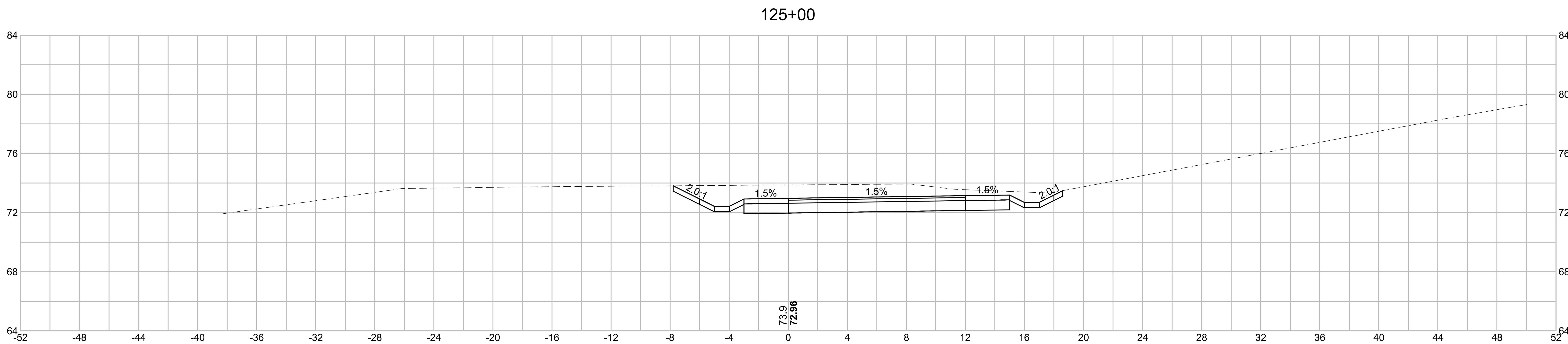
CUT: 16.07 SF
FILL: 37.11 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

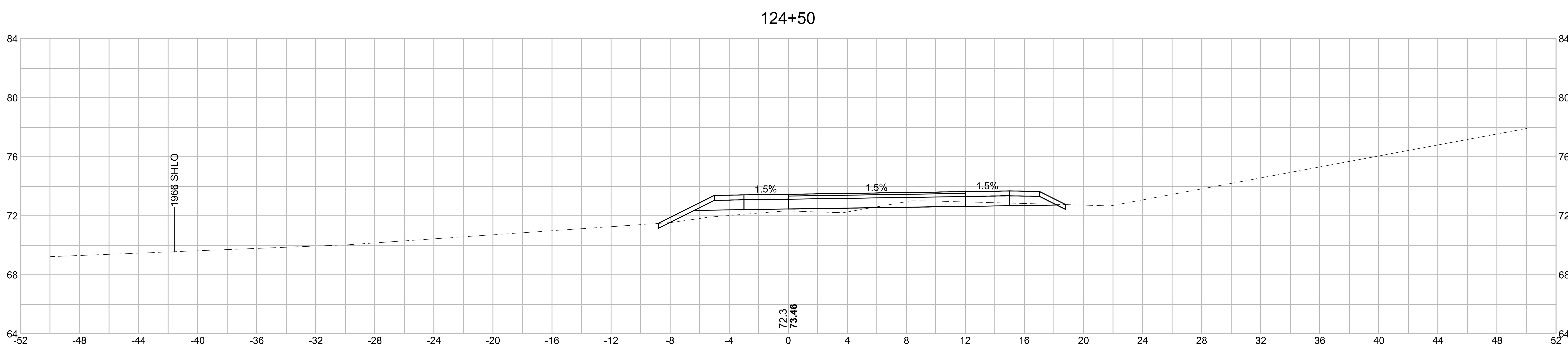
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	180	267
PROJECT FILE NO. 607398			

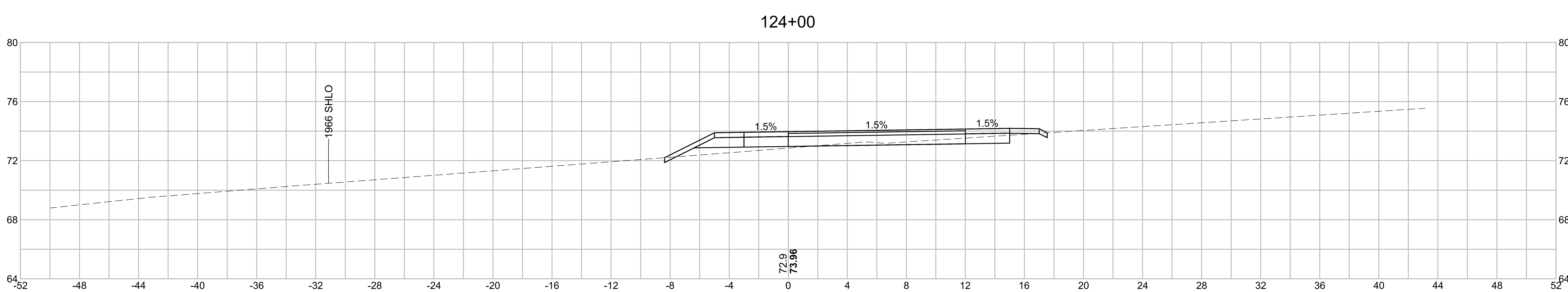
WEST CROSS SECTIONS



CUT: 40.59 SF
FILL: 0.00 SF



CUT: 3.02 SF
FILL: 3.31 SF



CUT: 3.43 SF
FILL: 2.22 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

607398_HD(XSEC-WEST-3).DWG Plotted on 21-Oct-2021 8:22 AM

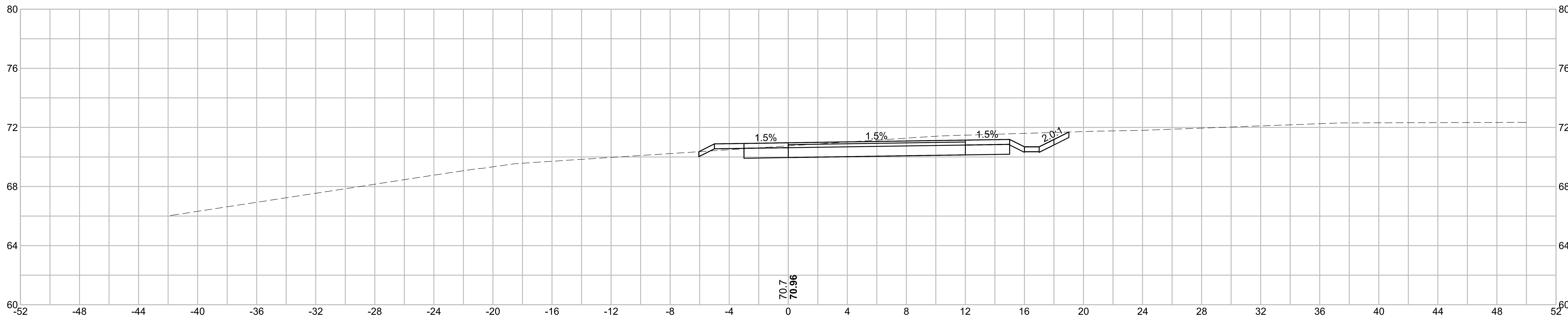
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	181	267

PROJECT FILE NO. 607398

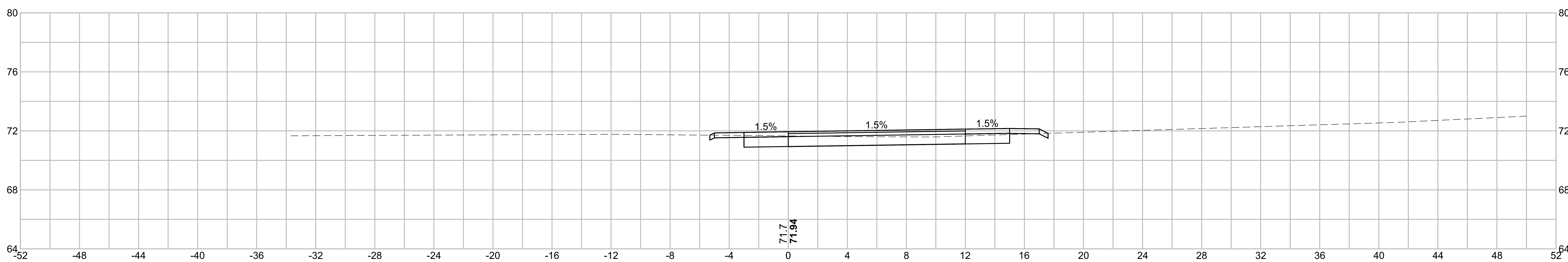
WEST CROSS SECTIONS

126+50



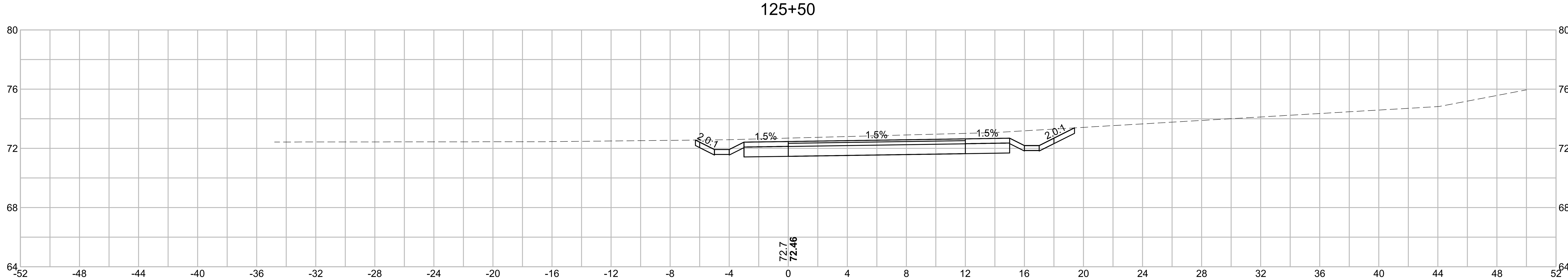
CUT: 23.27 SF
FILL: 0.15 SF

126+00



CUT: 11.36 SF
FILL: 0.07 SF

125+50



CUT: 30.69 SF
FILL: 0.00 SF

HOR. SCALE IN FEET
VER. SCALE IN FEET

Plotted on 21-Oct-2021 8:22 AM
607398_HD(XSEC-WEST-3).DWG

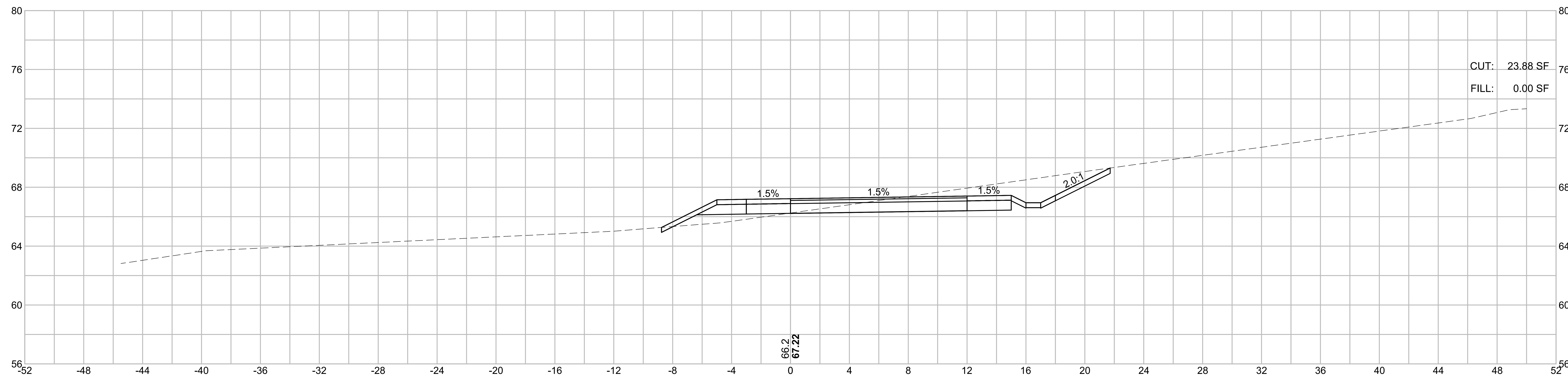
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	182	267
PROJECT FILE NO. 607398			

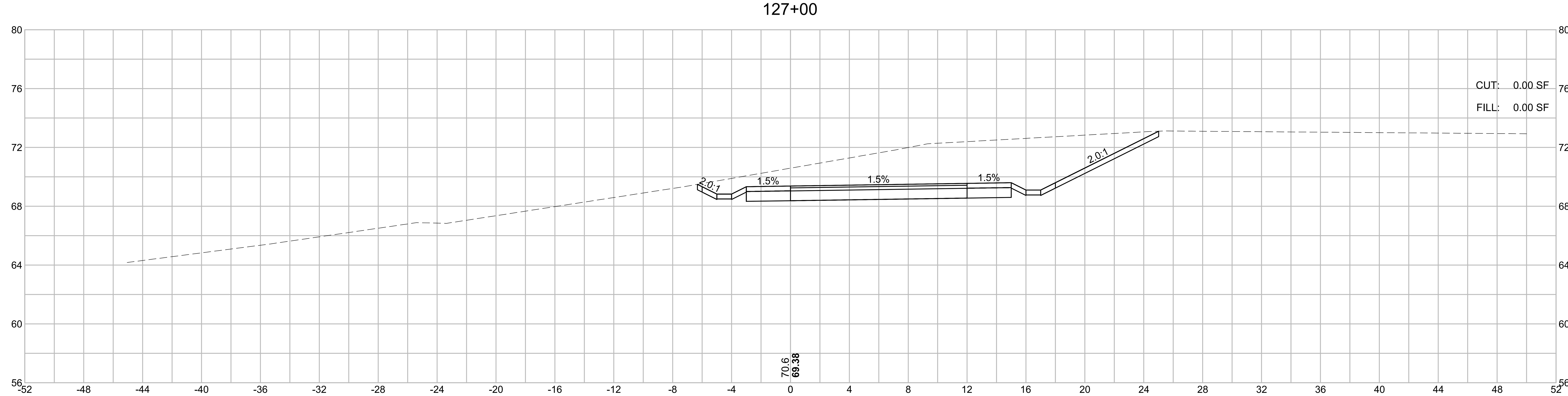
WEST CROSS SECTIONS

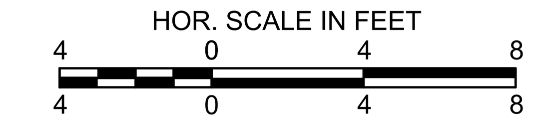
607398_HD(XSEC-WEST-4).DWG Plotted on 21-Oct-2021 8:24 AM

127+50



127+00



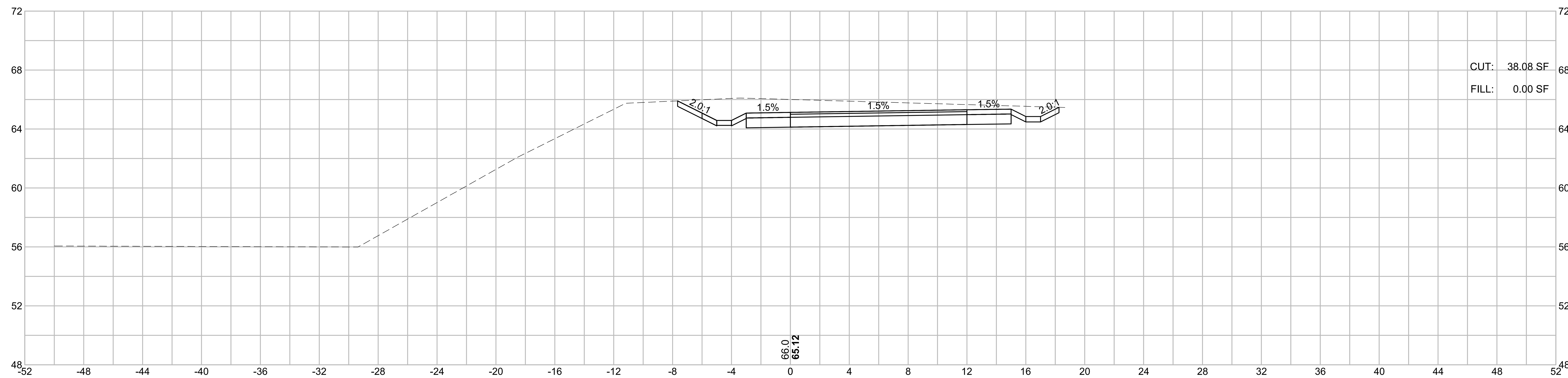


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

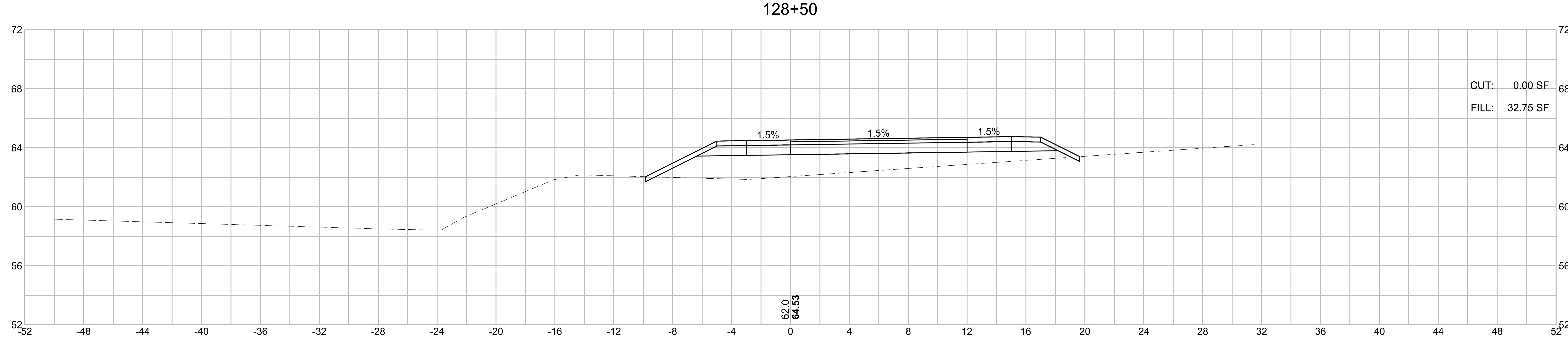
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	183	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

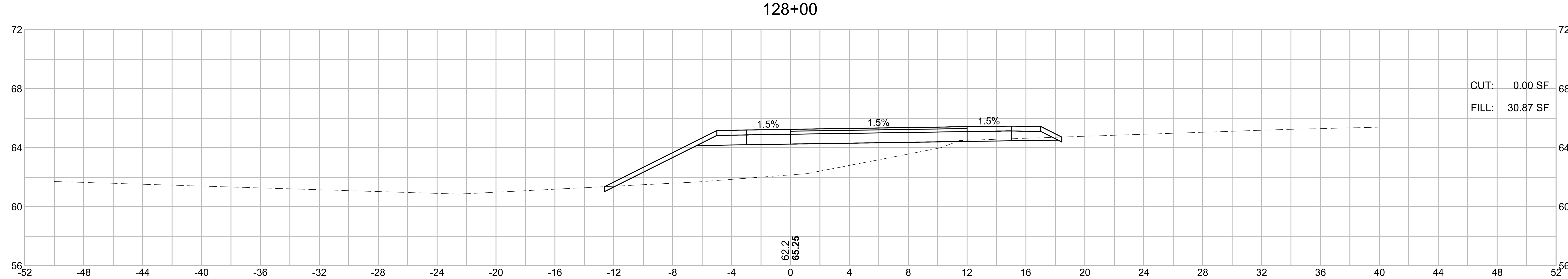
129+00



128+50



128+00



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

607398_HD(XSEC-WEST-4).DWG Plotted on 21-Oct-2021 8:24 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

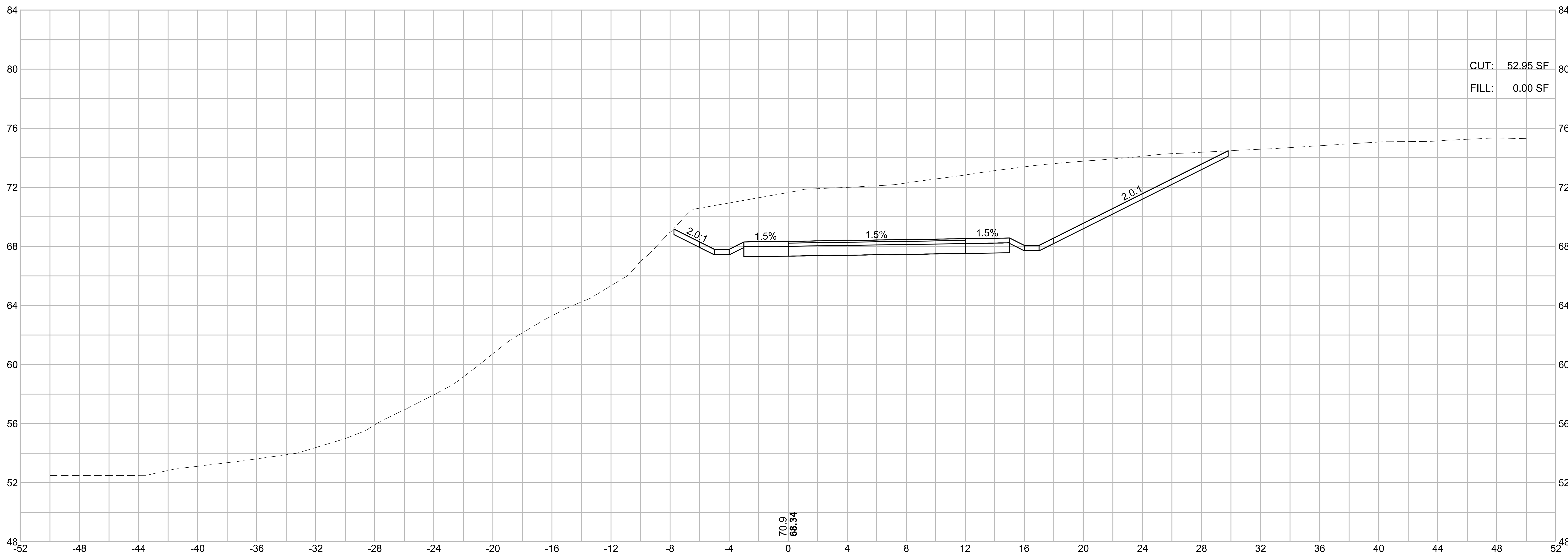
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	184	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

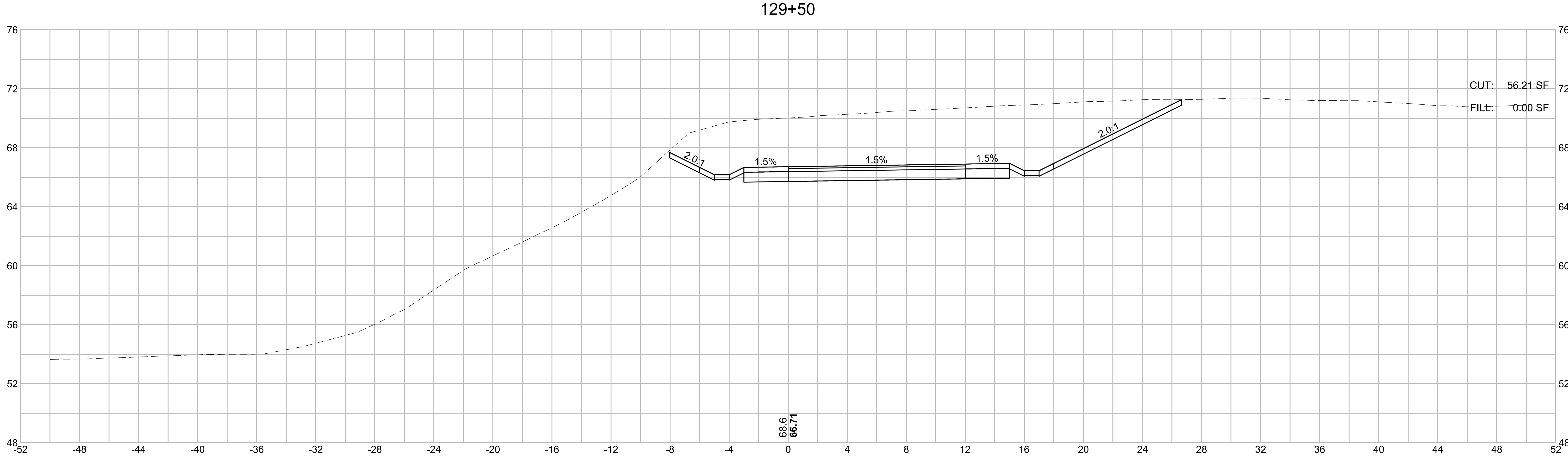
Plotted on 21-Oct-2021 8:24 AM

607398_HD(XSEC-WEST-4).DWG

130+00



129+50



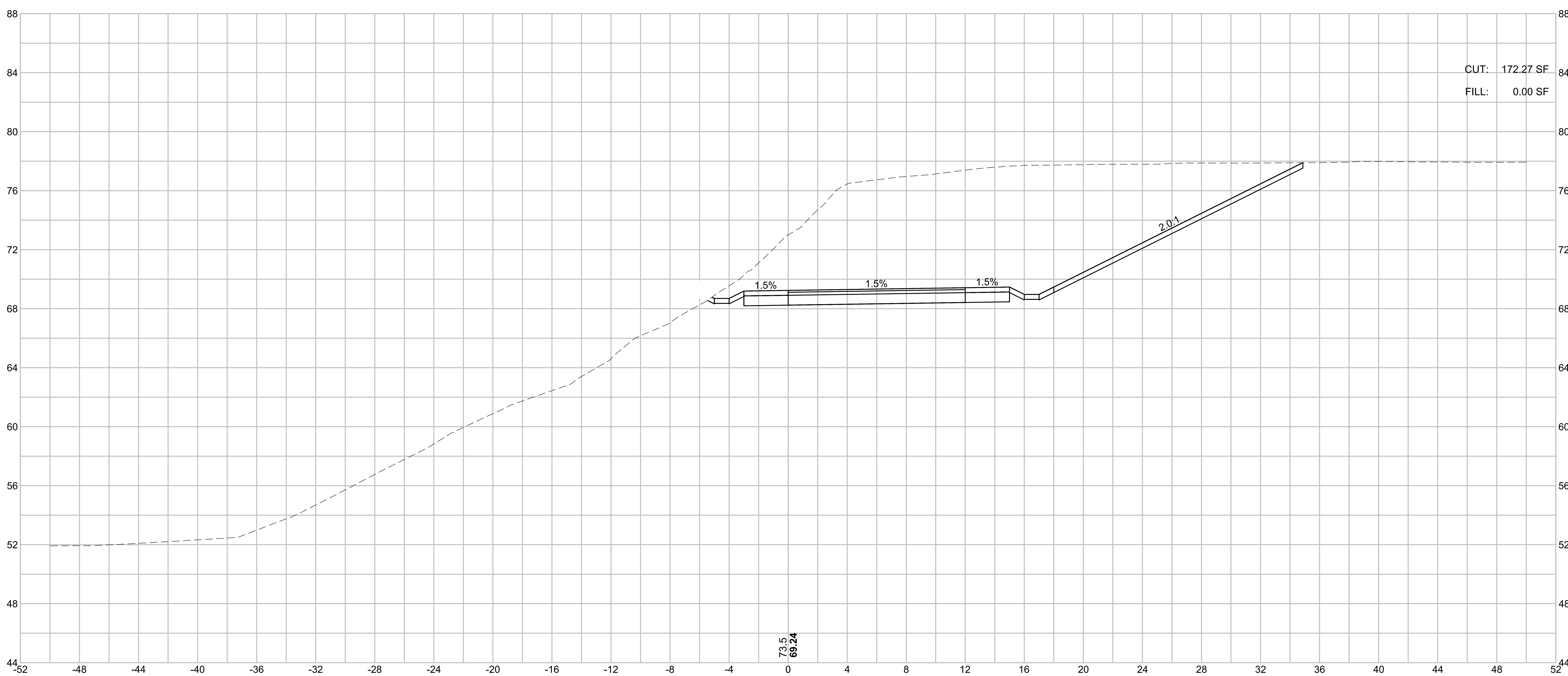
HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	185	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

130+50



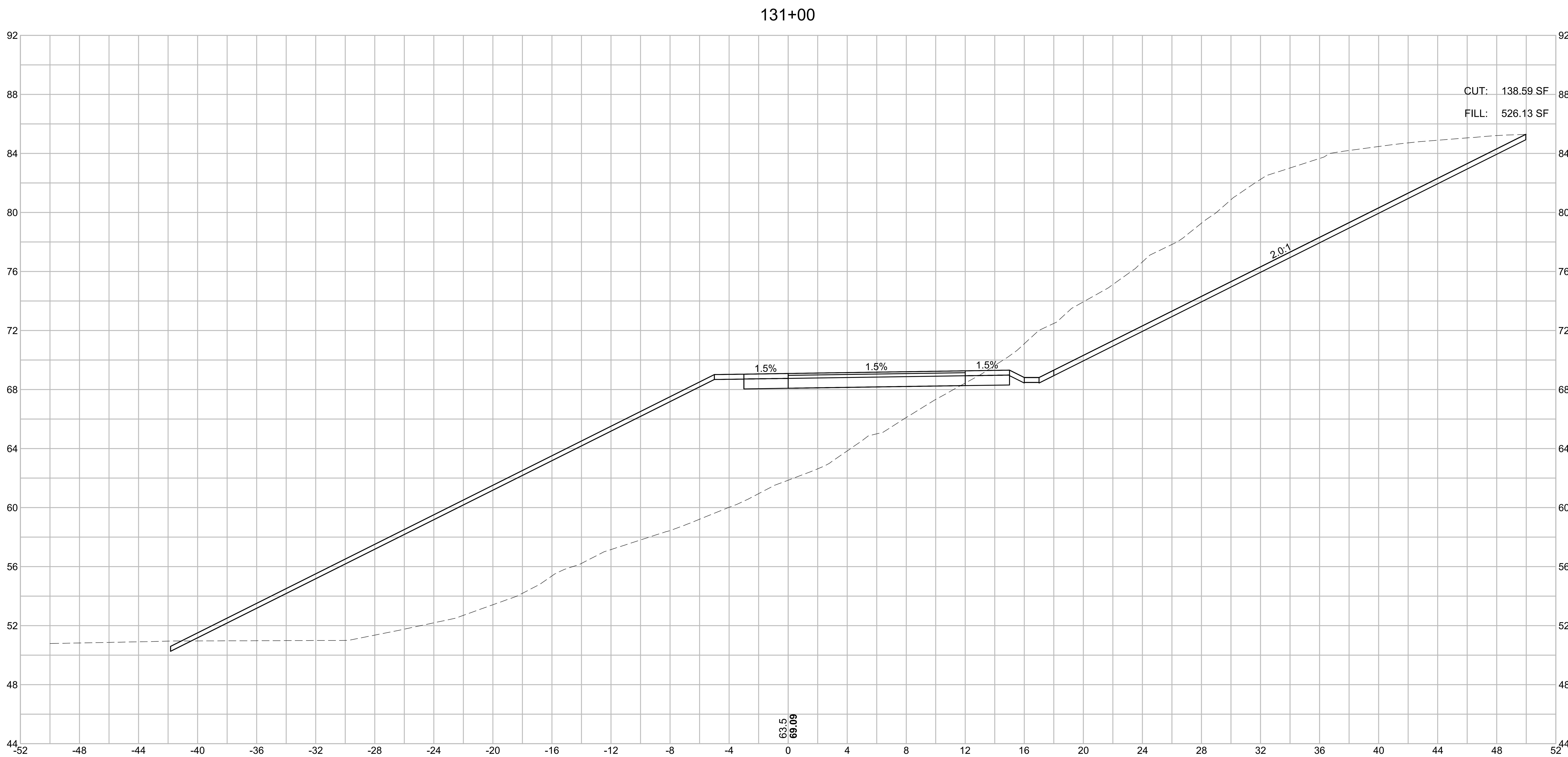
HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	186	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

607398_HD(XSEC-WEST-4).DWG Plotted on 21-Oct-2021 8:24 AM



HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

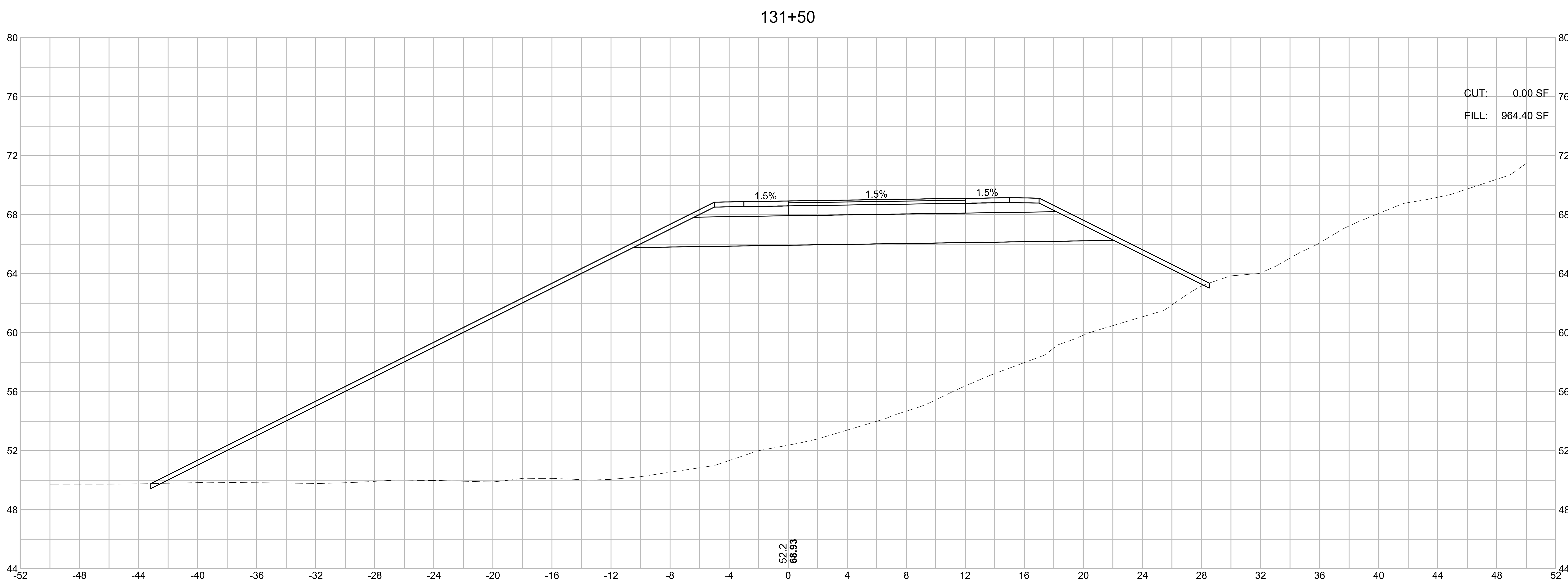
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	187	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:24 AM

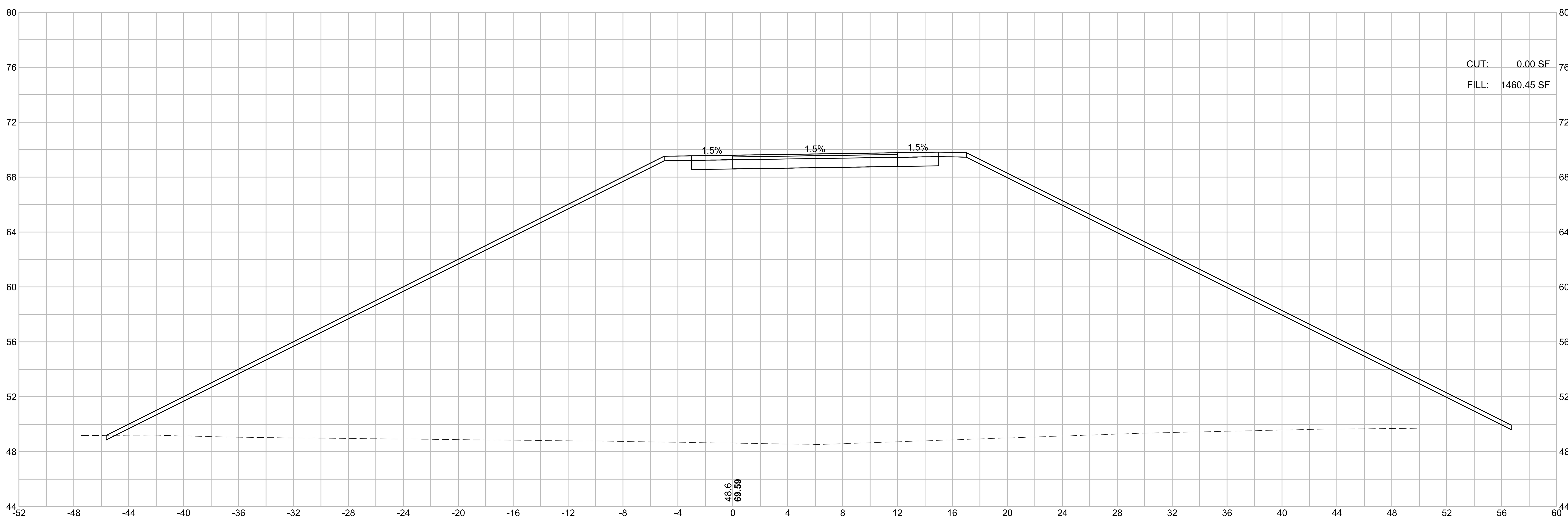
607398_HD(XSEC-WEST-4).DWG



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

Plotted on 21-Oct-2021 8:24 AM
607398_HD(XSEC-WEST-4).DWG

132+00



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

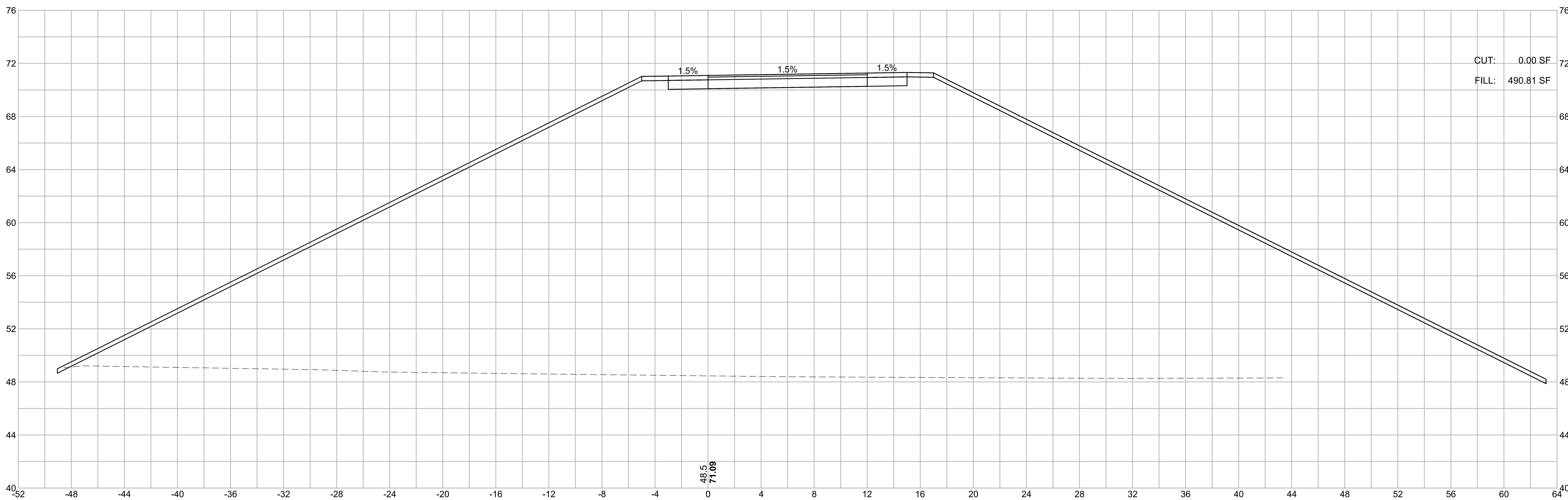
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	189	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:24 AM

607398_HD(XSEC-WEST-4).DWG

132+50



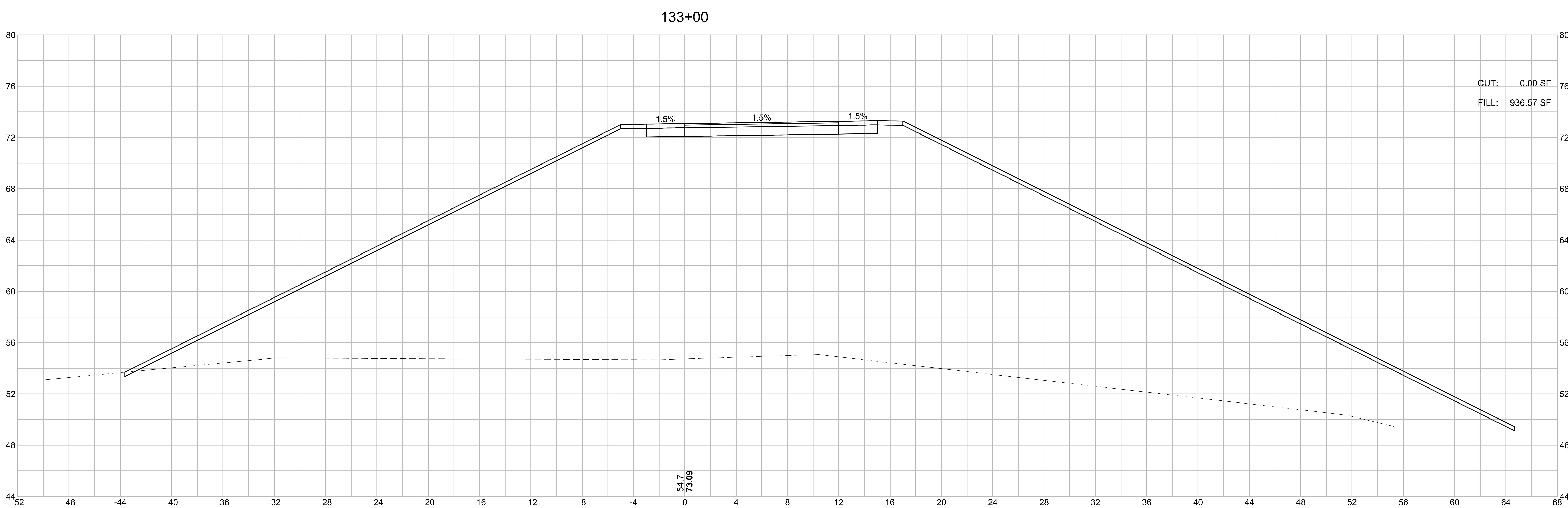
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	190	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

607398_HD(XSEC-WEST-4).DWG Plotted on 21-Oct-2021 8:24 AM



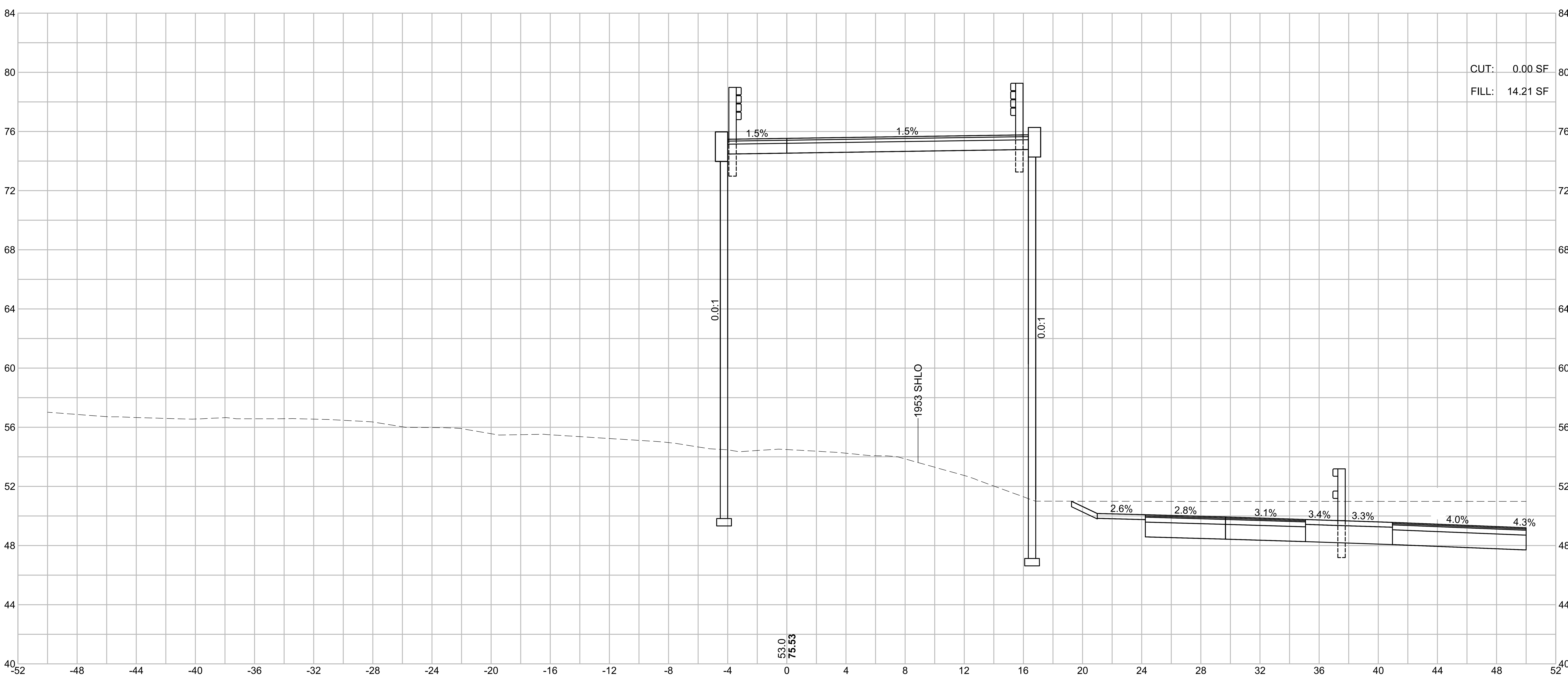
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	191	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

135+50



HOR. SCALE IN FEET
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

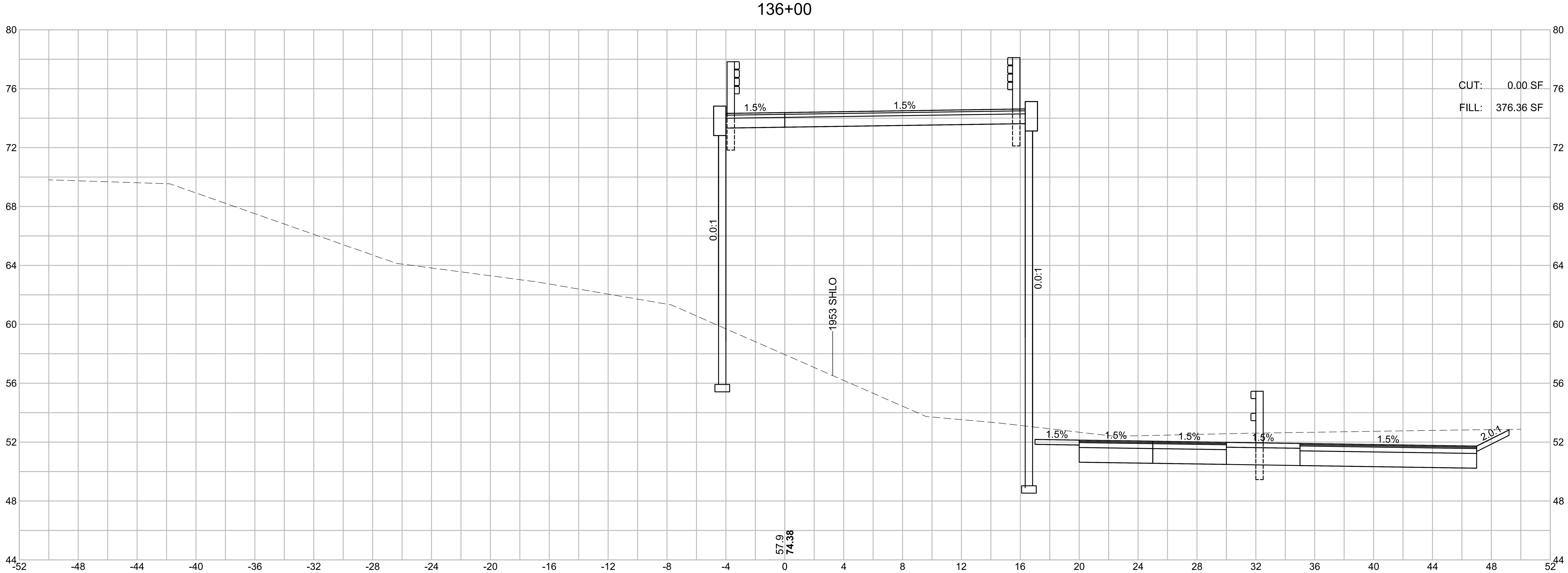
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	192	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:24 AM

607398_HD(XSEC-WEST-4).DWG

136+00



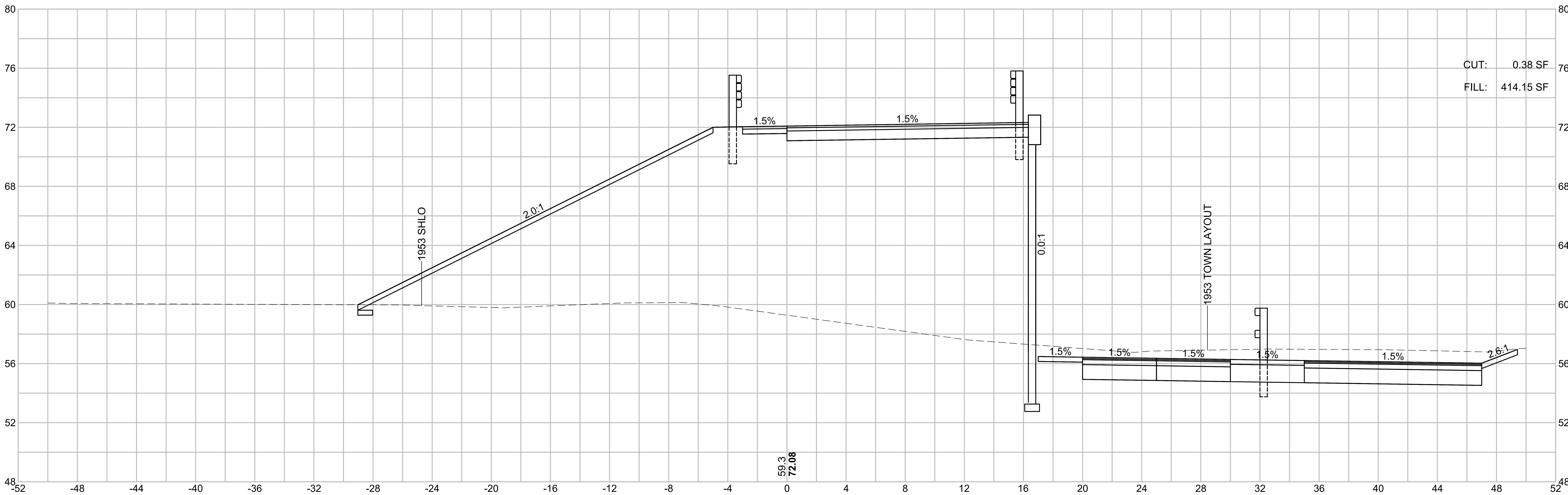
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

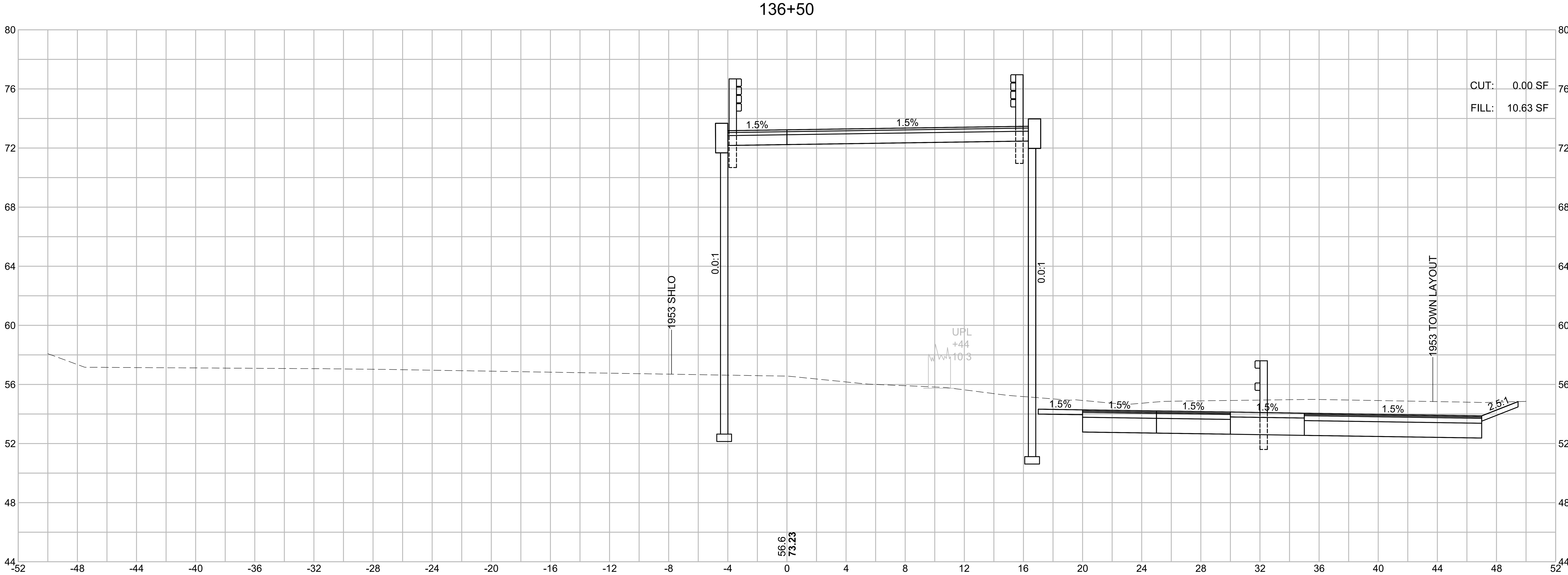
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	193	267
PROJECT FILE NO. 607398			

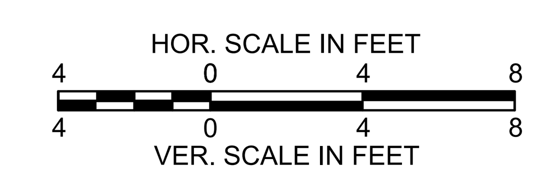
WEST CROSS SECTIONS

137+00



136+50





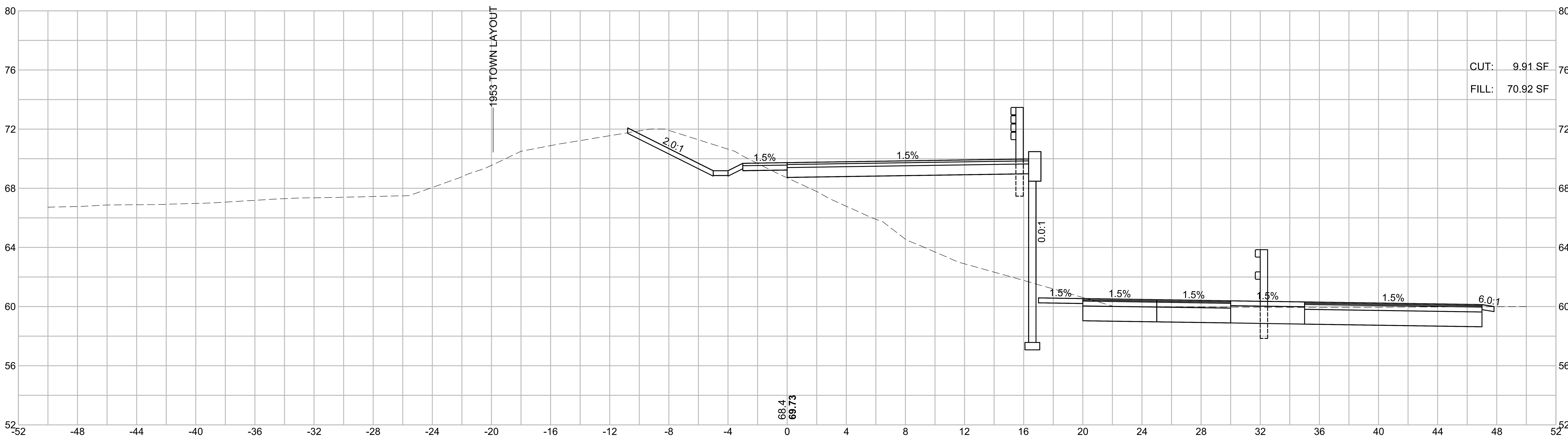
Plotted on 21-Oct-2021 8:24 AM
607398_HD(XSEC-WEST-4).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

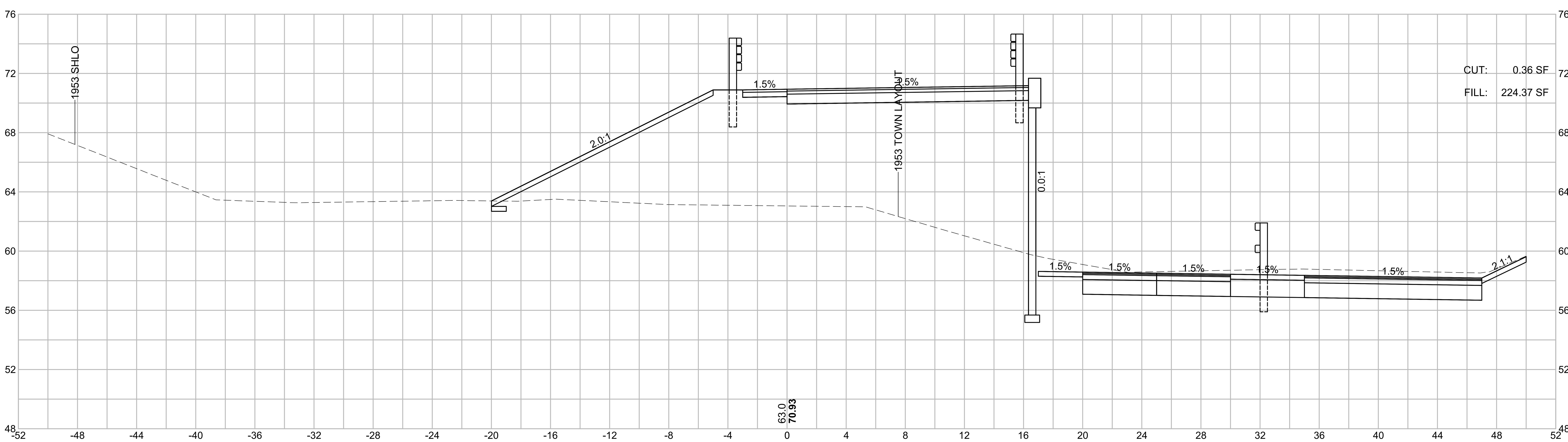
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	194	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

138+00



137+50



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

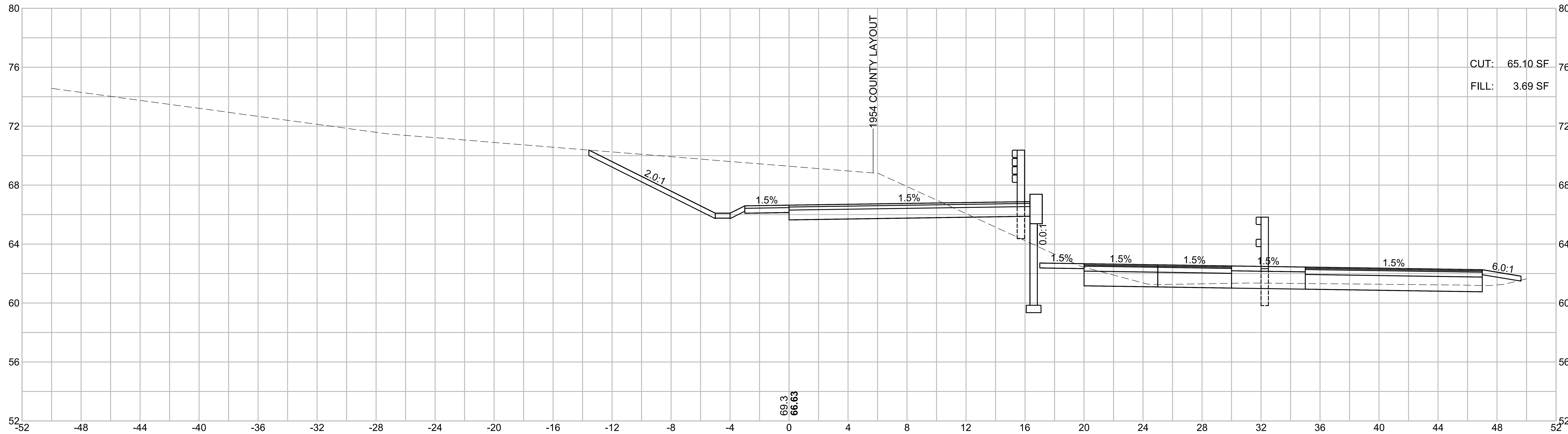
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	195	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

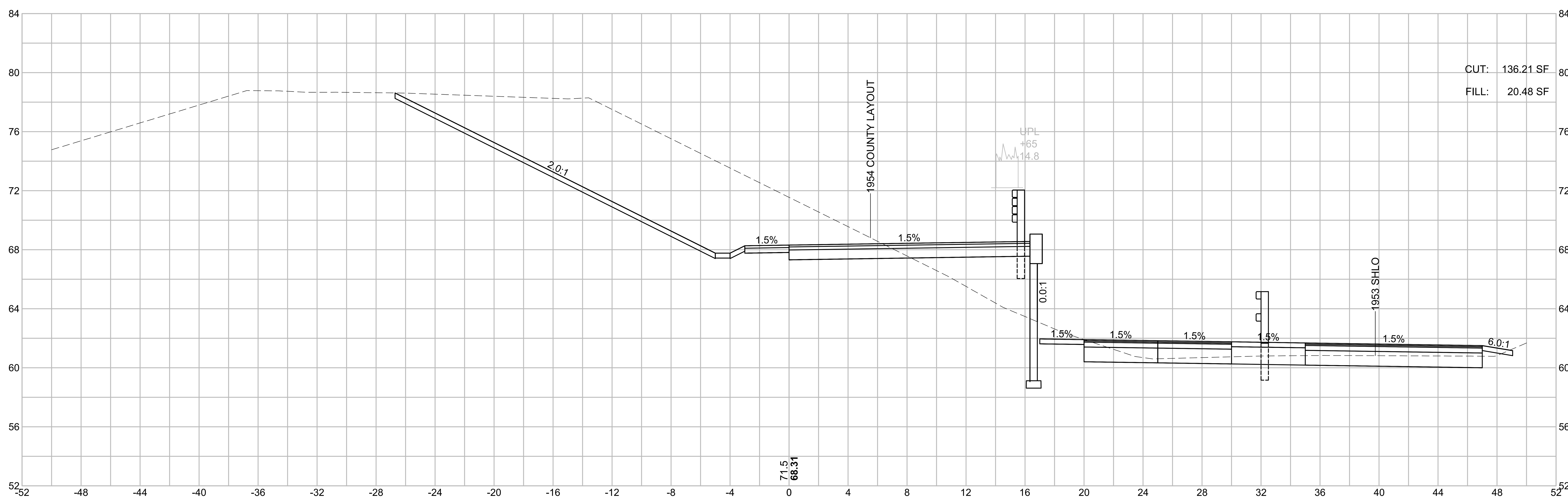
Plotted on 21-Oct-2021 8:25 AM

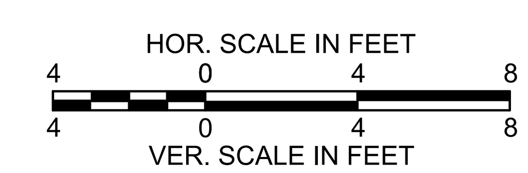
607398_HD(XSEC-WEST-4).DWG

139+00



138+50





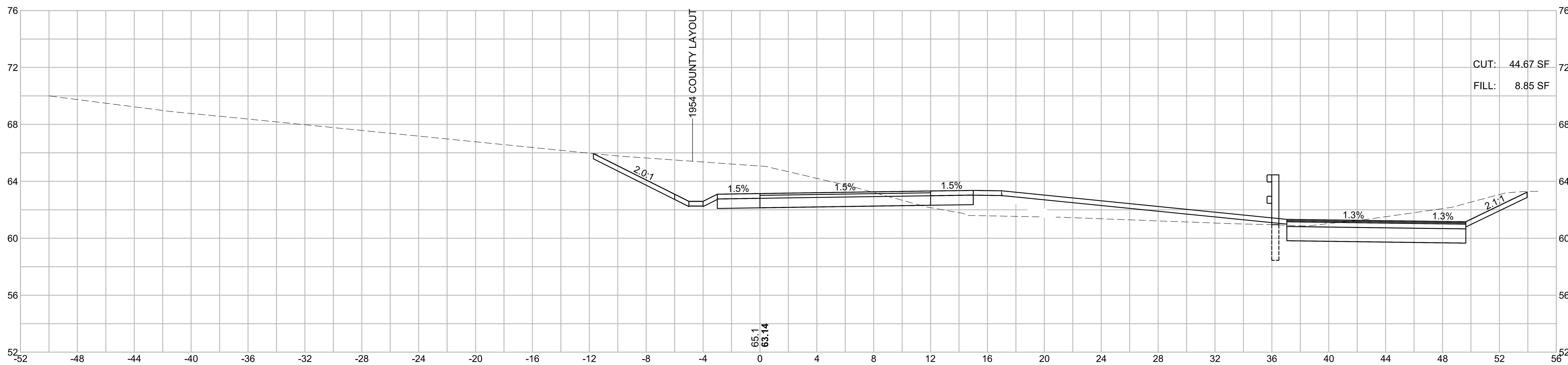
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

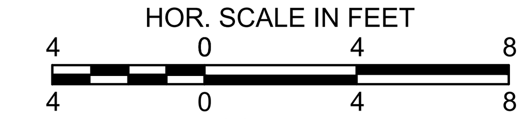
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	196	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

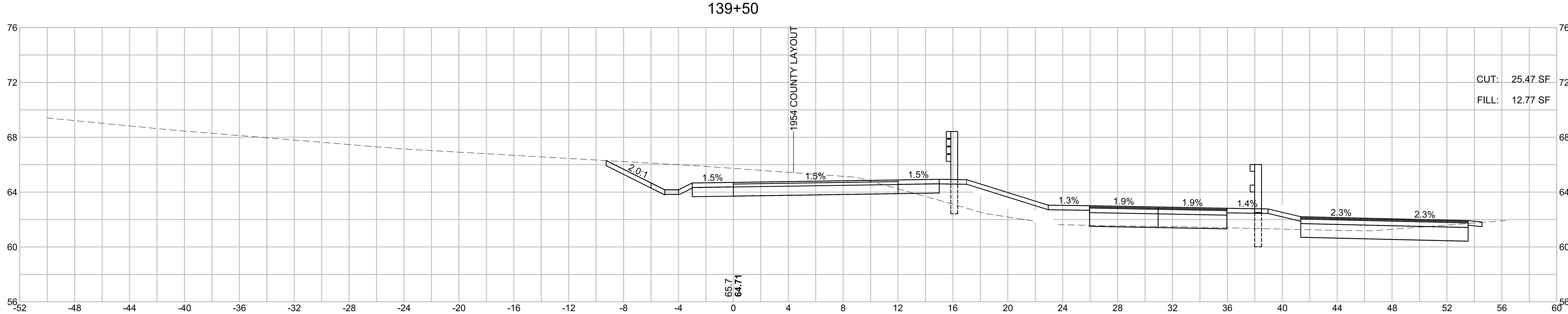
607398_HD(XSEC-WEST-4).DWG Plotted on 21-Oct-2021 8:25 AM

140+00





139+50



BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

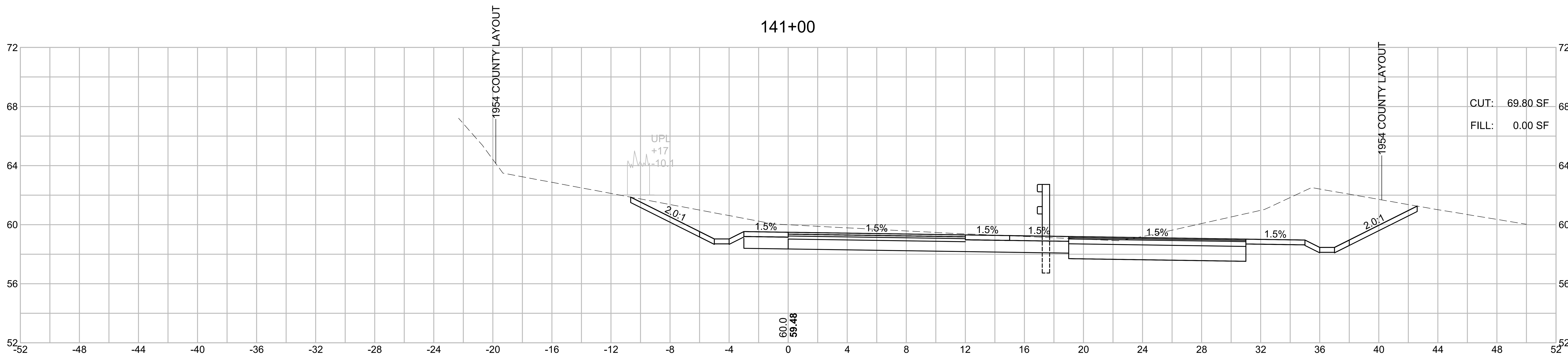
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	197	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

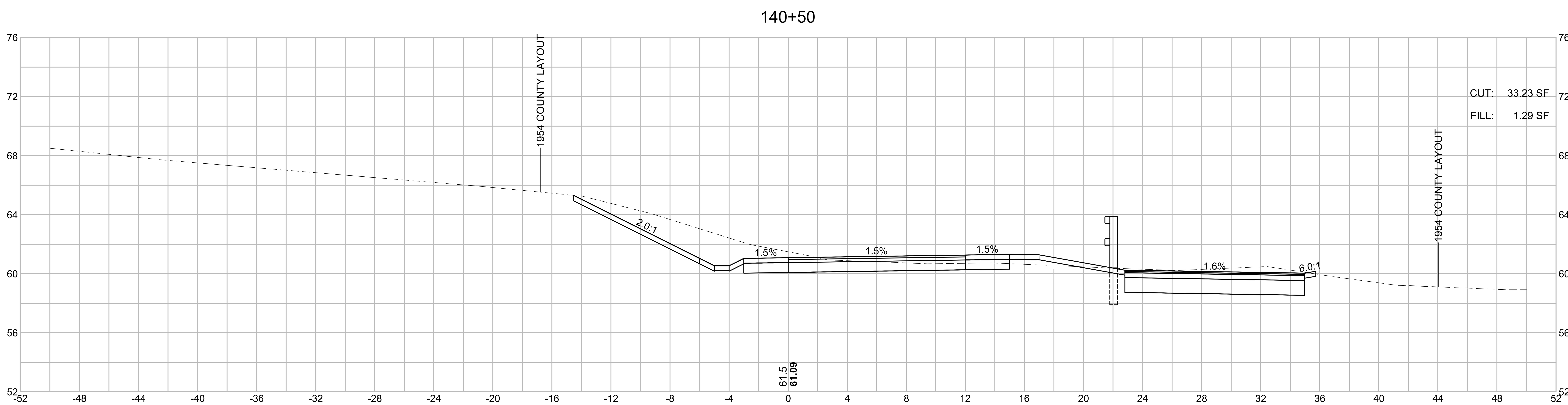
Plotted on 23-Nov-2021 2:54 PM

607398_HD(XSEC-WEST-4).DWG

141+00



140+50



HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

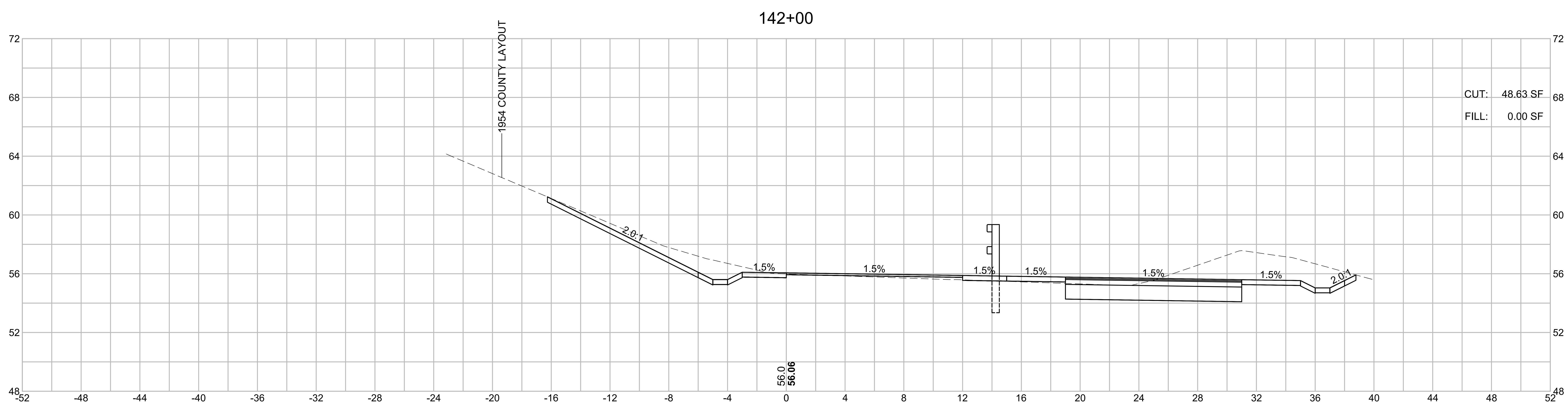
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

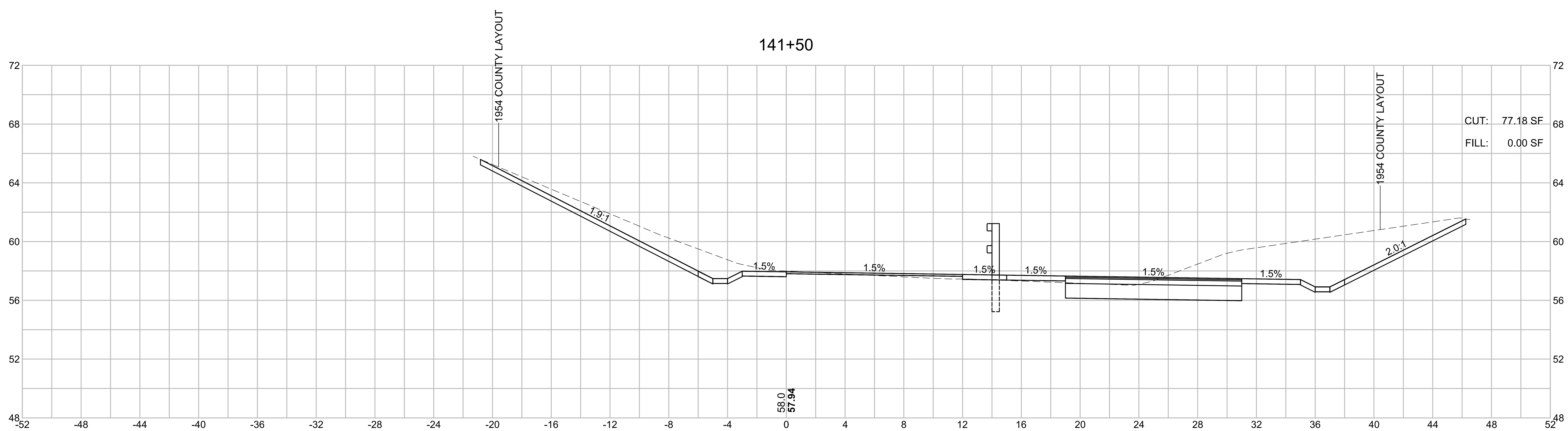
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	198	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:25 AM

607398_HD(XSEC-WEST-4).DWG





HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

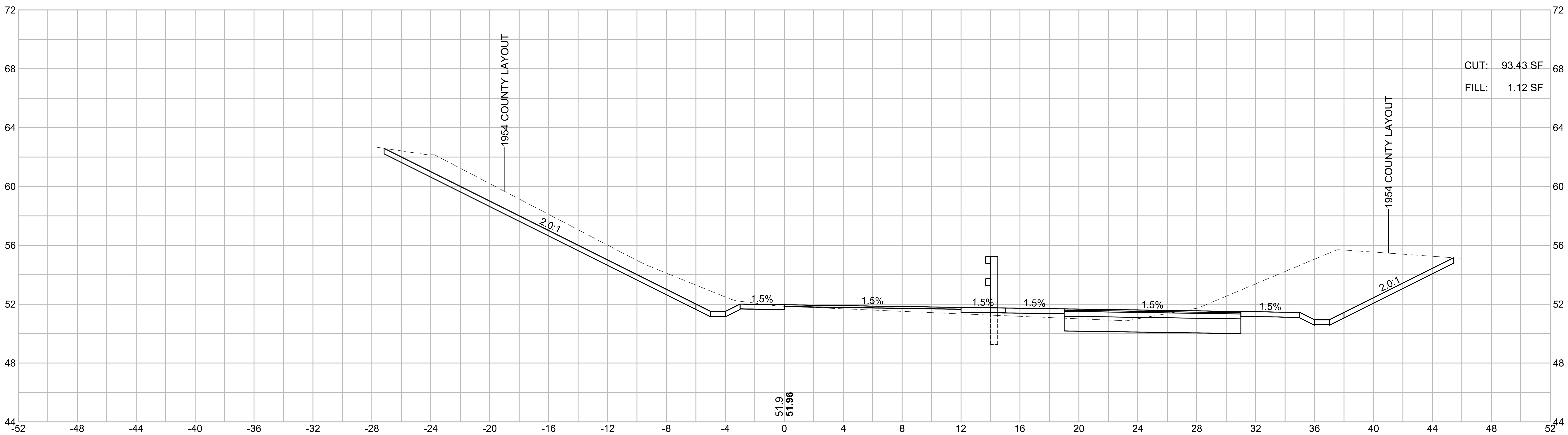
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	199	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

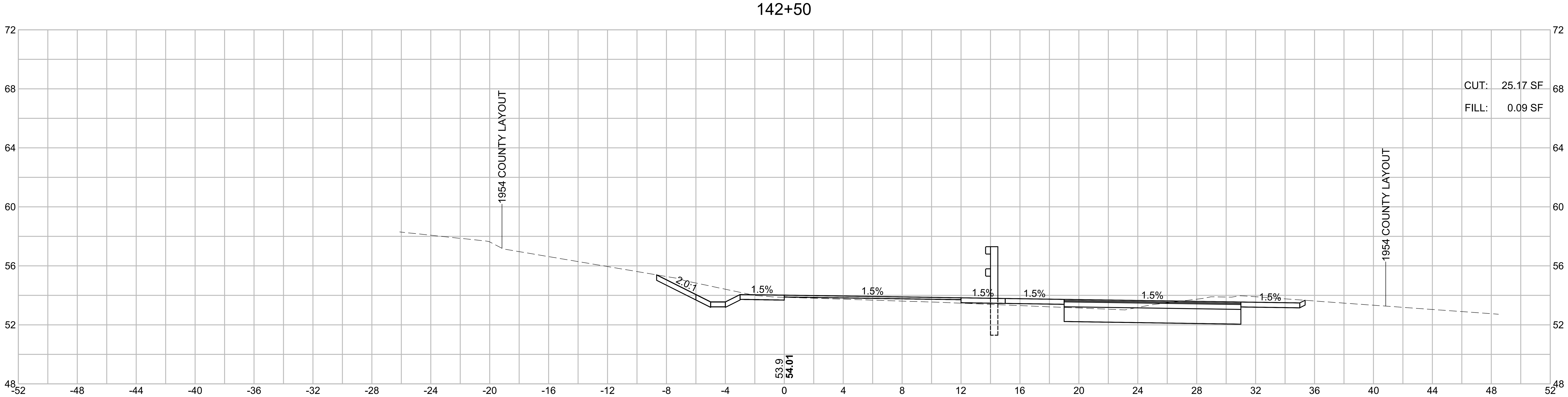
Plotted on 21-Oct-2021 8:25 AM

607398_HD(XSEC-WEST-4).DWG

143+00



142+50



HOR. SCALE IN FEET

VER. SCALE IN FEET

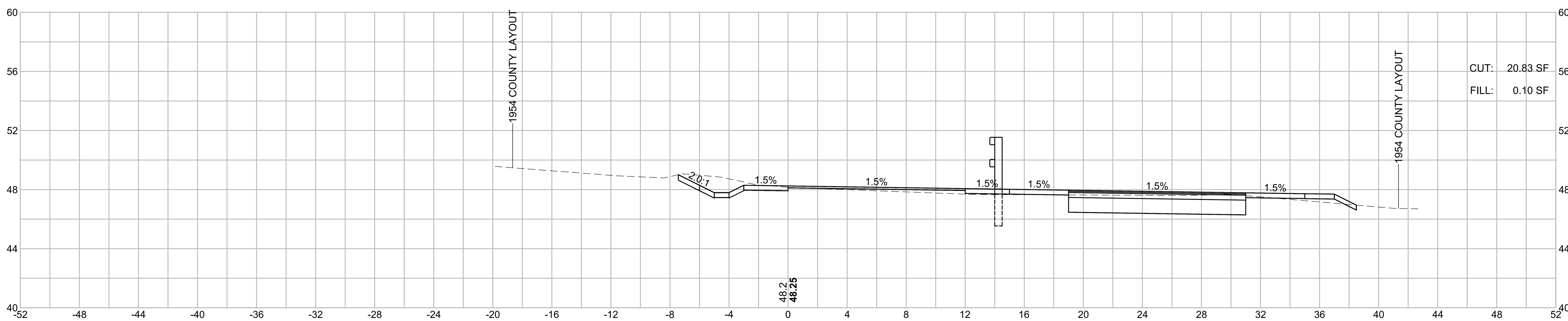
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	200	267
PROJECT FILE NO. 607398			

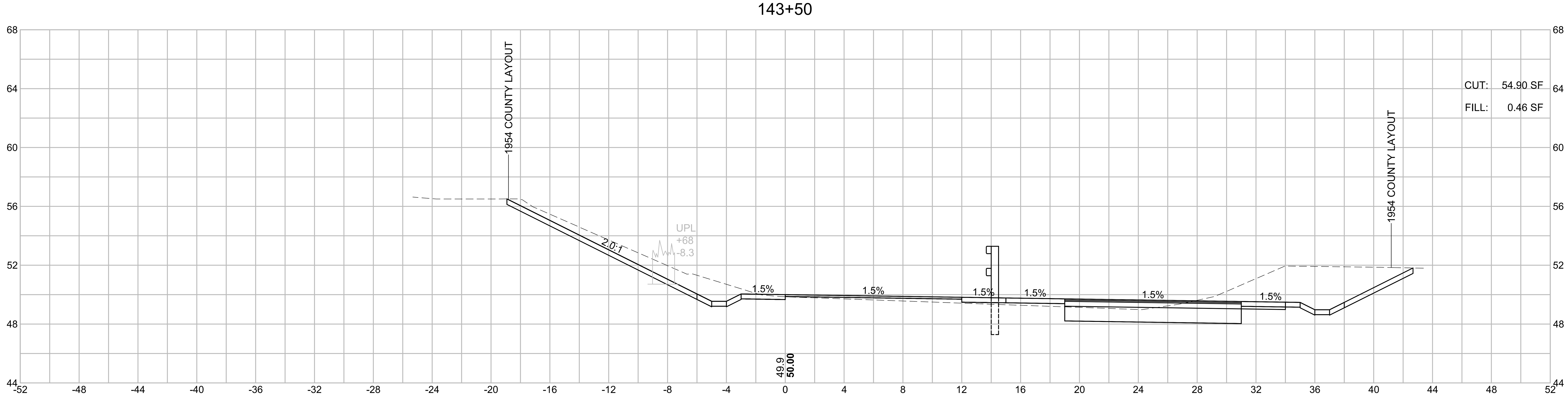
WEST CROSS SECTIONS

607398_HD(XSEC-WEST-4).DWG   Plotted on 21-Oct-2021 8:25 AM

144+00



143+50



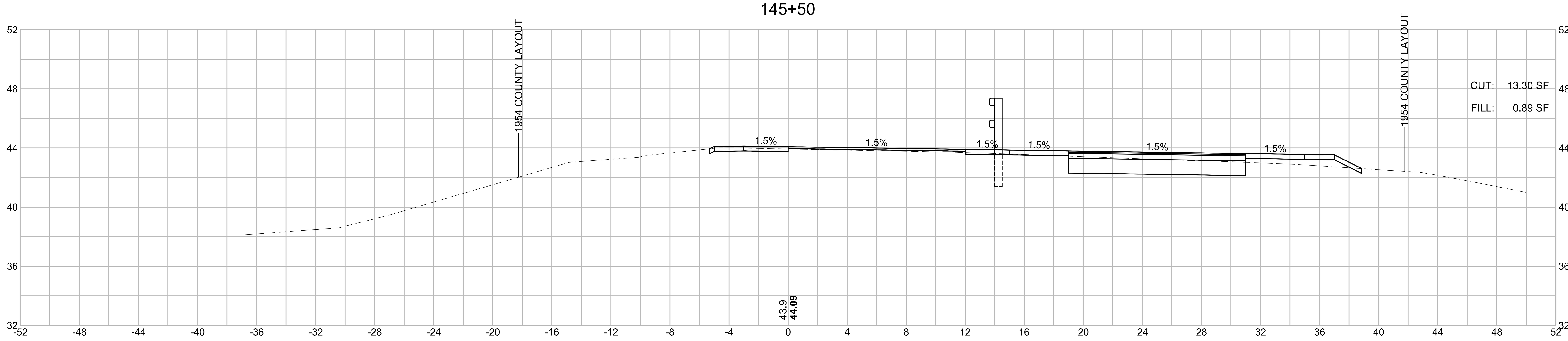
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

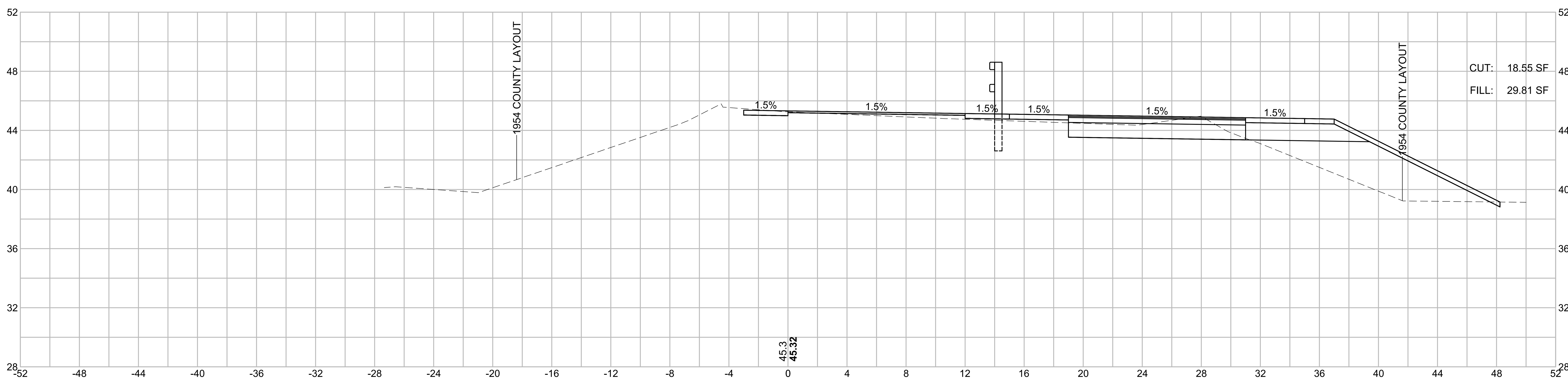
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	201	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

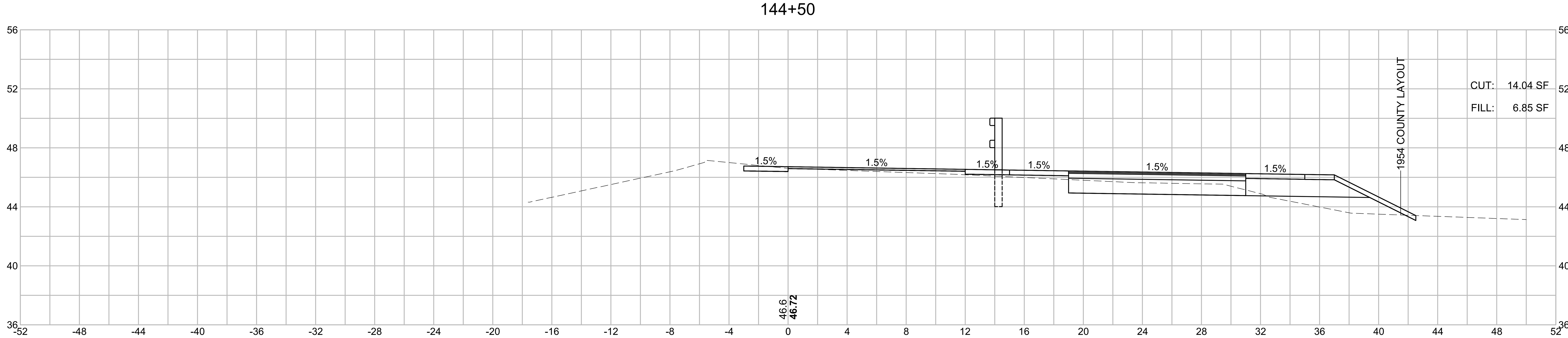
145+50



145+00



144+50



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

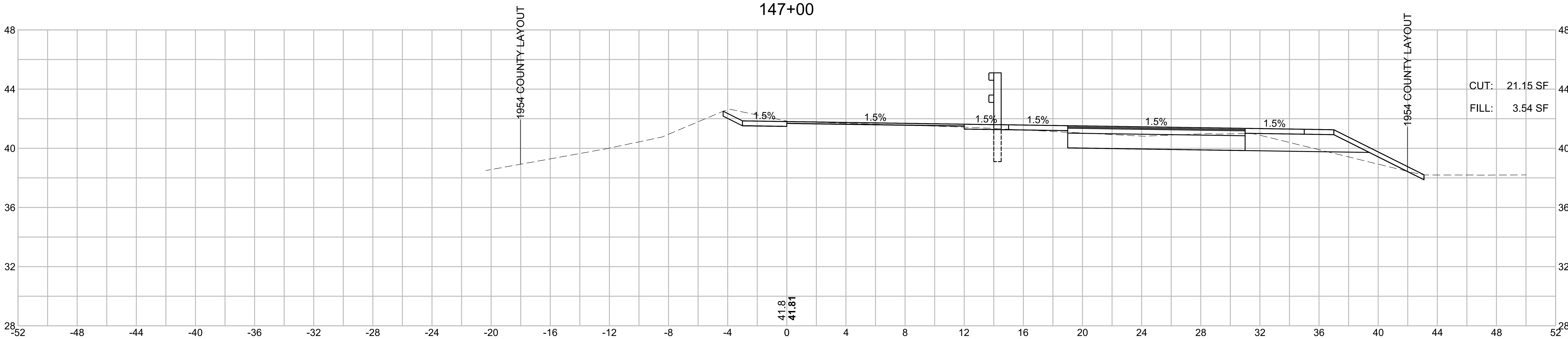
Plotted on 21-Oct-2021 8:25 AM
607398_HD(XSEC-WEST-4).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

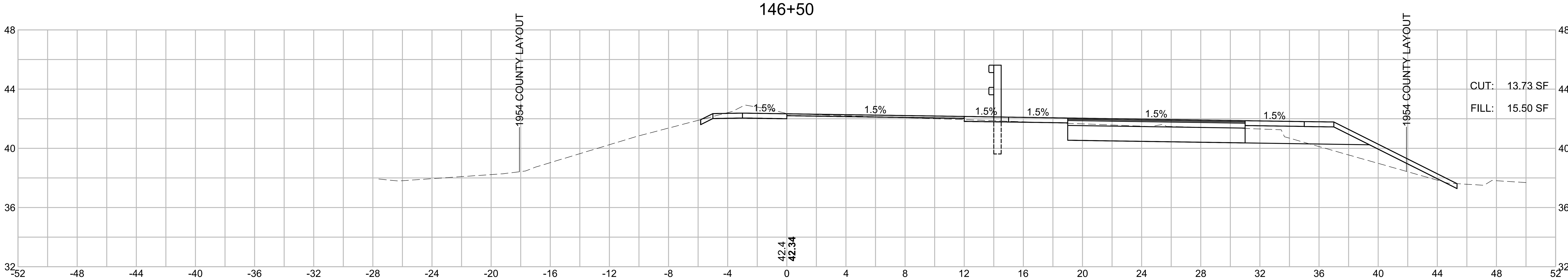
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	202	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS

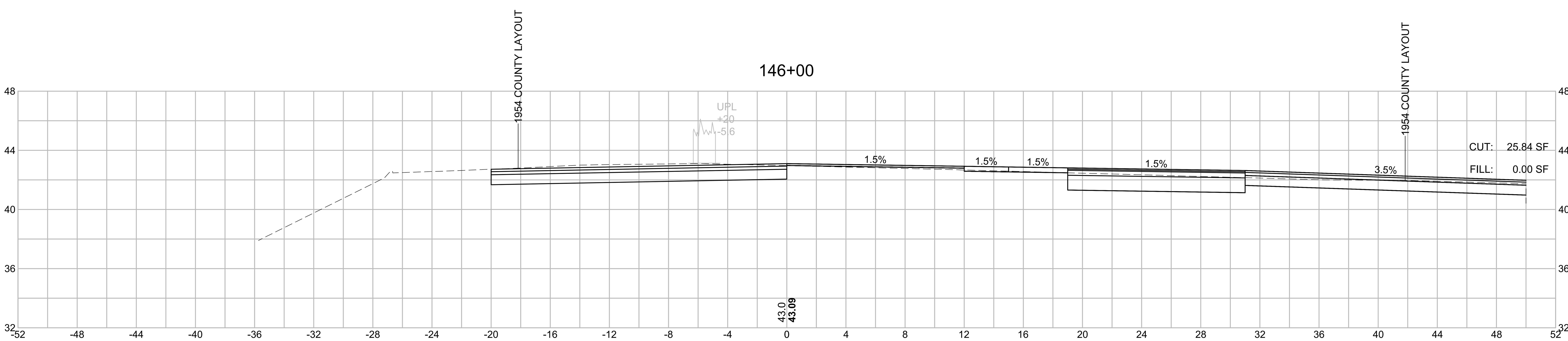
147+00



146+50



146+00



HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

Plotted on 21-Oct-2021 8:25 AM
607398_HD(XSEC-WEST-4).DWG

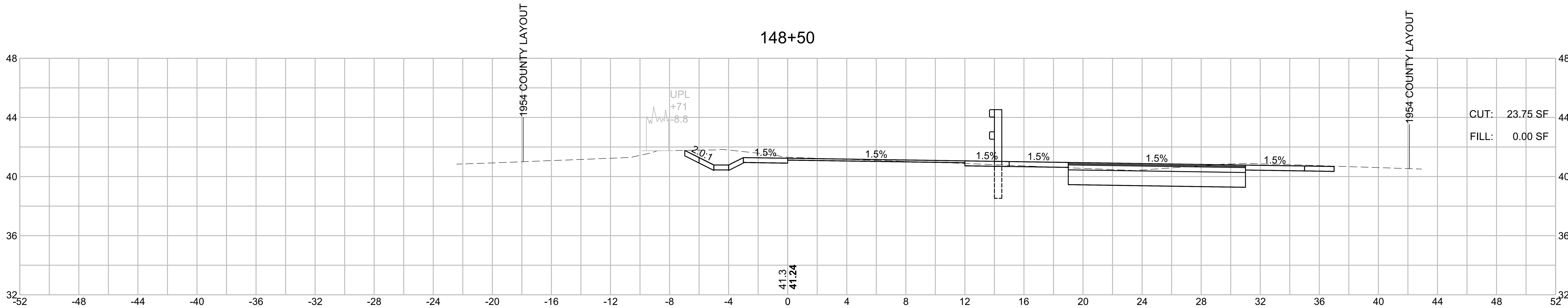
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

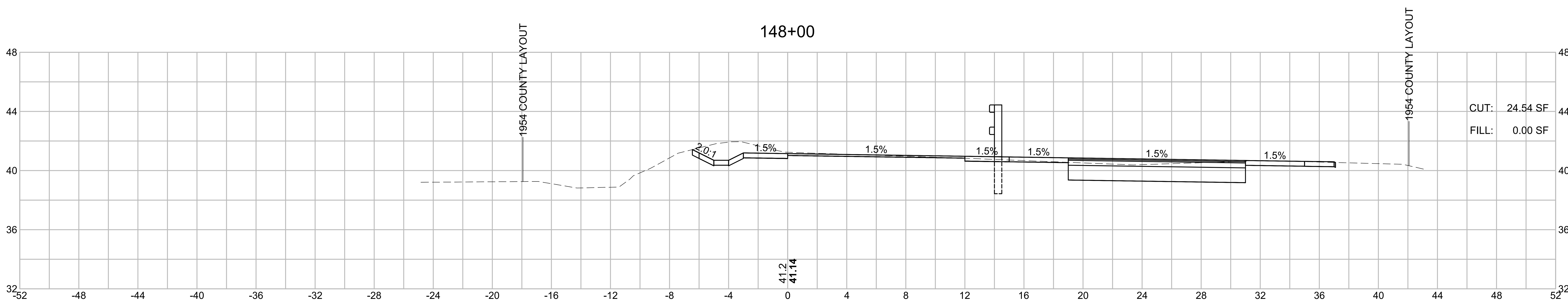
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	203	267
PROJECT FILE NO. 607398			

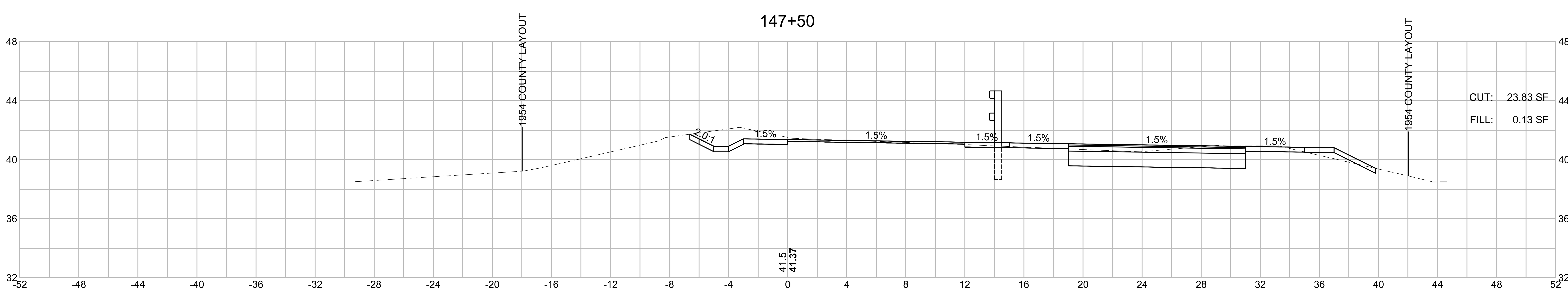
WEST CROSS SECTIONS

Plotted on 21-Oct-2021 8:25 AM

607398_HD(XSEC-WEST-4).DWG





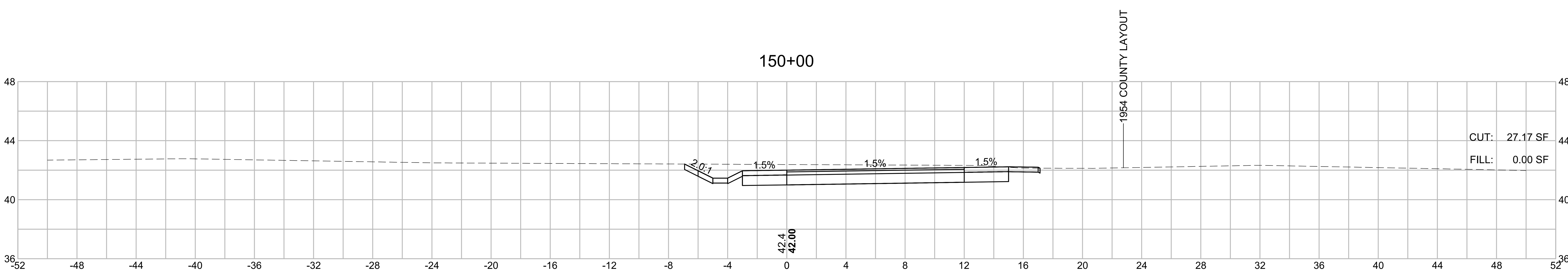


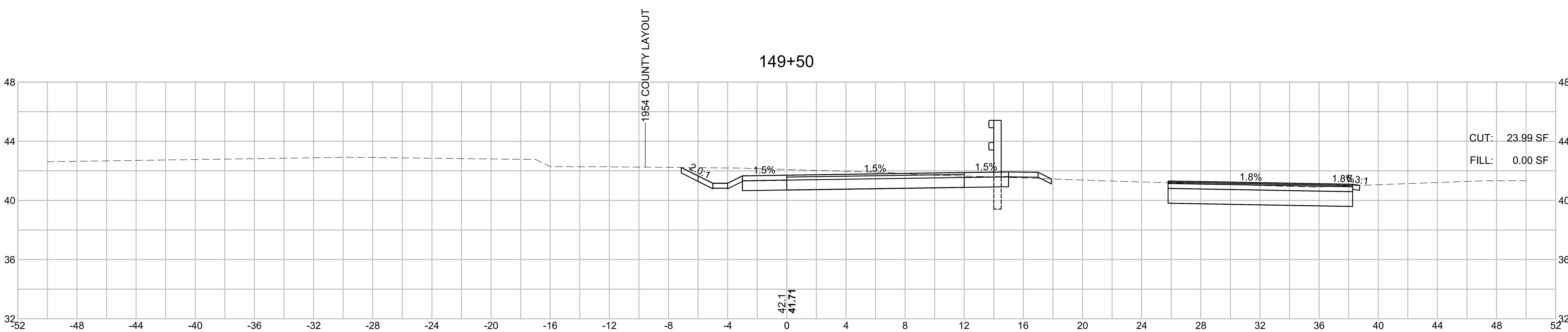
HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

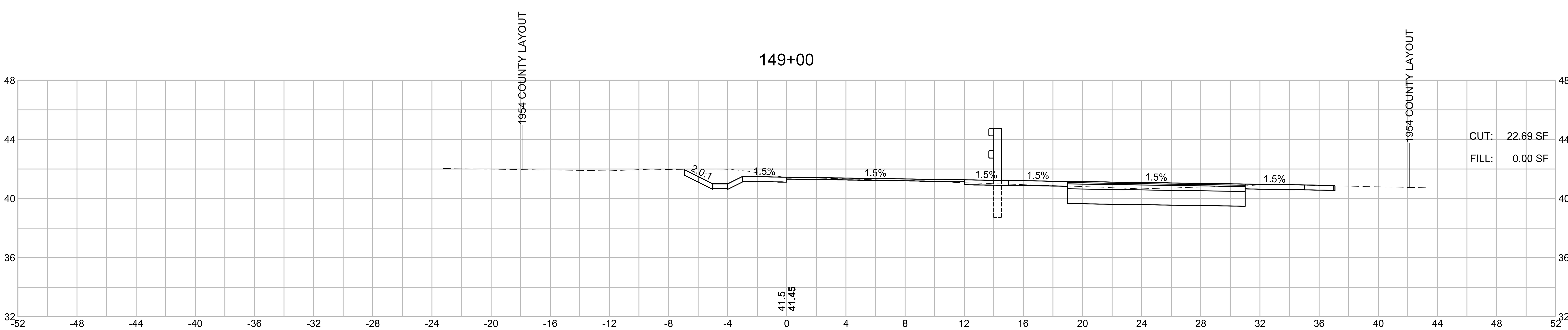
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

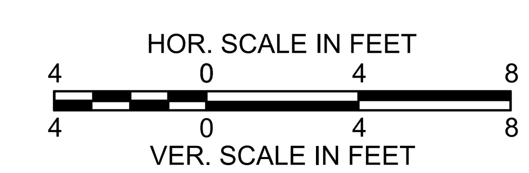
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	204	267
PROJECT FILE NO. 607398			

WEST CROSS SECTIONS









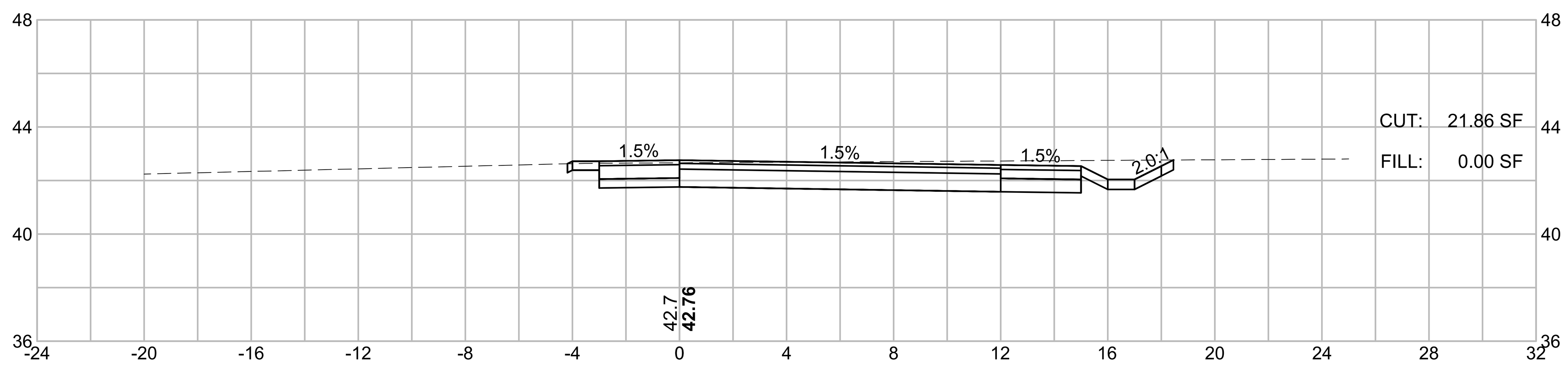
607398_HD(XSEC-WEST-4).DWG Plotted on 21-Oct-2021 8:25 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

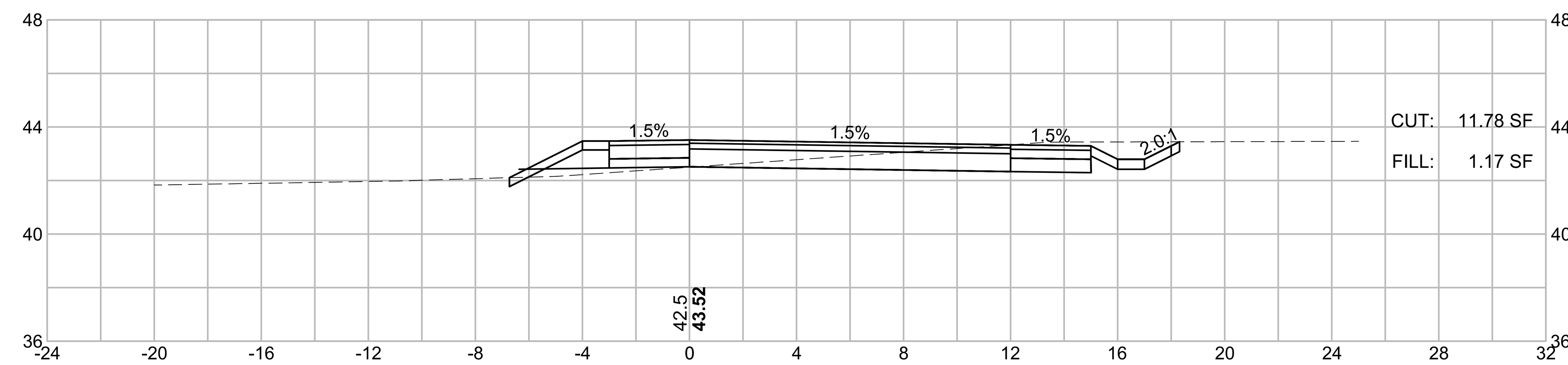
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	205	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

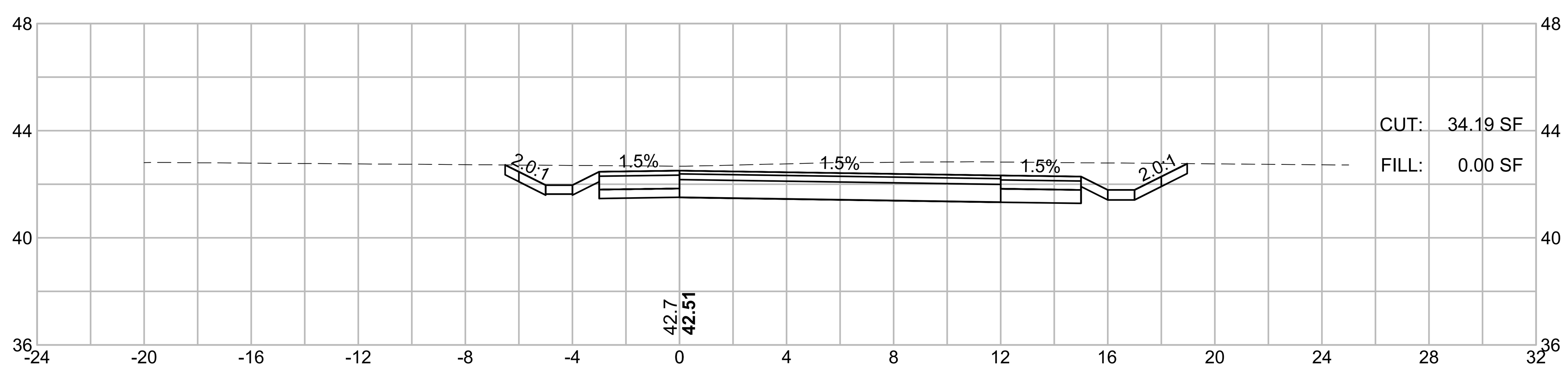
501+00



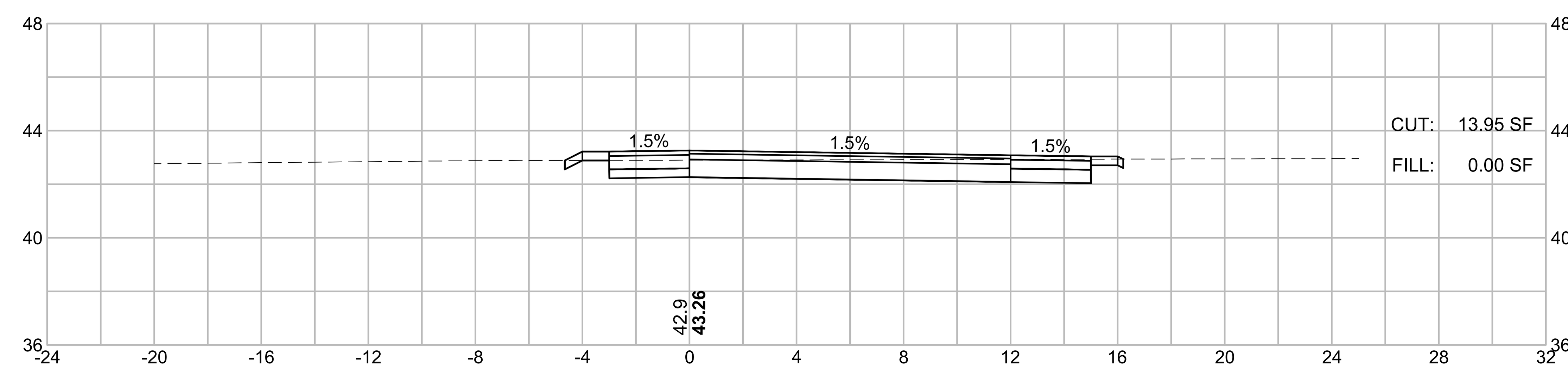
502+50

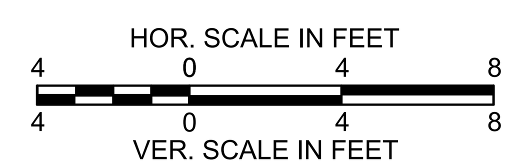


500+50

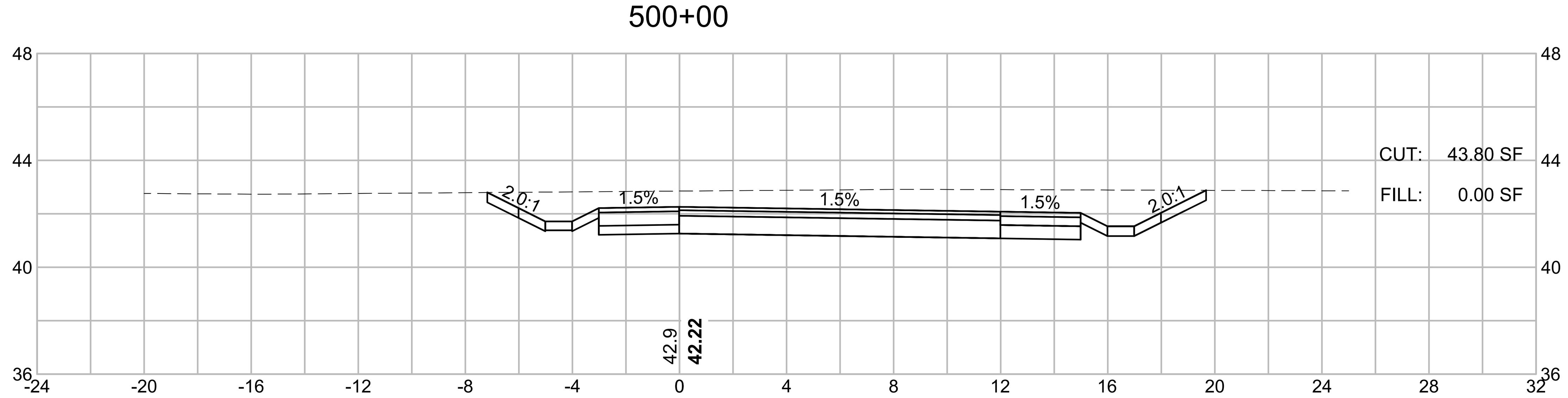


502+00

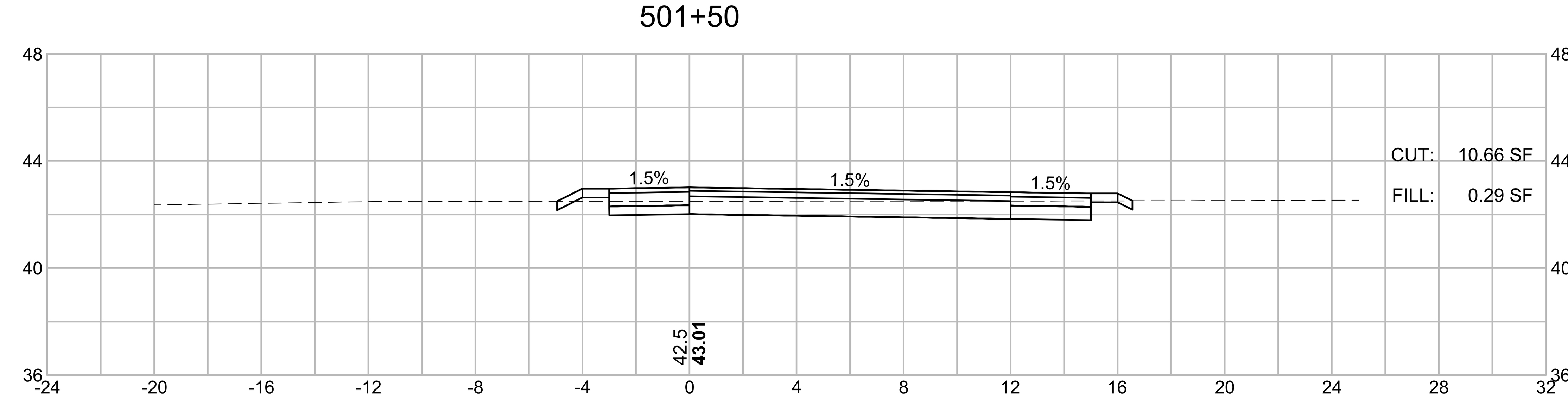




500+00



501+50



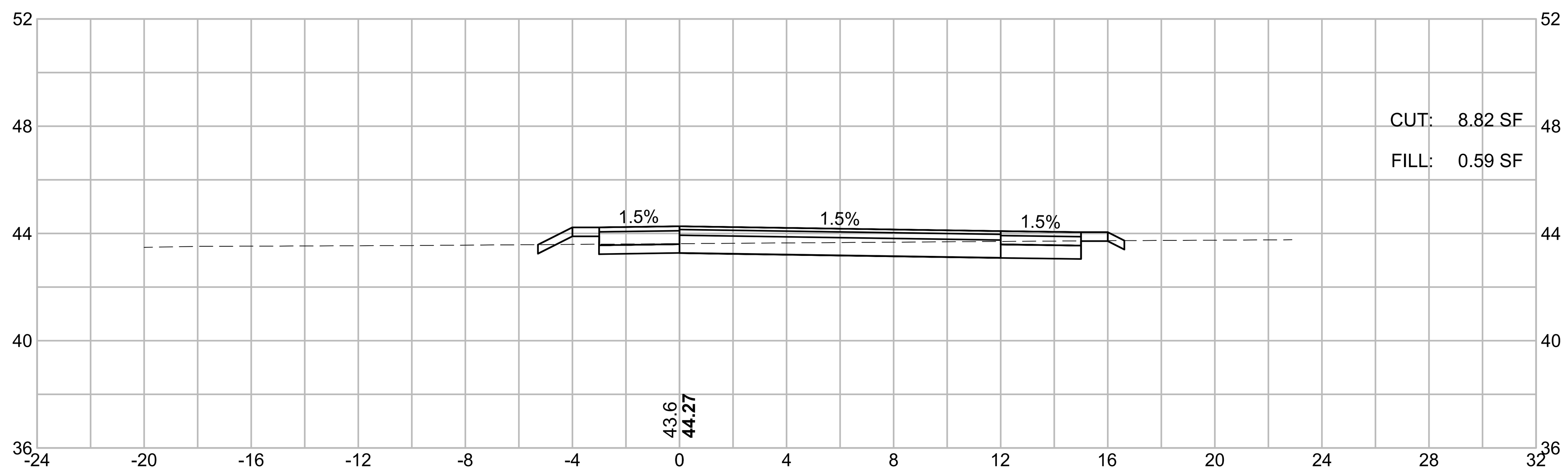
607398_HD(XSEC-EAST-1).DWG Plotted on 21-Oct-2021 8:45 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

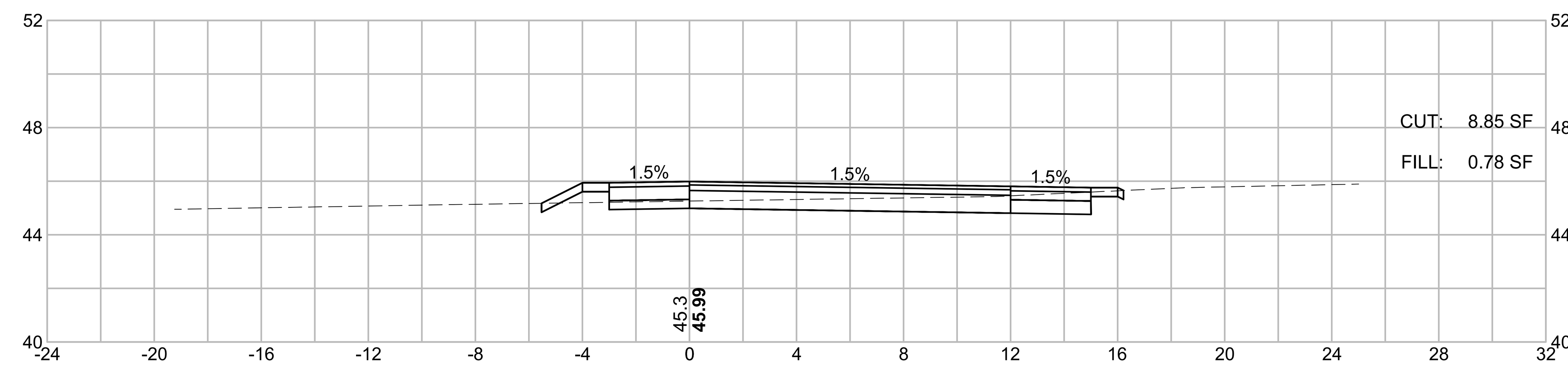
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	206	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

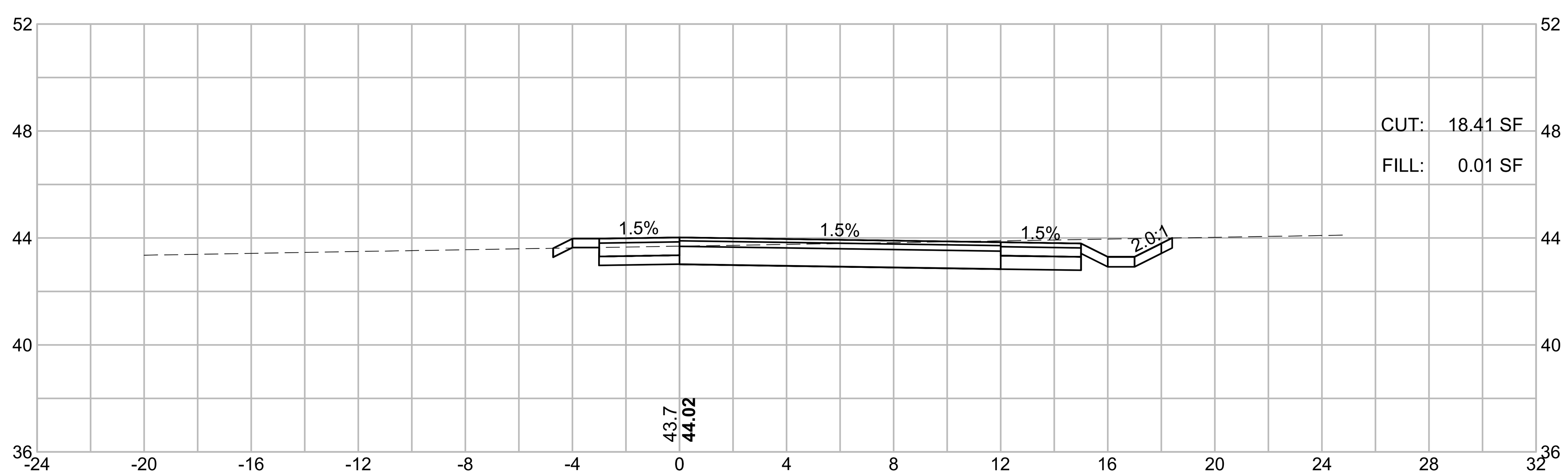
504+00



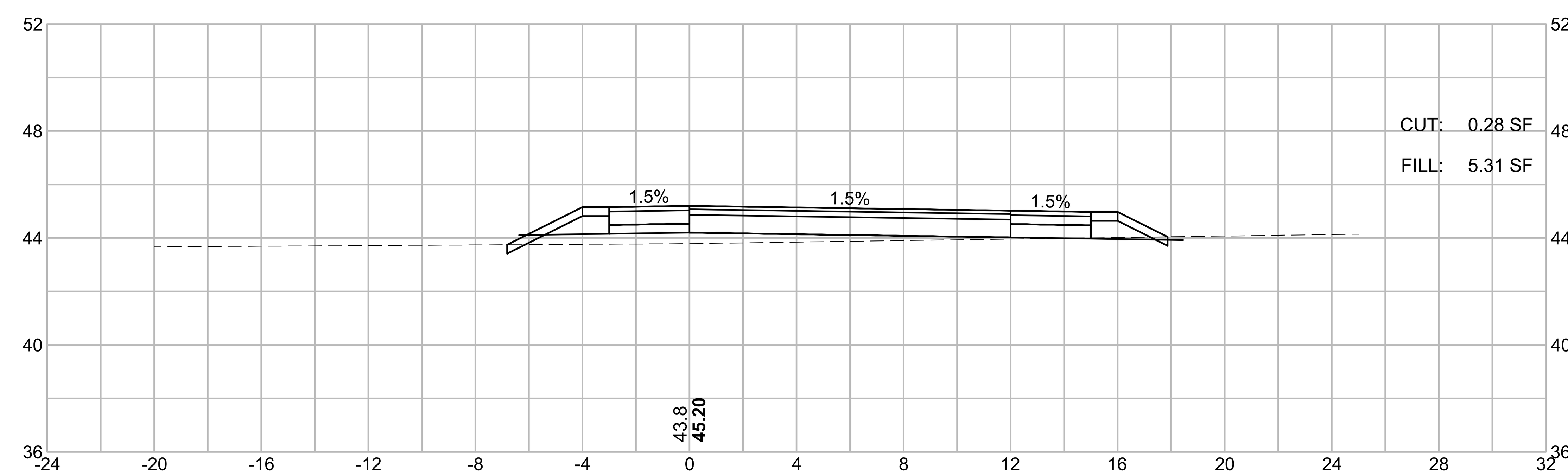
505+50



503+50

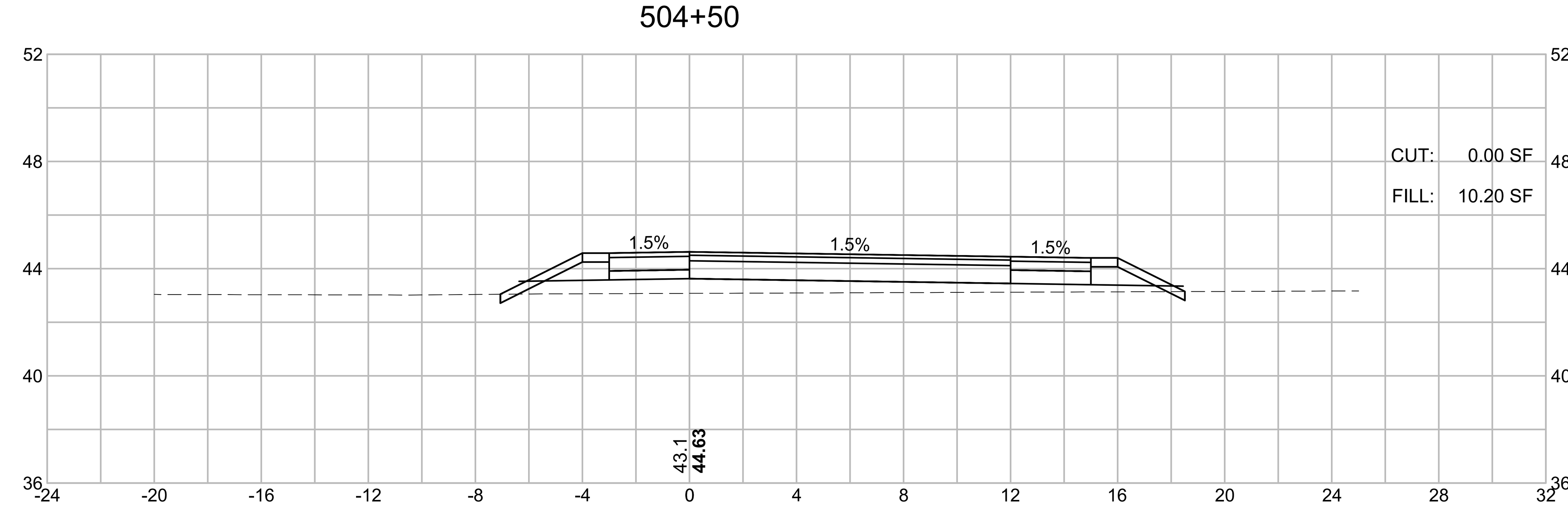


505+00

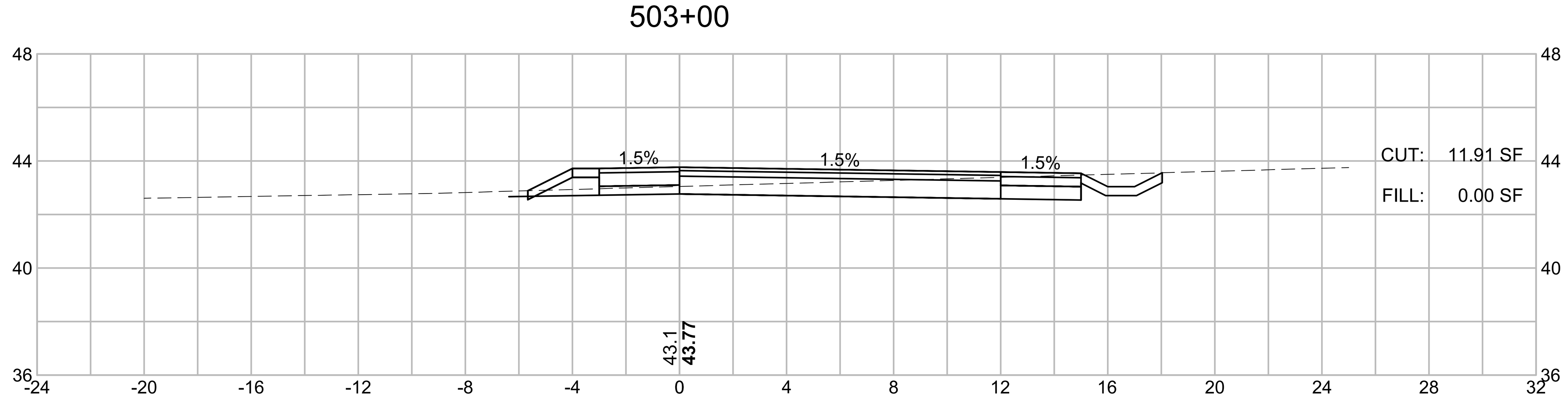


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

504+50



503+00



Plotted on 21-Oct-2021 8:45 AM

607398_HD(XSEC-EAST-1).DWG

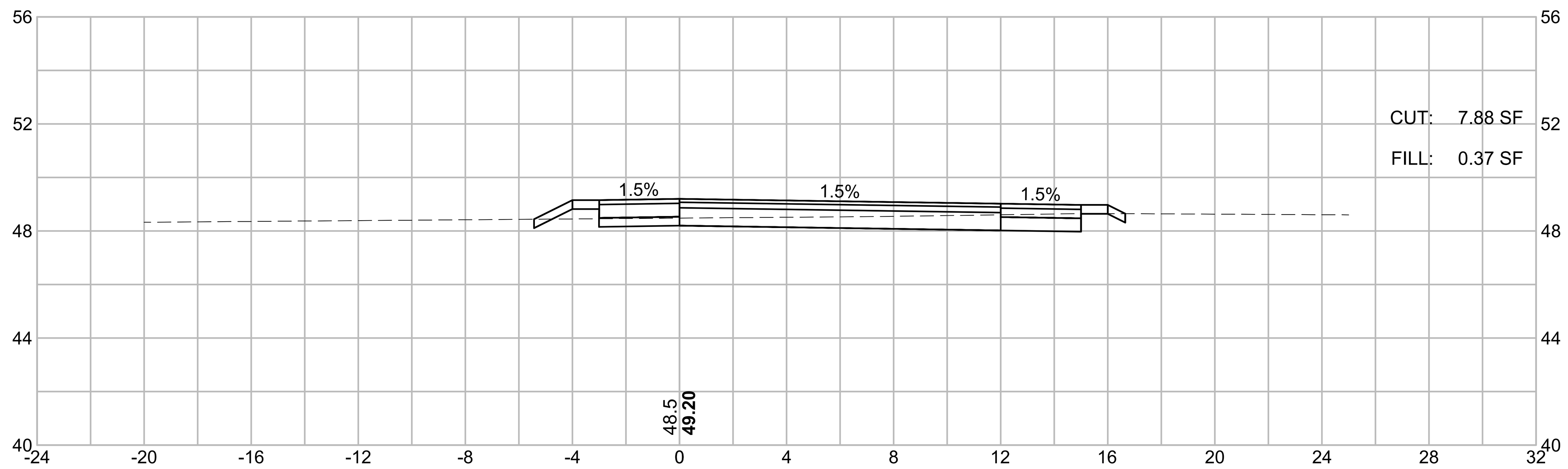
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	207	267
PROJECT FILE NO. 607398			

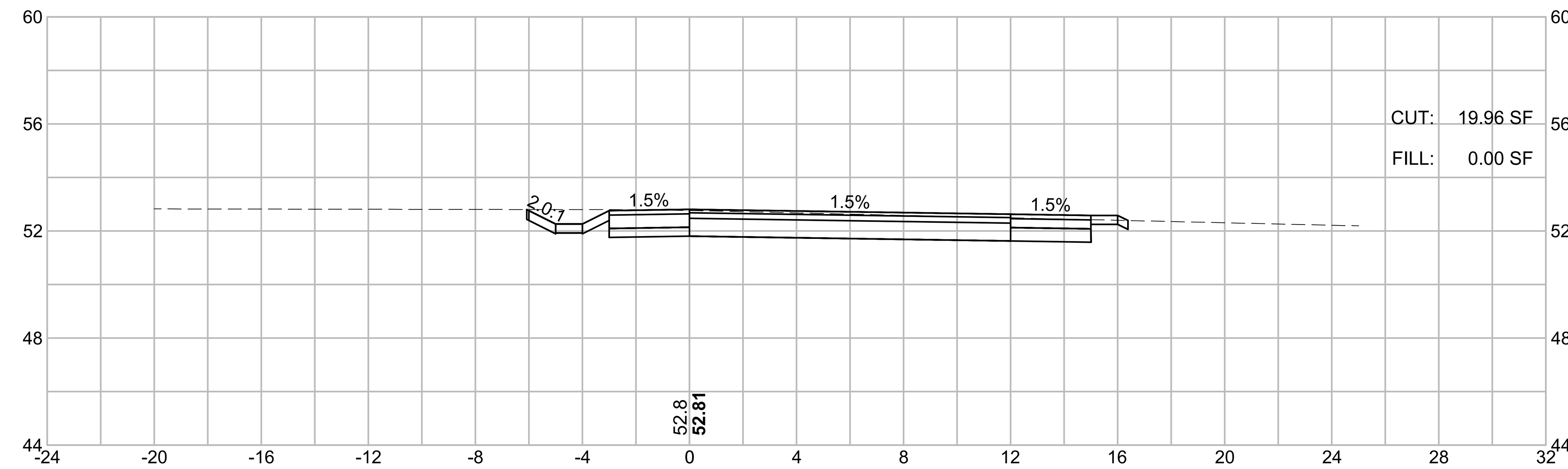
EAST CROSS SECTIONS

Plotted on 21-Oct-2021 8:45 AM
607398_HD(XSEC-EAST-1).DWG

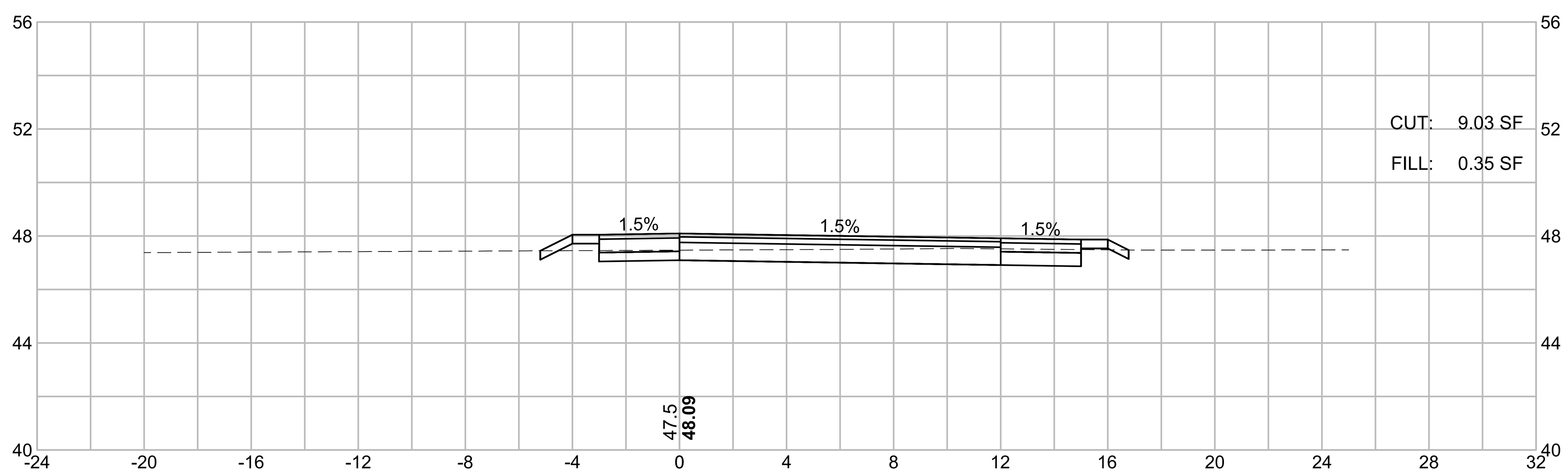
507+00



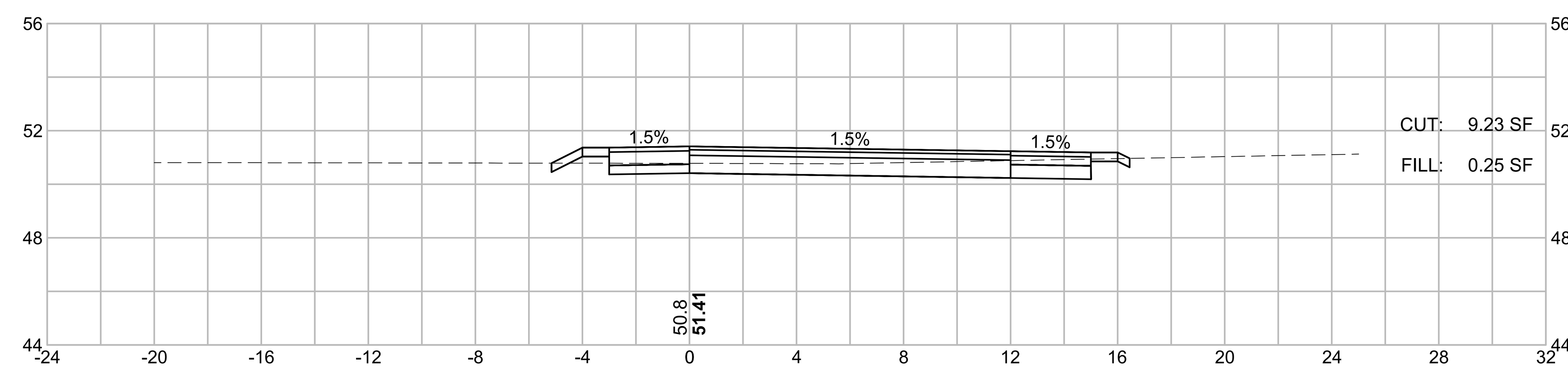
508+50



506+50

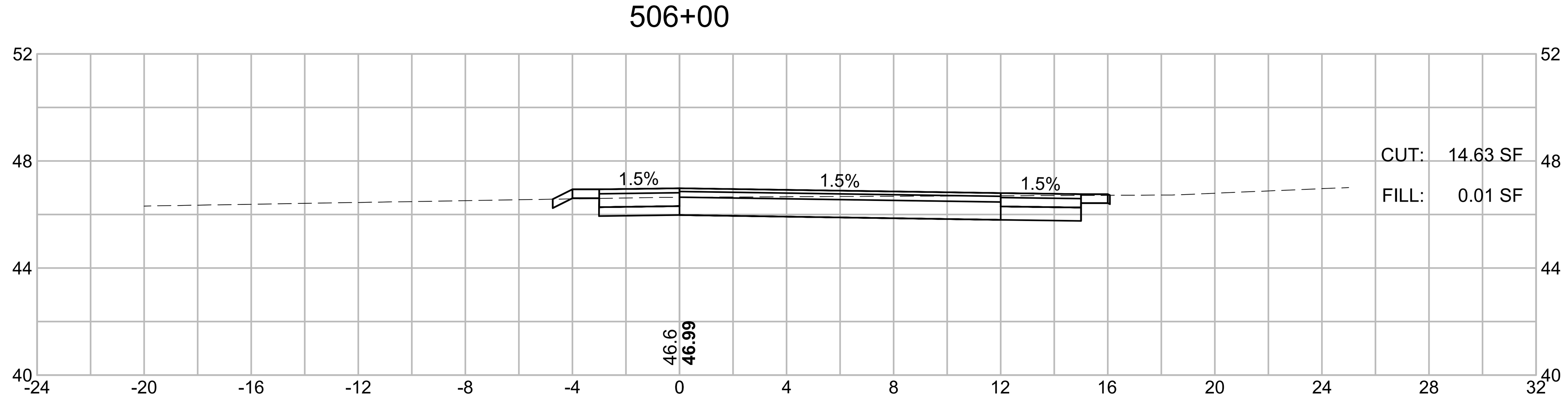


508+00

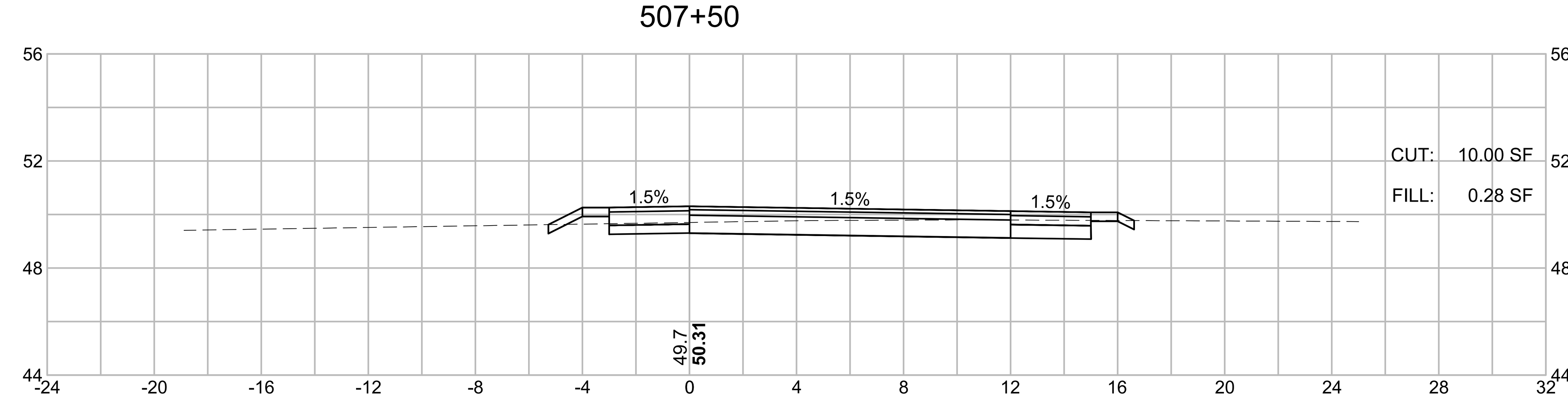


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

506+00



507+50

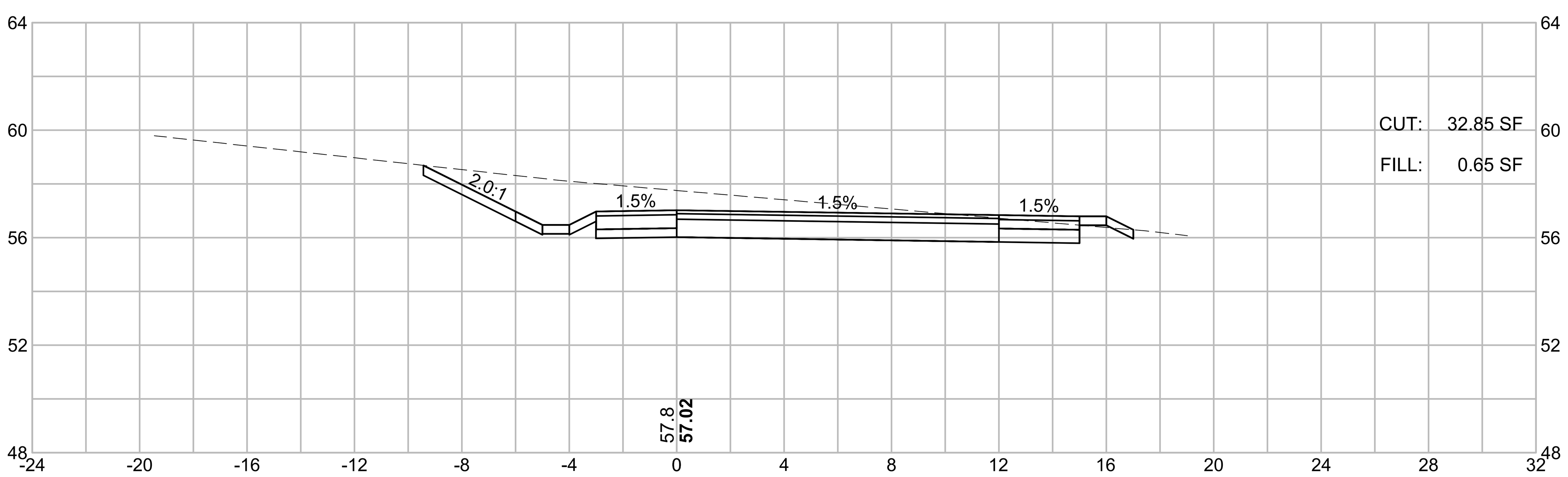


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

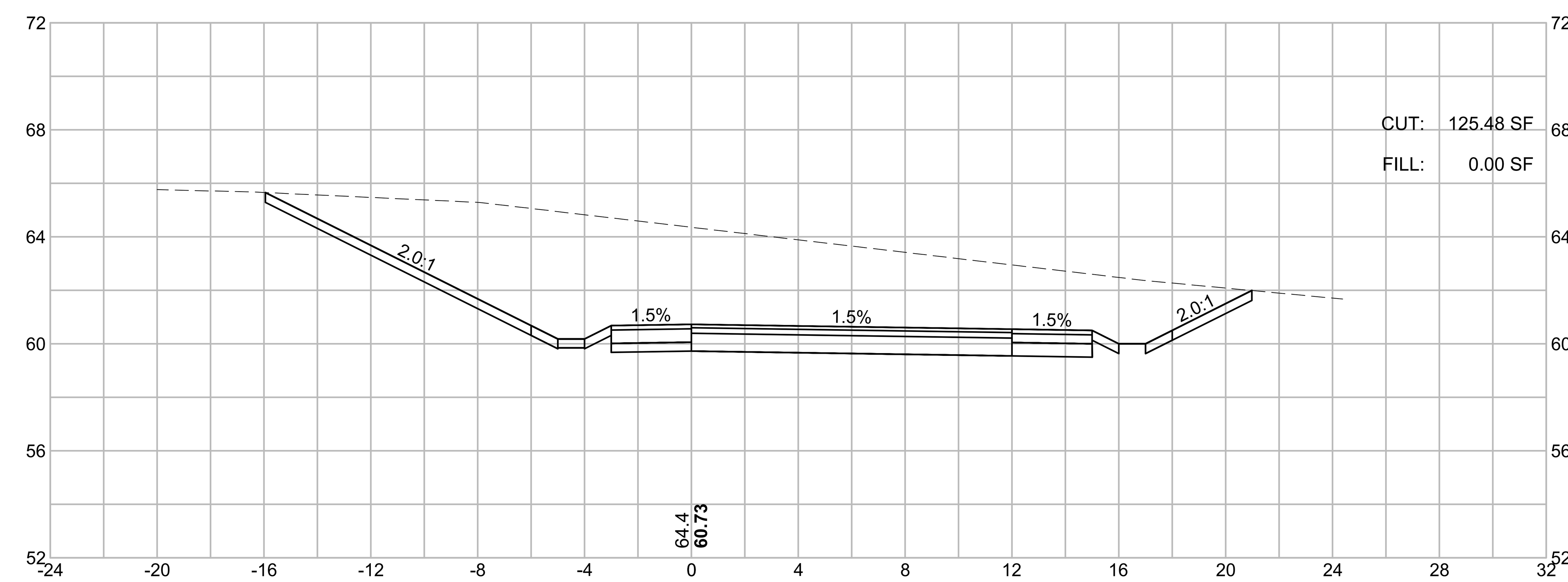
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	208	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

509+50

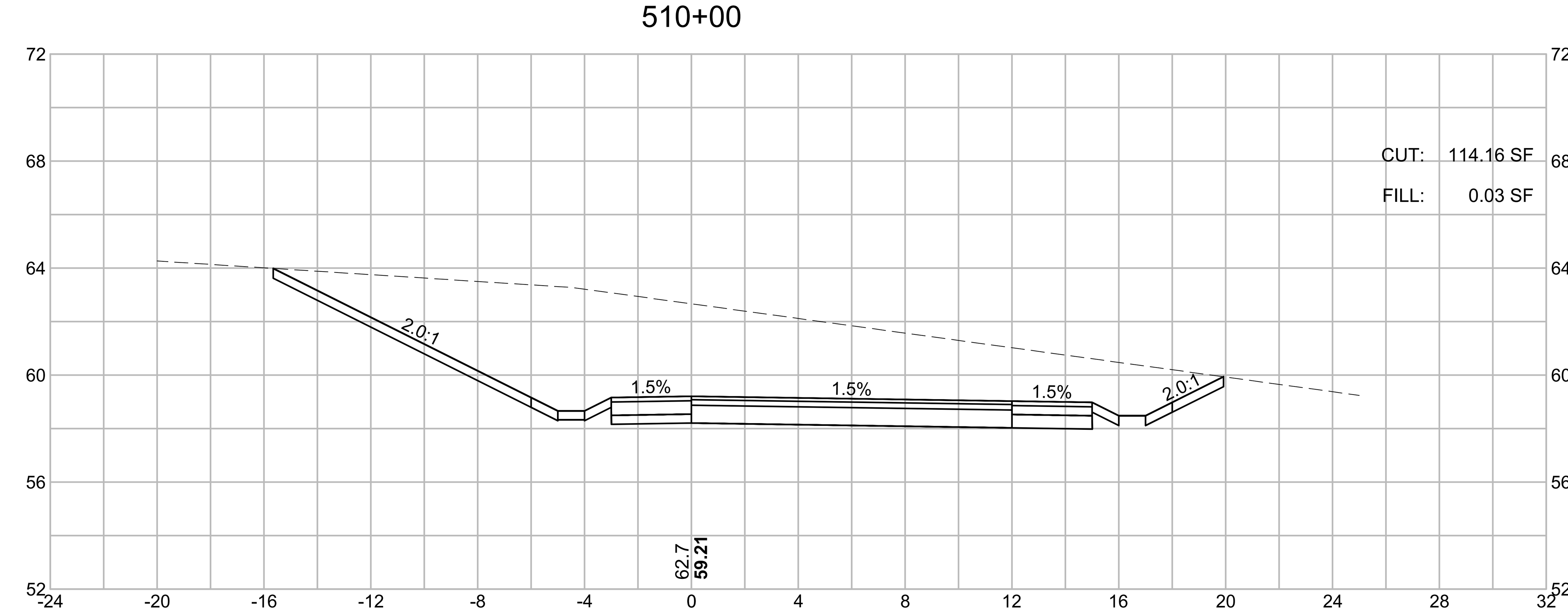


510+50

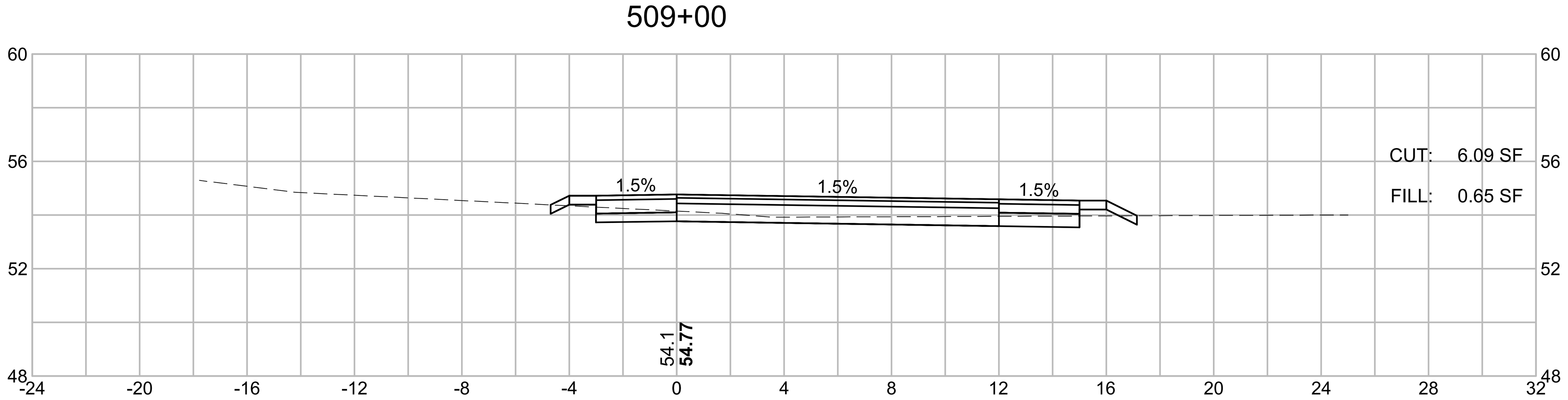


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

510+00



509+00



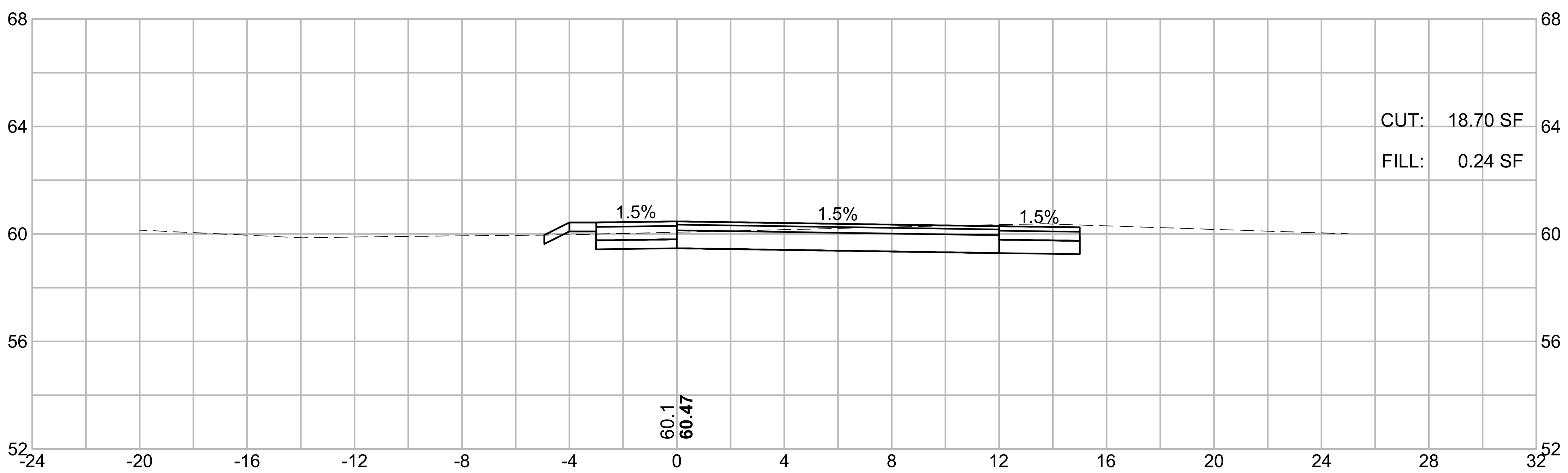
607398_HD(XSEC-EAST-1).DWG Plotted on 21-Oct-2021 8:45 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

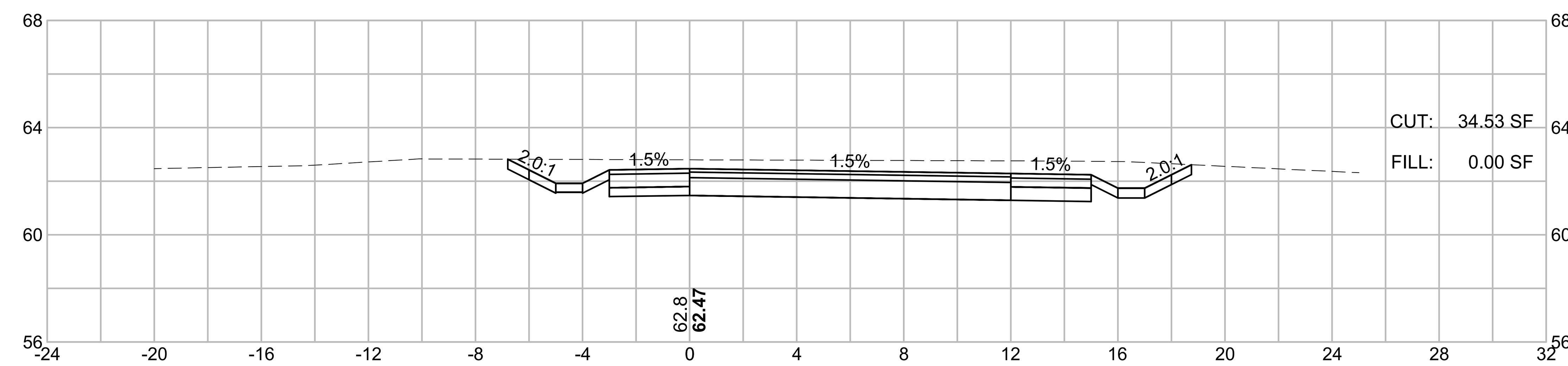
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	209	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

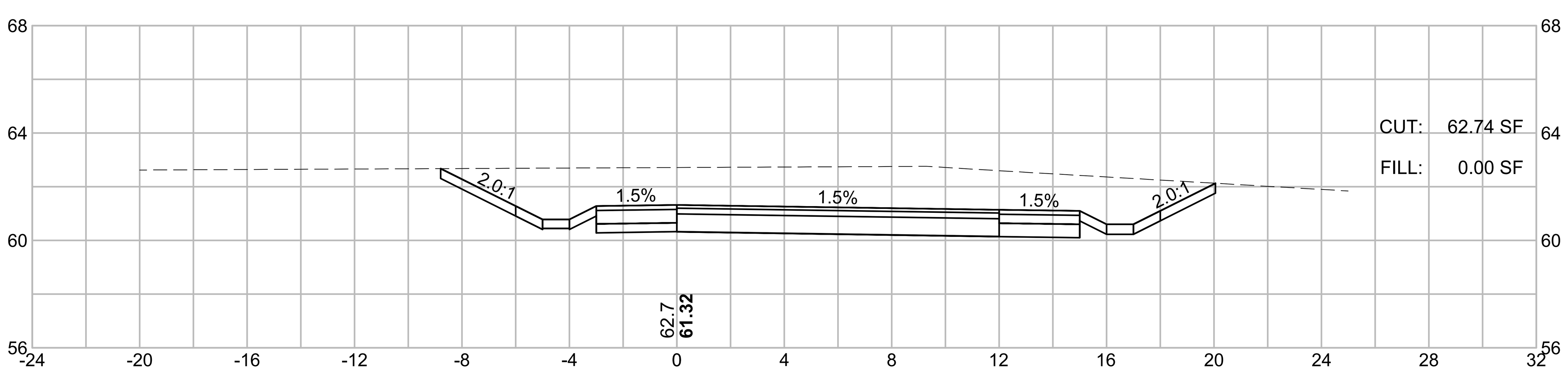
512+00



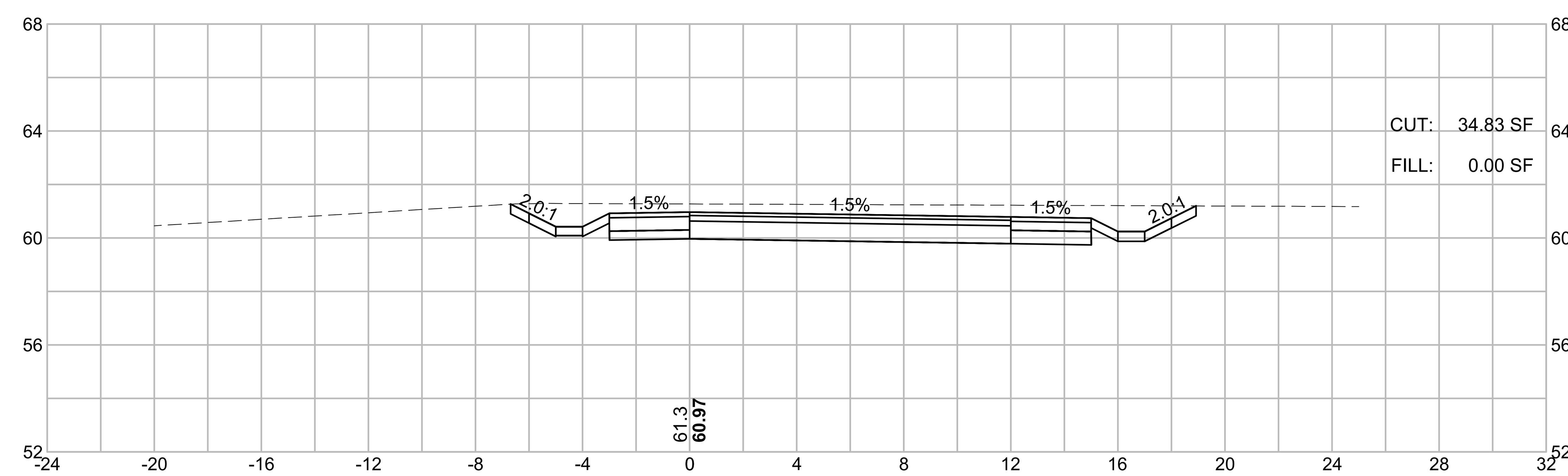
513+50



511+50

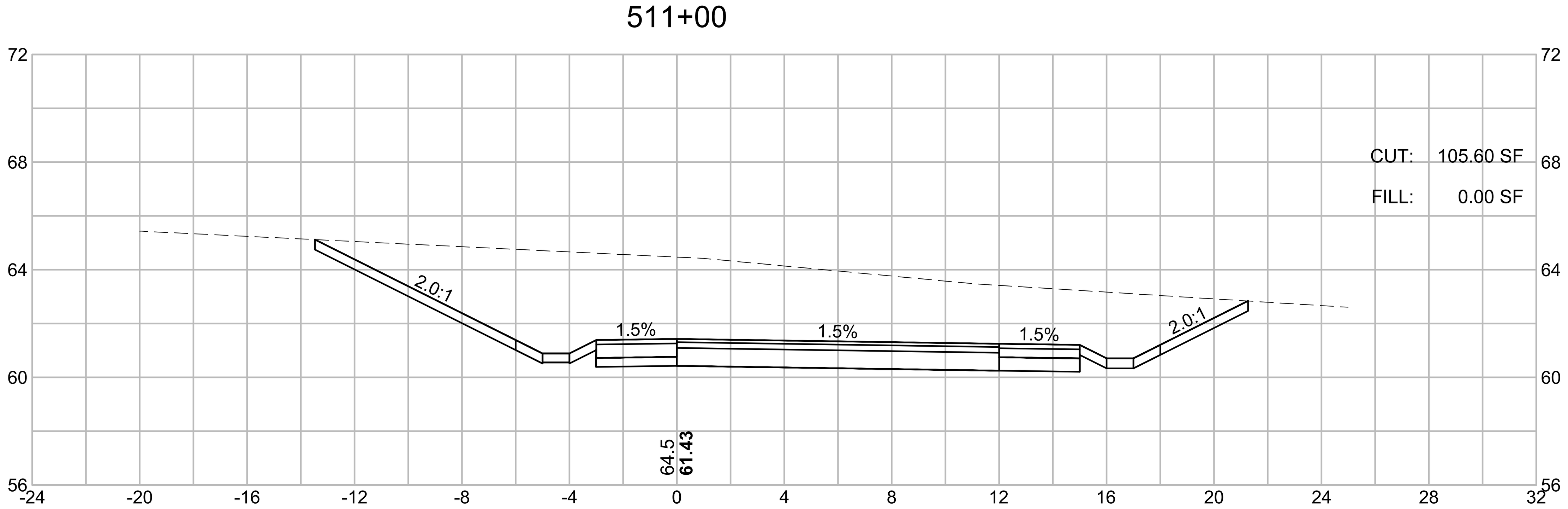


513+00

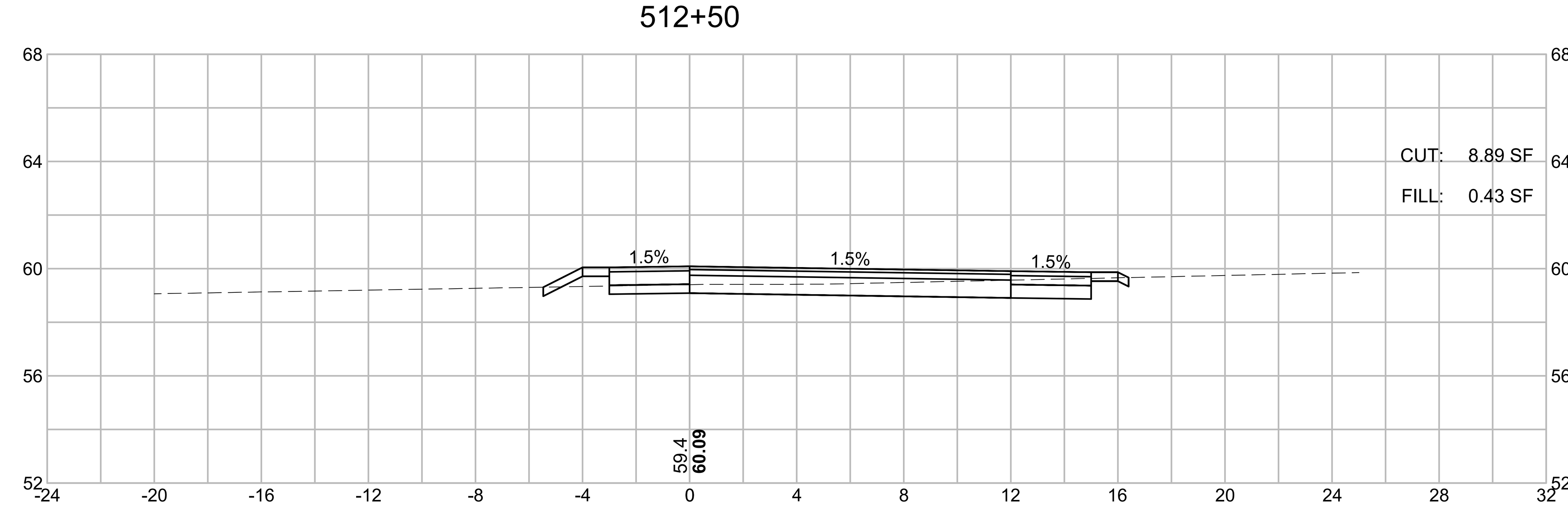


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

511+00



512+50

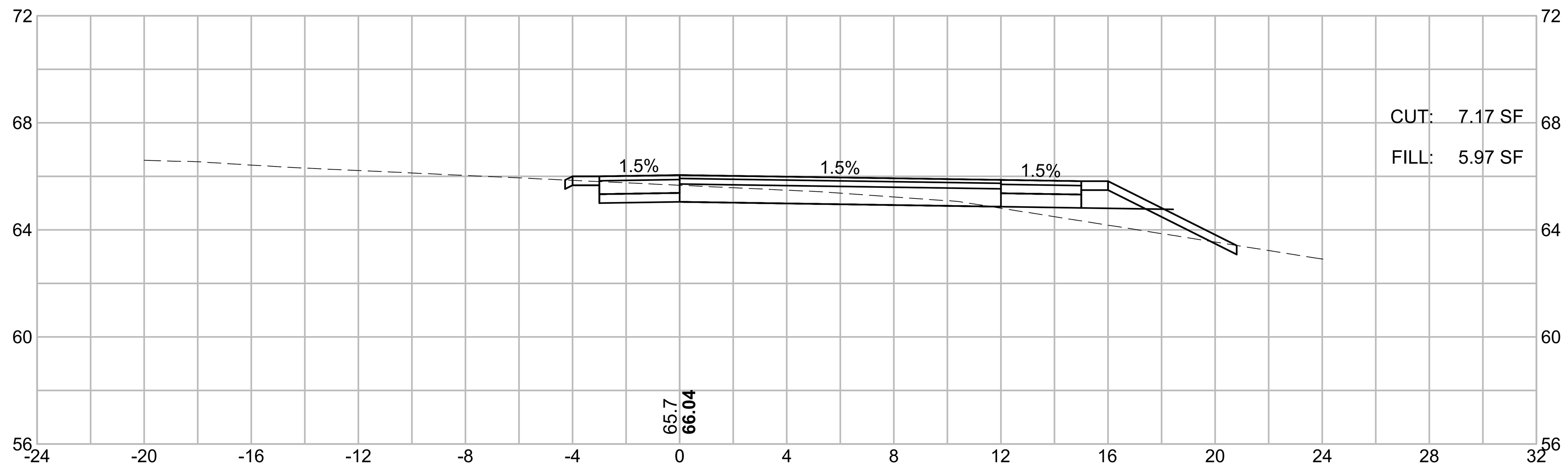


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

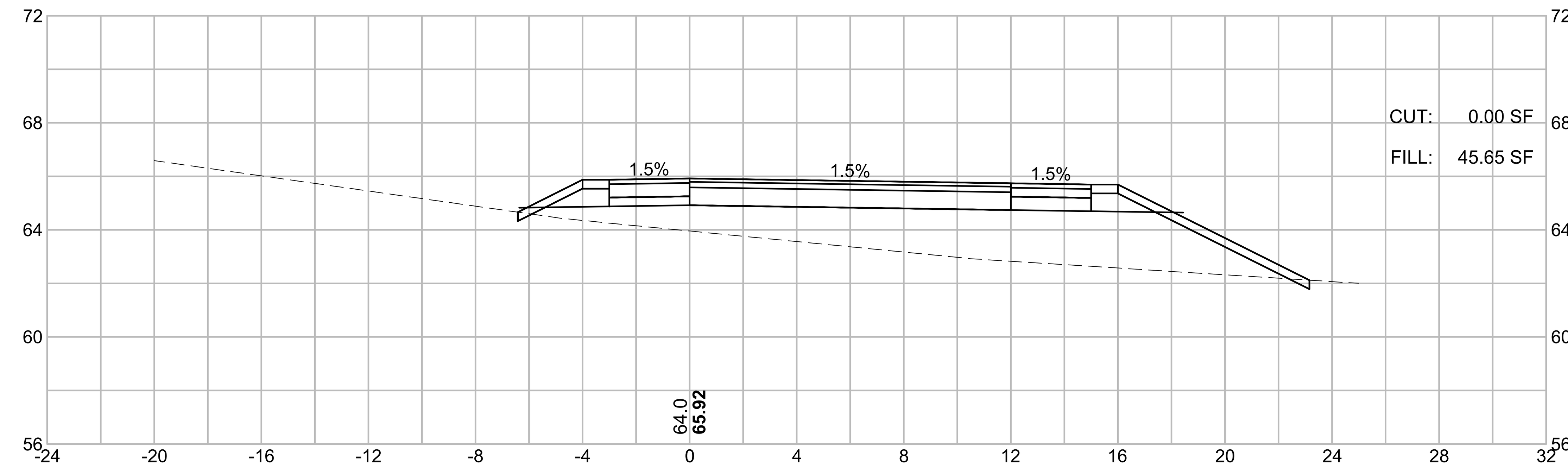
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	210	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

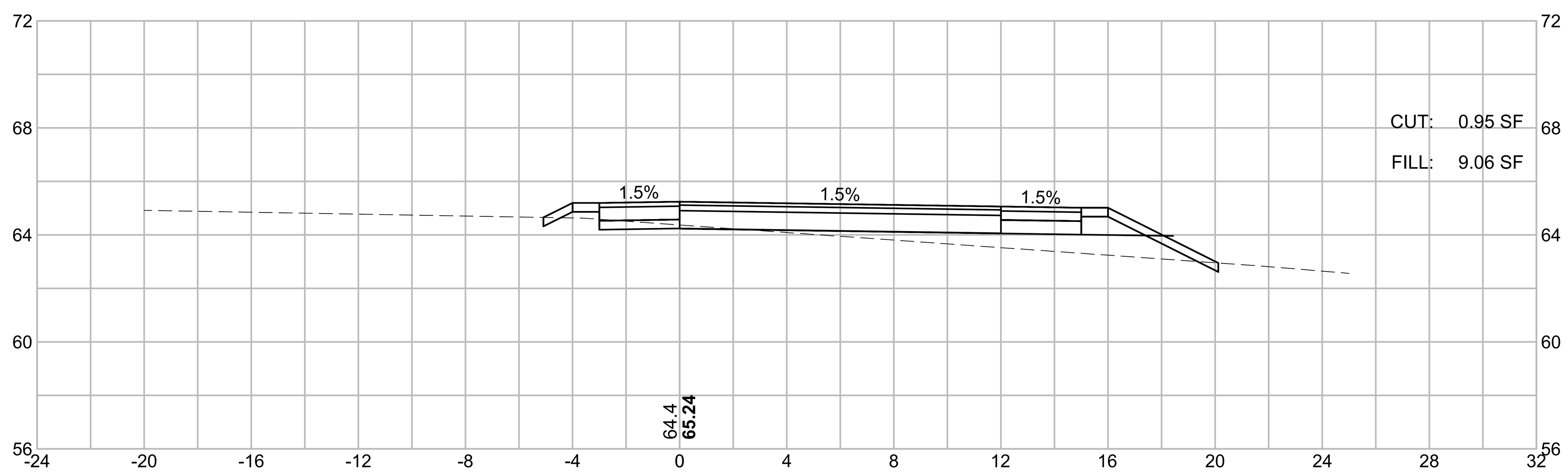
515+00



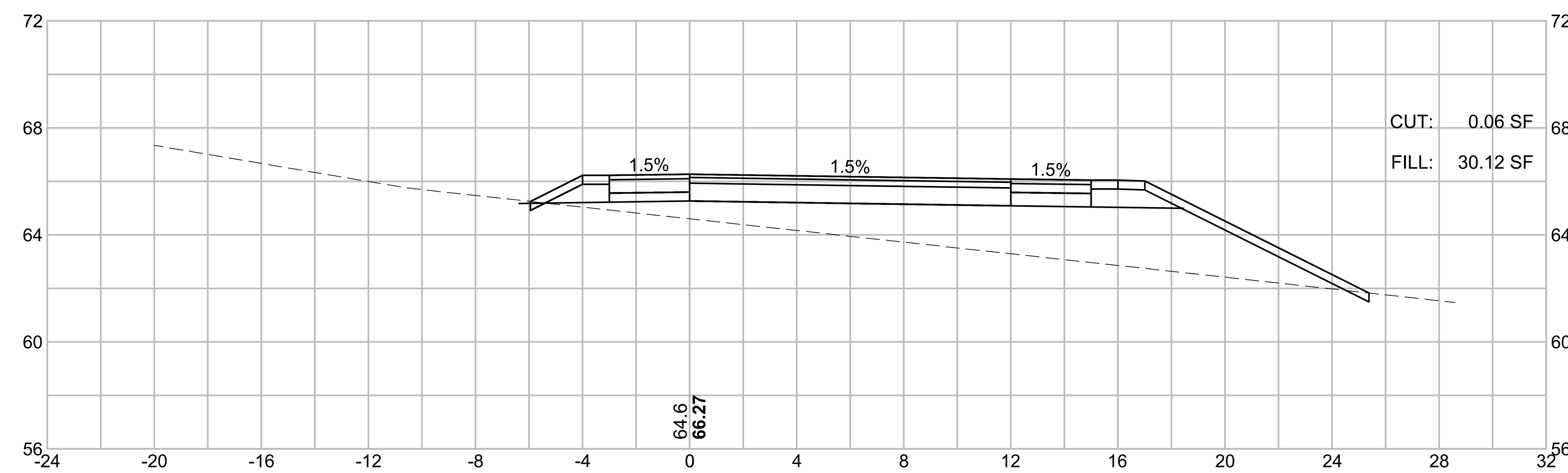
516+50

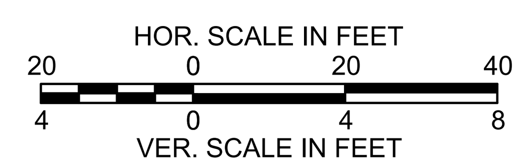


514+50

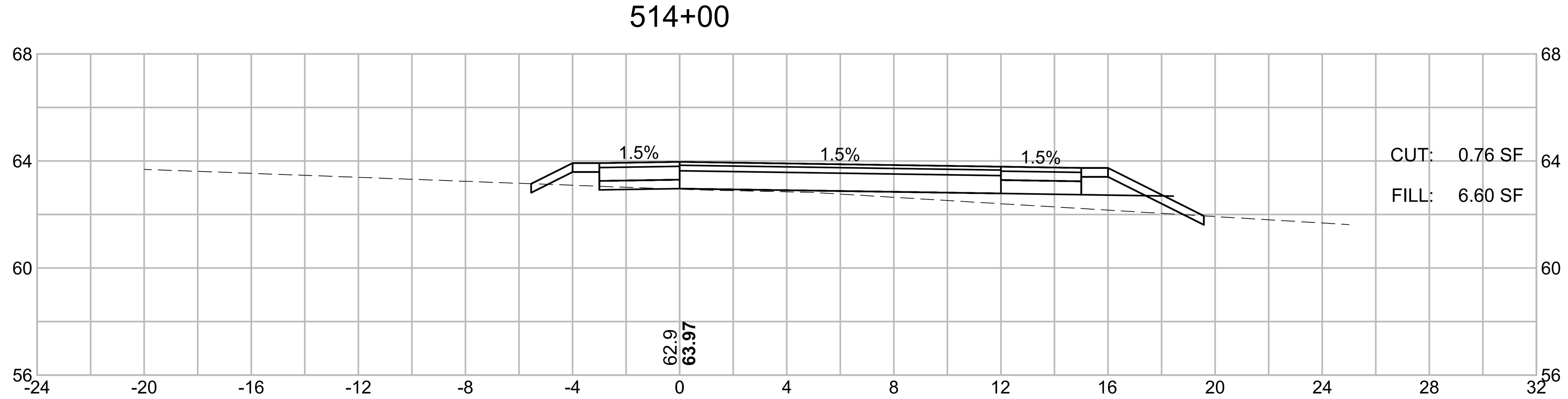


516+00

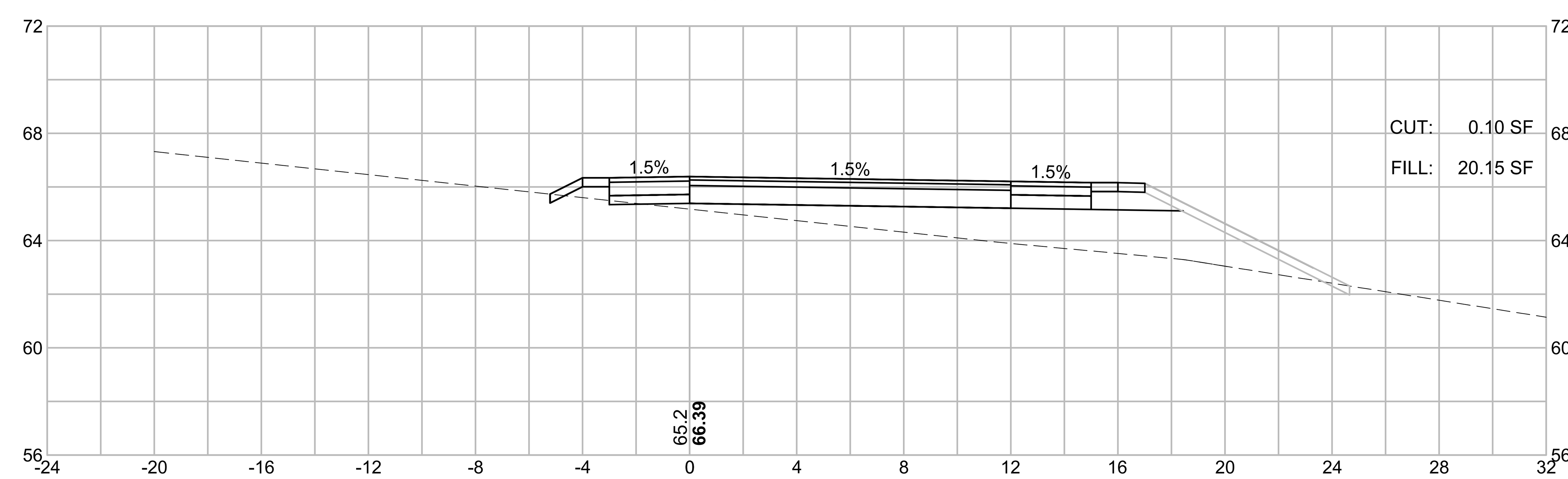




514+00



515+50



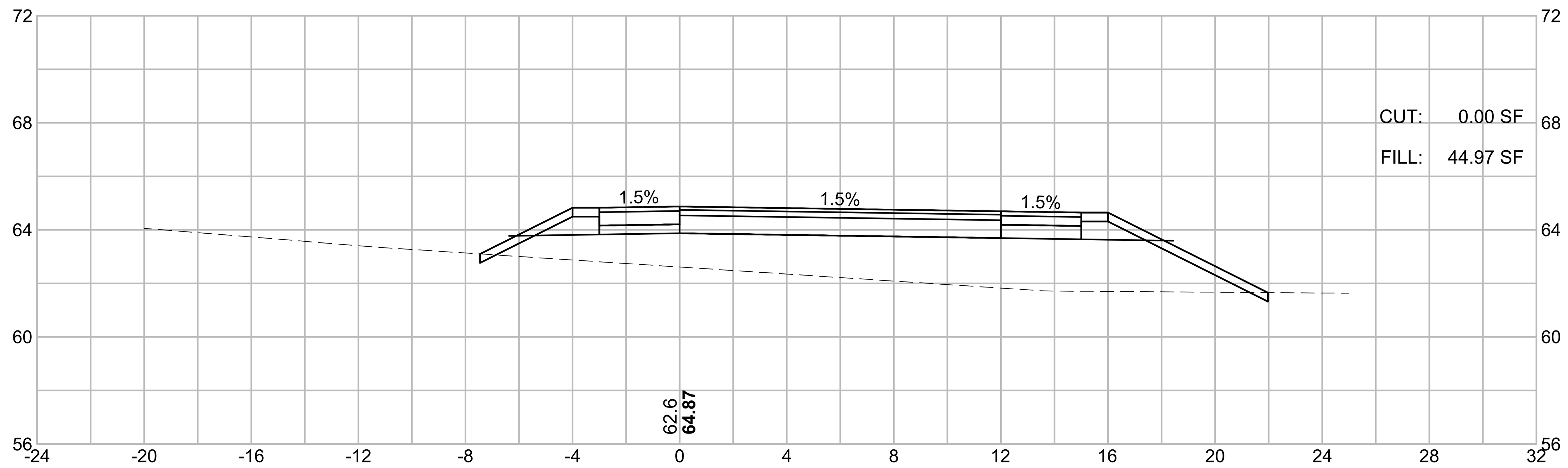
607398_HD(XSEC-EAST-1).DWG Plotted on 21-Oct-2021 8:46 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

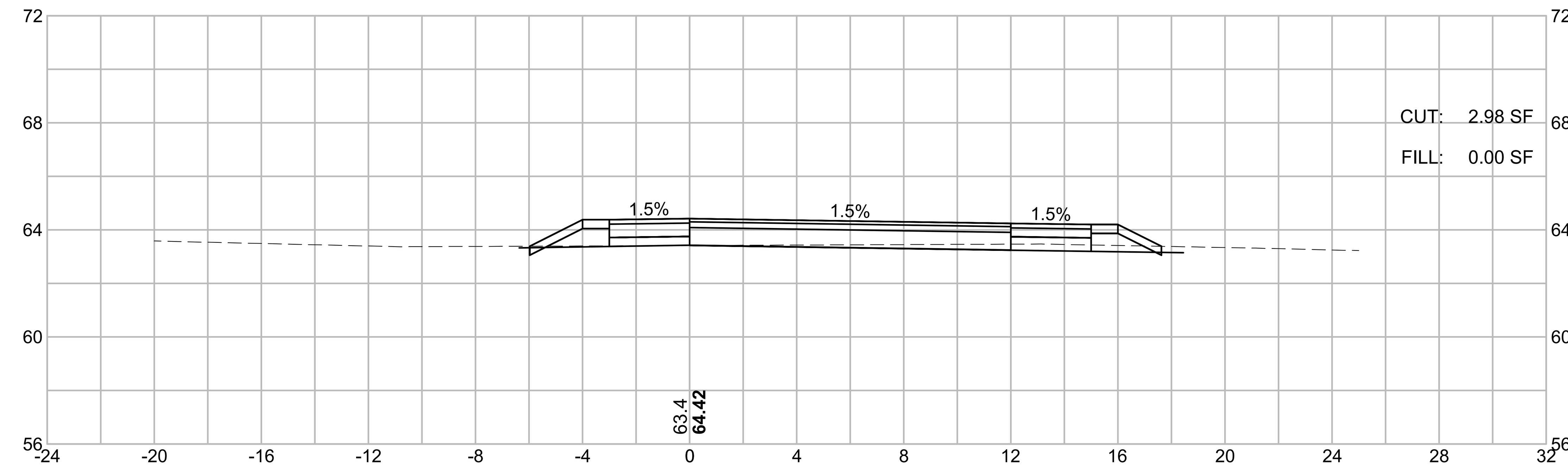
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	211	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

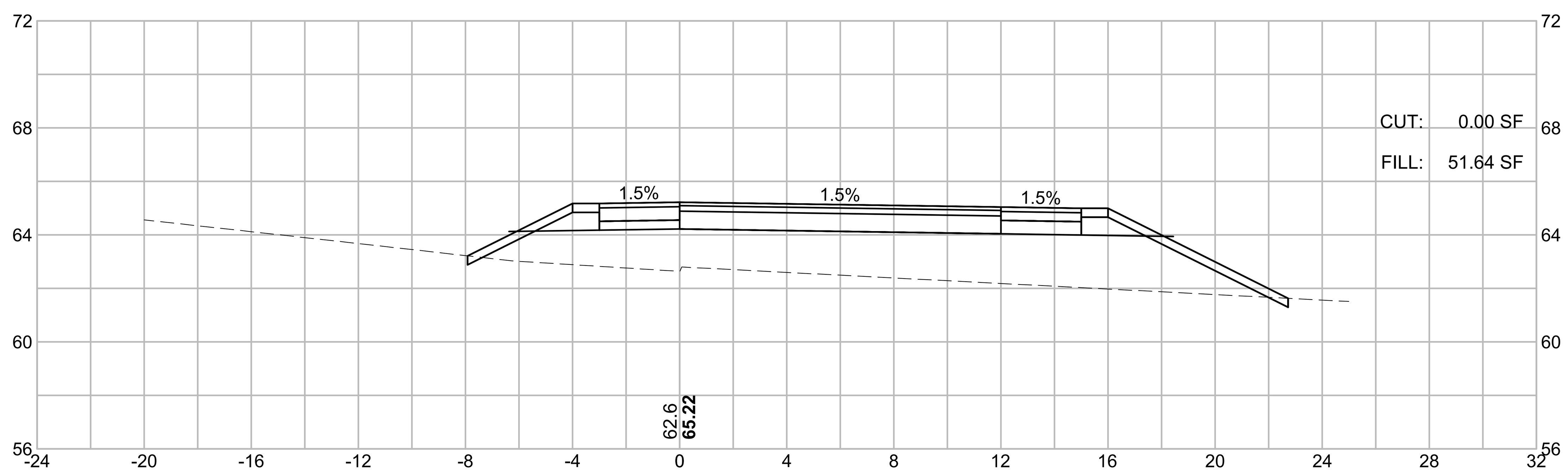
518+00



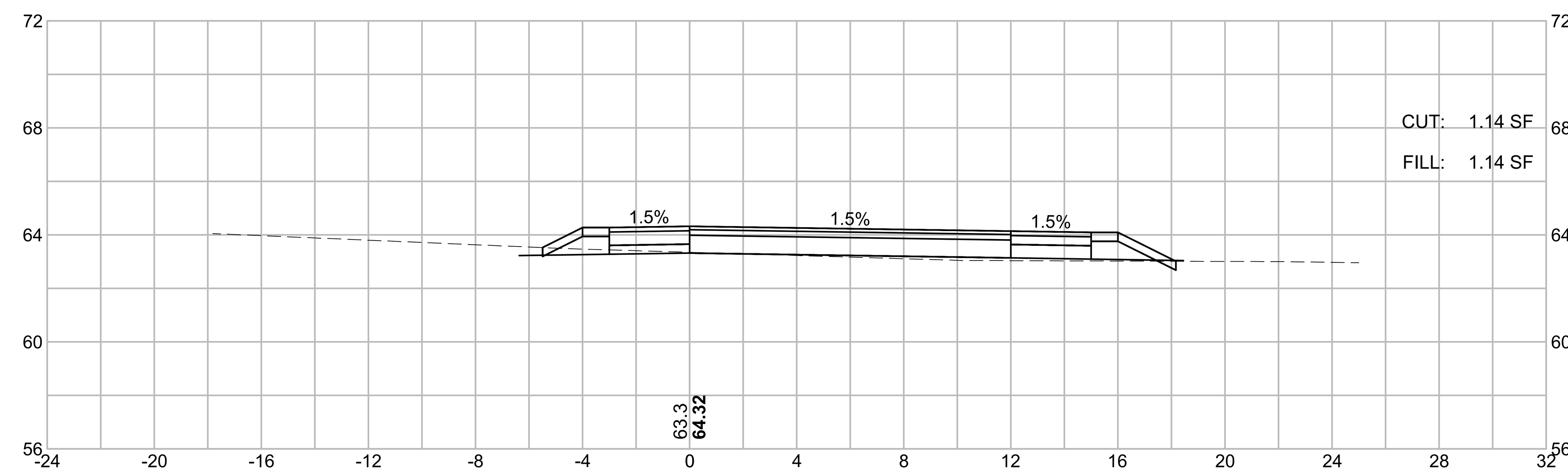
519+50



517+50

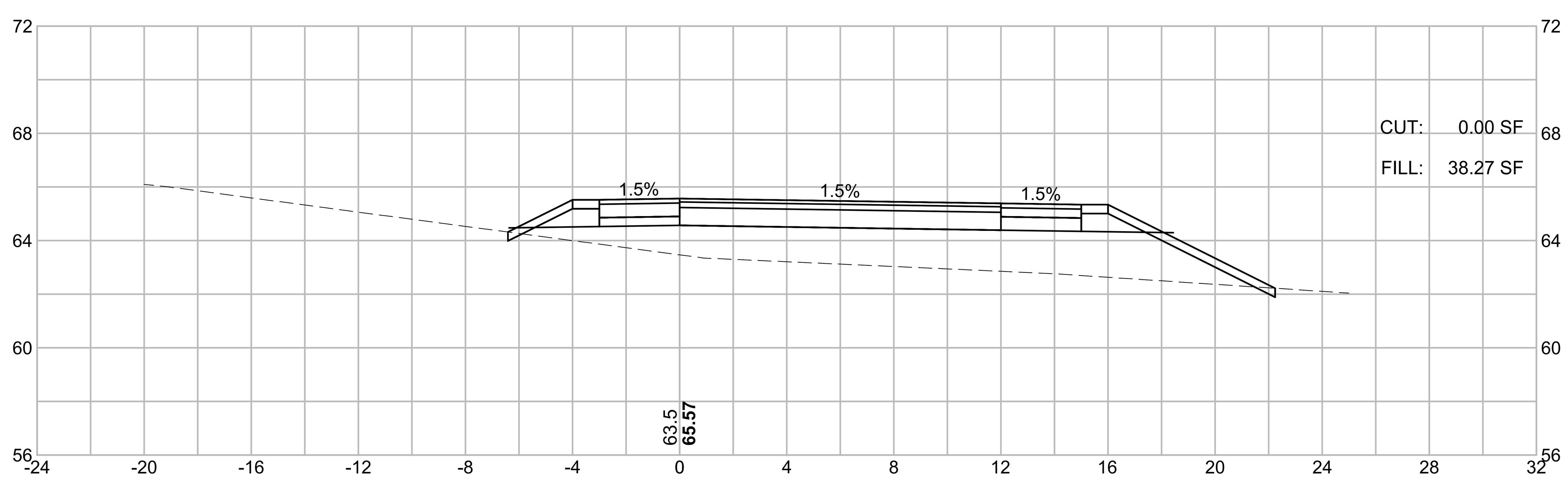


519+00

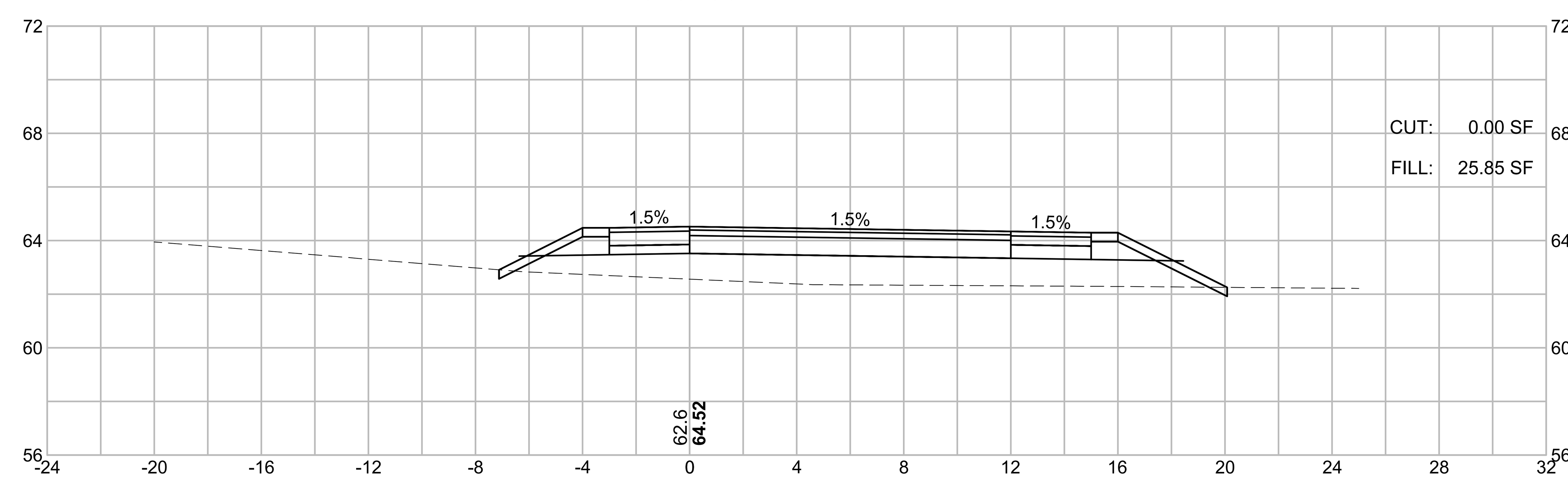


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

517+00



518+50



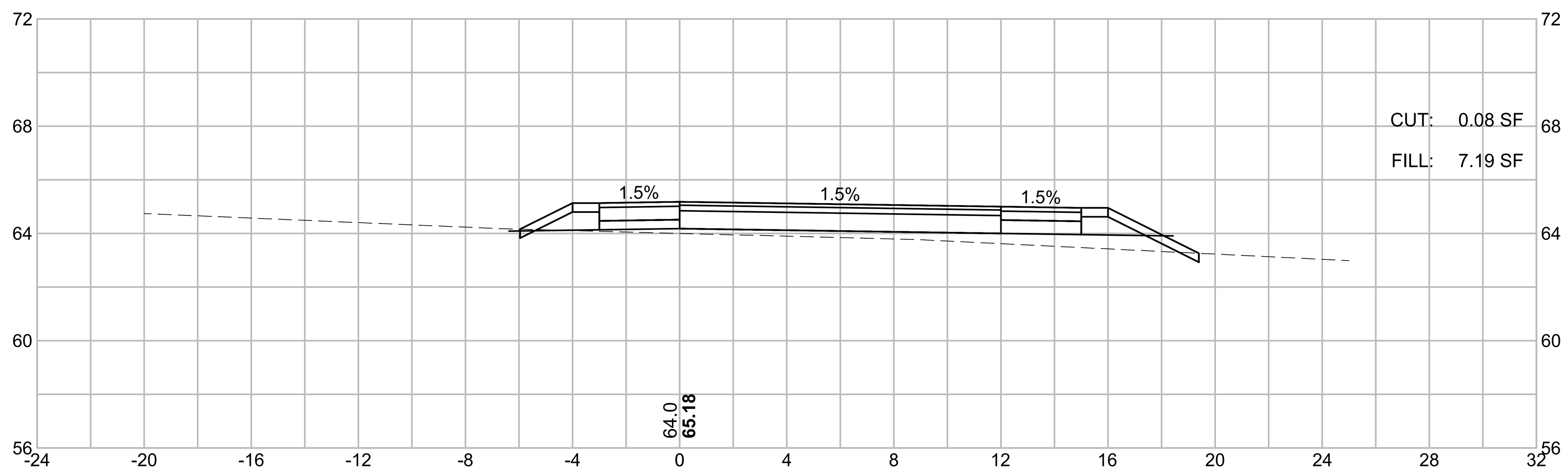
Plotted on 21-Oct-2021 8:46 AM
607398_HD(XSEC-EAST-1).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

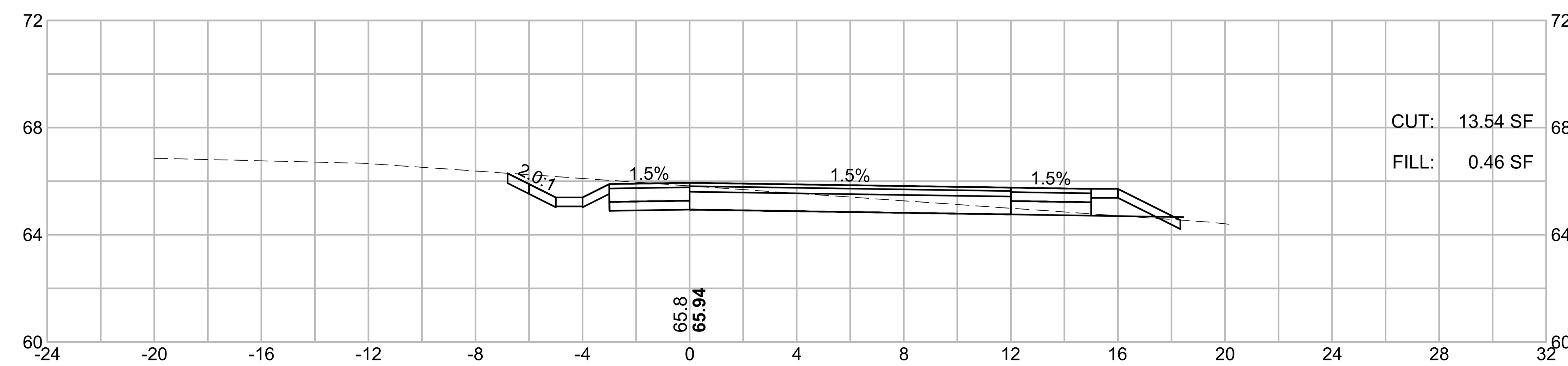
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	212	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

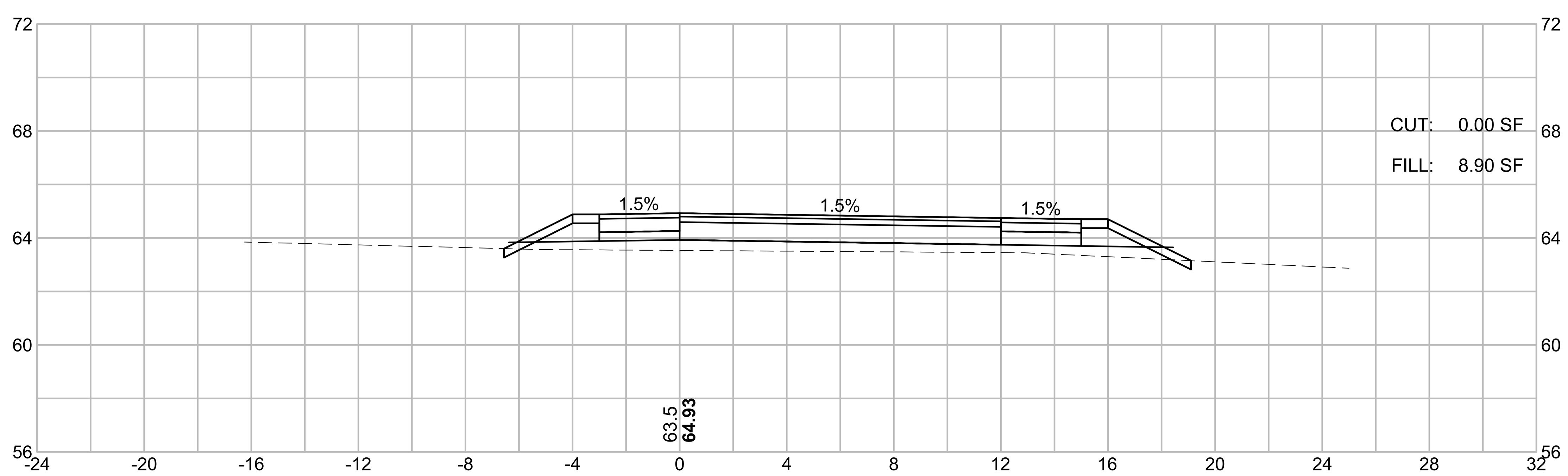
521+00



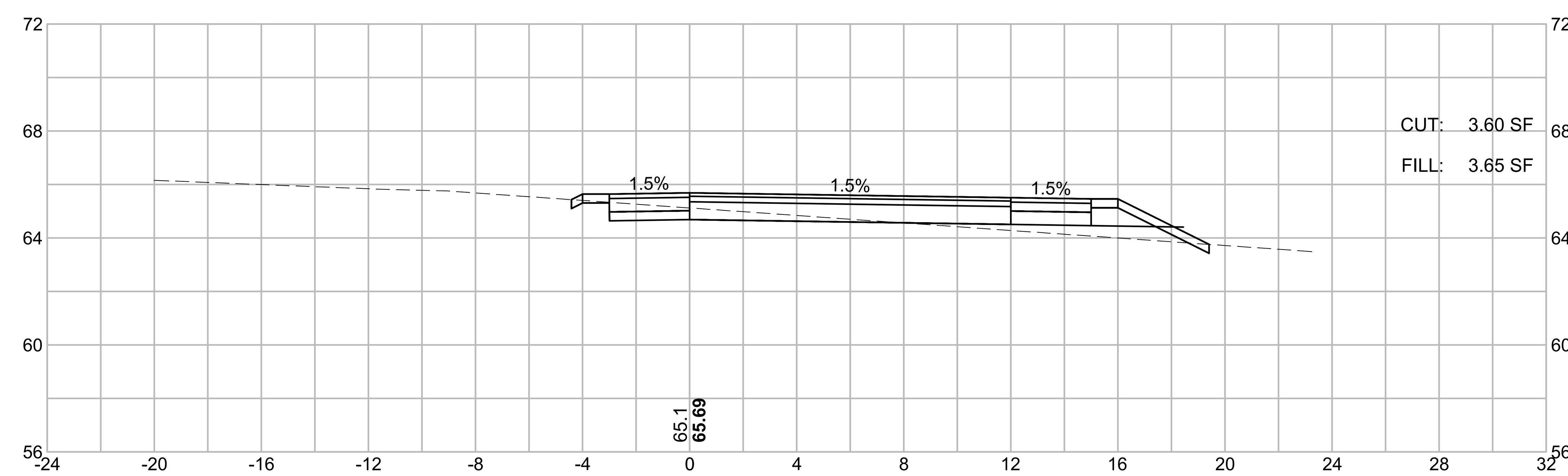
522+50

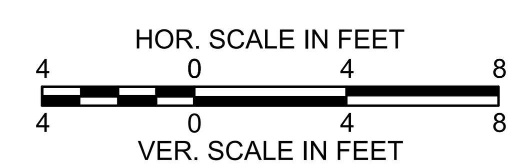


520+50

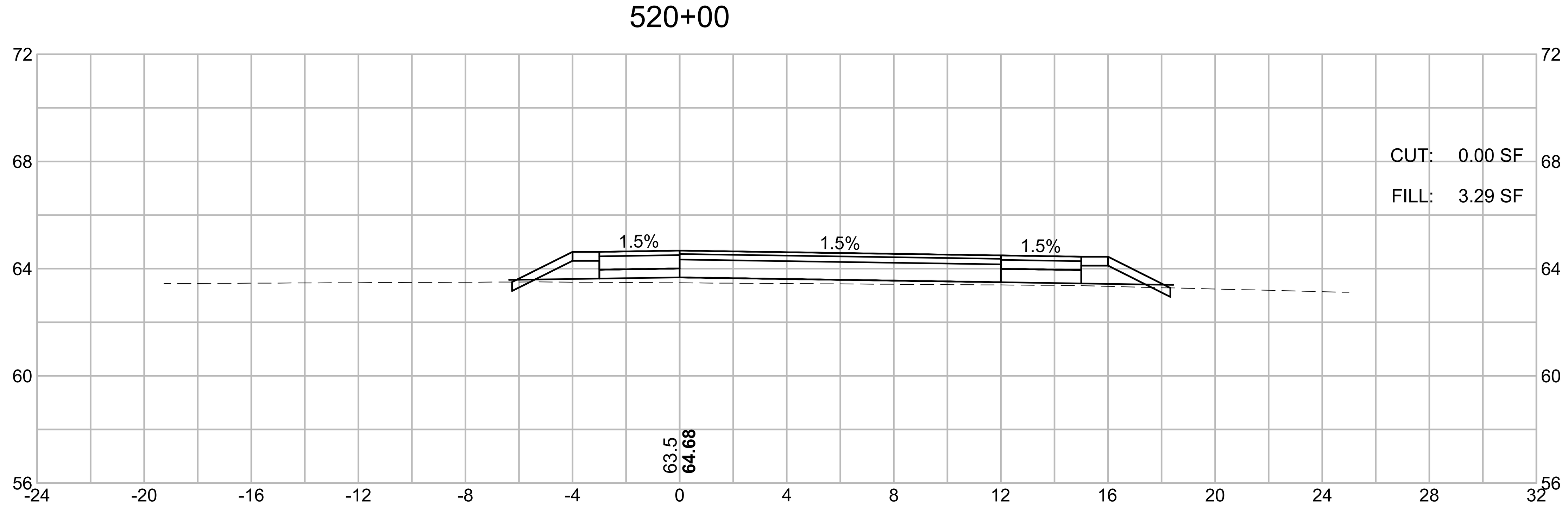


522+00

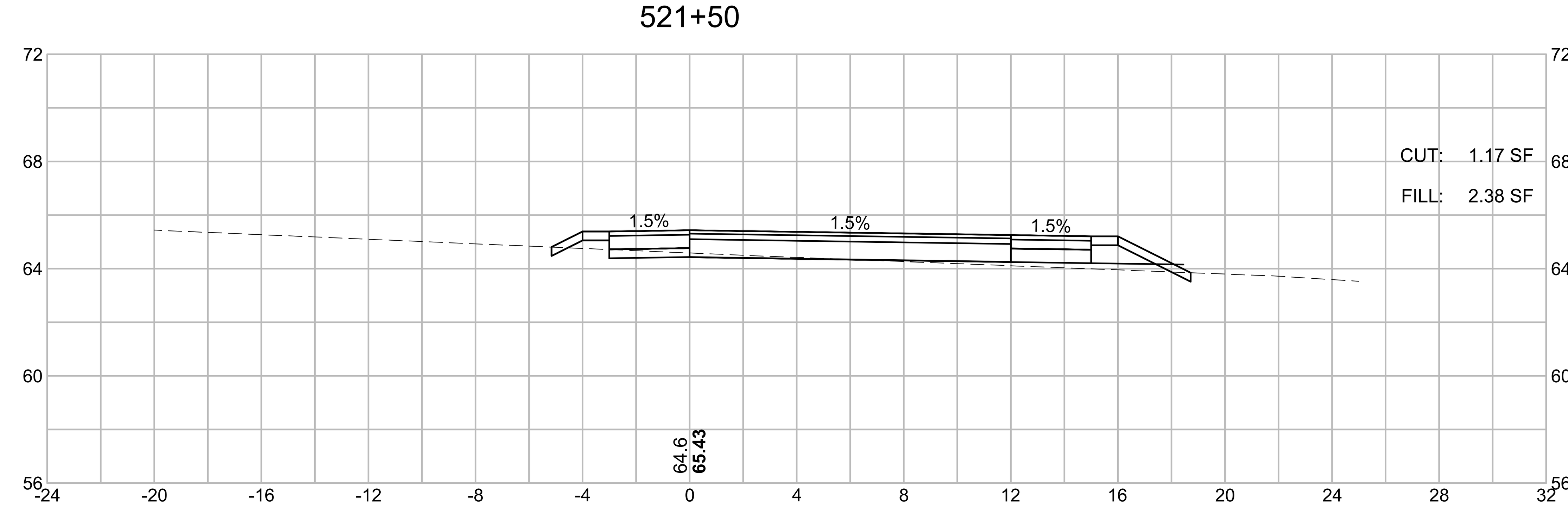




520+00



521+50



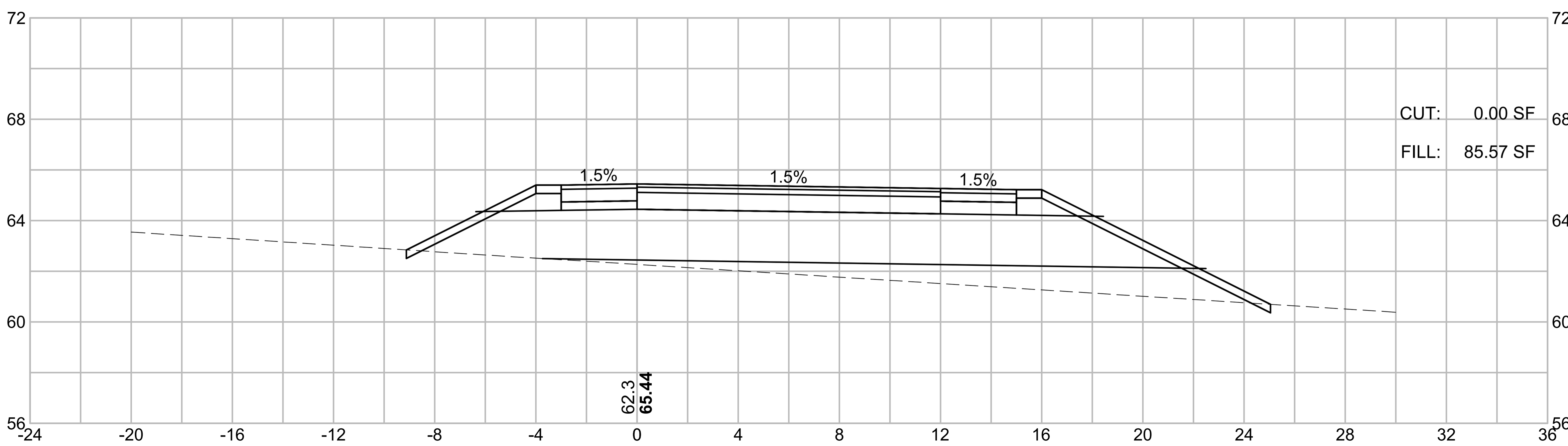
Plotted on 21-Oct-2021 8:46 AM
607398_HD(XSEC-EAST-1).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

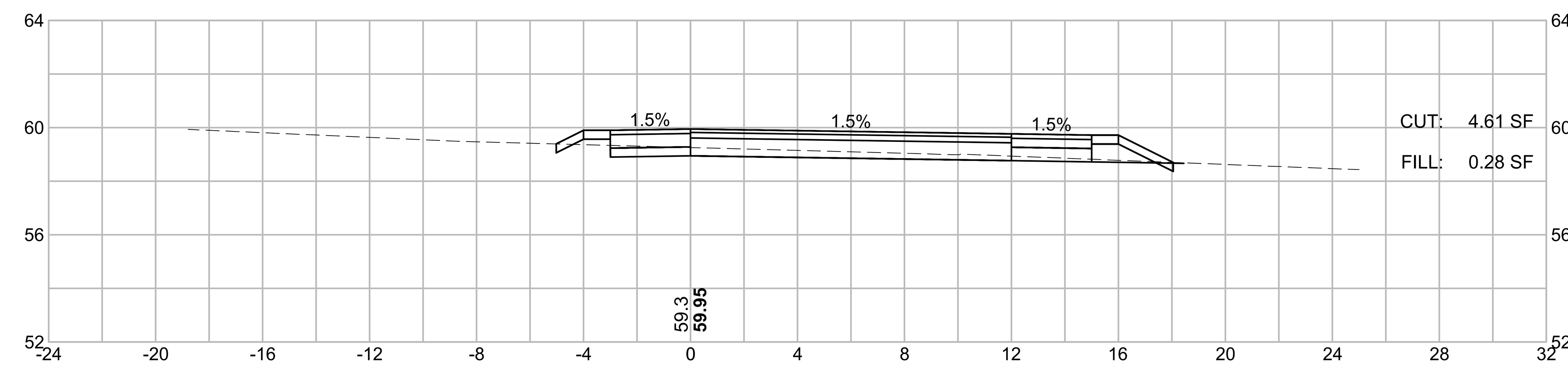
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	213	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

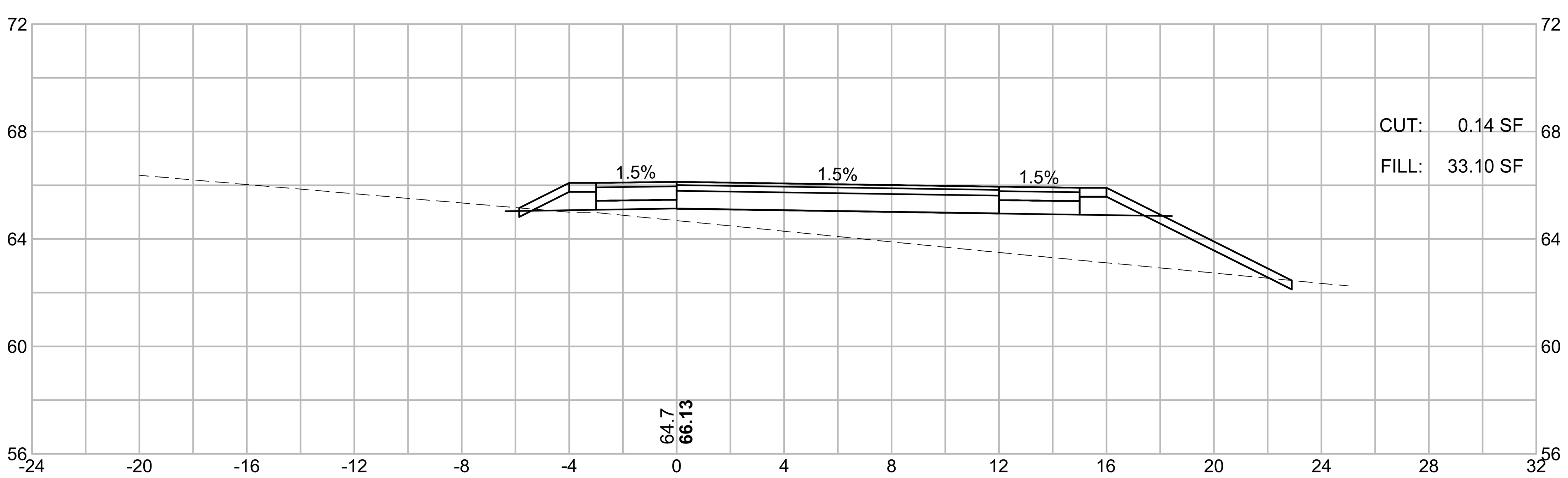
524+00



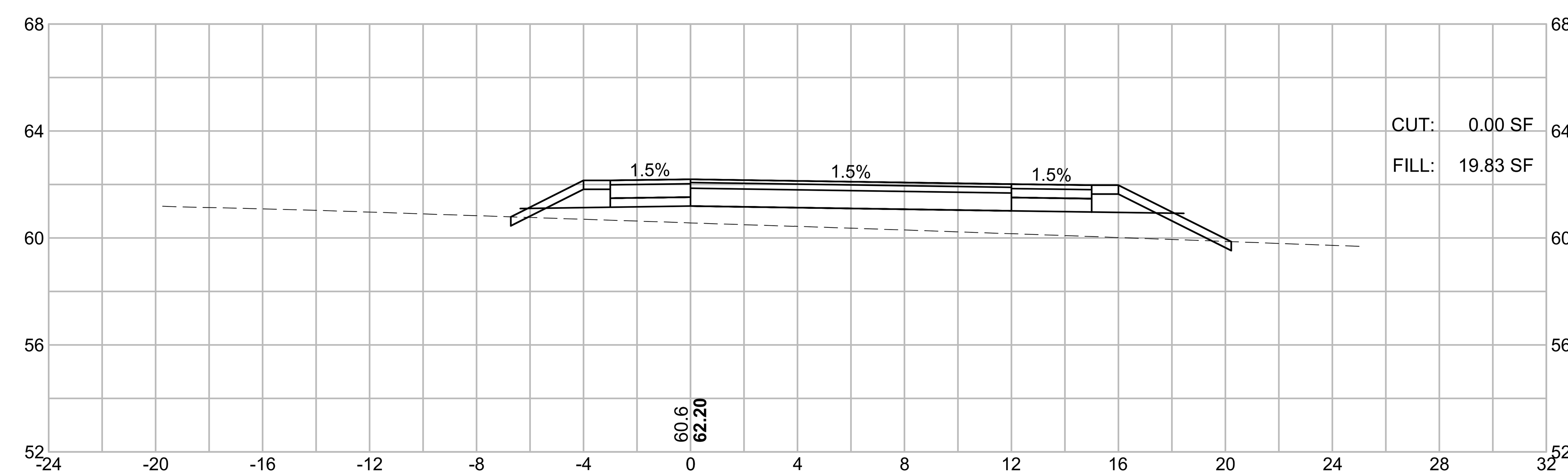
525+50



523+50

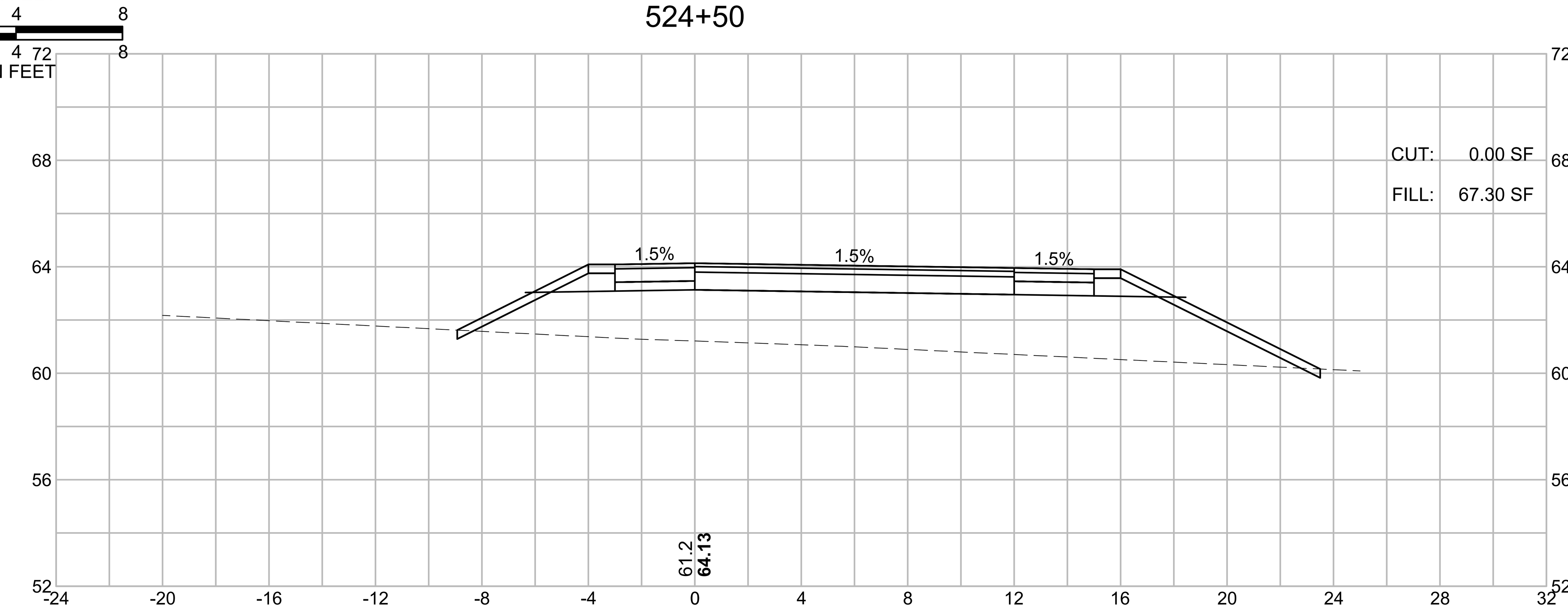


525+00

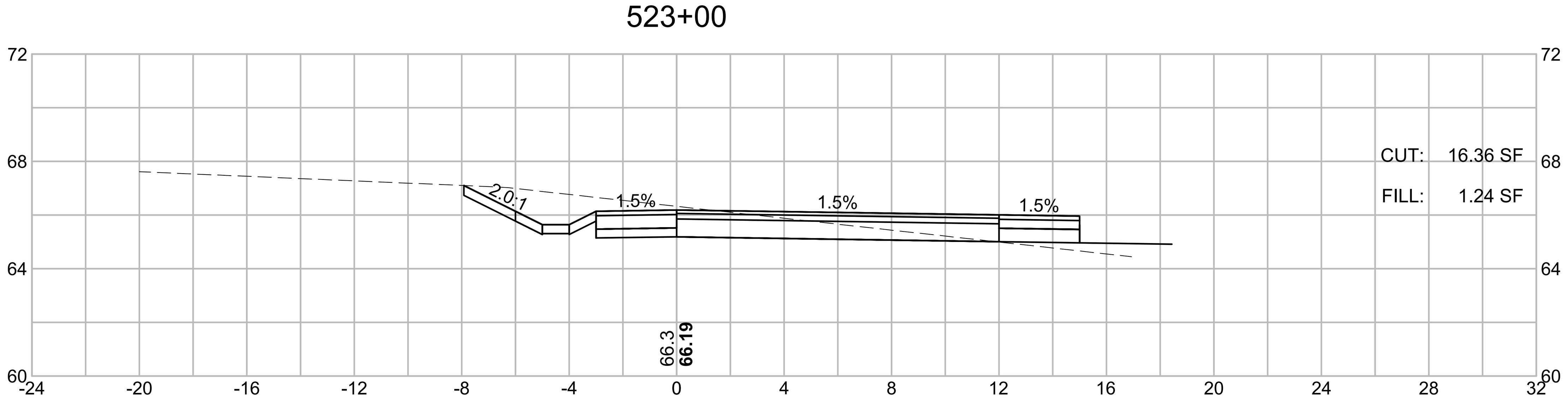


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

524+50

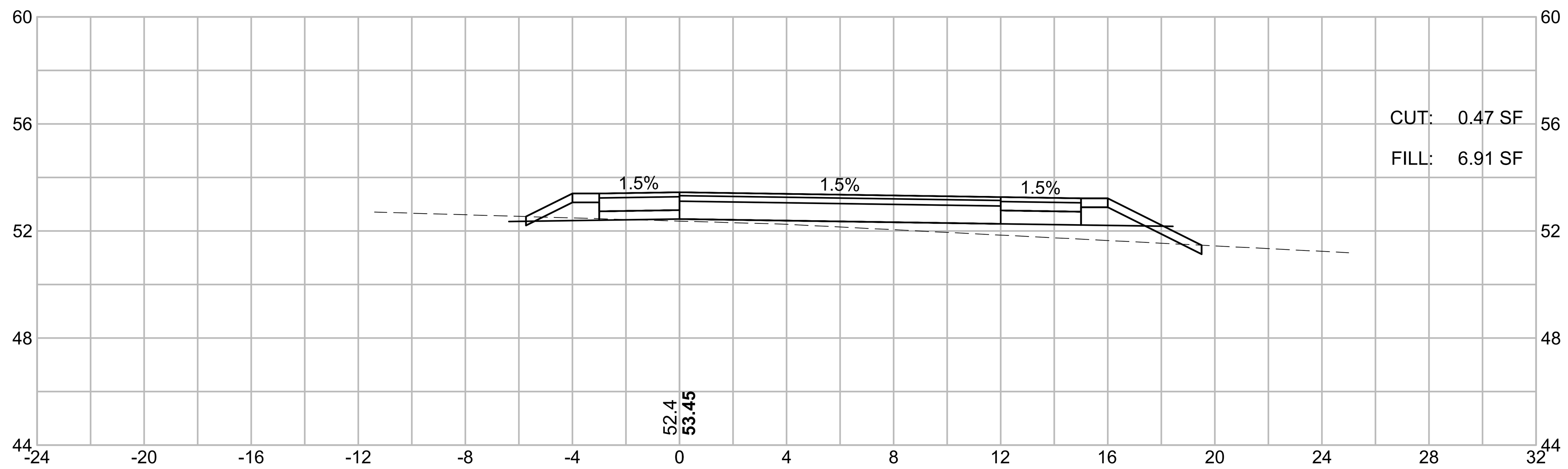


523+00



Plotted on 21-Oct-2021 8:46 AM
607398_HD(XSEC-EAST-1).DWG

527+00



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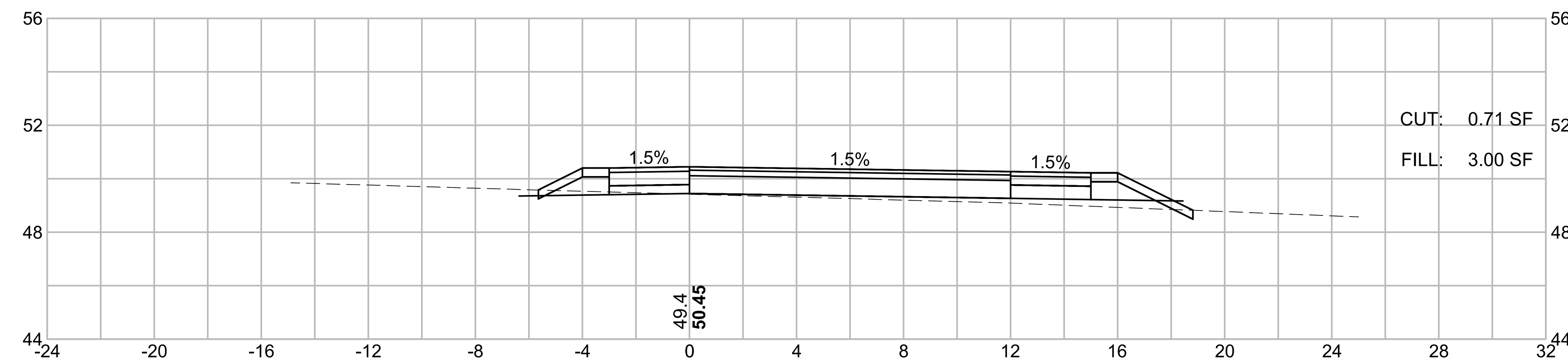
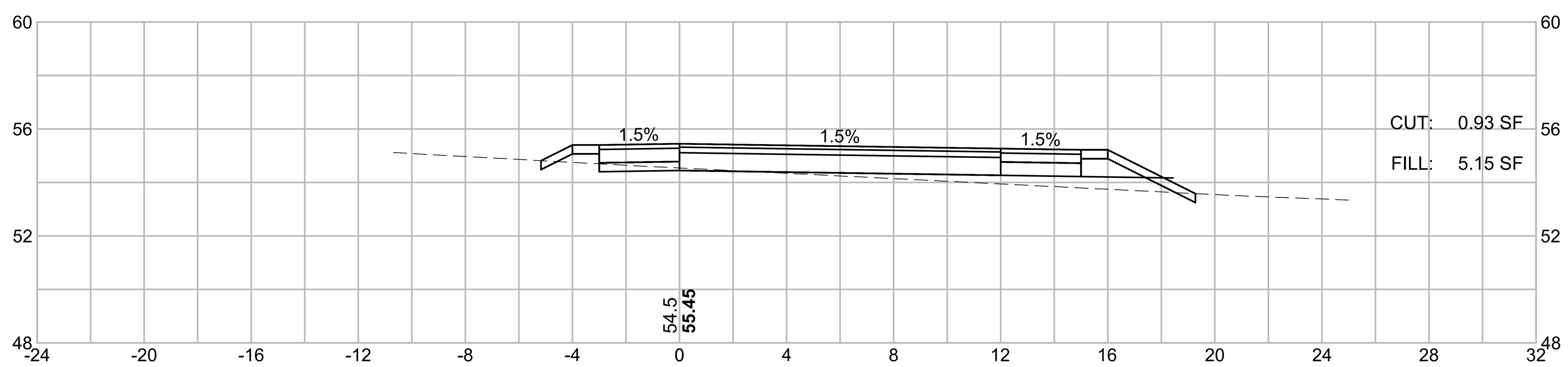
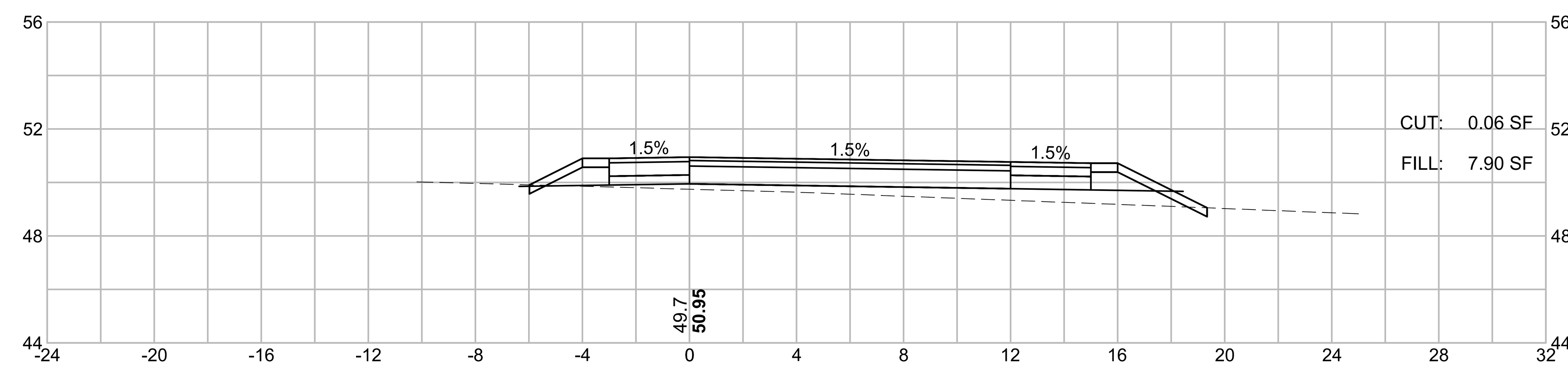


526+50

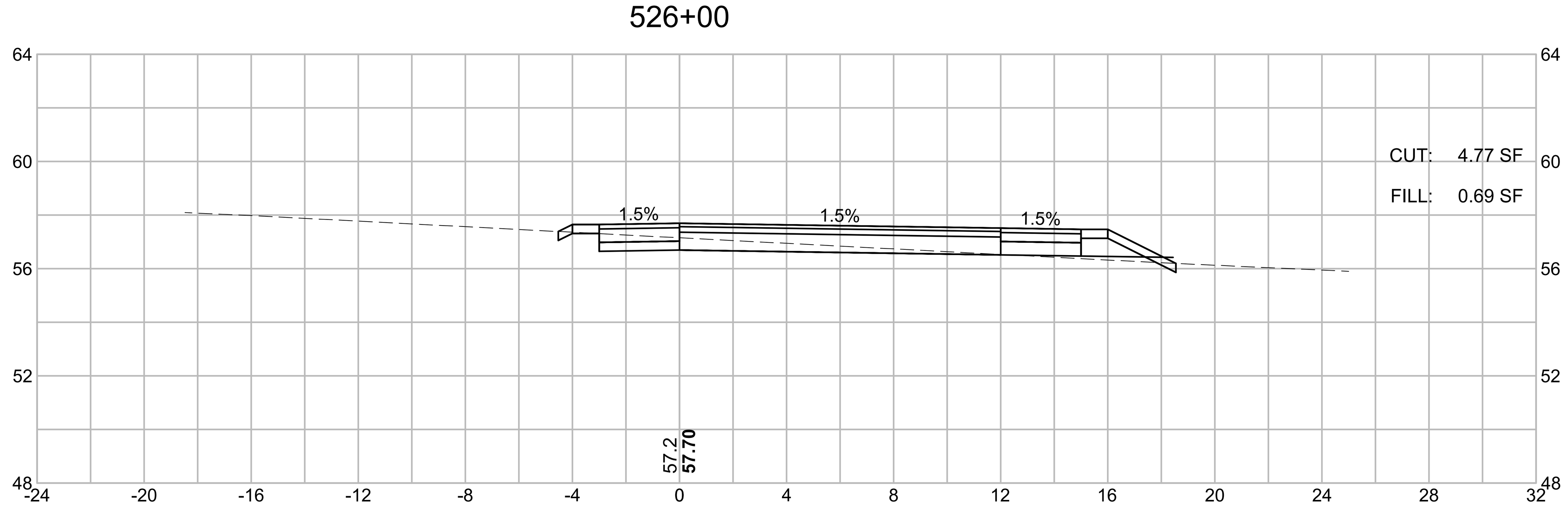


528+00

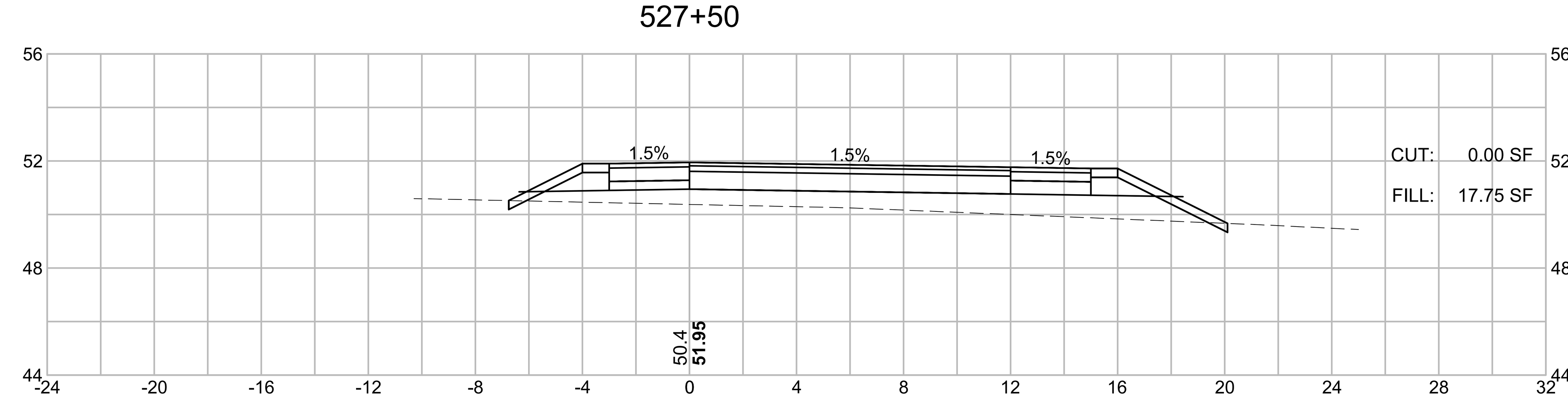


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

526+00



527+50

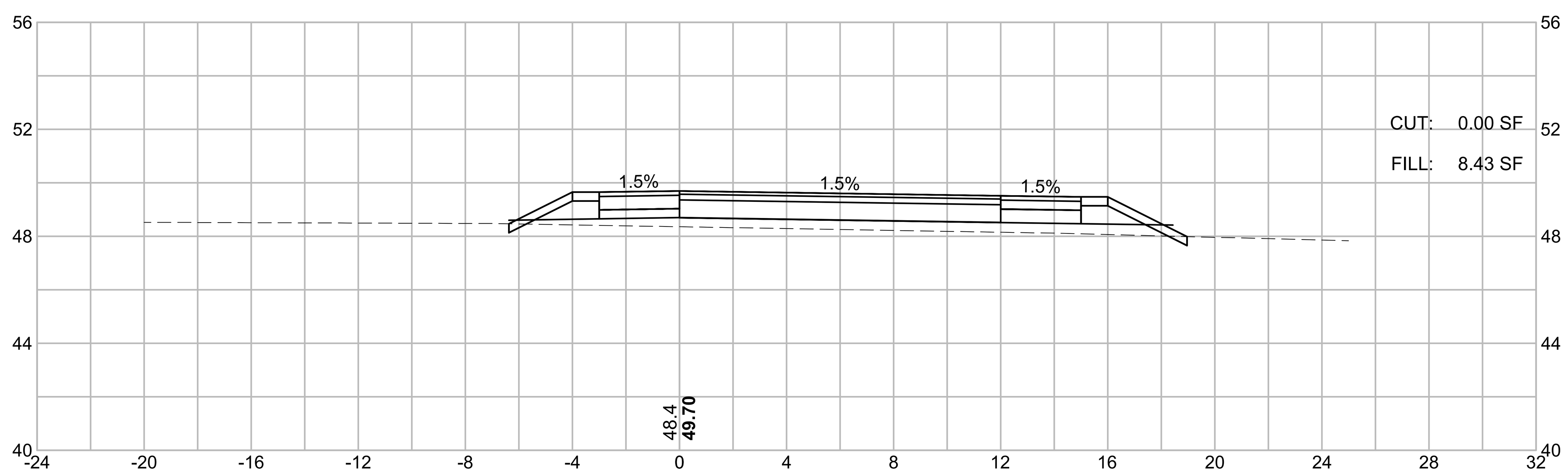


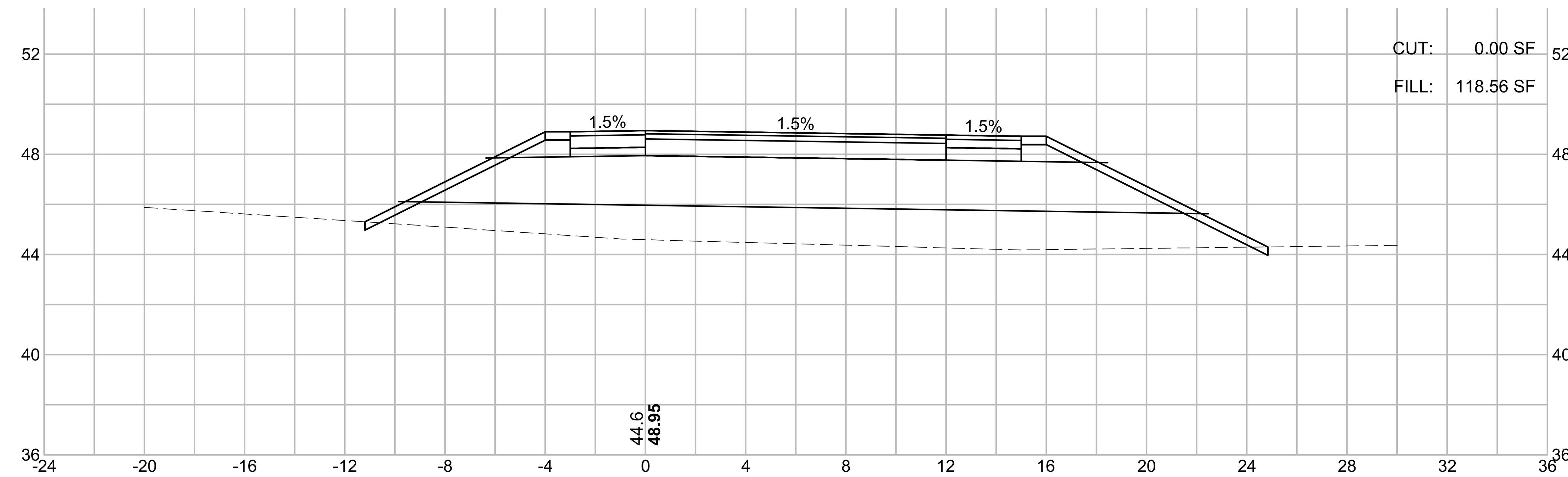
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	215	267
PROJECT FILE NO. 607398			

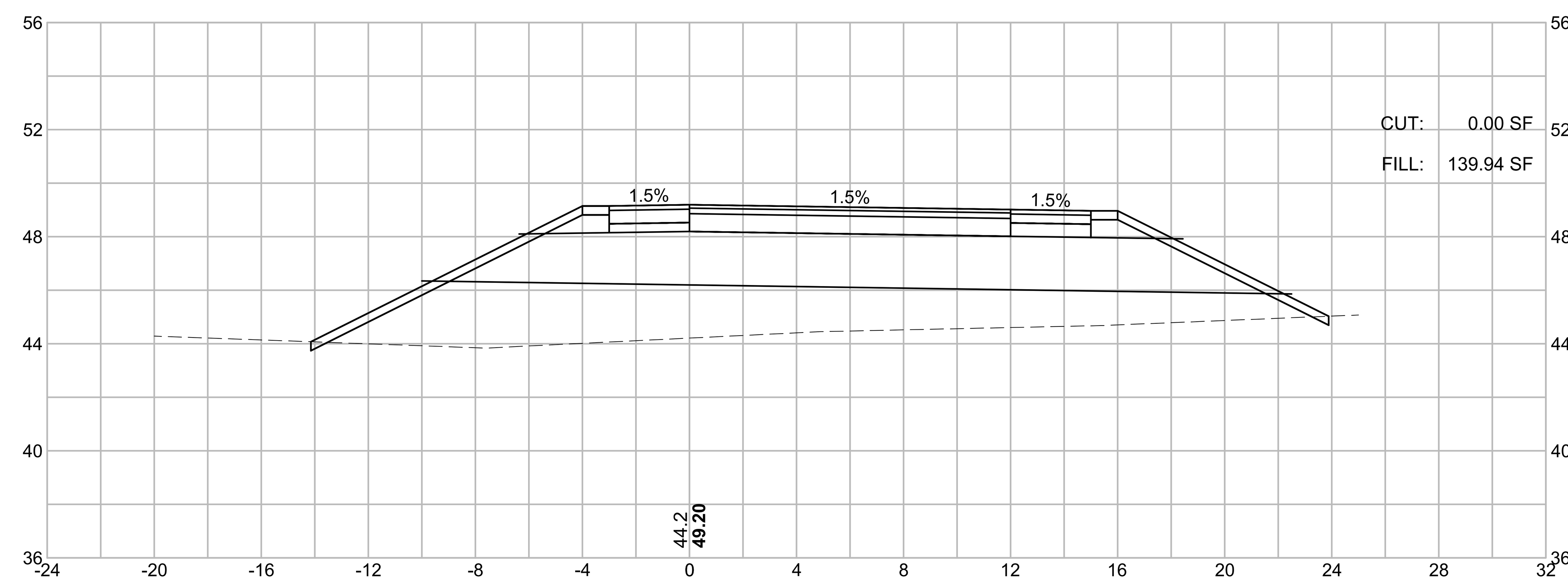
EAST CROSS SECTIONS

530+00

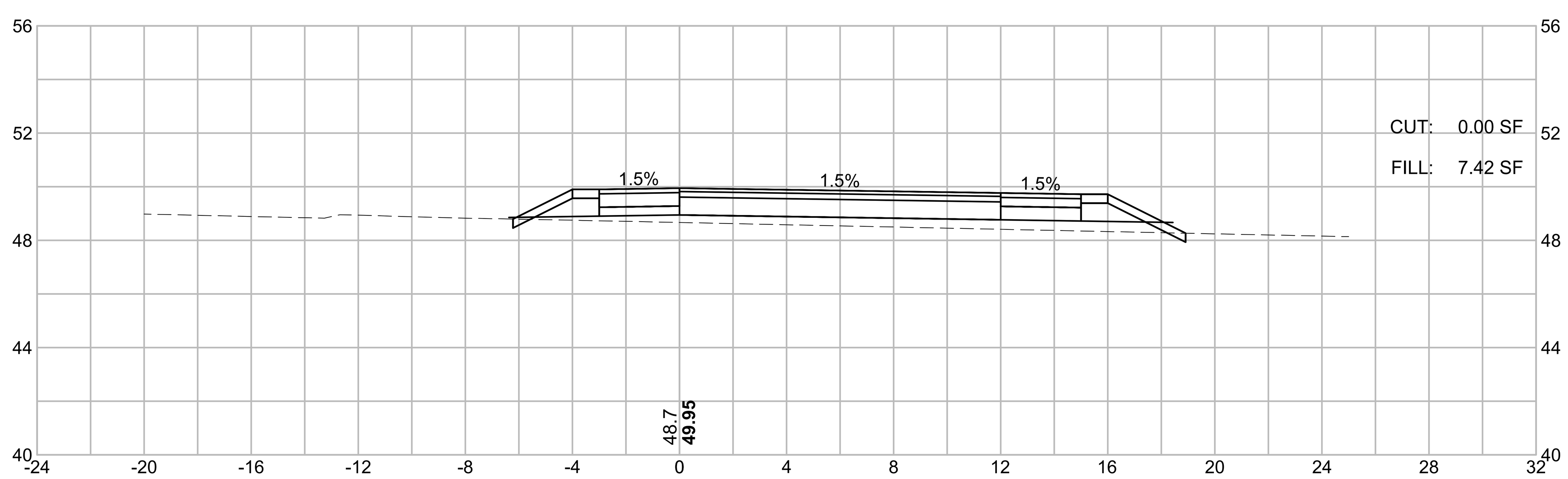




531+00

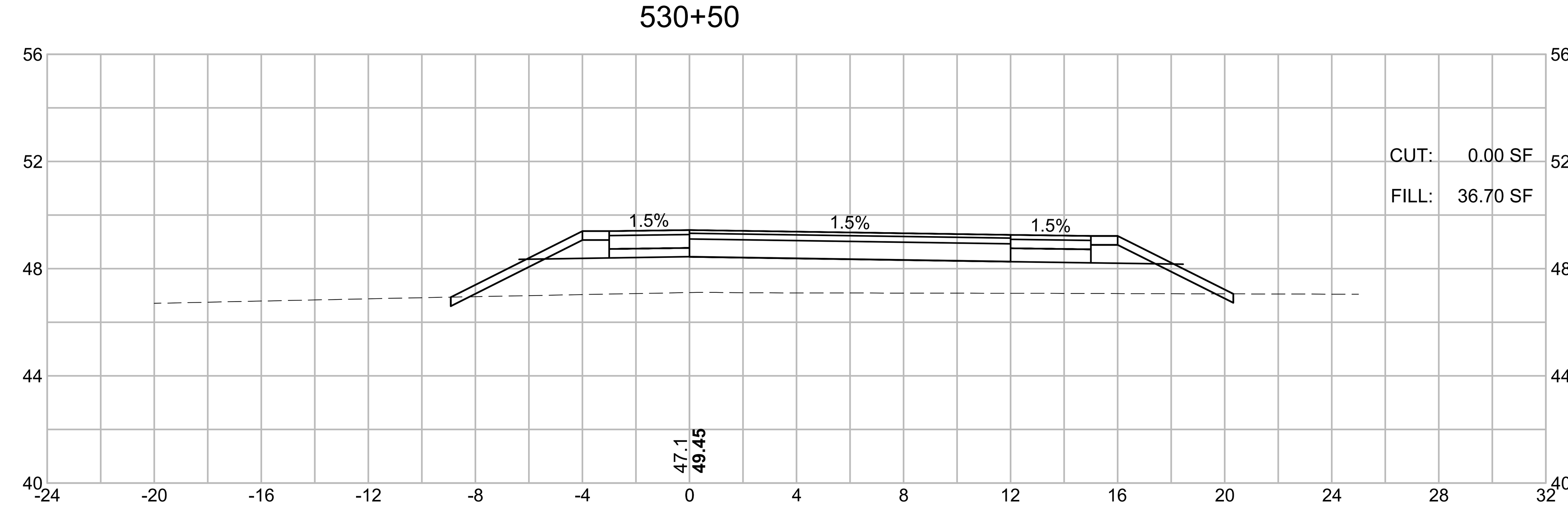


529+50

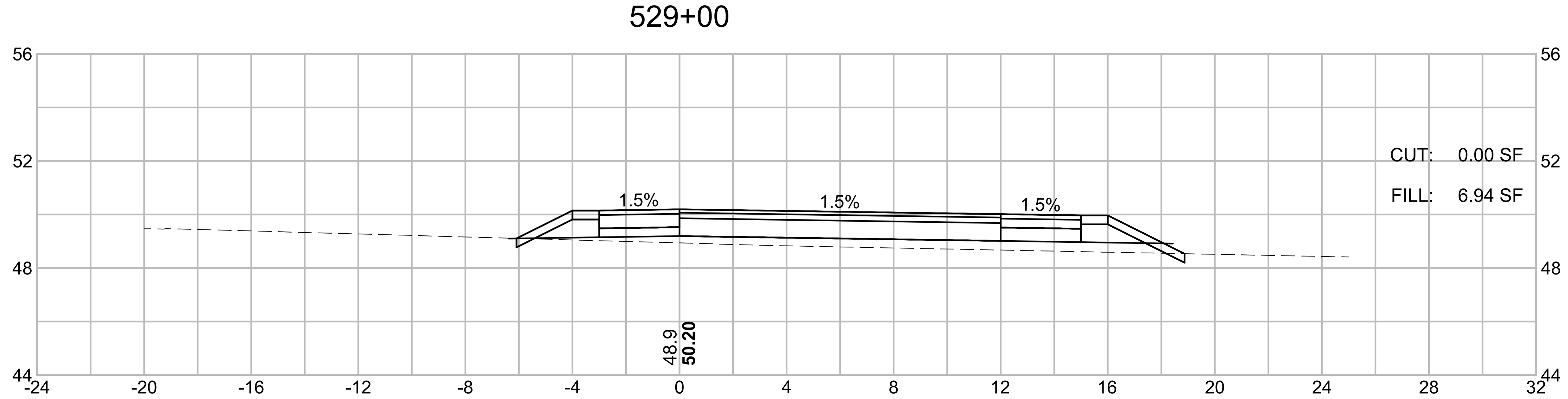


HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

530+50



529+00



Plotted on 21-Oct-2021 8:46 AM

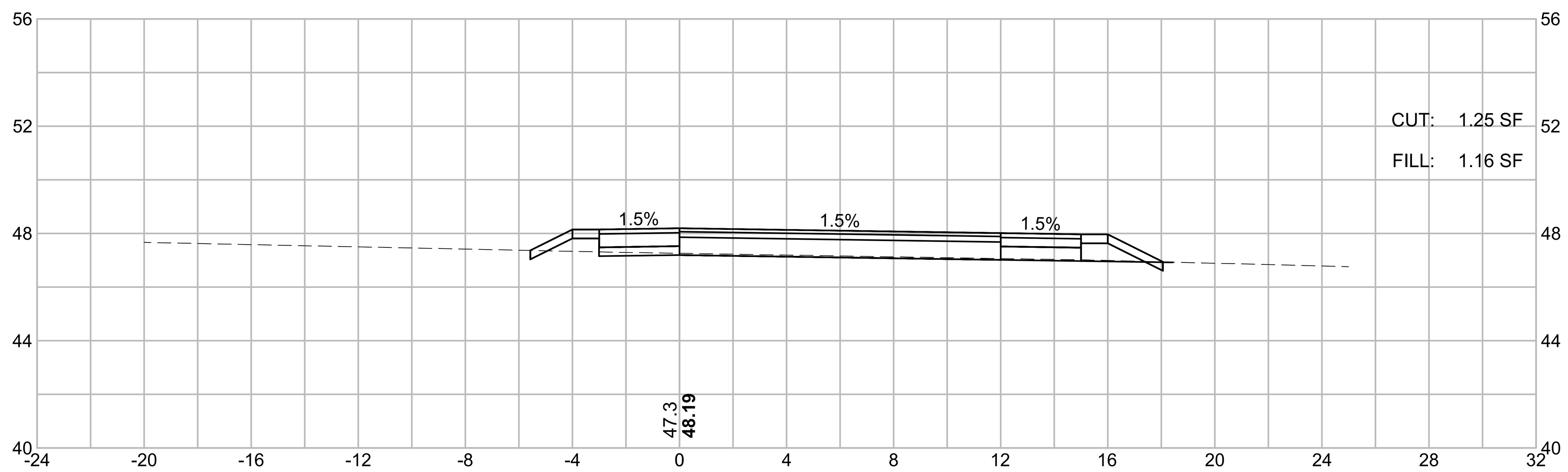
607398_HD(XSEC-EAST-1).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	216	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

533+00



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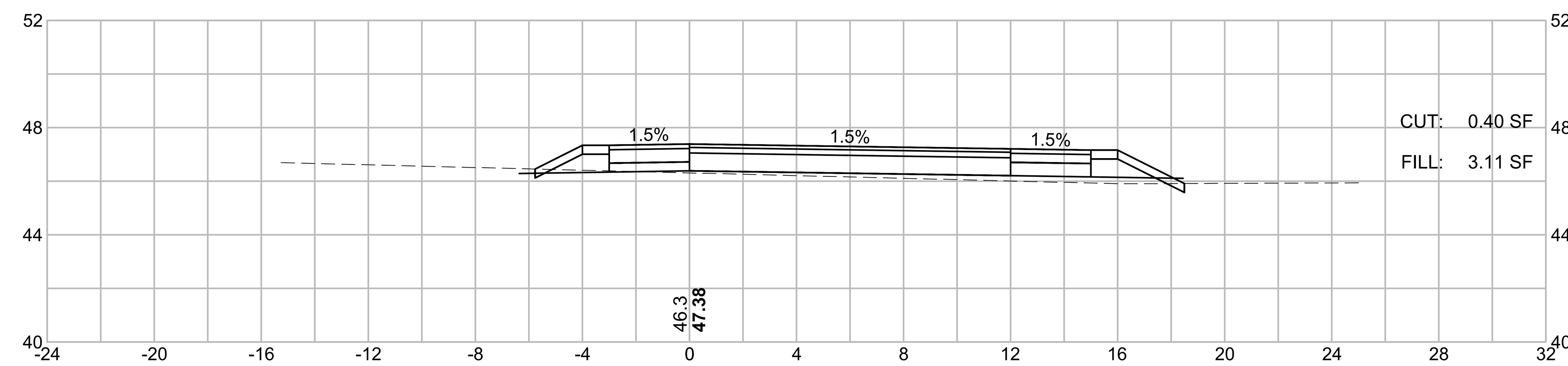
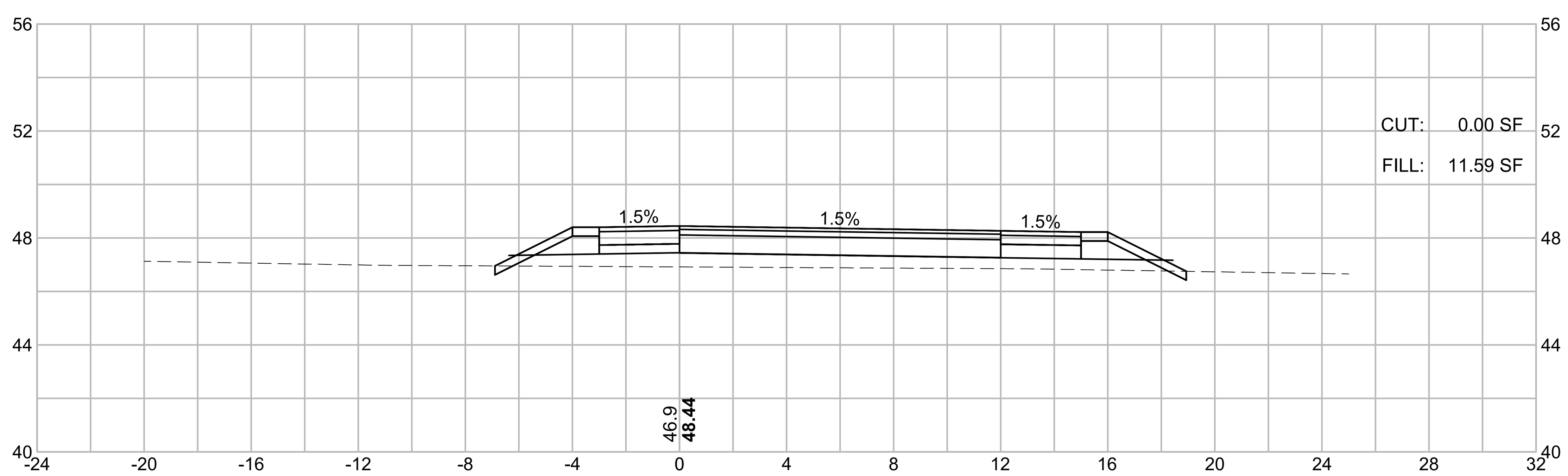
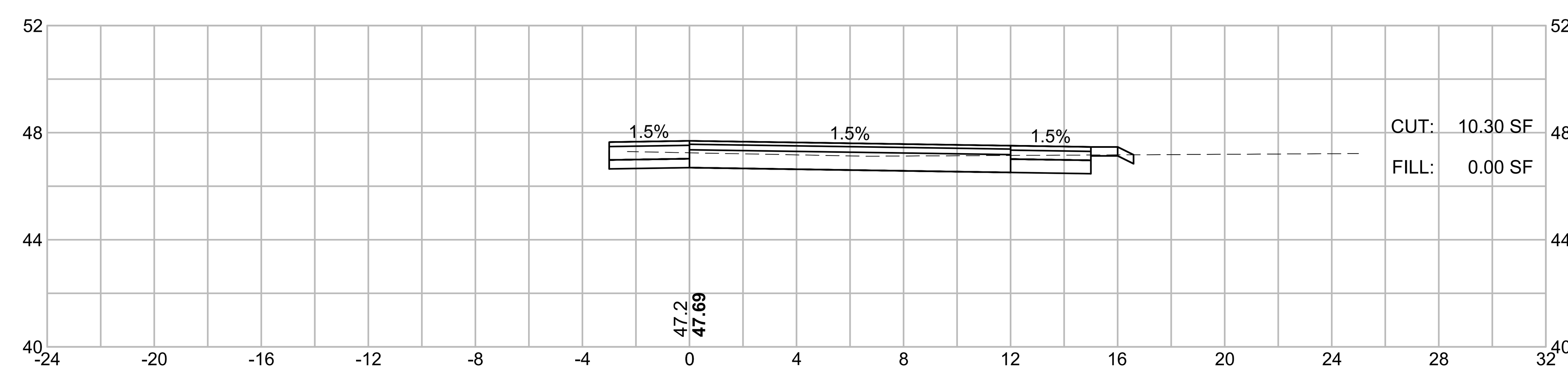


532+50

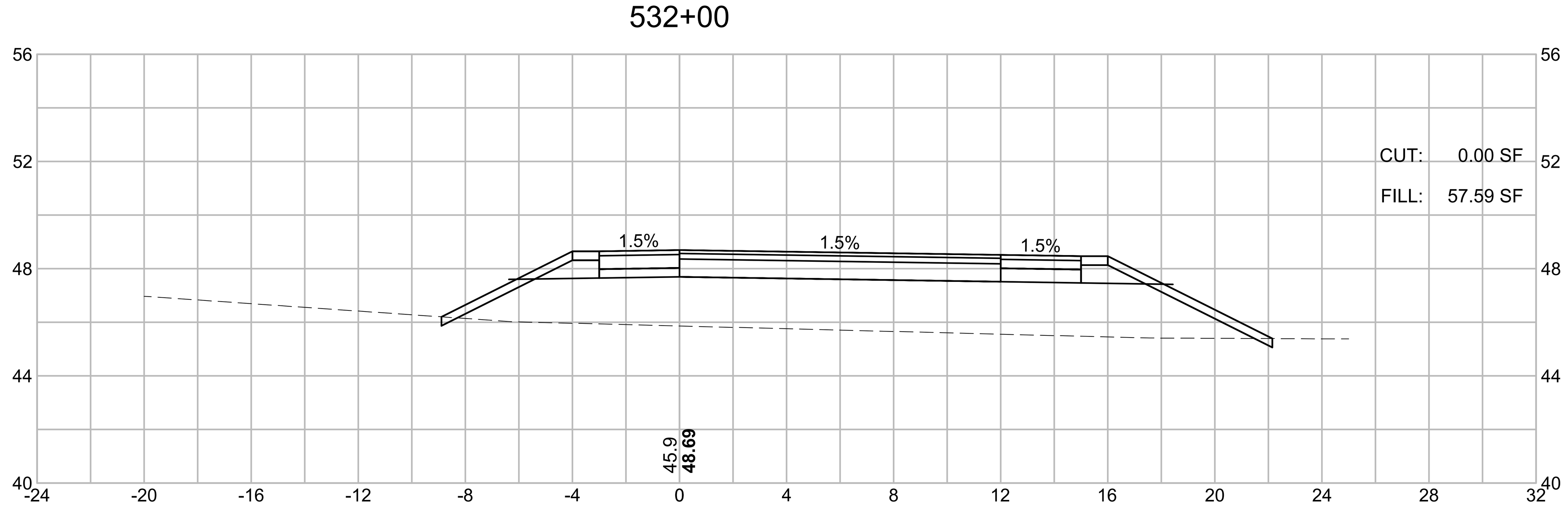


534+00

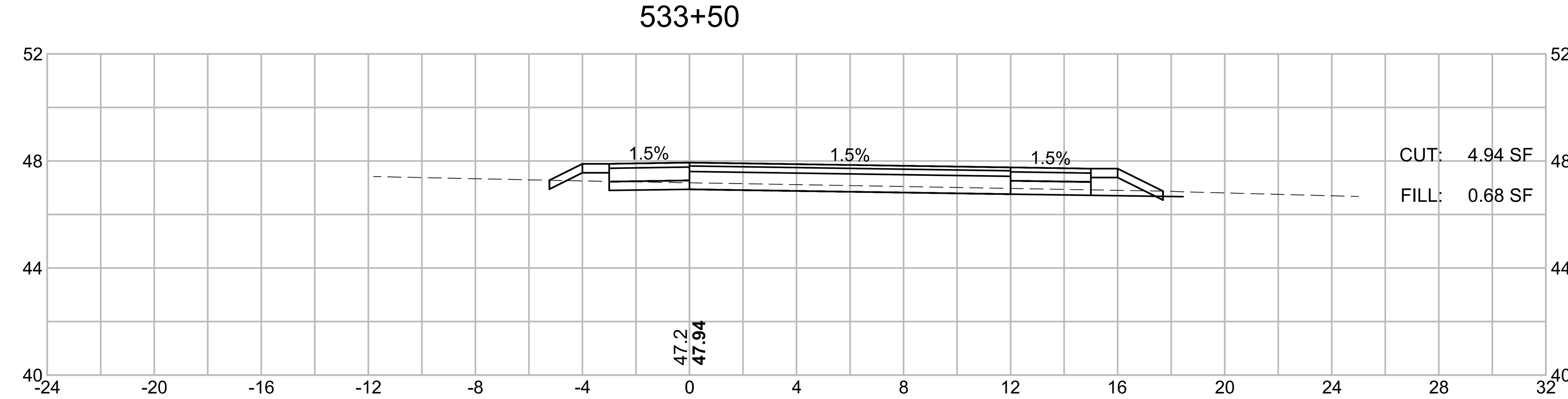


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

532+00



533+50



Plotted on 21-Oct-2021 8:47 AM
607398_HD(XSEC-EAST-1).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

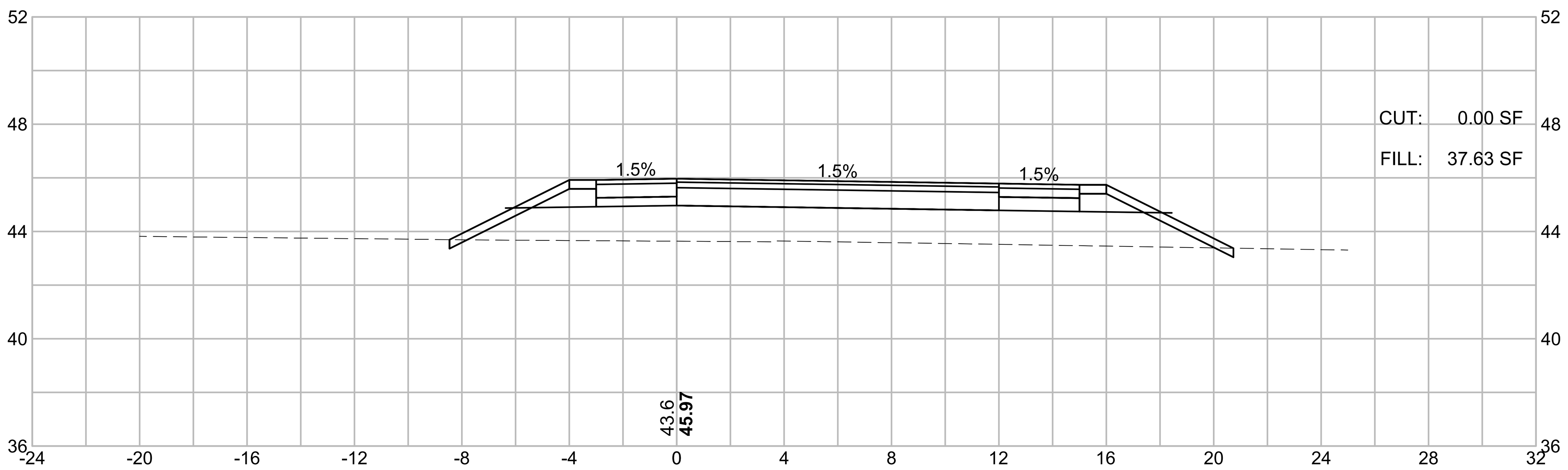
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	217	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

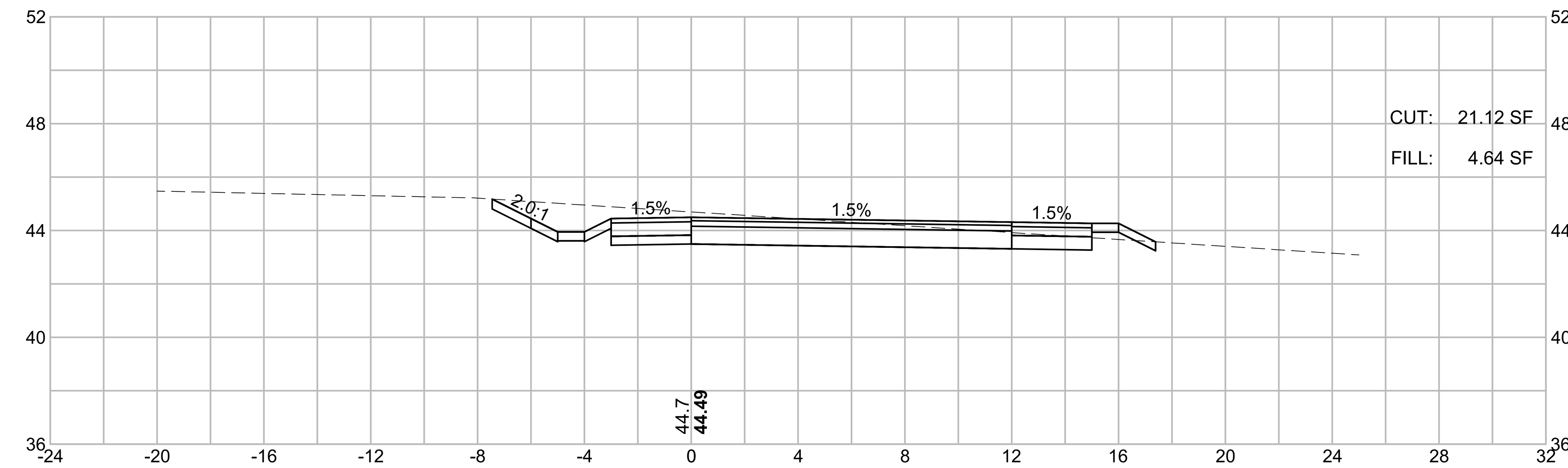
Plotted on 21-Oct-2021 8:47 AM

607398_HD(XSEC-EAST-1).DWG

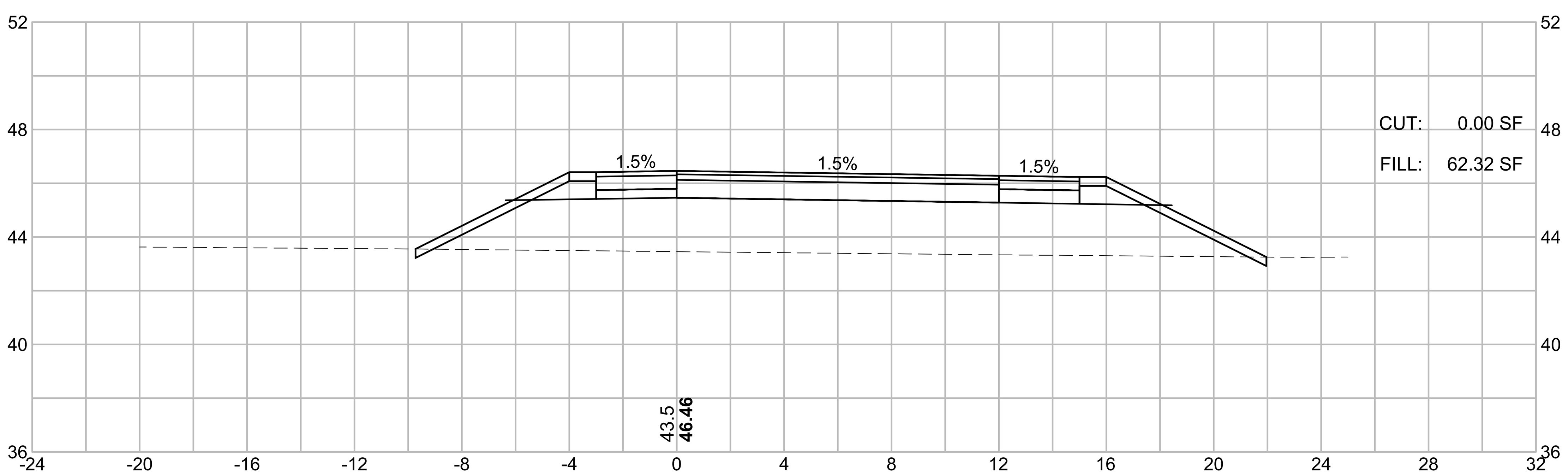
536+00



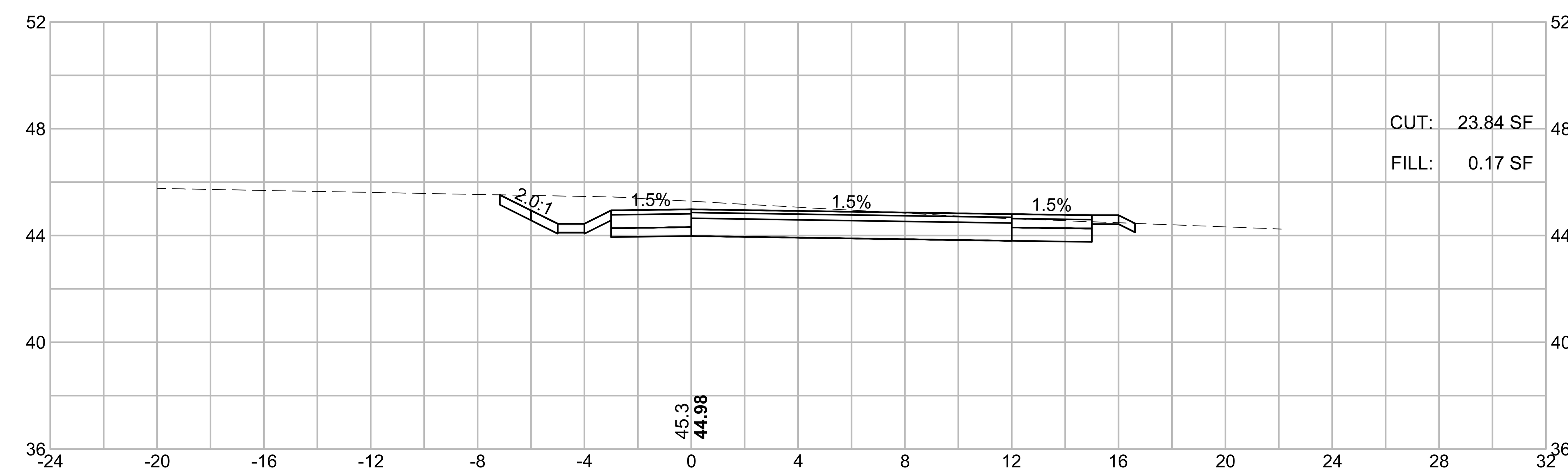
537+50



535+50

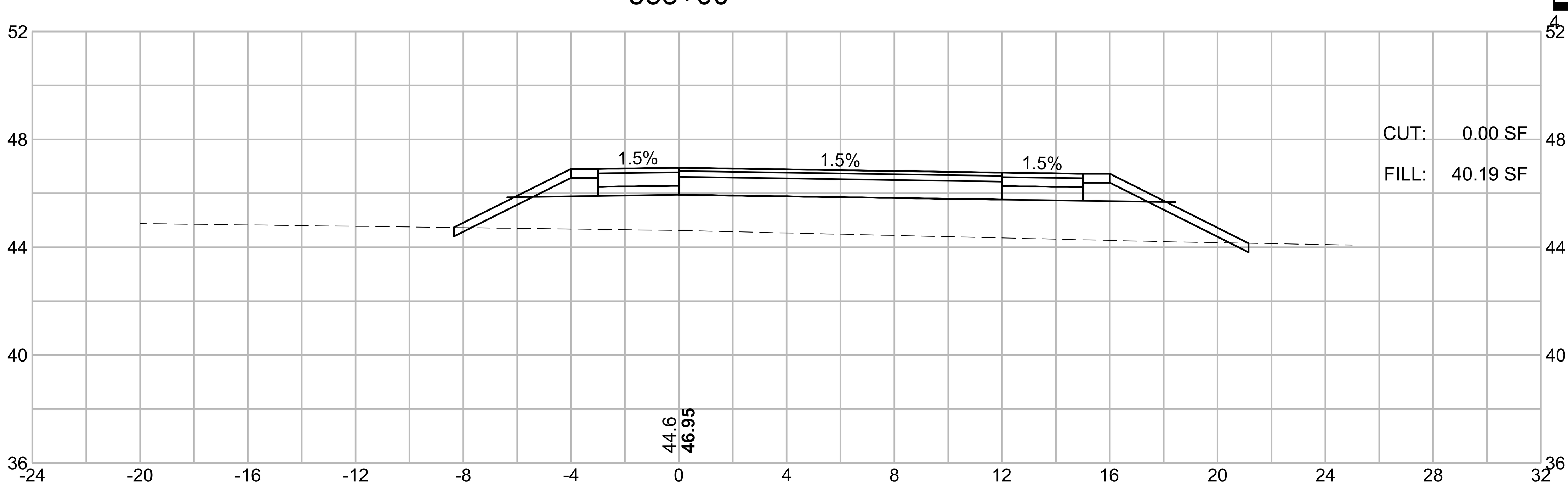


537+00

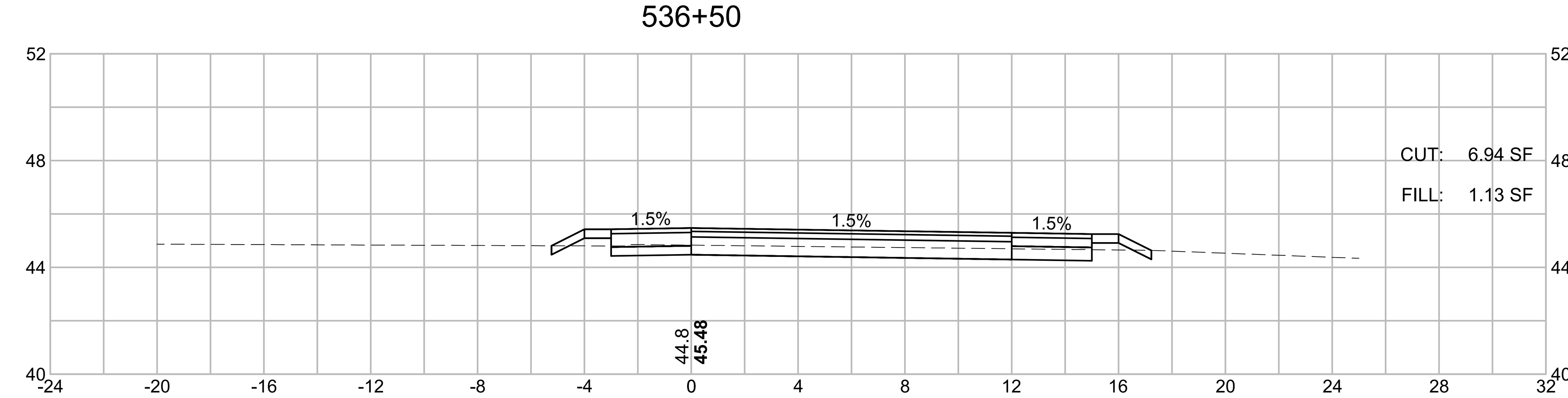


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

535+00



536+50

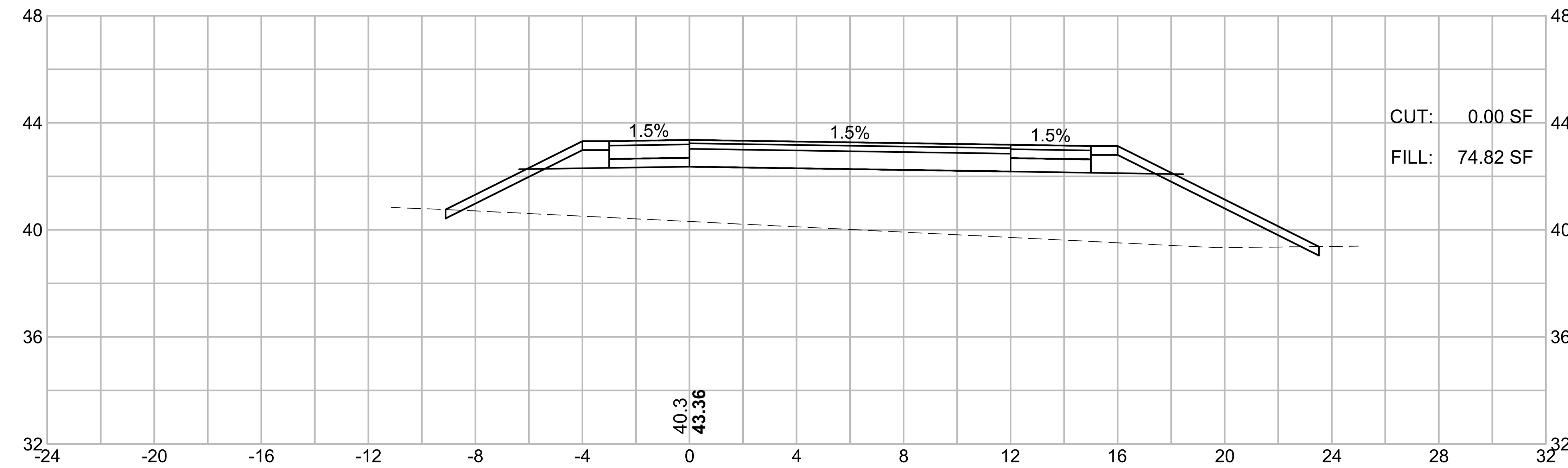


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

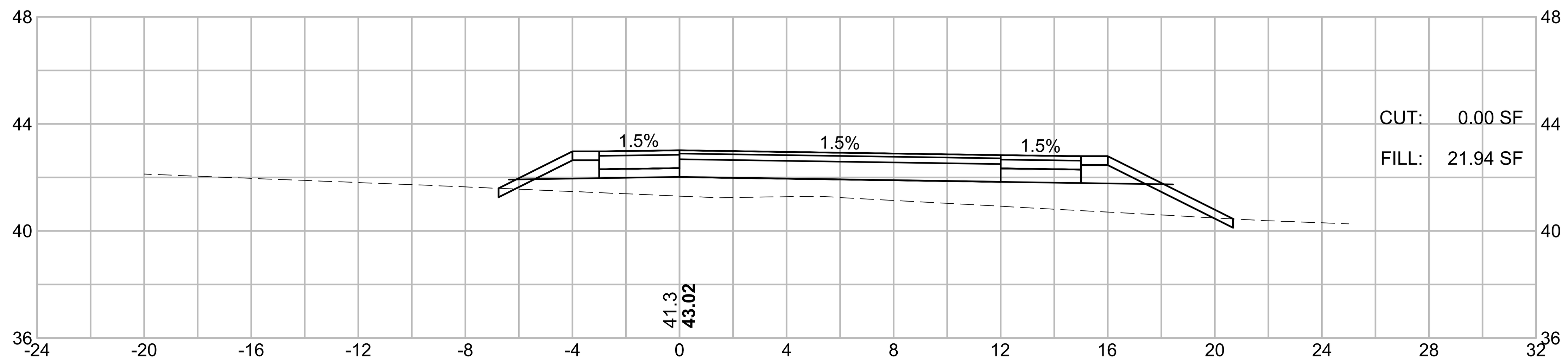
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	218	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

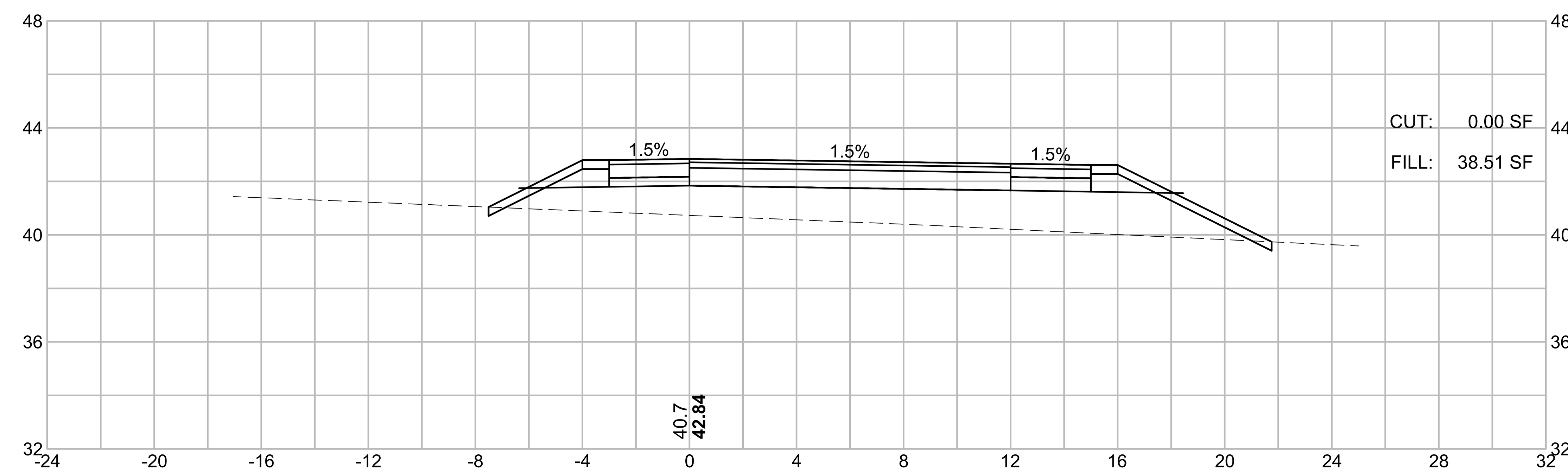
540+50



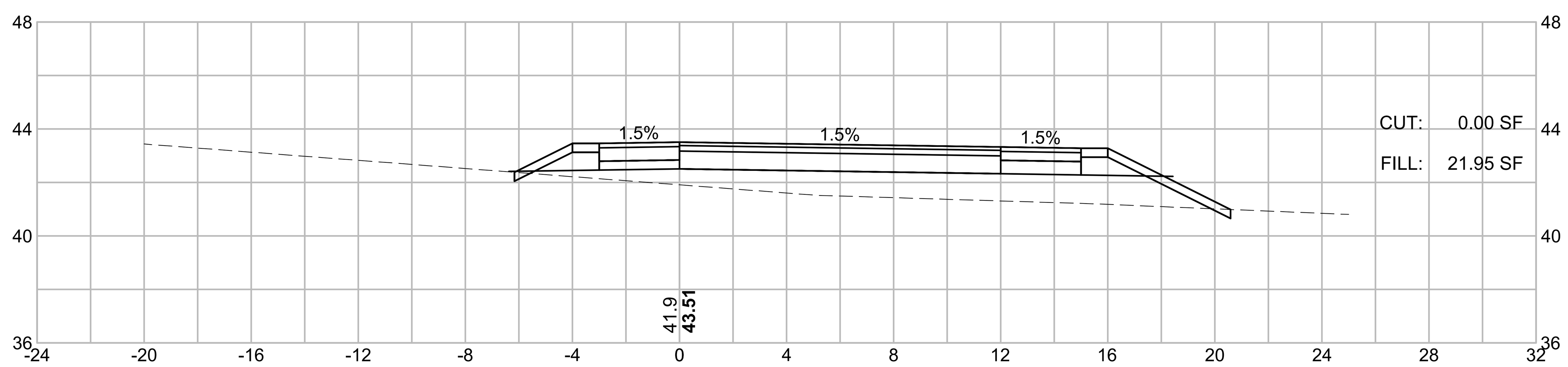
539+00



540+00

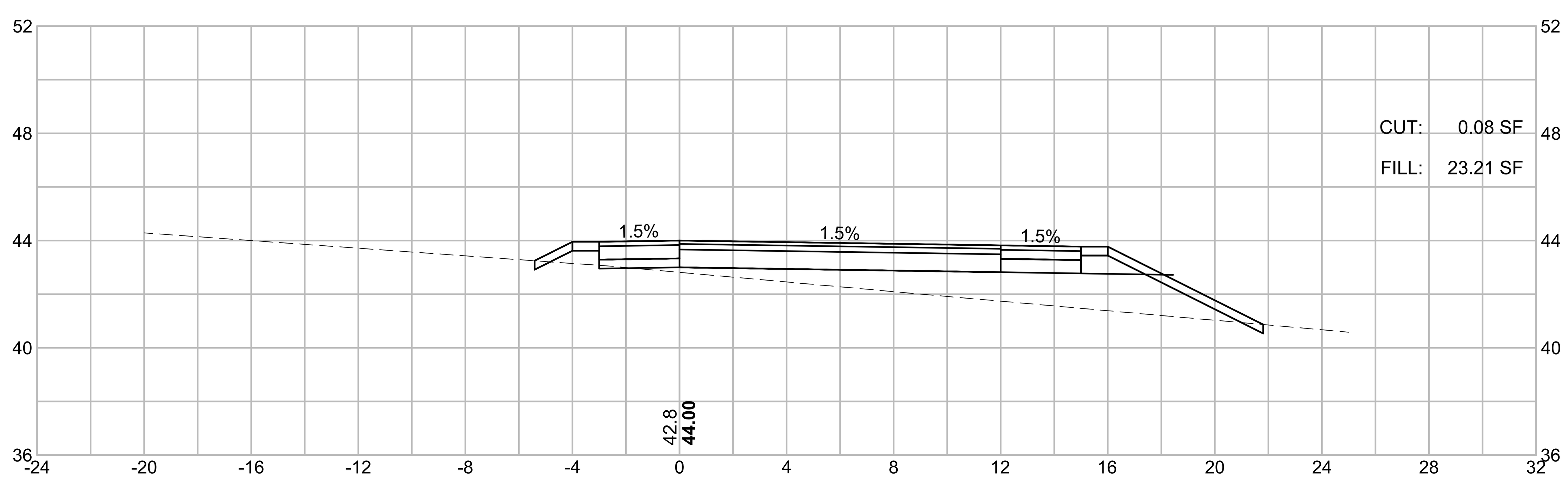


538+50

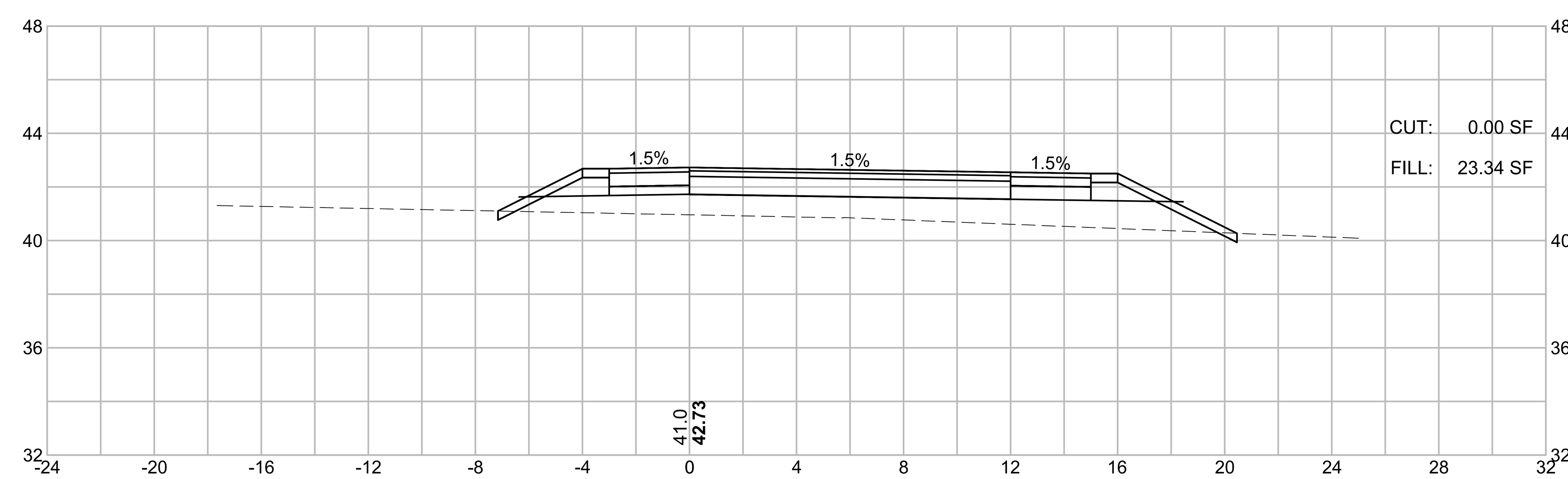


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

538+00



539+50



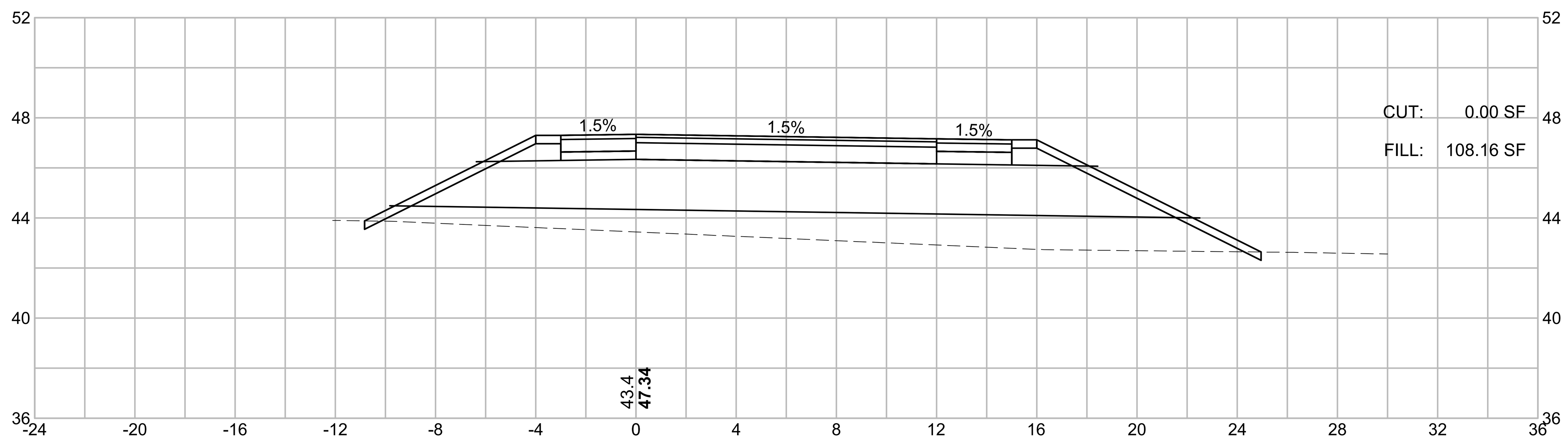
Plotted on 21-Oct-2021 8:47 AM
607398_HD(XSEC-EAST-1).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

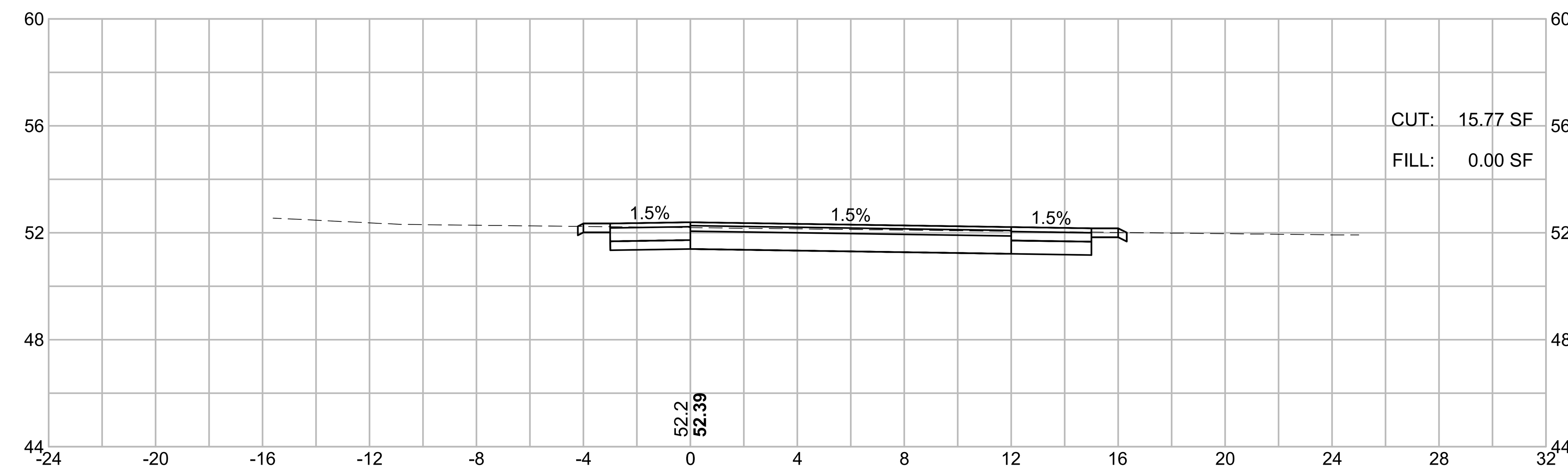
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	219	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

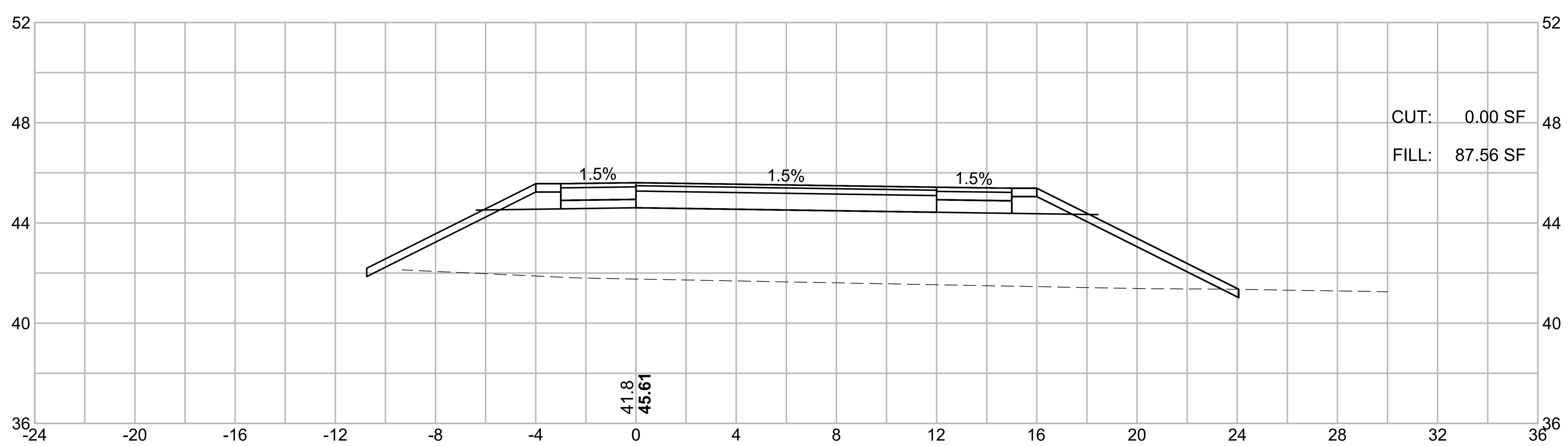
542+00



543+50



541+50



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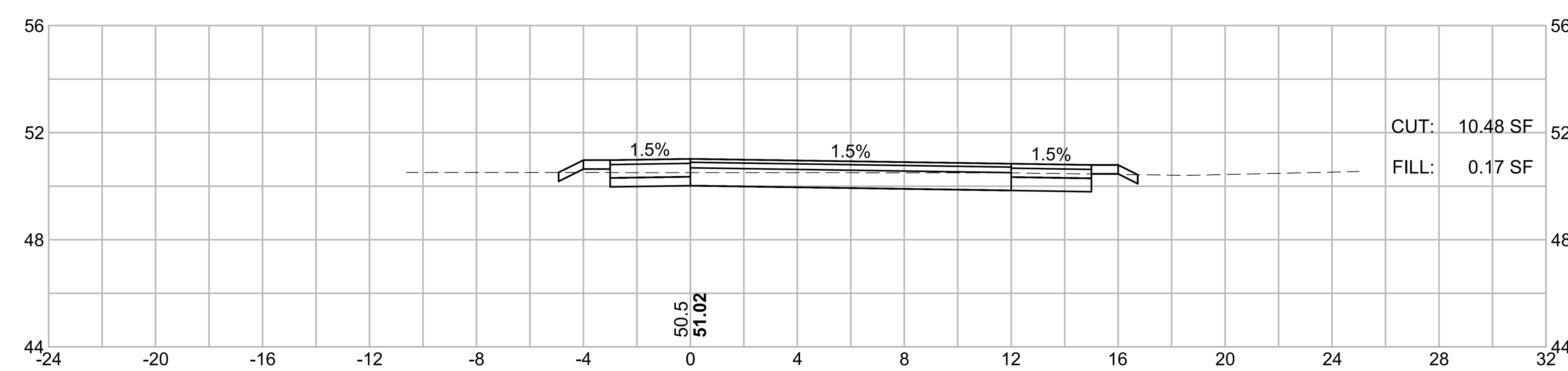

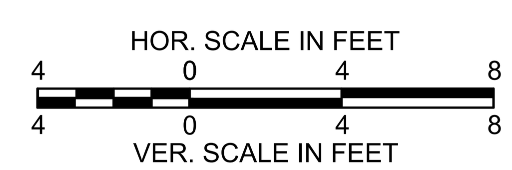

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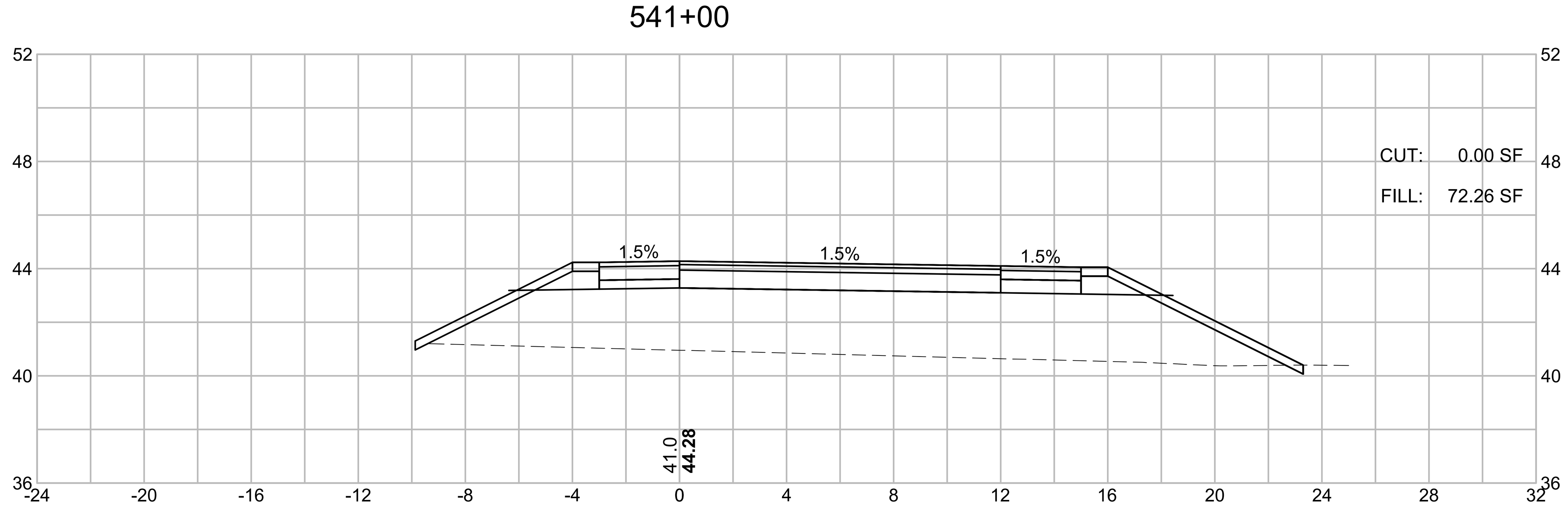

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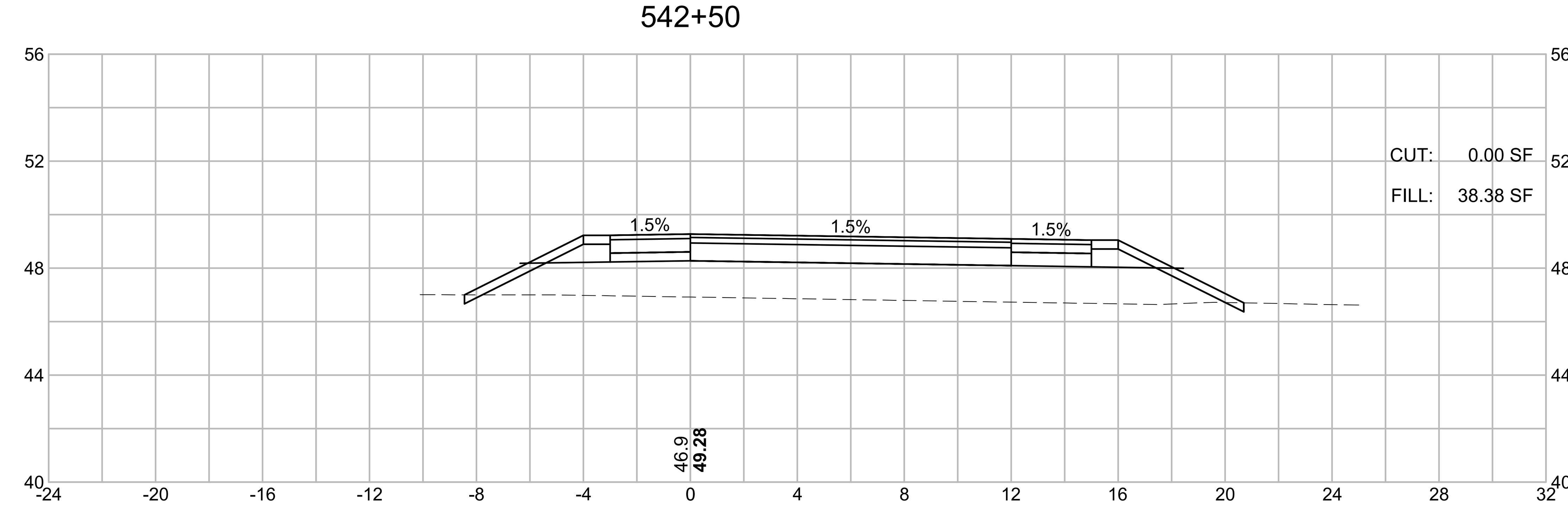


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

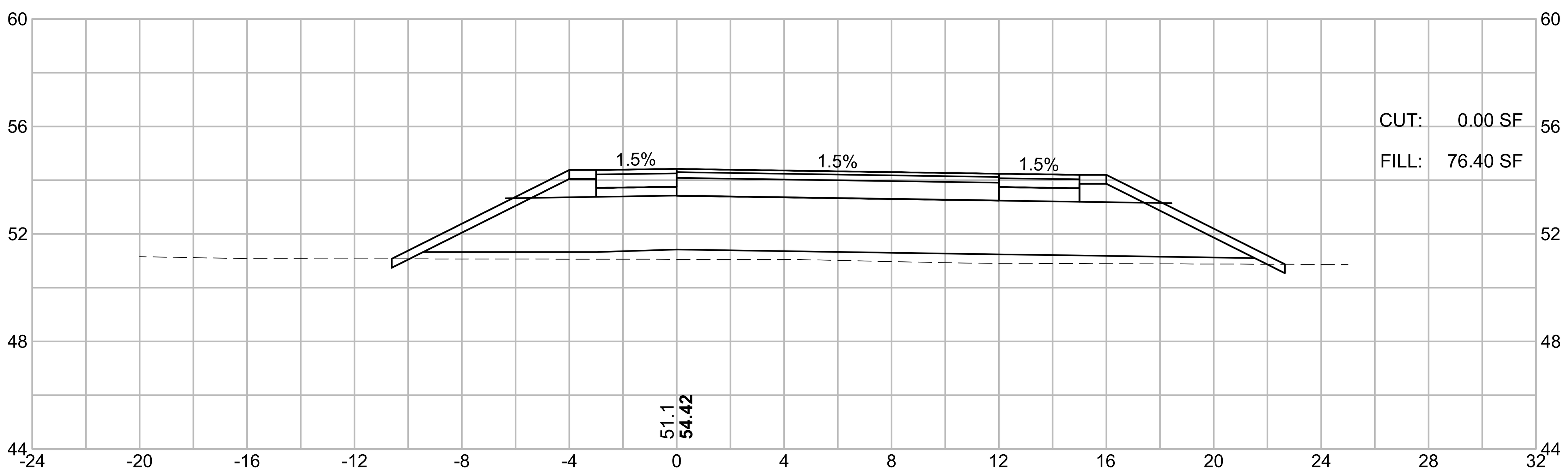
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	217	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

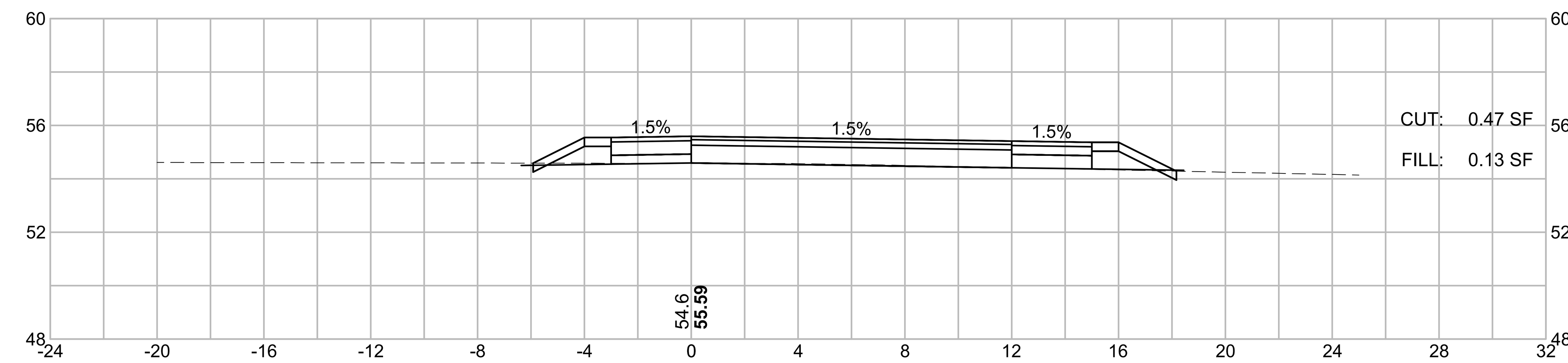
Plotted on 21-Oct-2021 8:48 AM

607398_HD(XSEC-EAST-2).DWG

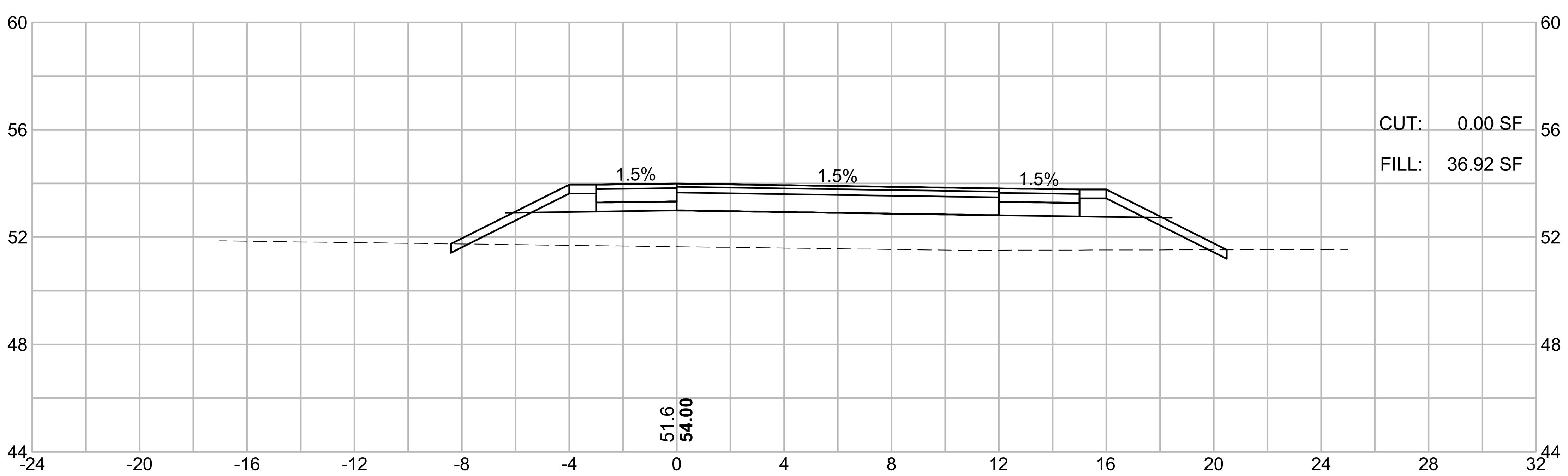
545+00



546+50



544+50



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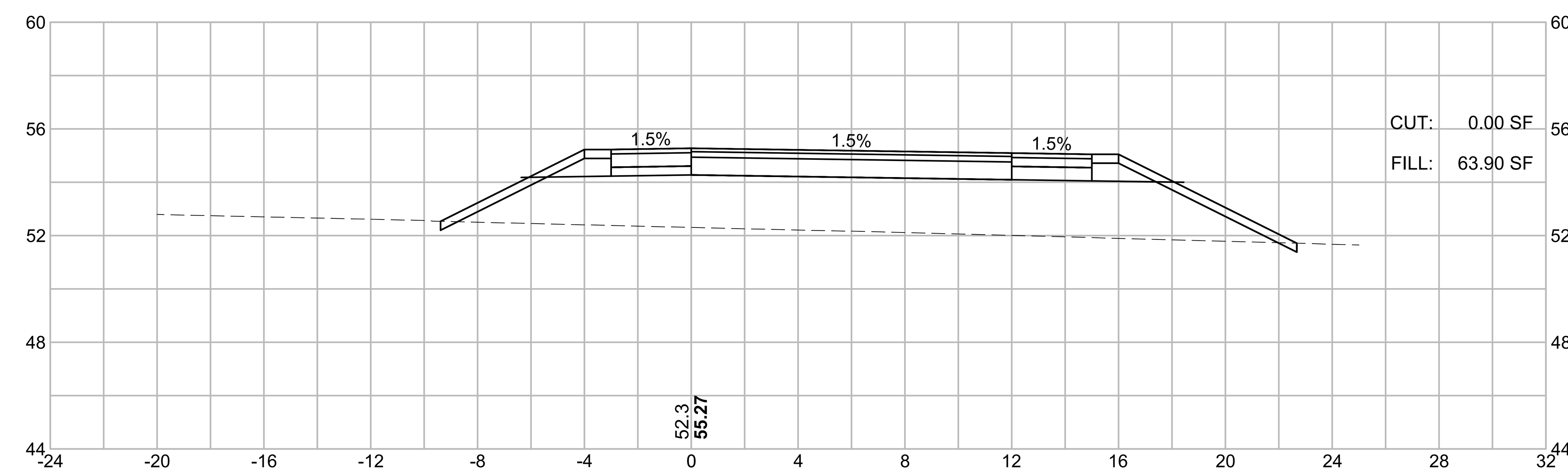

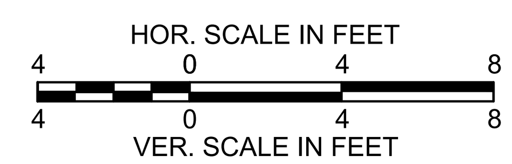

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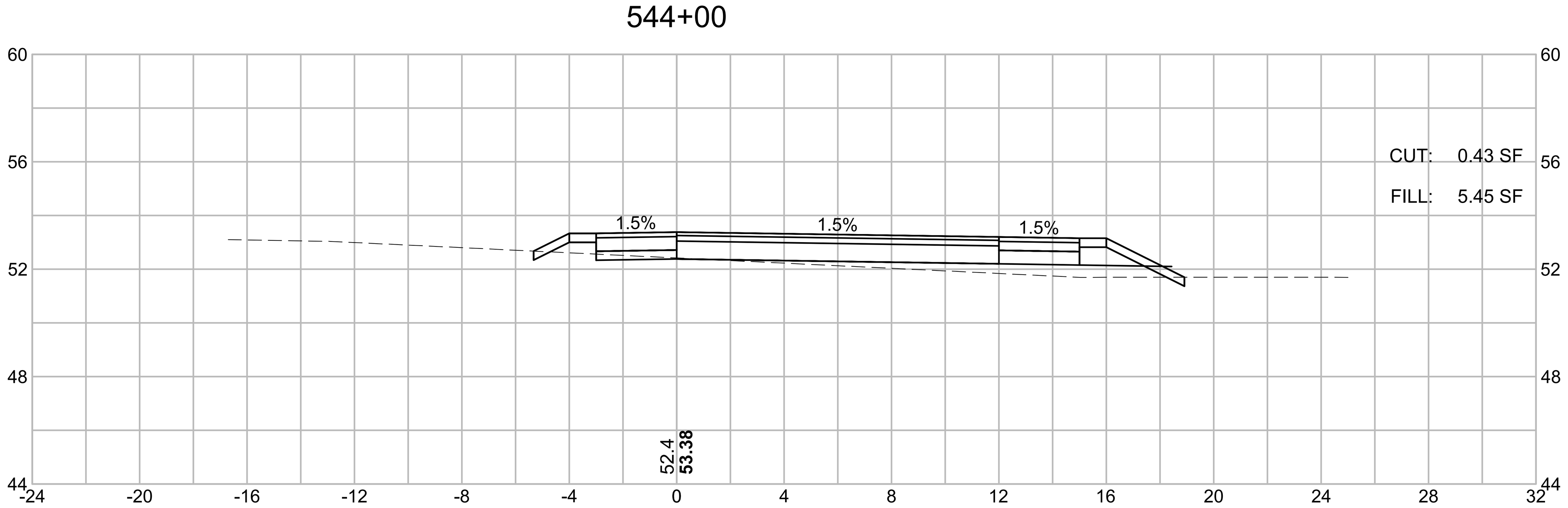

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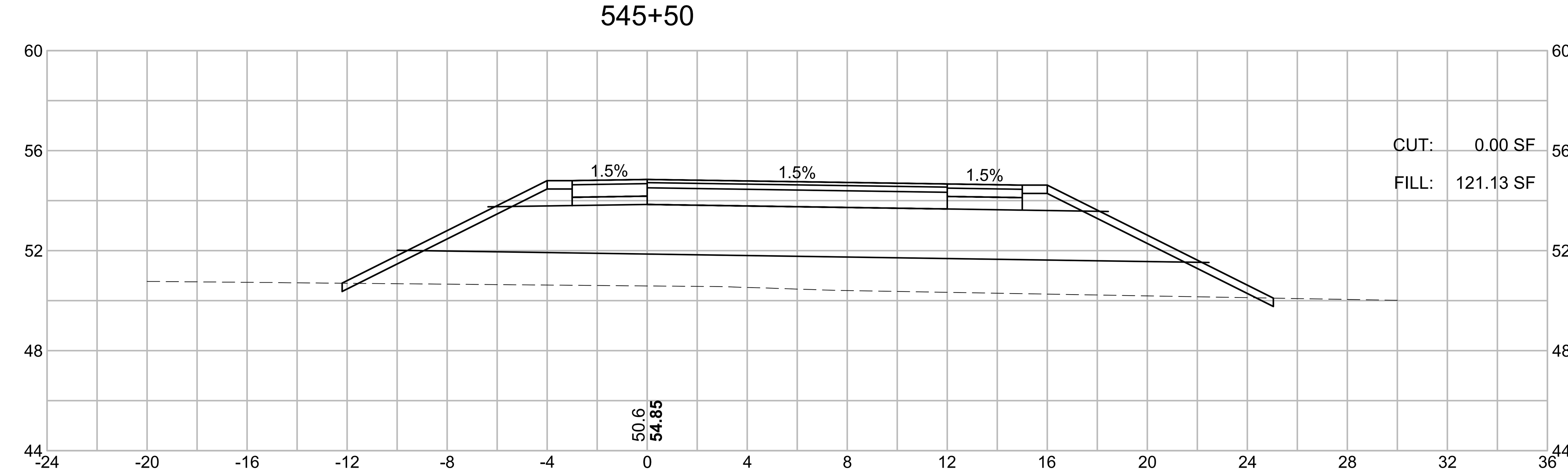
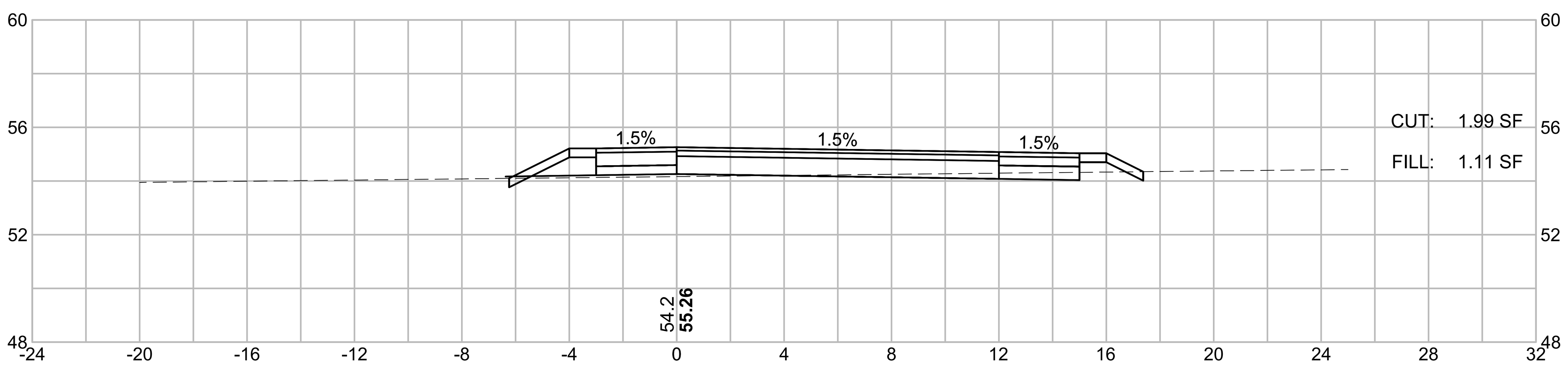


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	218	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

548+00



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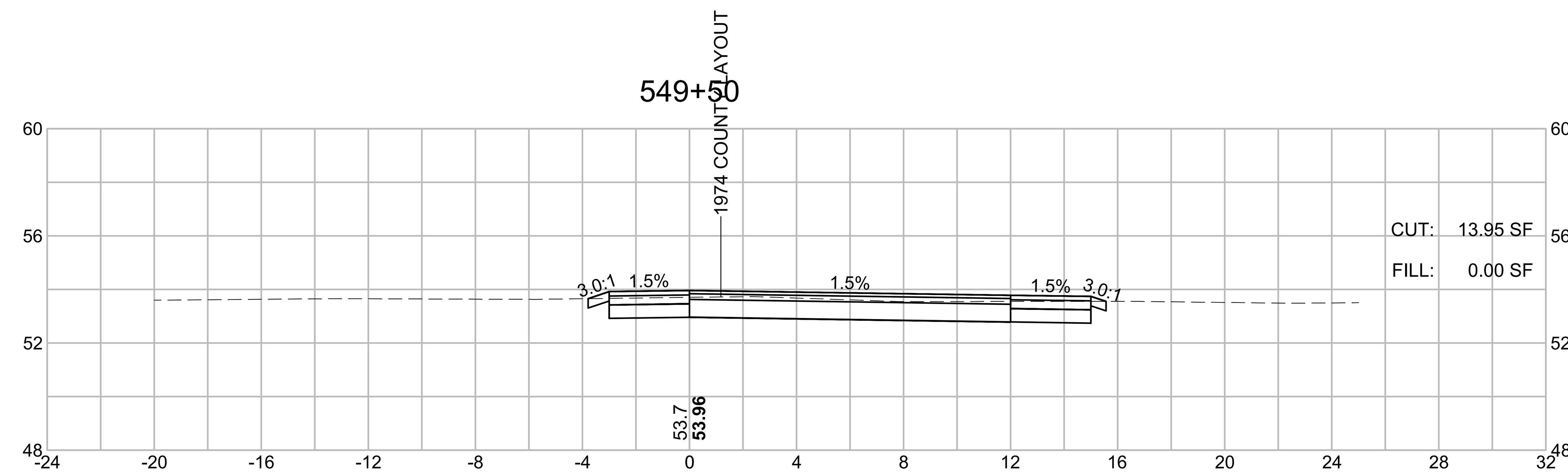

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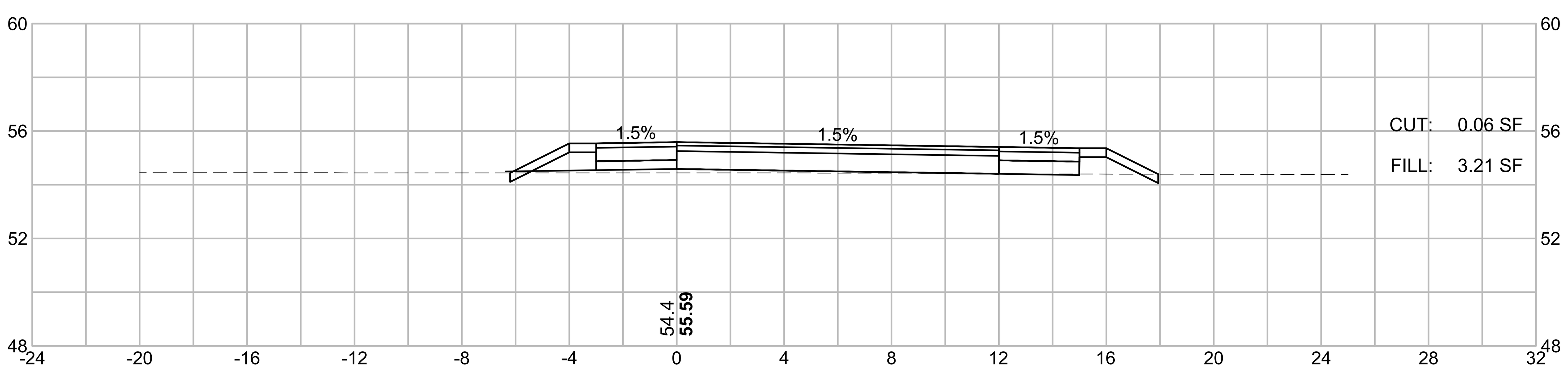

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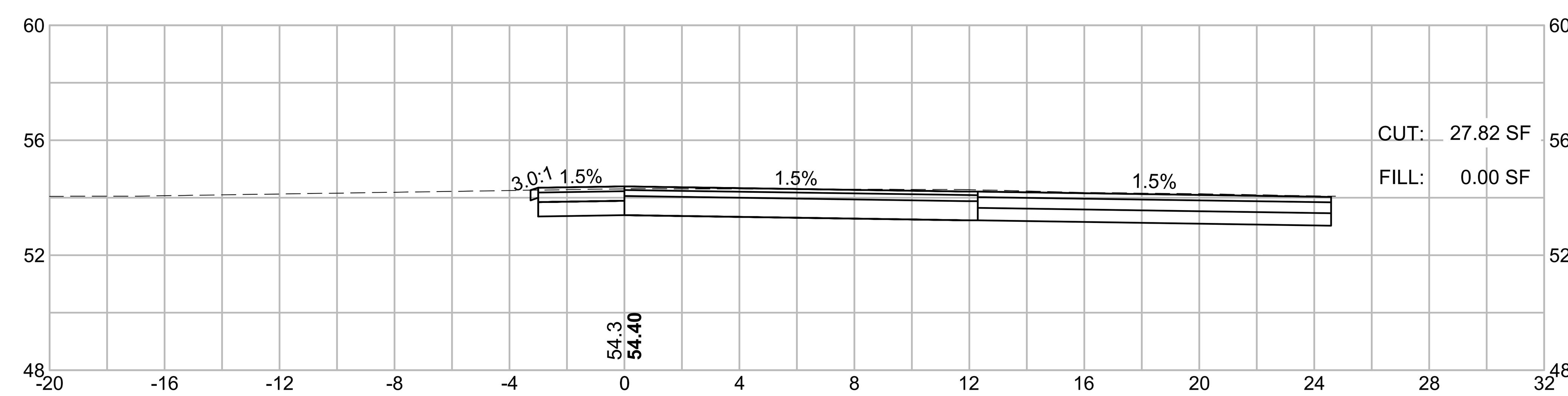
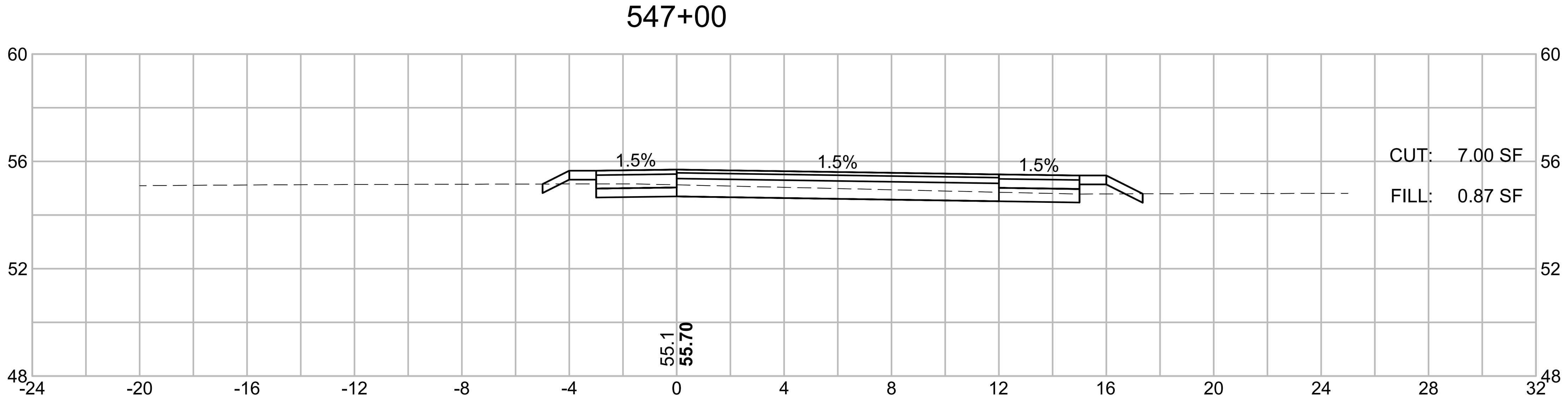


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

547+00



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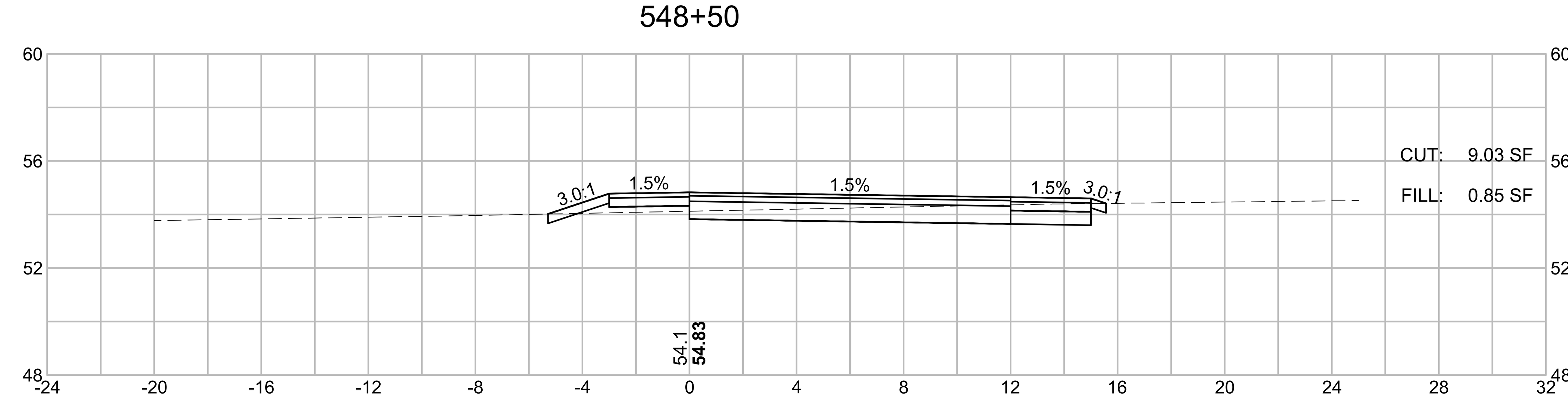


Plotted on 21-Oct-2021 8:49 AM

607398_HD(XSEC-EAST-2).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

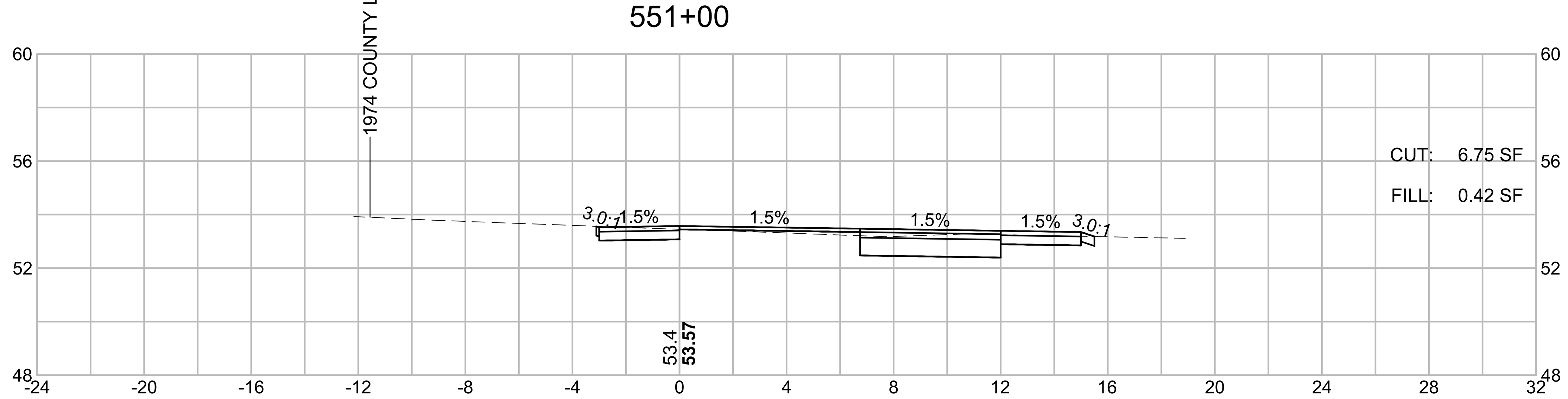
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	219	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

Plotted on 21-Oct-2021 8:49 AM

607398_HD(XSEC-EAST-2).DWG

551+00



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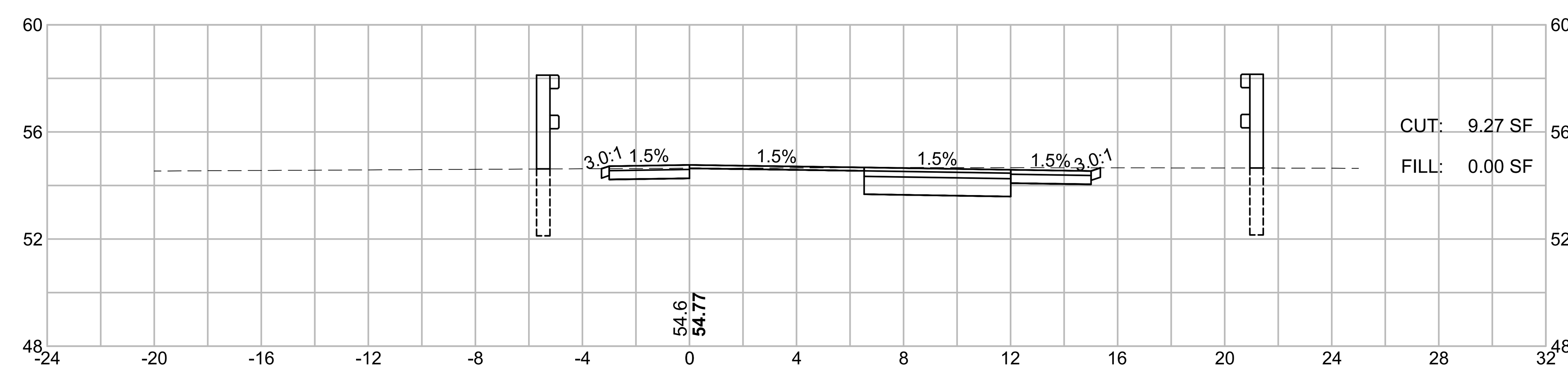

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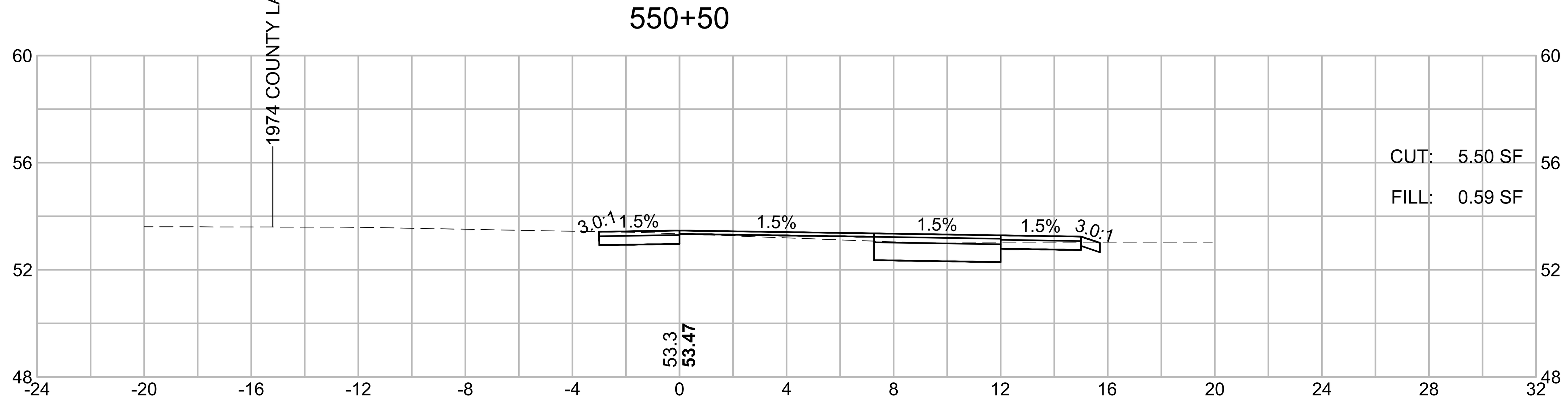

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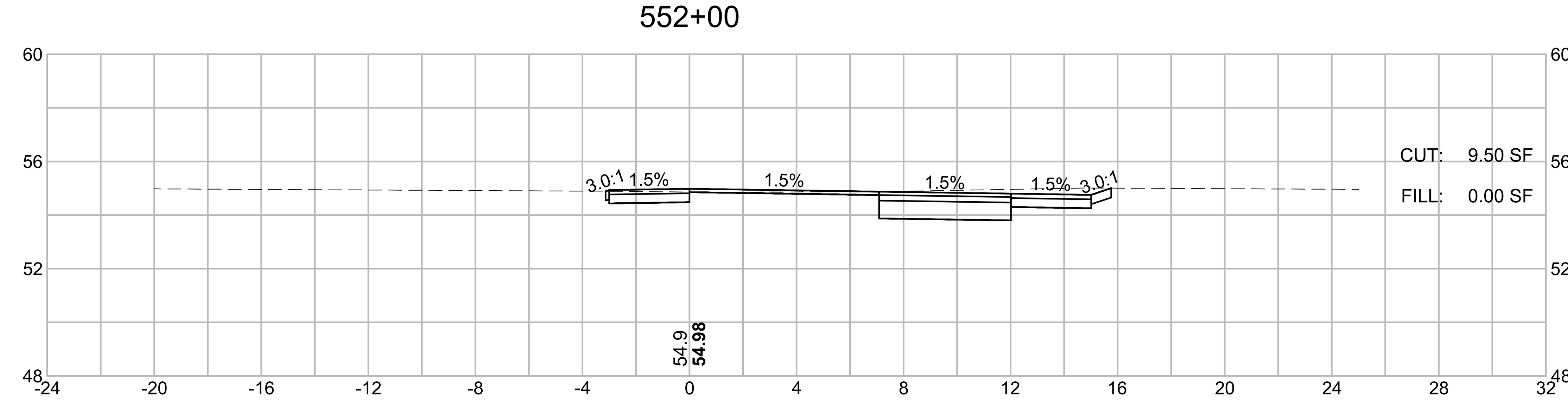

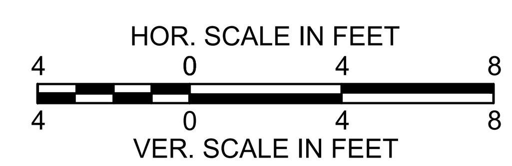

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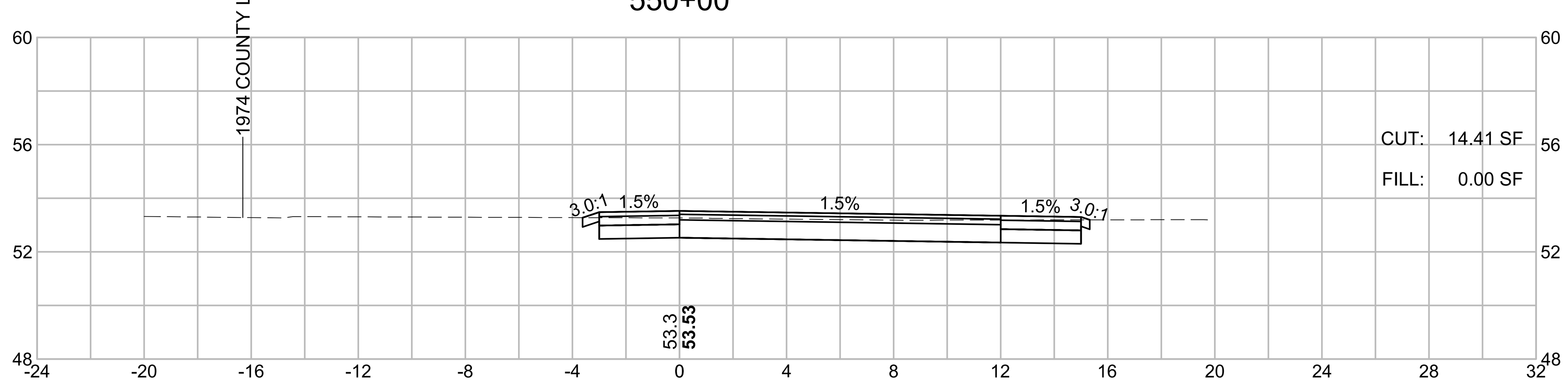
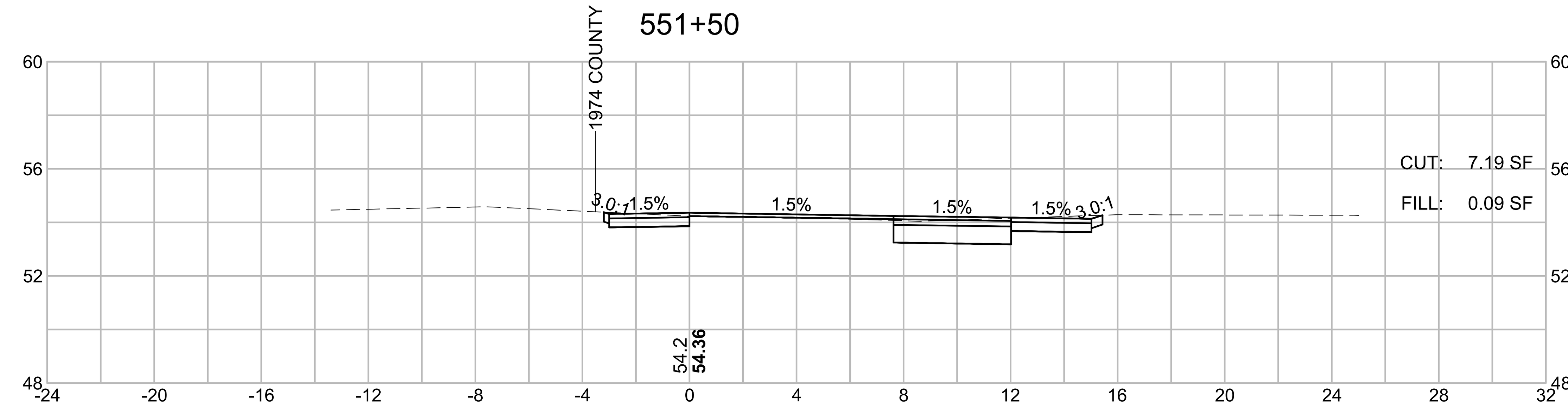


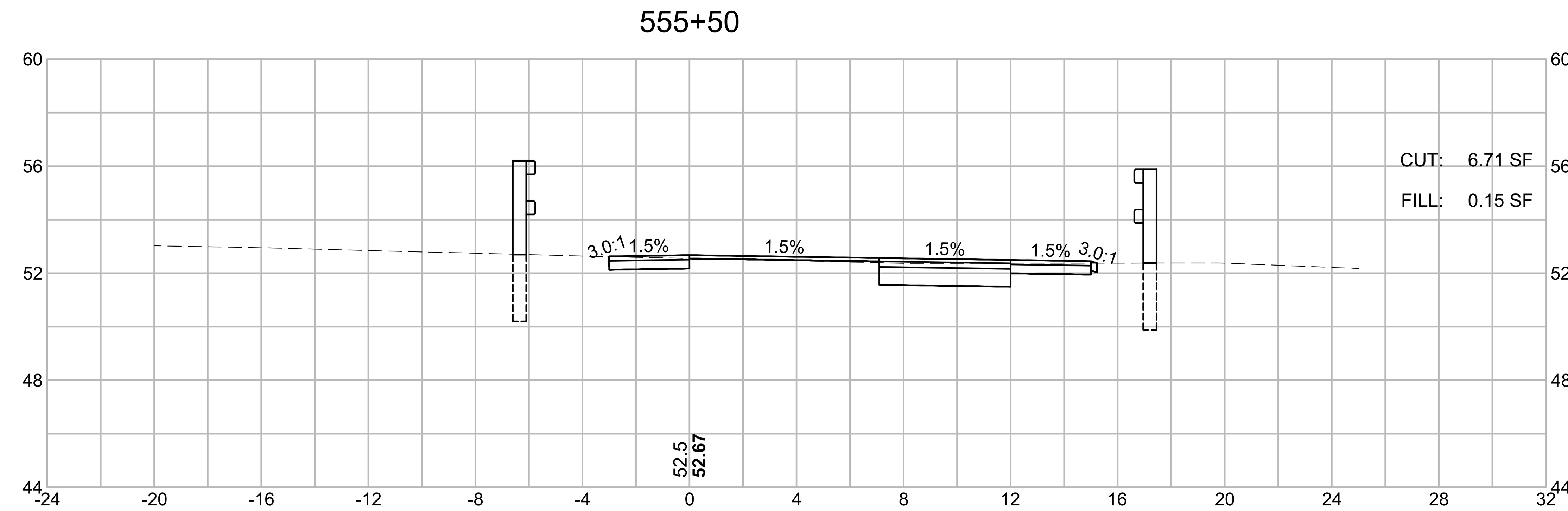
551+50

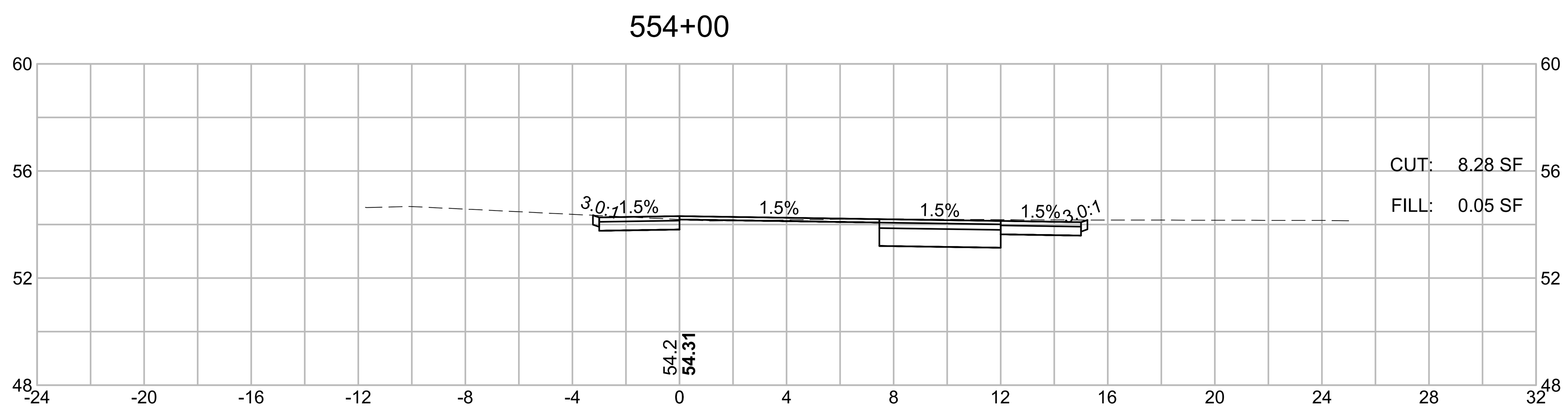


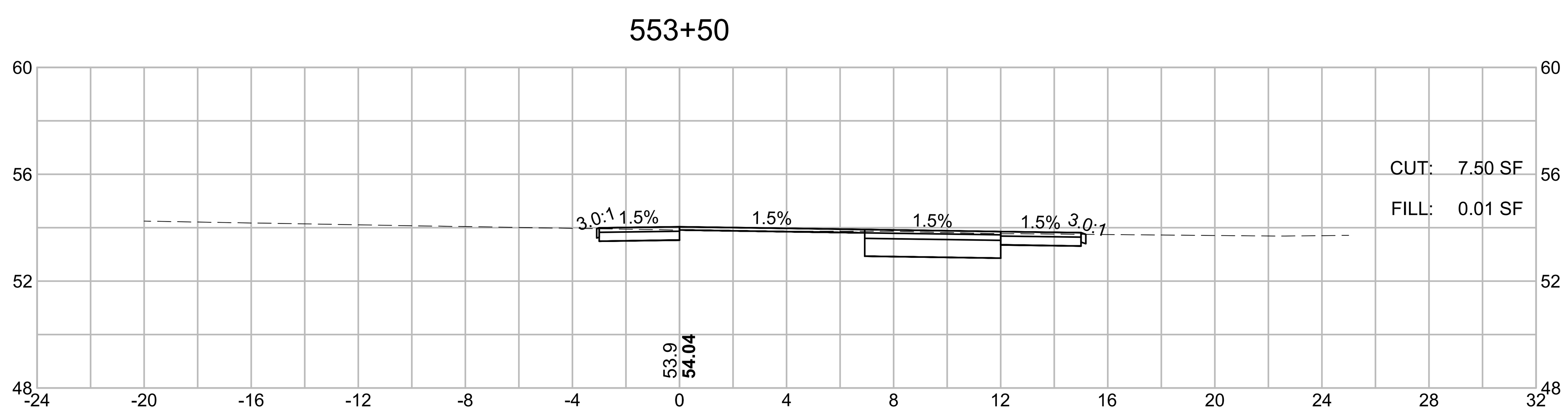
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

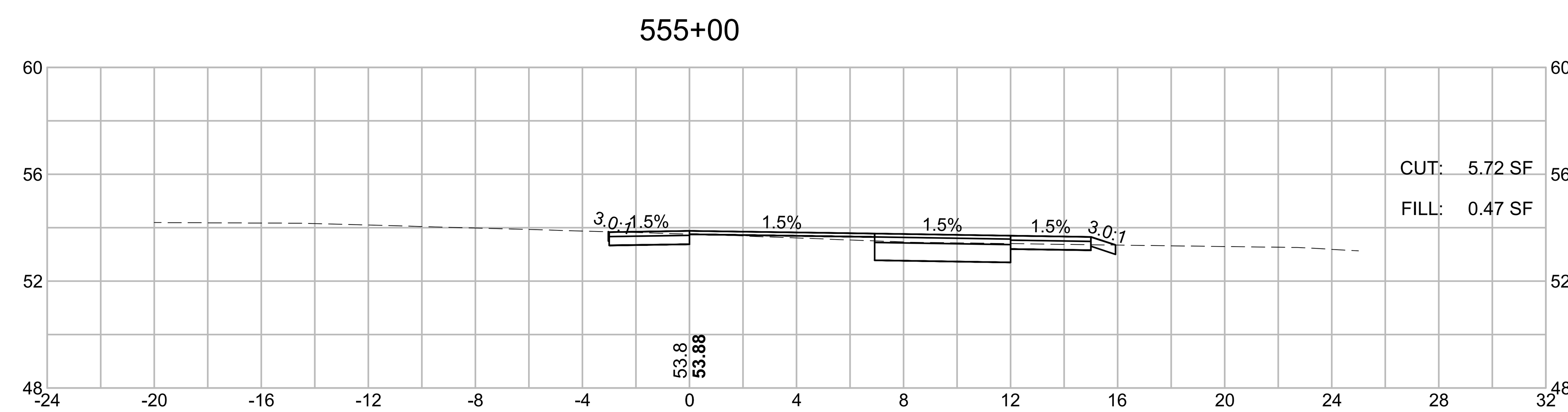
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	220	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

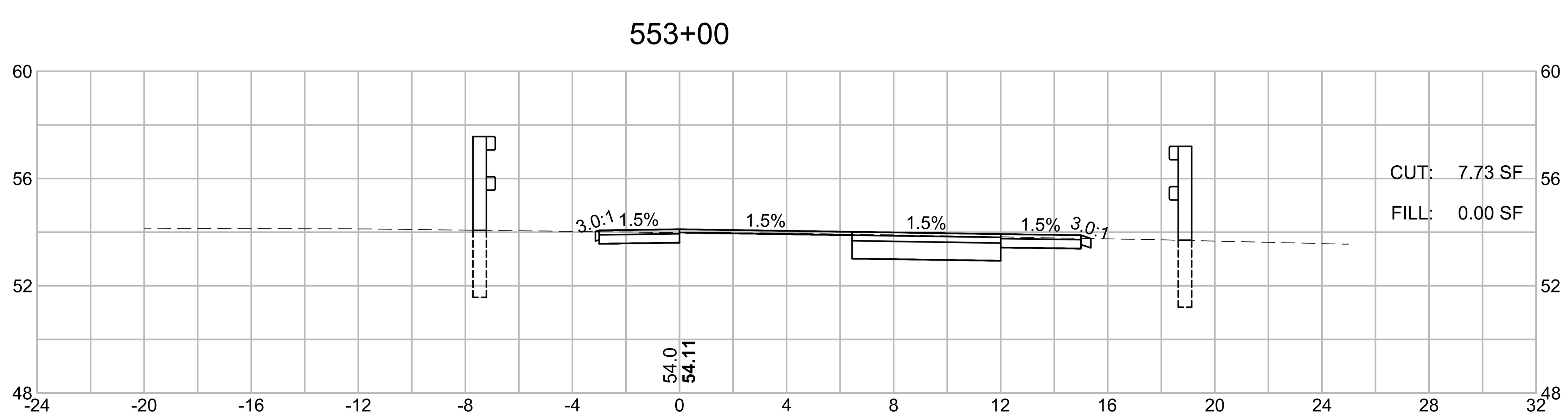


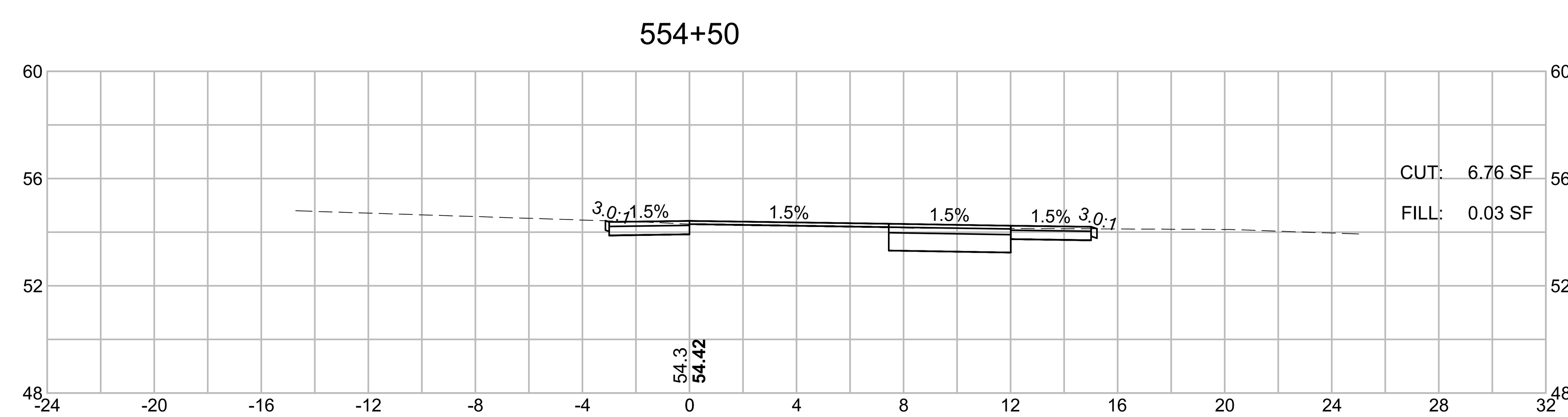






HOR. SCALE IN FEET
VER. SCALE IN FEET



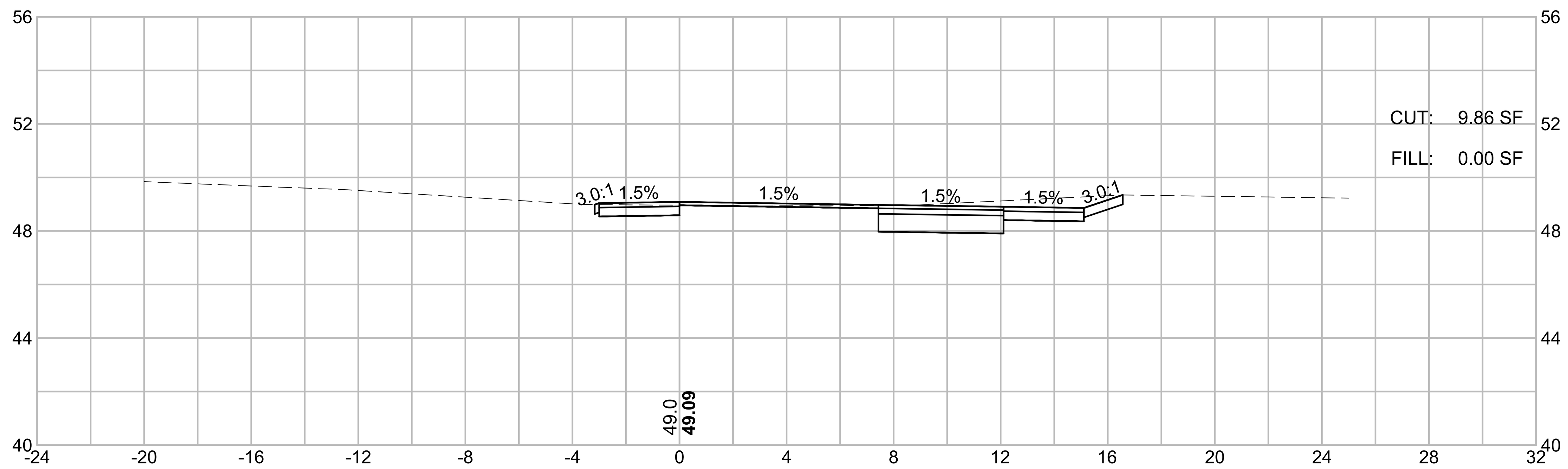


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	221	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

557+00



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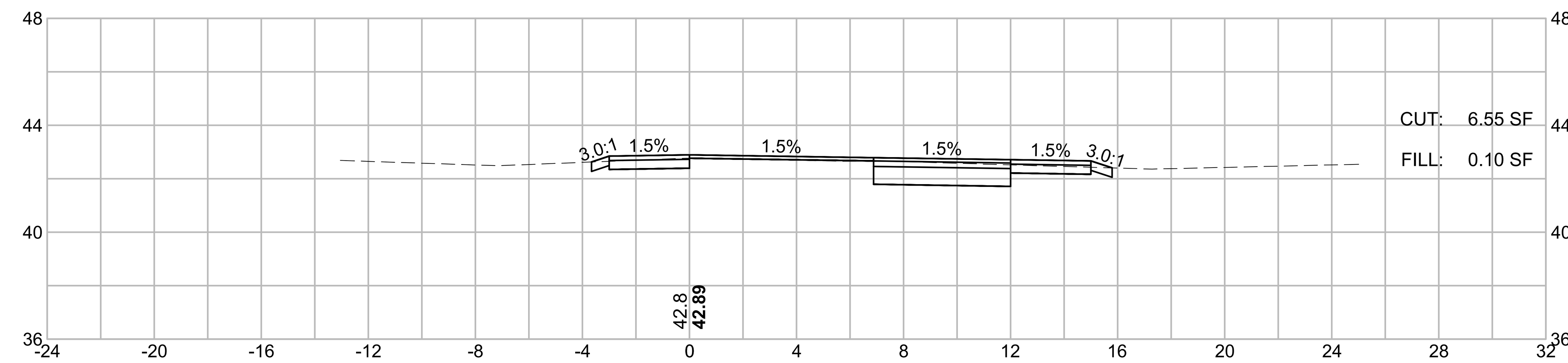

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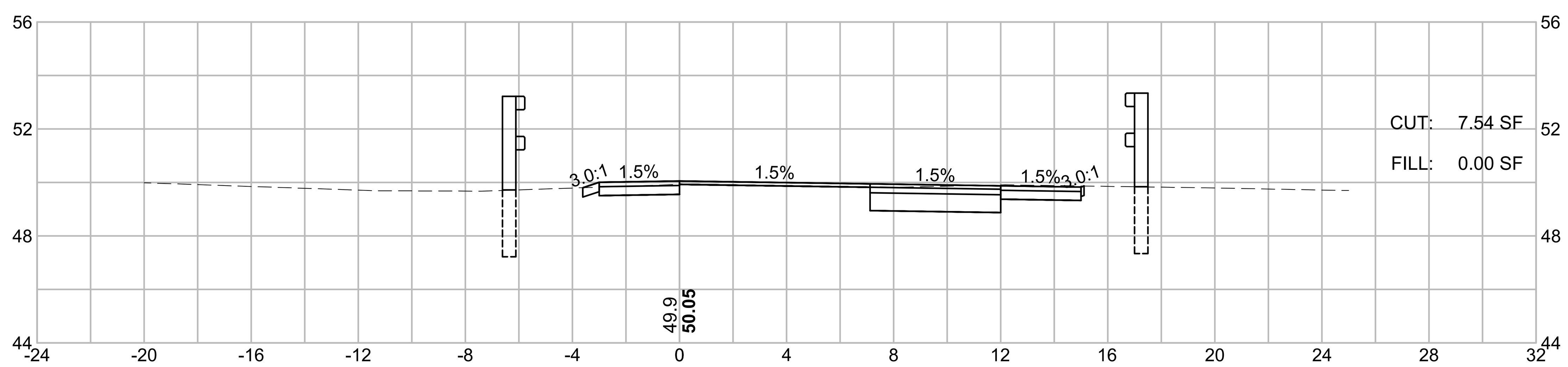
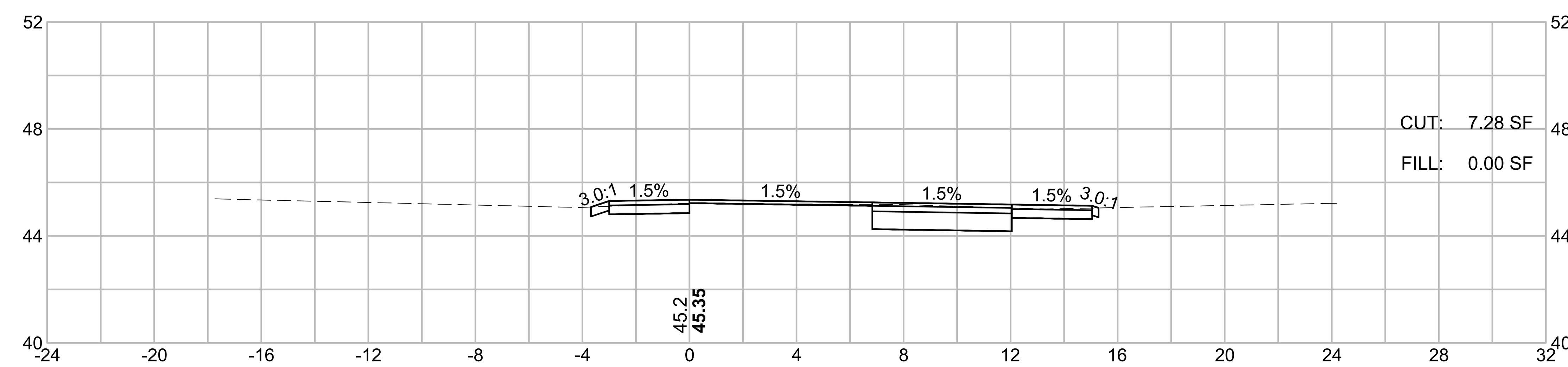


558+00



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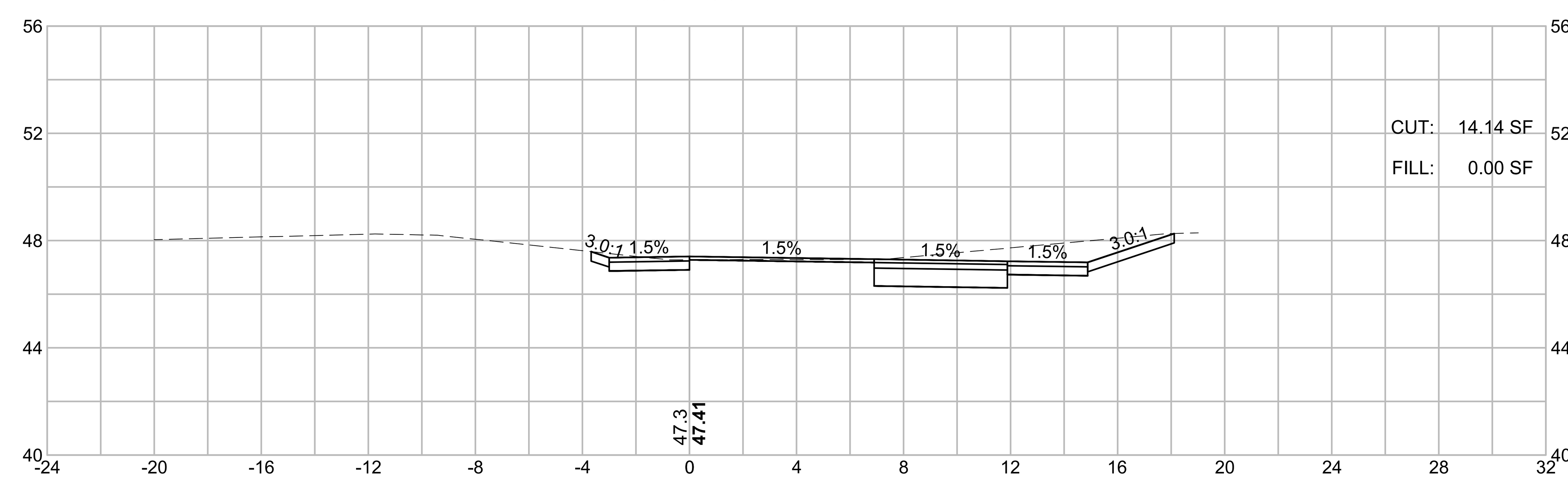
4 0 4 8
VER. SCALE IN FEET

557+50



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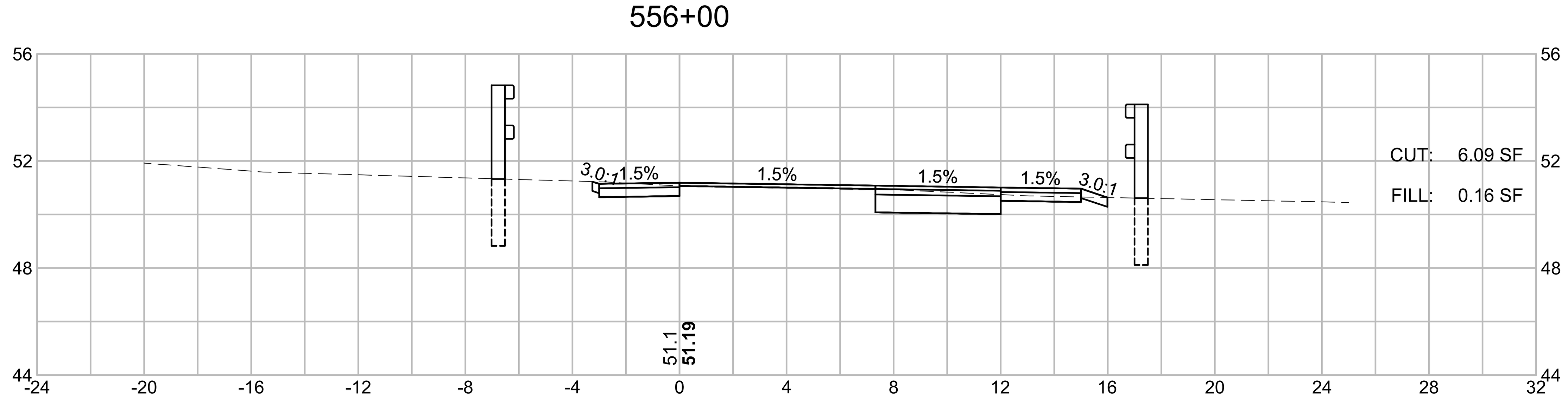
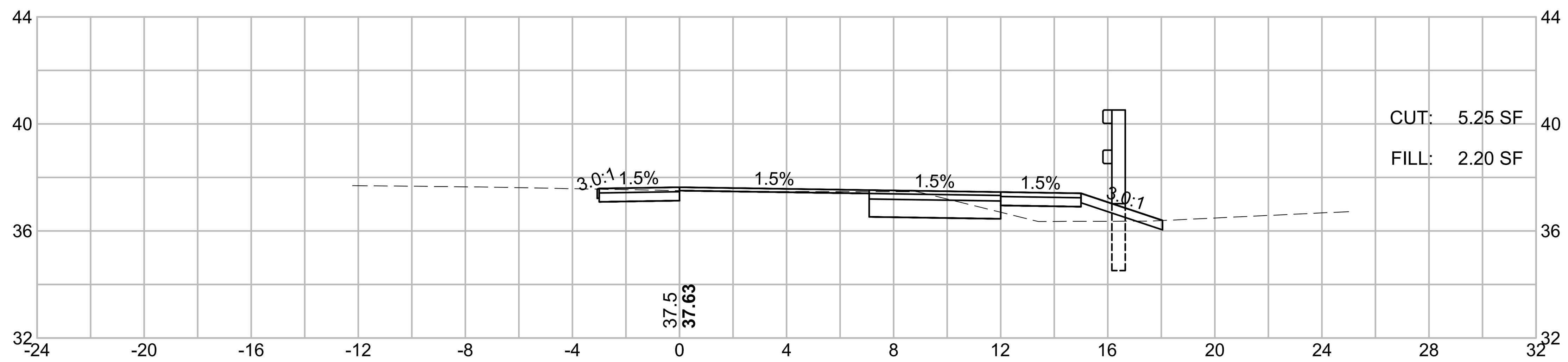


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	222	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

560+00



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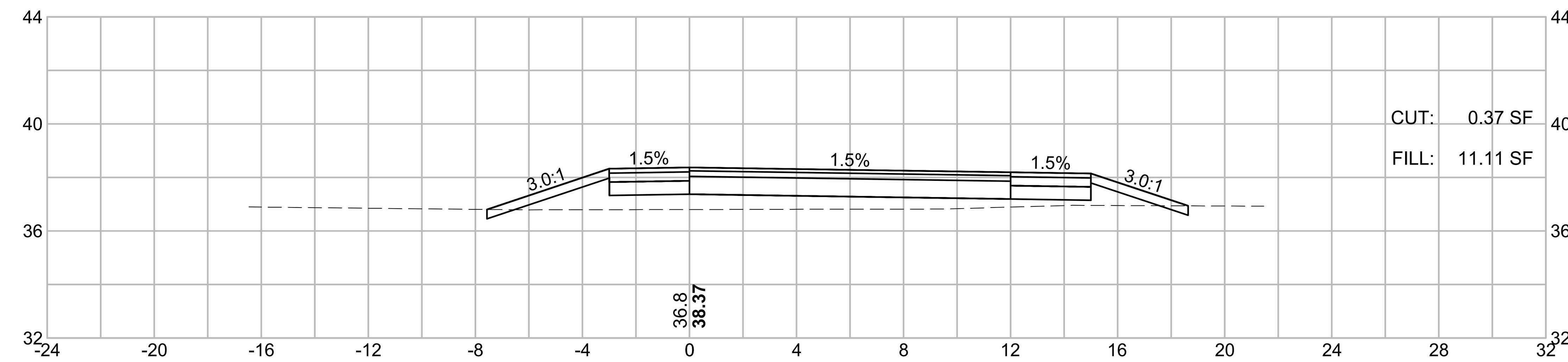

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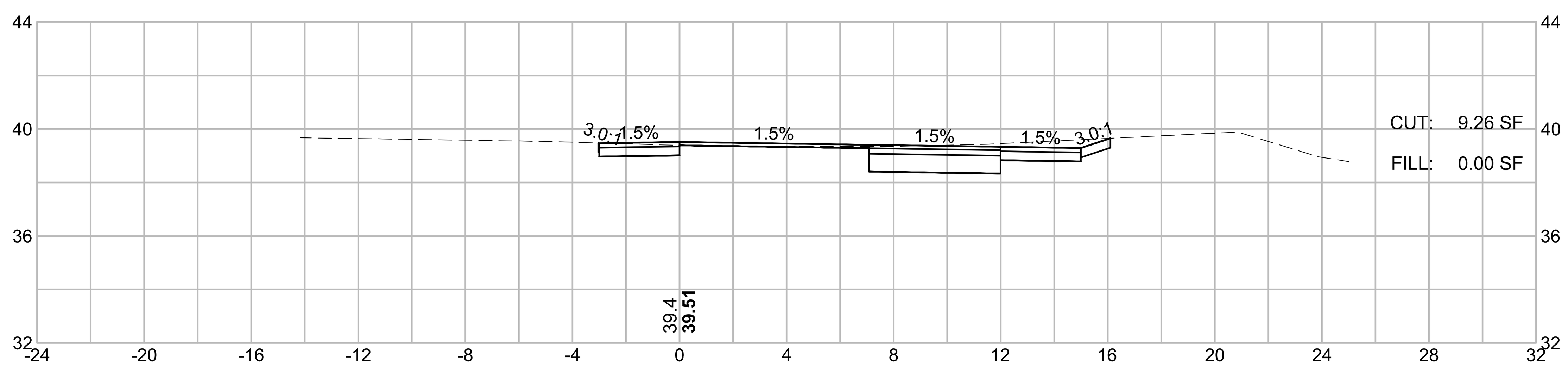

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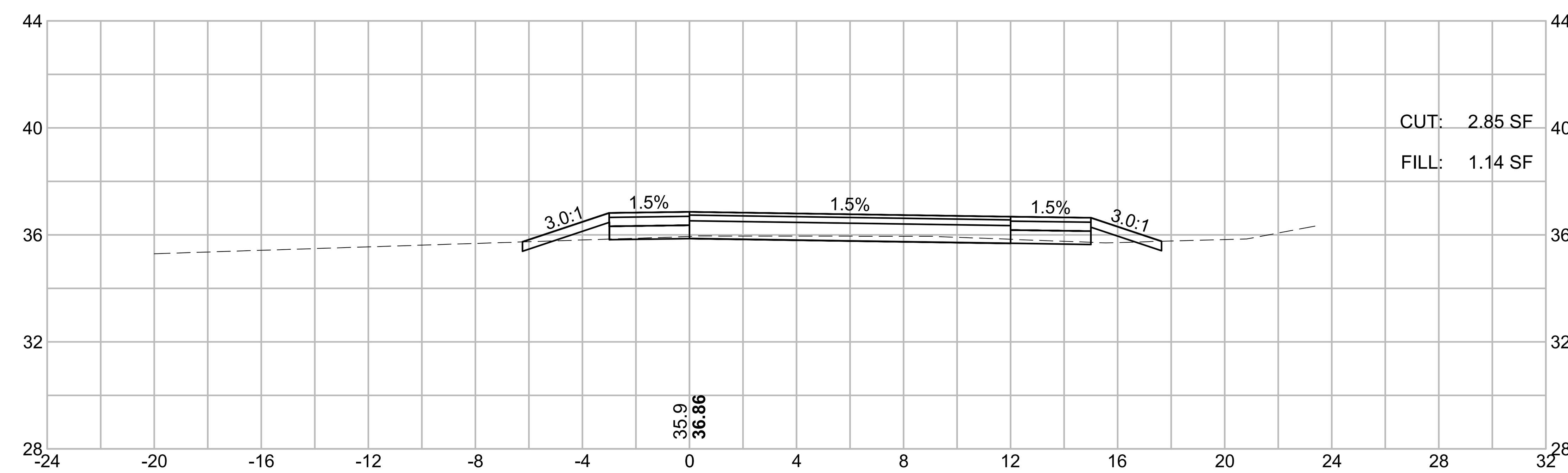

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4 0 4 8
VER. SCALE IN FEET

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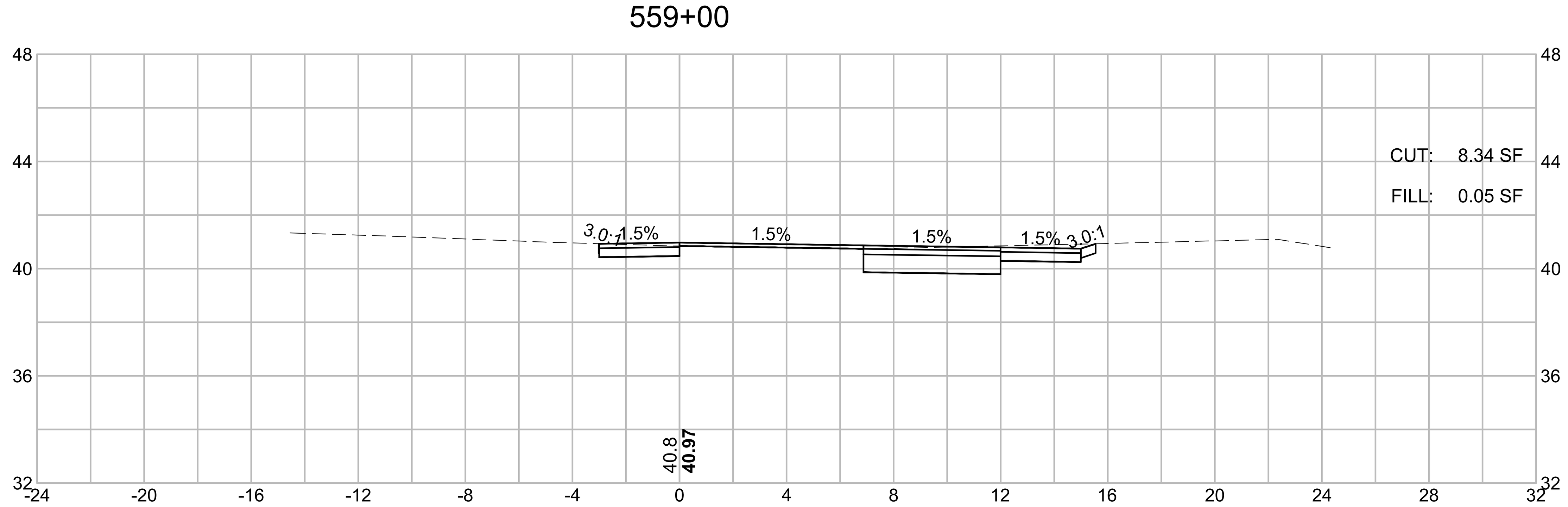

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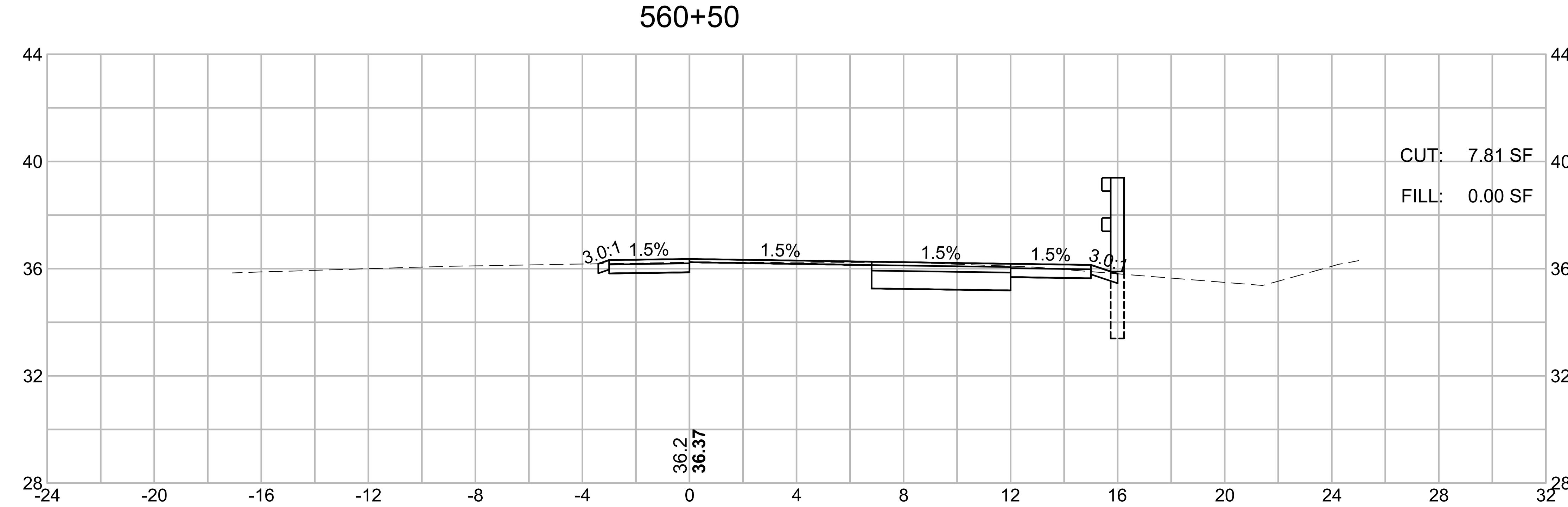


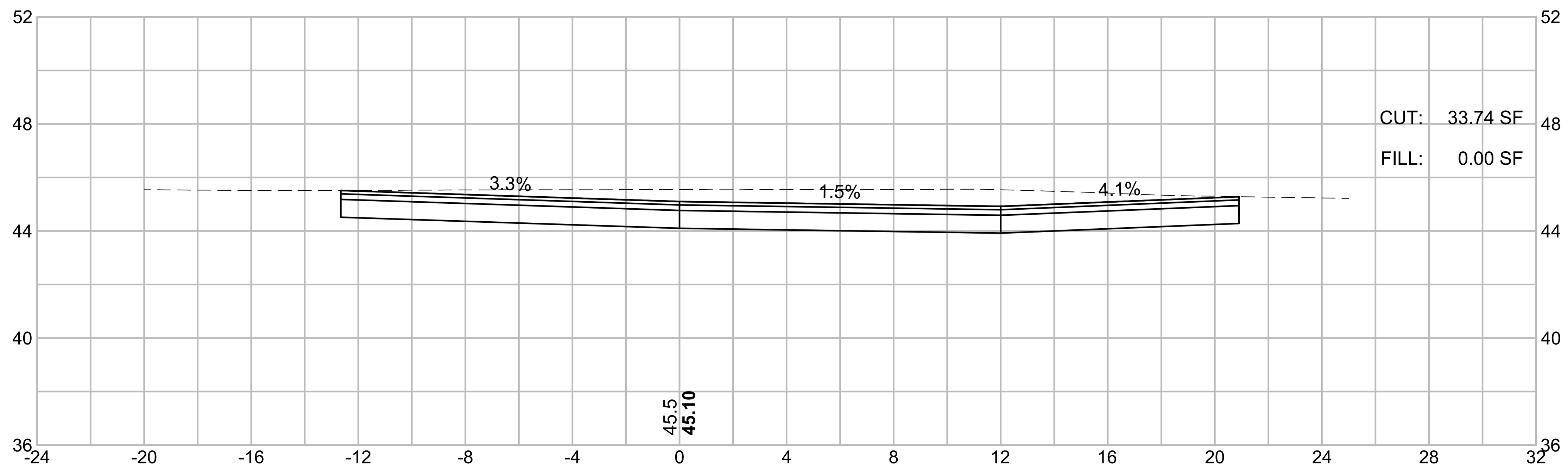
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

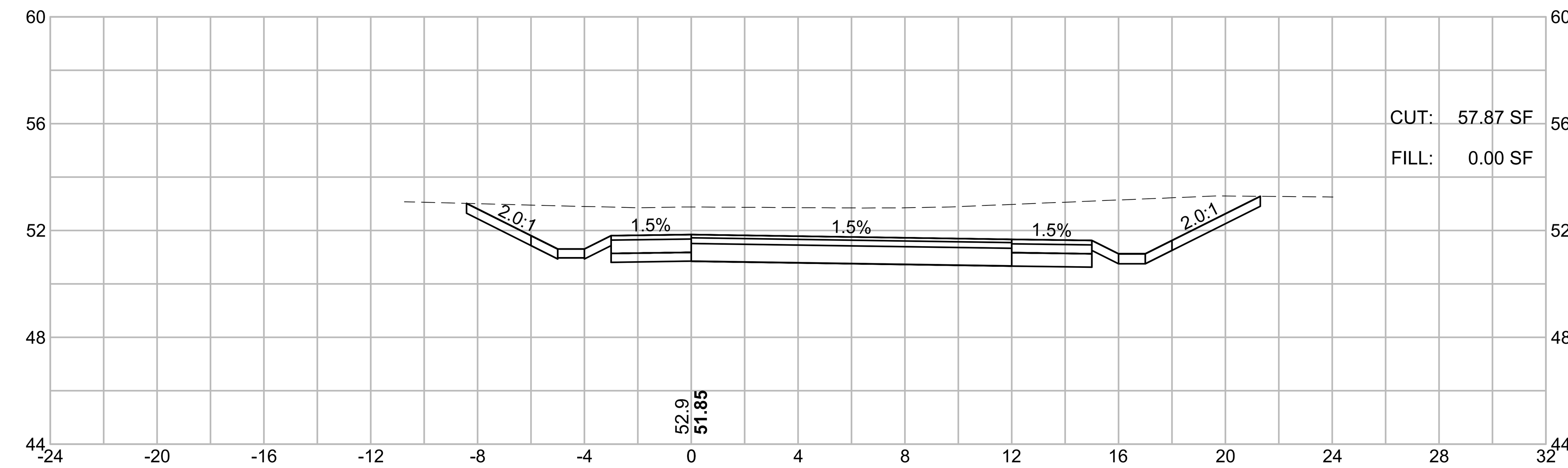
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	223	264
PROJECT FILE NO. 607398			

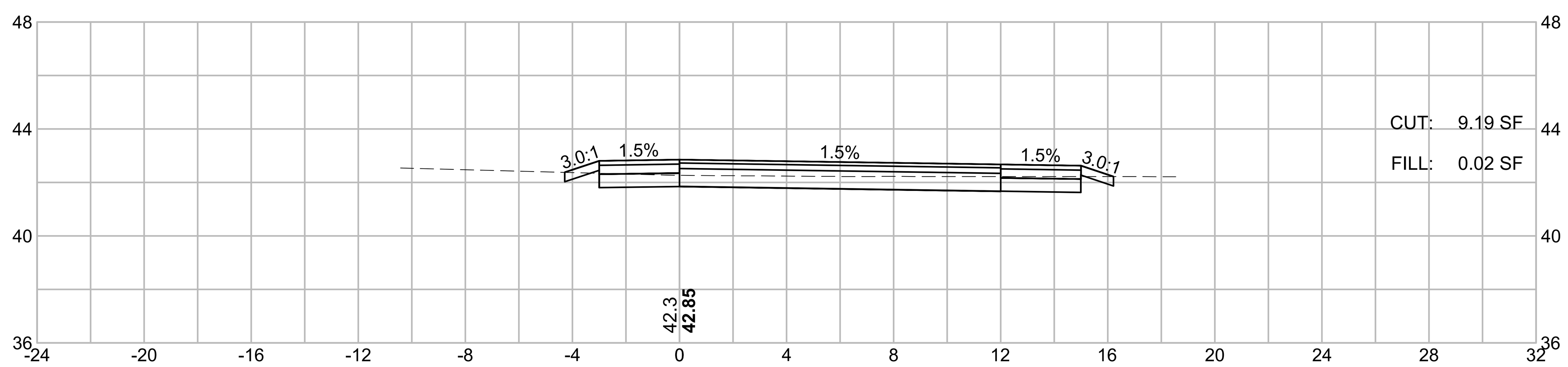
EAST CROSS SECTIONS

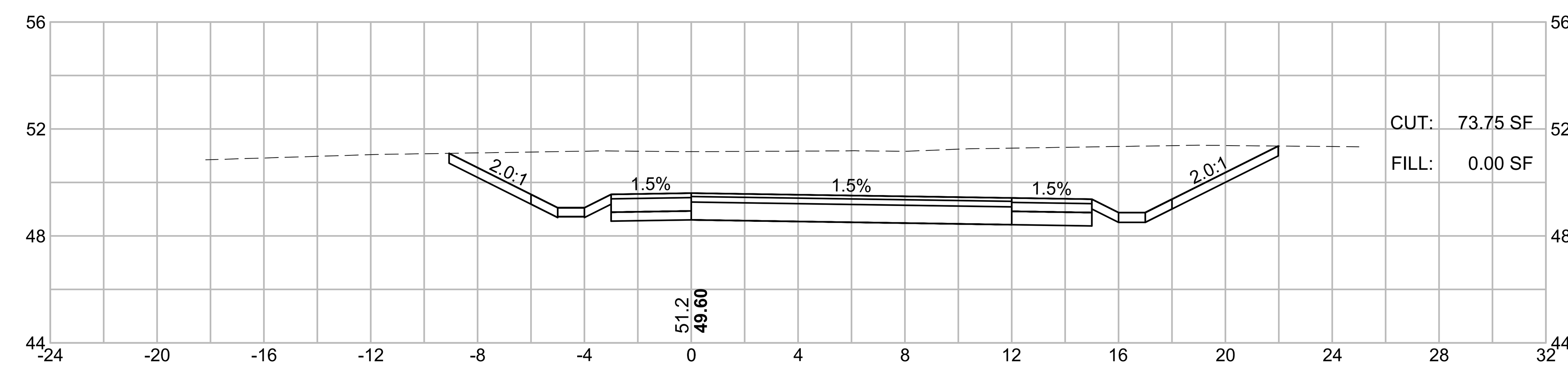
Plotted on 21-Oct-2021 8:49 AM

607398_HD(XSEC-EAST-2).DWG









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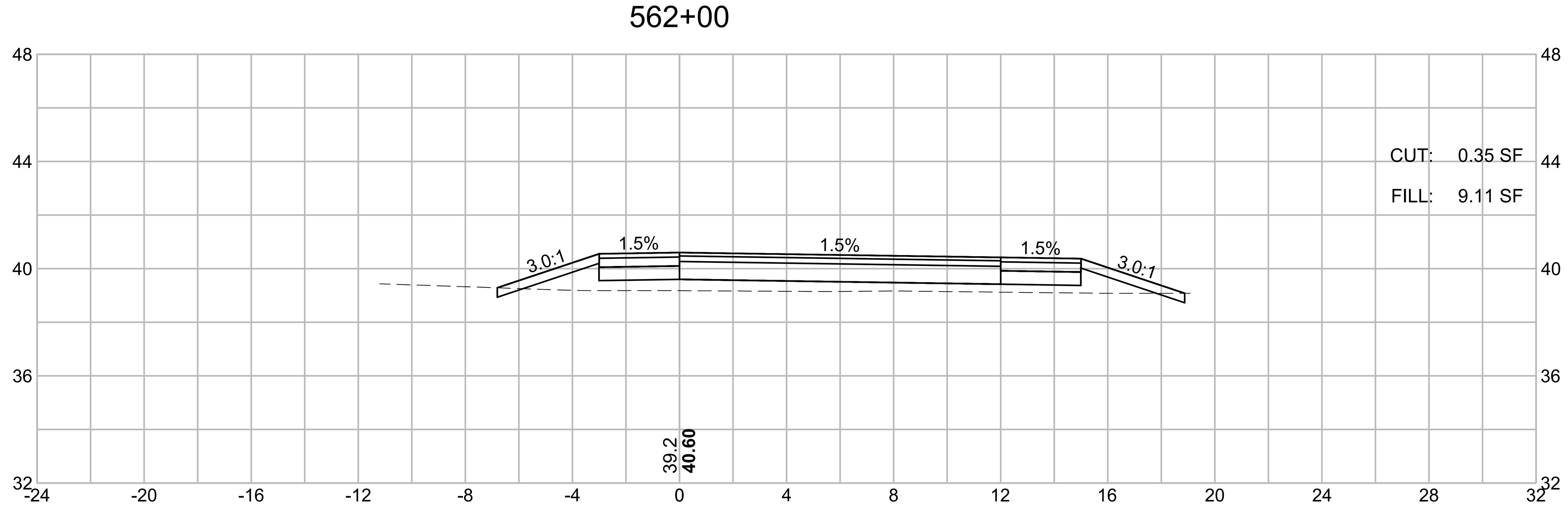
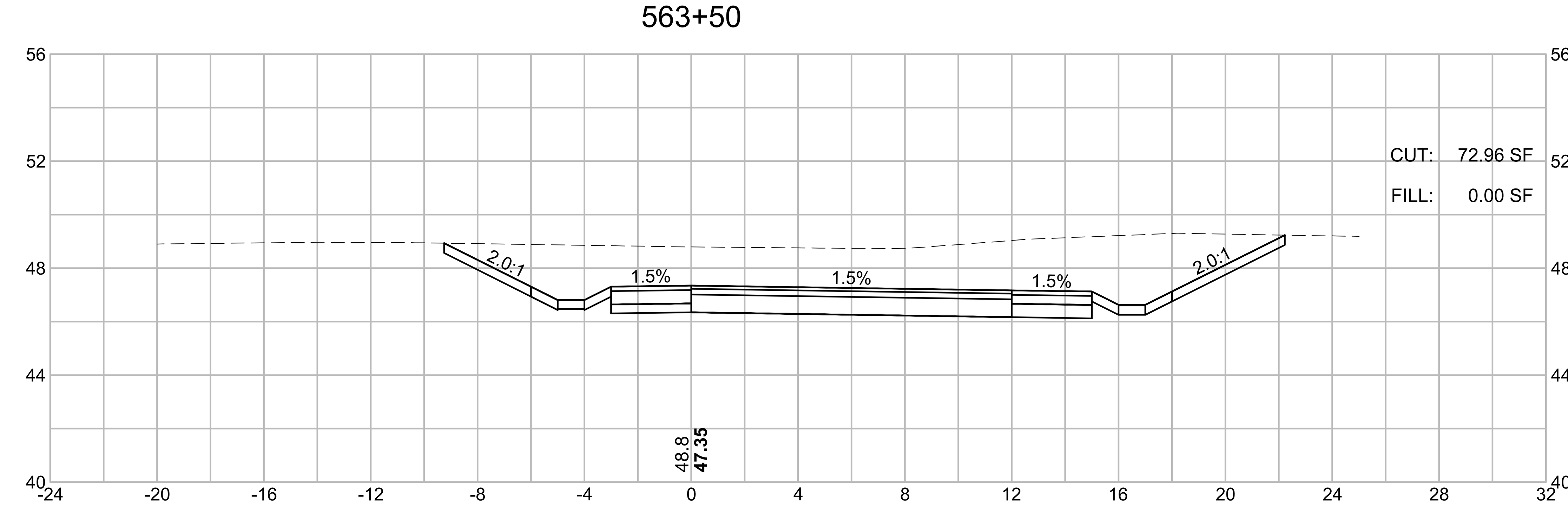
VER. SCALE IN FEET



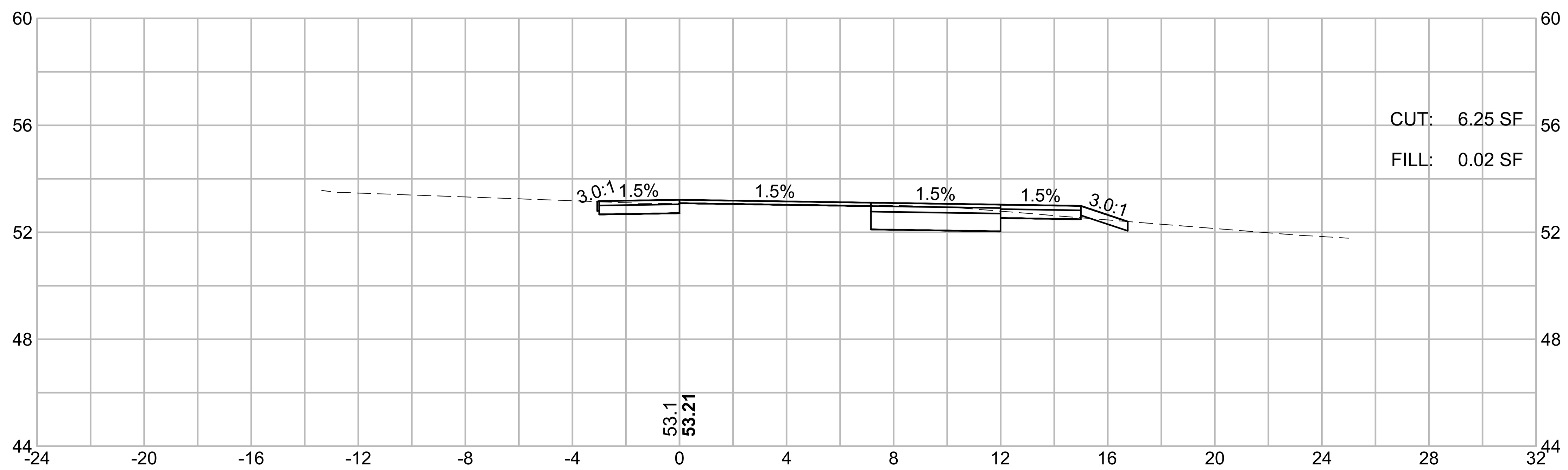


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

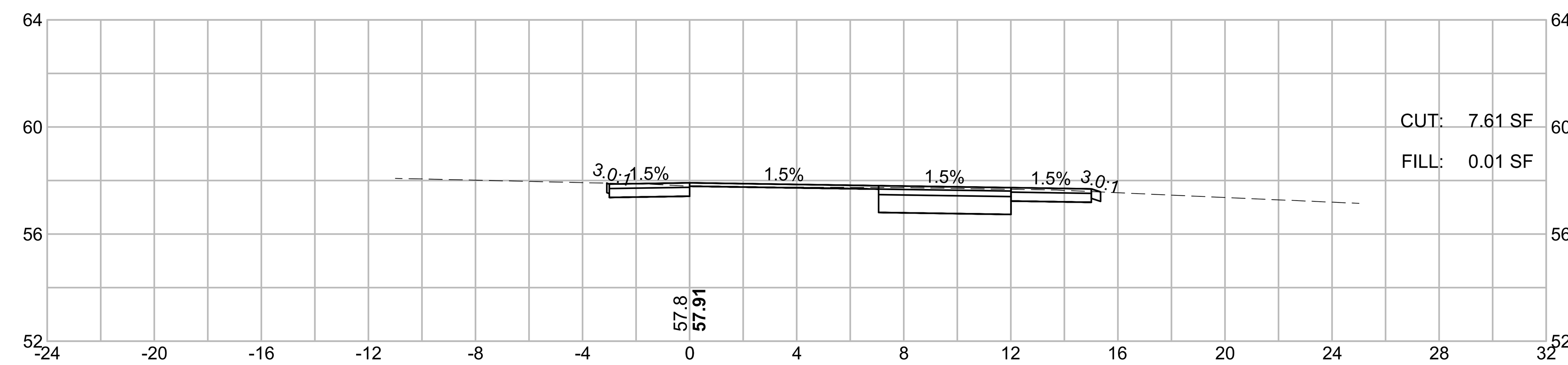
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	224	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

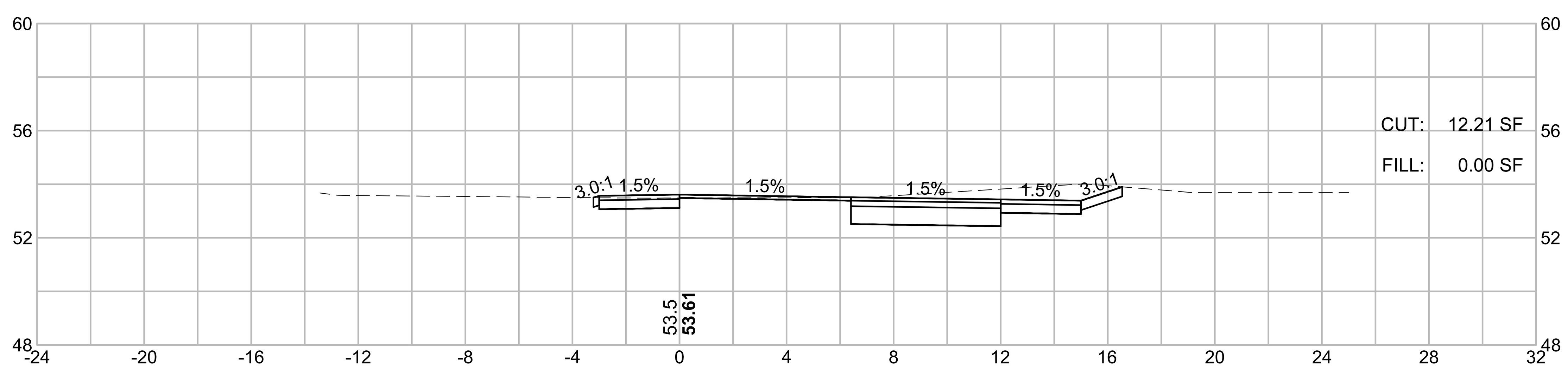
566+00



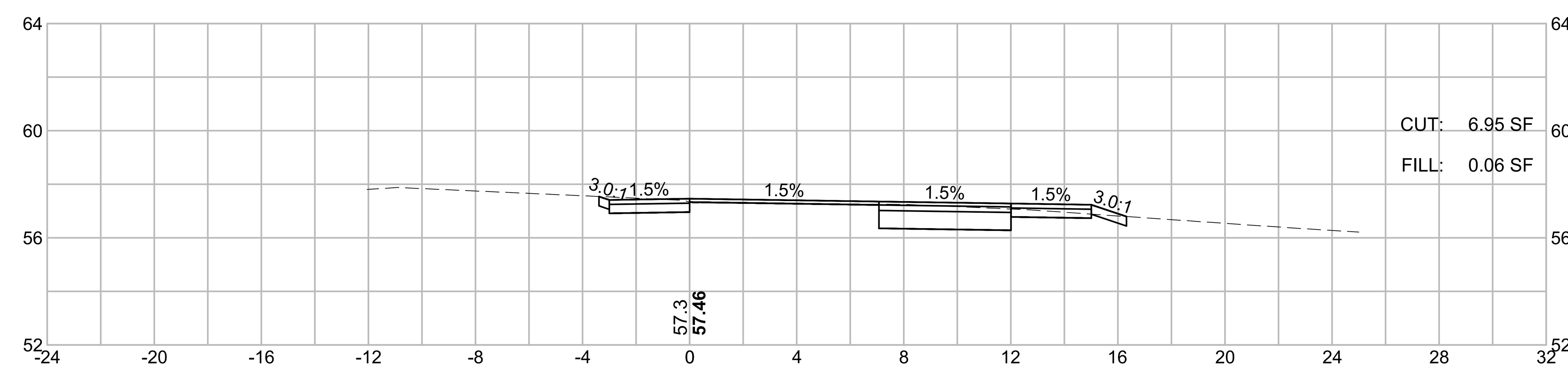
567+50



565+50



567+00



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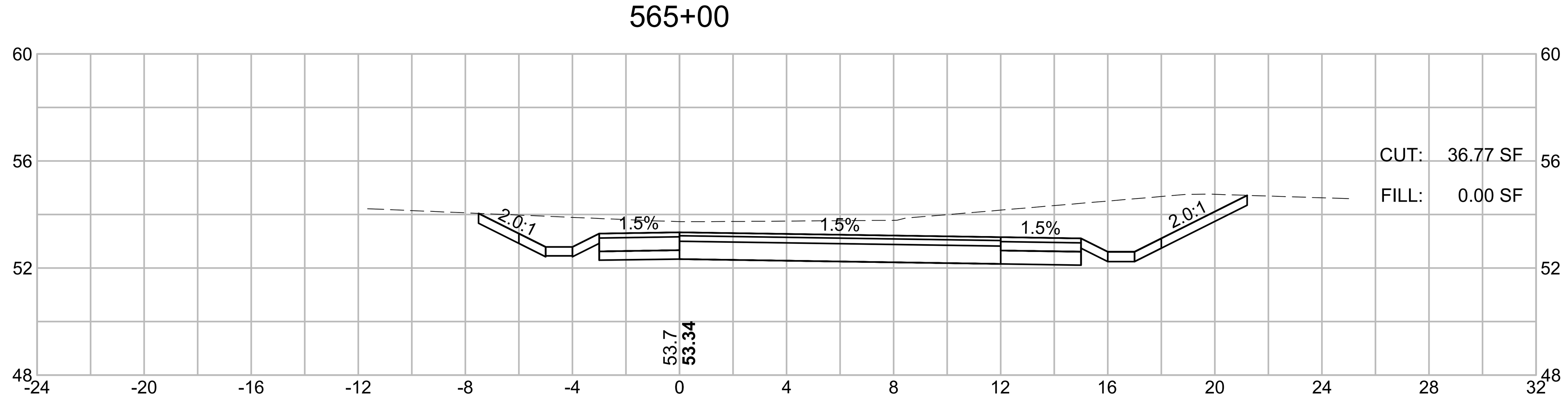
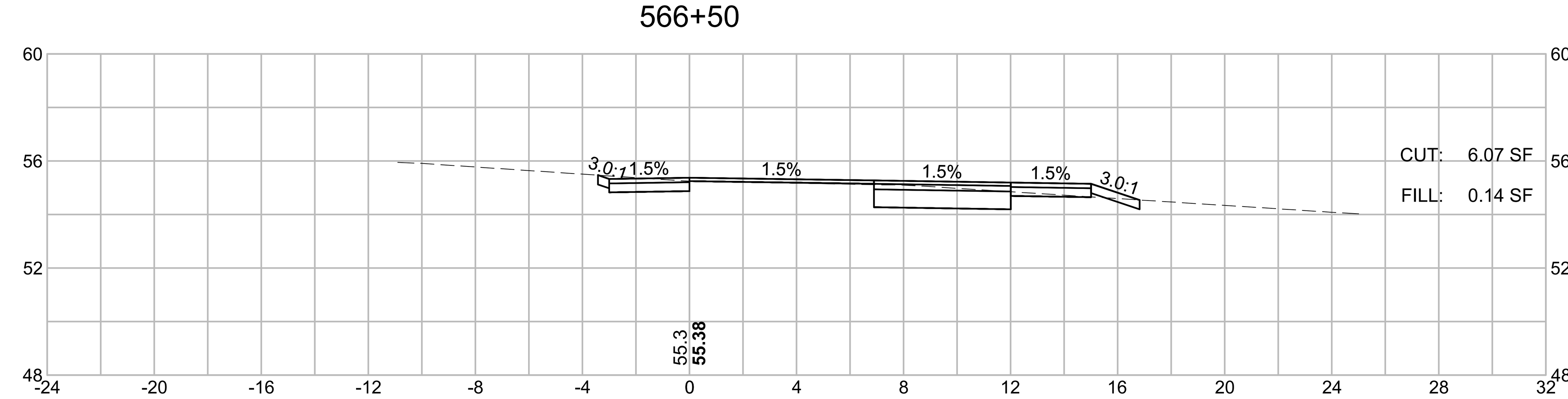
4 0 4 8
VER. SCALE IN FEET

565+00



566+50



607398_HD(XSEC-EAST-2).DWG Plotted on 21-Oct-2021 8:49 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

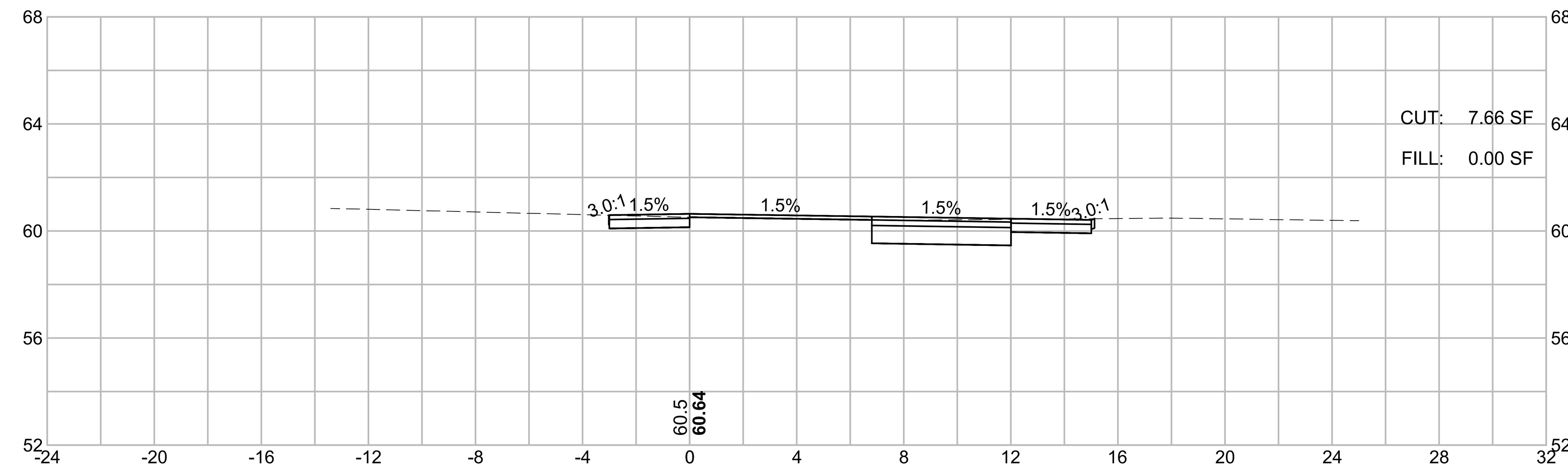
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	225	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

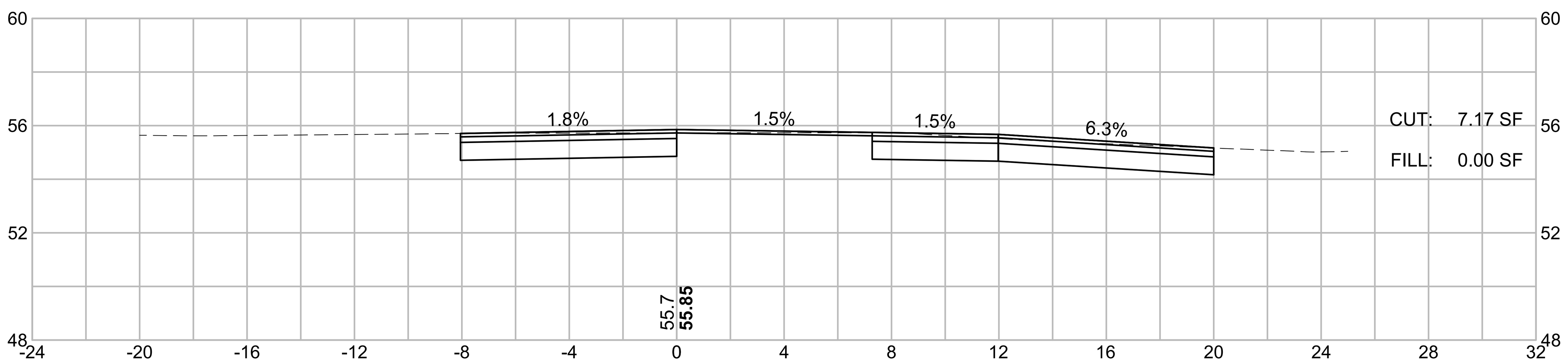
Plotted on 21-Oct-2021 8:50 AM

607398_HD(XSEC-EAST-2).DWG

570+50



569+00



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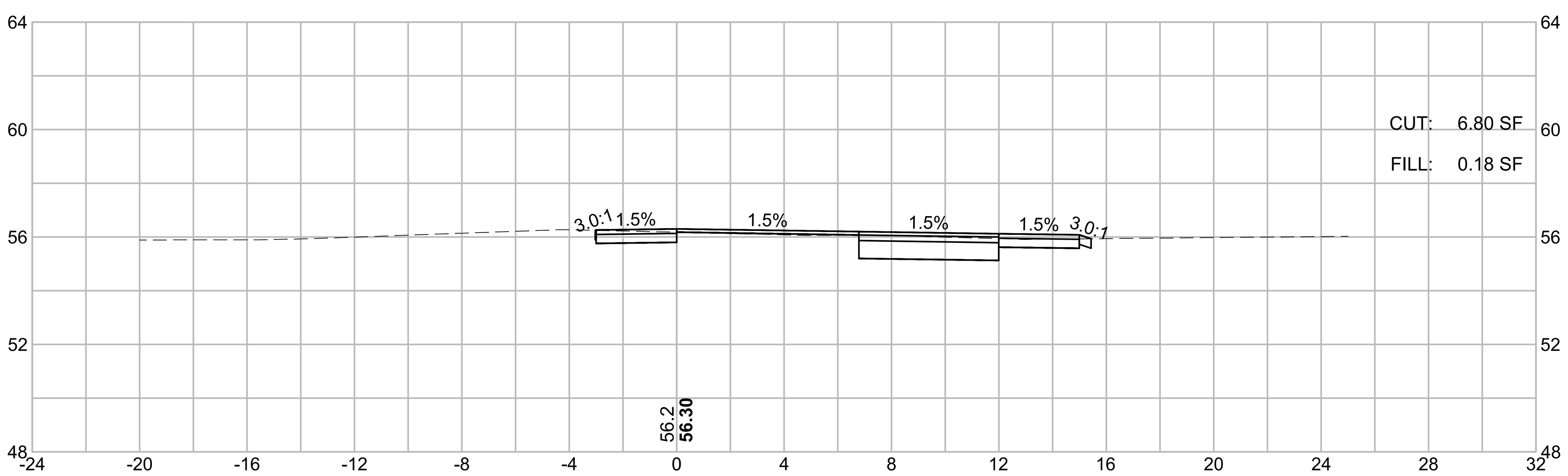

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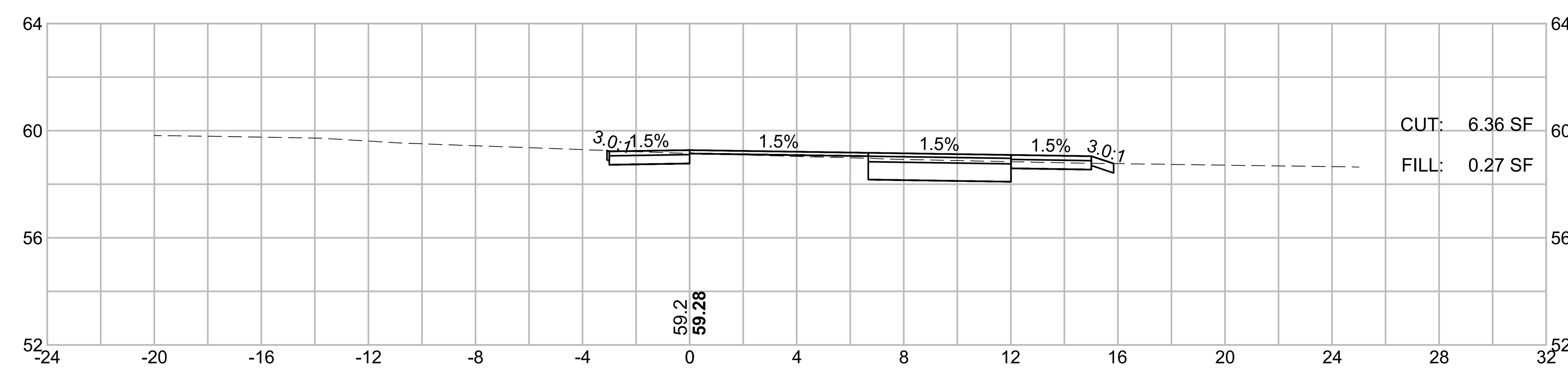
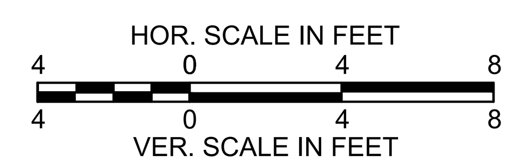
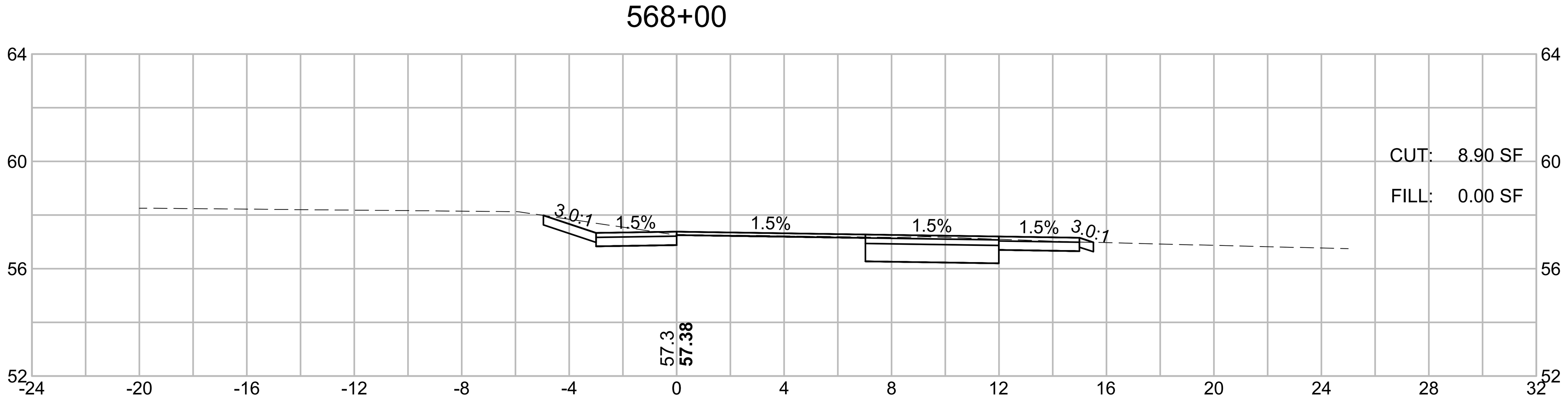
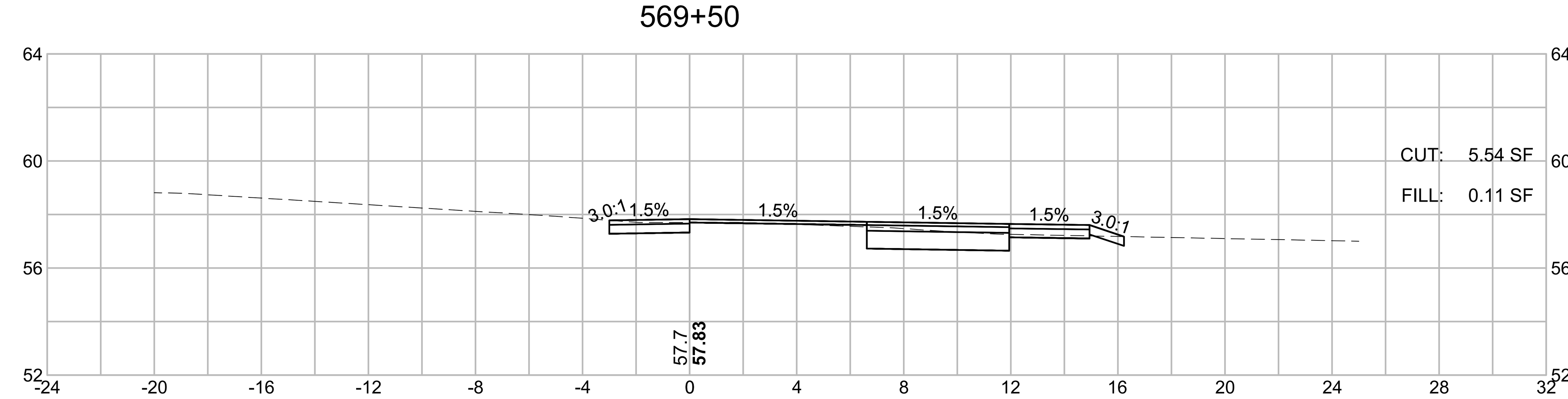




568+00



569+50

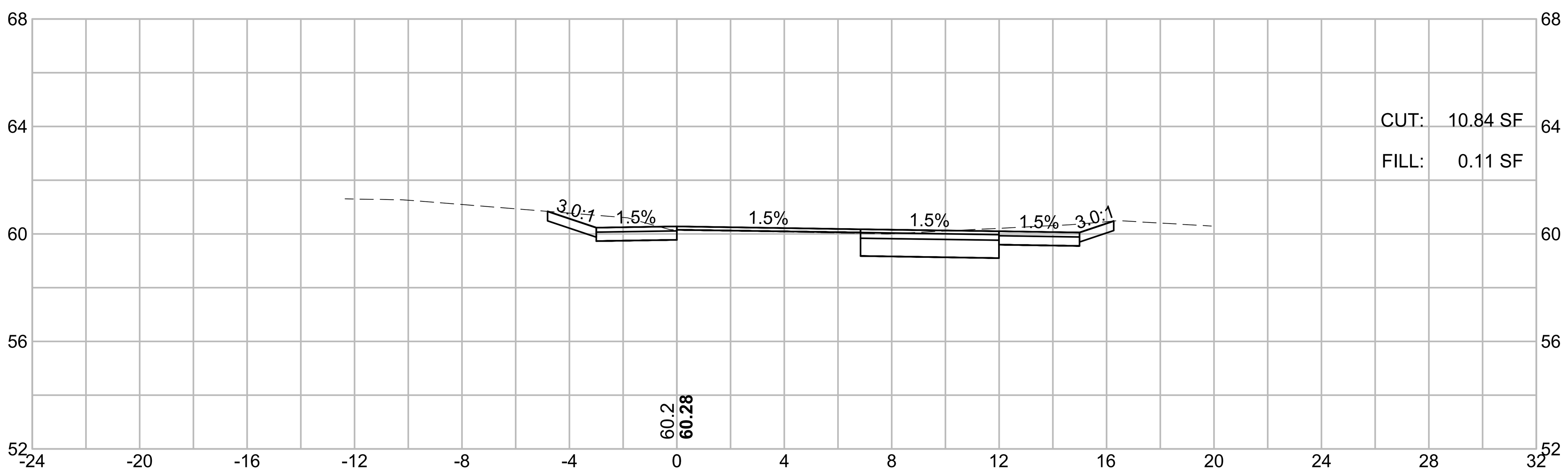


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

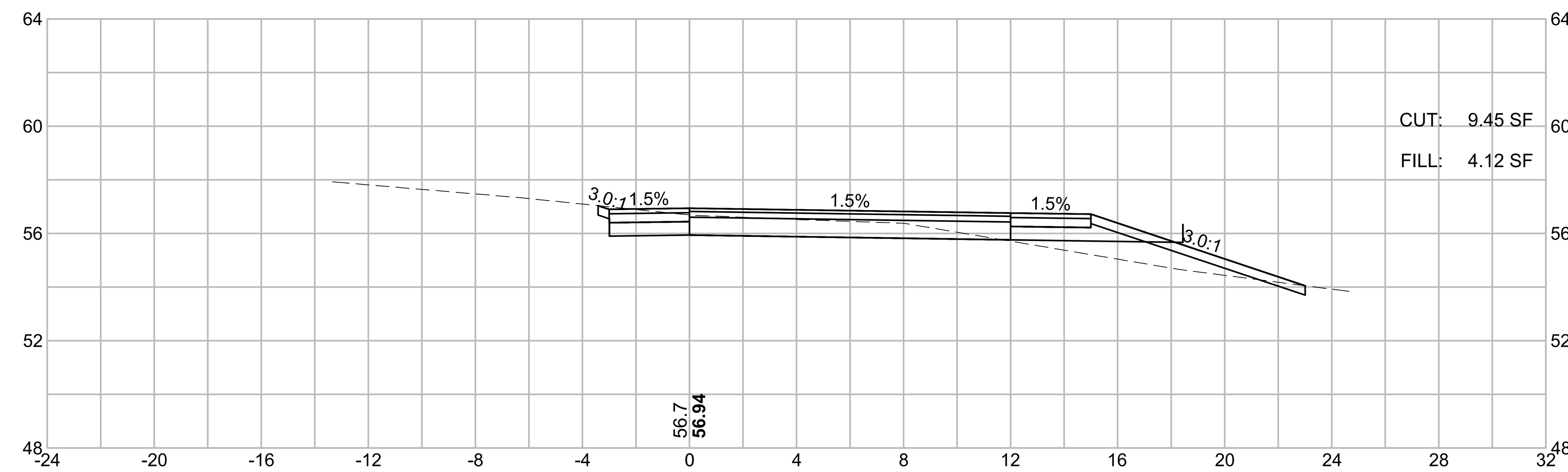
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	226	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

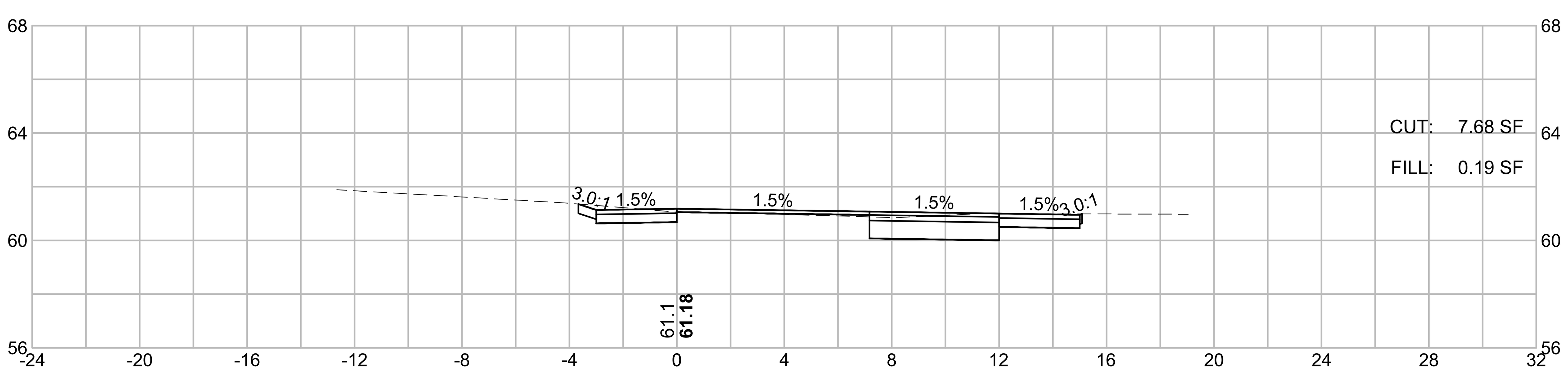
572+00



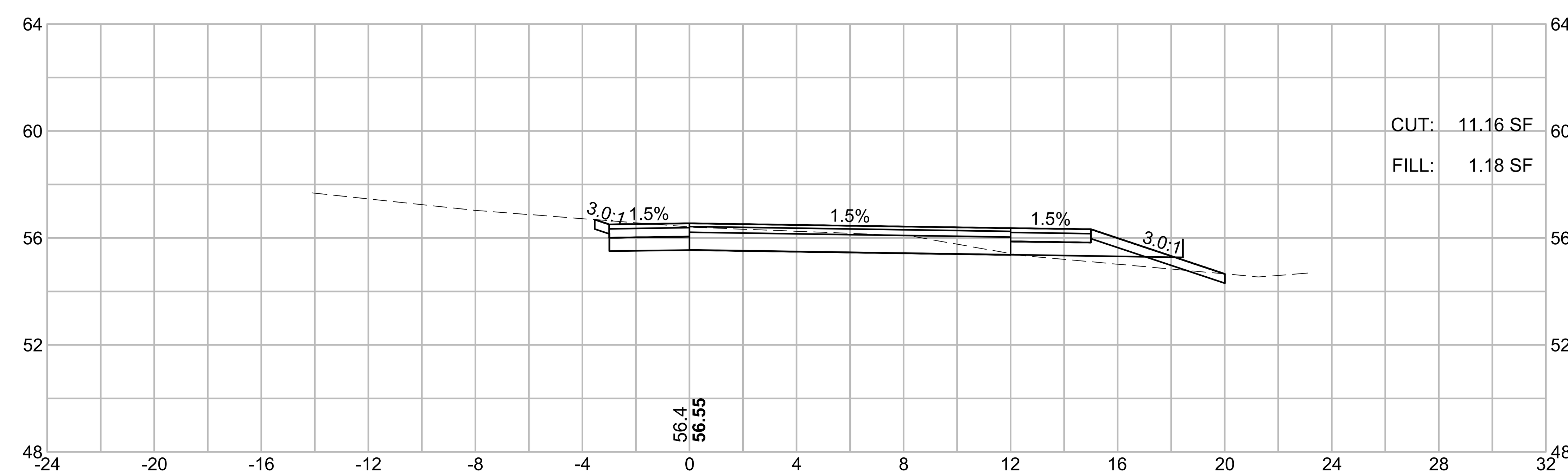
573+50



571+50

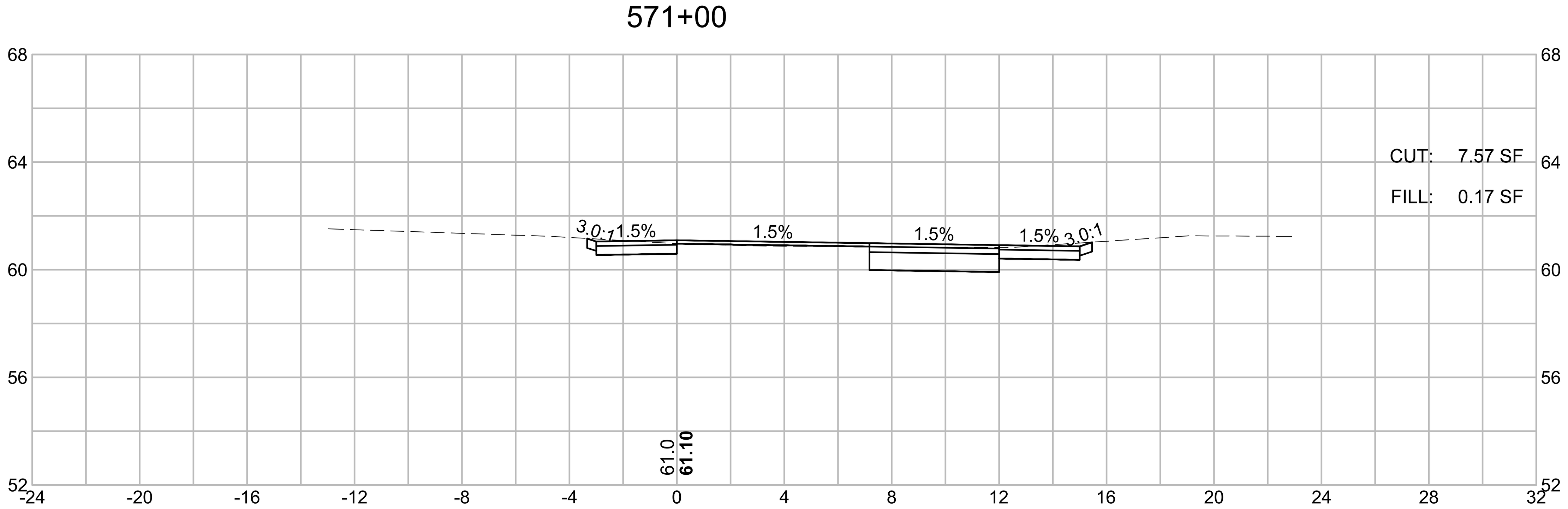


573+00

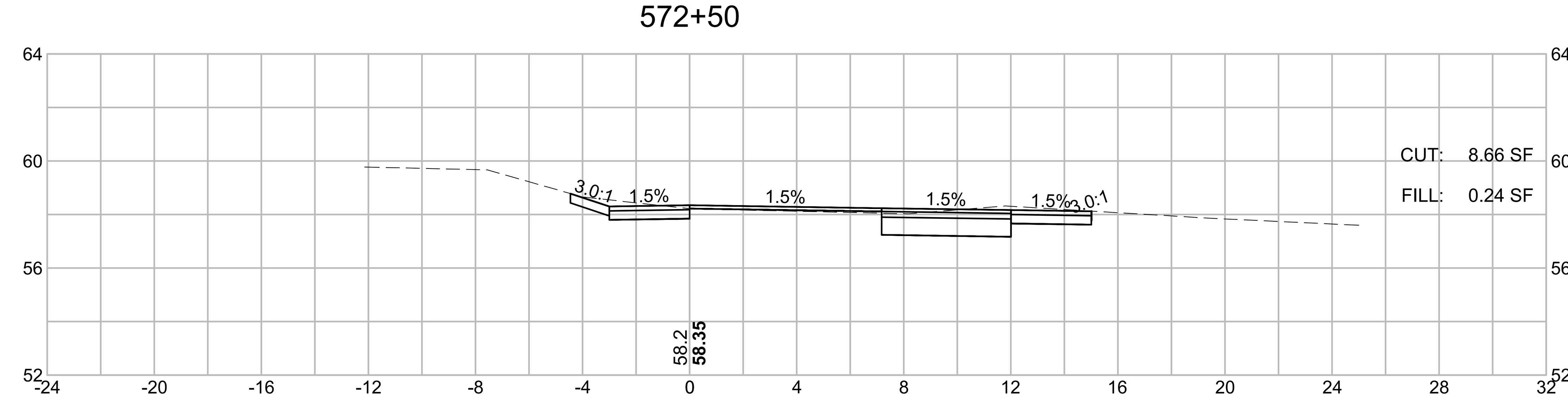


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

571+00



572+50



Plotted on 21-Oct-2021 8:50 AM
607398_HD(XSEC-EAST-2).DWG

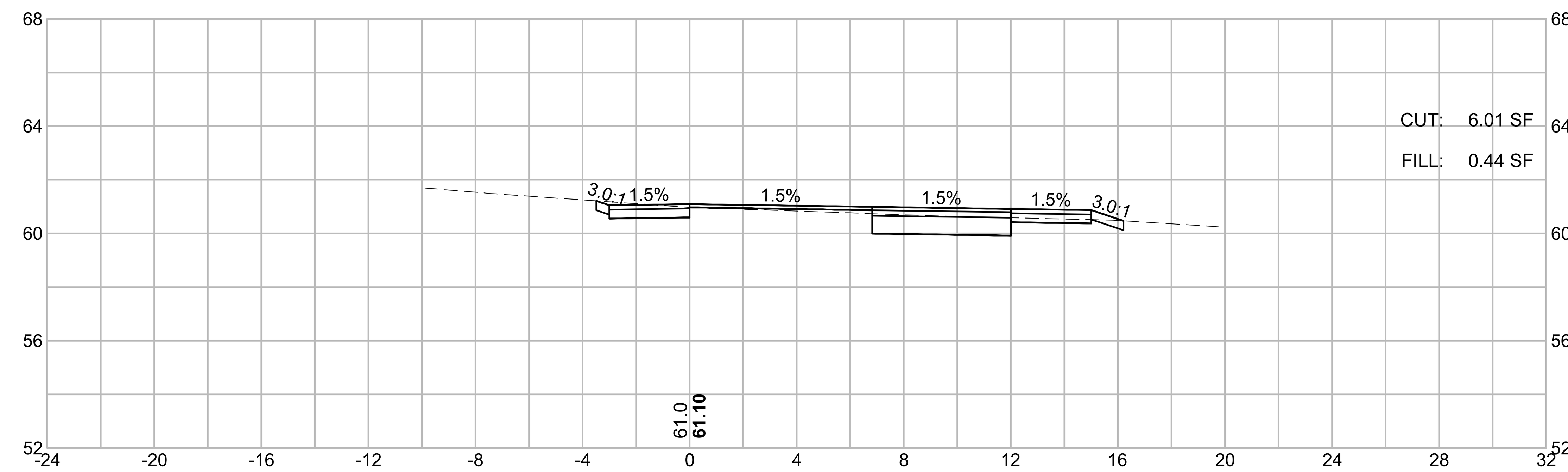
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	227	264

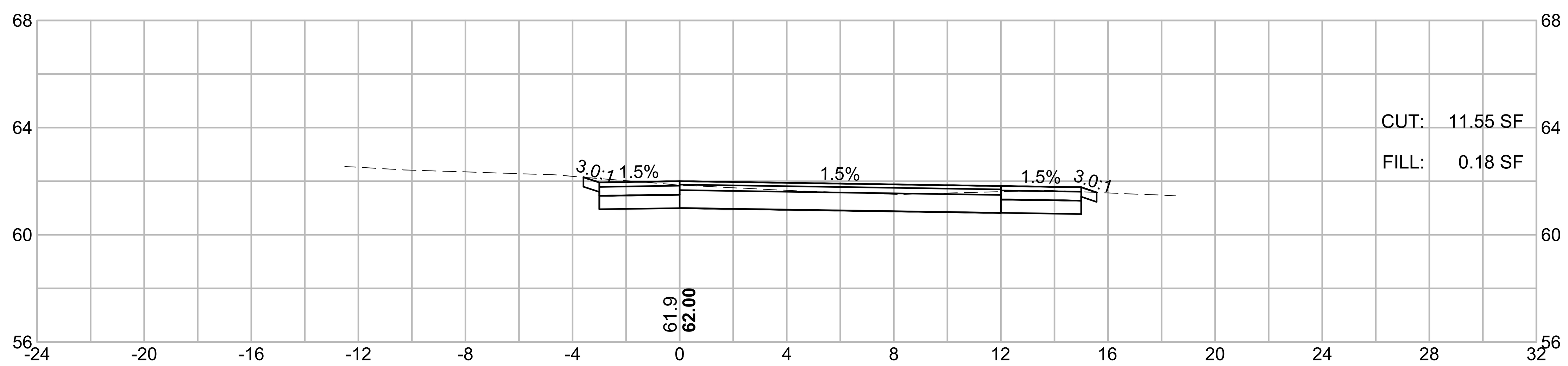
PROJECT FILE NO. 607398

EAST CROSS SECTIONS

576+50



575+00



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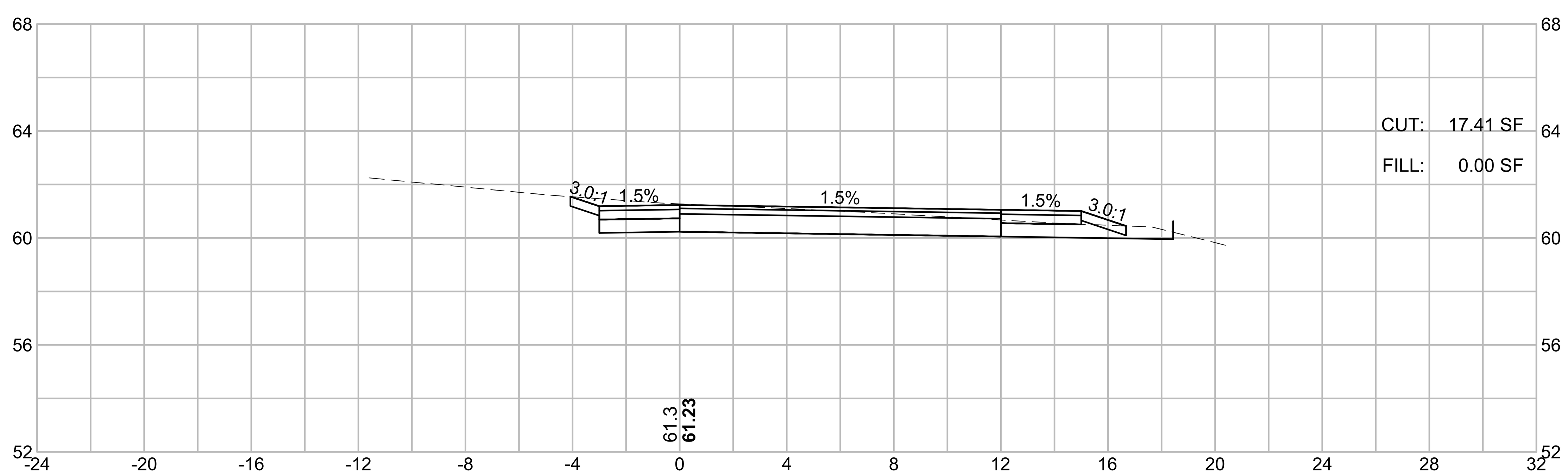

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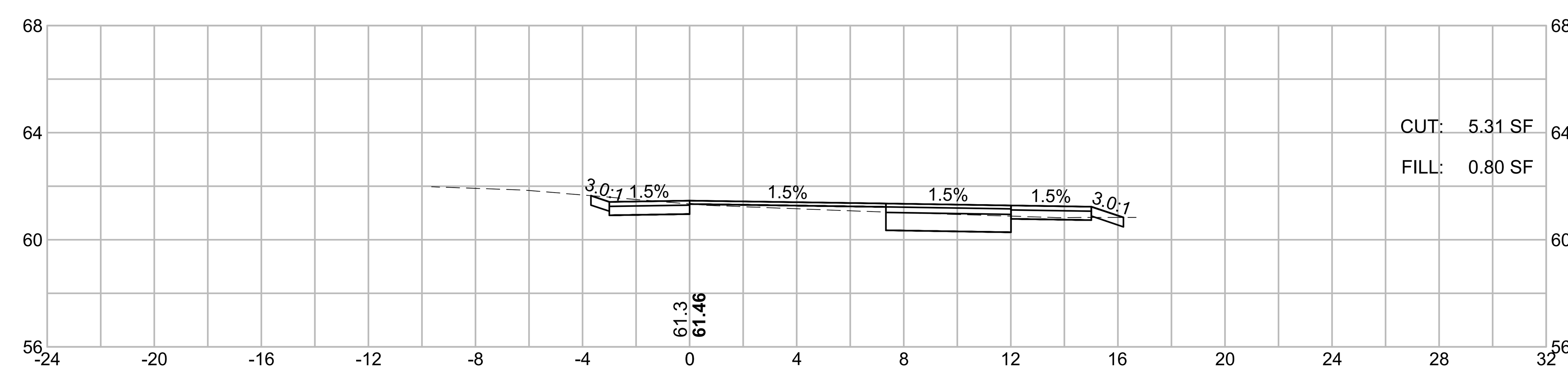
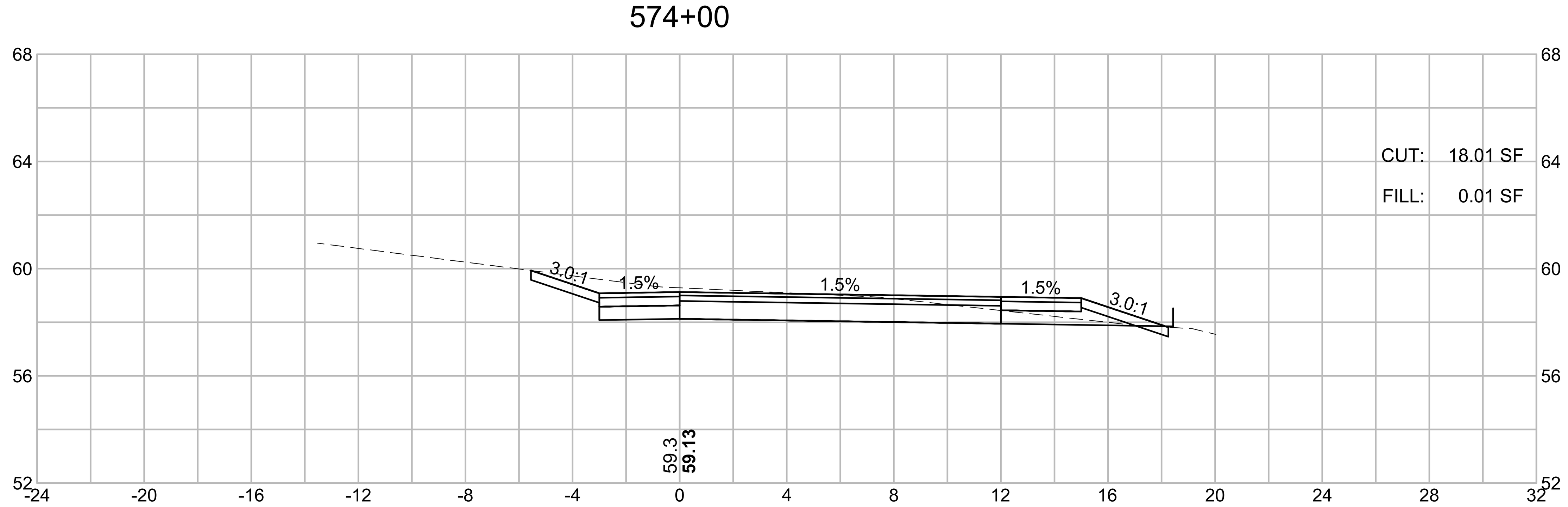
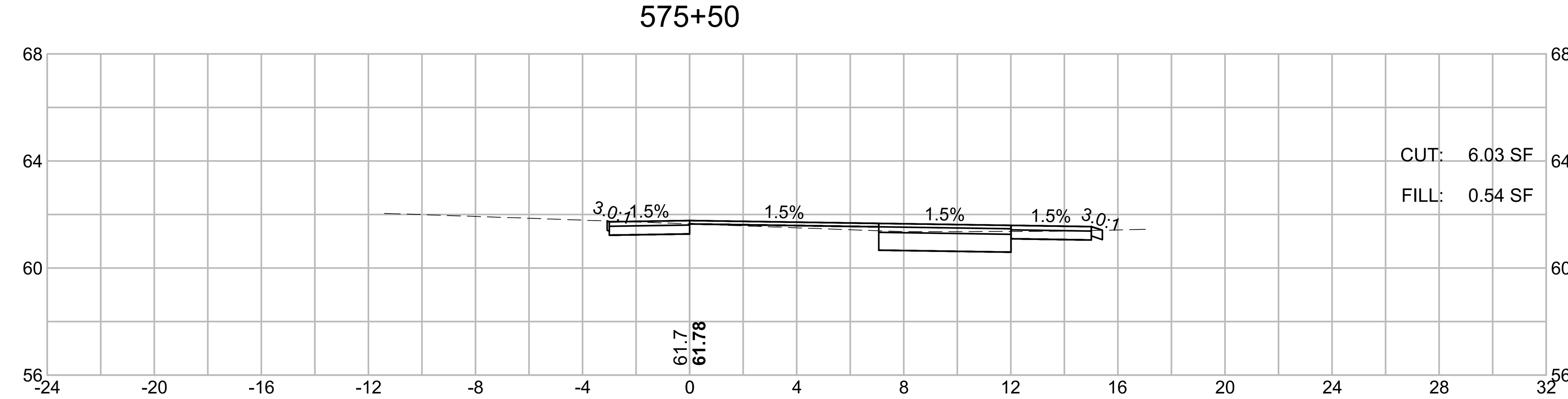


HOR. SCALE IN FEET
VER. SCALE IN FEET

574+00



575+50

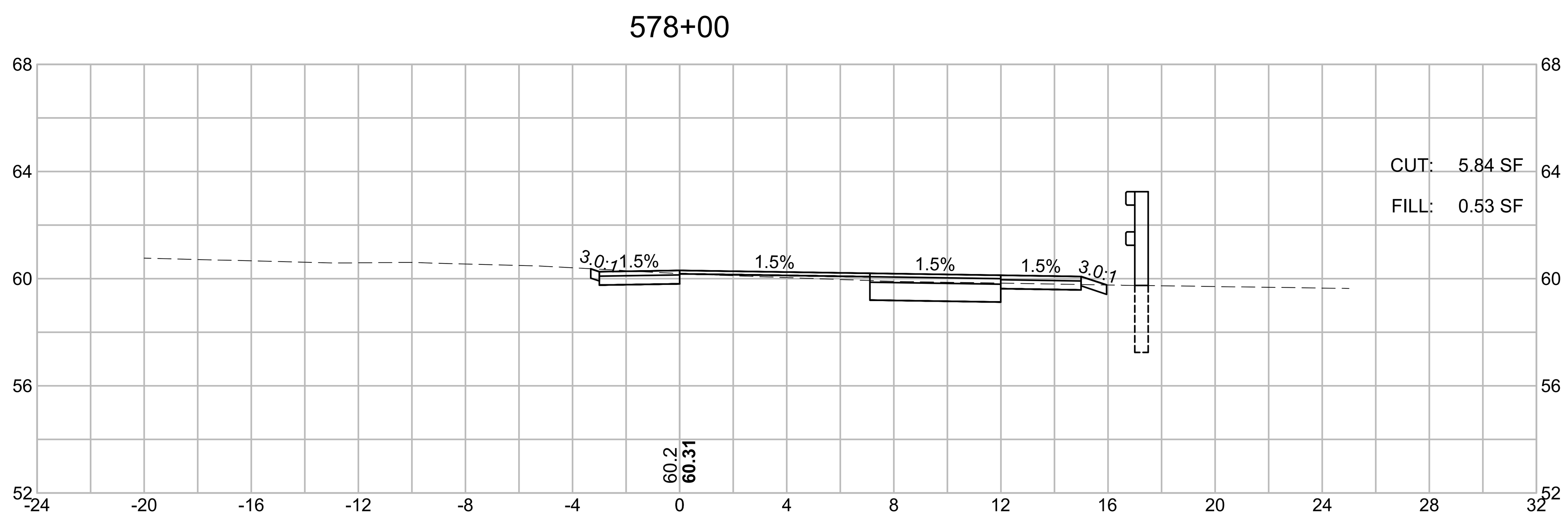


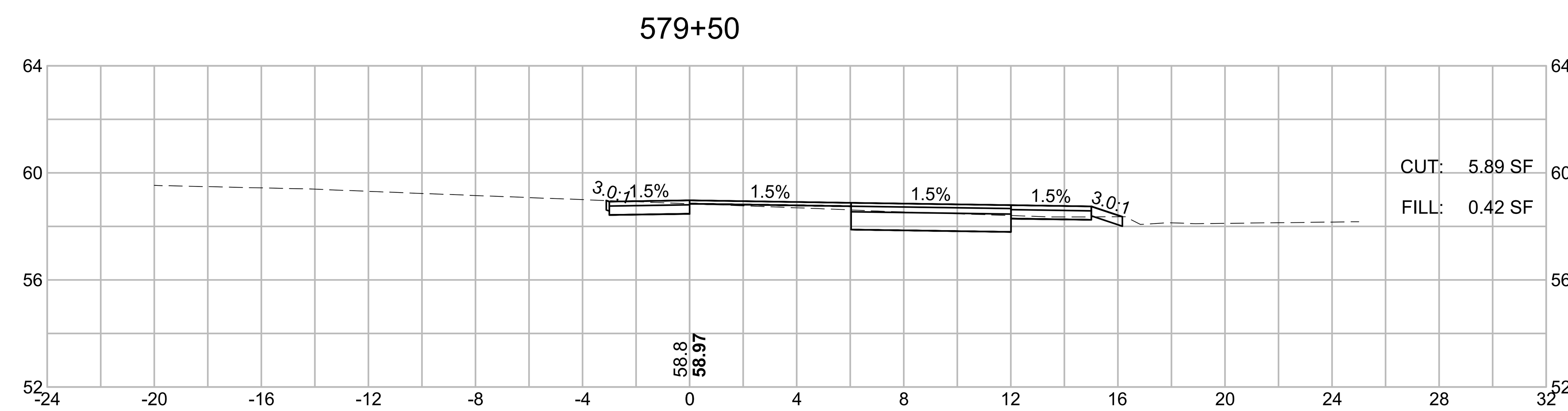
Plotted on 21-Oct-2021 8:50 AM
607398_HD(XSEC-EAST-2).DWG

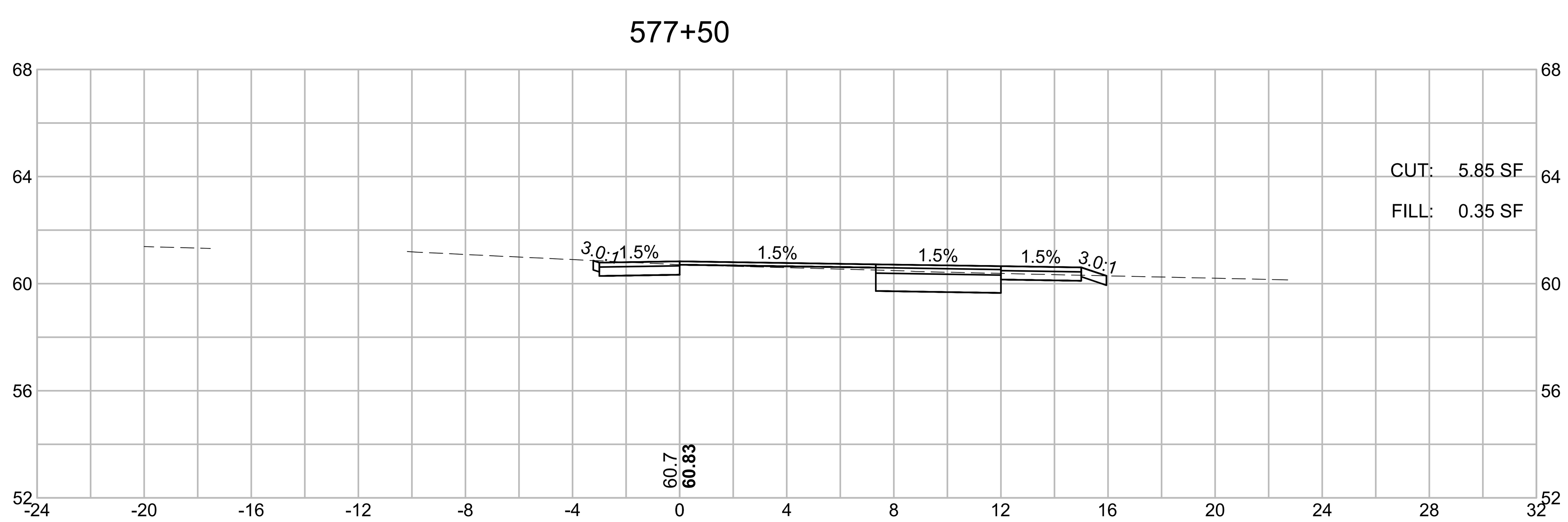
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

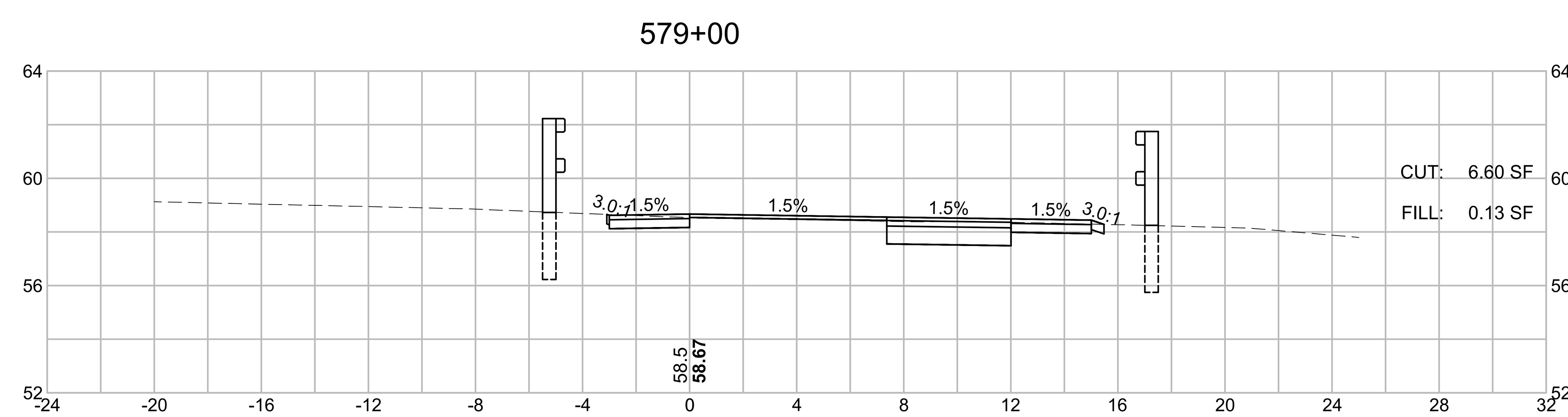
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	228	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

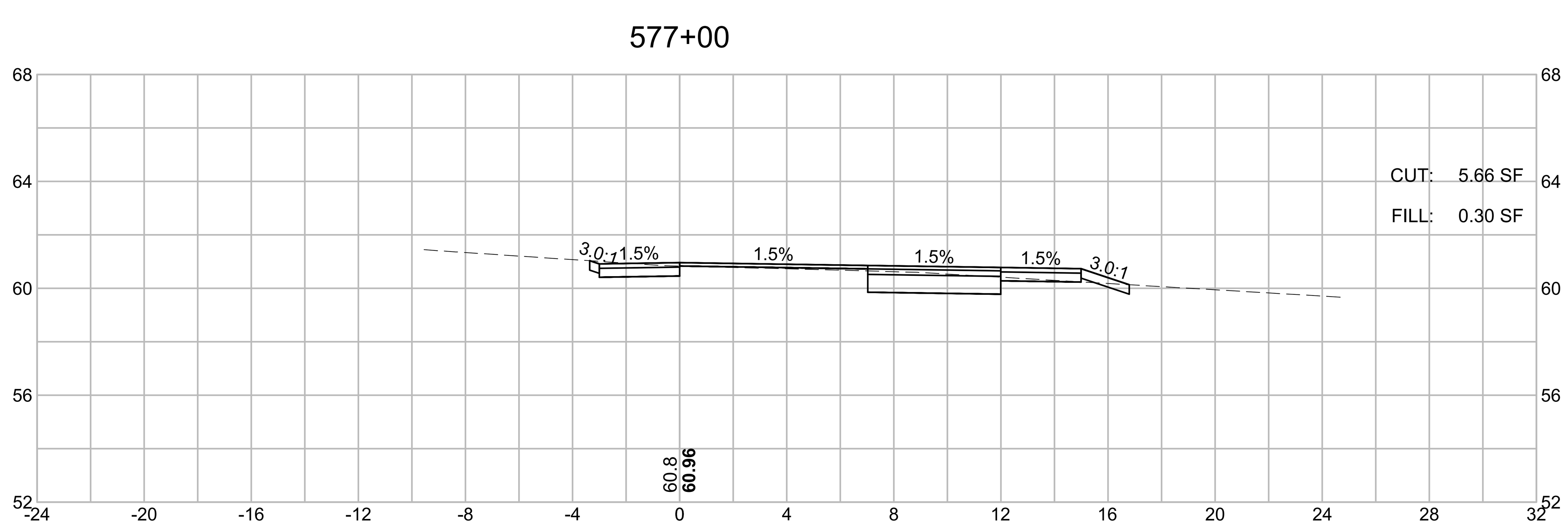


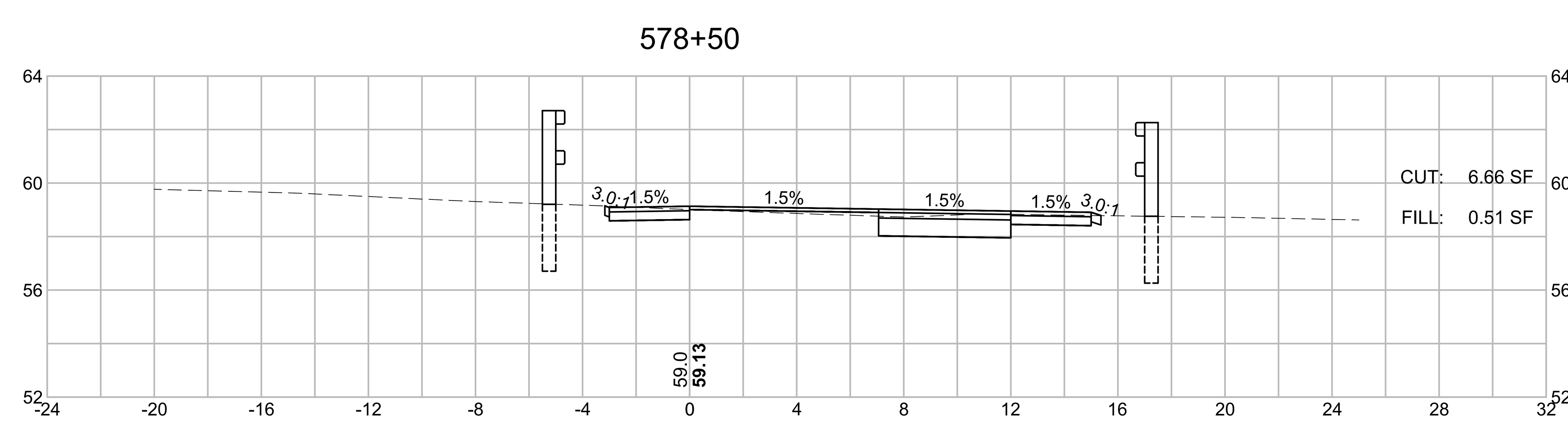






HOR. SCALE IN FEET
VER. SCALE IN FEET





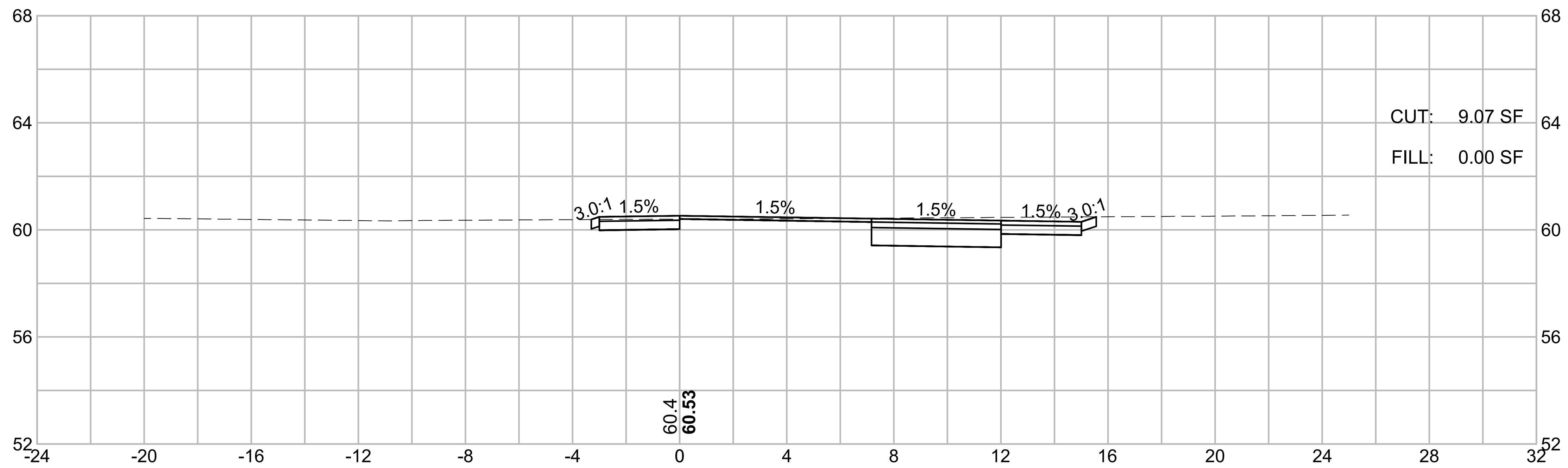
Plotted on 21-Oct-2021 8:50 AM
607398_HD(XSEC-EAST-2).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

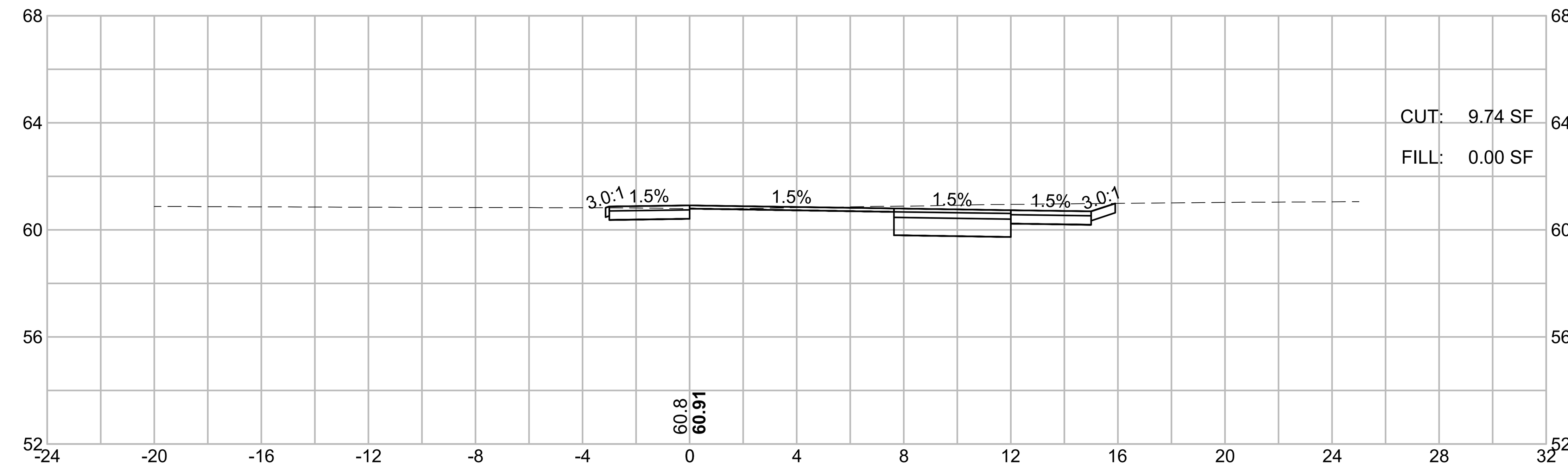
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	229	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

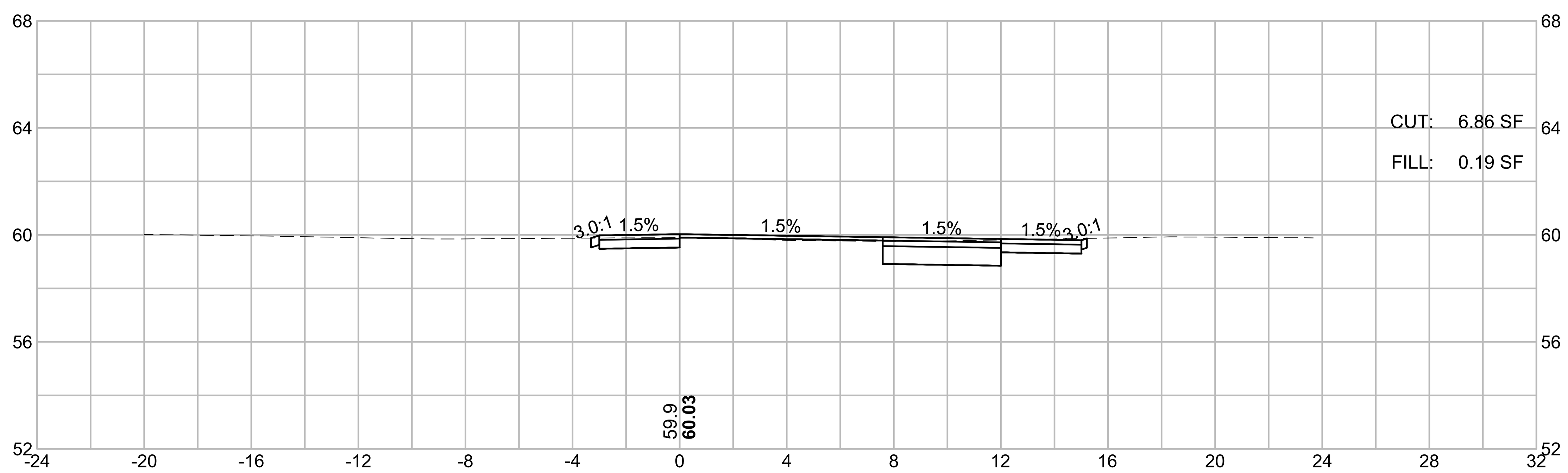
581+00



582+50



580+50



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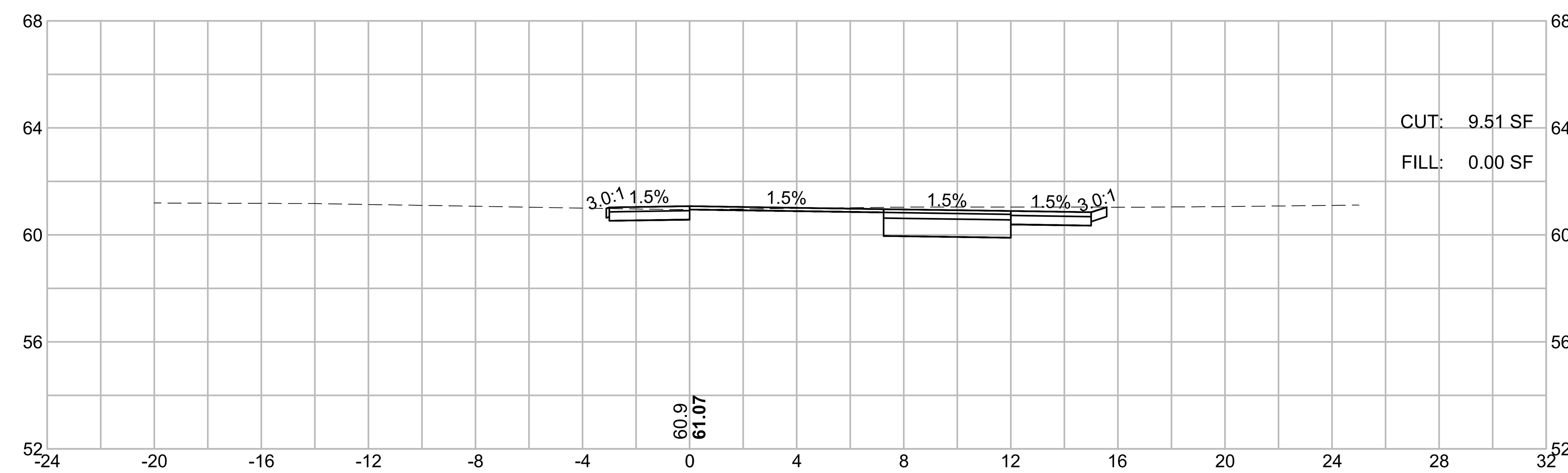
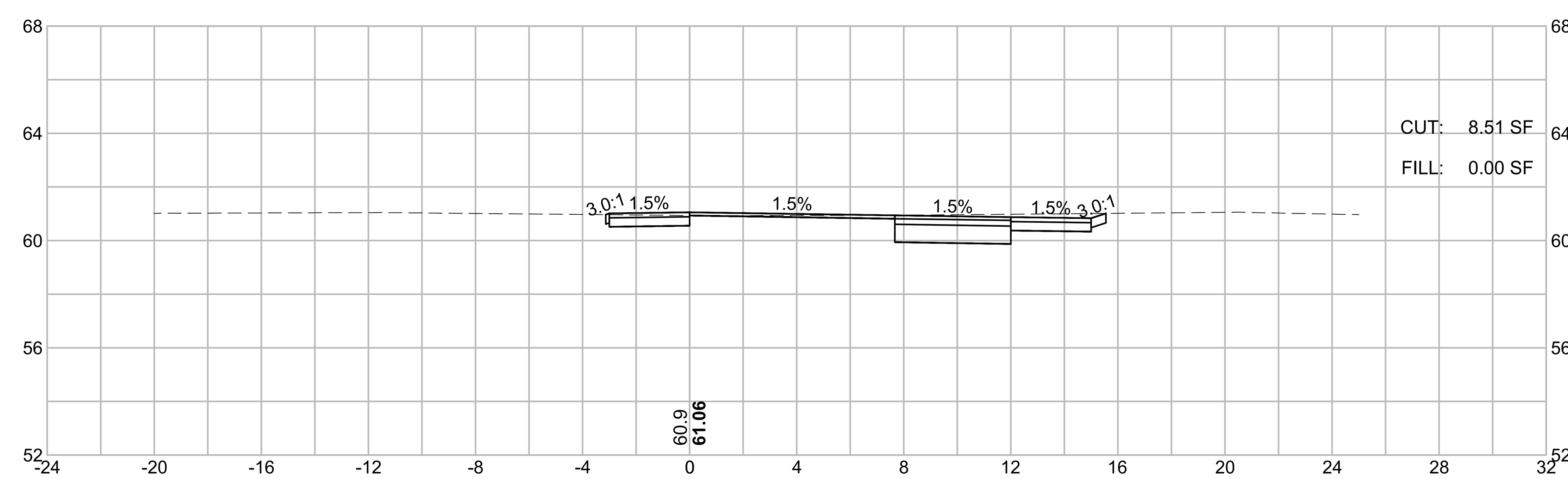


HOR. SCALE IN FEET
VER. SCALE IN FEET

581+50



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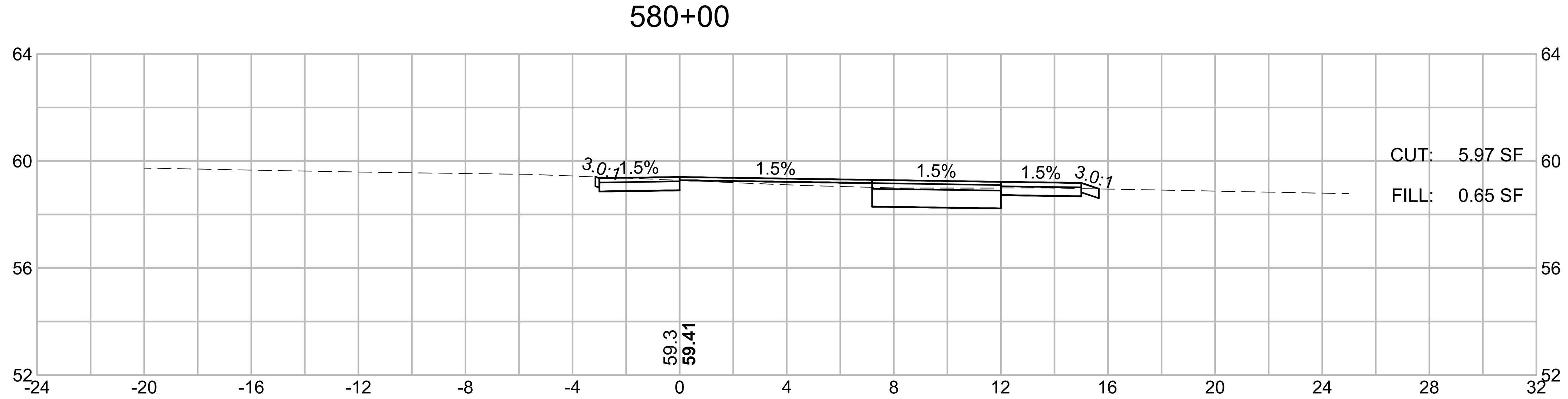


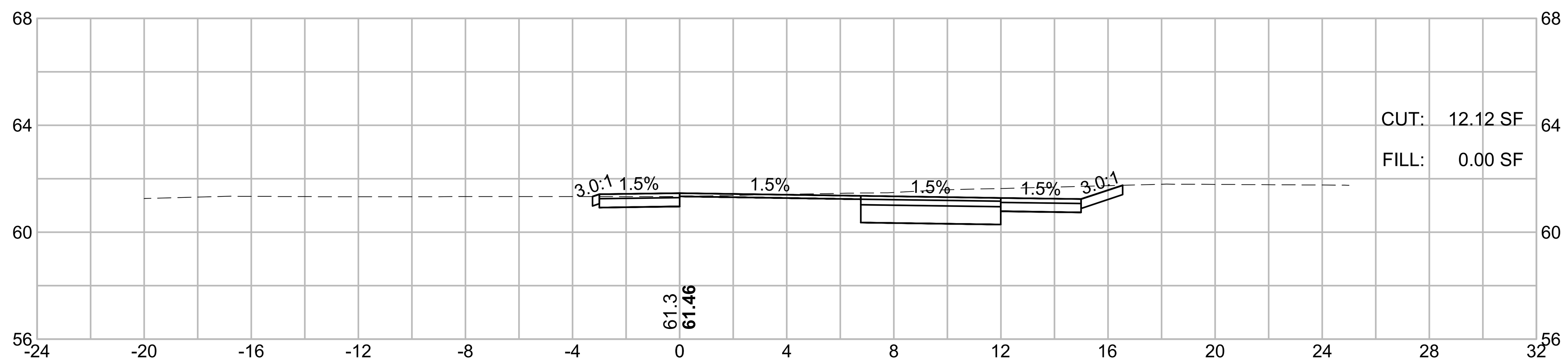
607398_HD(XSEC-EAST-2).DWG Plotted on 21-Oct-2021 8:50 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

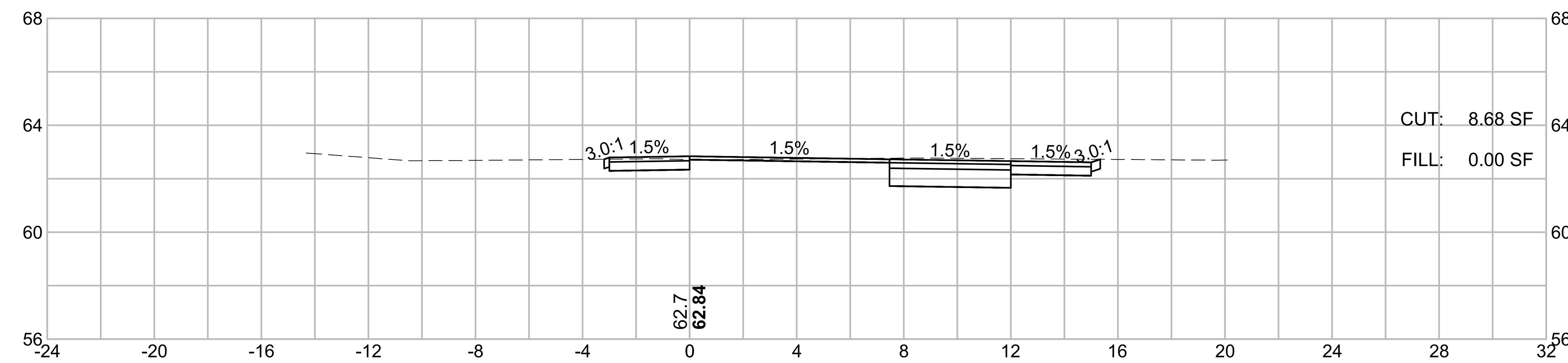
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	230	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

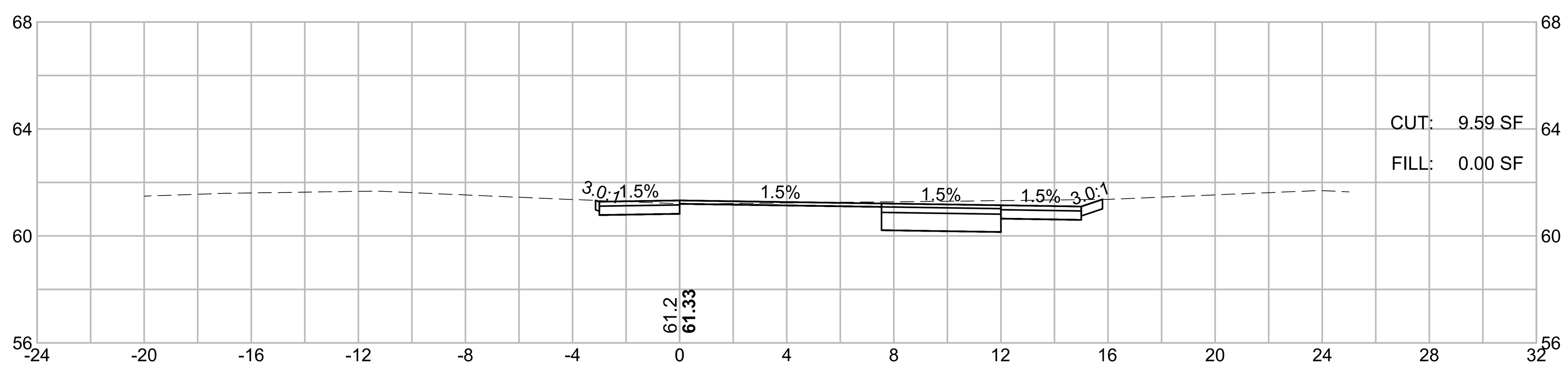
584+00



585+50



583+50



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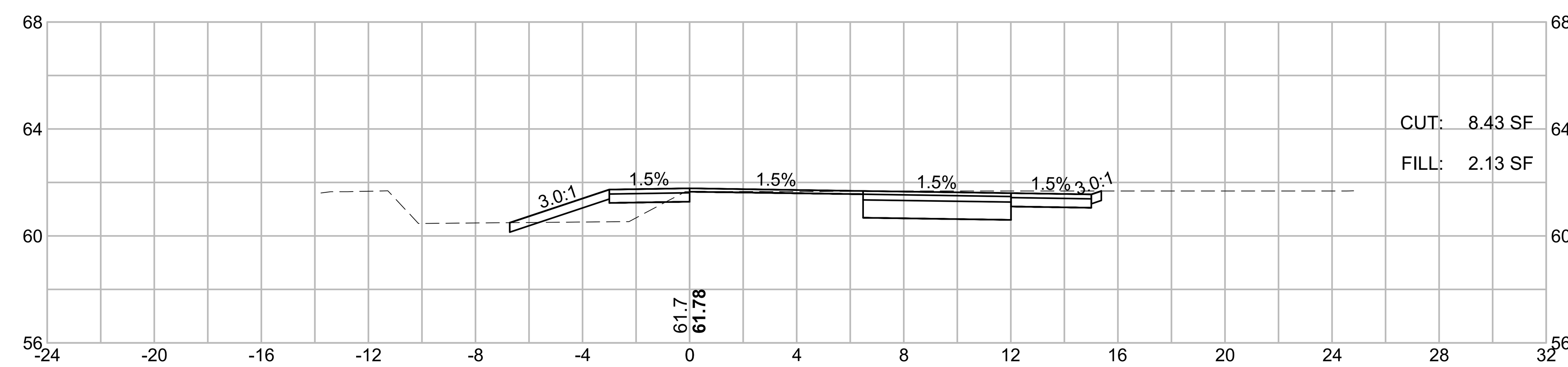

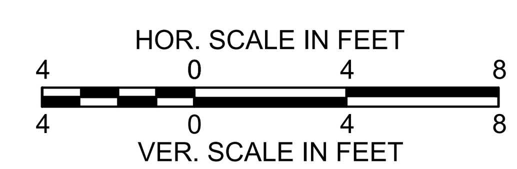

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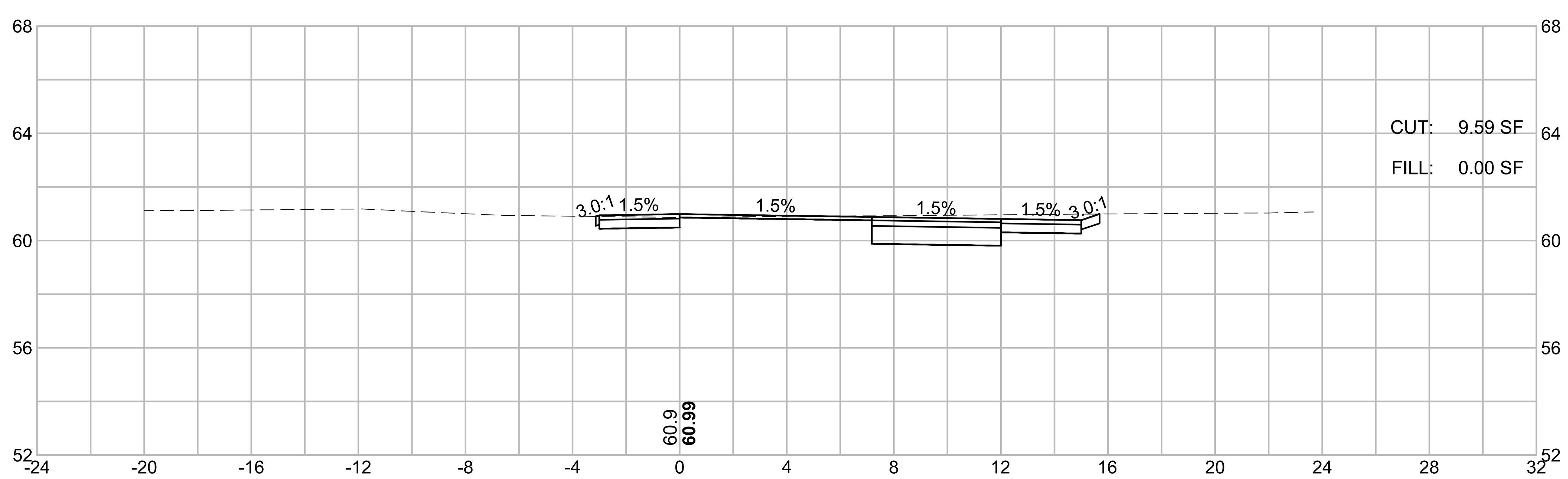

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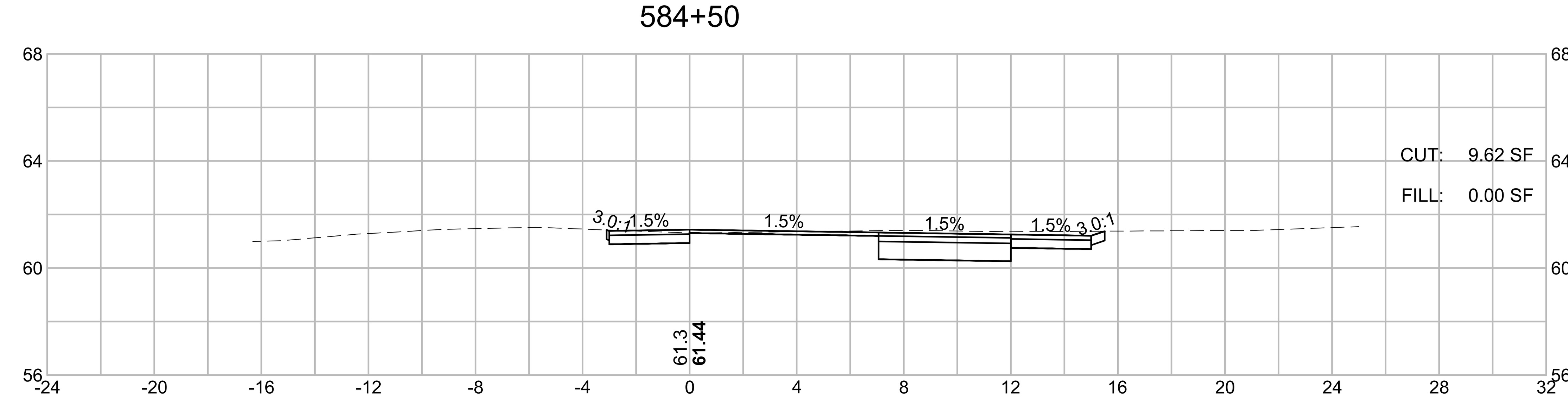
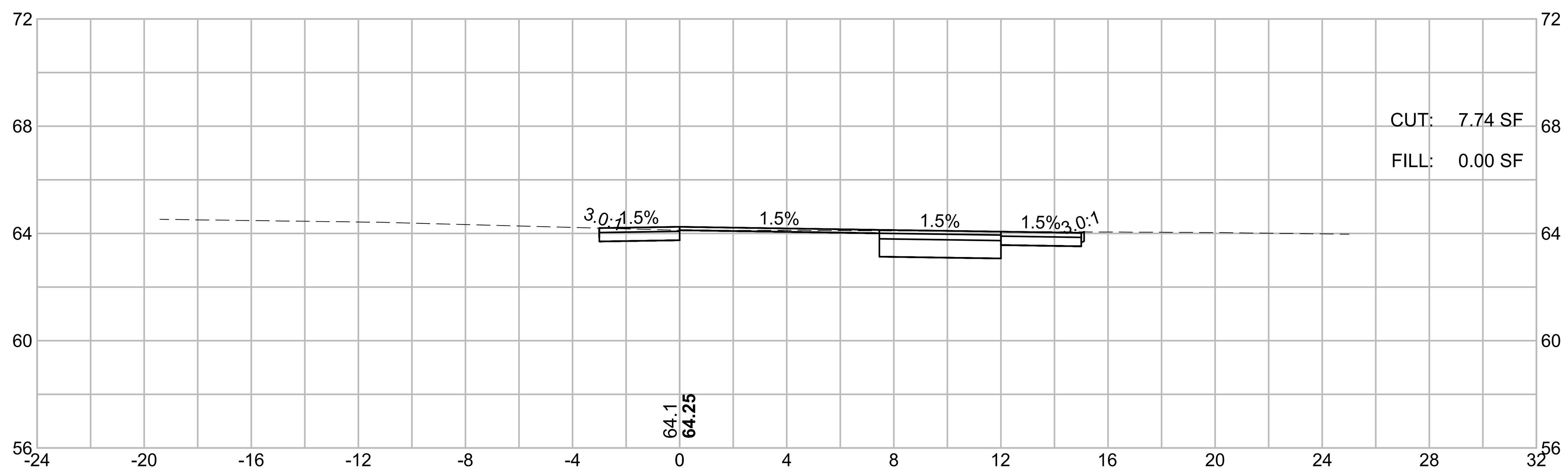


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	231	264
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

587+00



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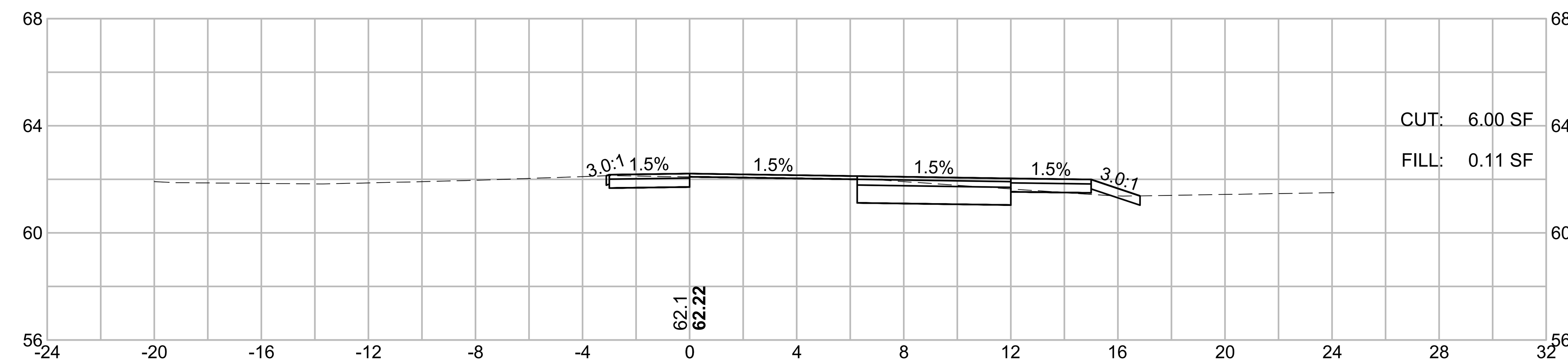

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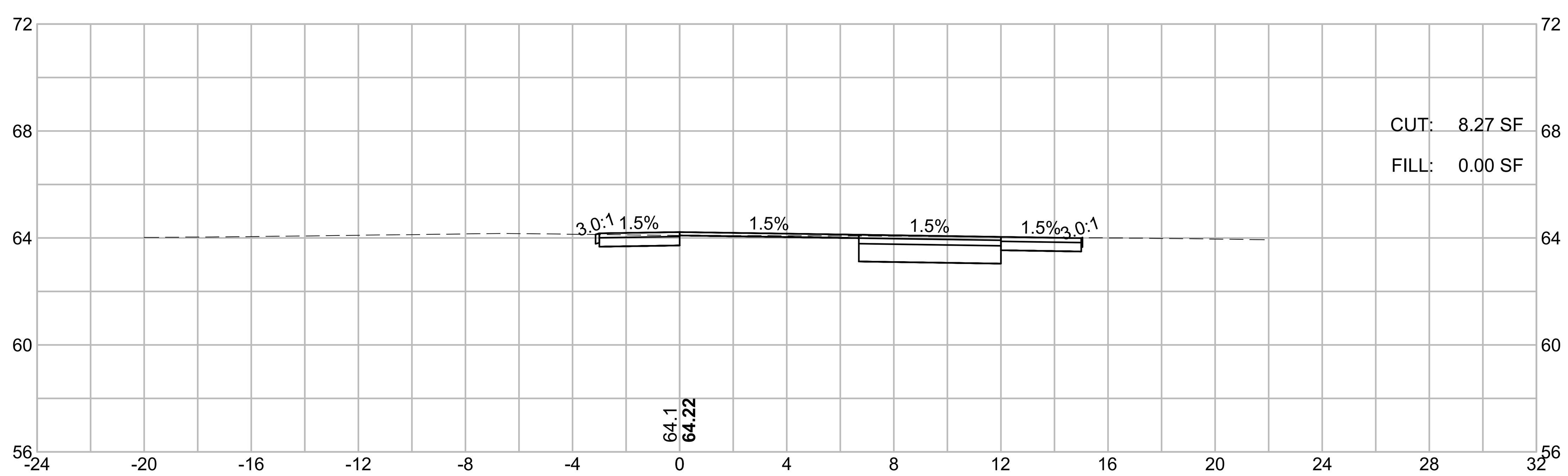

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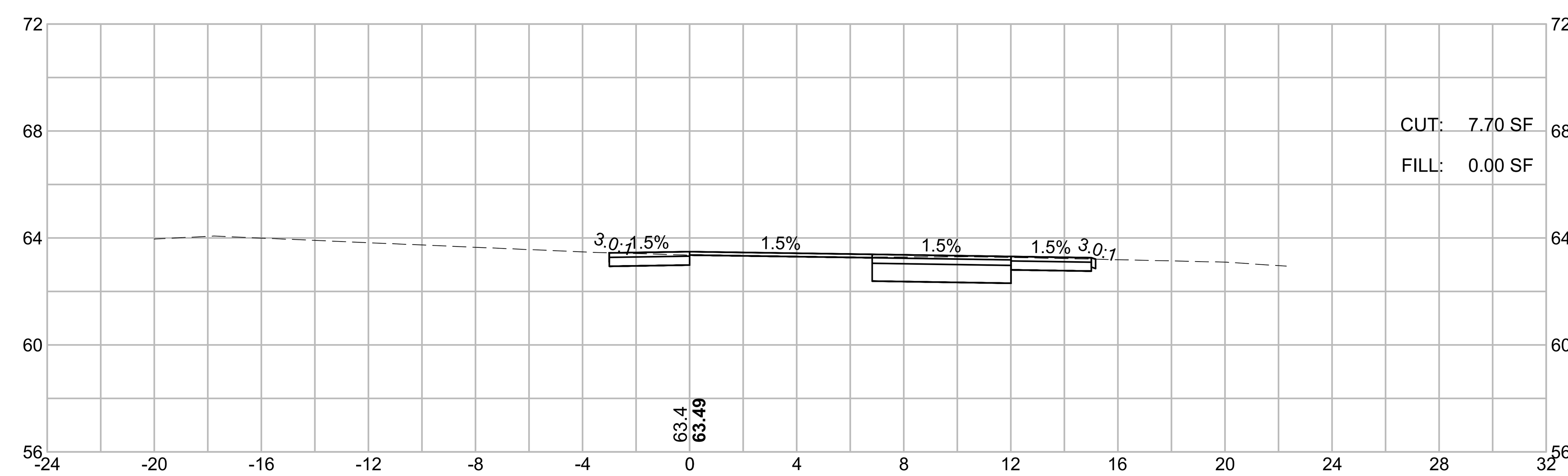

HOR. SCALE IN FEET
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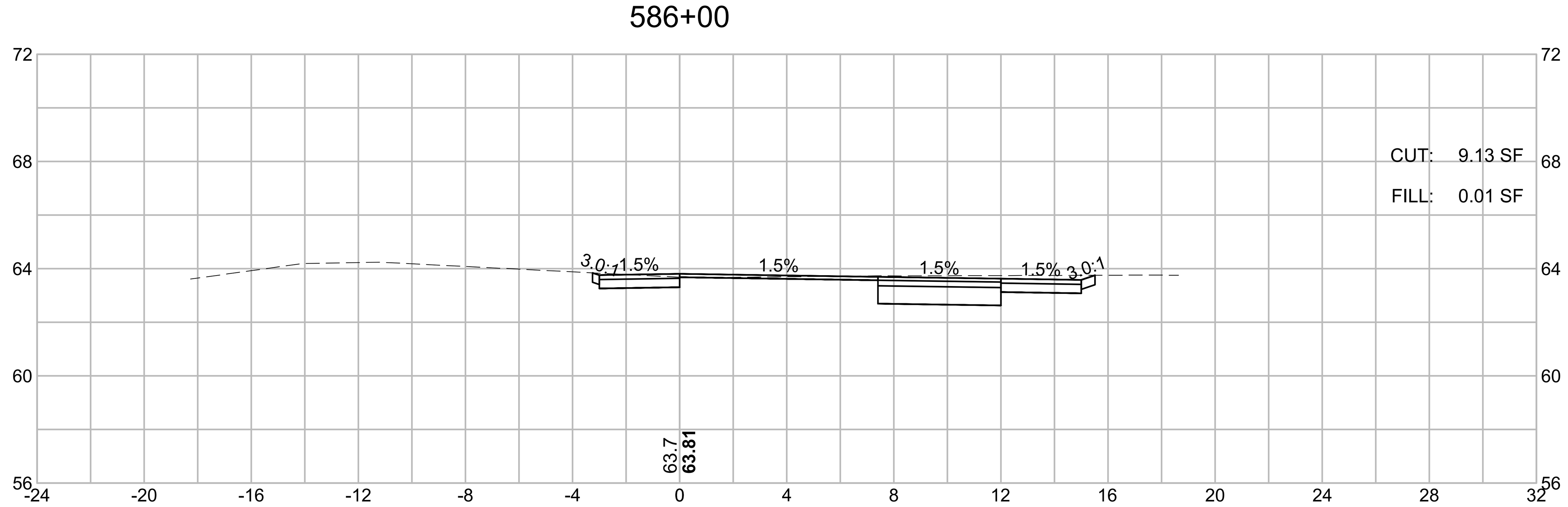
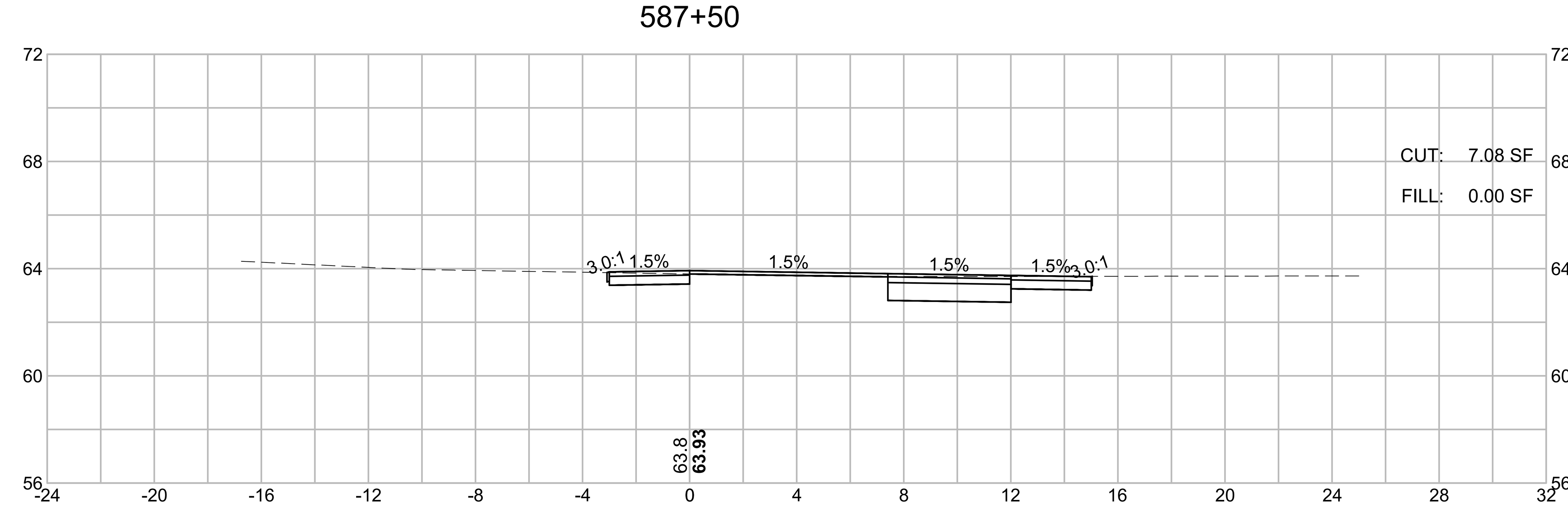
VER. SCALE IN FEET

586+00



587+50

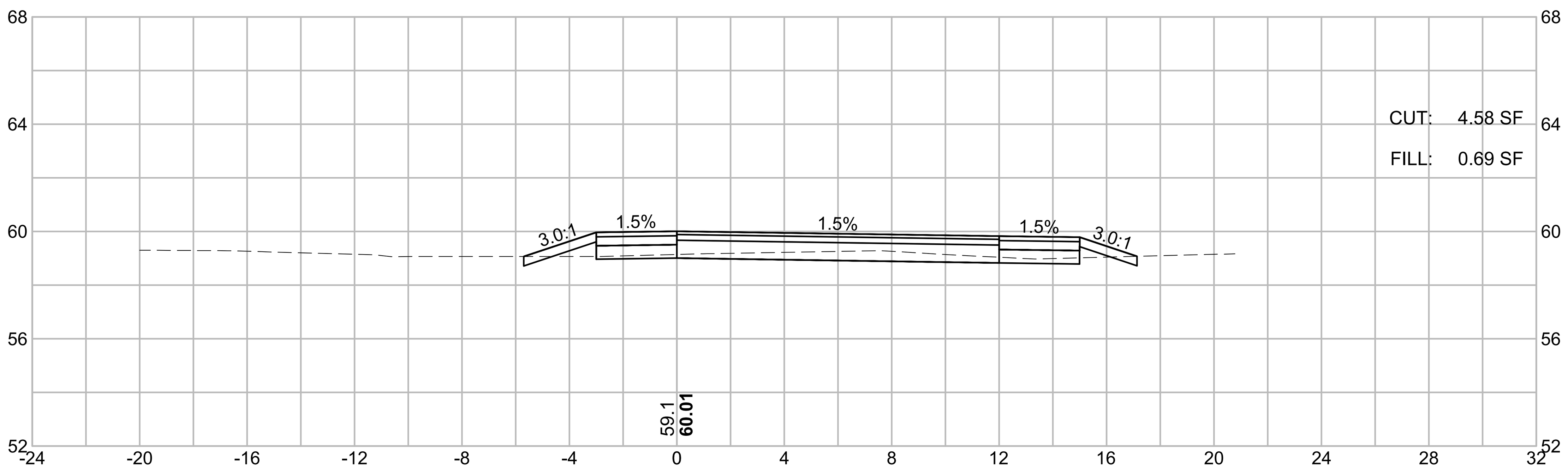


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	235	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

590+00



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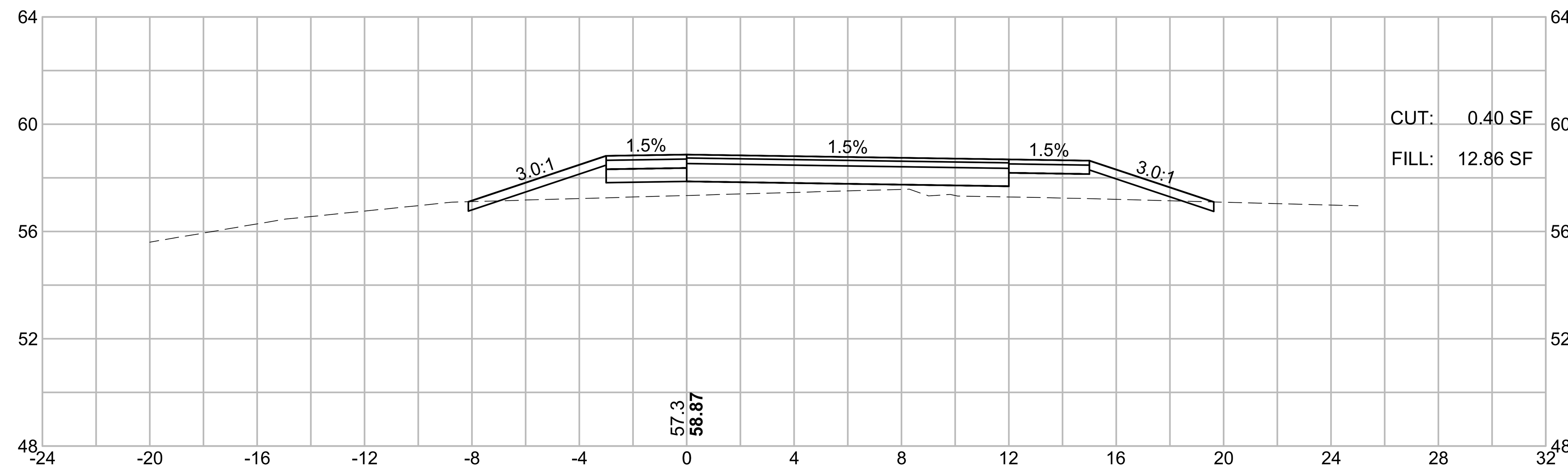
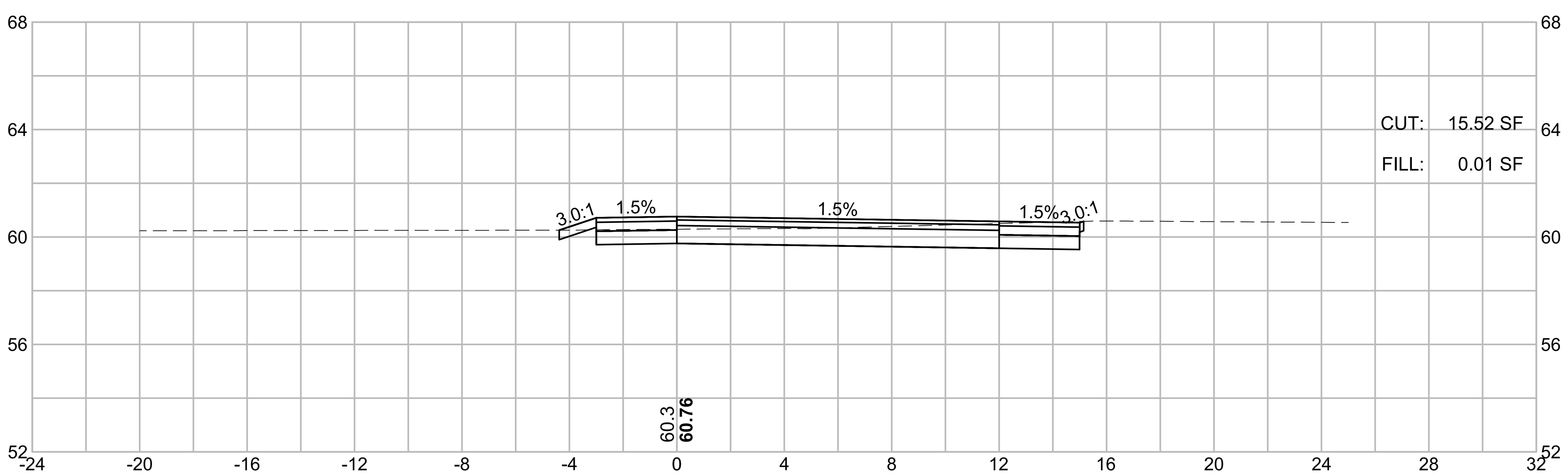


589+50



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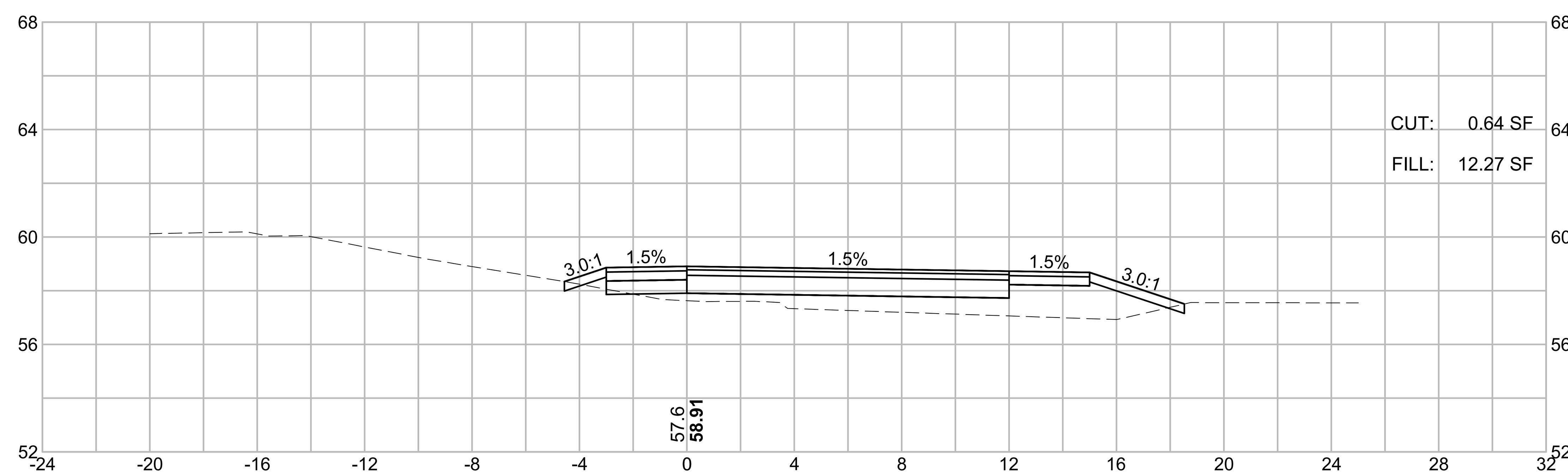
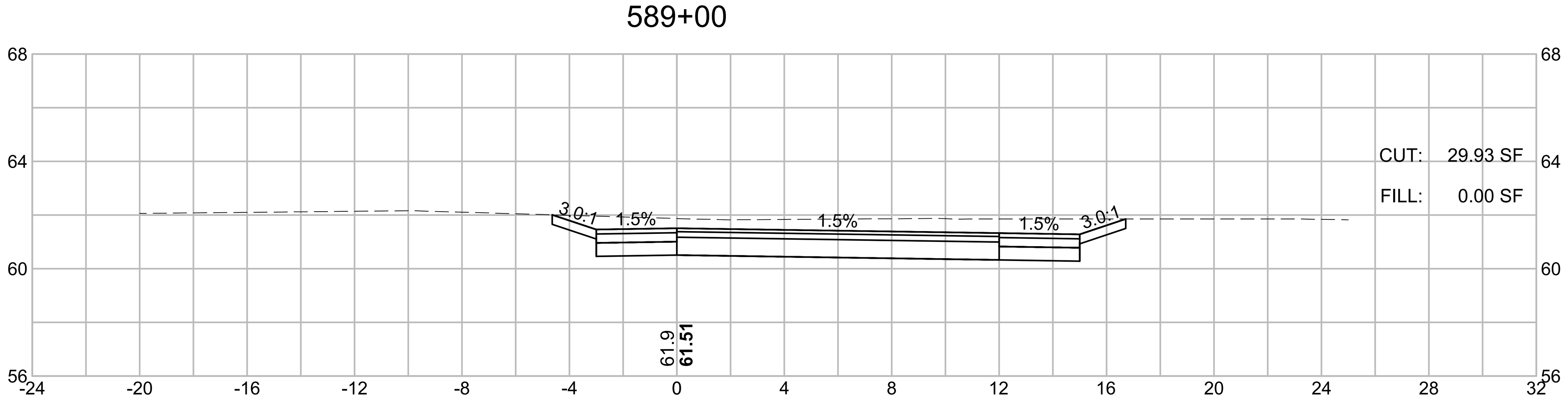


HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET

589+00



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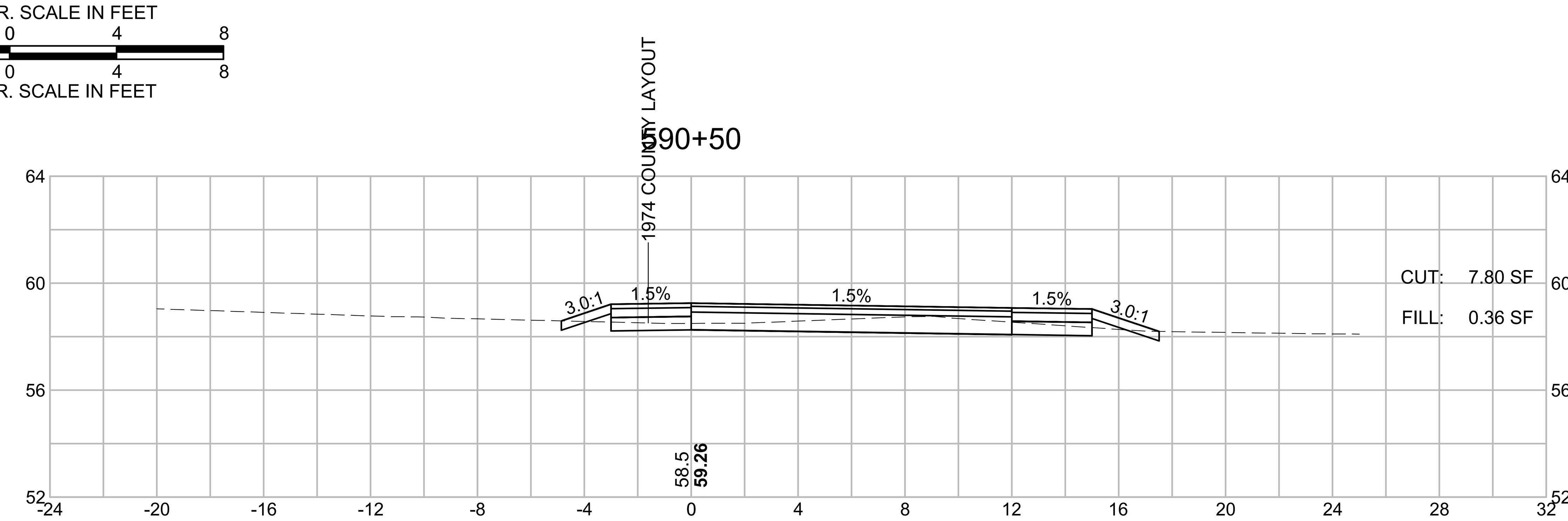
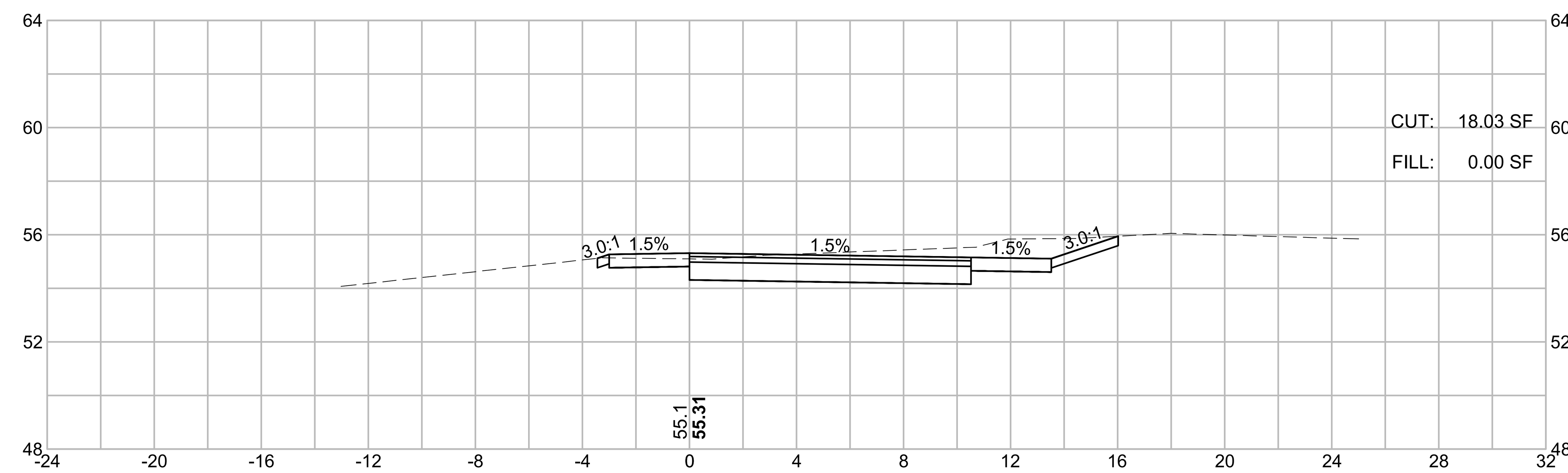


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	236	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

594+50



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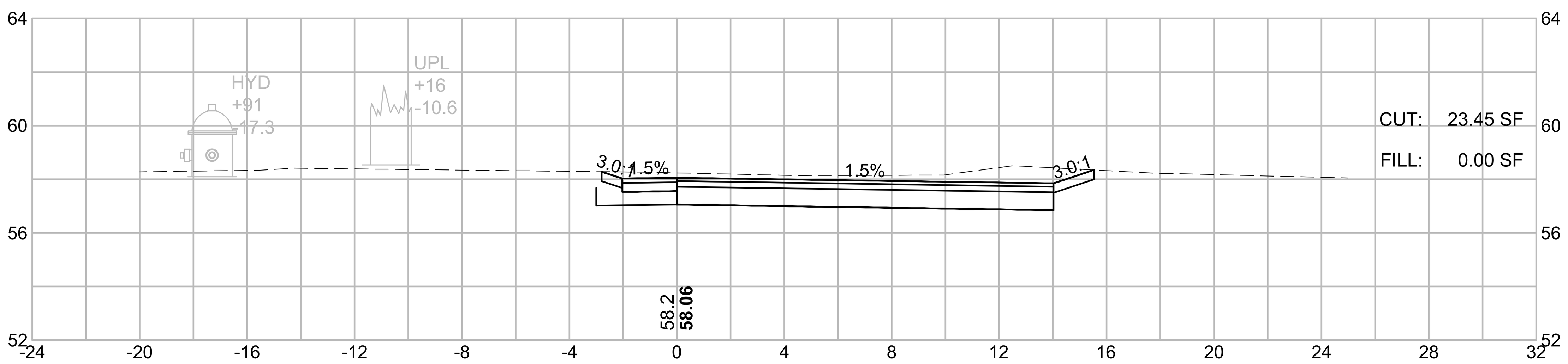

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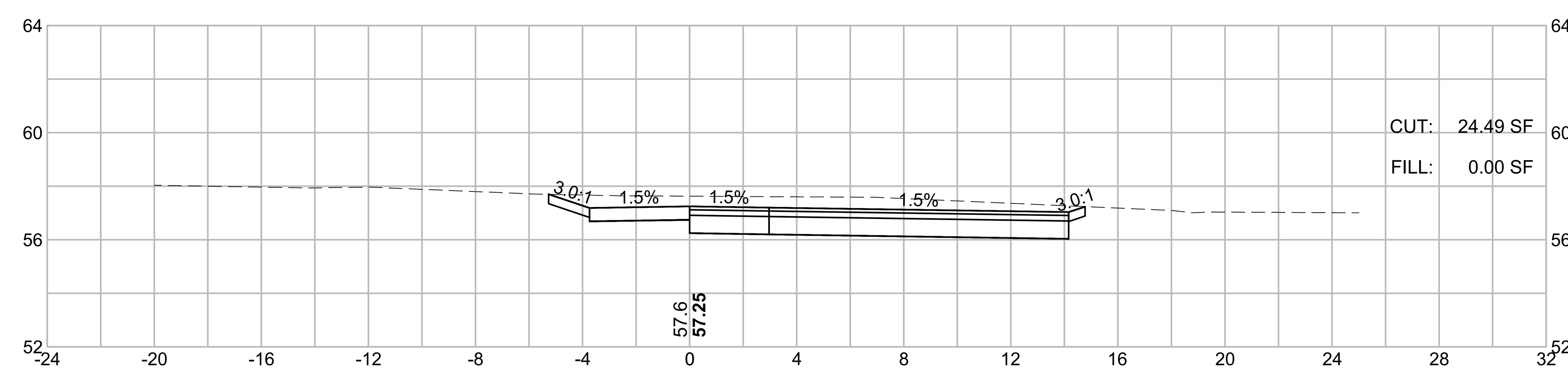

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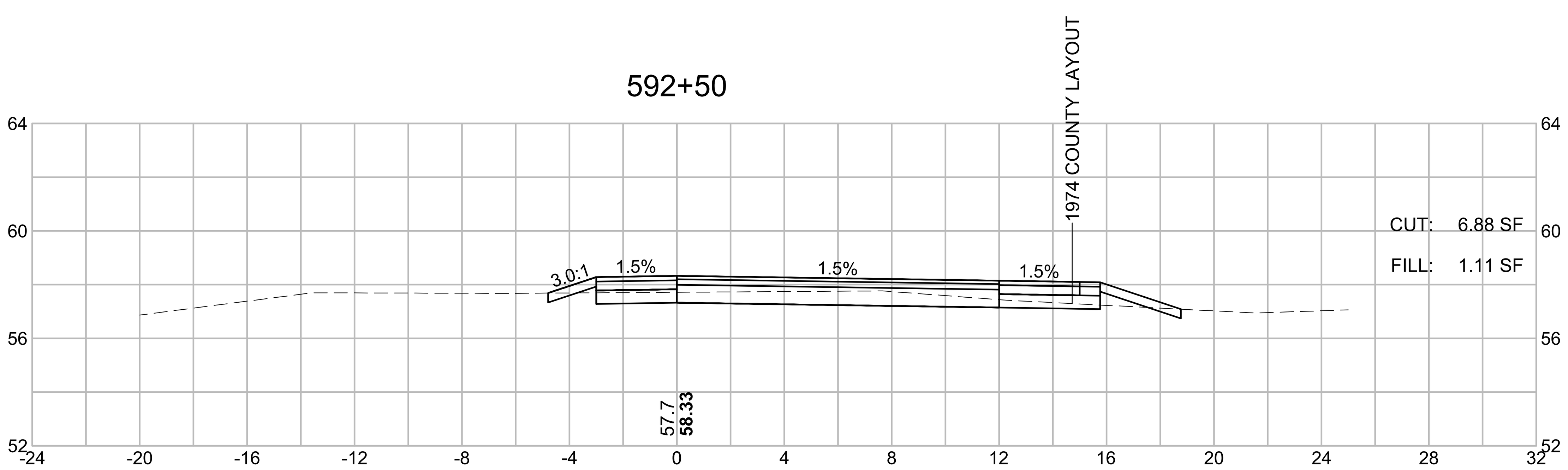

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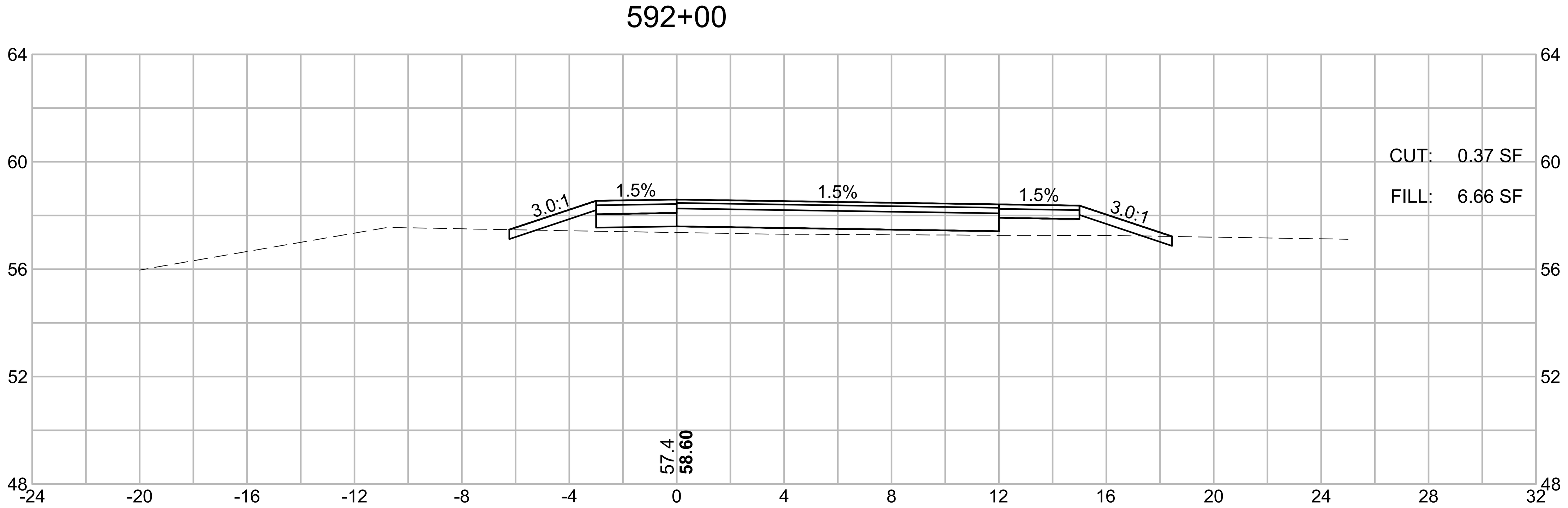


607398_HD(XSEC-EAST-3).DWG
Plotted on 21-Oct-2021 8:53 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

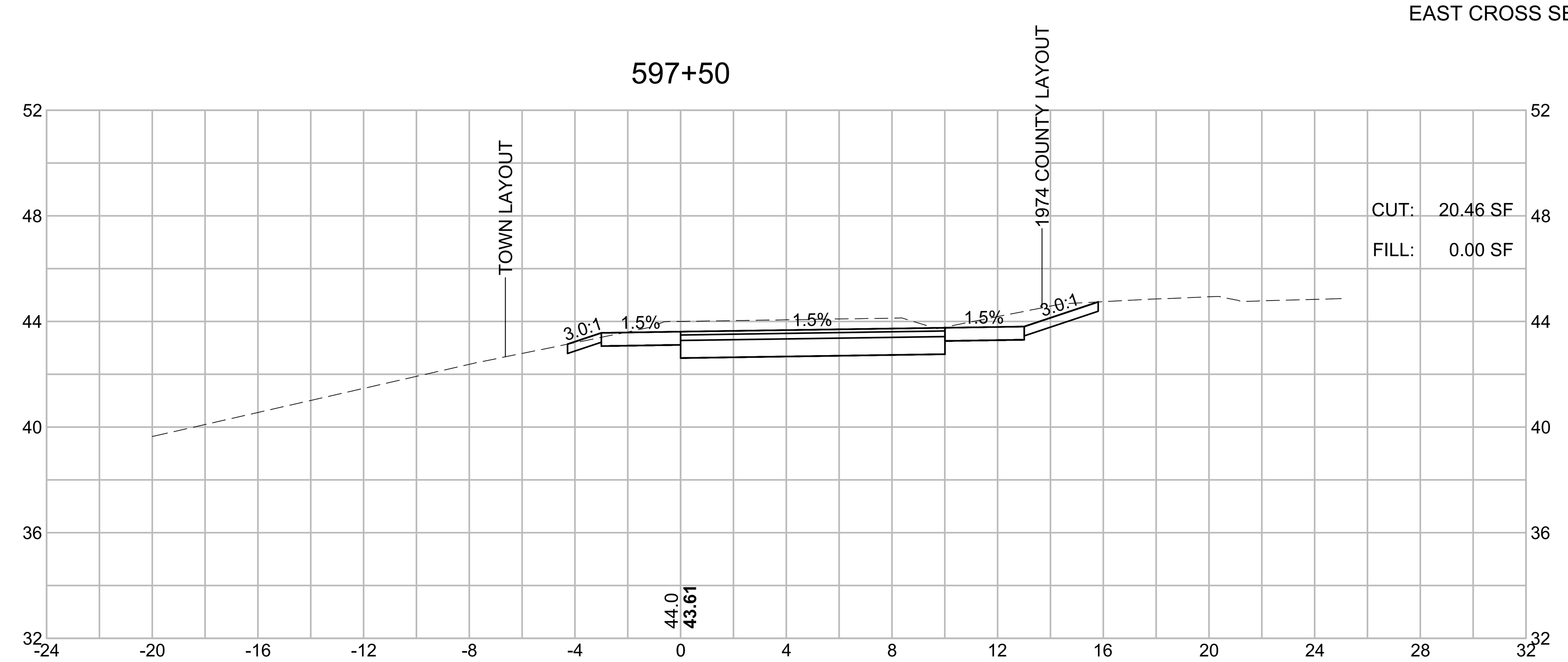
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	237	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

Plotted on 21-Oct-2021 8:53 AM

607398_HD(XSEC-EAST-3).DWG

597+50



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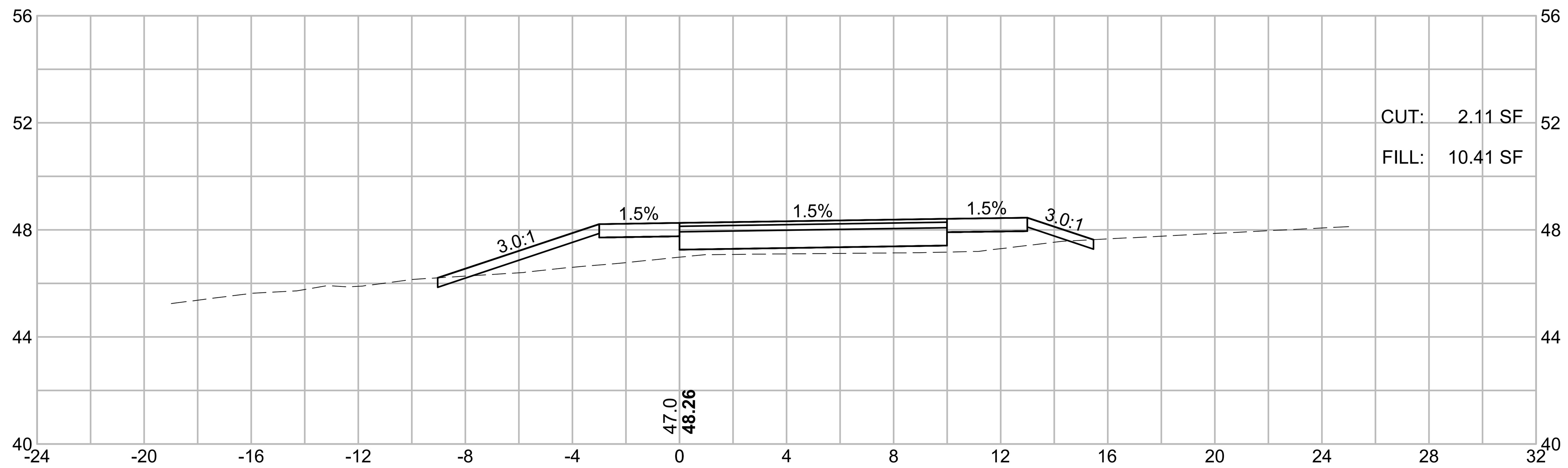

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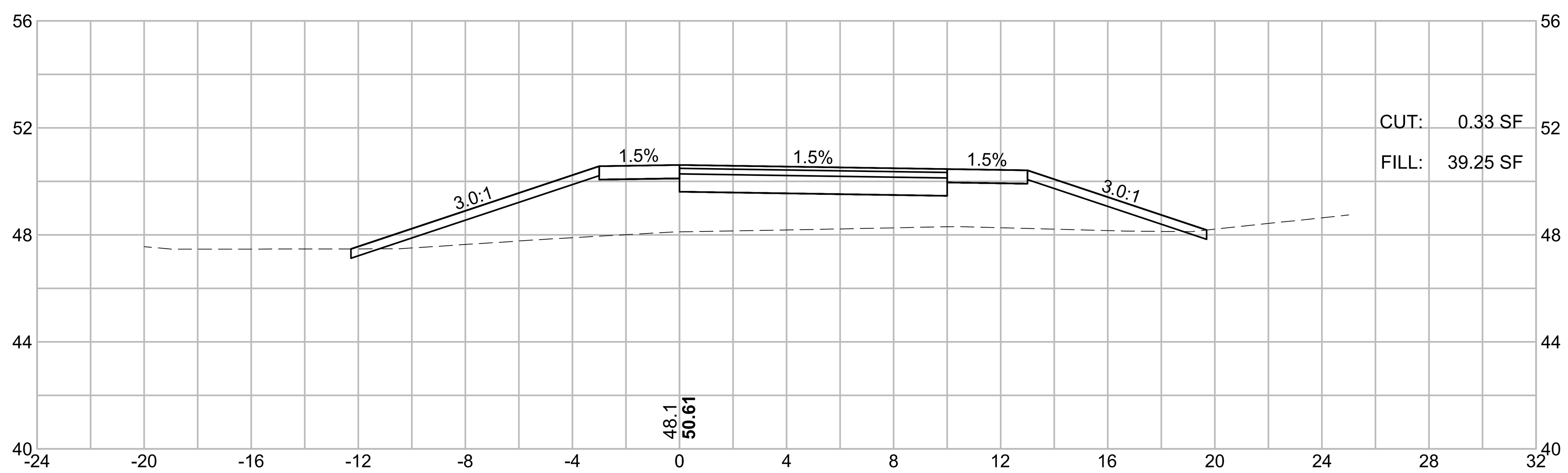

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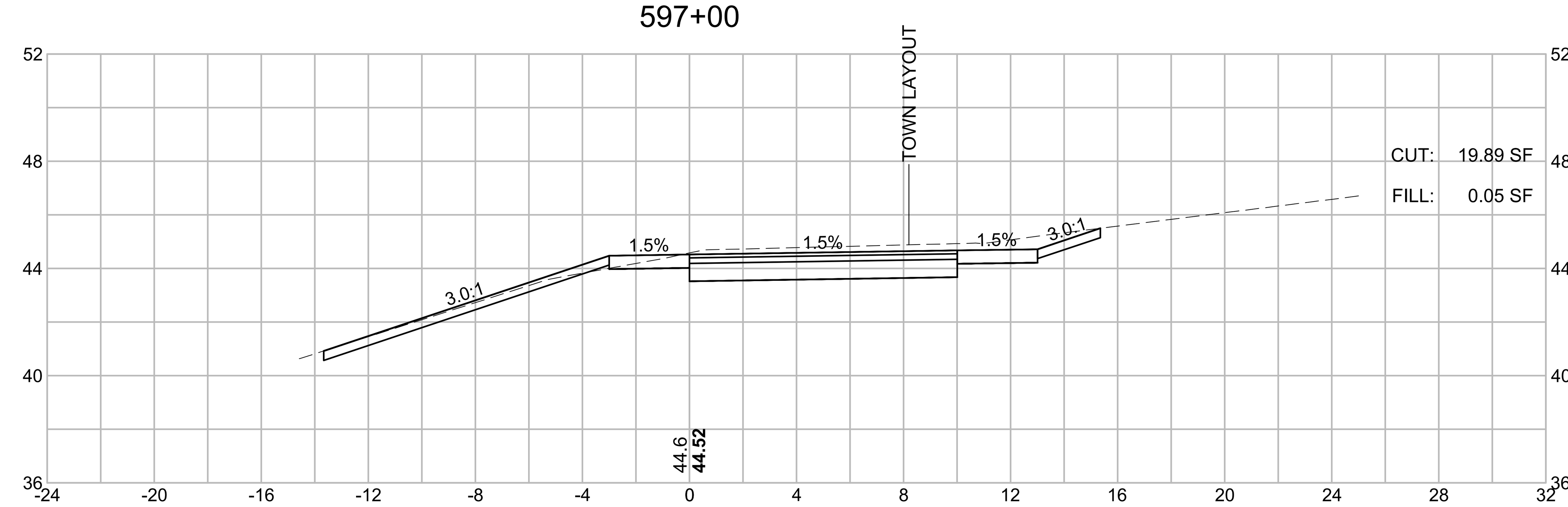

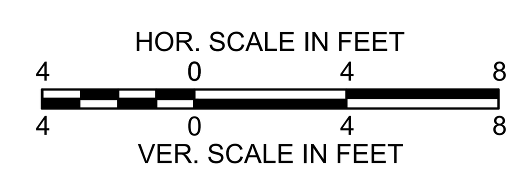

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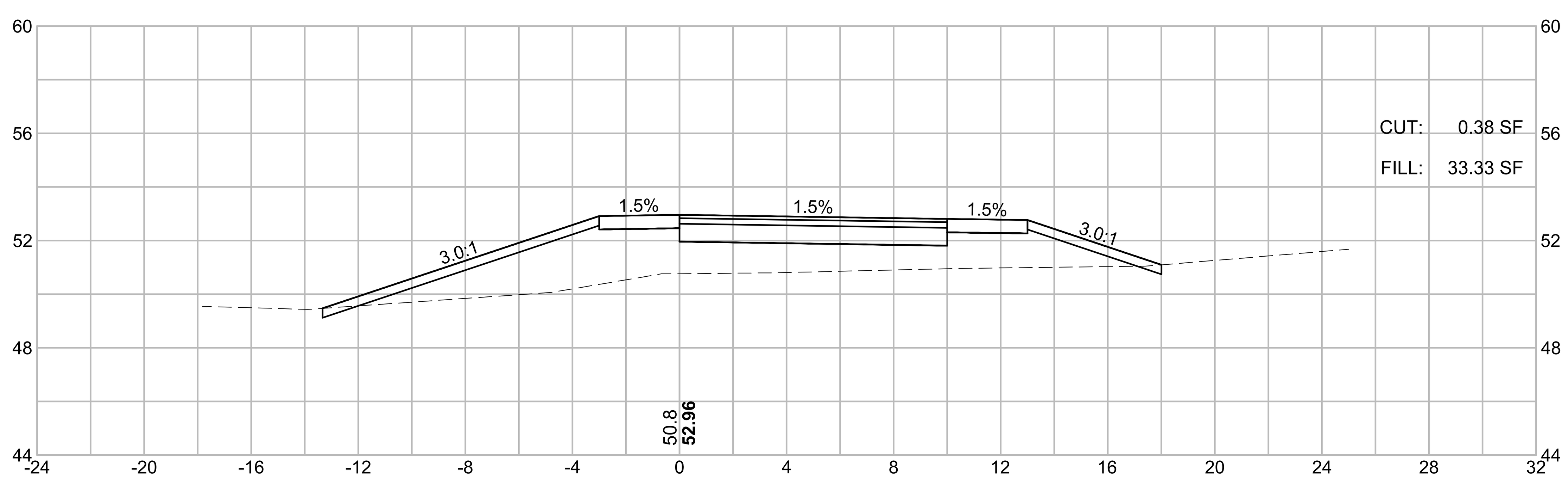
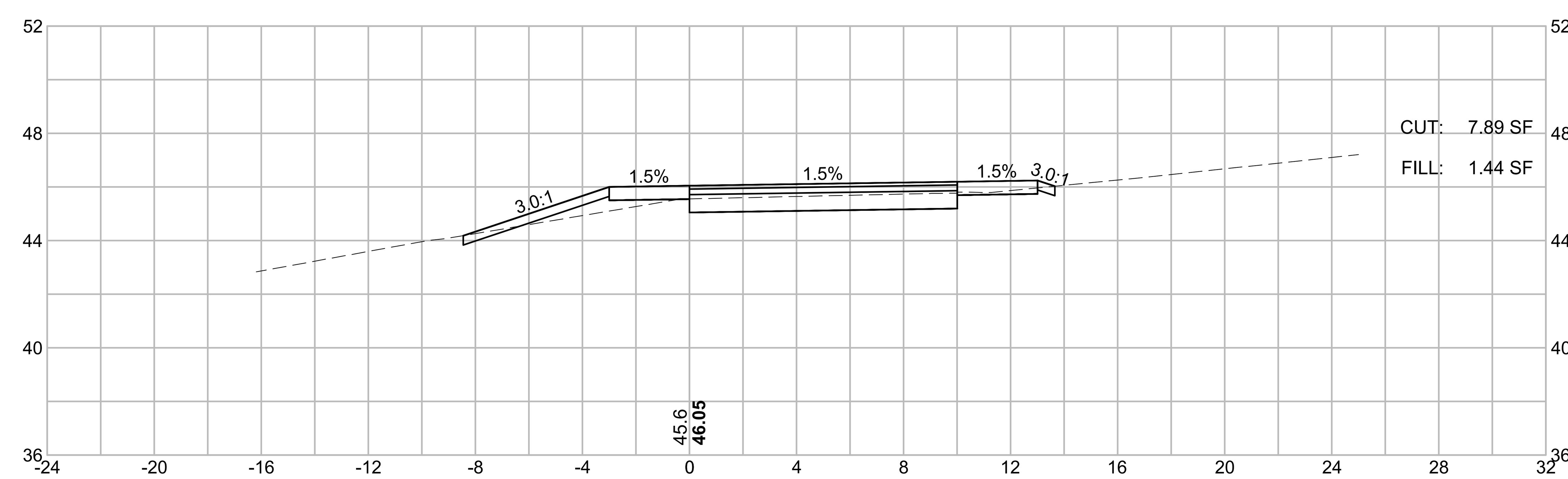


596+50

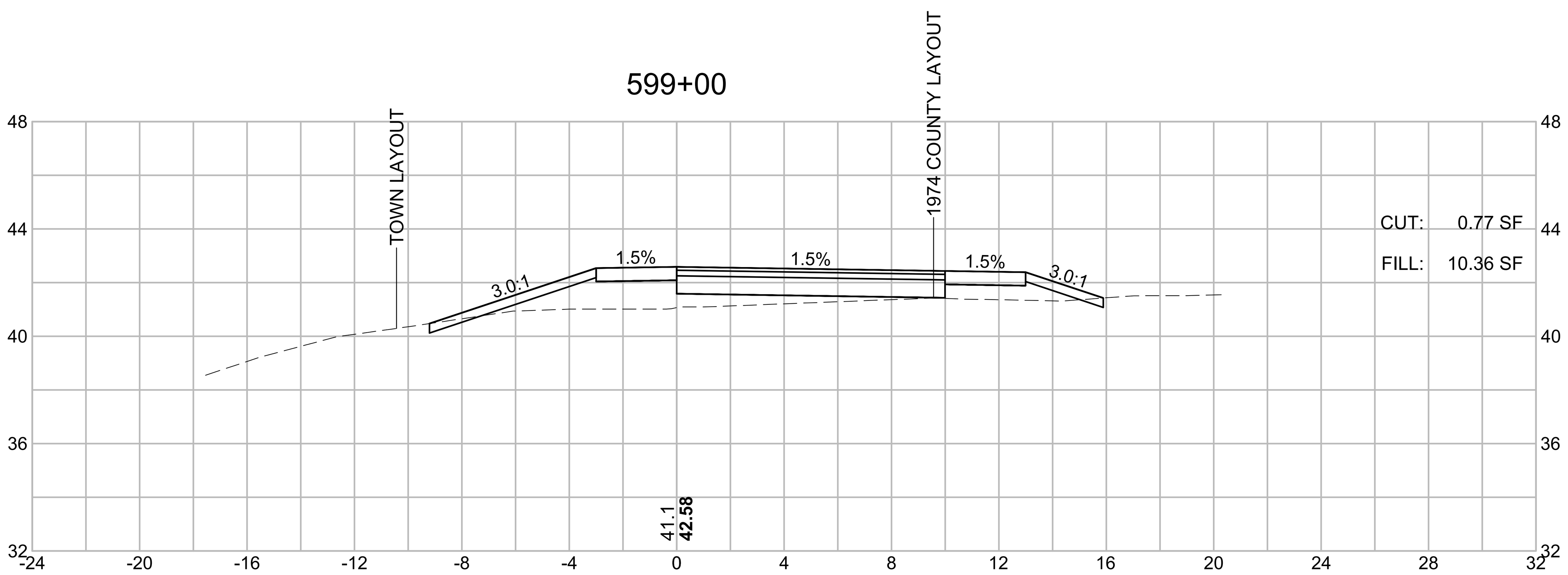


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

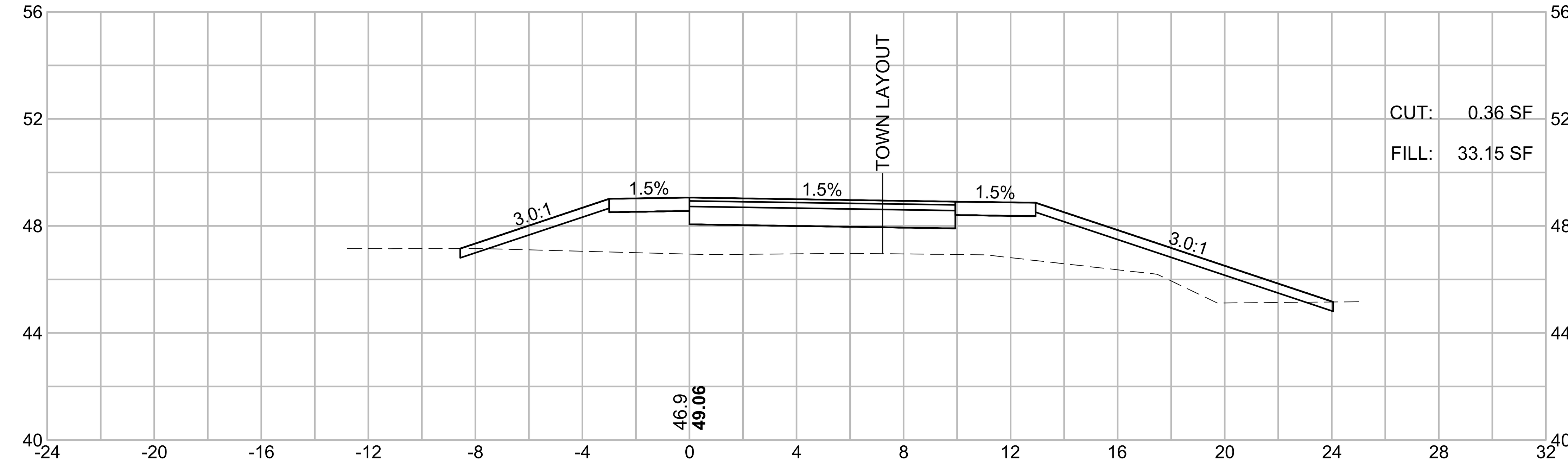
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	238	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

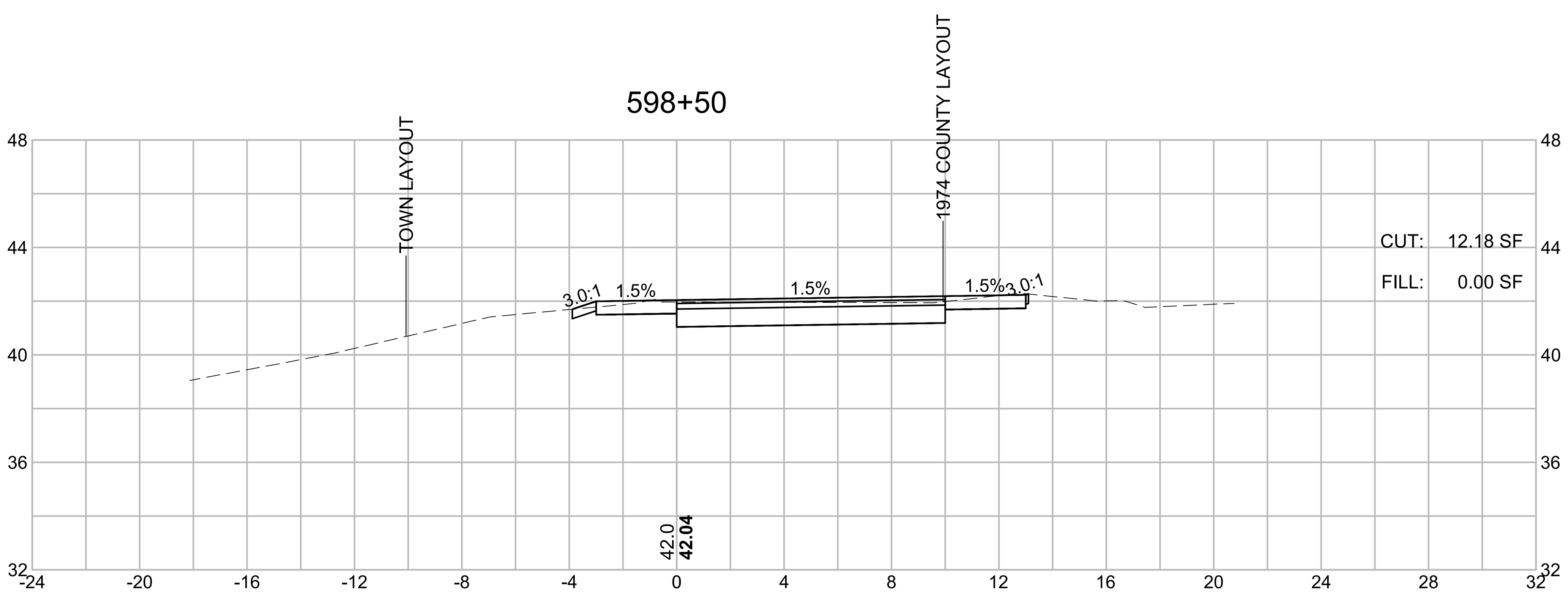
599+00



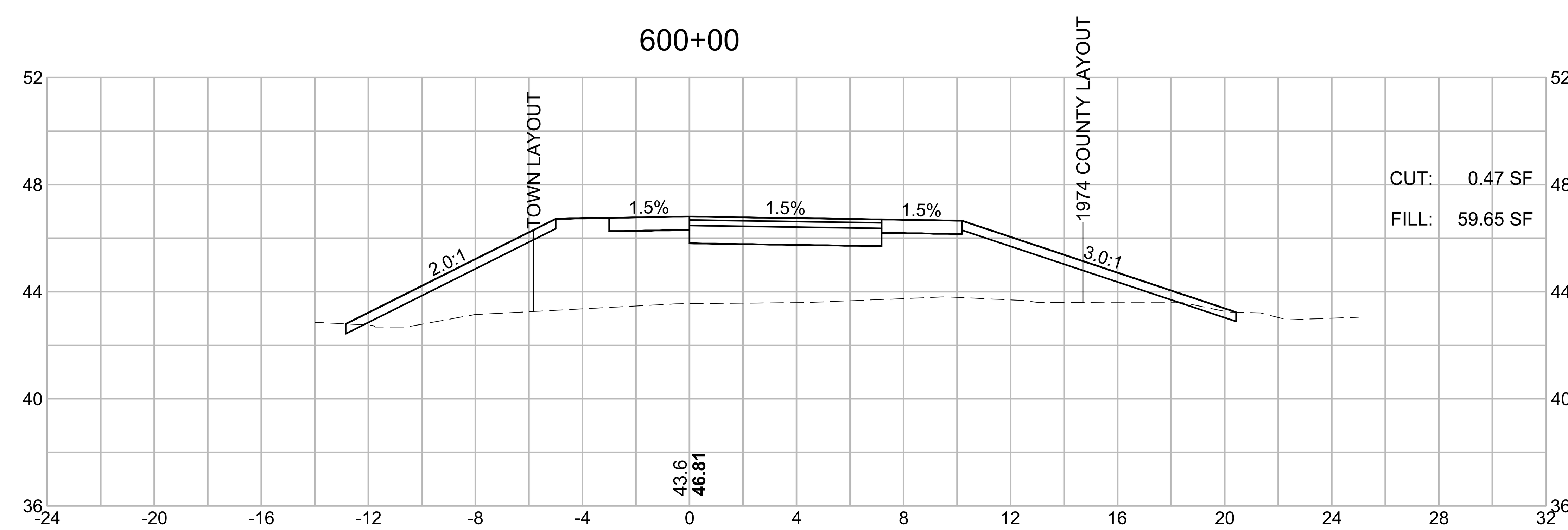
600+50

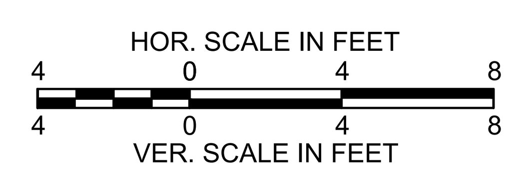


598+50



600+00





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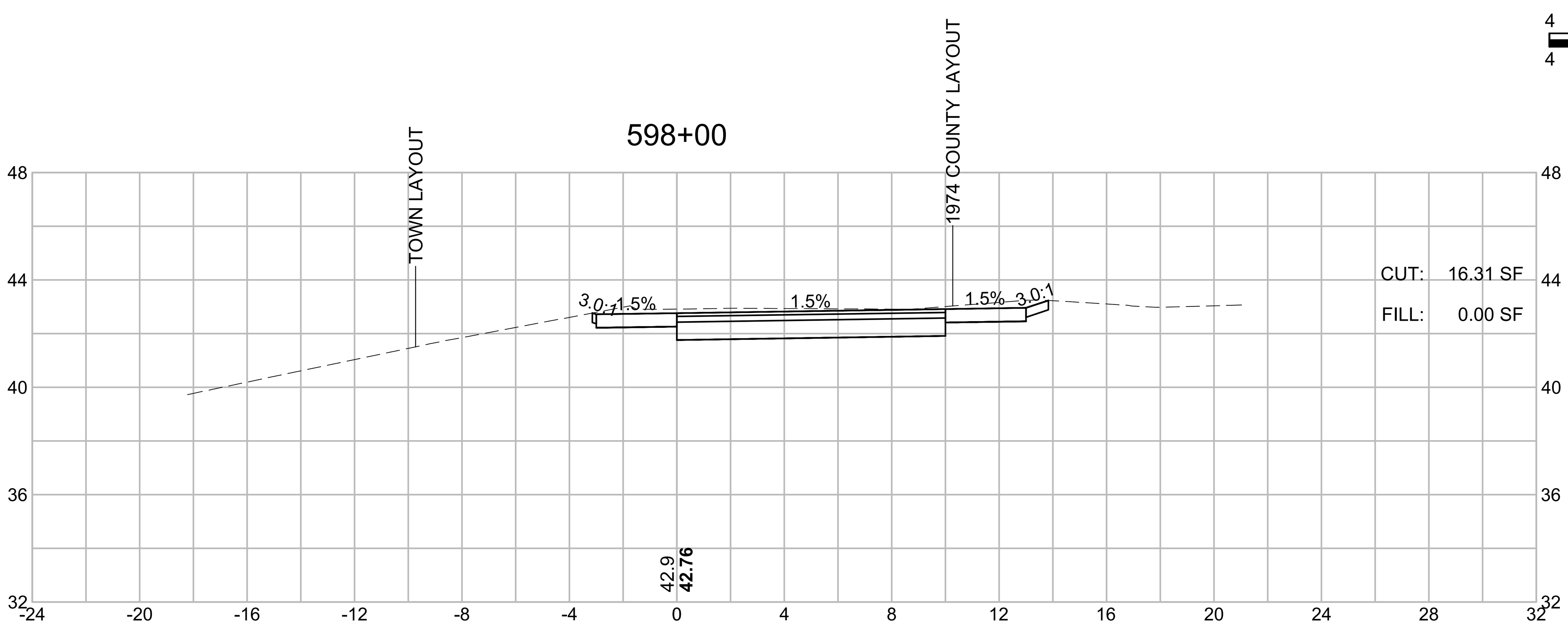
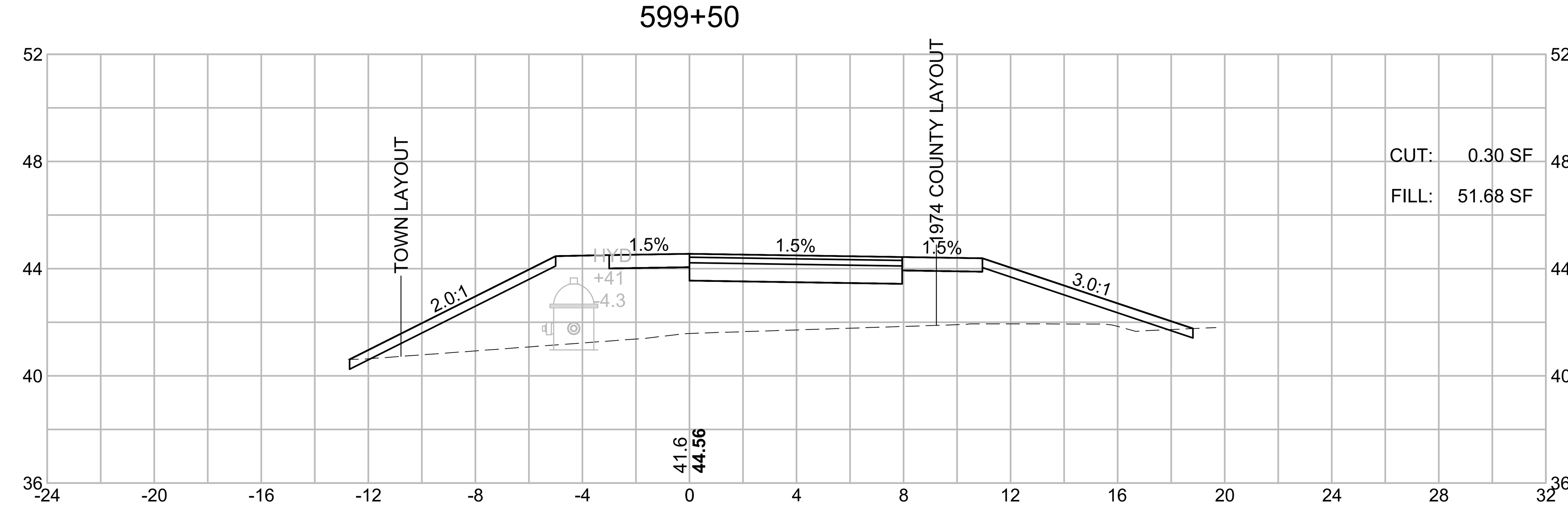


599+50



Plotted on 21-Oct-2021 8:54 AM
607398_HD(XSEC-EAST-3).DWG

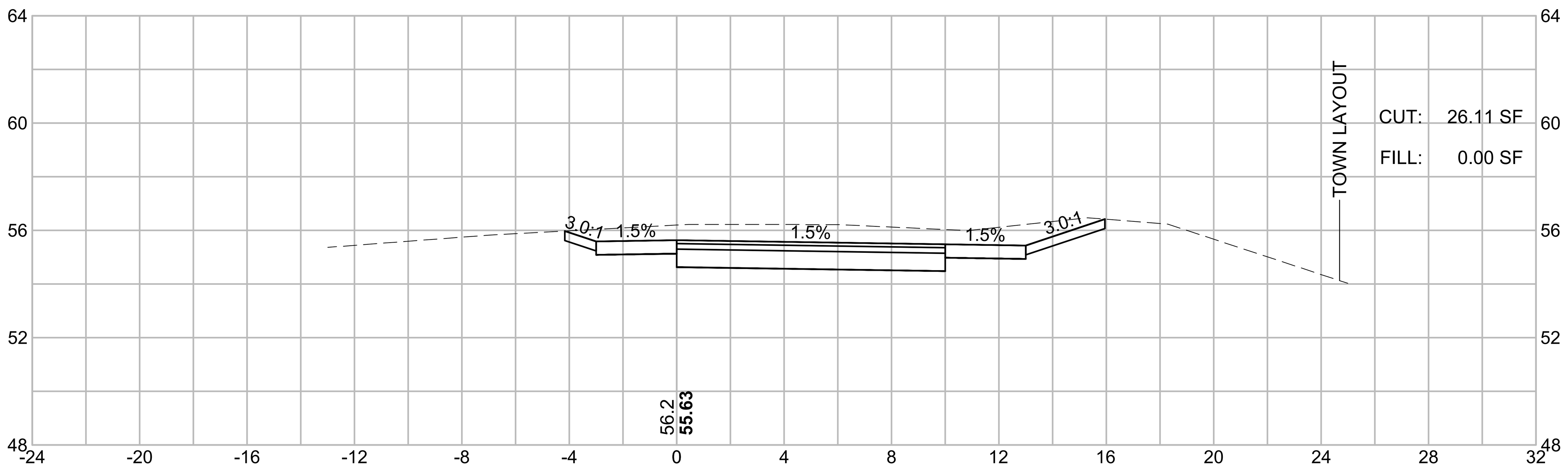
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	239	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

607398_HD(XSEC-EAST-3).DWG Plotted on 21-Oct-2021 8:54 AM

602+00



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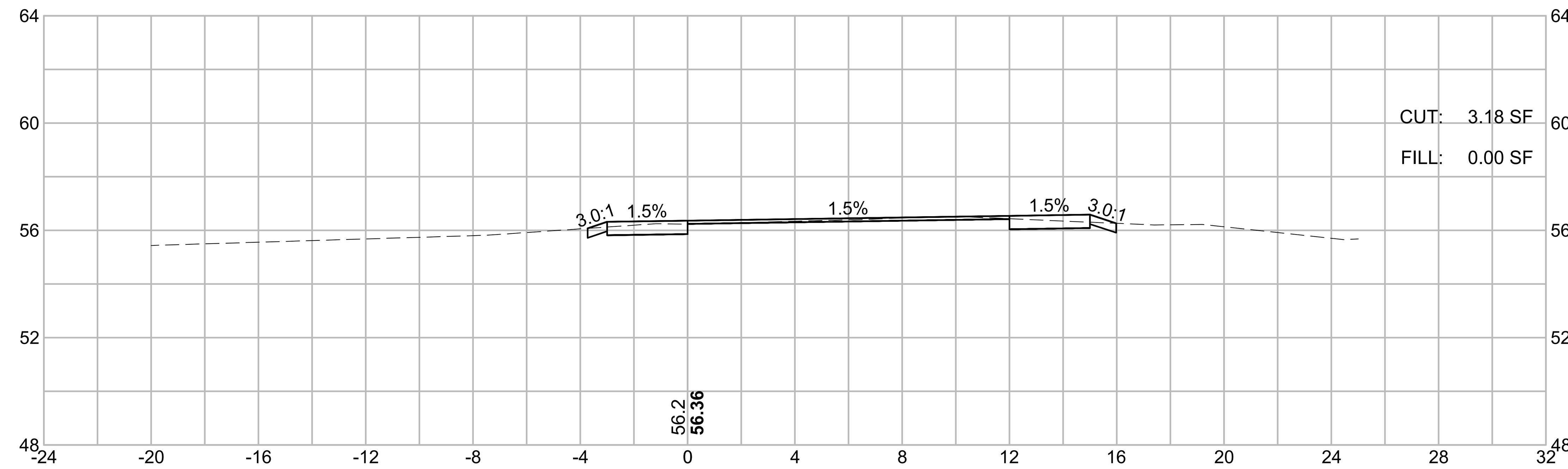

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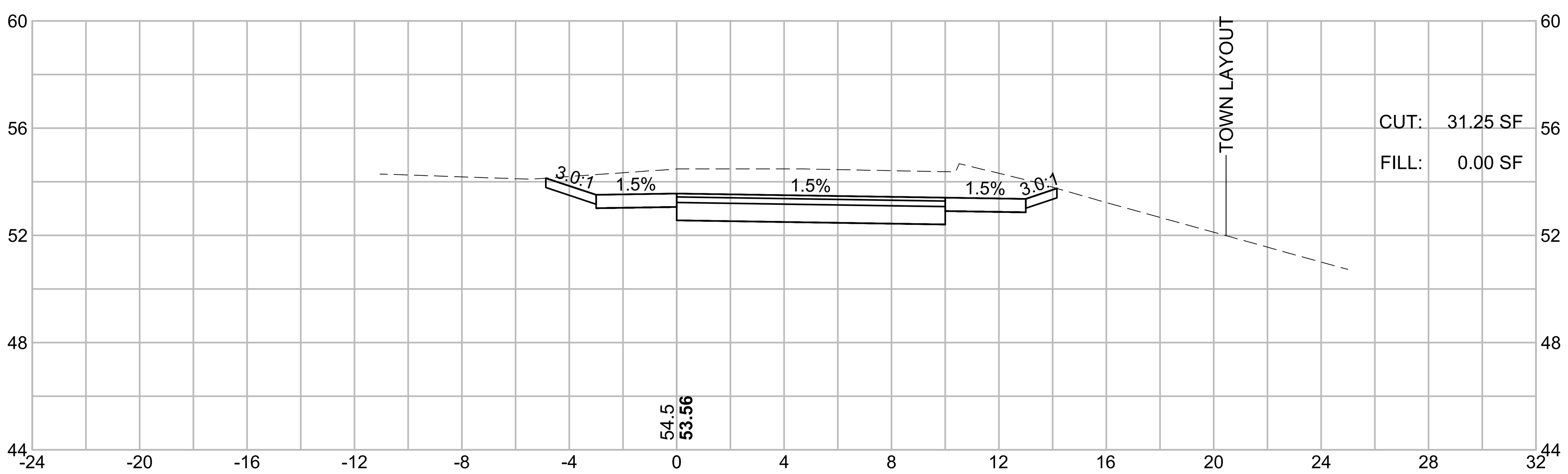
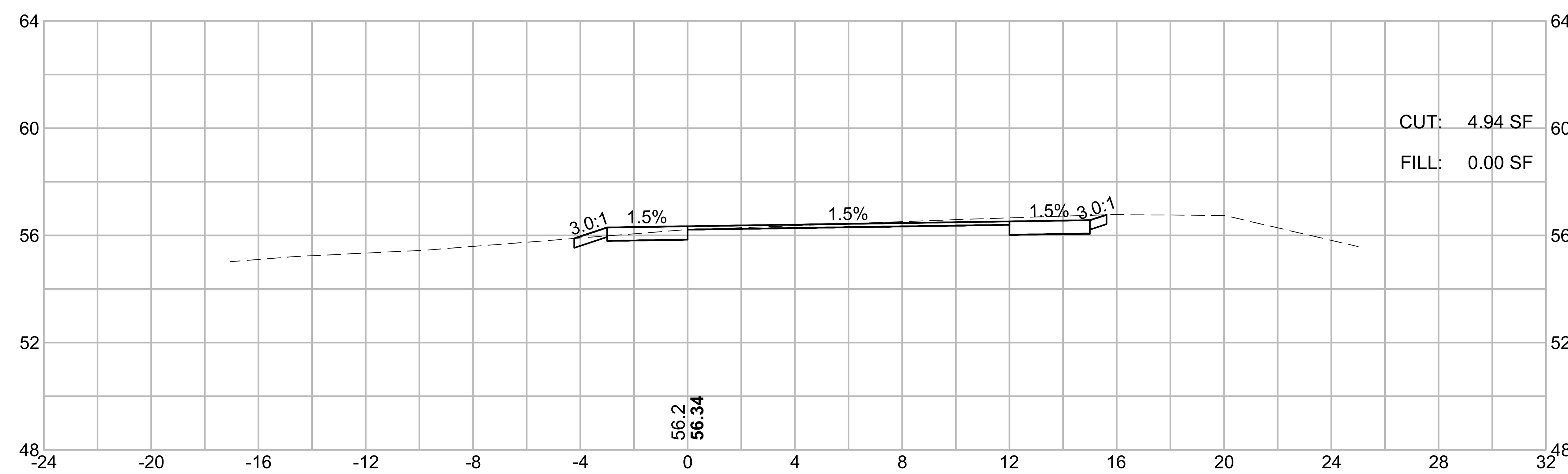
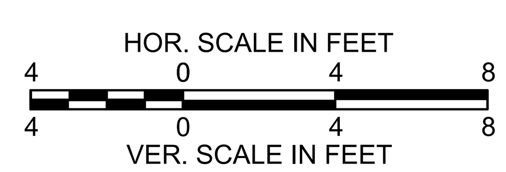
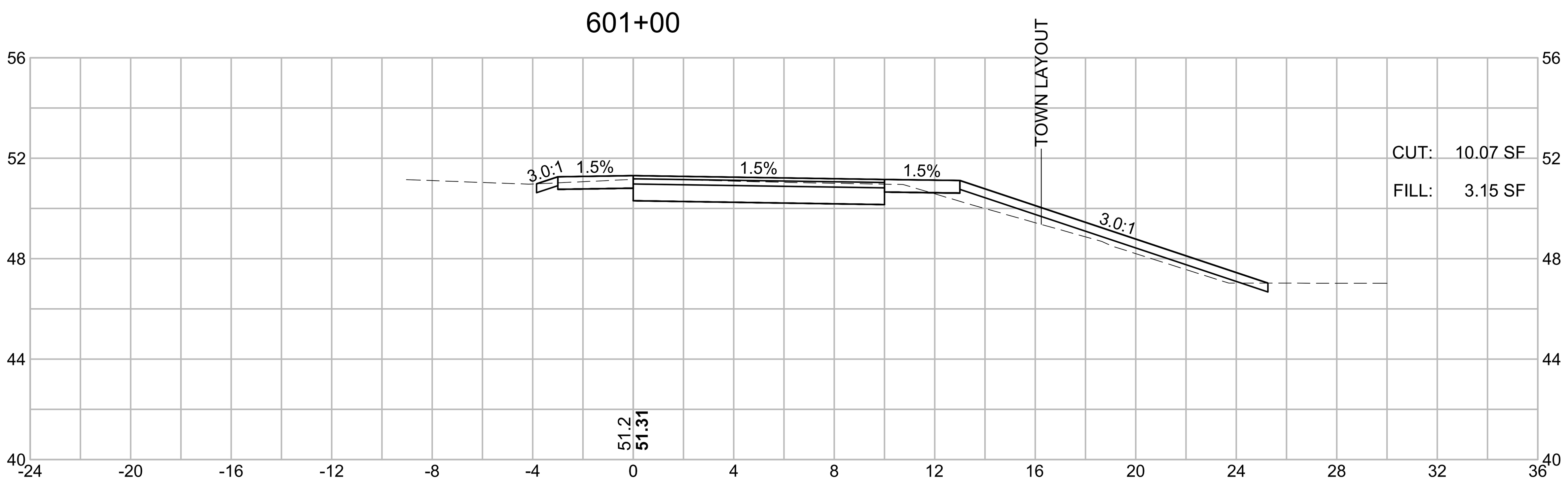


603+00

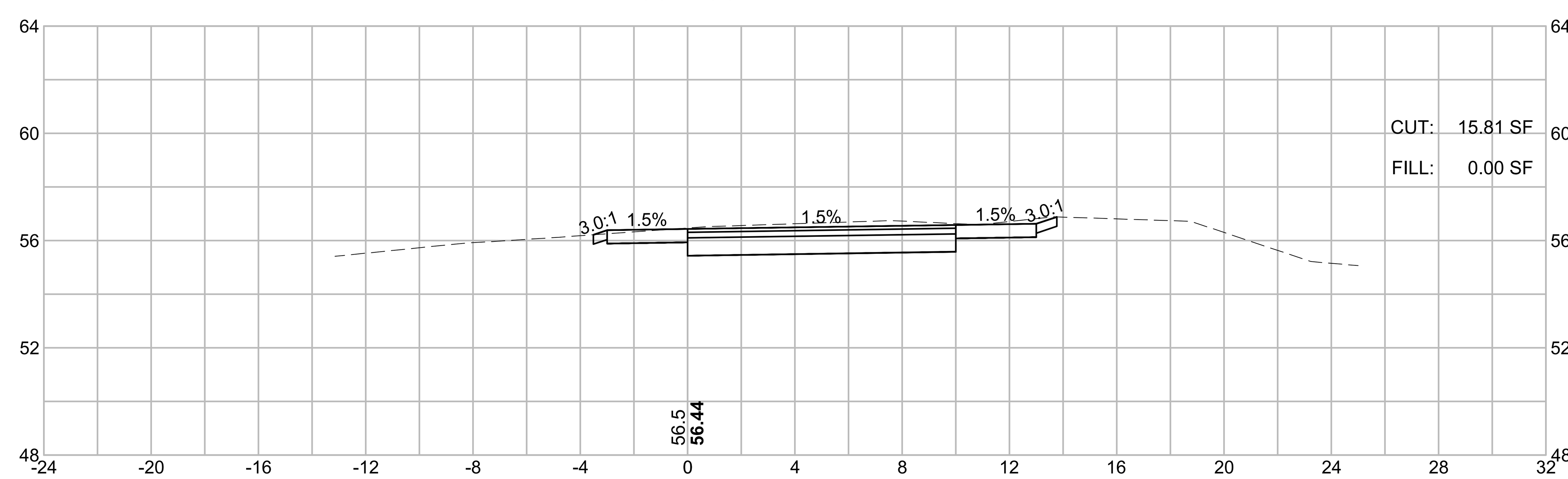




601+00



602+50

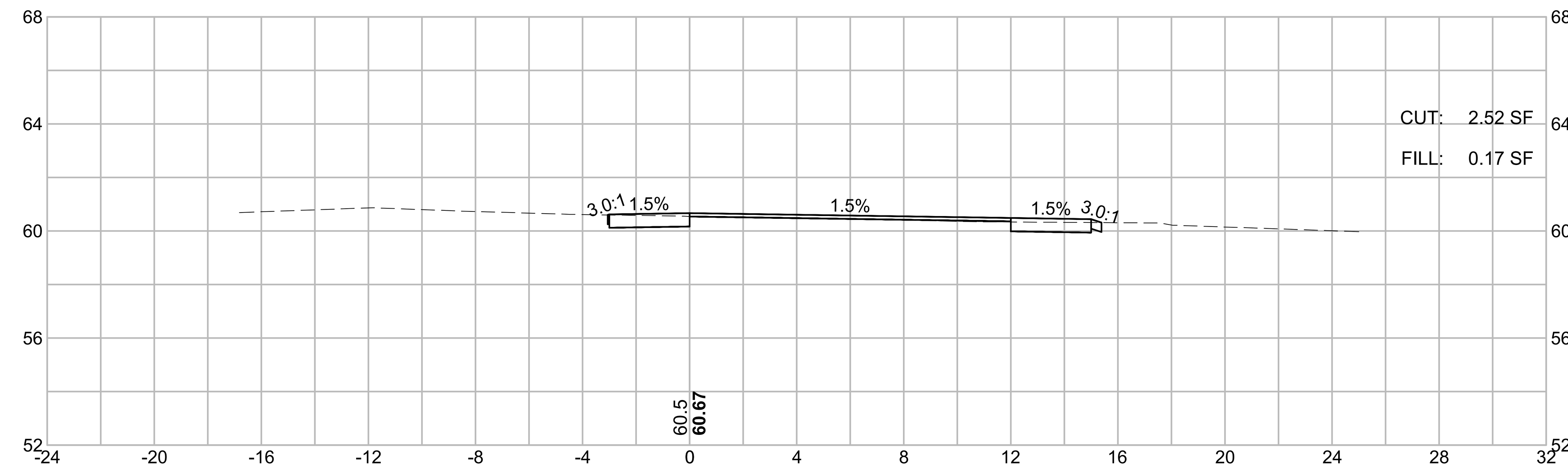


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

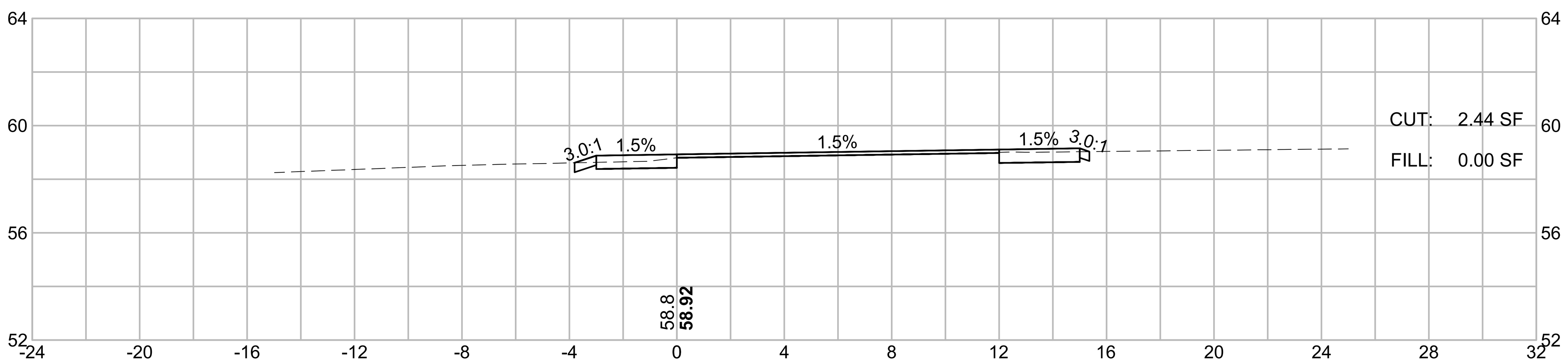
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	240	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

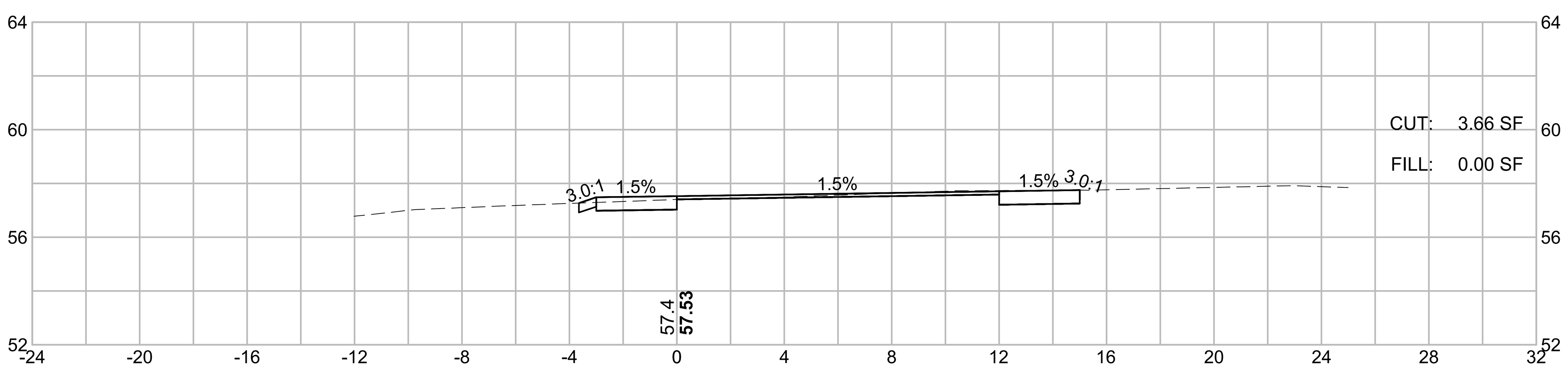
606+50



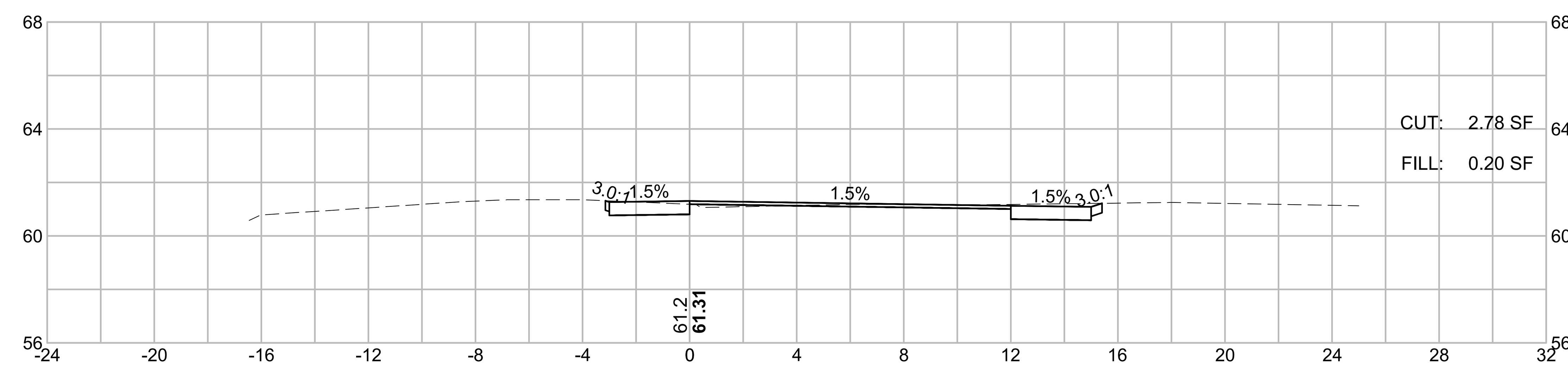
605+00



604+50

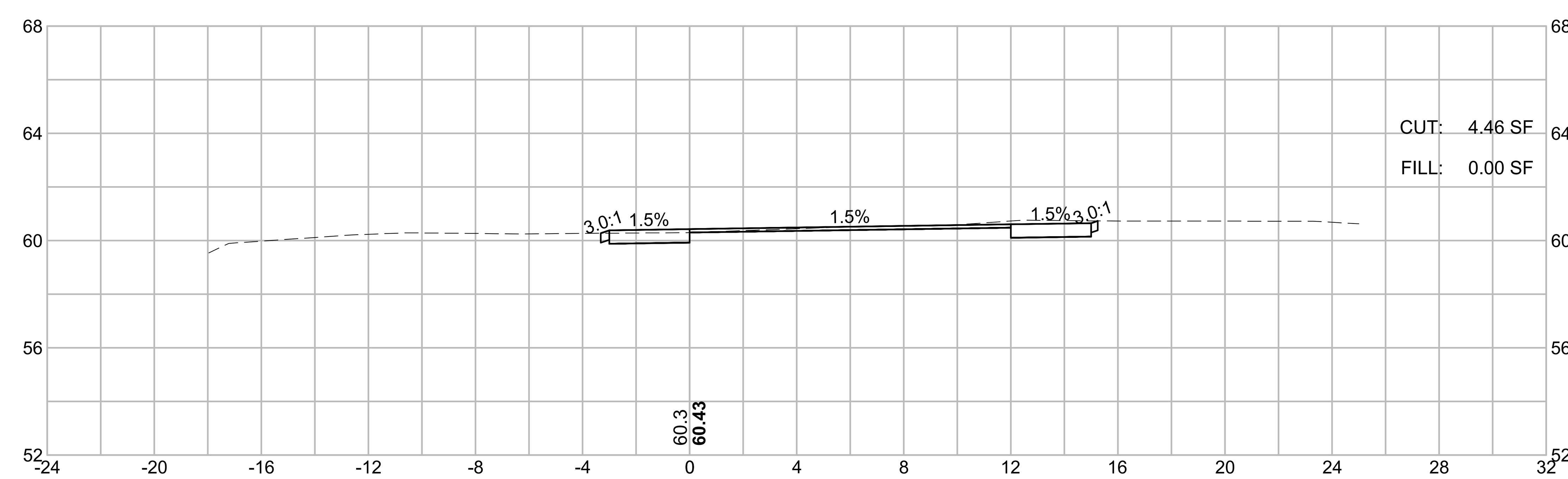


606+00

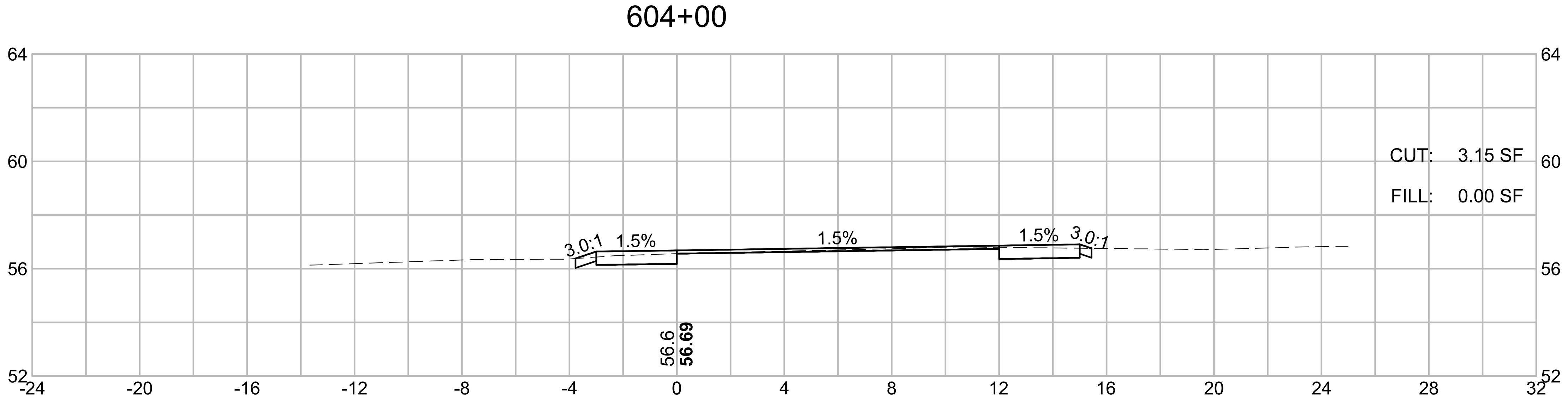


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

605+50



604+00



Plotted on 21-Oct-2021 8:54 AM

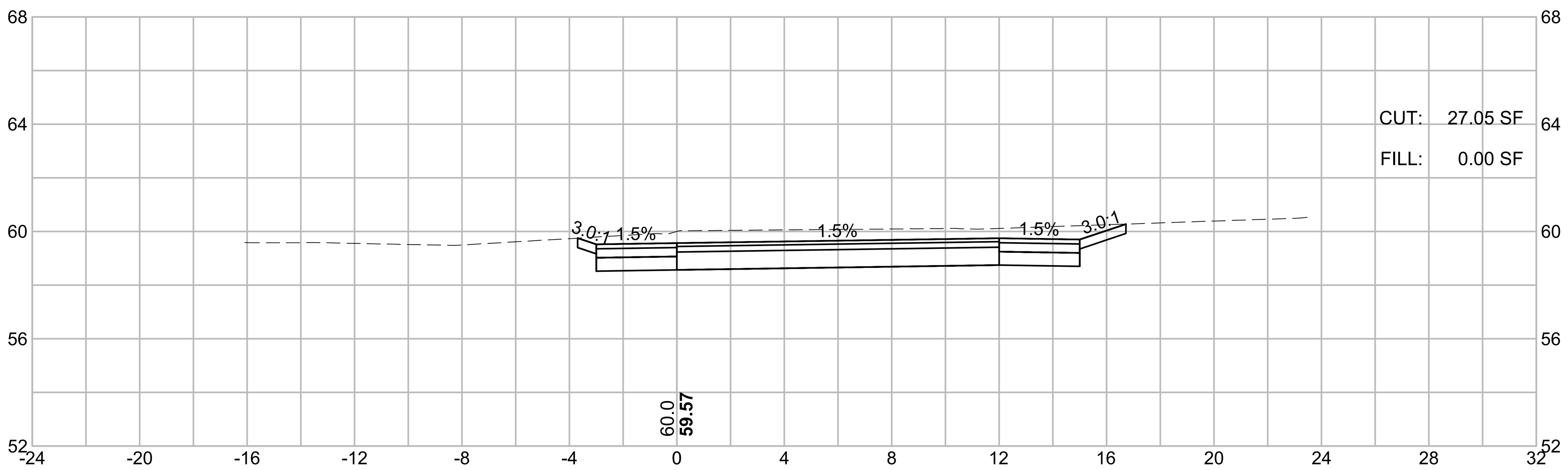
607398_HD(XSEC-EAST-3).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

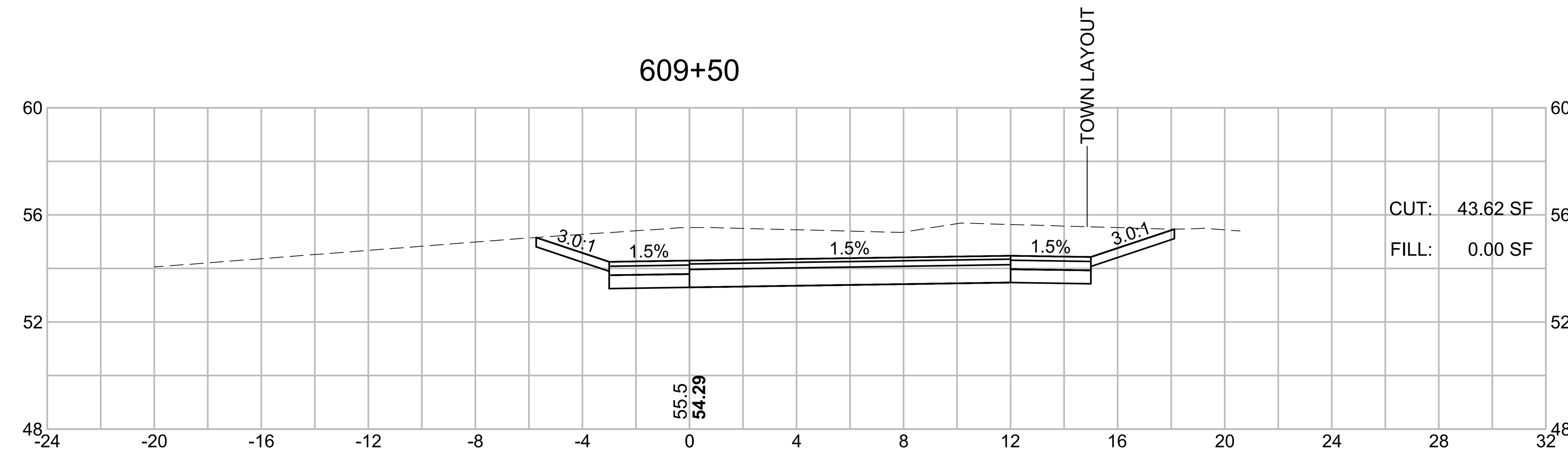
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	241	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

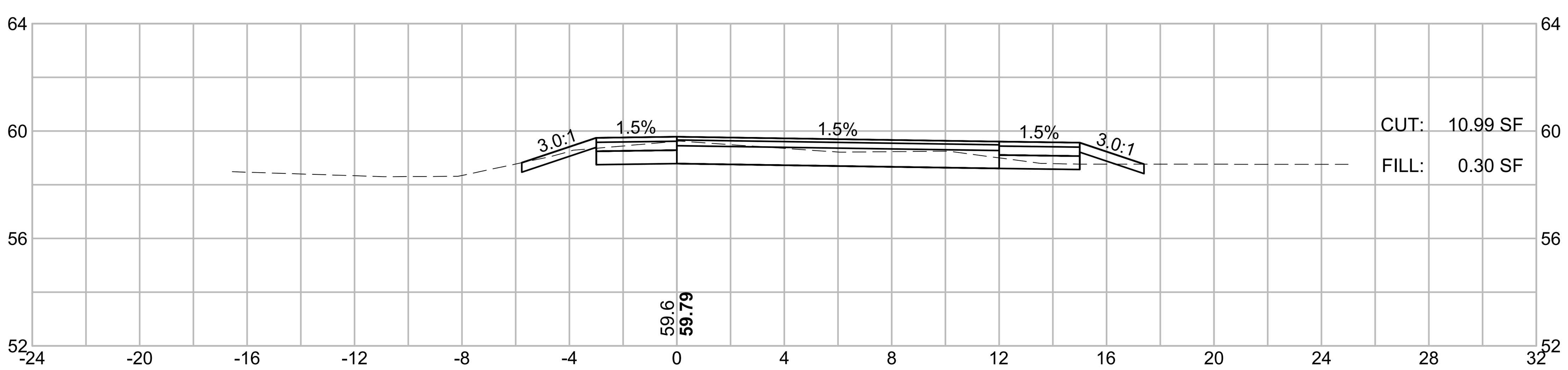
608+00



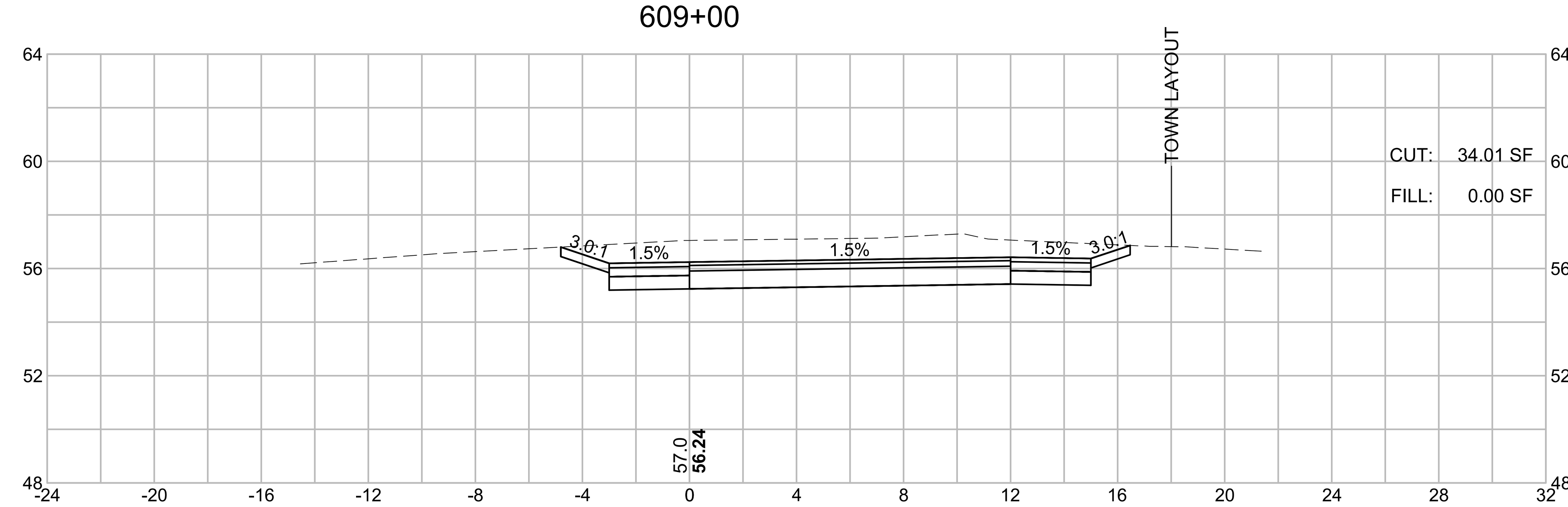
609+50

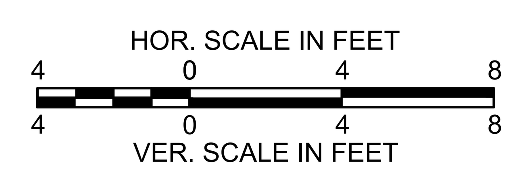


607+50



609+00





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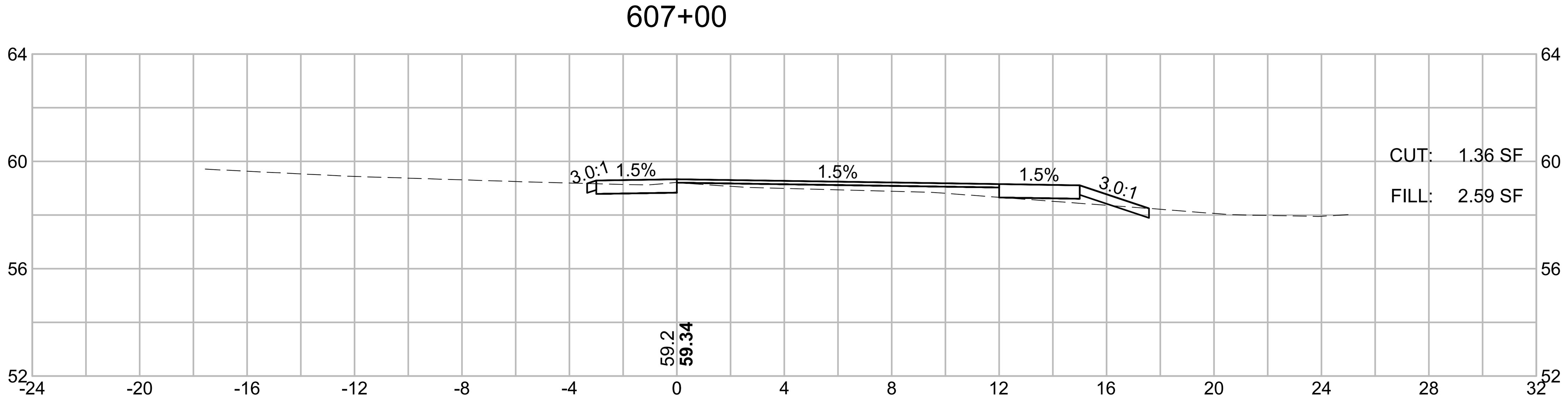
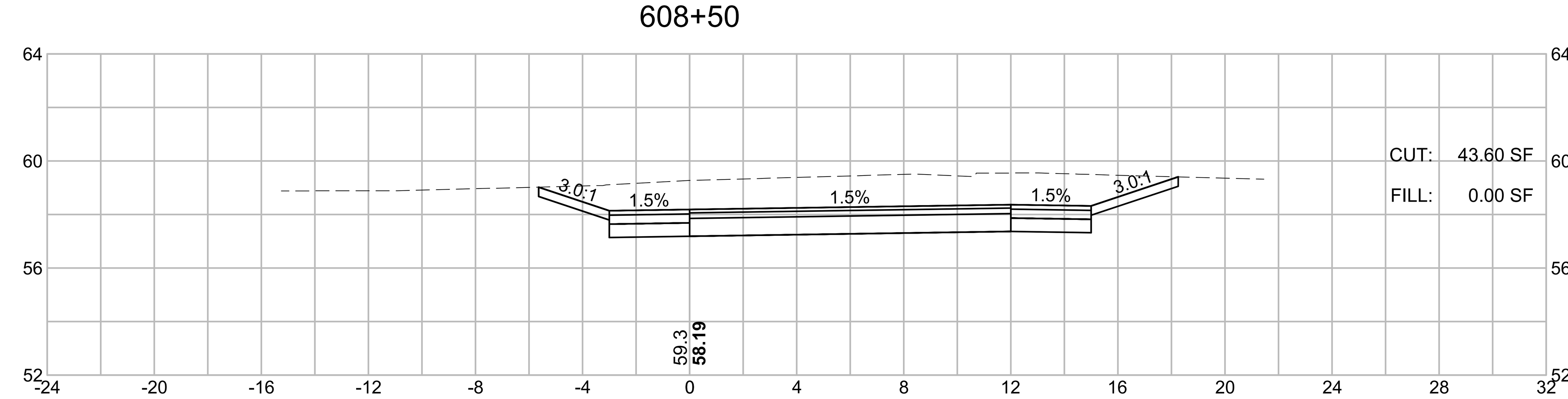


608+50



Plotted on 21-Oct-2021 8:54 AM

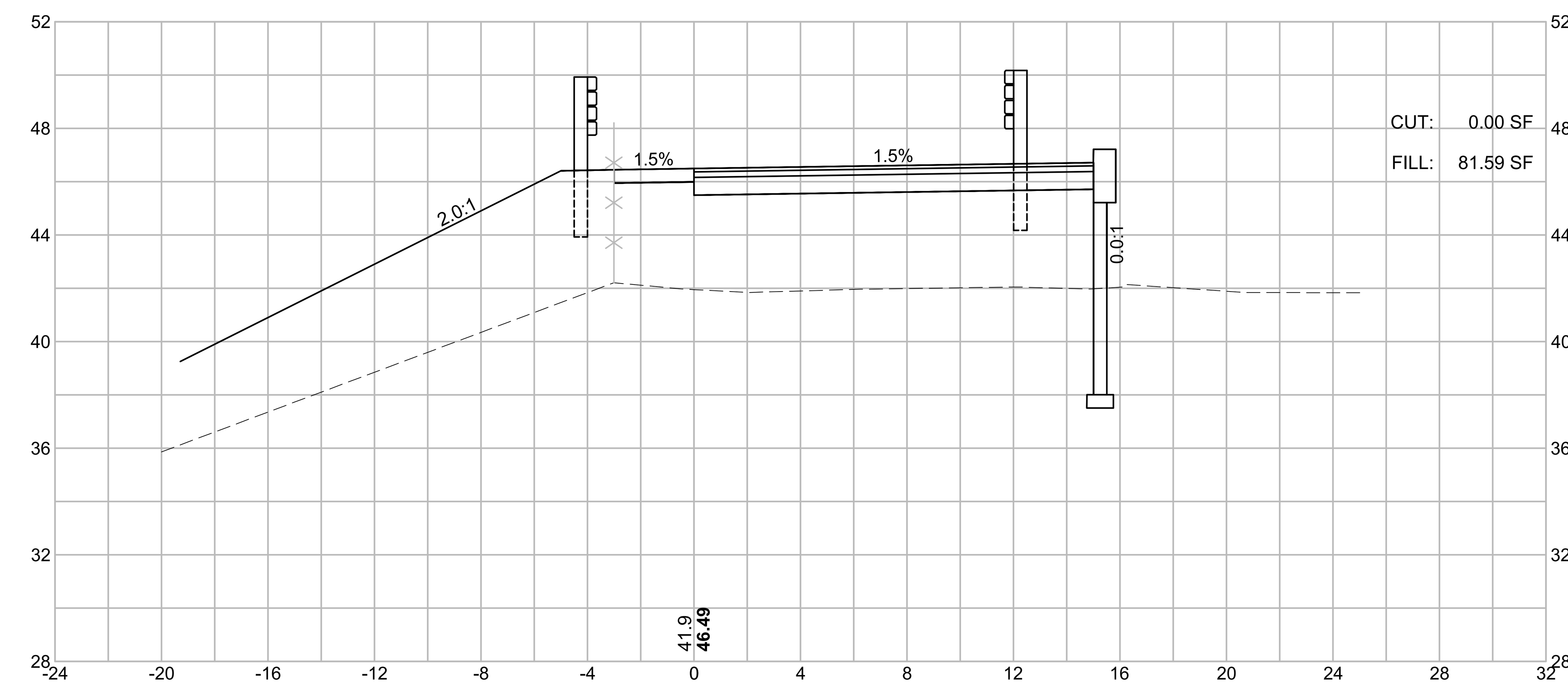
607398_HD(XSEC-EAST-3).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

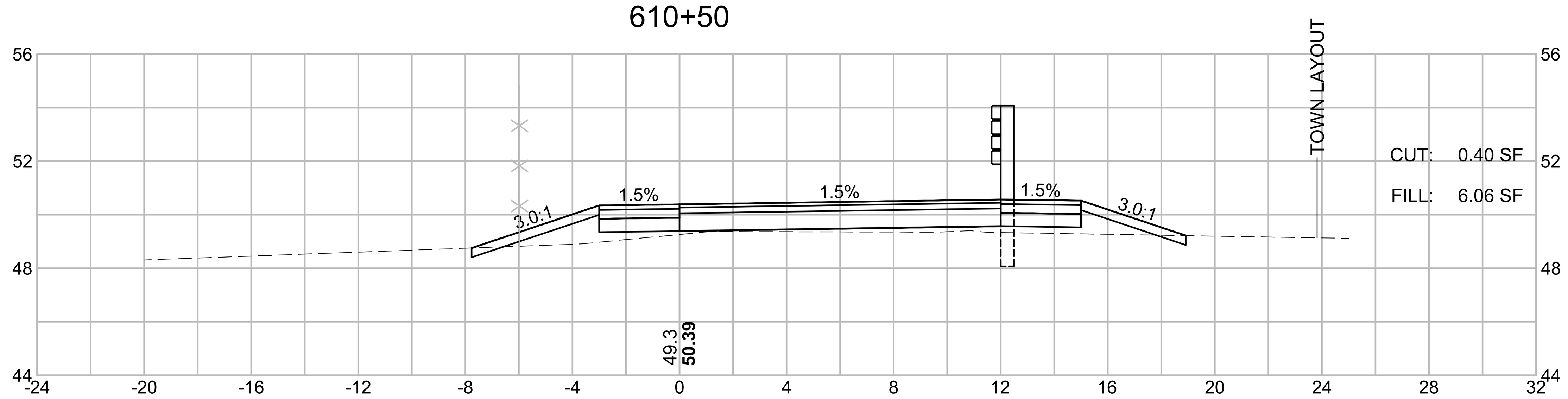
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	242	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

611+50

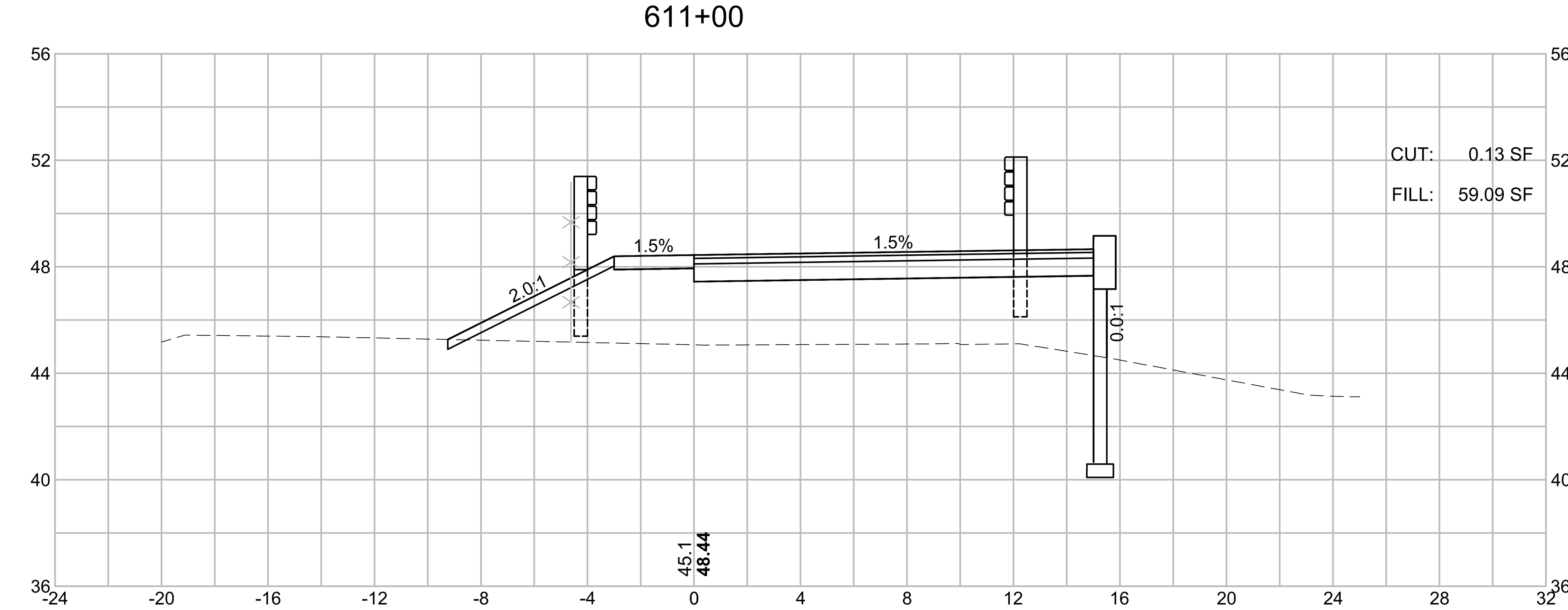


610+50

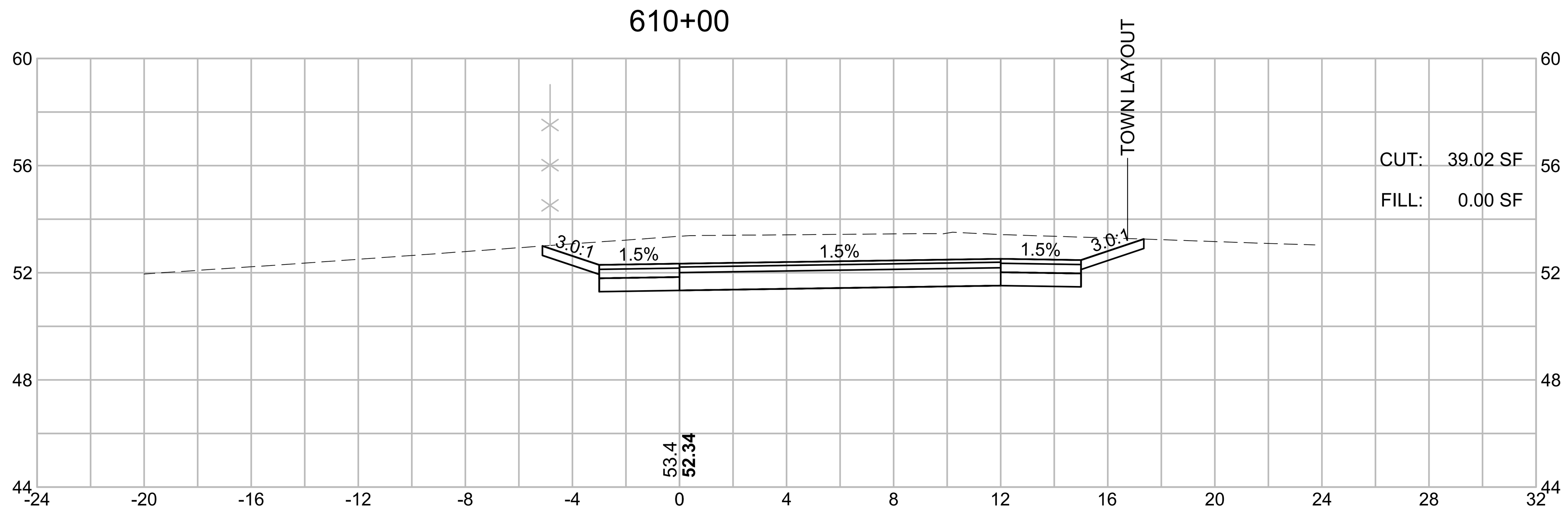


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

611+00



610+00



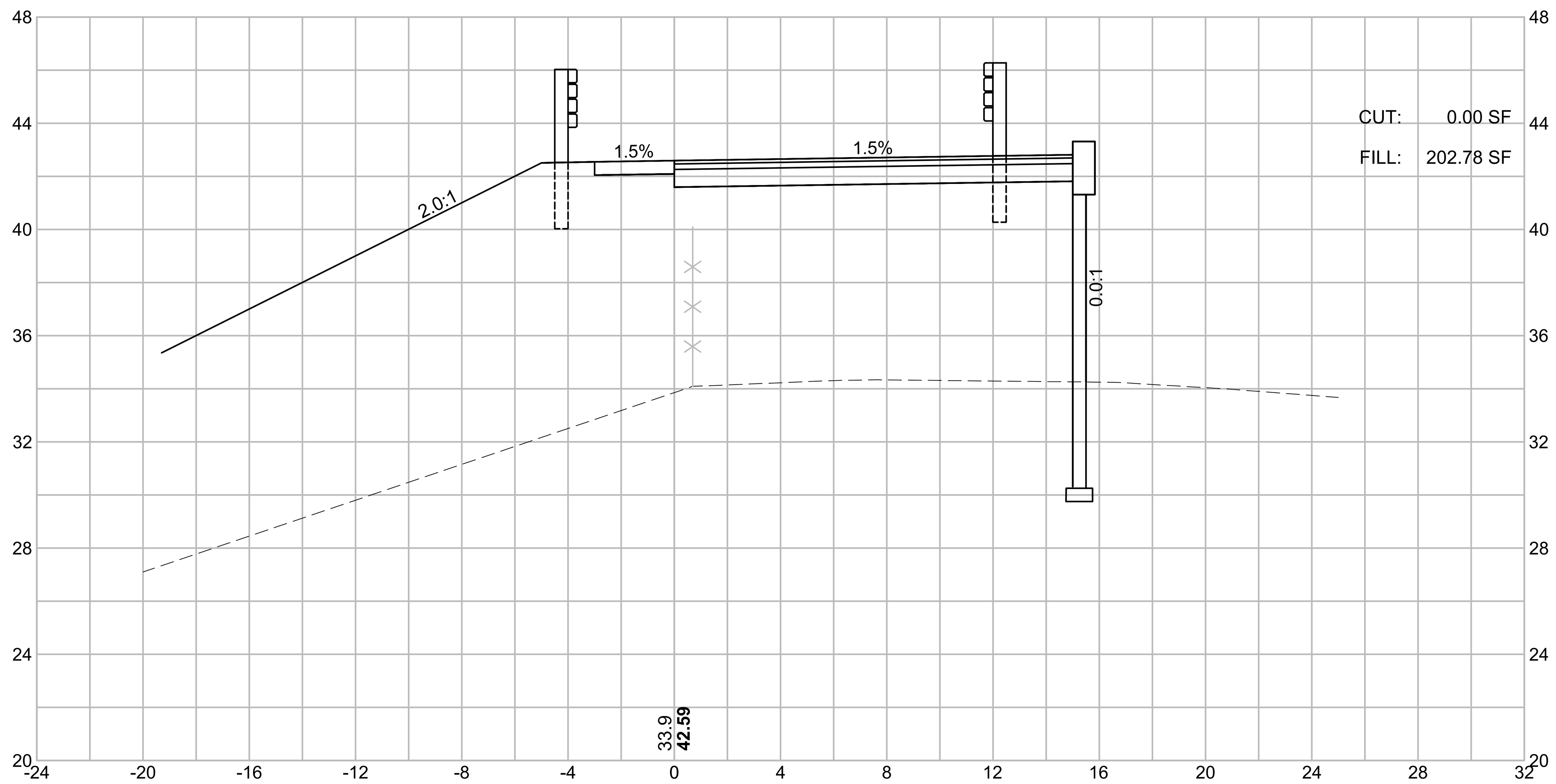
607398_HD(XSEC-EAST-3).DWG Plotted on 21-Oct-2021 8:54 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

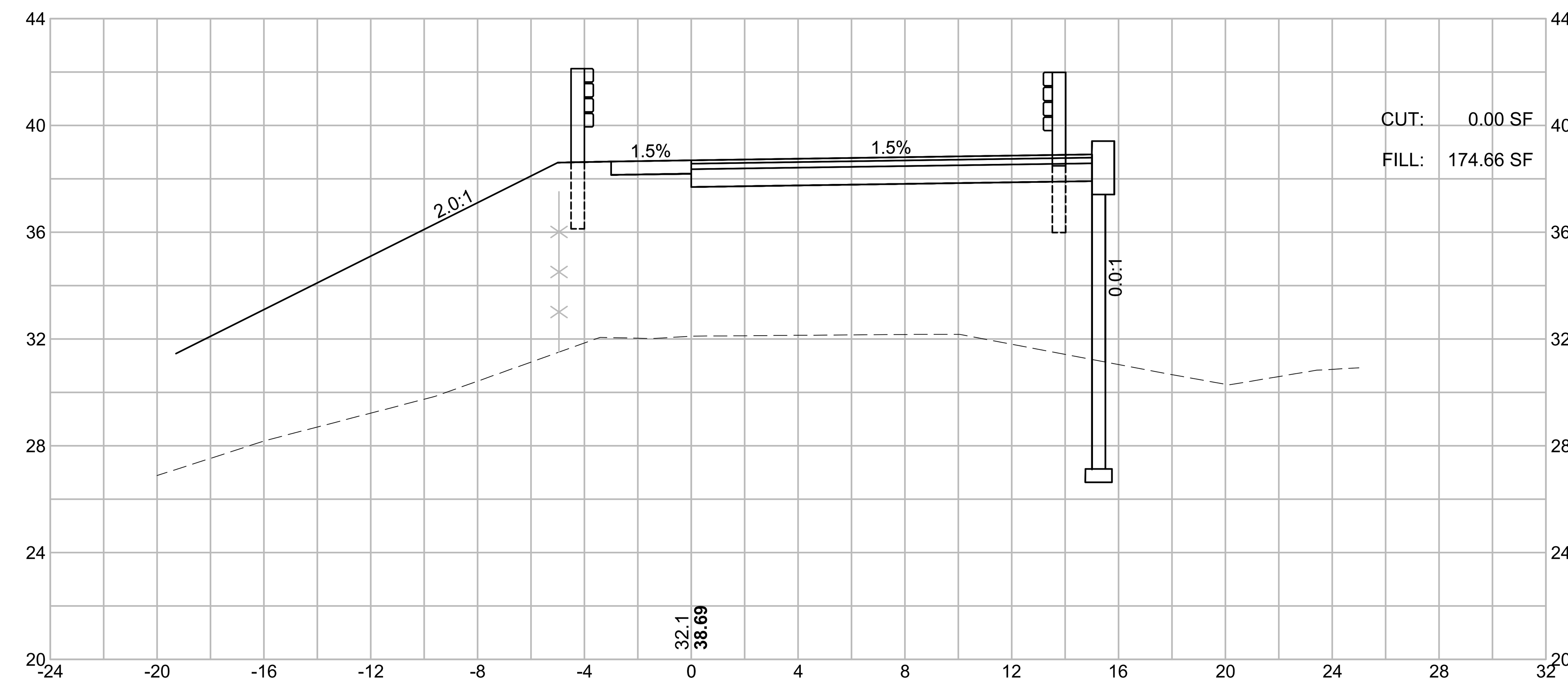
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	243	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

612+50

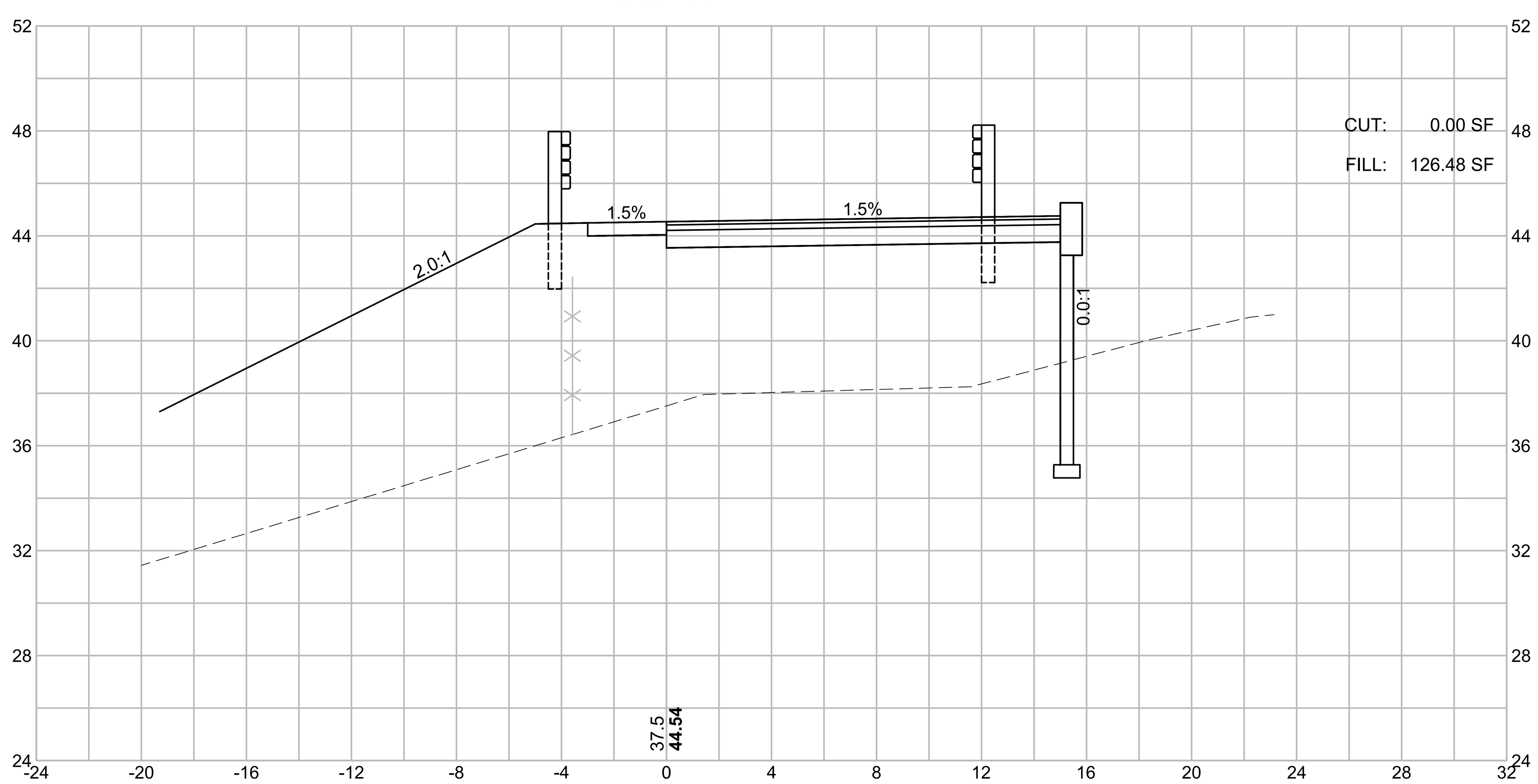


613+50

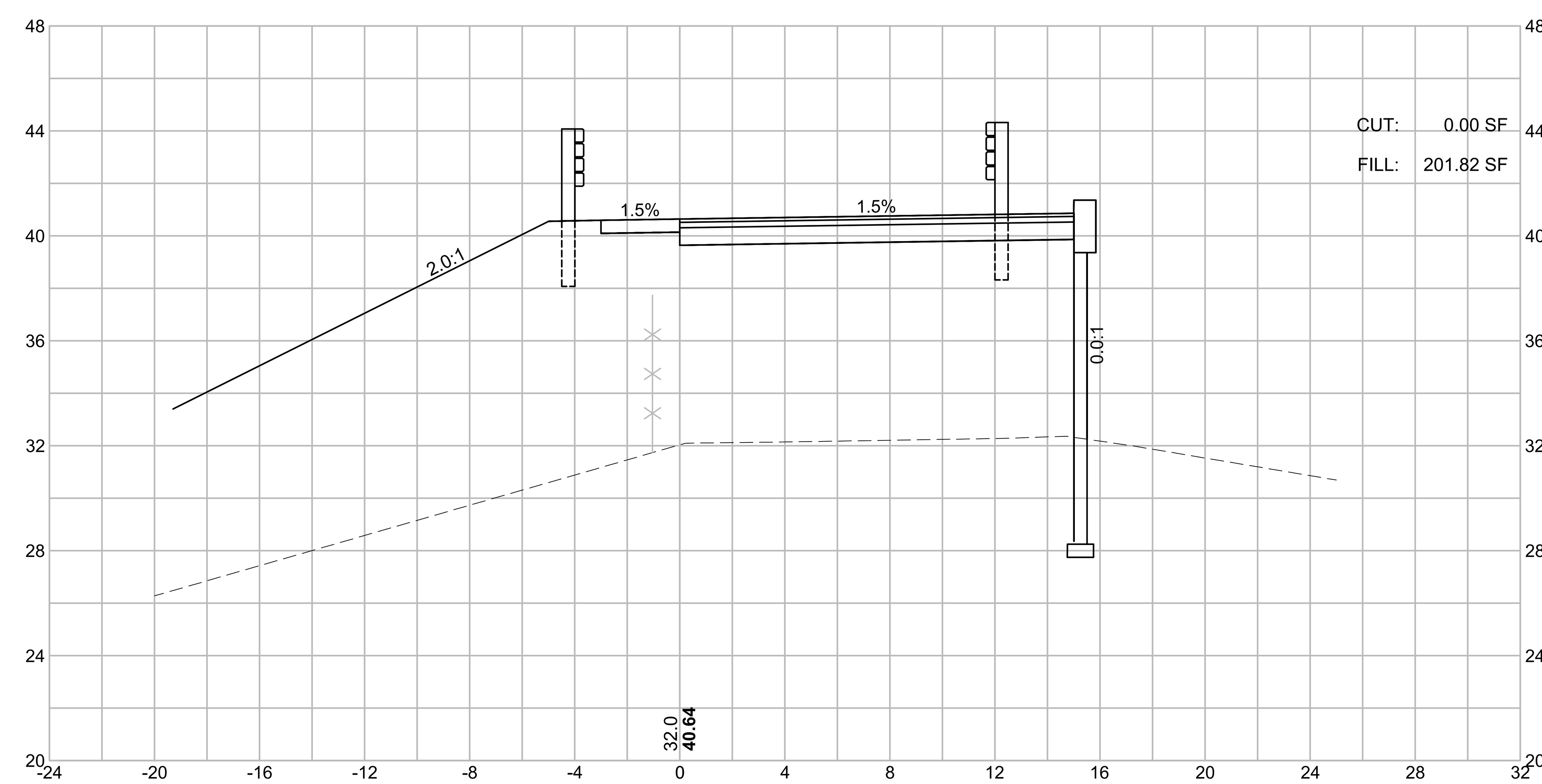


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

612+00



613+00

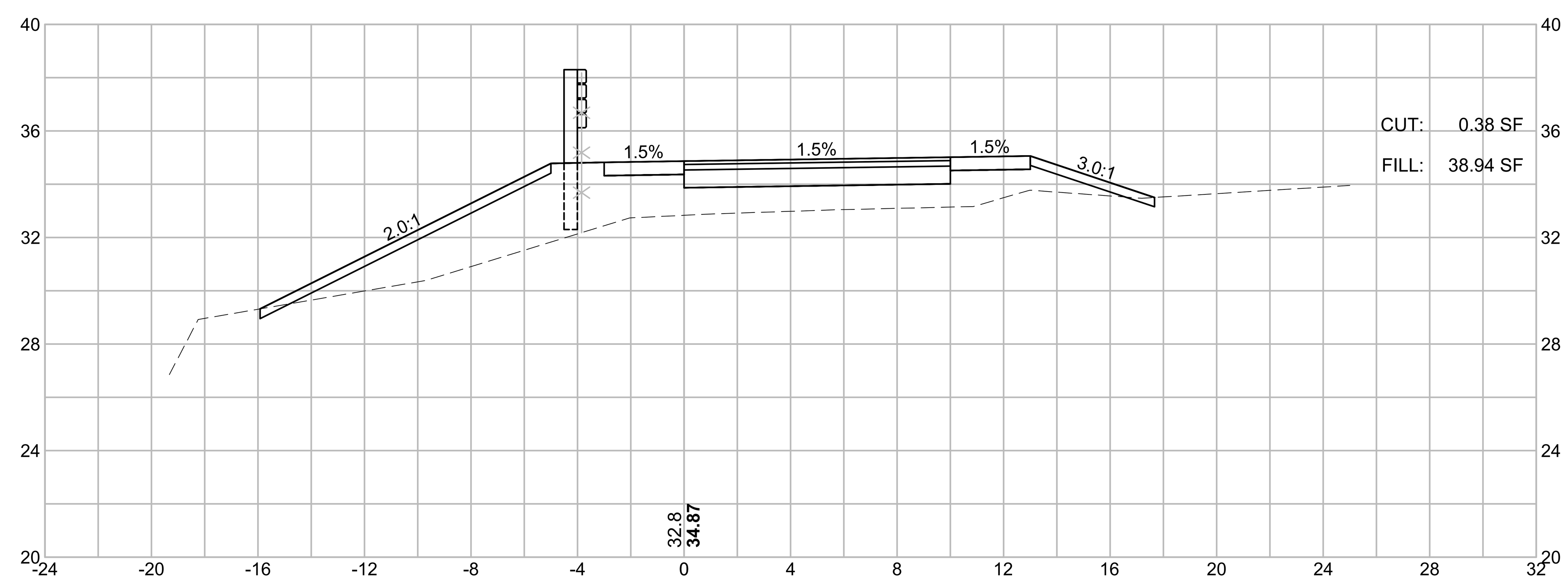


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

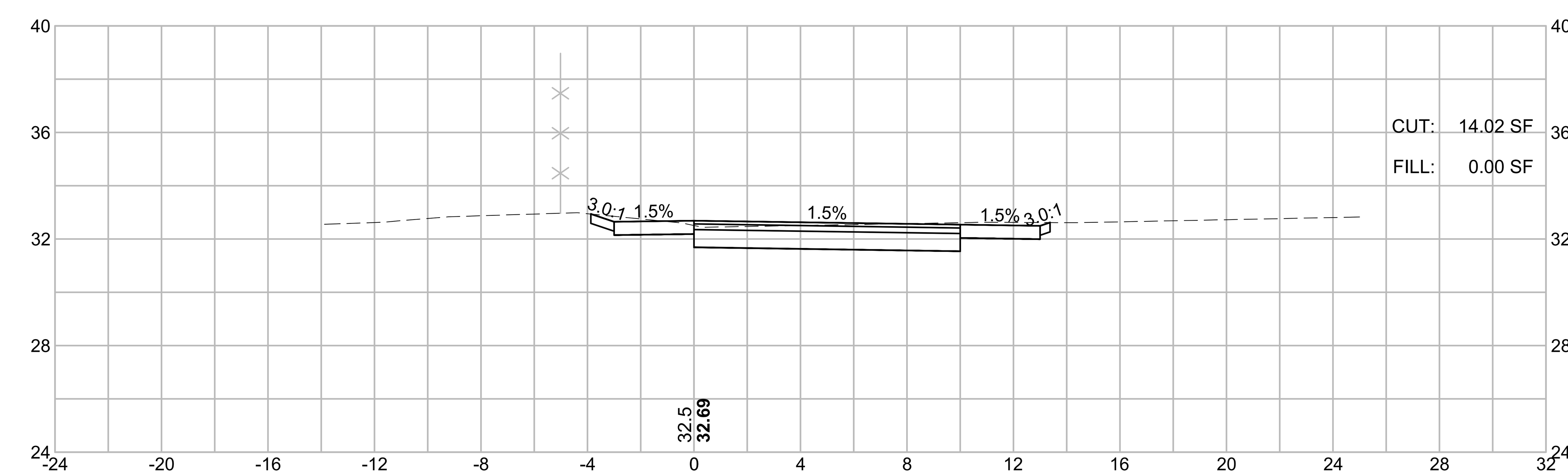
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	244	267
PROJECT FILE NO. 607398			

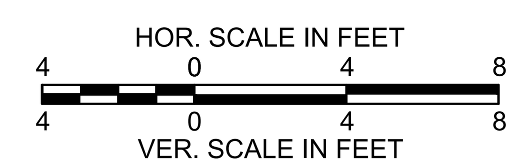
EAST CROSS SECTIONS

614+50



615+50





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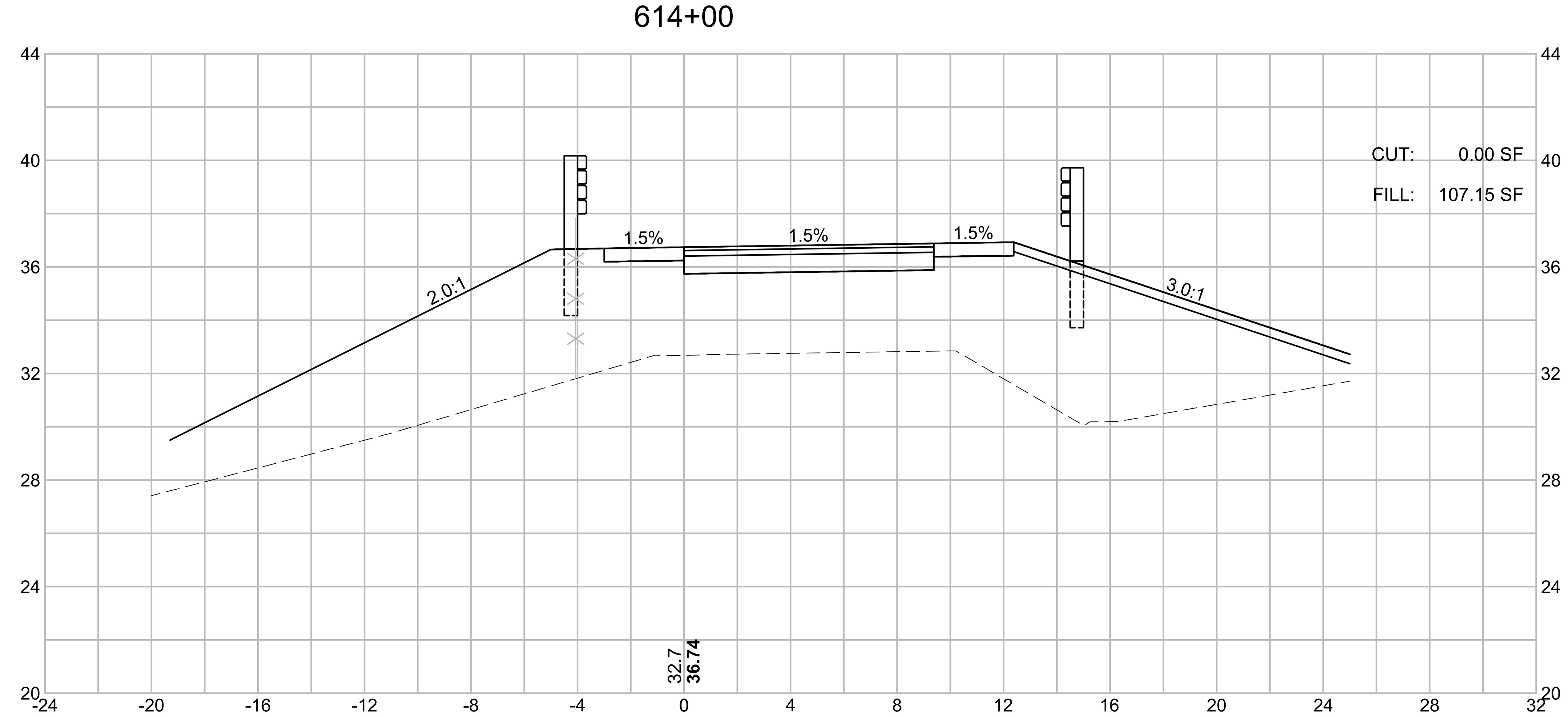
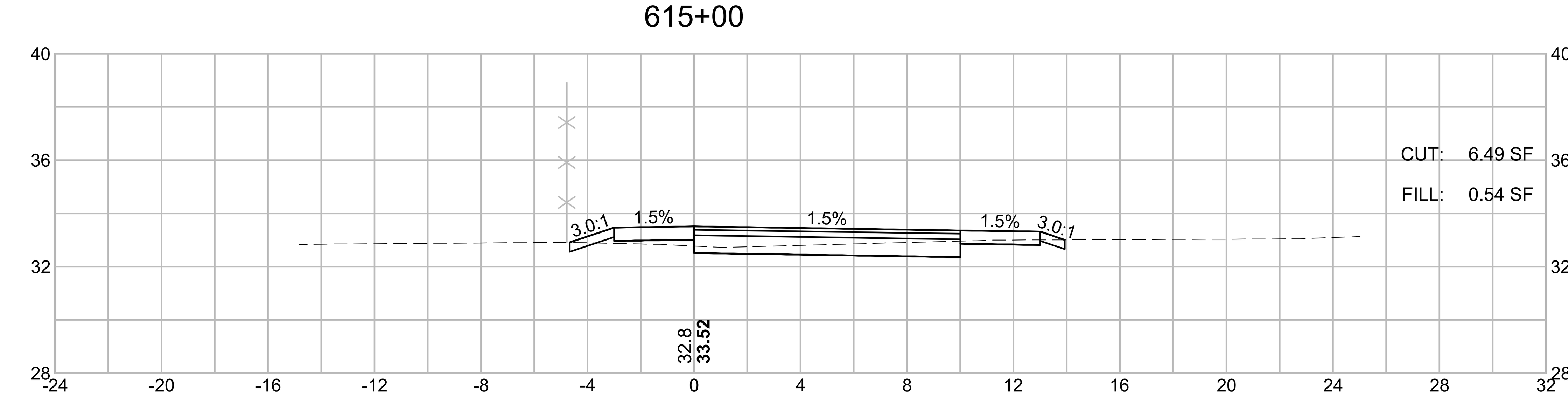


615+00



607398_HD(XSEC-EAST-3).DWG Plotted on 21-Oct-2021 8:54 AM

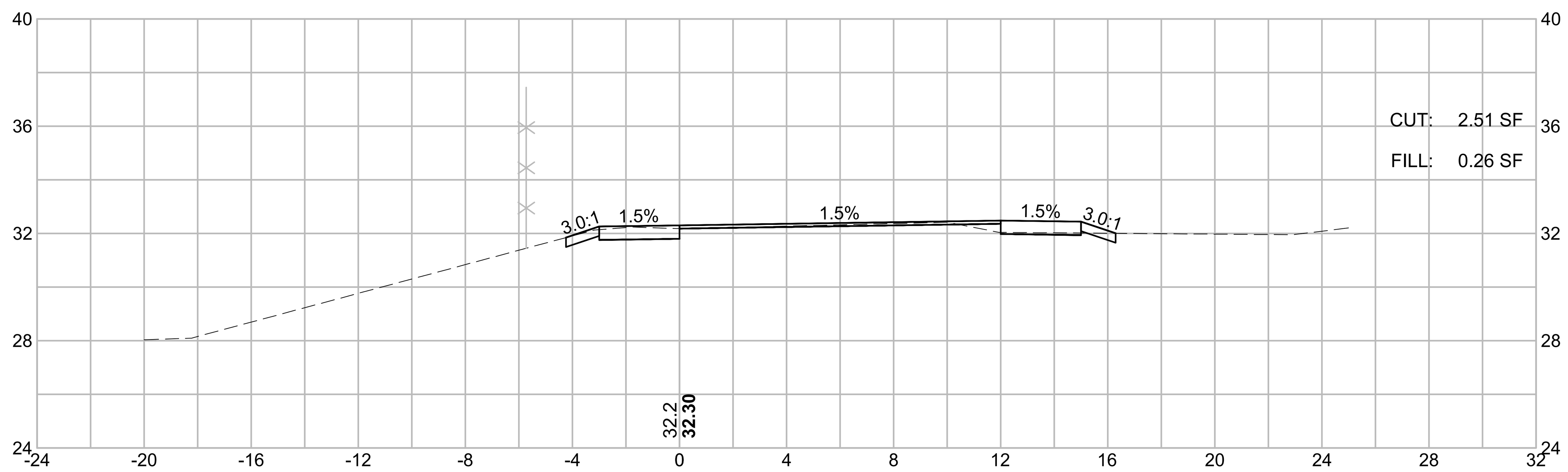
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	245	267
PROJECT FILE NO. 607398			

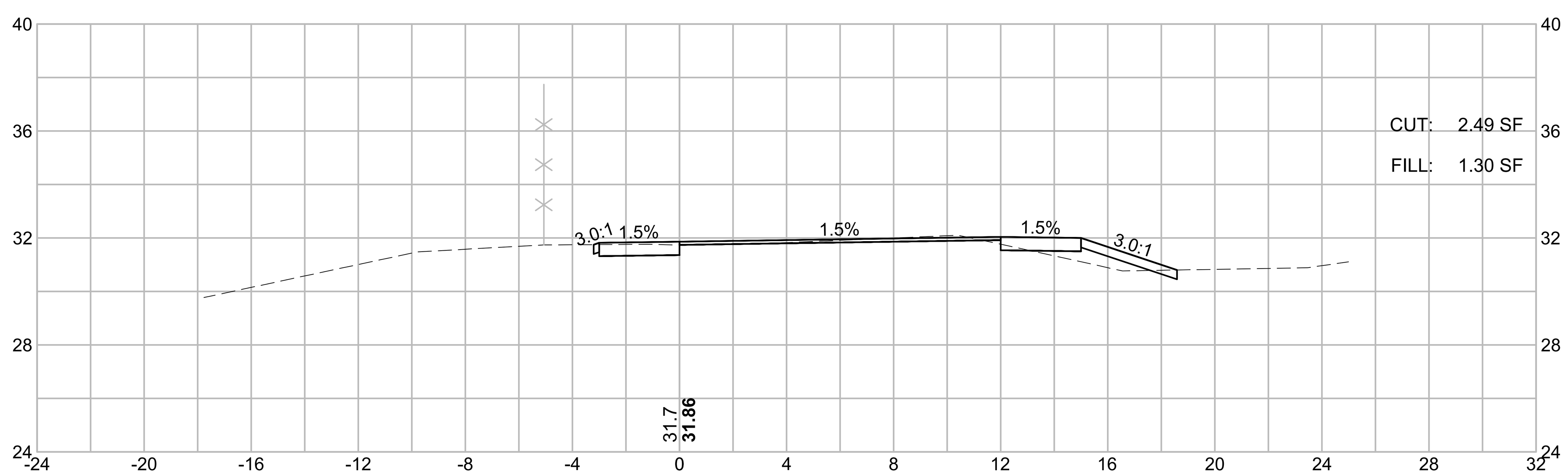
EAST CROSS SECTIONS

607398_HD(XSEC-EAST-3).DWG Plotted on 21-Oct-2021 8:55 AM

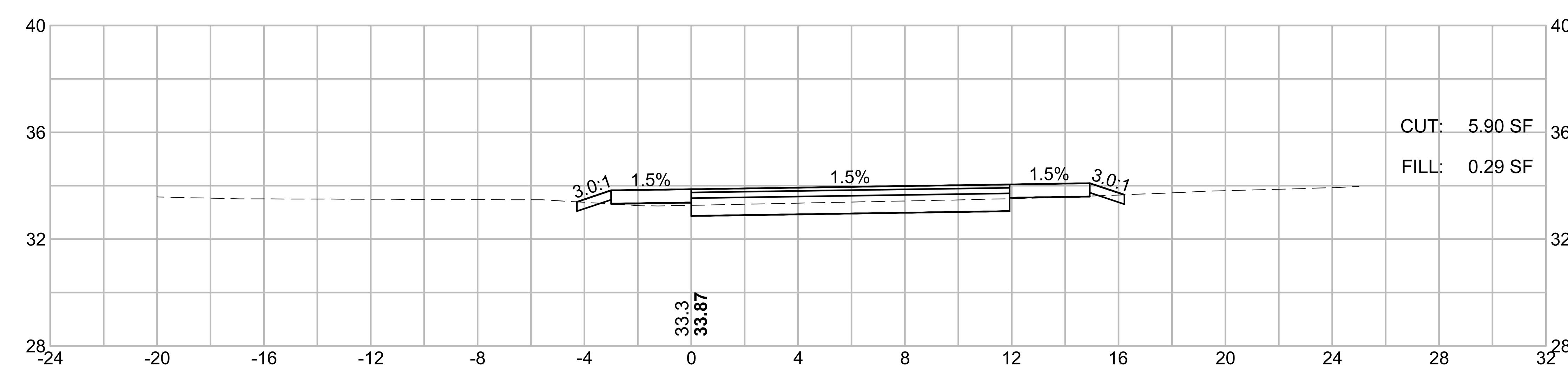
617+00



616+50

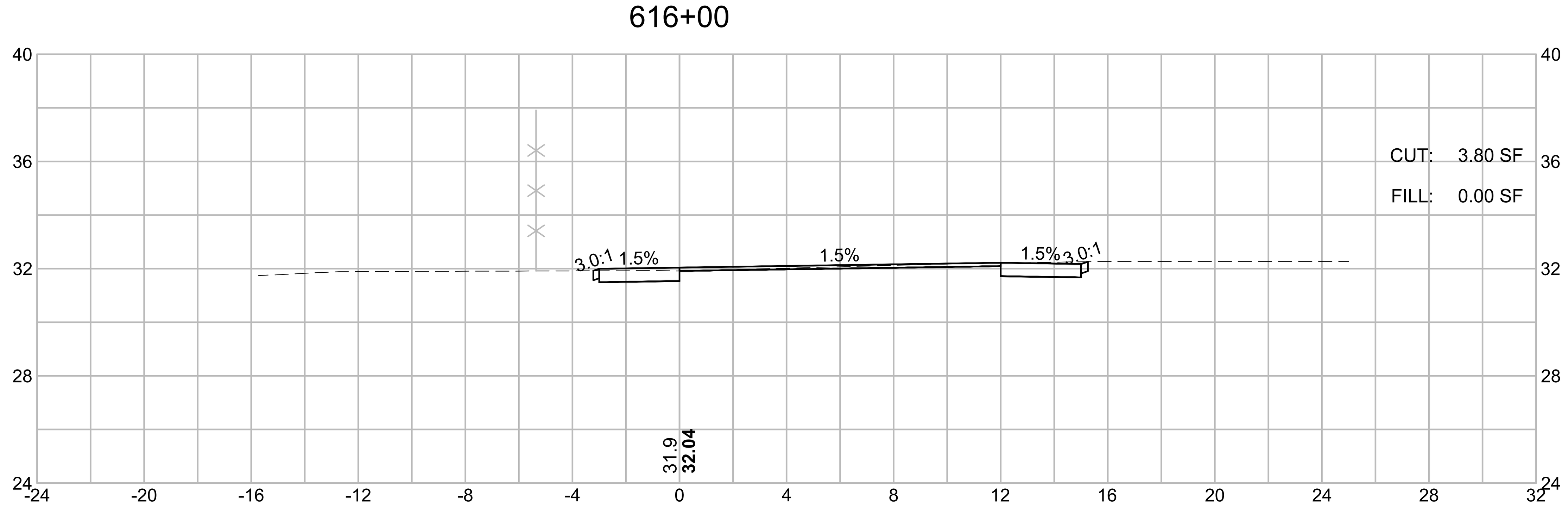


618+00

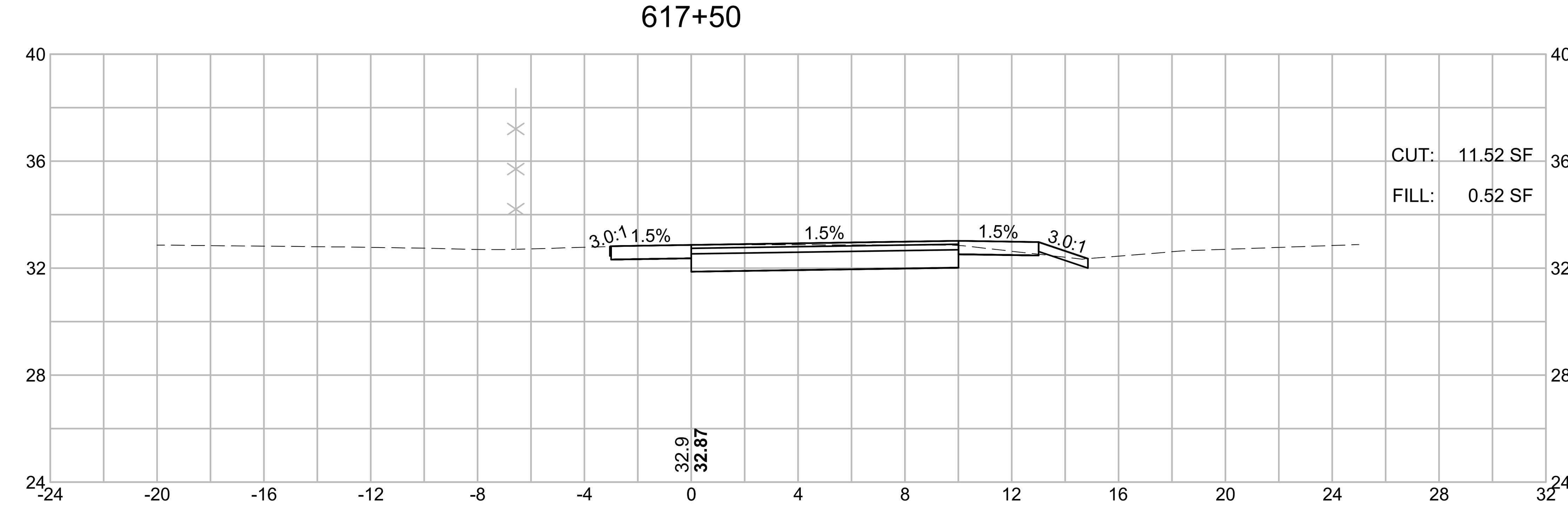


HOR. SCALE IN FEET
VER. SCALE IN FEET

616+00



617+50

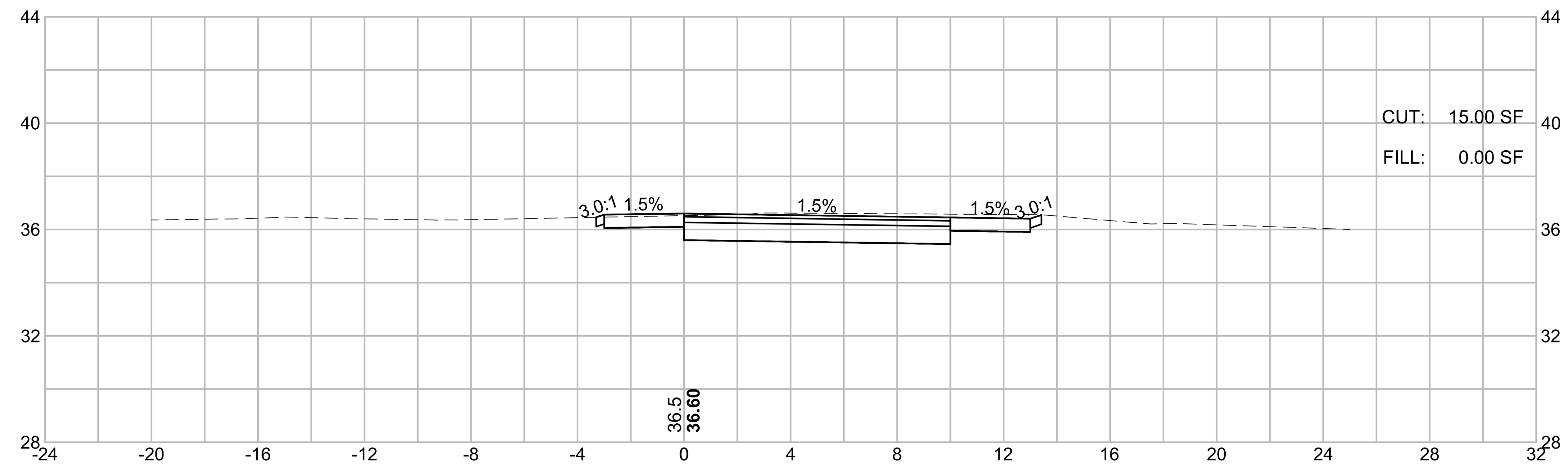


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

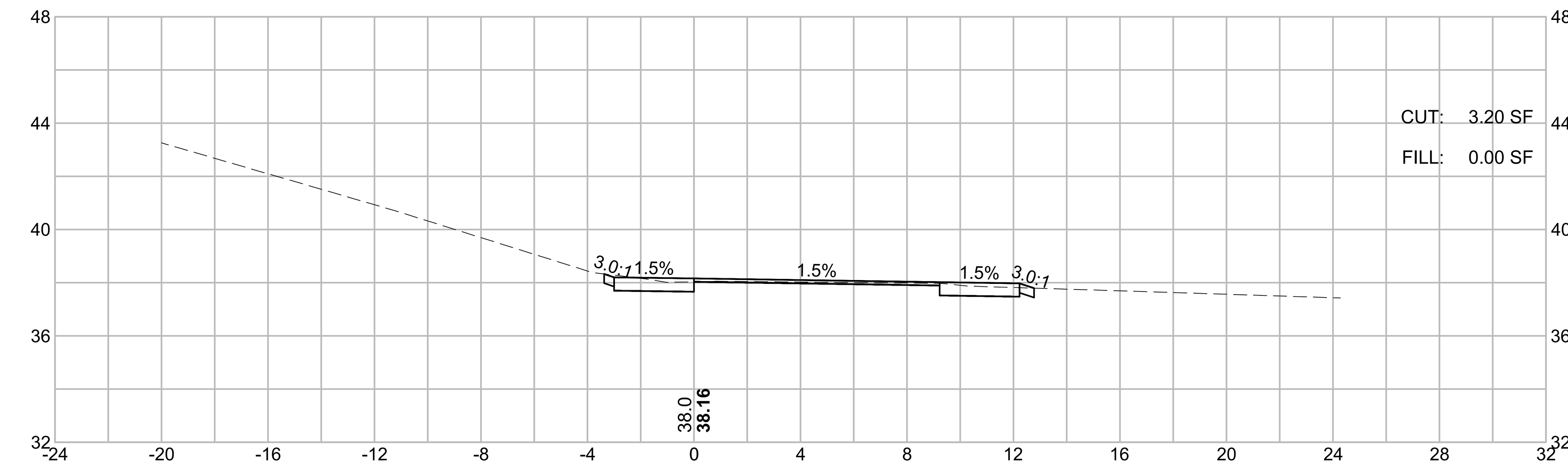
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	246	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

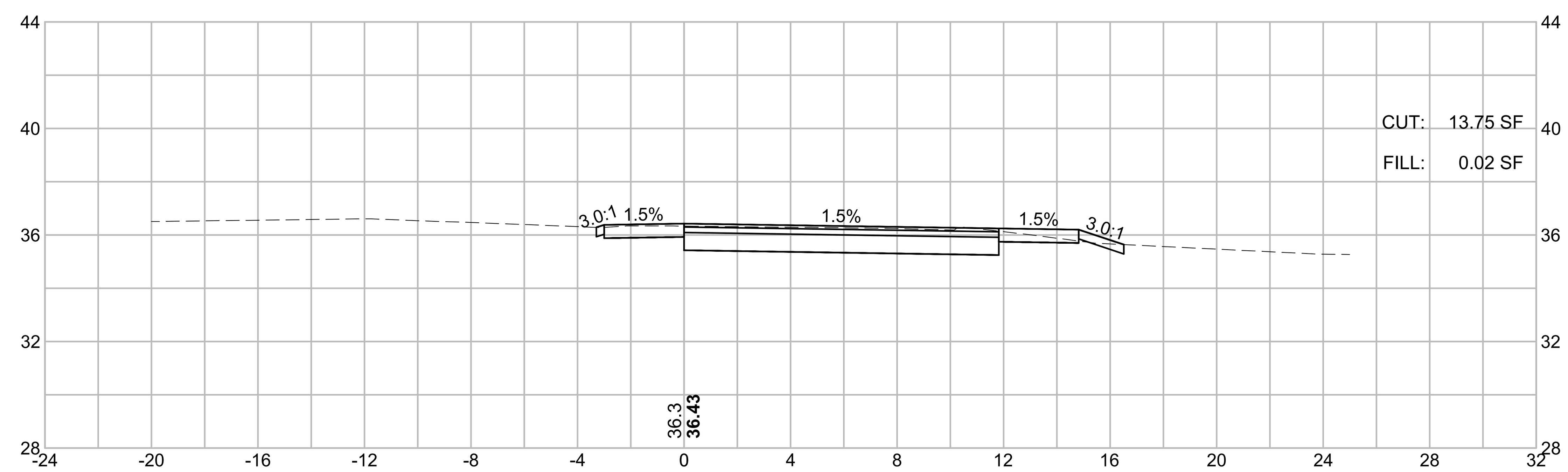
620+00



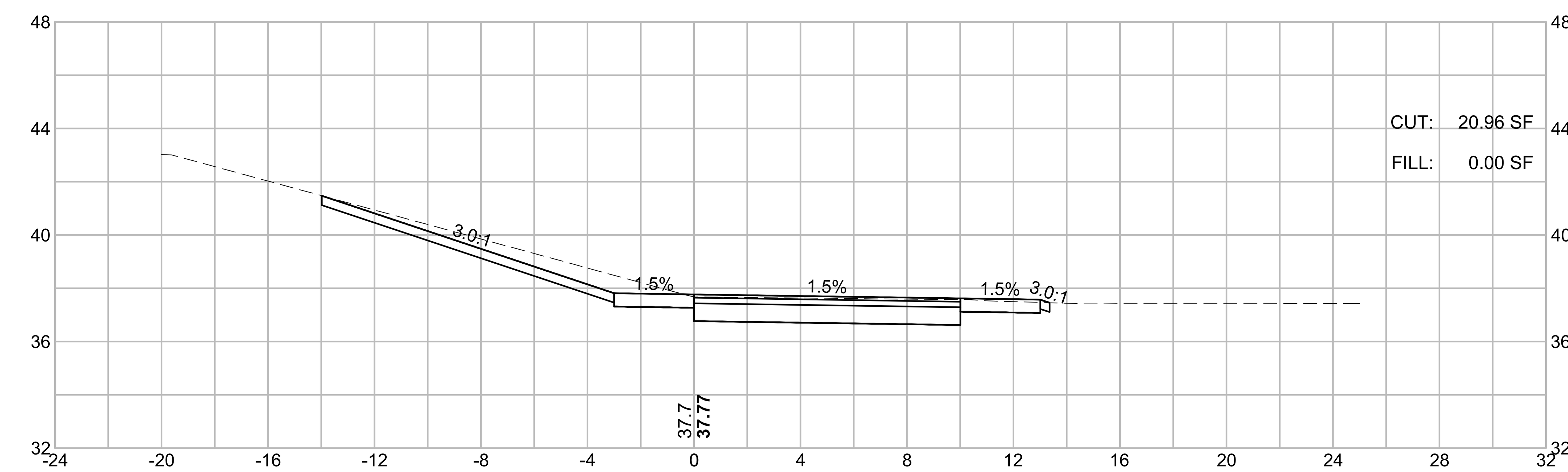
621+50

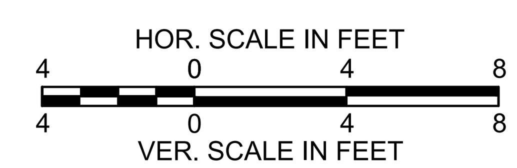


619+50

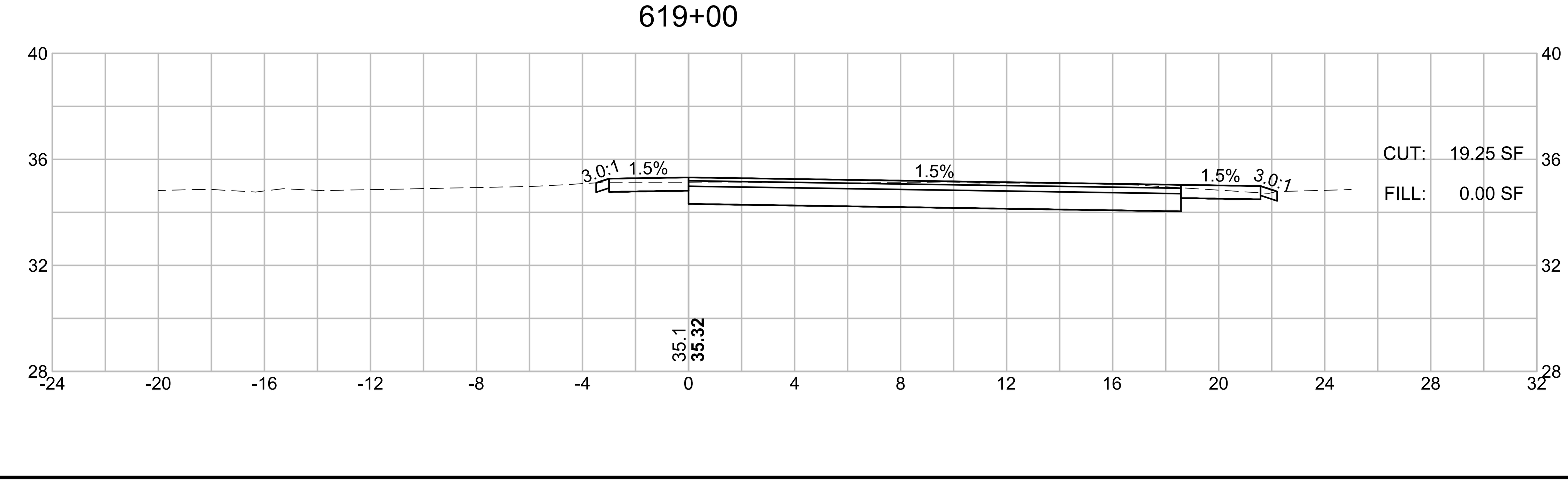


621+00

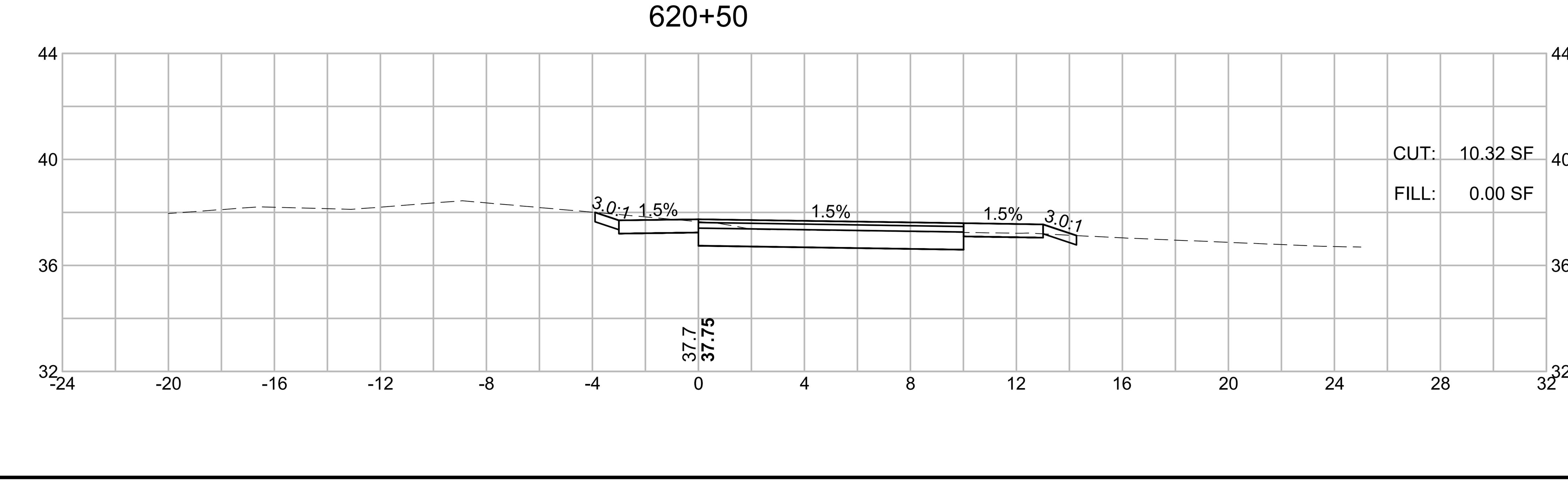




619+00



620+50



607398_HD(XSEC-EAST-3).DWG Plotted on 23-Nov-2021 1:31 PM

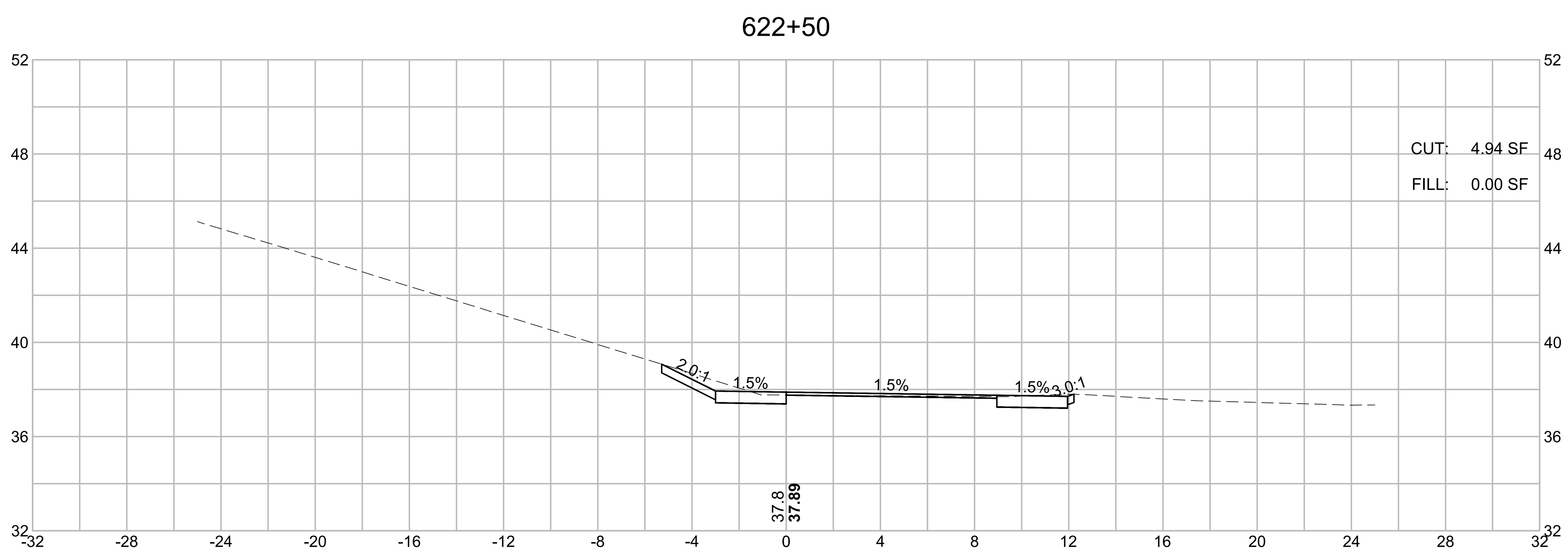
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

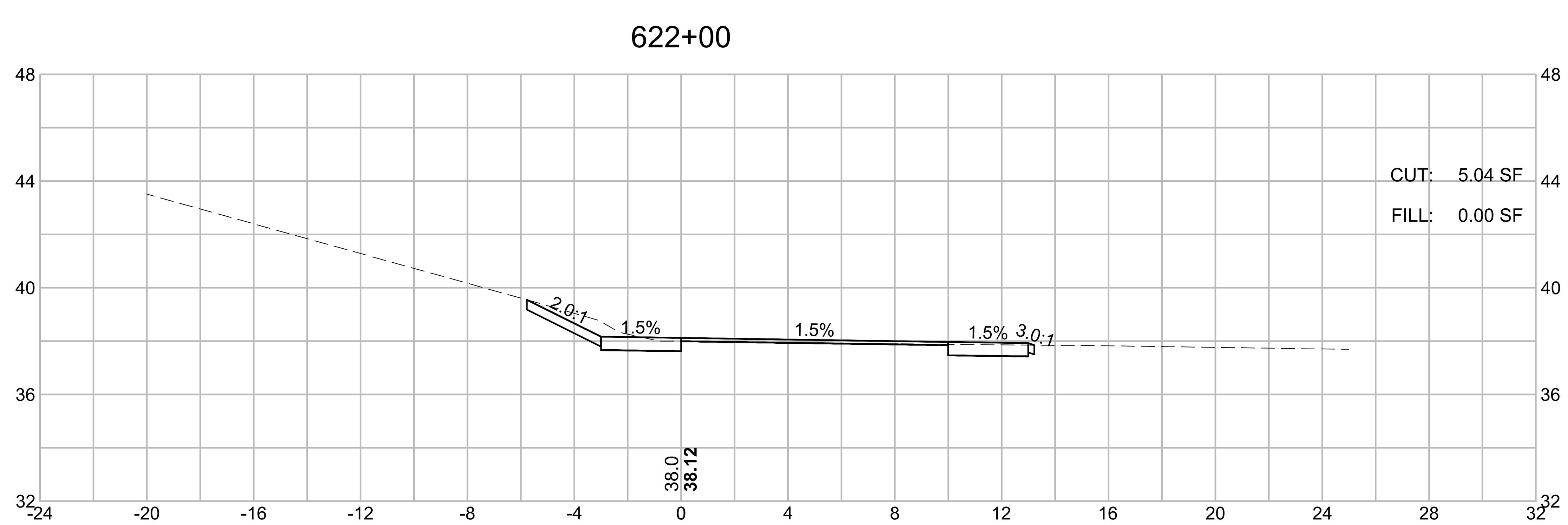
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	247	267
PROJECT FILE NO. 607398			

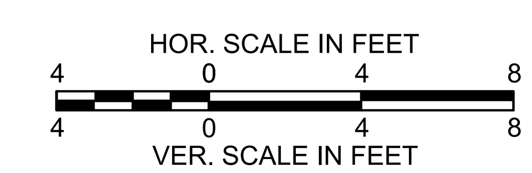
EAST CROSS SECTIONS

Plotted on 23-Nov-2021 1:31 PM

607398_HD(XSEC-EAST-3).DWG







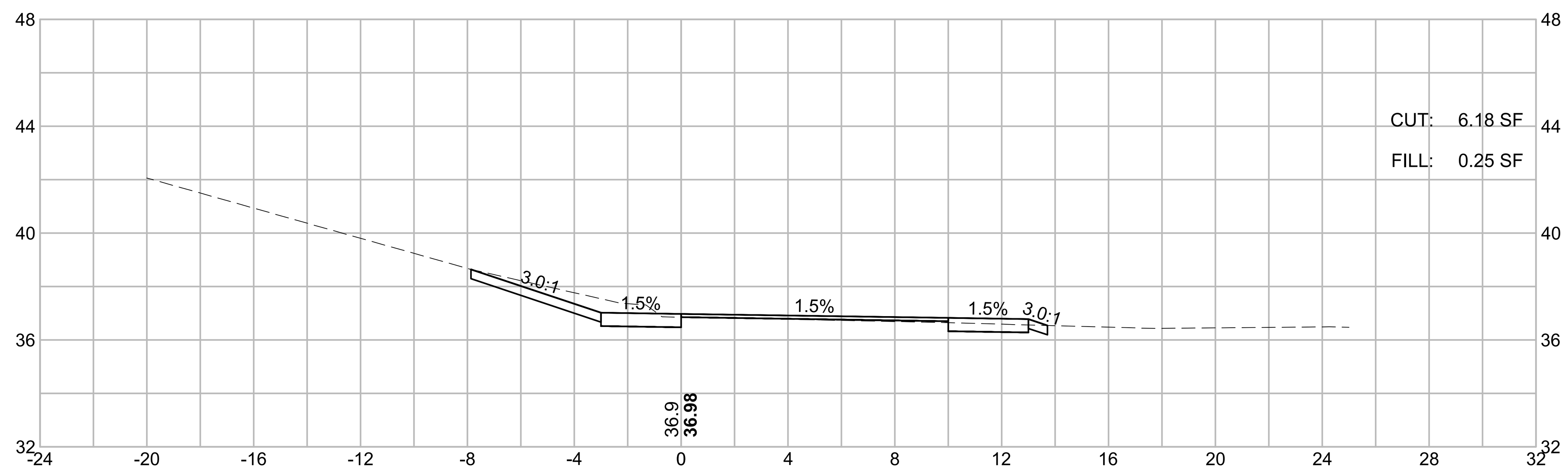
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	248	267
PROJECT FILE NO. 607398			

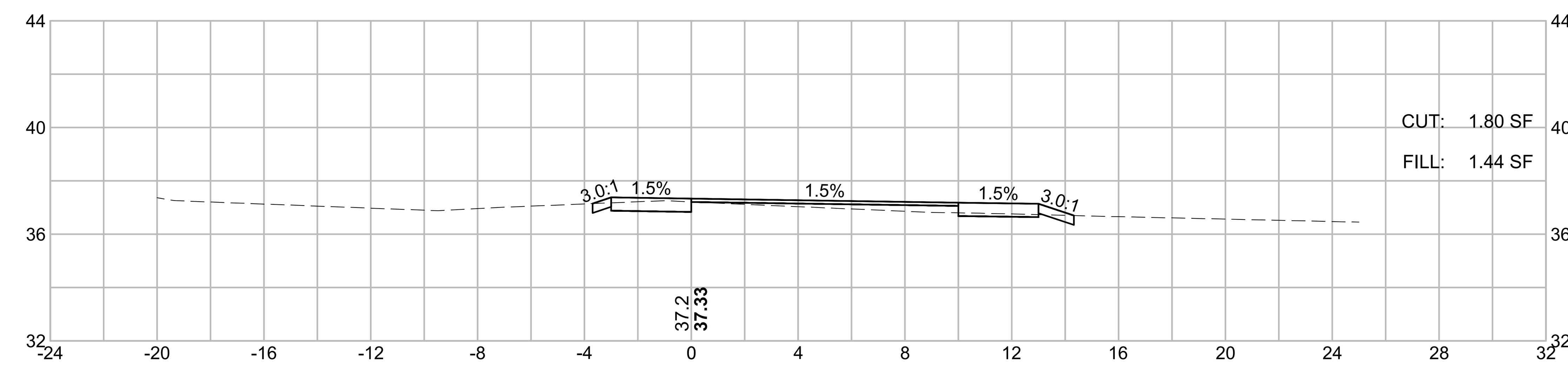
EAST CROSS SECTIONS

607398_HD(XSEC-EAST-3).DWG Plotted on 23-Nov-2021 1:32 PM

623+50

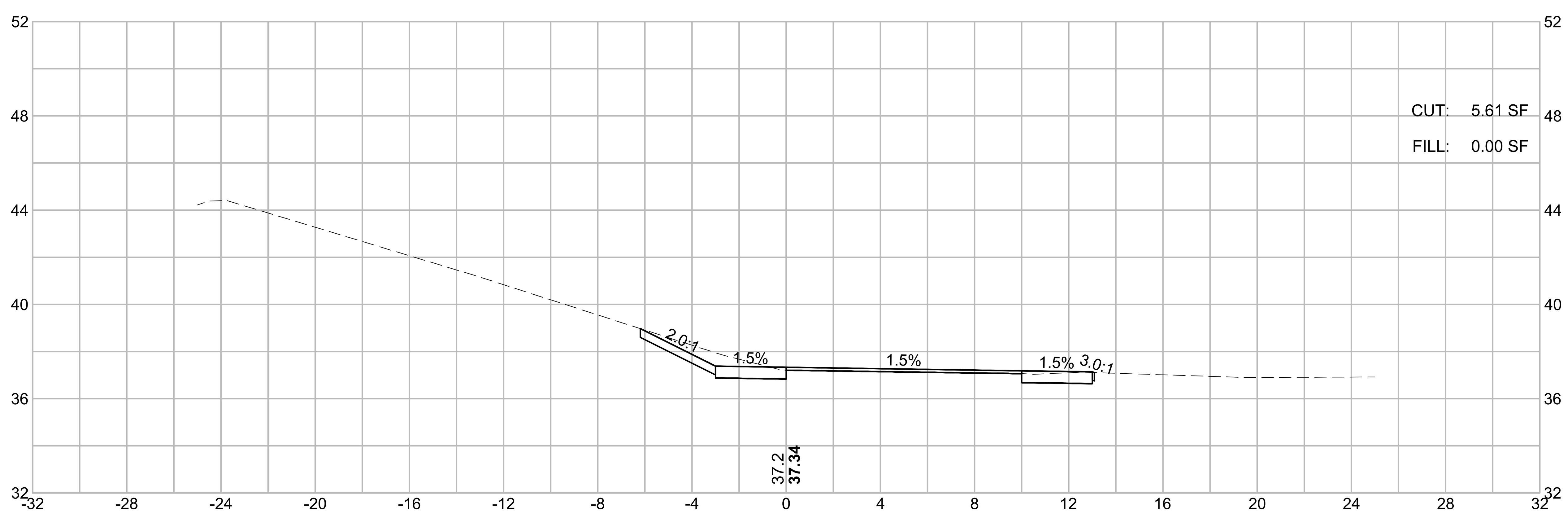


624+50

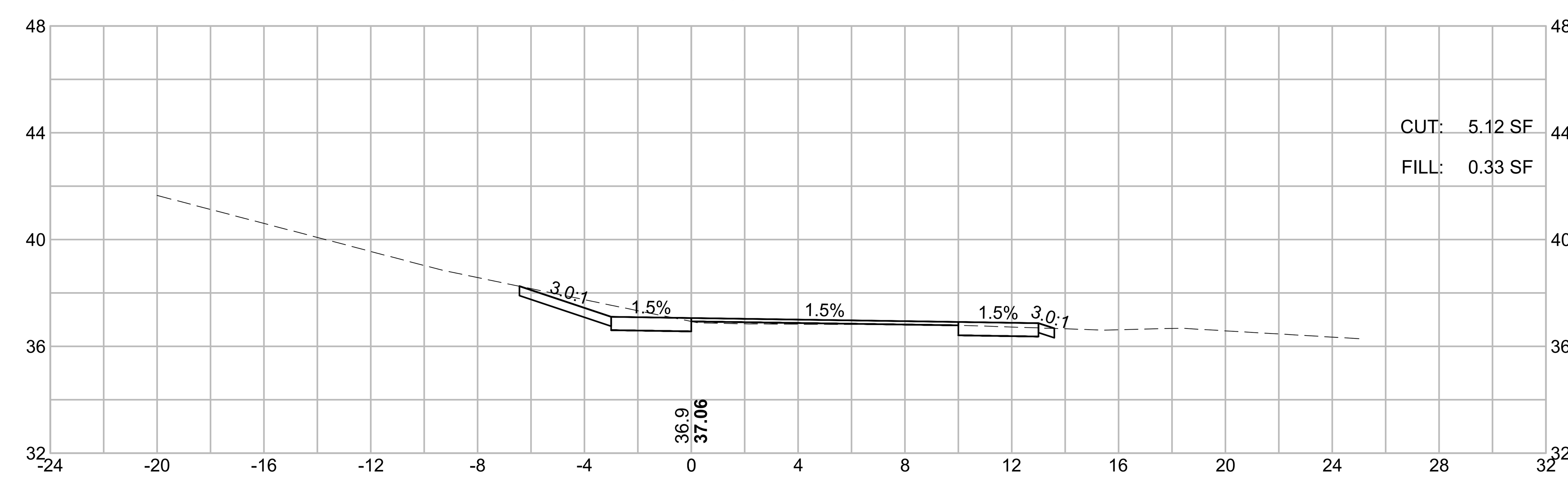


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

623+00



624+00

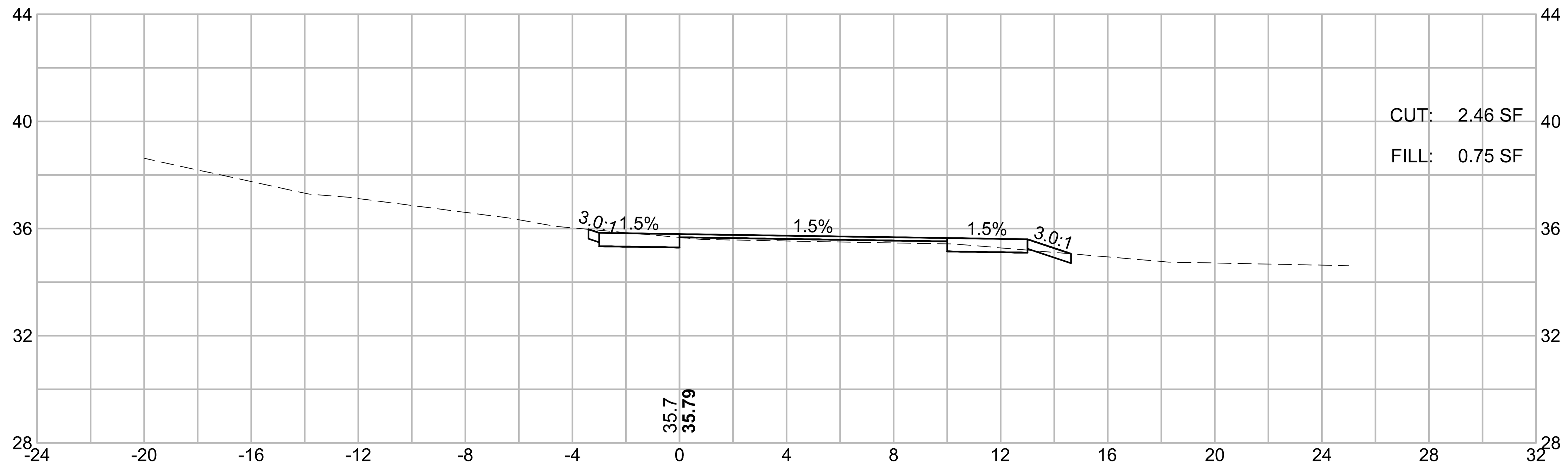


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

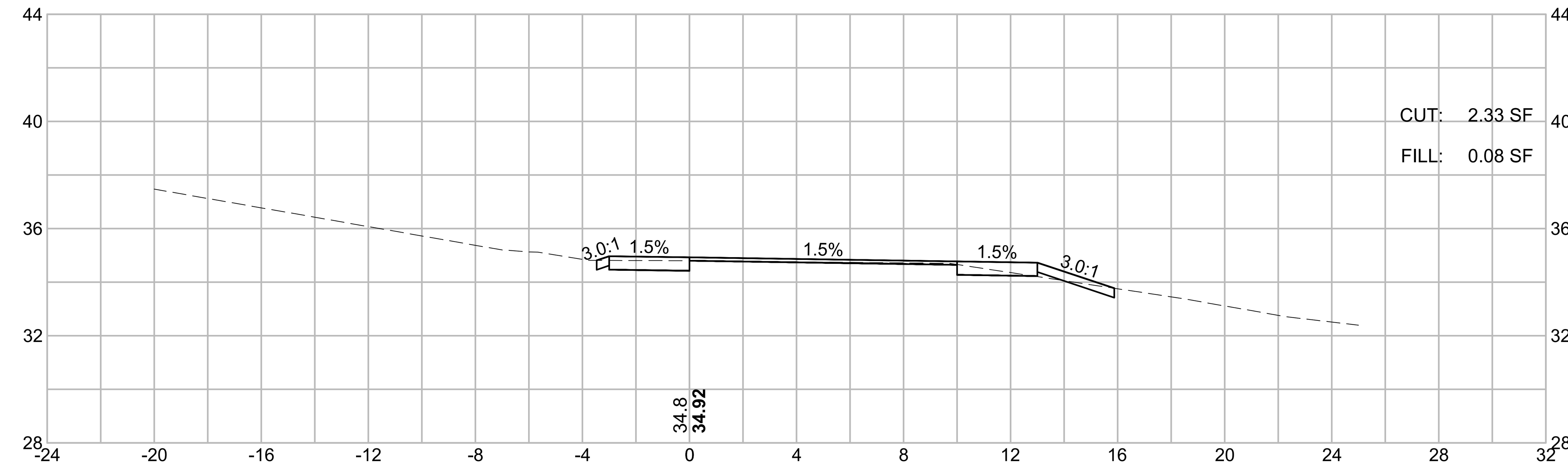
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	249	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

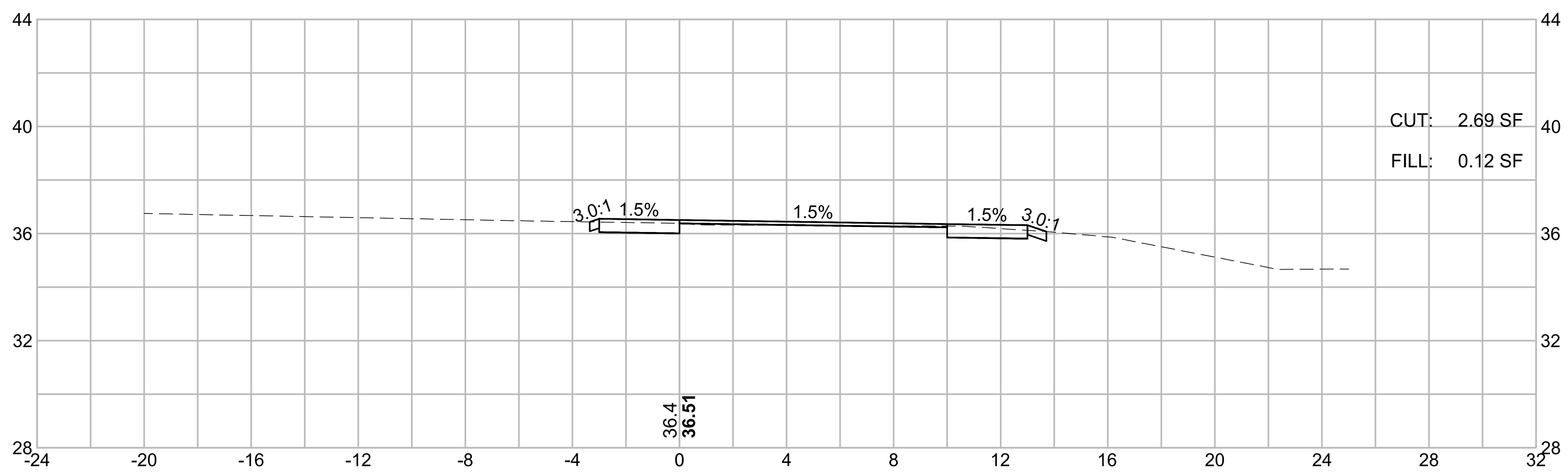
626+00



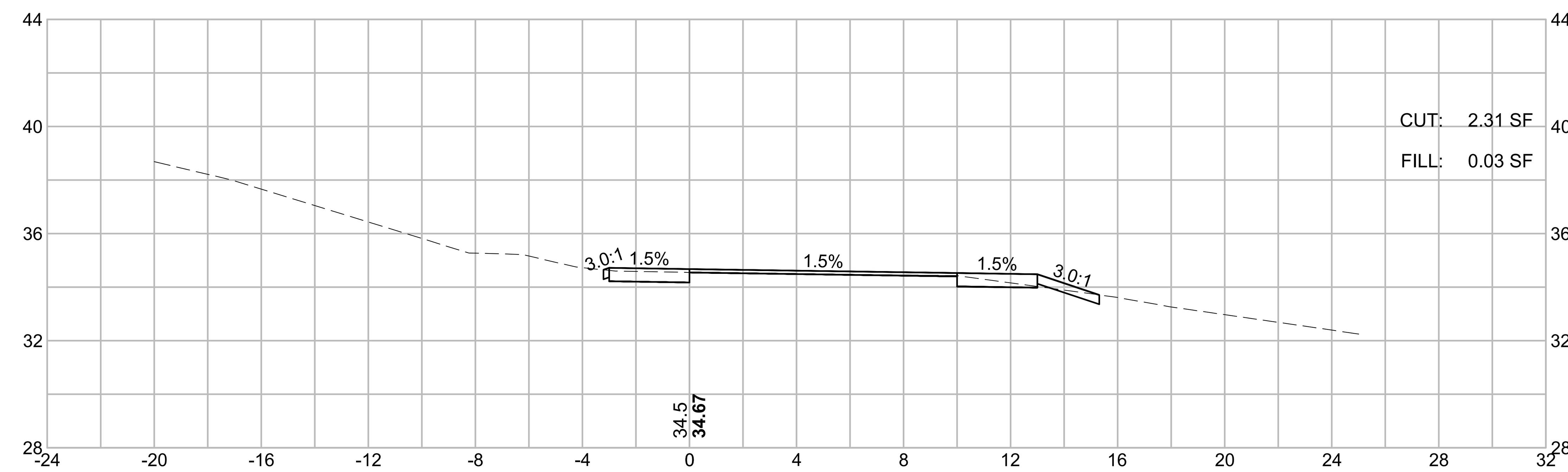
627+50



625+50

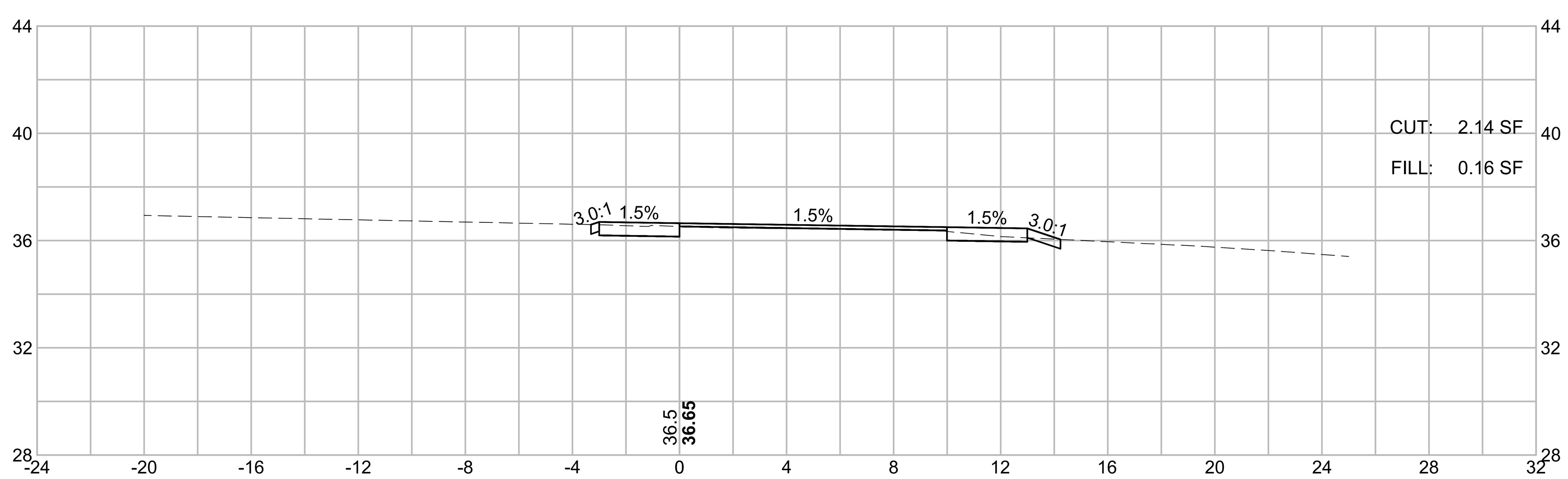


627+00

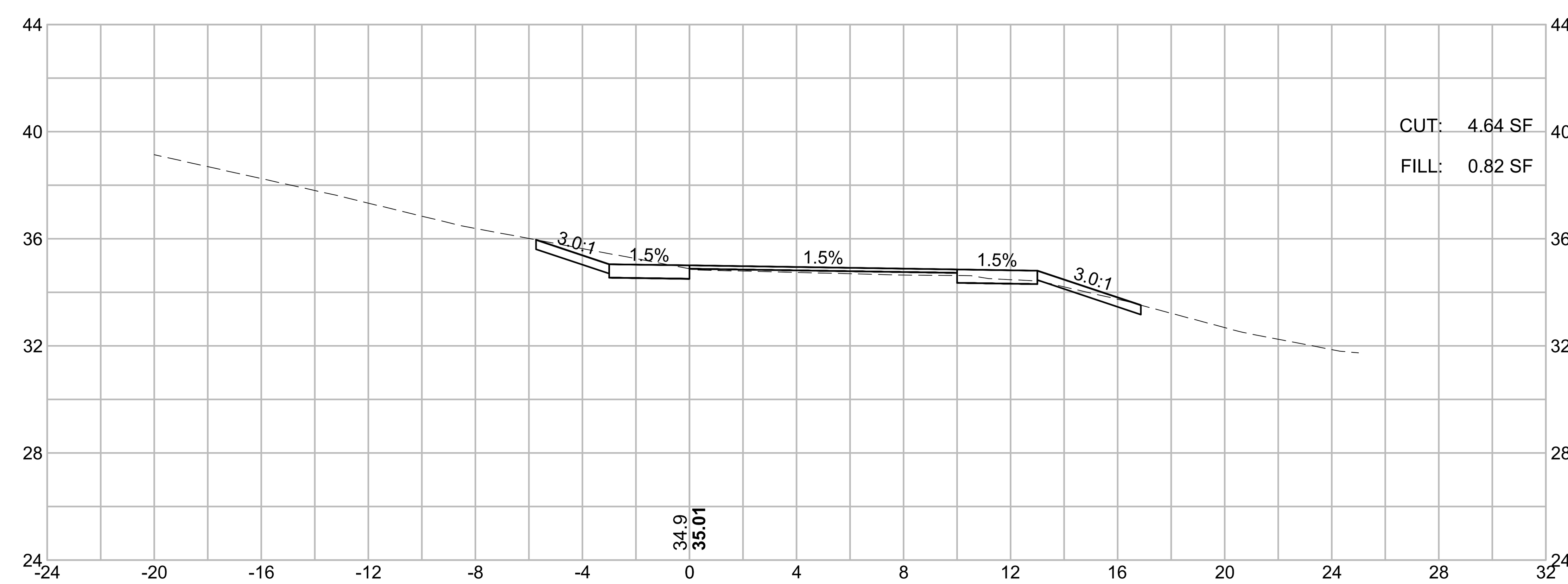


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

625+00



626+50

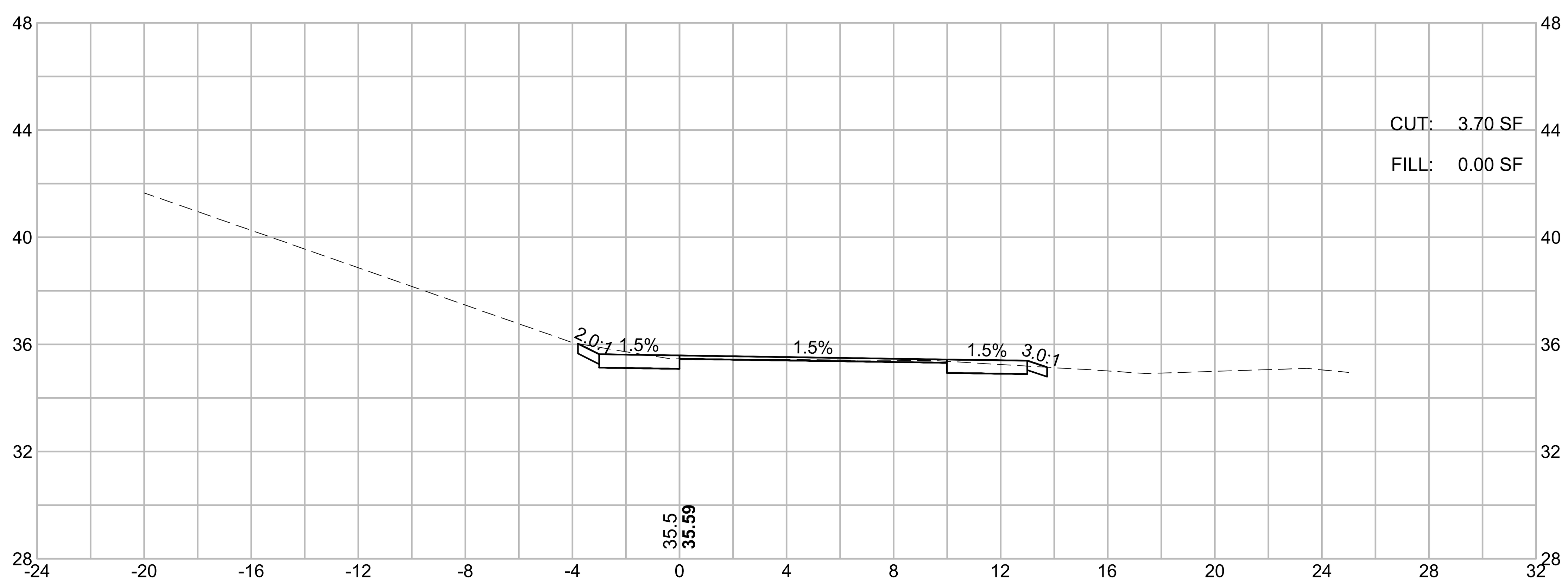


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

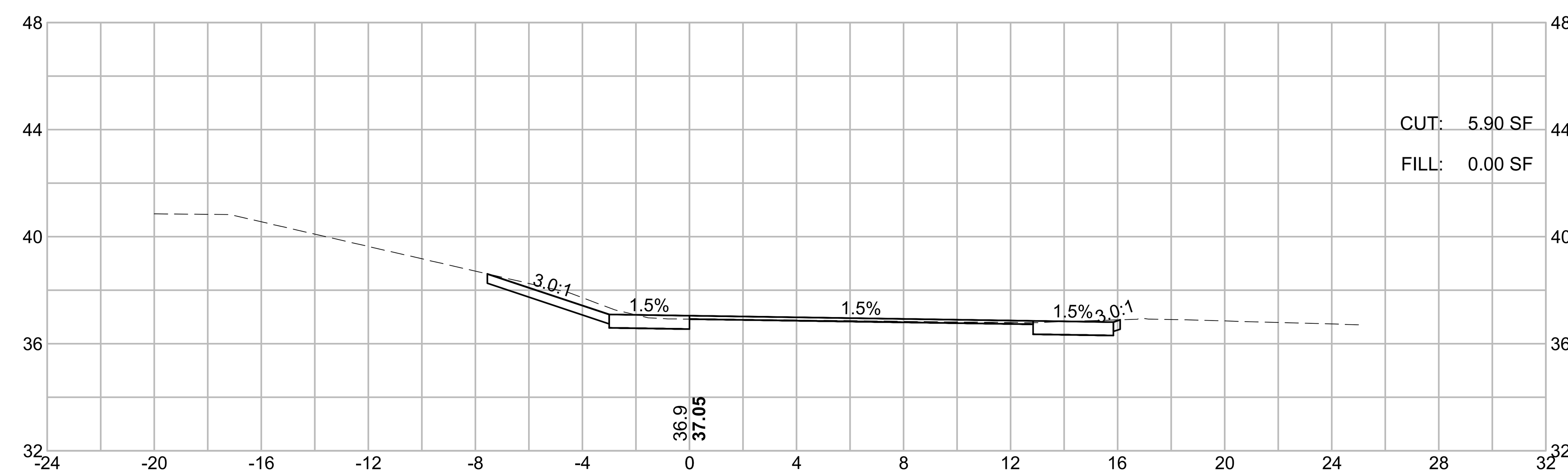
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	250	267
PROJECT FILE NO. 607398			

EAST CROSS SECTIONS

628+50

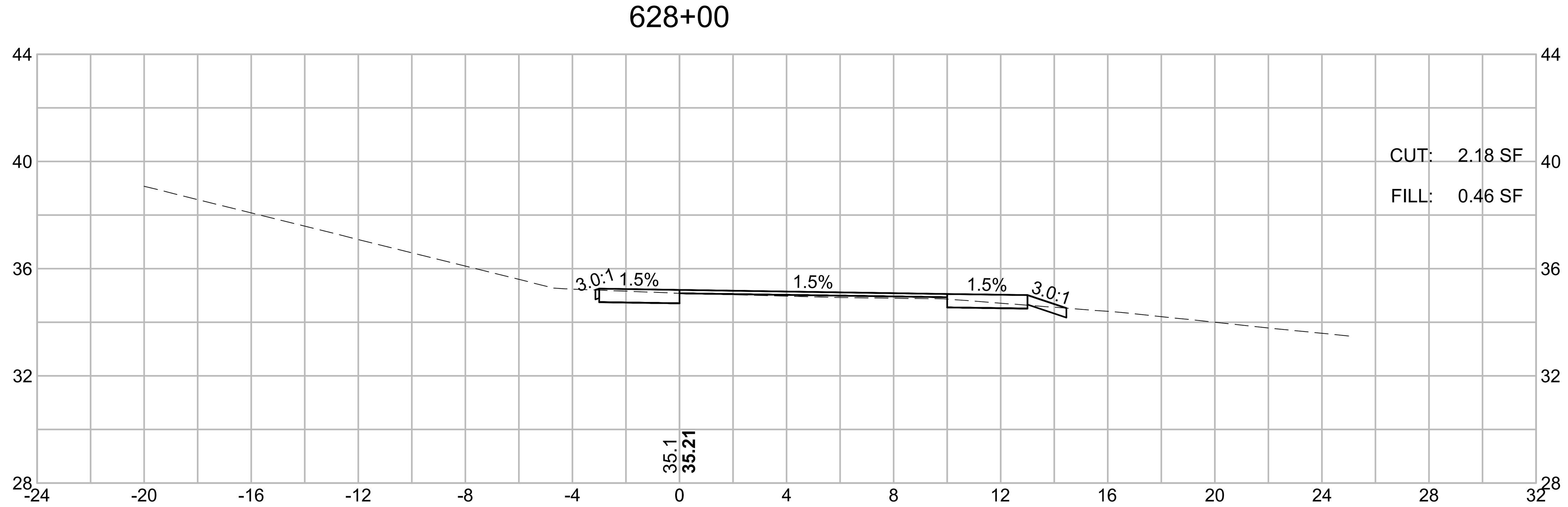


629+50

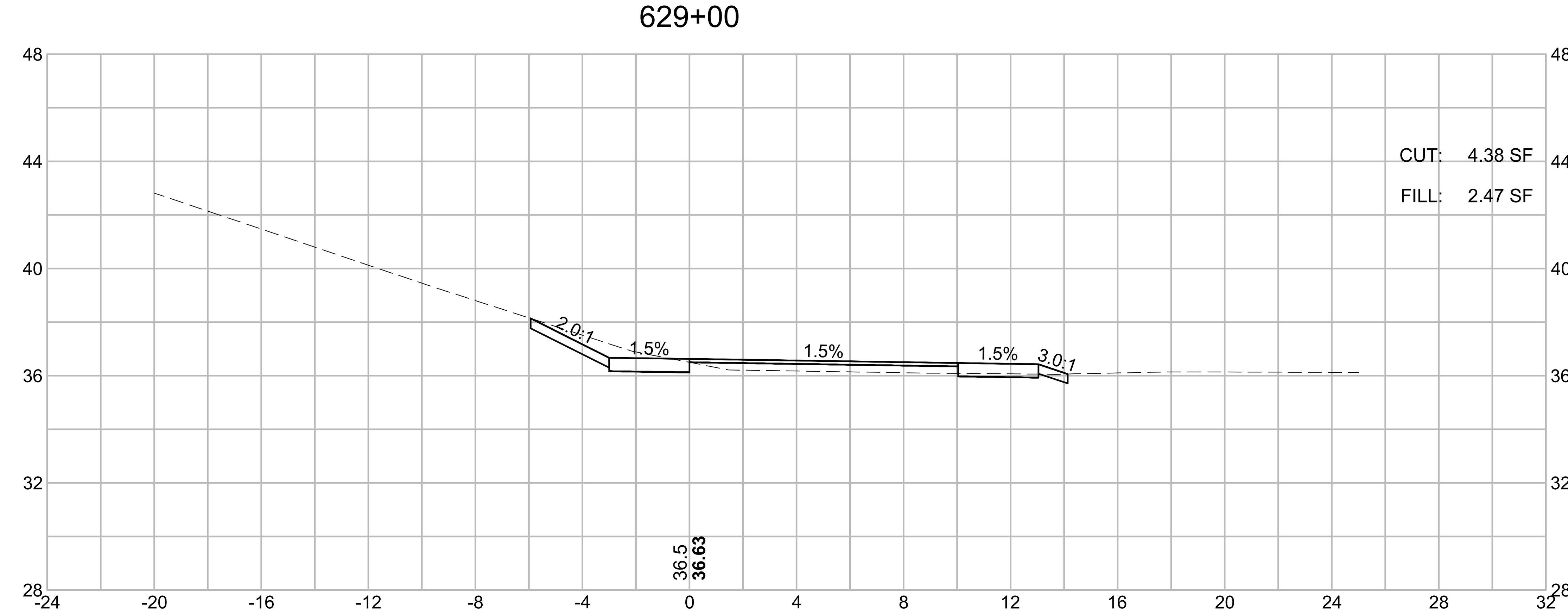


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

628+00



629+00



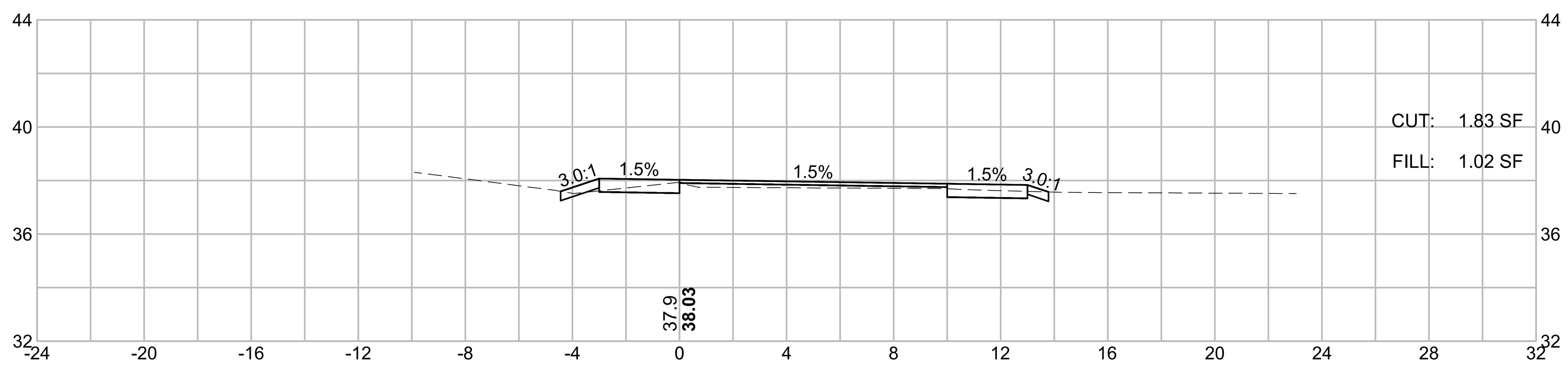
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	251	267
PROJECT FILE NO. 607398			

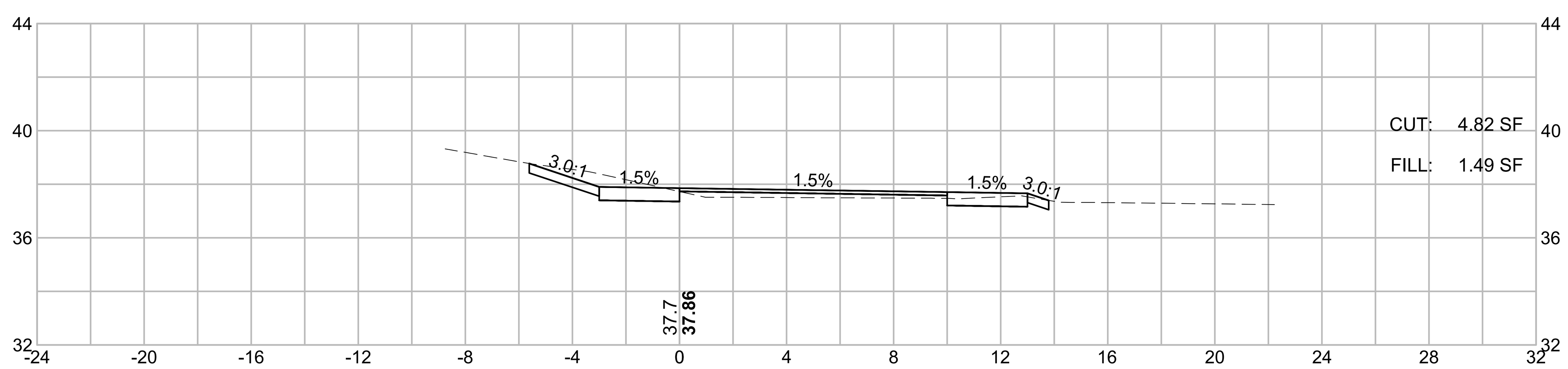
EAST CROSS SECTIONS

607398_HD(XSEC-EAST-3).DWG Plotted on 23-Nov-2021 1:32 PM

631+00

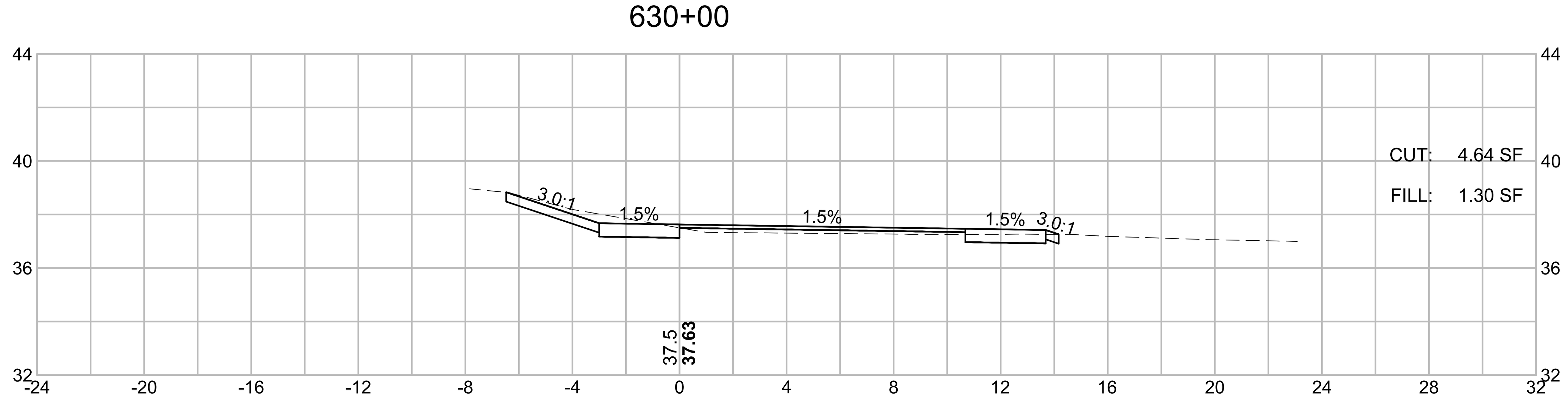


630+50

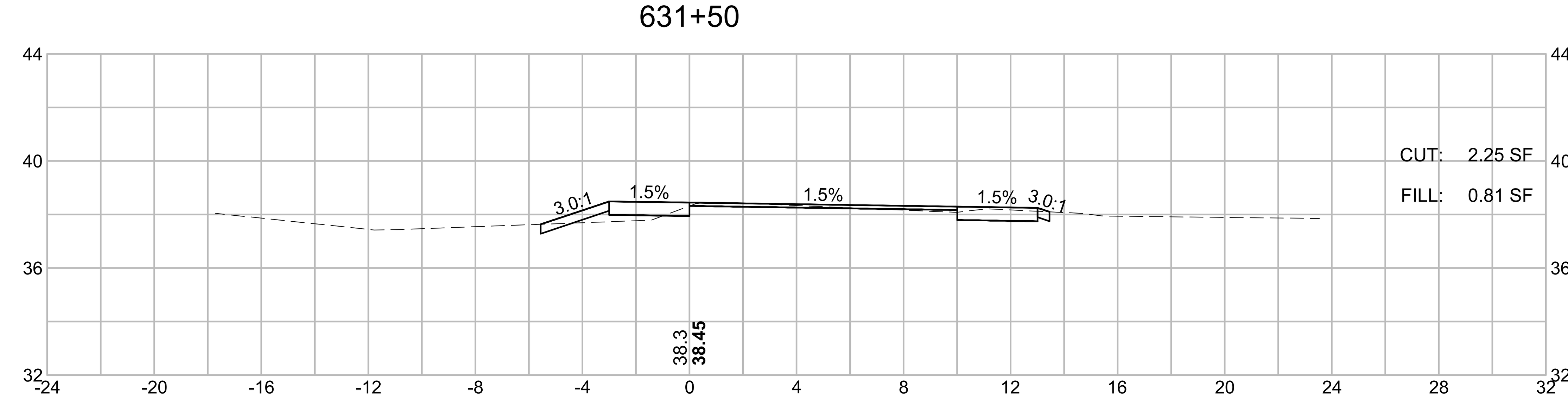


HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

630+00



631+50

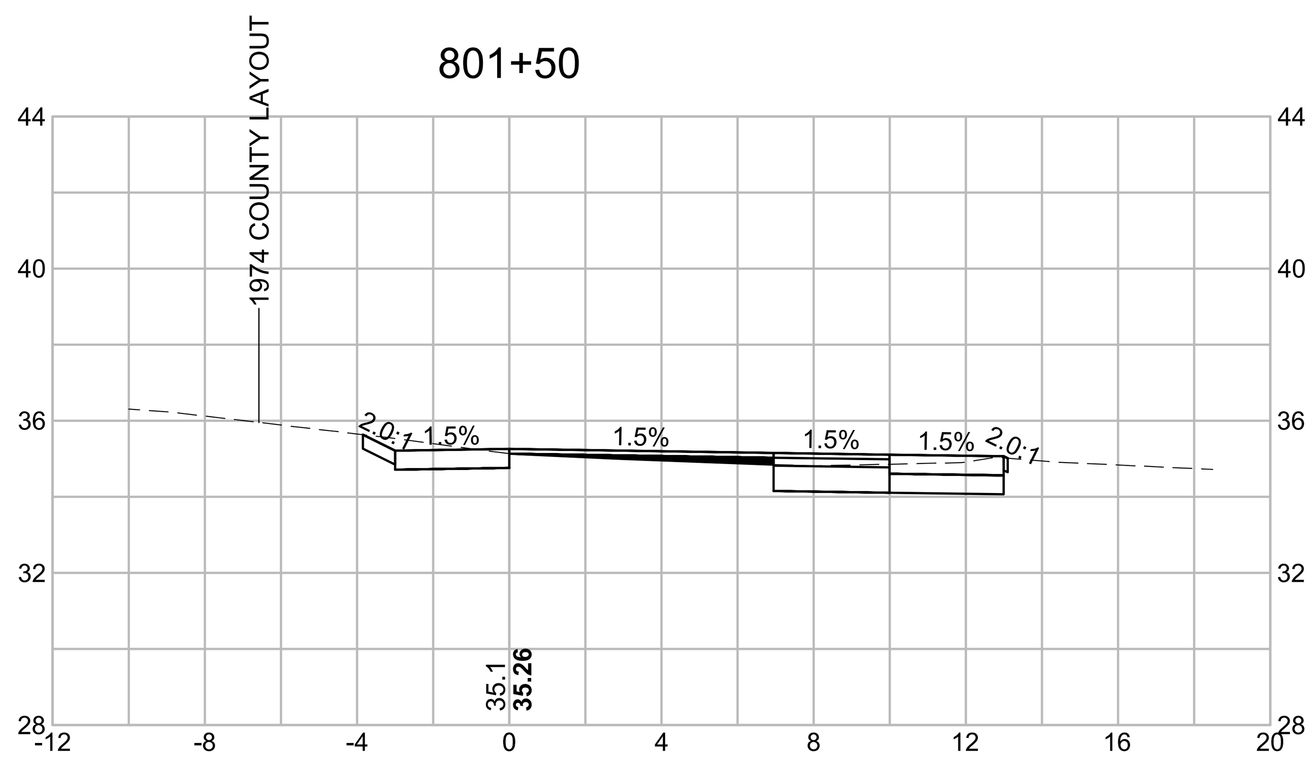


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	252	267
PROJECT FILE NO. 607398			

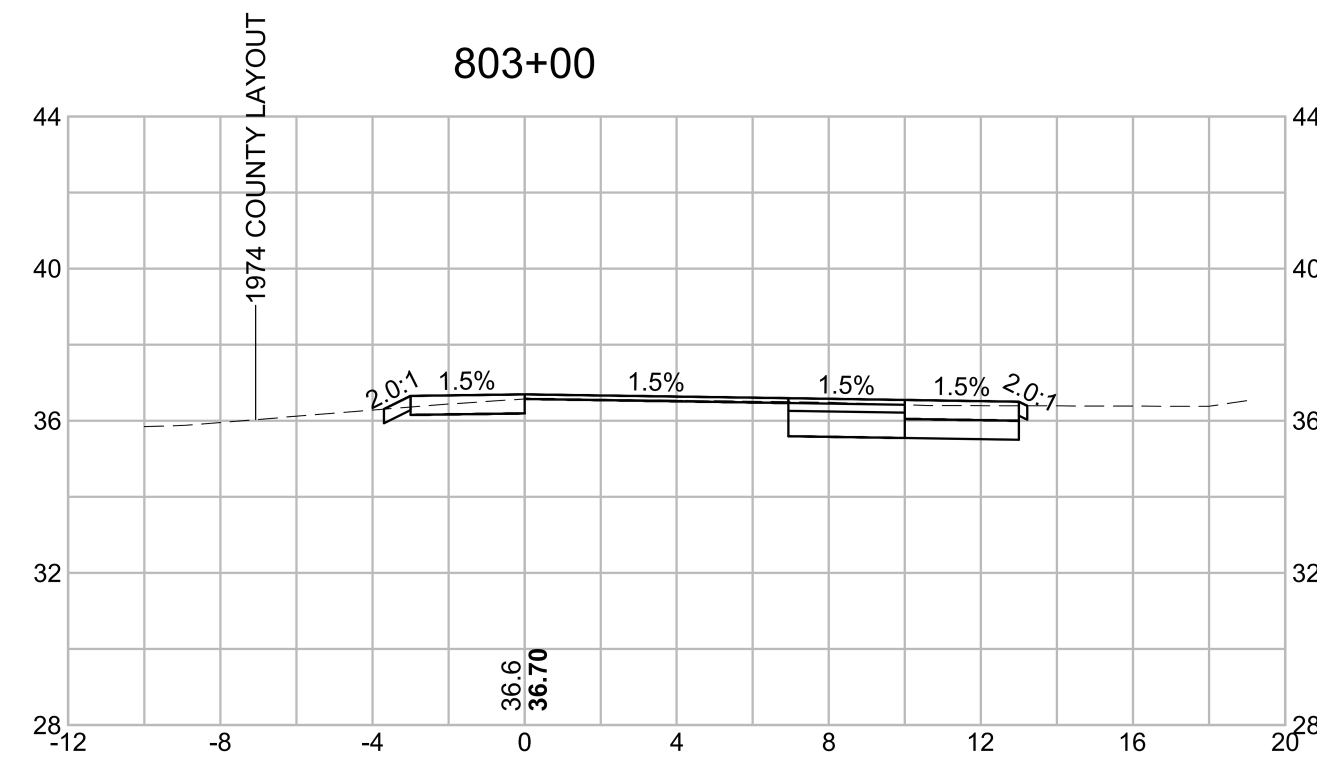
HIGGINS CROWELL SPUR CROSS SECTIONS

801+50



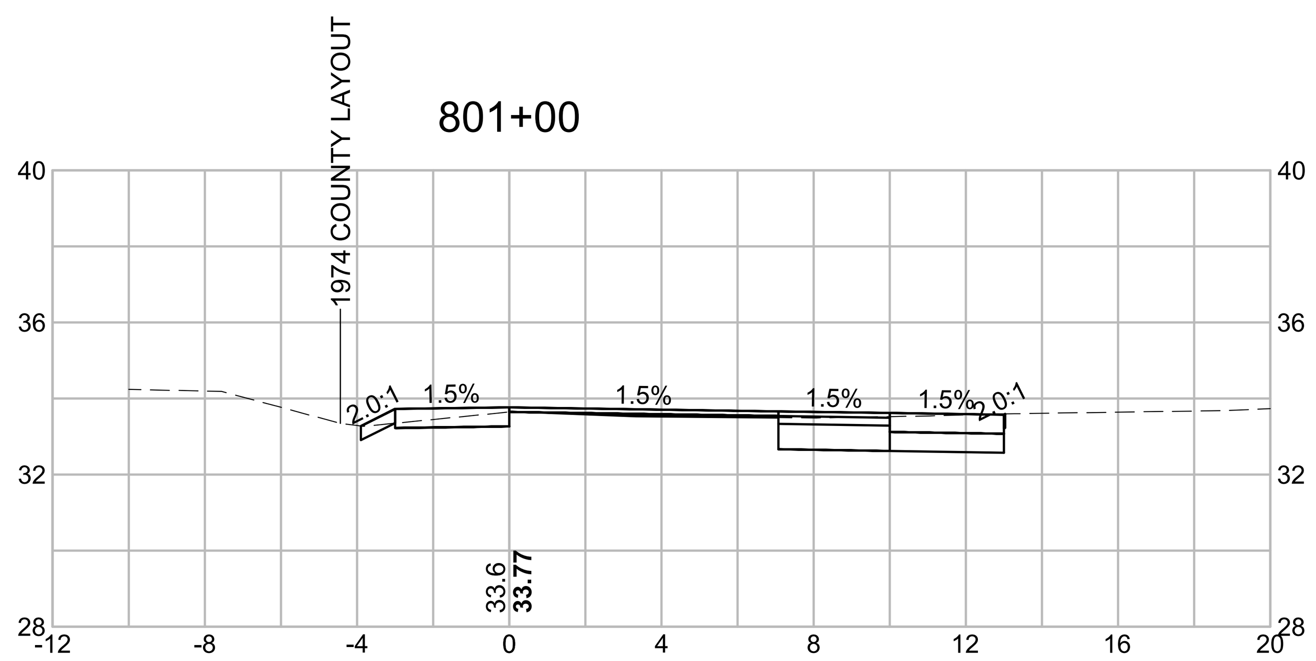
CUT: 5.40 SF
FILL: 0.67 SF

803+00



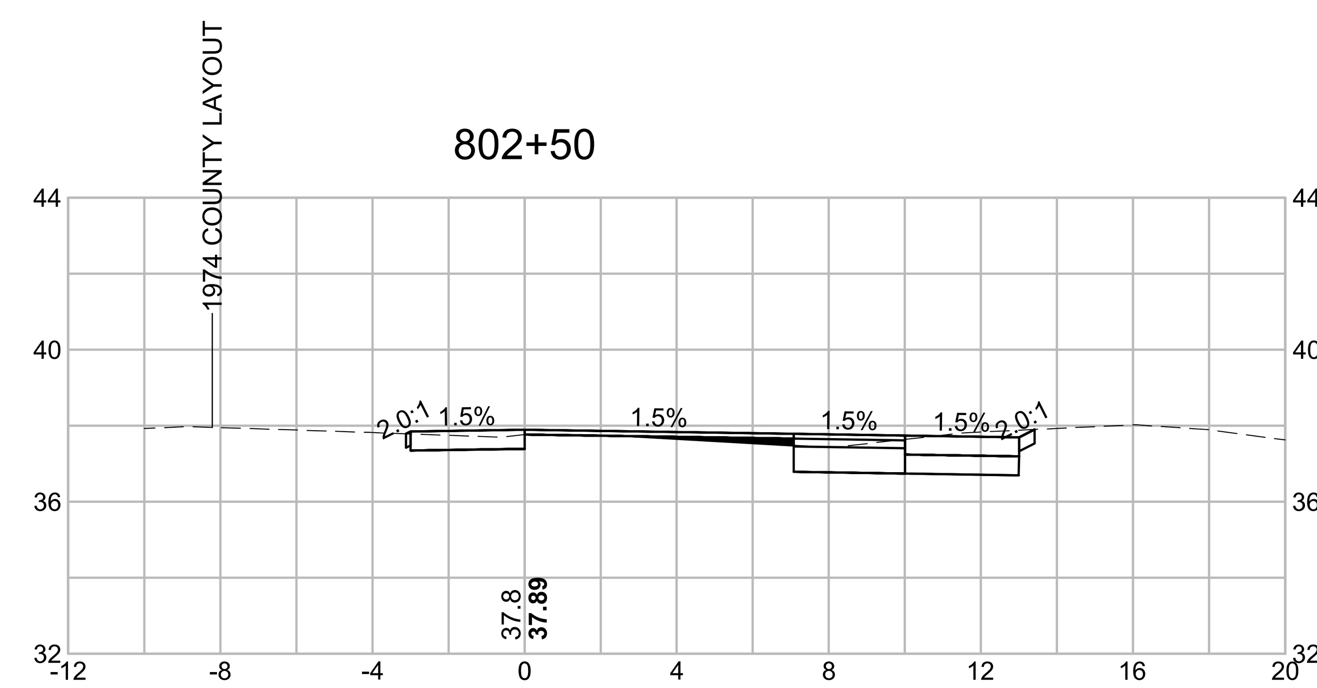
CUT: 5.17 SF
FILL: 0.00 SF

801+00



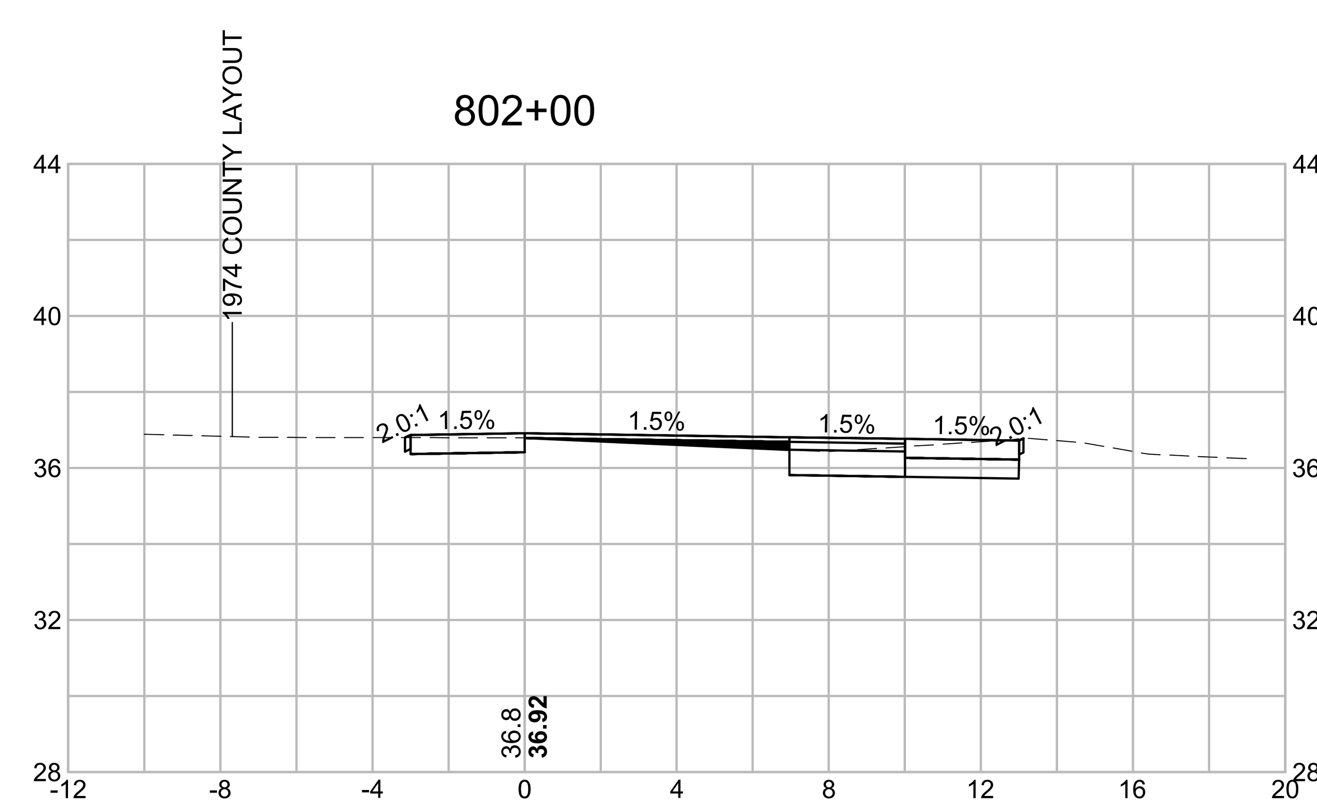
CUT: 4.82 SF
FILL: 0.28 SF

802+50



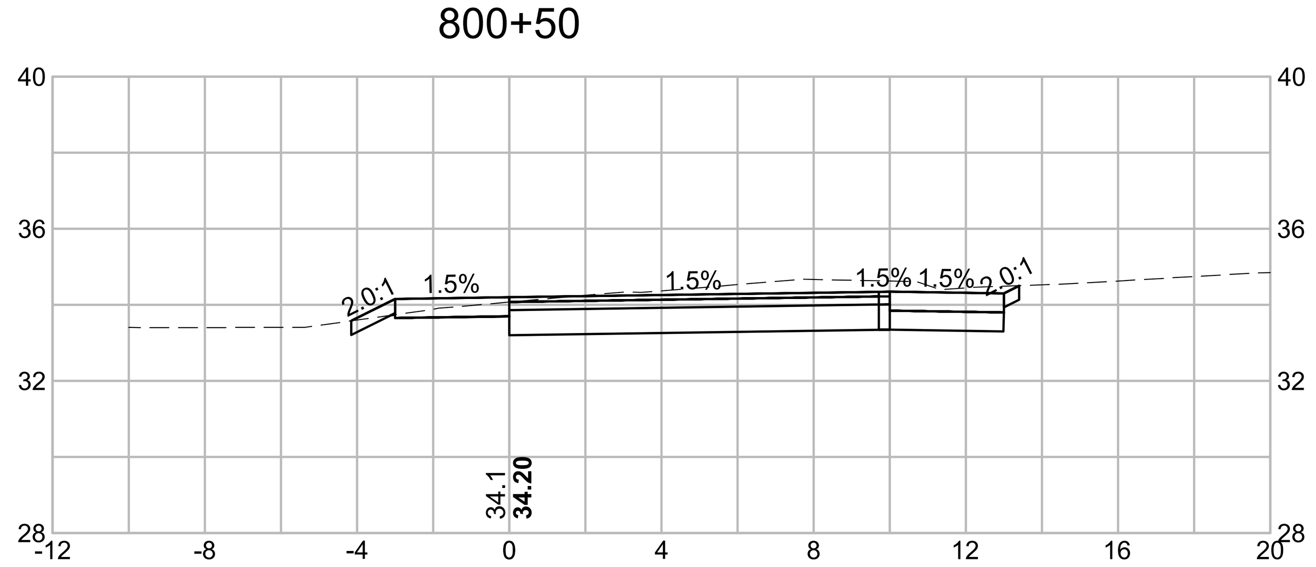
CUT: 5.26 SF
FILL: 0.38 SF

802+00



CUT: 4.66 SF
FILL: 0.75 SF

800+50



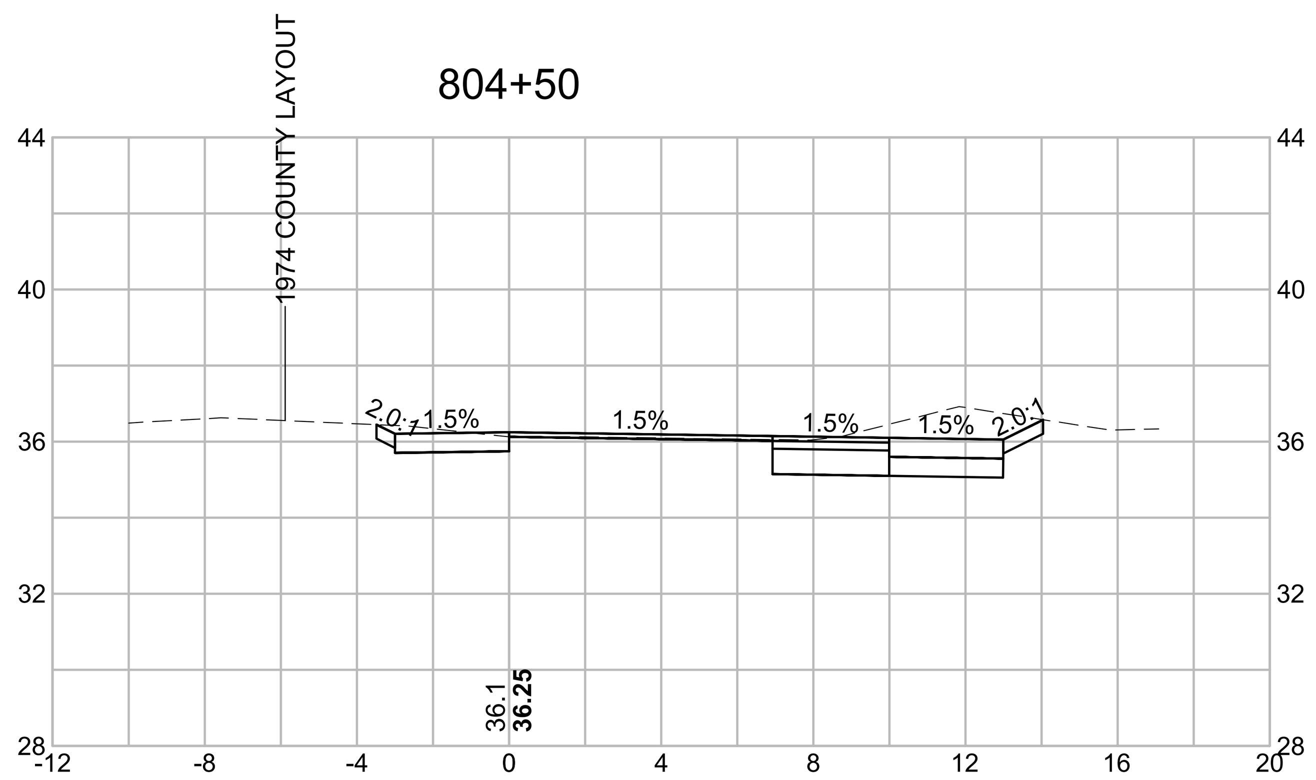
CUT: 6.30 SF
FILL: 0.00 SF

607398_HD(XSEC-SPUR).DWG Plotted on 21-Oct-2021 8:57 AM

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	253	267
PROJECT FILE NO. 607398			

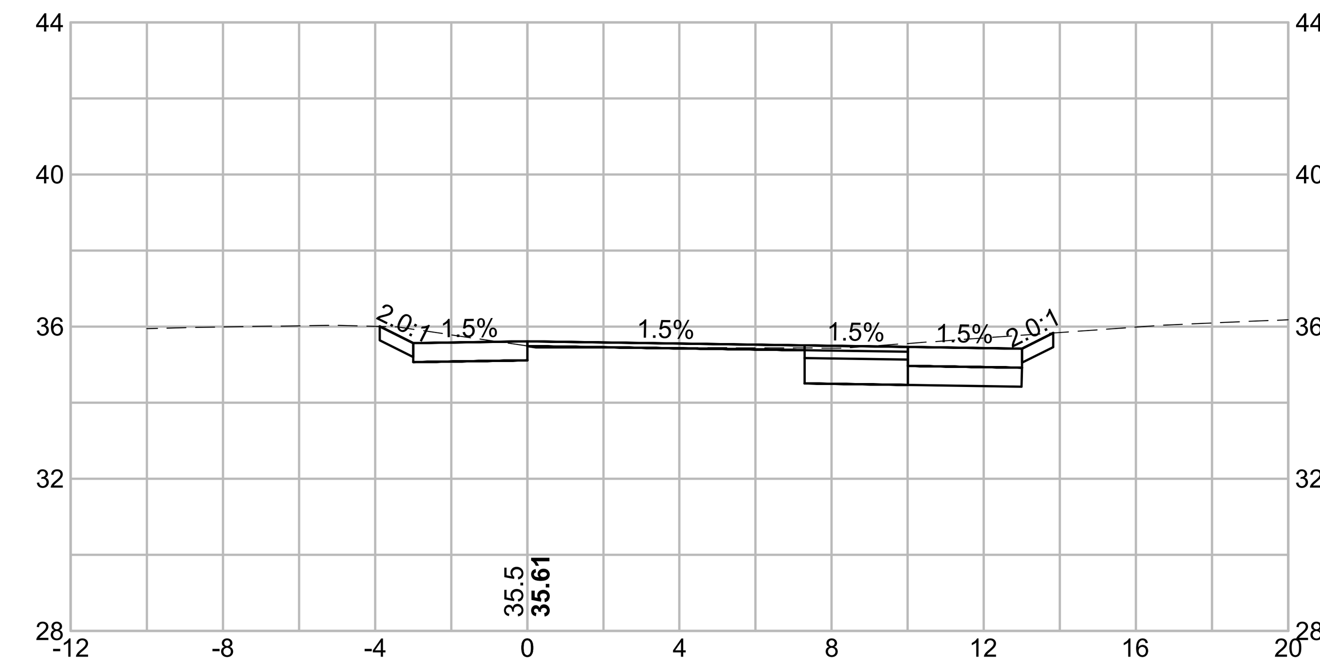
HIGGINS CROWELL SPUR CROSS SECTIONS

804+50



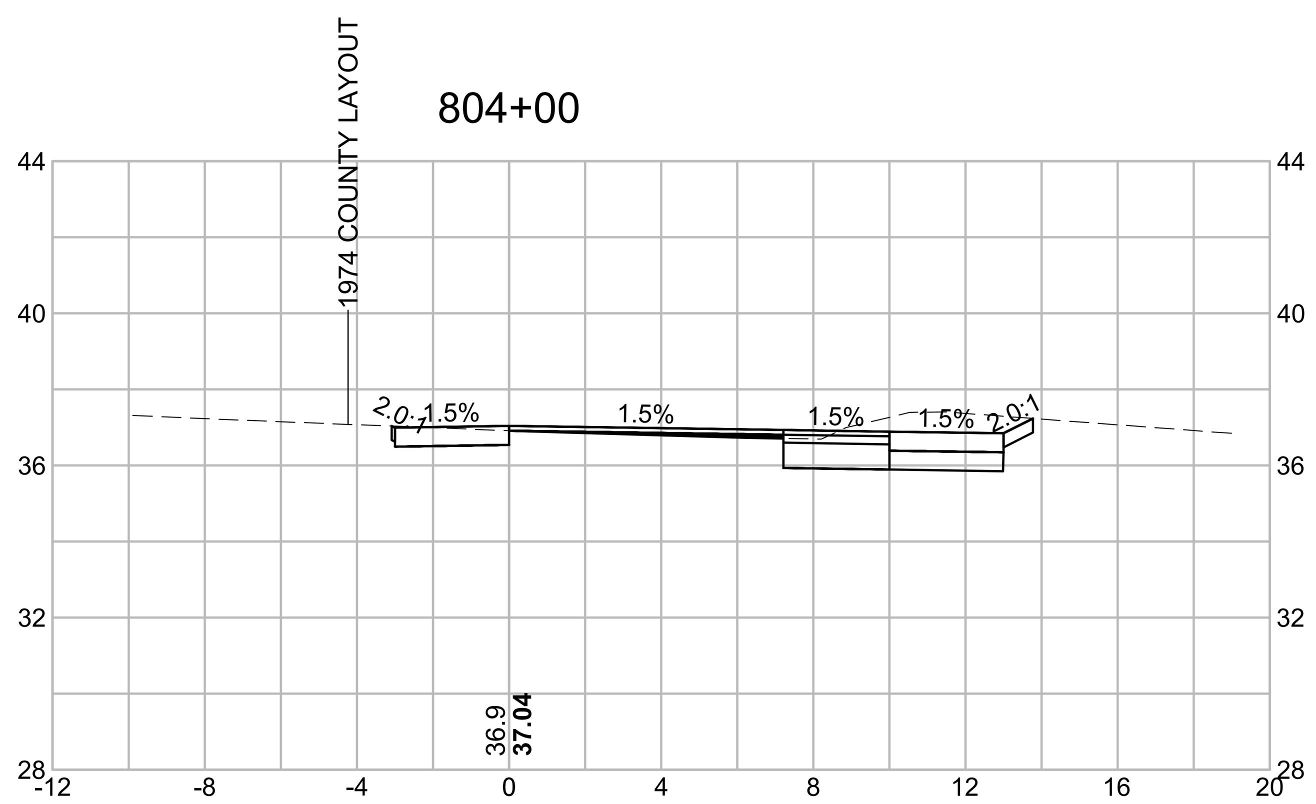
CUT: 9.54 SF
FILL: 0.00 SF

806+00



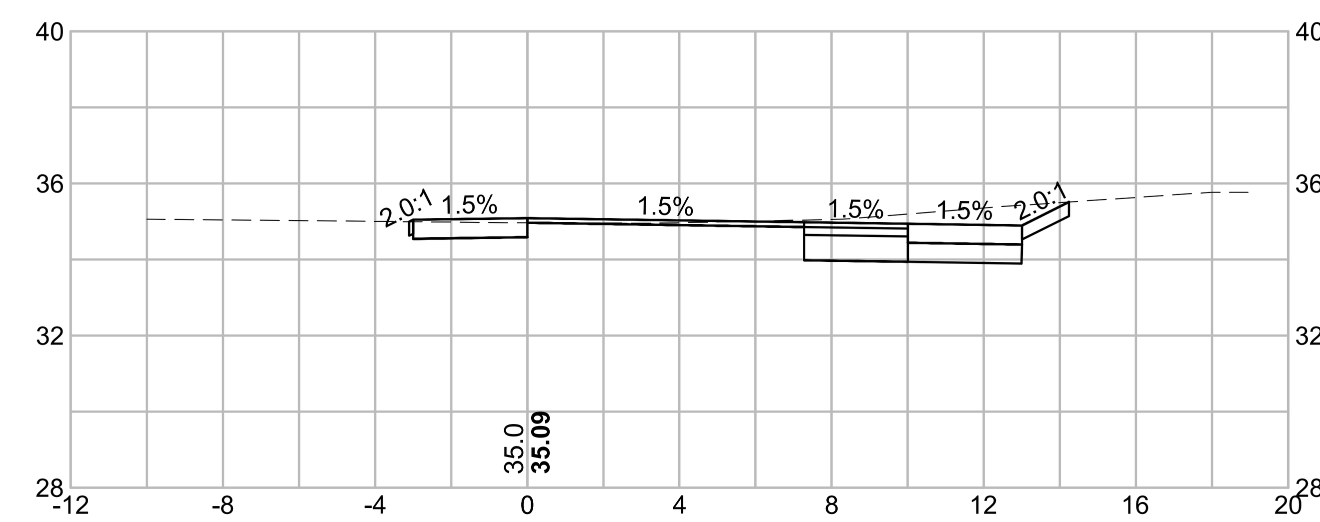
CUT: 7.79 SF
FILL: 0.04 SF

804+00



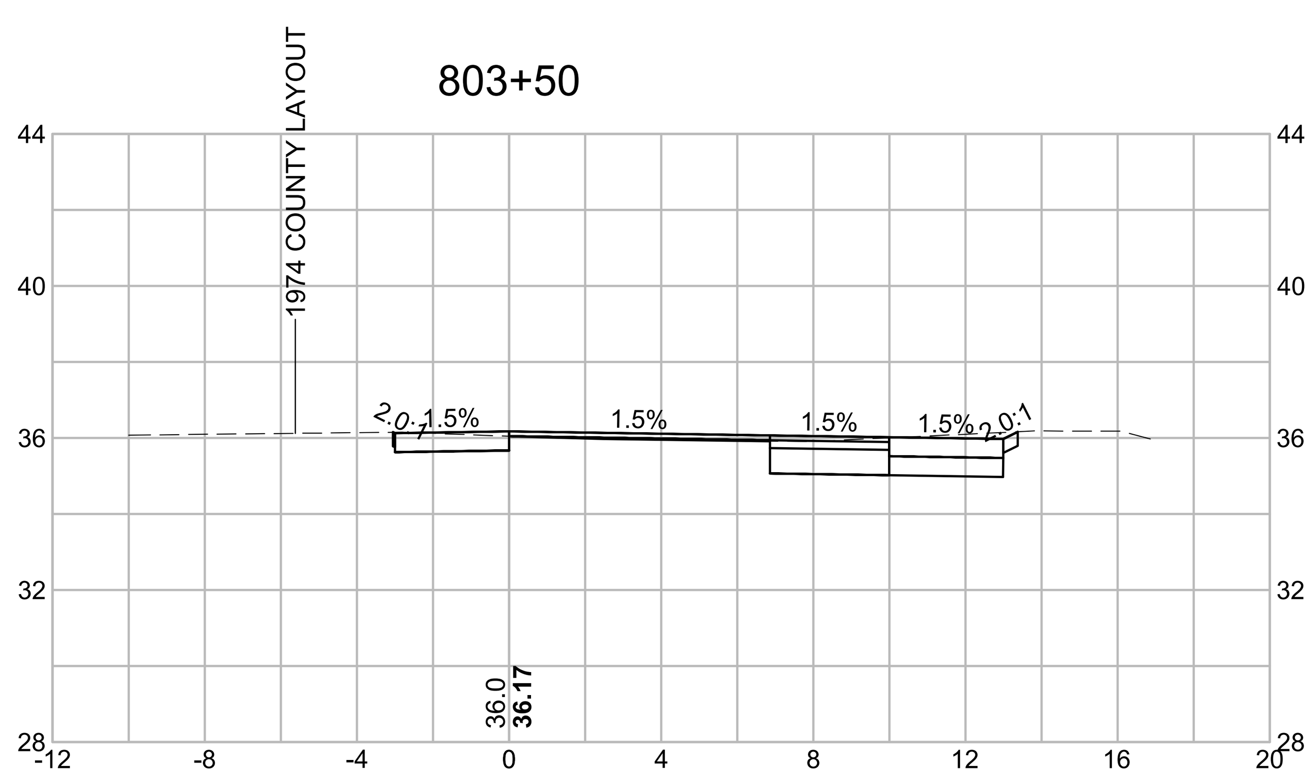
CUT: 7.63 SF
FILL: 0.39 SF

805+50



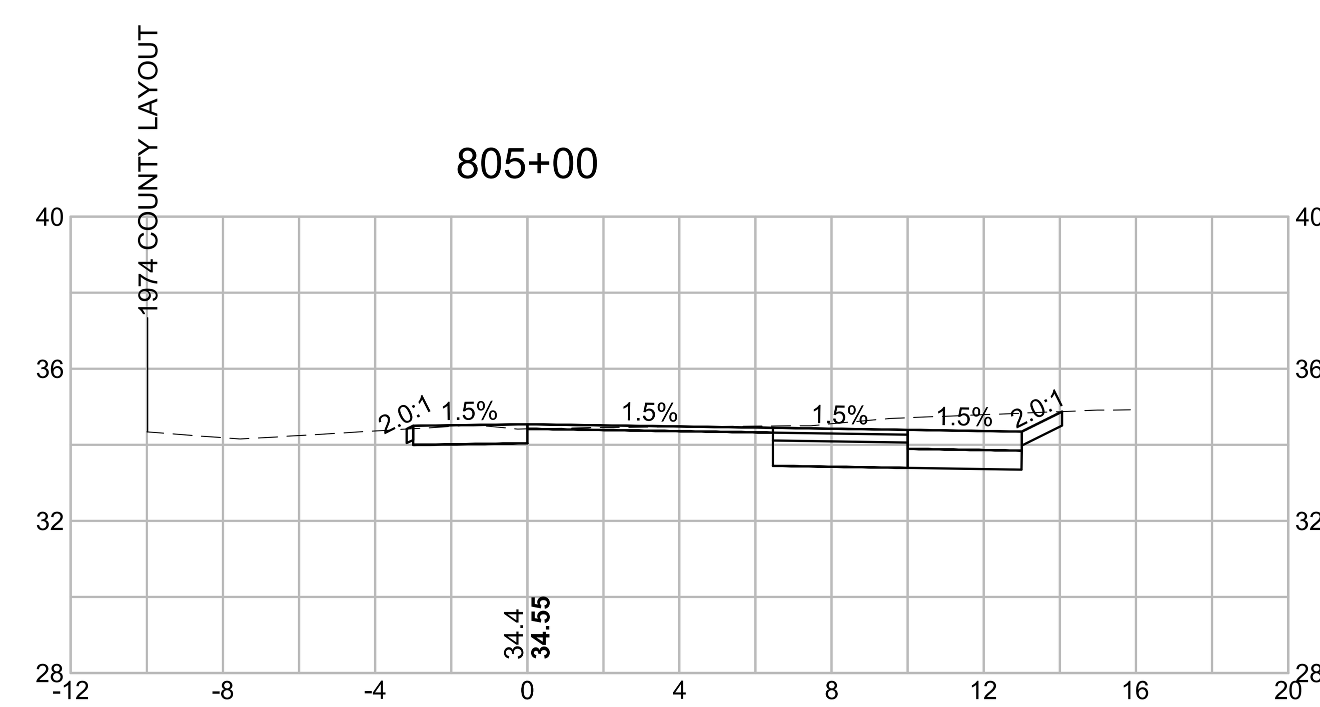
CUT: 8.35 SF
FILL: 0.00 SF

803+50



CUT: 6.09 SF
FILL: 0.18 SF

805+00



CUT: 9.48 SF
FILL: 0.00 SF

HOR. SCALE IN FEET

VER. SCALE IN FEET

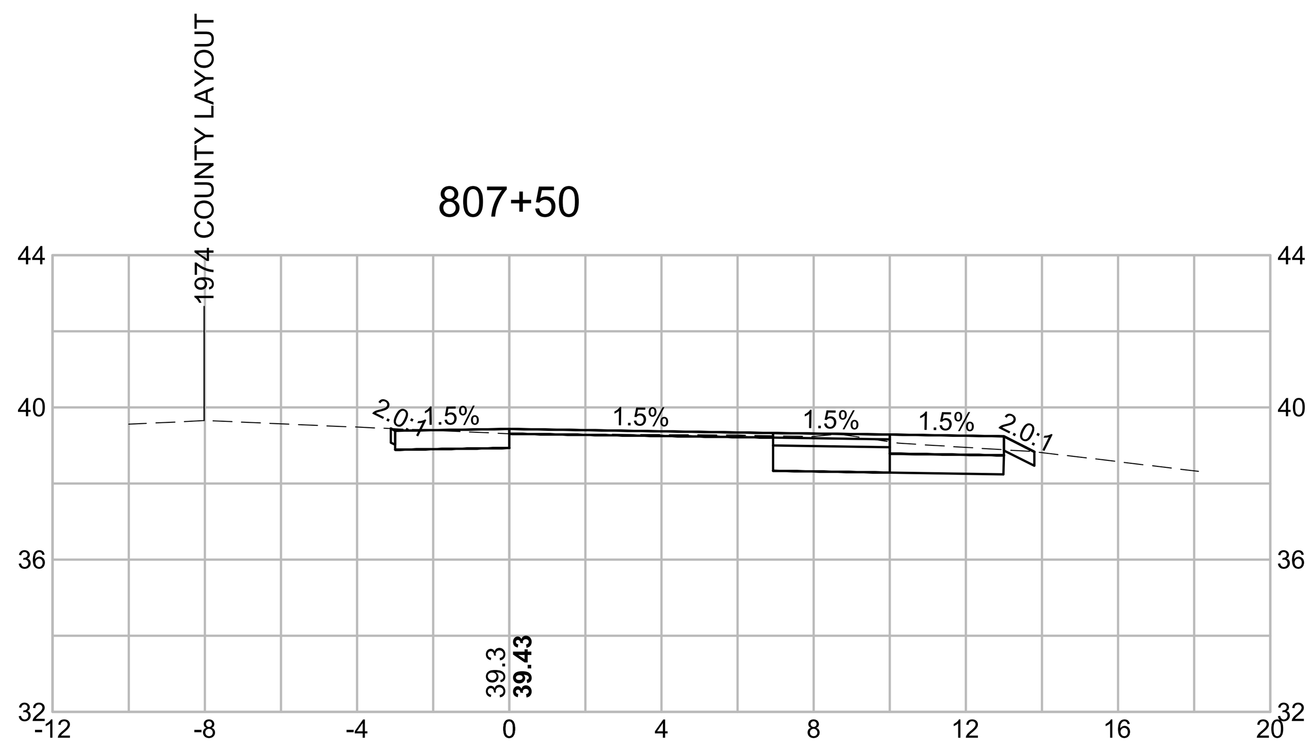
Plotted on 21-Oct-2021 8:57 AM
607398_HD(XSEC-SPUR).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	254	267
PROJECT FILE NO. 607398			

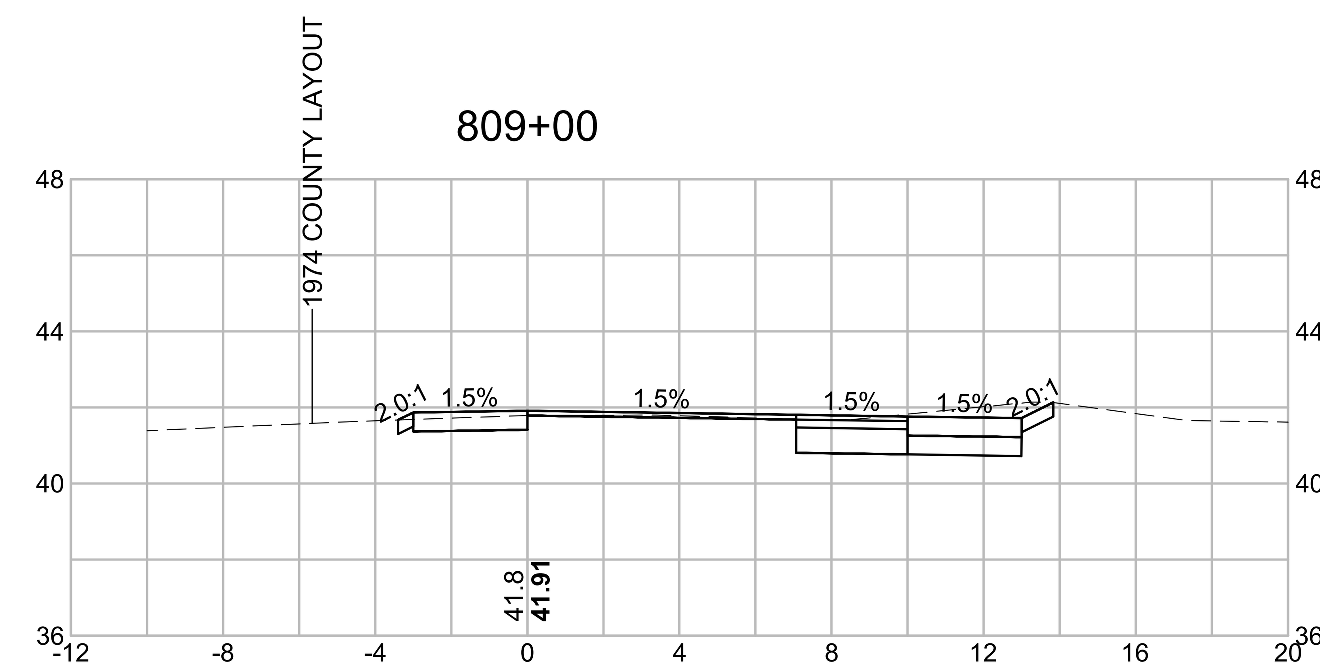
HIGGINS CROWELL SPUR CROSS SECTIONS

807+50



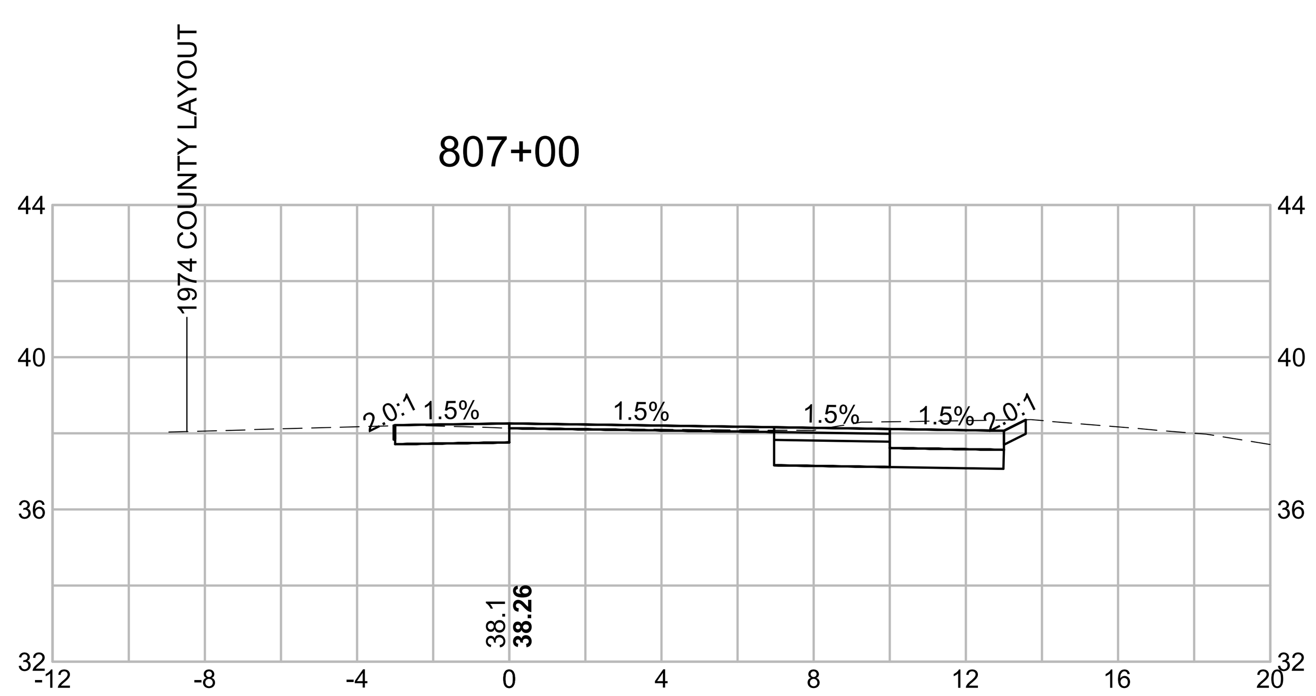
CUT: 5.29 SF
FILL: 0.00 SF

809+00



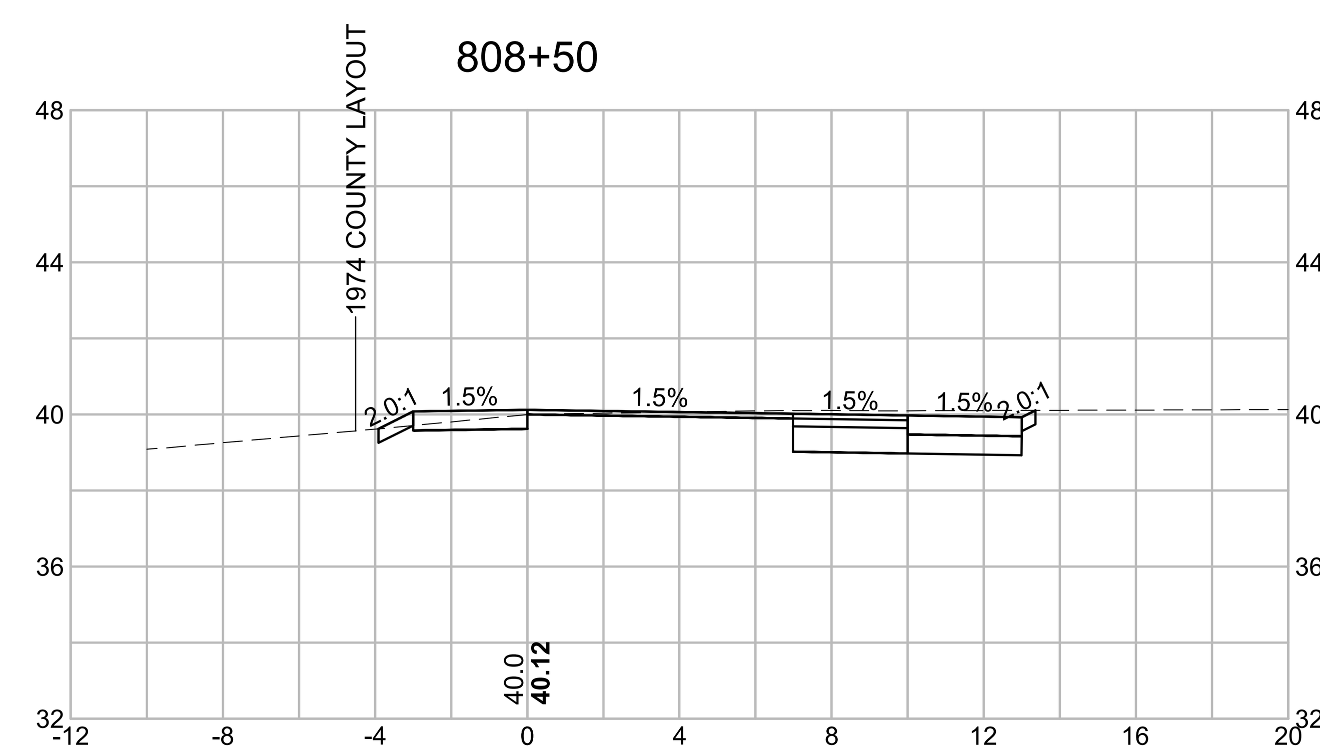
CUT: 6.77 SF
FILL: 0.00 SF

807+00



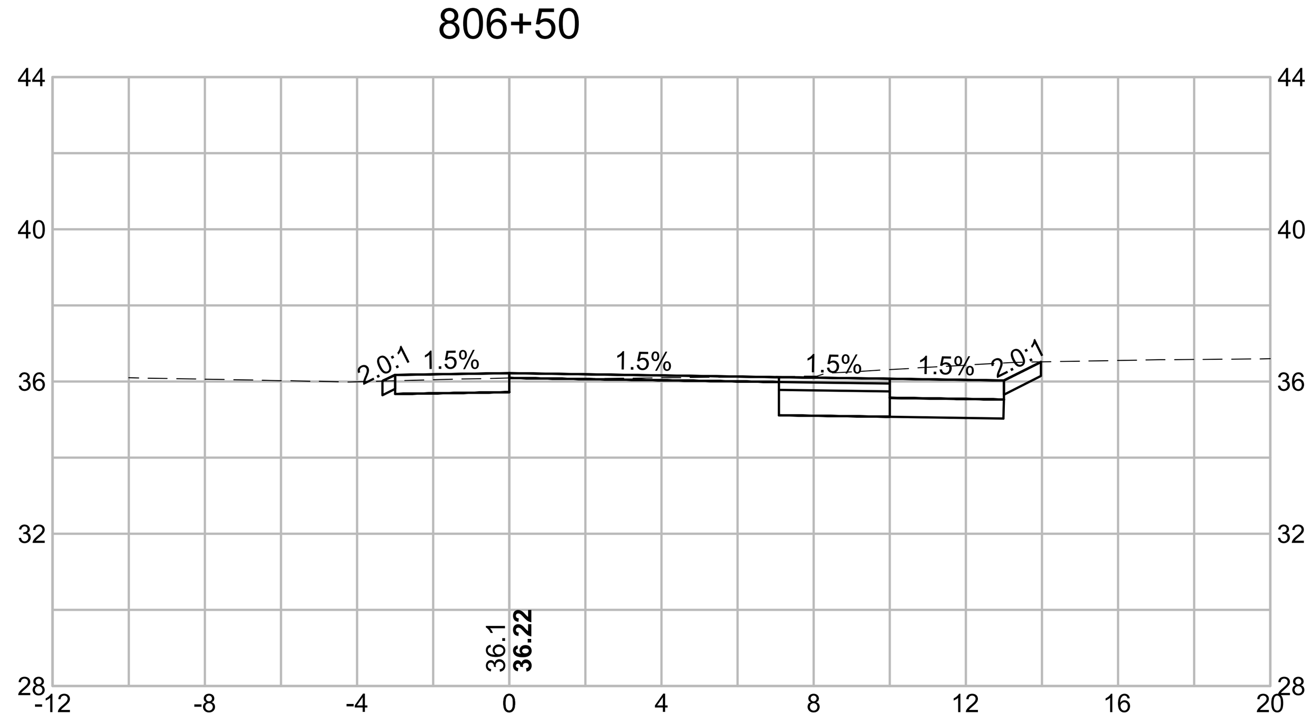
CUT: 7.16 SF
FILL: 0.00 SF

808+50



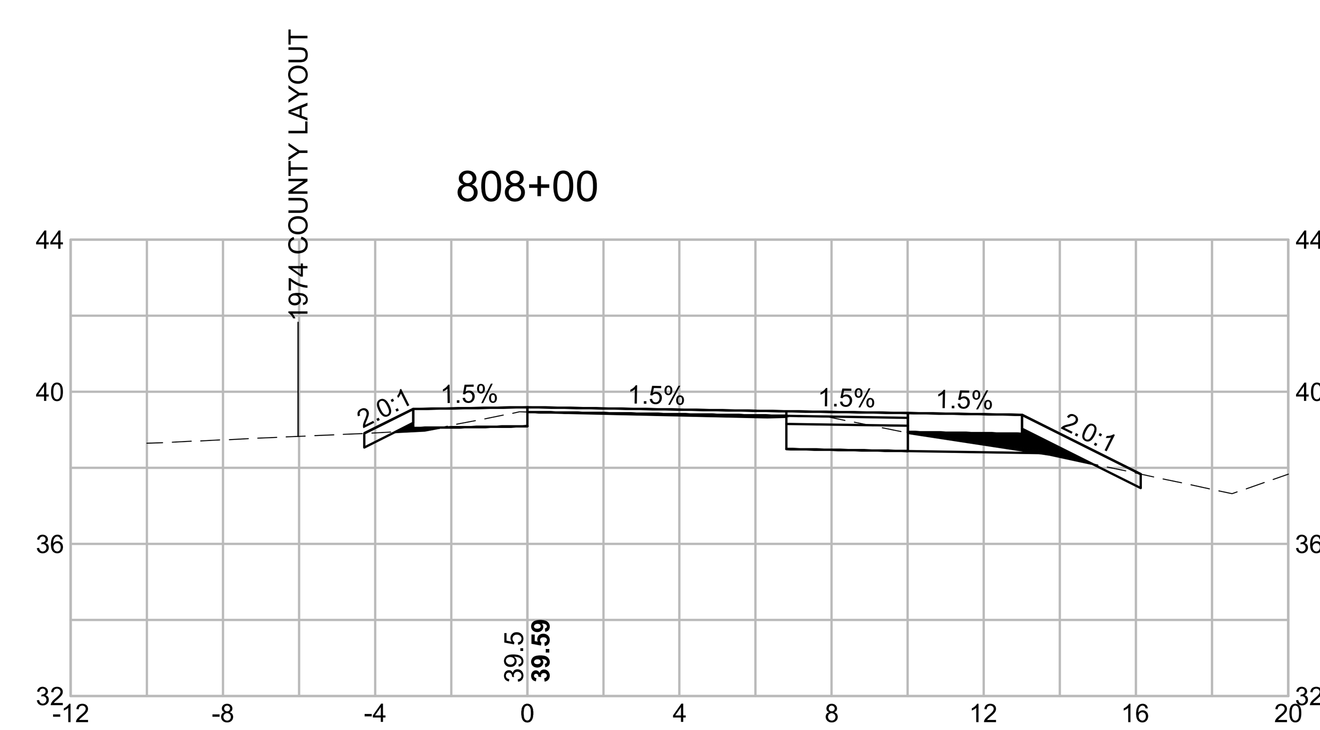
CUT: 7.15 SF
FILL: 0.00 SF

806+50



CUT: 8.00 SF
FILL: 0.00 SF

808+00



CUT: 3.22 SF
FILL: 1.43 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

Plotted on 21-Oct-2021 8:57 AM

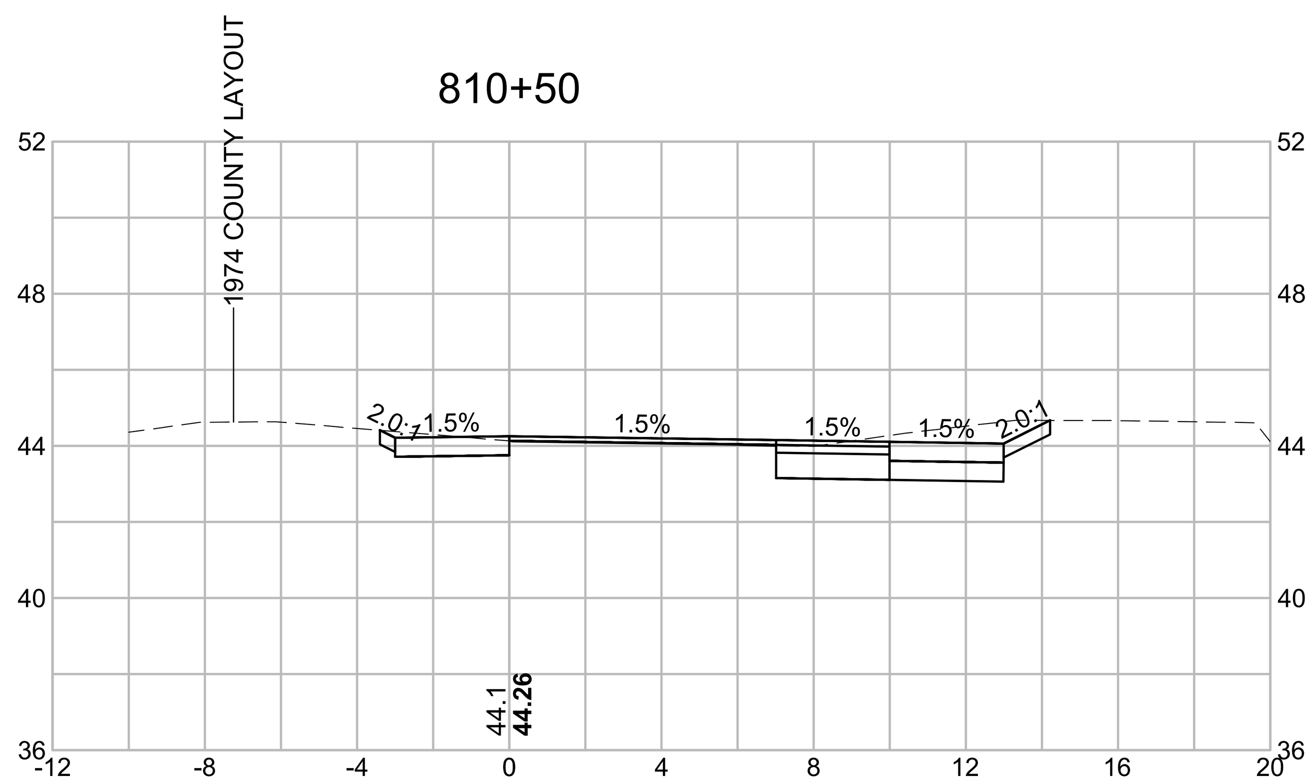
607398_HD(XSEC-SPUR).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

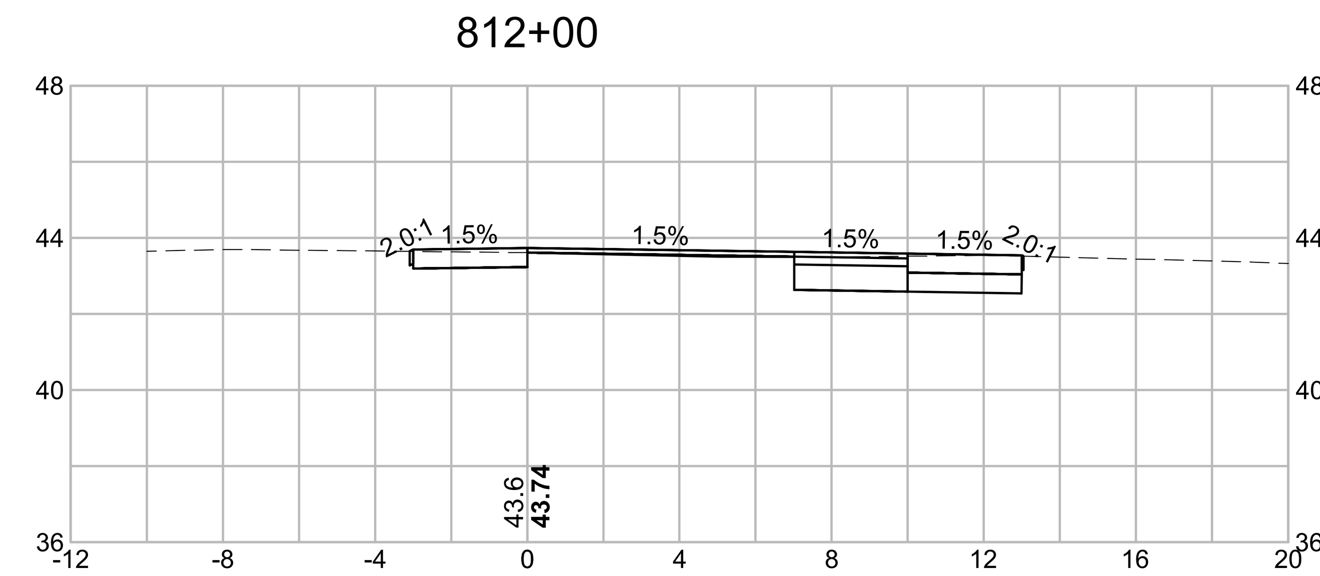
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	255	267
PROJECT FILE NO. 607398			

HIGGINS CROWELL SPUR CROSS SECTIONS

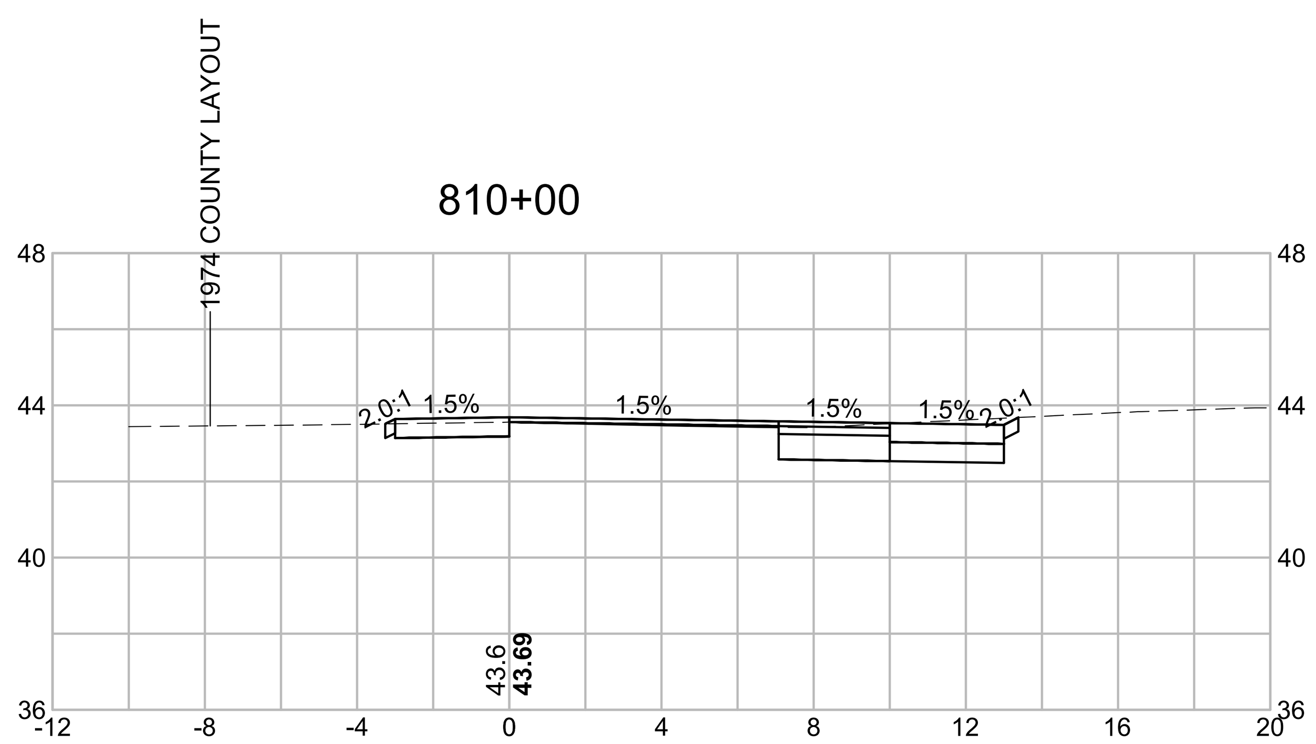
Plotted on 21-Oct-2021 8:57 AM
607398_HD(XSEC-SPUR).DWG



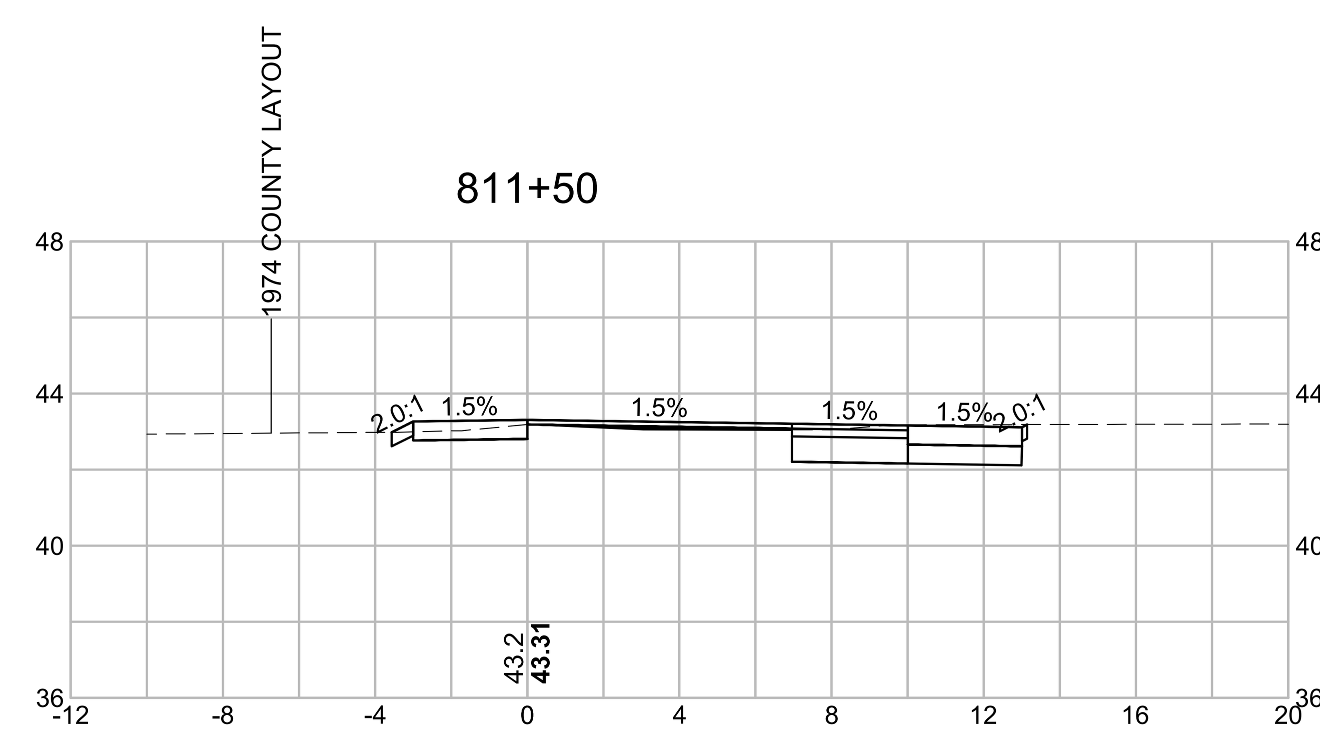
CUT: 8.05 SF
FILL: 0.06 SF



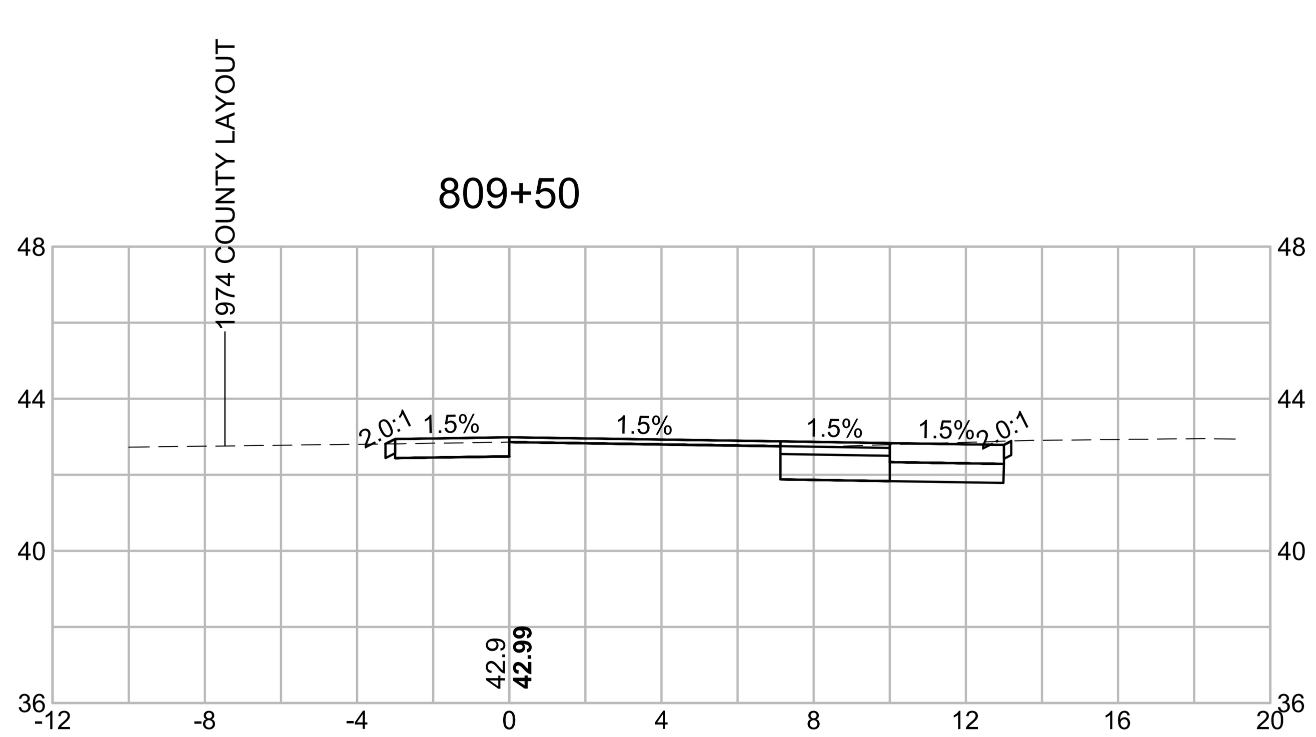
CUT: 5.37 SF
FILL: 0.09 SF



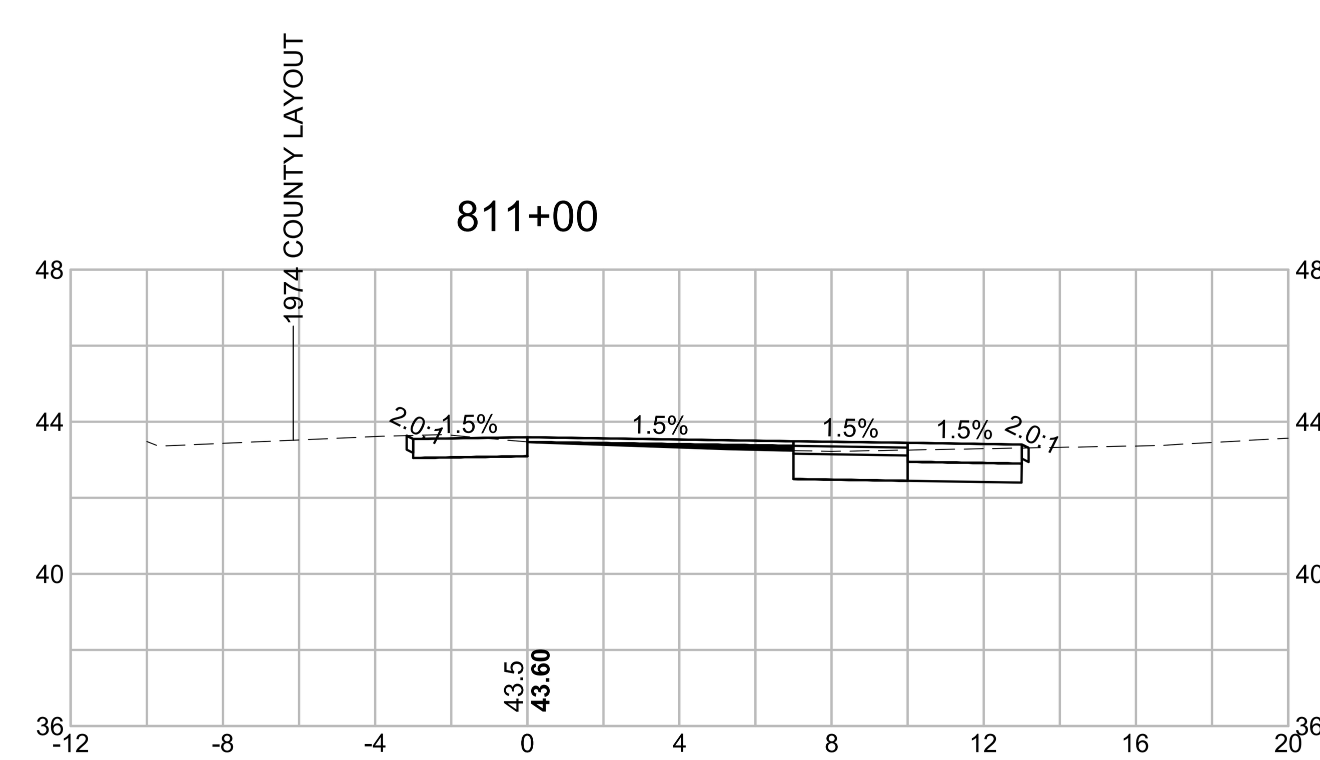
CUT: 5.75 SF
FILL: 0.11 SF



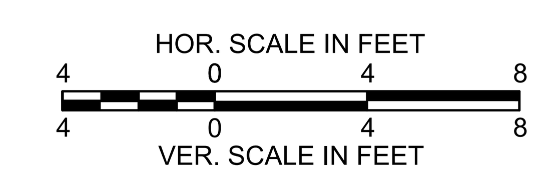
CUT: 5.44 SF
FILL: 0.31 SF



CUT: 5.46 SF
FILL: 0.02 SF



CUT: 5.07 SF
FILL: 0.52 SF

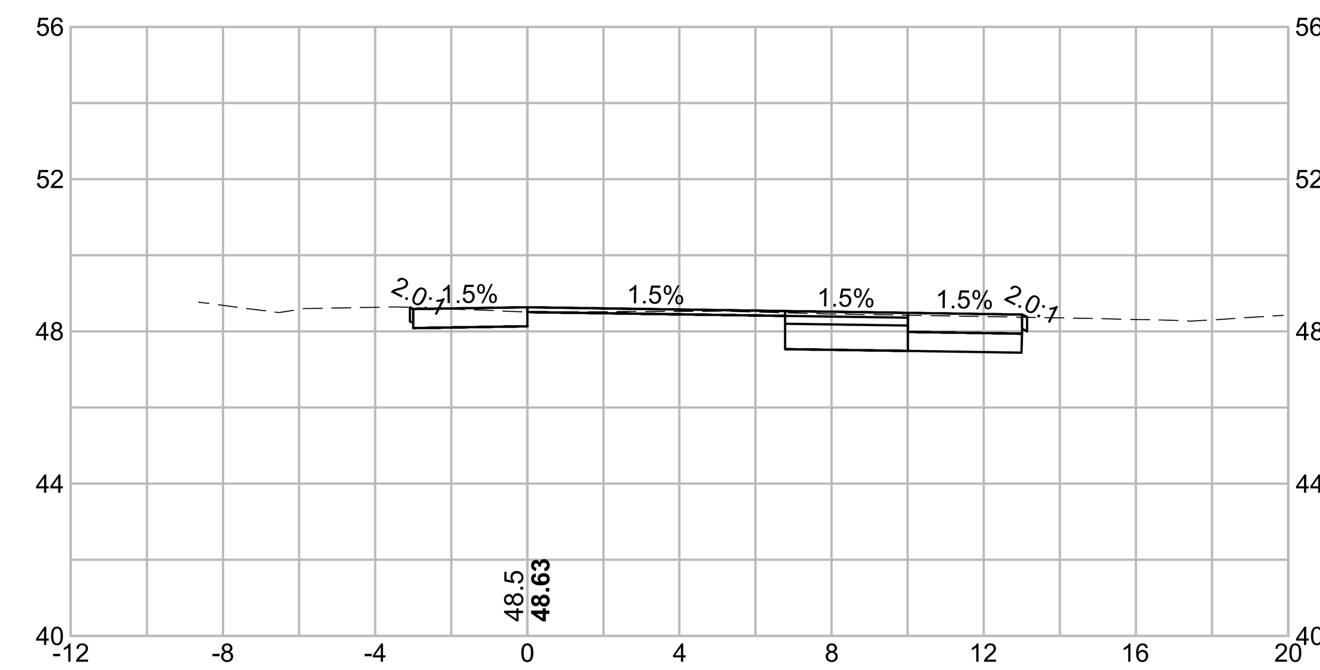


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	256	267
PROJECT FILE NO. 607398			

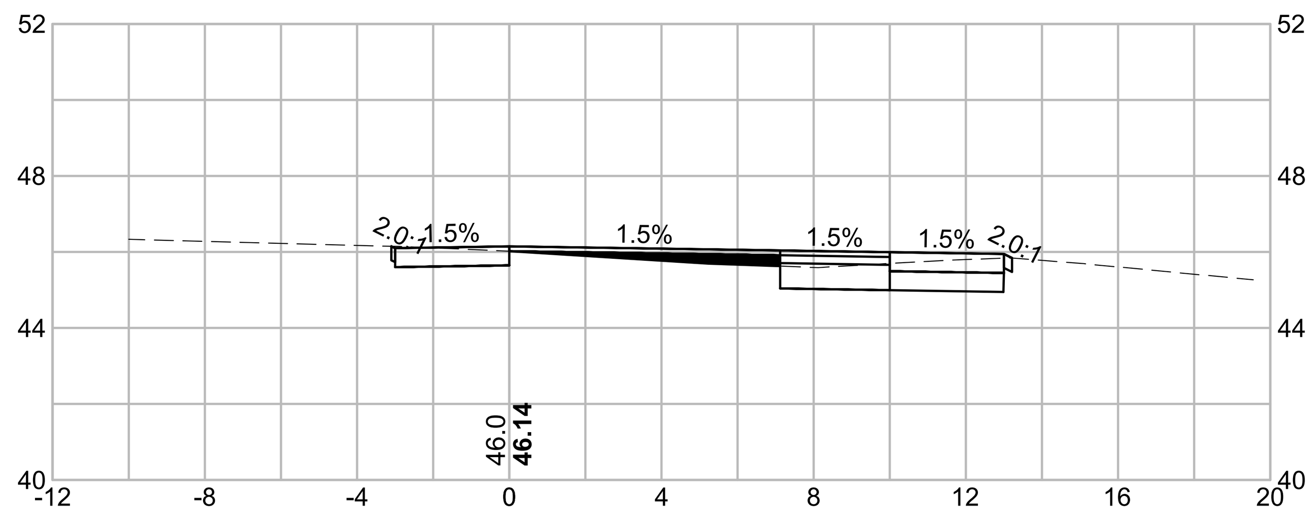
HIGGINS CROWELL SPUR CROSS SECTIONS

815+00



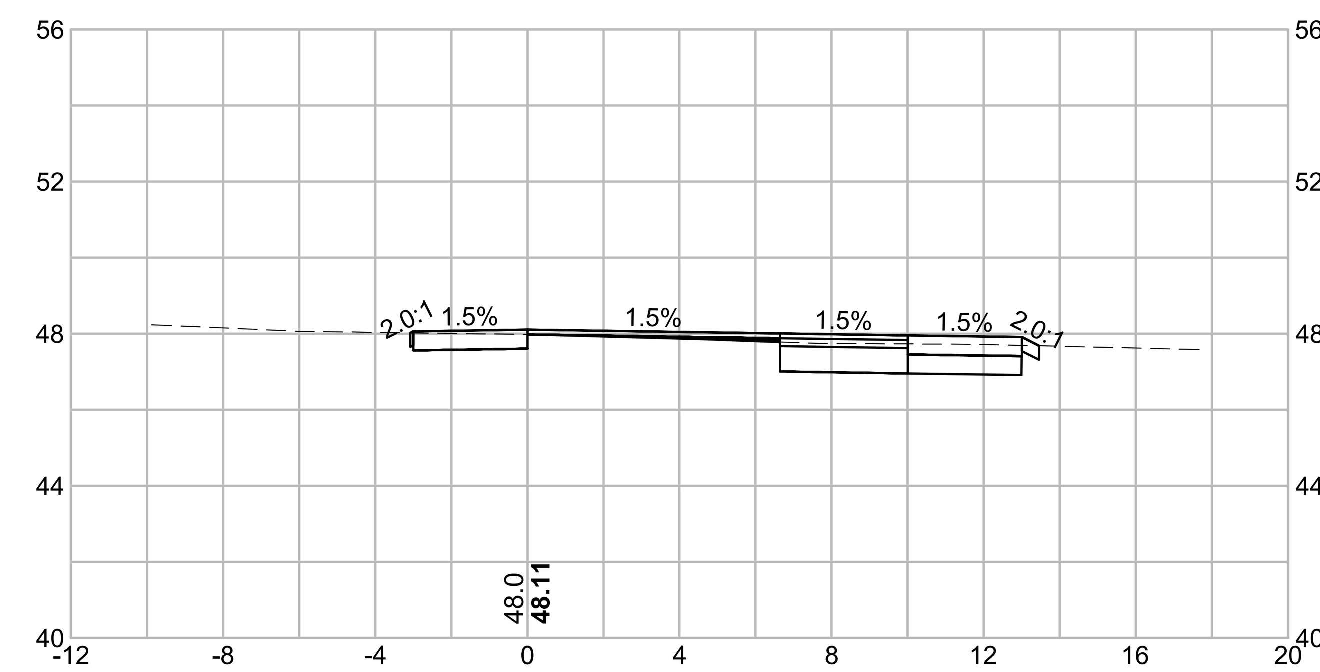
CUT: 6.19 SF
FILL: 0.00 SF

813+50



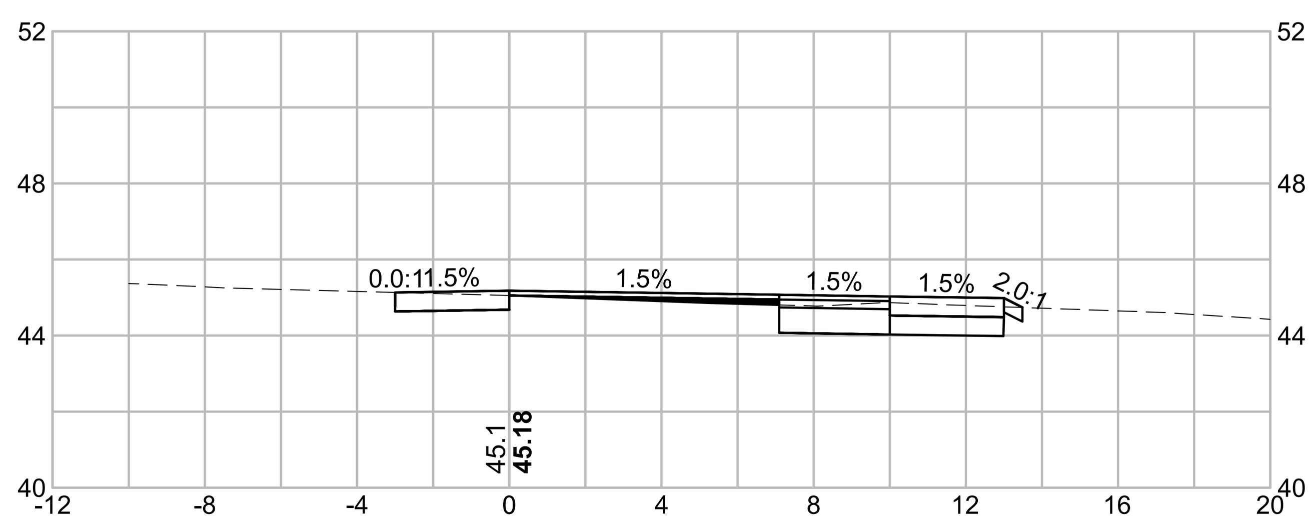
CUT: 4.16 SF
FILL: 1.13 SF

814+50



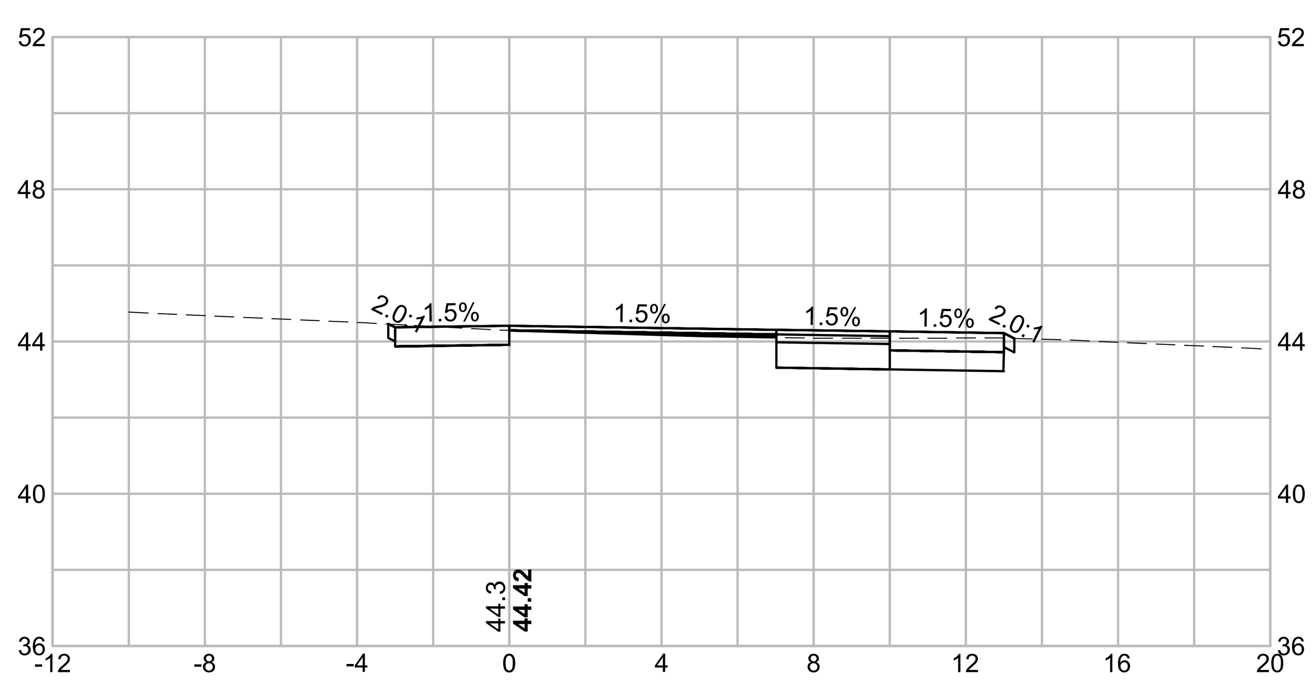
CUT: 4.83 SF
FILL: 0.27 SF

813+00



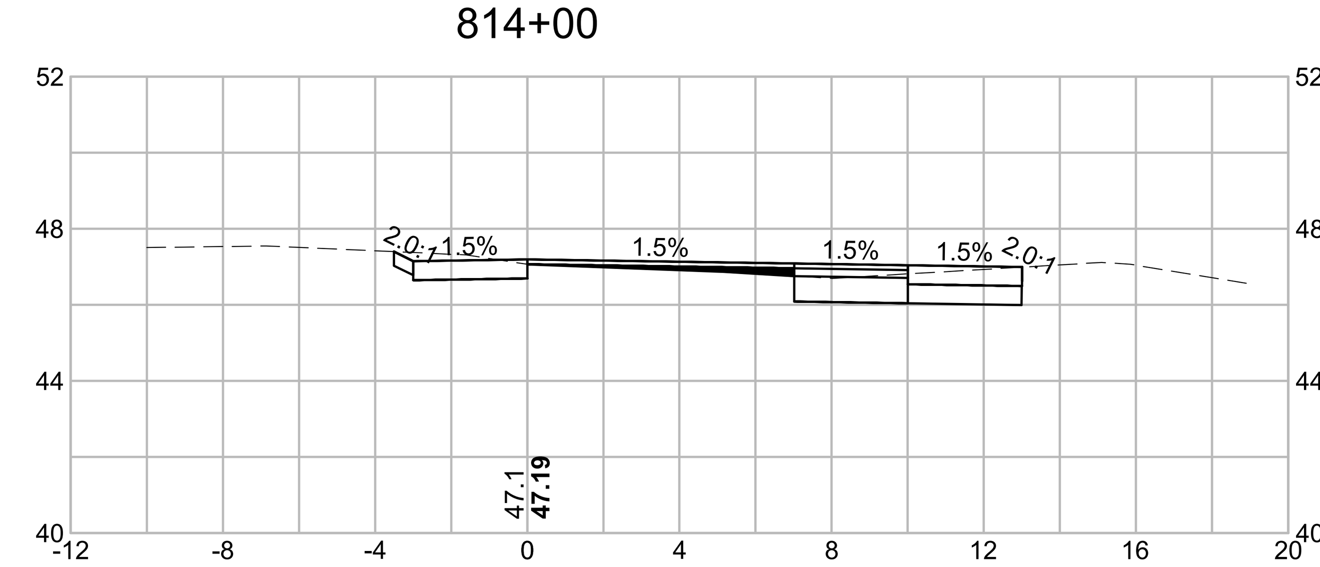
CUT: 4.56 SF
FILL: 0.55 SF

812+50

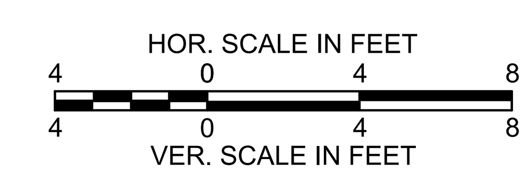


CUT: 5.02 SF
FILL: 0.33 SF

814+00



CUT: 5.20 SF
FILL: 0.63 SF



Plotted on 21-Oct-2021 8:57 AM

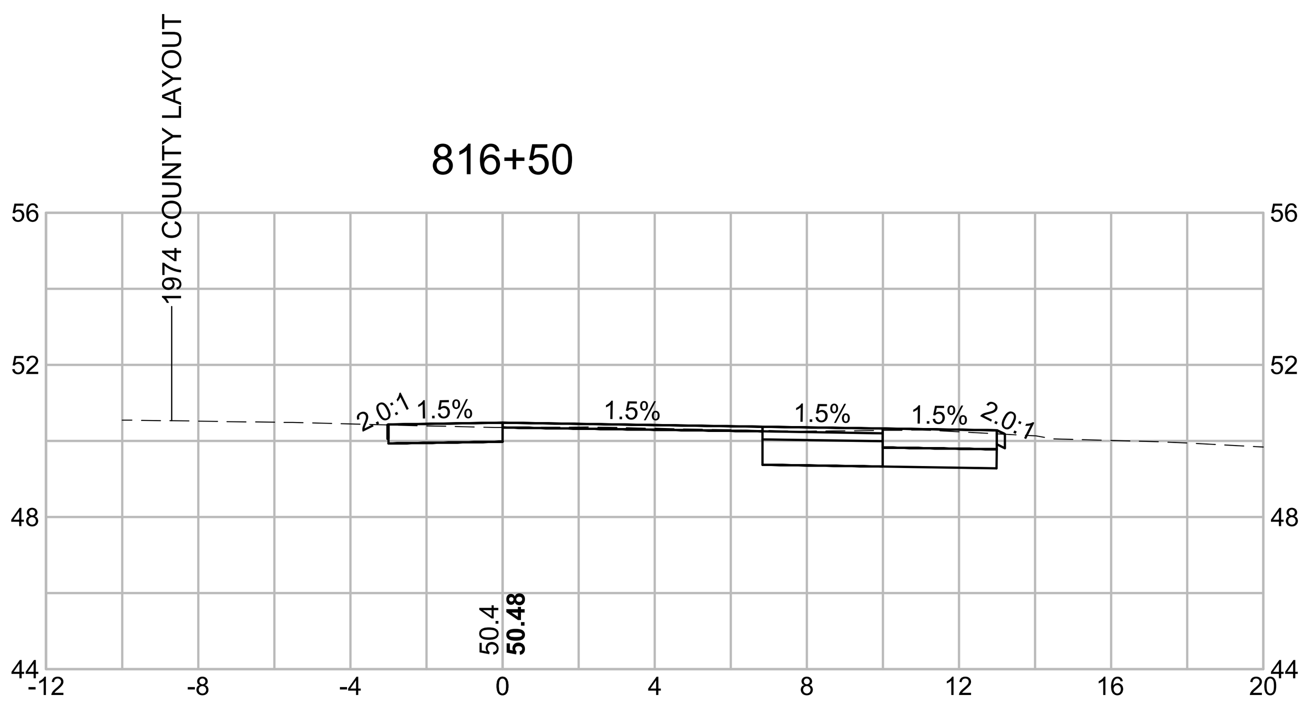
607398_HD(XSEC-SPUR).DWG

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	257	267
PROJECT FILE NO. 607398			

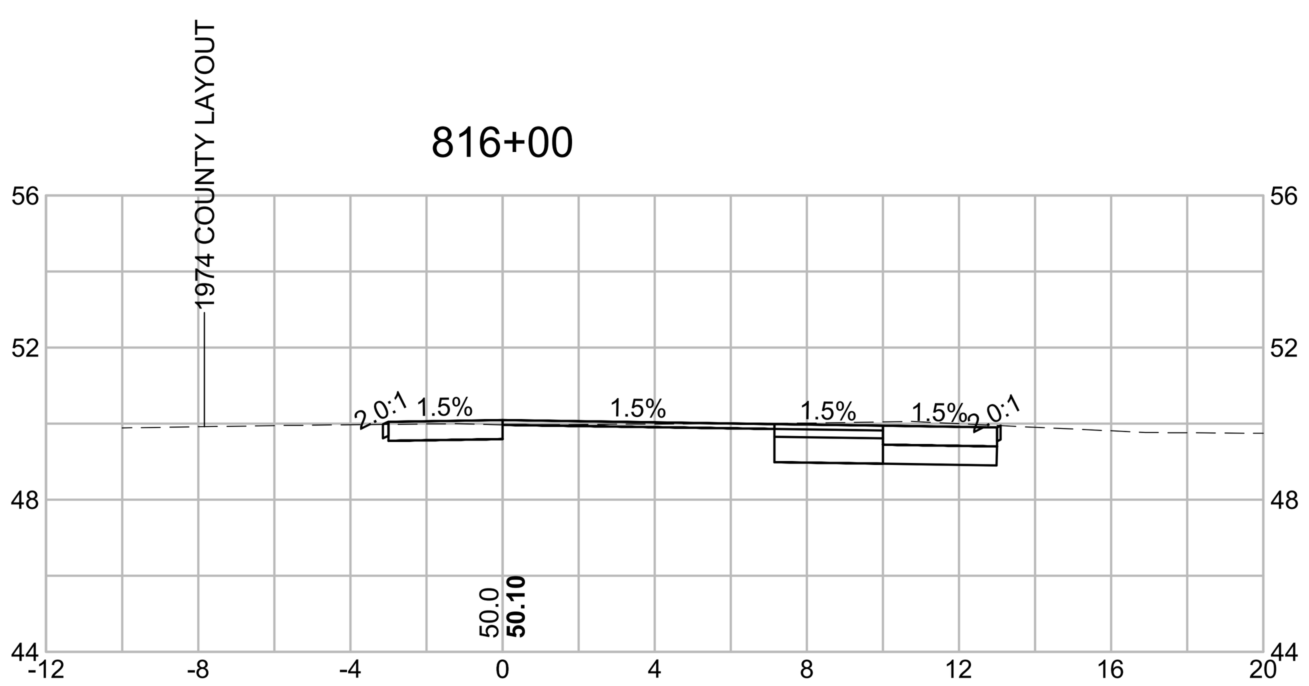
HIGGINS CROWELL SPUR CROSS SECTIONS

816+50



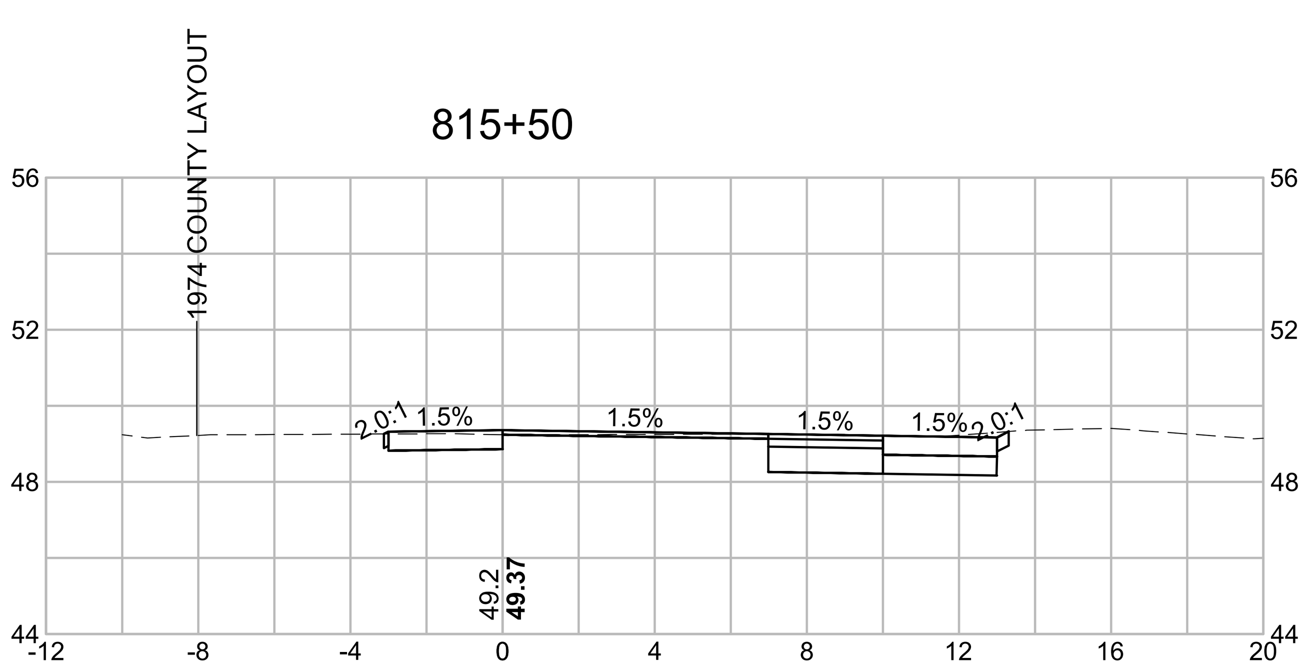
CUT: 5.82 SF
FILL: 0.00 SF

816+00



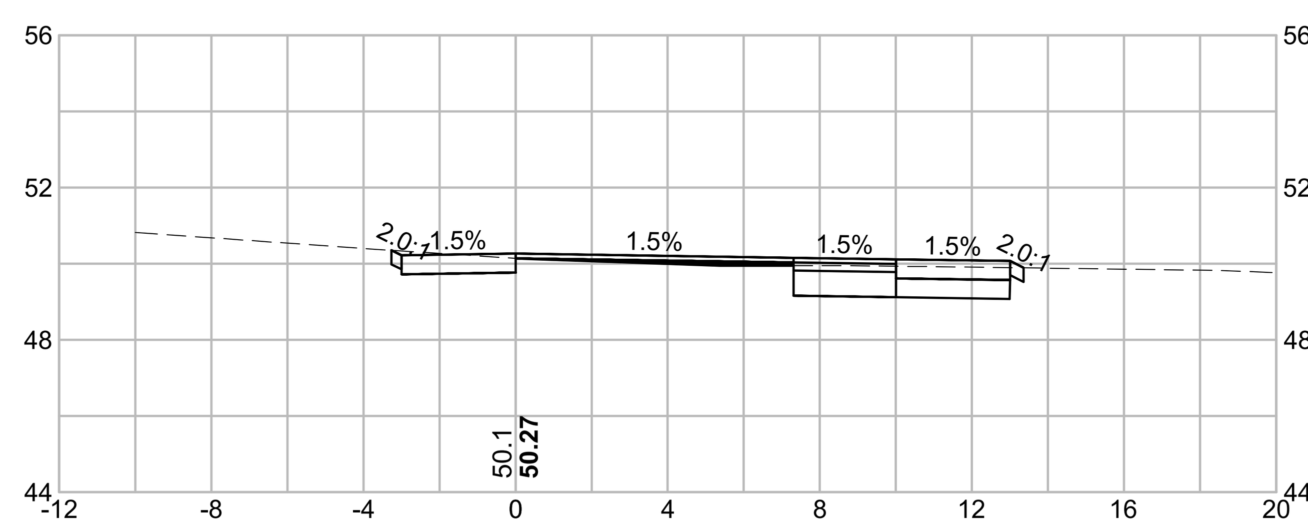
CUT: 6.64 SF
FILL: 0.00 SF

815+50



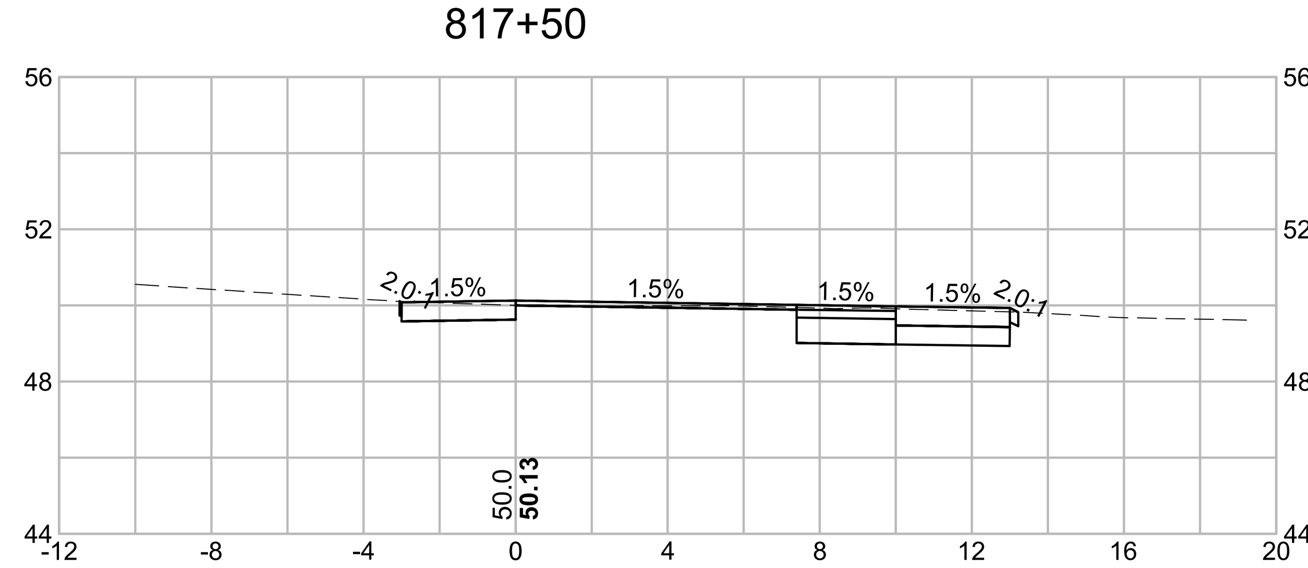
CUT: 6.53 SF
FILL: 0.00 SF

818+00



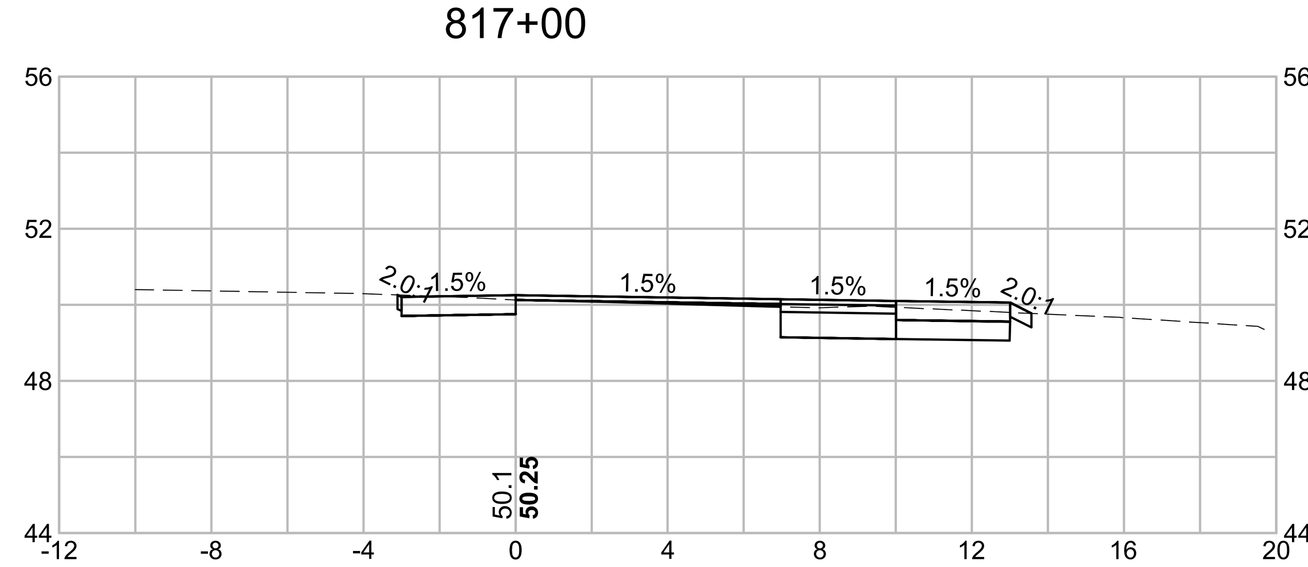
CUT: 4.84 SF
FILL: 0.51 SF

817+50



CUT: 5.43 SF
FILL: 0.00 SF

817+00



CUT: 4.92 SF
FILL: 0.21 SF

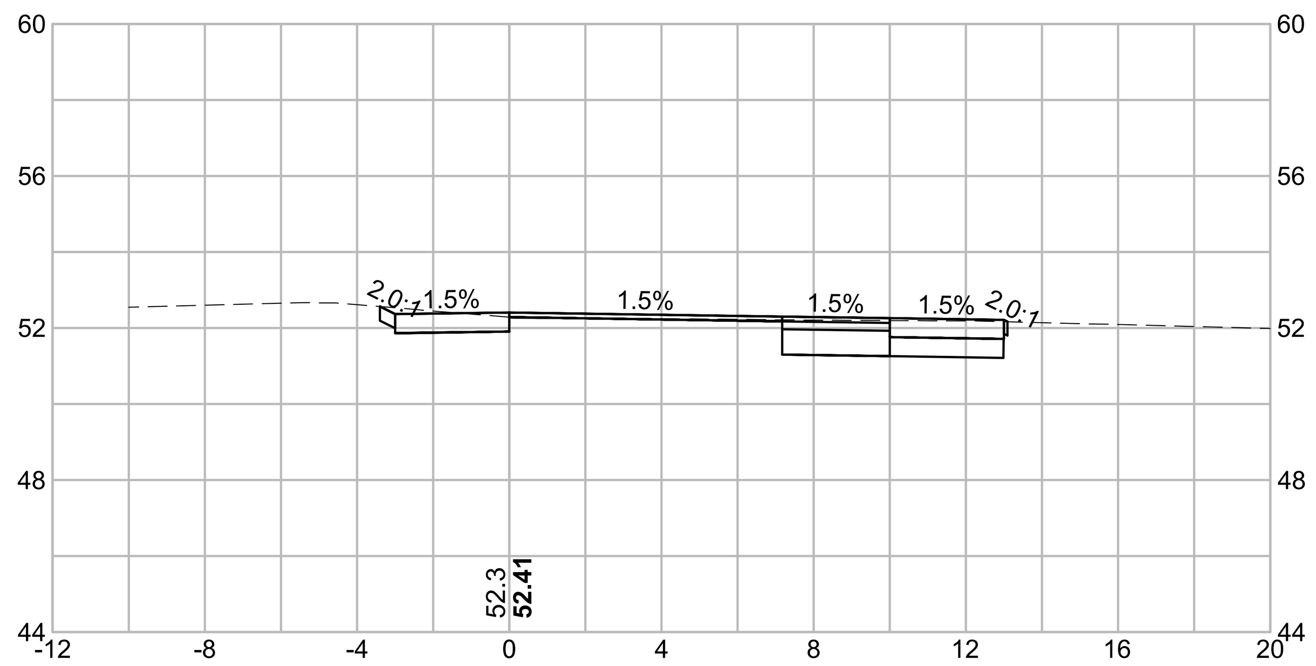
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

Plotted on 21-Oct-2021 8:57 AM
607398_HD(XSEC-SPUR).DWG

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	258	267
PROJECT FILE NO. 607398			

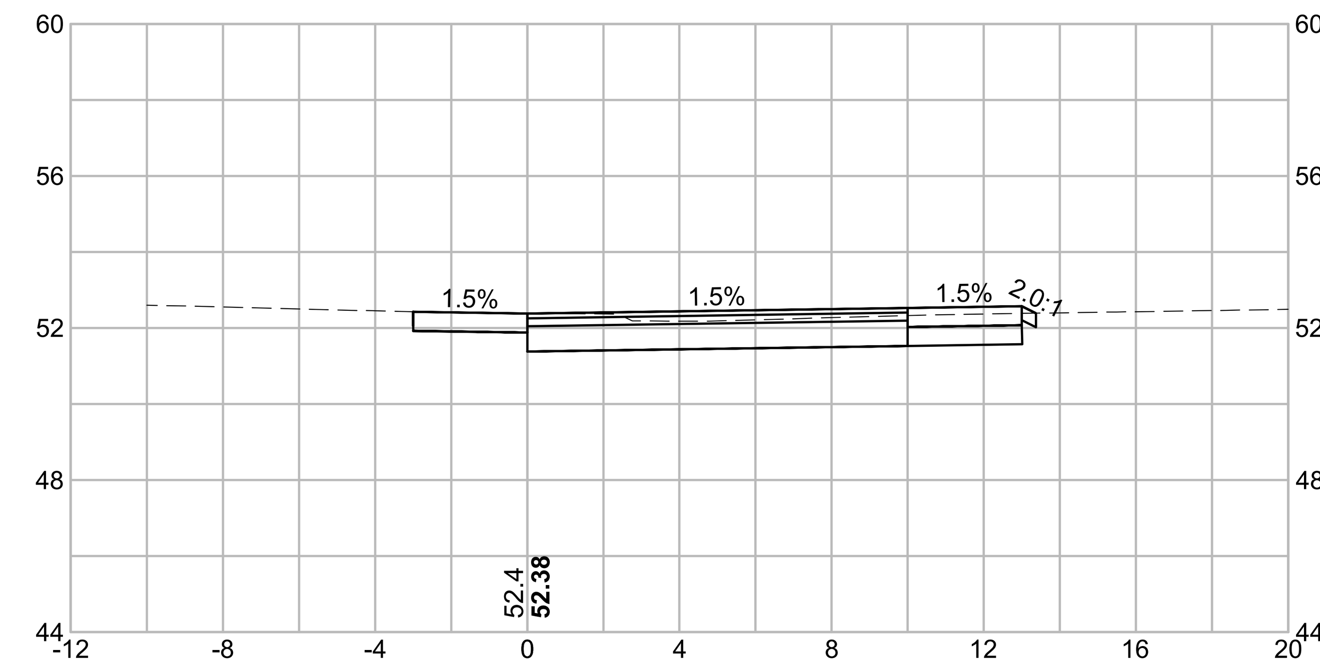
HIGGINS CROWELL SPUR CROSS SECTIONS

819+50



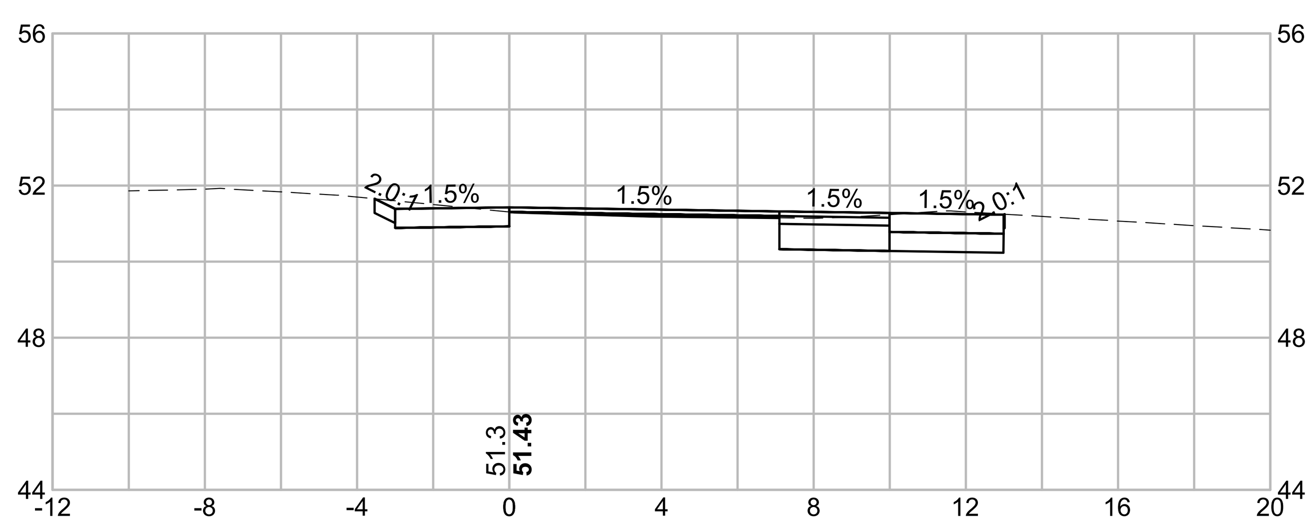
CUT: 5.86 SF
FILL: 0.00 SF

821+00



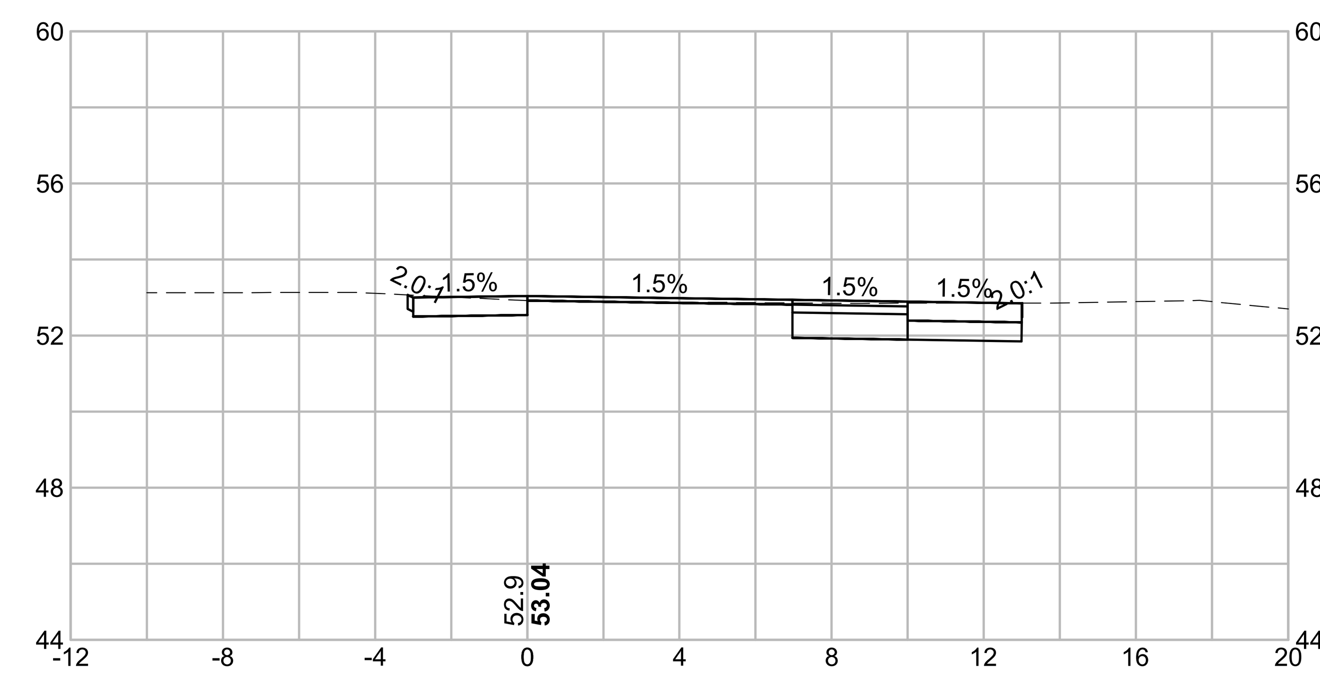
CUT: 10.71 SF
FILL: 0.00 SF

819+00



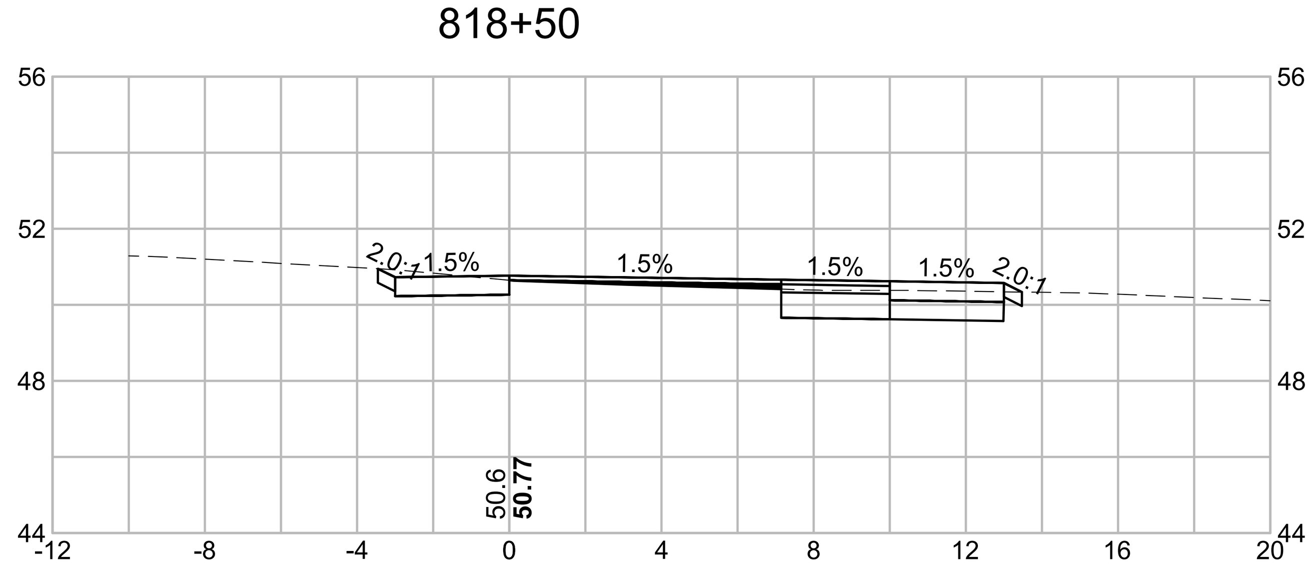
CUT: 6.01 SF
FILL: 0.33 SF

820+50



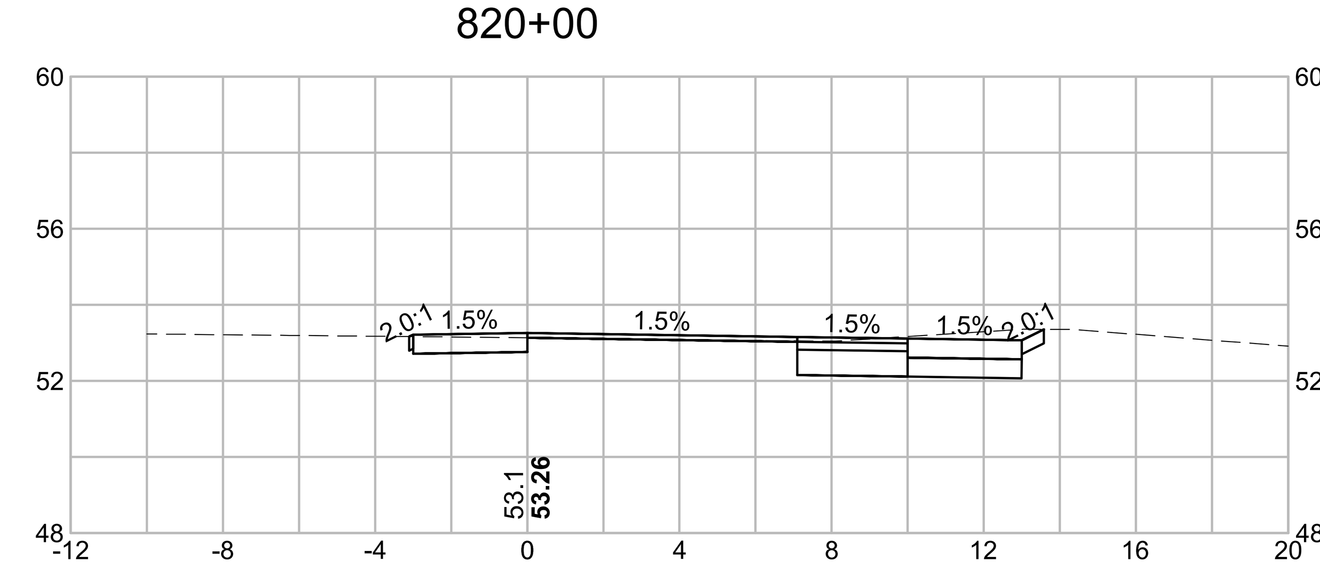
CUT: 5.90 SF
FILL: 0.00 SF

818+50

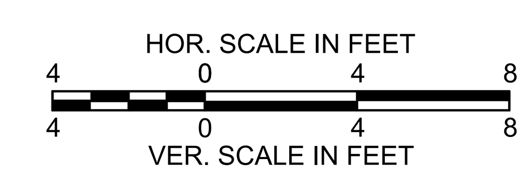


CUT: 4.87 SF
FILL: 0.50 SF

820+00



CUT: 6.40 SF
FILL: 0.00 SF



Plotted on 21-Oct-2021 8:57 AM
607398_HD(XSEC-SPUR).DWG

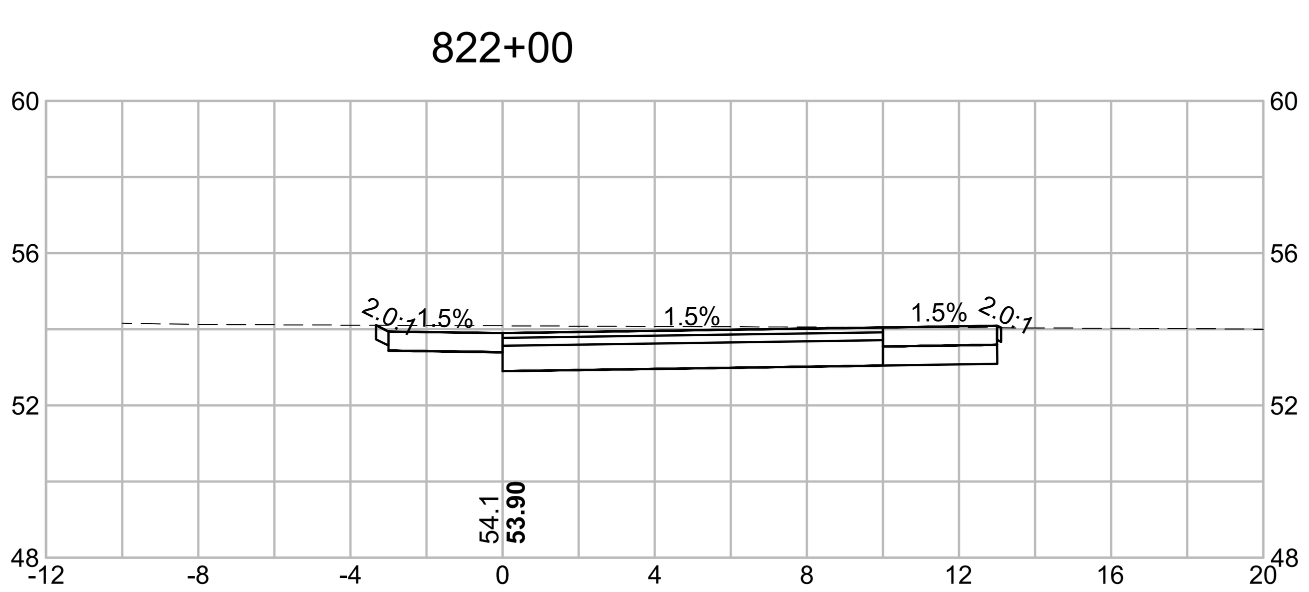
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	259	267
PROJECT FILE NO. 607398			

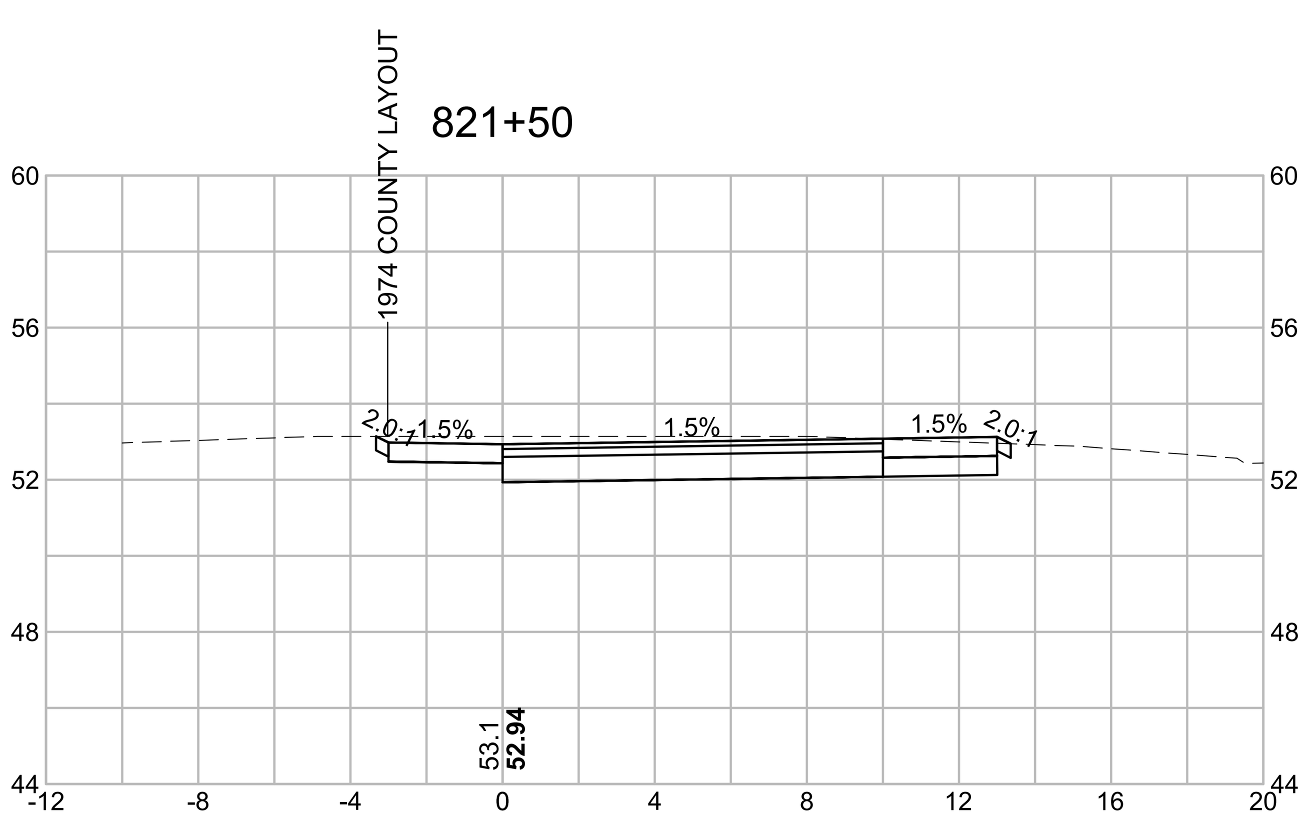
HIGGINS CROWELL SPUR CROSS SECTIONS

Plotted on 21-Oct-2021 8:57 AM

607398_HD(XSEC-SPUR).DWG



CUT: 14.63 SF
FILL: 0.00 SF



CUT: 14.79 SF
FILL: 0.00 SF

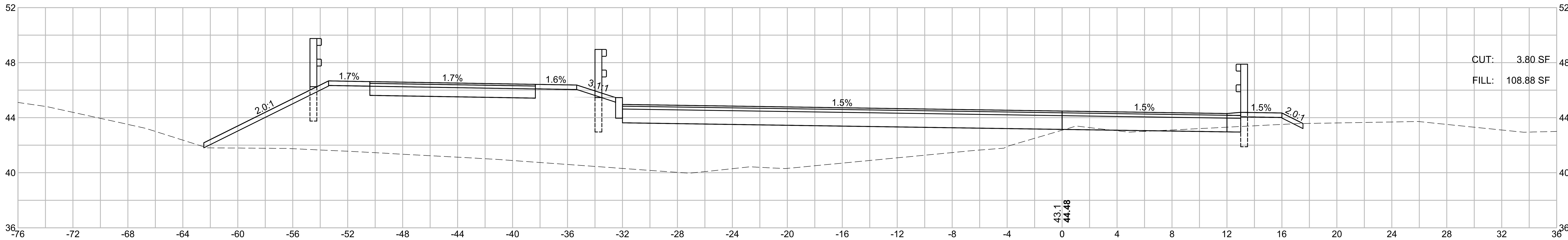
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

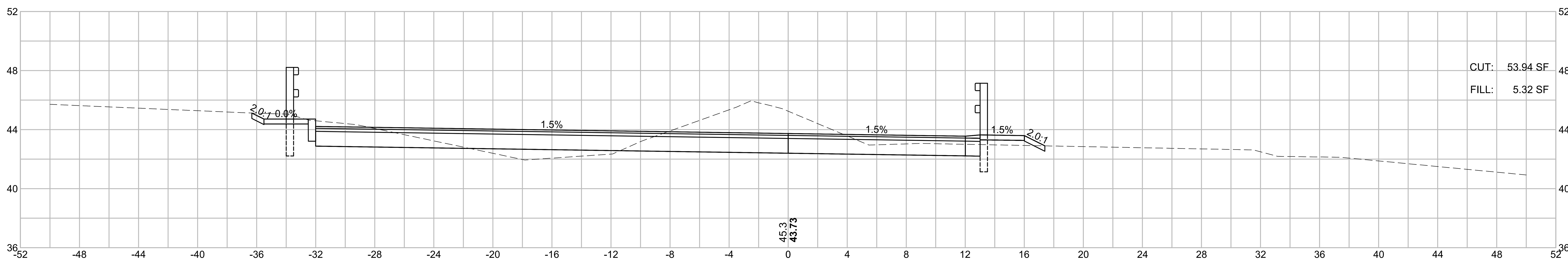
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	260	267
PROJECT FILE NO. 607398			

MARY DUNN PARKING CROSS SECTIONS

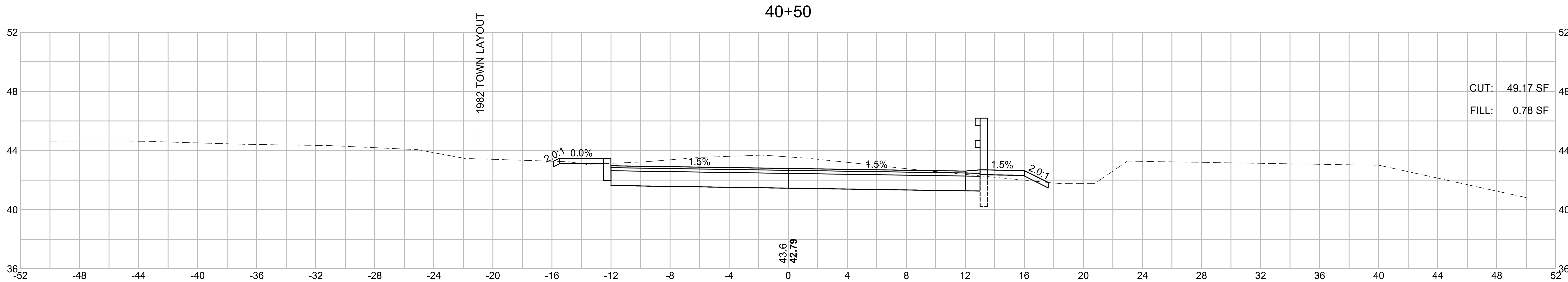
41+50

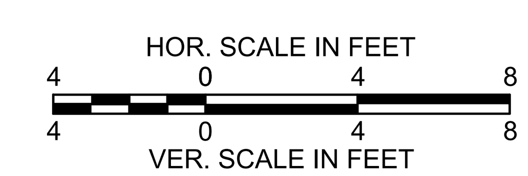


41+00



40+50





607398_HD(XSEC-WEST-1).DWG Plotted on 21-Oct-2021 9:01 AM

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

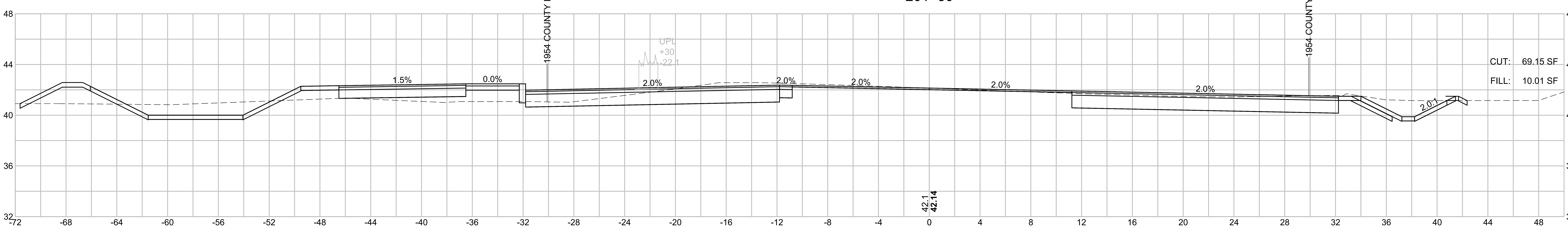
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	261	267
PROJECT FILE NO. 607398			

HIGGINS CROWELL PARKING CROSS SECTIONS

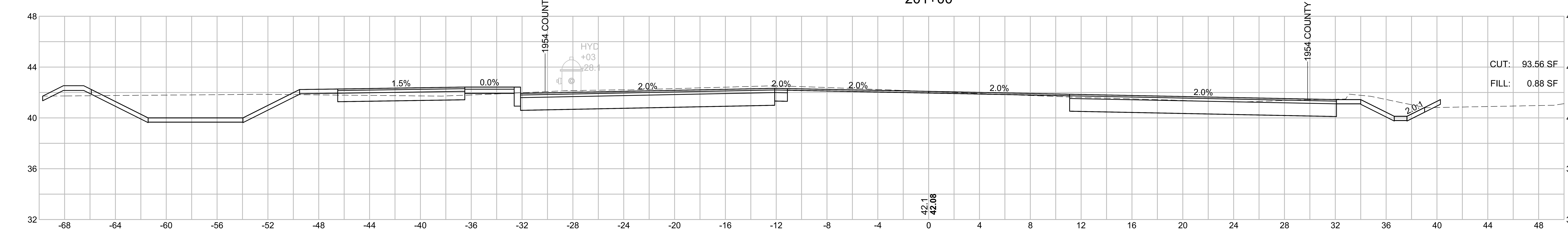
Plotted on 23-Nov-2021 2:03 PM

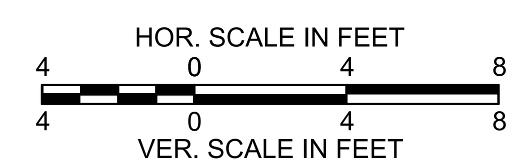
607398_HD(XSEC-SPUR).DWG

201+50



201+00





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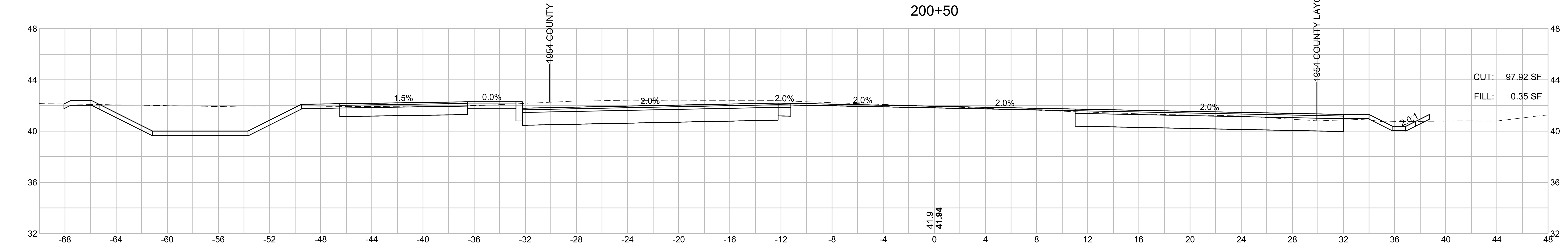

BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	262	267
PROJECT FILE NO. 607398			

HIGGINS CROWELL PARKING CROSS SECTIONS

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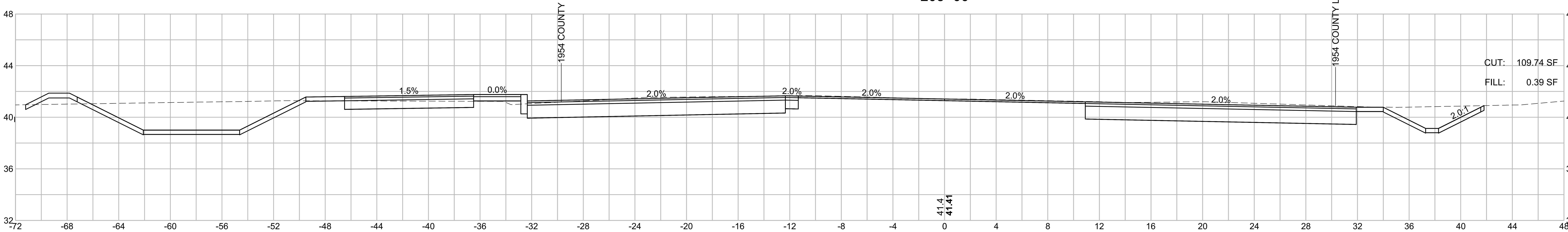

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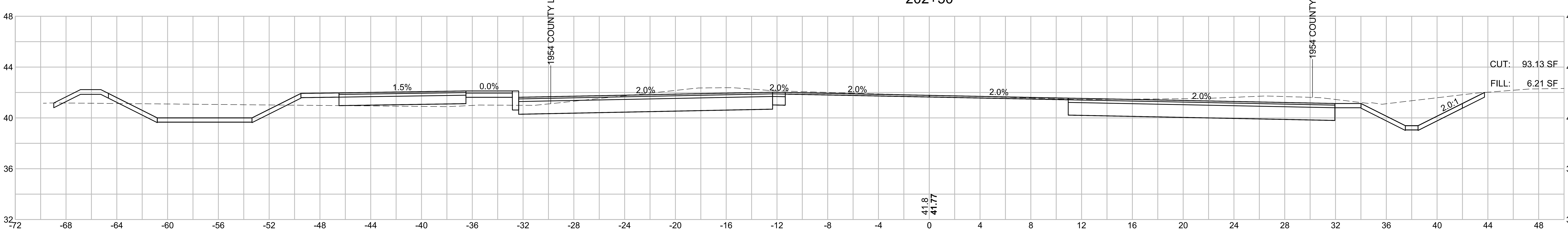

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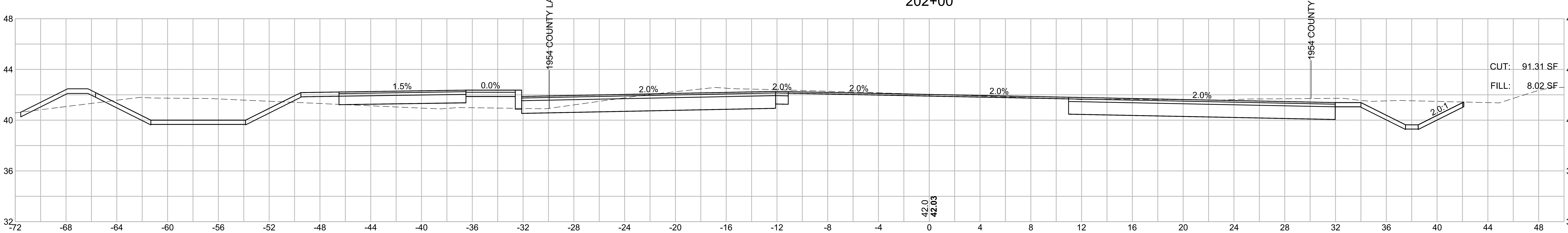
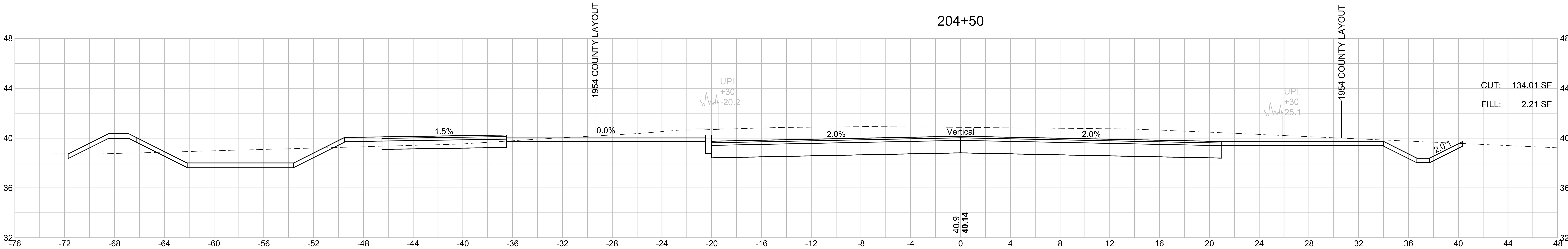
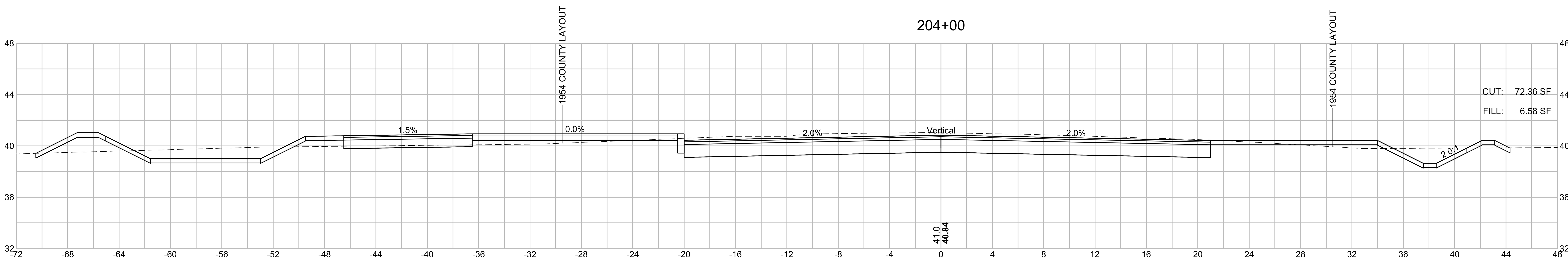


BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	263	267
PROJECT FILE NO. 607398			

HIGGINS CROWELL PARKING CROSS SECTIONS





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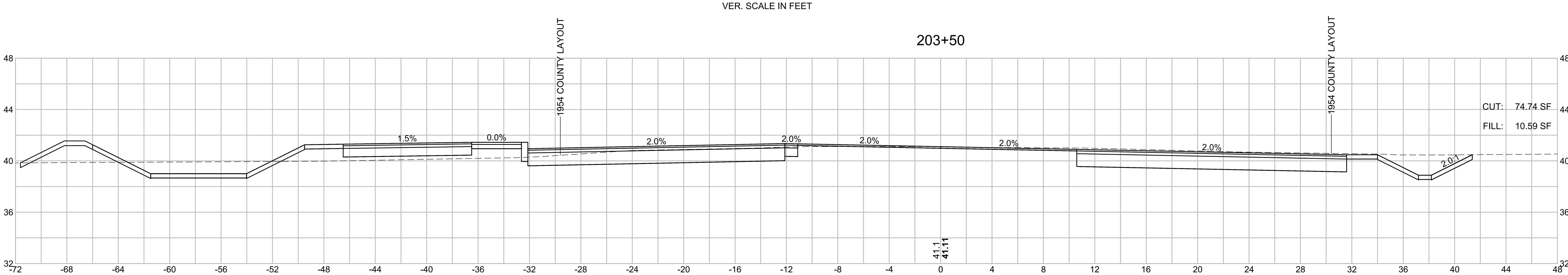

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BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	264	267
PROJECT FILE NO. 607398			

HIGGINS CROWELL PARKING CROSS SECTIONS

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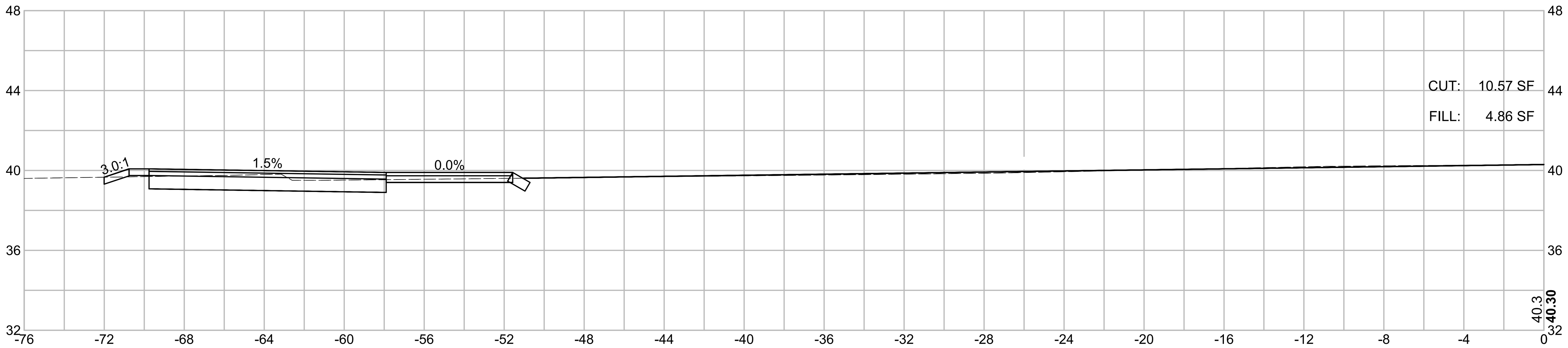

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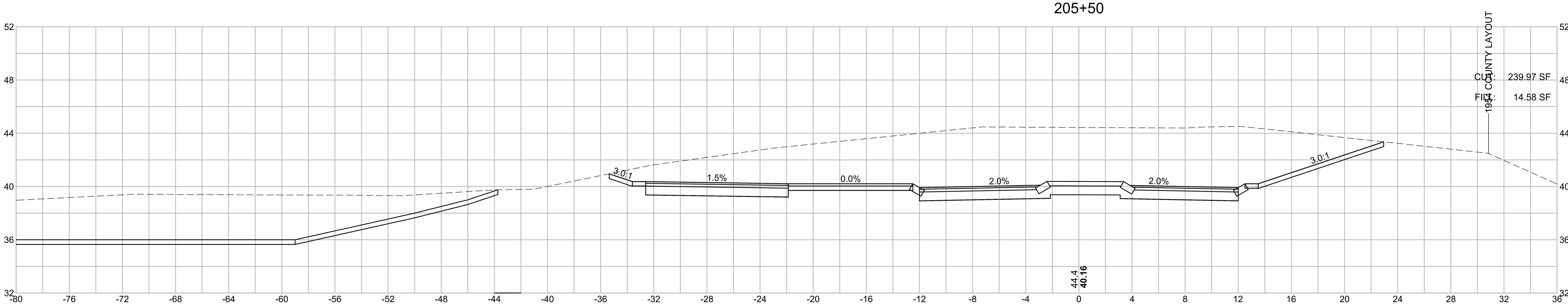

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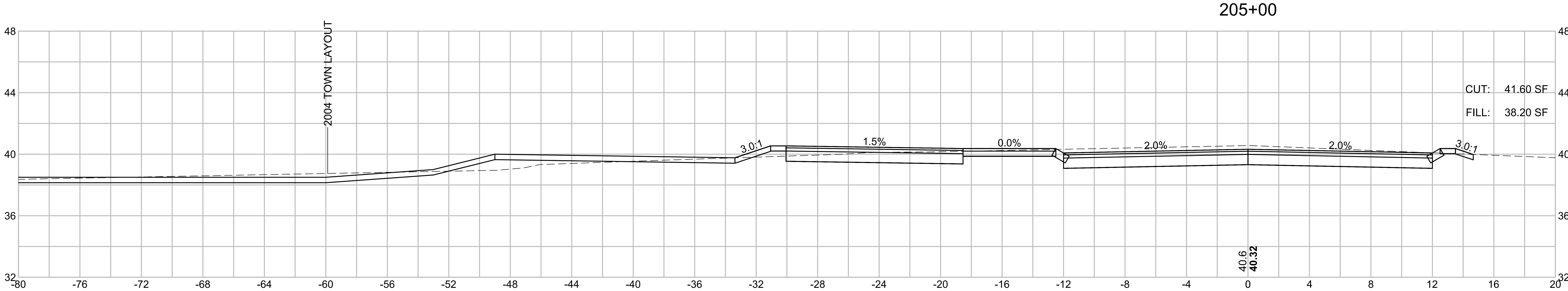

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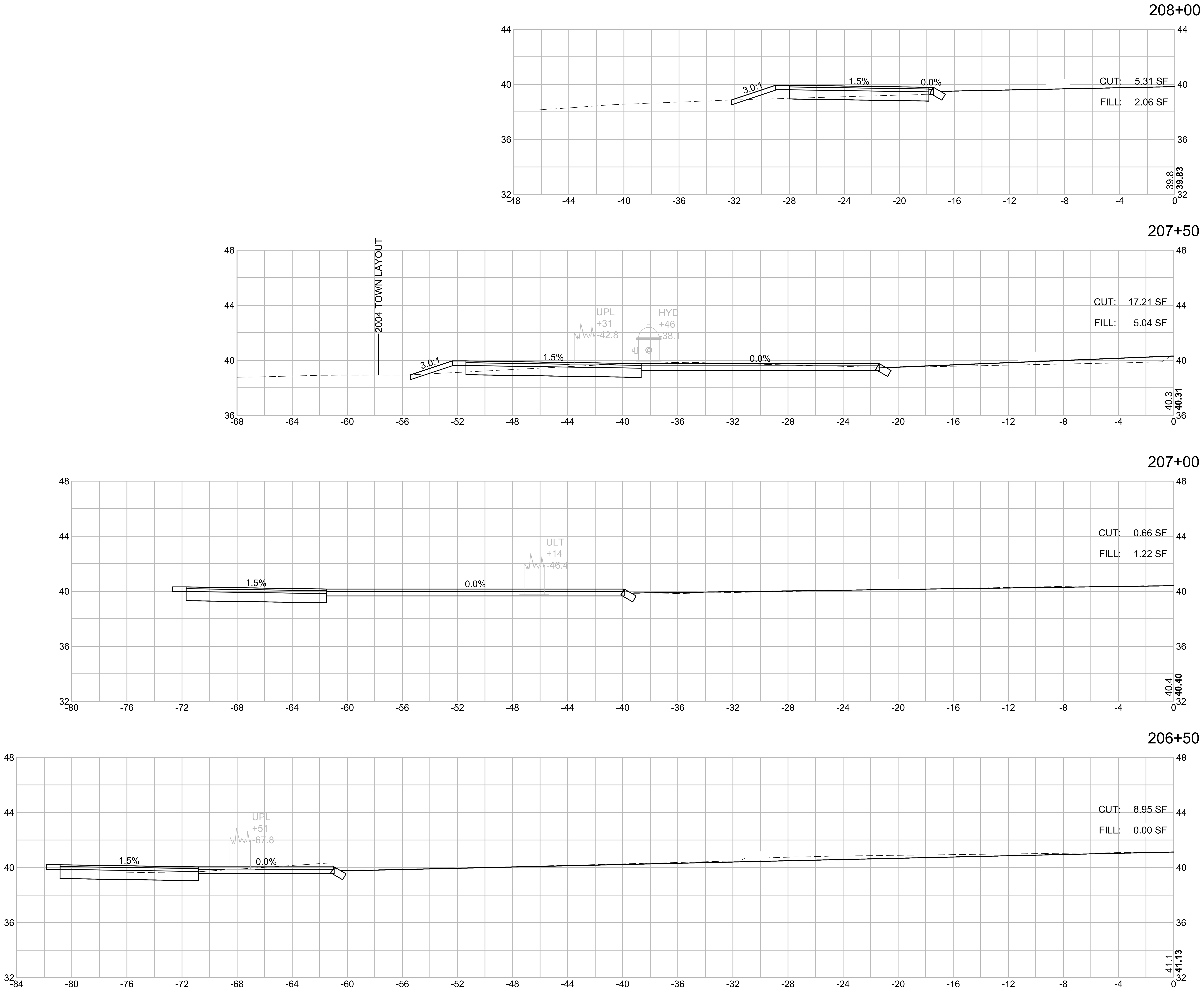
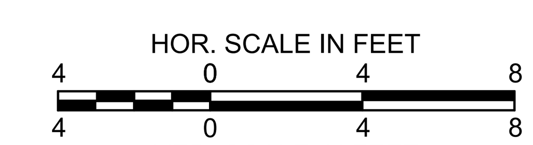
BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	265	267
PROJECT FILE NO. 607398			

HIGGINS CROWELL PARKING CROSS SECTIONS





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BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	266	267
PROJECT FILE NO. 607398			

GOLF COURSE PARKING CROSS SECTIONS

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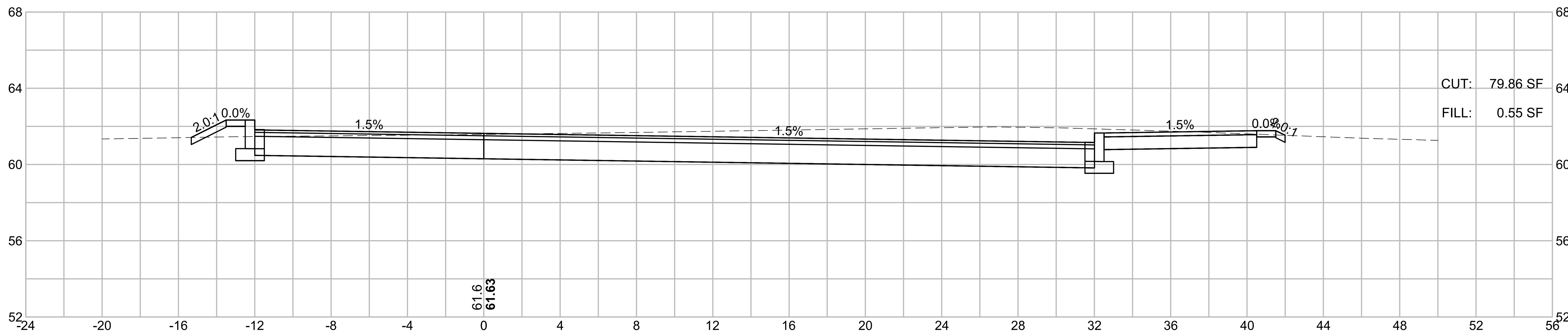

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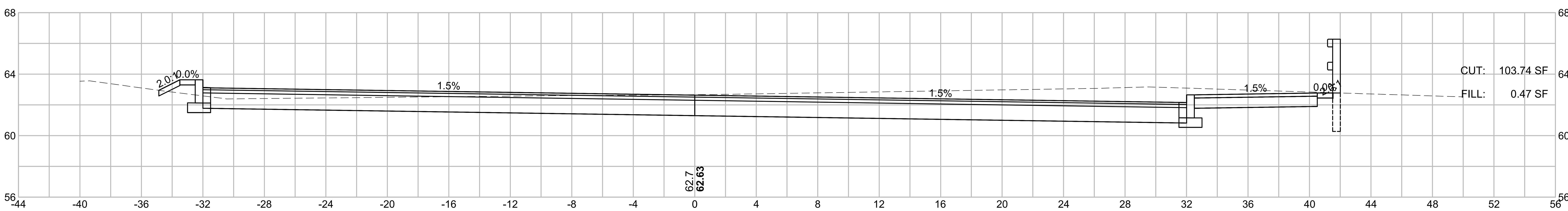

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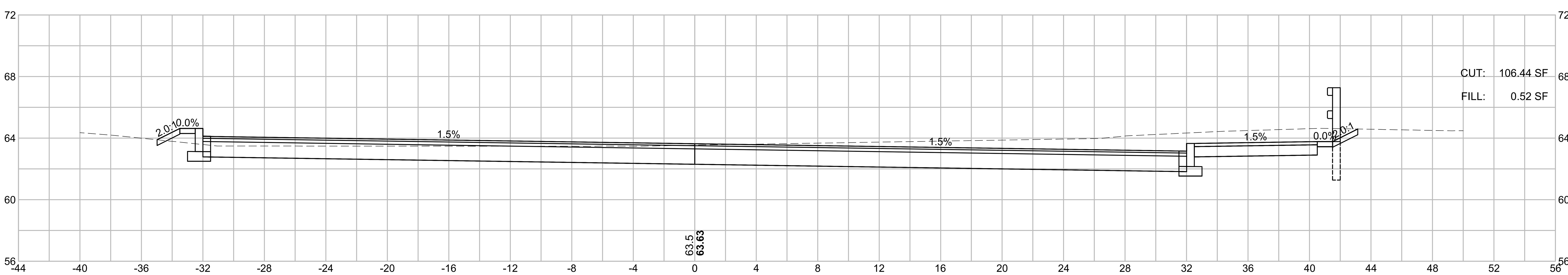

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BARNSTABLE / YARMOUTH
CAPE COD RAIL TRAIL EXT.- PHASE 3

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	267	267
PROJECT FILE NO. 607398			

TRANSFER STATION CROSS SECTIONS

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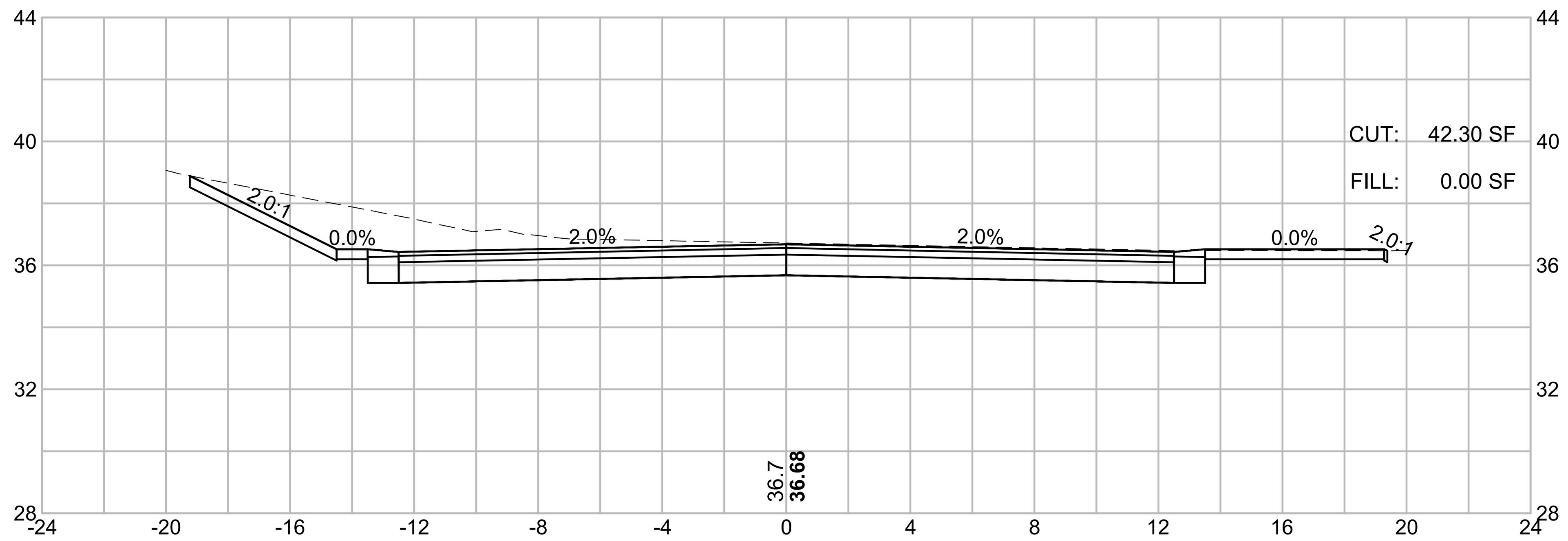

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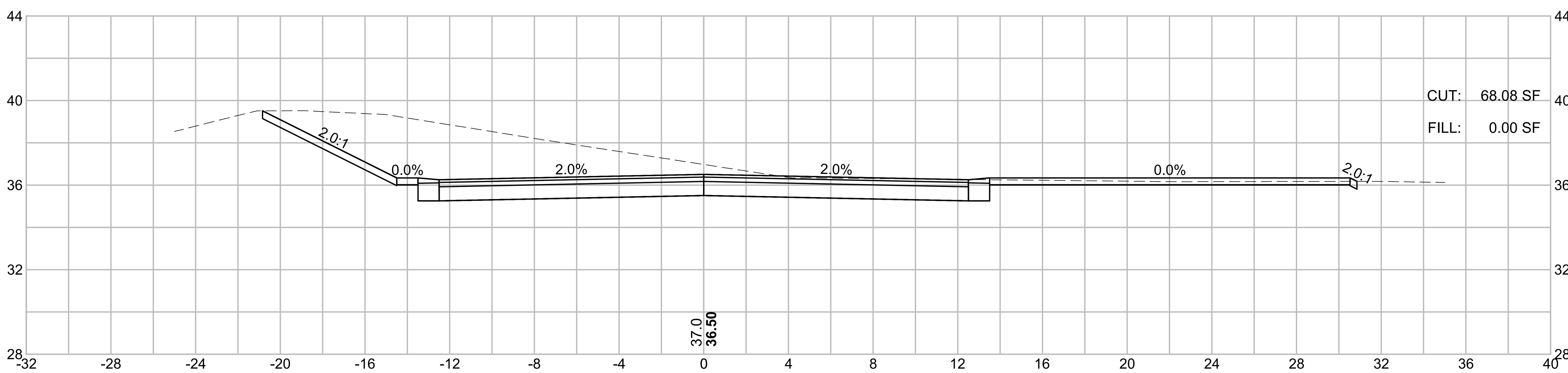

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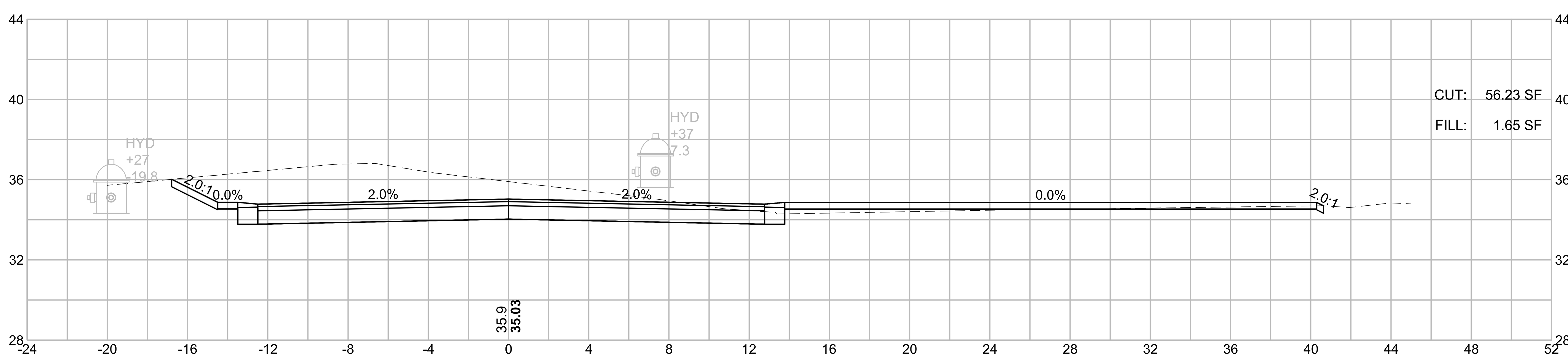

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Acts (2016)

Chapter 211

AN ACT AUTHORIZING THE COMMONWEALTH TO GRANT AN EASEMENT TO THE TOWN OF BARNSTABLE AND THE TOWN OF BARNSTABLE TO GRANT OR ASSIGN SEVERAL CONSERVATION RESTRICTIONS TO THE COMMONWEALTH

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same as follows:

SECTION 1. Notwithstanding sections 32 to 37, inclusive, of chapter 7C of the General Laws or any other general or special law to the contrary, the division of capital asset management and maintenance, in consultation with the division of fisheries and wildlife within the department of fish and game, may enter into an agreement with the city known as the town of Barnstable to grant to the town an easement upon a certain parcel of land, currently under the care and control of the department, to be used as a shared use pedestrian and bicycle path. The parcel of land upon which the easement may be granted was acquired by the commonwealth for the protection of endangered species and habitat, natural habitat protection, fish and wildlife conservation and associated public recreation contains, 237,250 square feet, more or less, and is shown from "Project Begin Sta. 40+00.00" to "town line" on the plan of land entitled "Massachusetts Department of Transportation Highway Division Plan and Profile of Cape Cod Rail Trail Extension in the Towns of Barnstable & Yarmouth Barnstable County Preliminary Right of Way" dated February 20, 2015. The exact boundaries of the easement shall be agreed to by the division of capital asset management and maintenance and, prior to finalizing the transaction or making the conveyance authorized in this section, the town and the division of capital asset management and maintenance may make minor modifications to the area and plan in order to carry out this act.

SECTION 2. In consideration of and as a condition of the grant of the easement authorized in section 1, the city known as the town of Barnstable shall make available by grant or assignment to the division of capital asset management and maintenance, in consultation with the division of fisheries and wildlife within the department of fish and game, conservation restrictions on the following parcels of land:

(i) a lot shown as parcel 009 on Barnstable assessors' map 332, containing 1.5 acres, more or less, with a street address of 844 Mary Dunn road in the village of Hyannis in the city known as the town of Barnstable and recorded in the Barnstable county registry of deeds in plan book 477, page 66;

(ii) a lot shown as parcel 005 on Barnstable assessors' map 332, containing 0.59 acres, more or less, with a street address of 864 Mary Dunn road in the village of Hyannis in the city known as the town of Barnstable, shown on plan recorded in Barnstable county registry of deeds in plan book 340, page 26 and owned by the town by a deed recorded in the Barnstable county registry of deeds in book 26130, page 73;

(iii) a lot shown as parcel 036 on Barnstable assessors' map 348, containing 1.2 acres, more or less, located on United States highway route 6 and owned by the town by a deed recorded in the Barnstable county registry of deeds in book 26130, page 73;

(iv) a lot shown as parcel 001 on Barnstable assessors' map 177, containing 133 acres, more or less, owned by the town for conservation purposes under land court certificate of title number 76207 in the Barnstable county registry of deeds; and

(v) a portion of the land owned by the Cobb Trust, with a street address of 755 Independence drive in the village of Hyannis in the city known as the town of Barnstable, shown on assessors map 332 as parcel 010002, containing 9.86 acres, more or less, after completion of a survey of the restricted portion in accordance with the registry of deeds' recording standards.

SECTION 3. The city known as the town of Barnstable shall be responsible for all costs associated with engineering, surveys, appraisals and deed preparation related to the conveyances authorized in this act as determined by the commissioner of the division of capital asset management and maintenance.

SECTION 4. An instrument executed pursuant to this act shall not be valid unless it provides that the area conveyed shall be used solely for the purposes described in this act. The instrument authorized in section 1 shall include a reversionary clause that stipulates that the property shall revert to the commonwealth and be assigned to the care, custody and control of the department of fish and game, upon the terms and conditions that the commissioner of capital asset management and maintenance may determine, if the property ceases to be used for the express purposes authorized in this act. If any interest reverts to the commonwealth, any further disposition shall be subject to sections 32 to 37, inclusive, of chapter 7C of the General Laws and the prior approval of the general court.

Approved, August 9, 2016

3225 MAIN STREET • P.O. BOX 226
BARNSTABLE, MASSACHUSETTS 02630

(508) 362-3828 • Fax (508) 362-3136 • www.capecodcommission.org

CAPE COD
COMMISSION

Via Email

March 2, 2020
Kathleen A. Theoharides, Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office, Eva Murray, MEPA Analyst
100 Cambridge Street, Suite 900, Boston, MA 02114

Re: Environmental Notification Form — EEA No. 16150 (CCC File No. 20042)
Cape Cod Rail Trail (CCRT) Extension Phase III, MassDOT, Towns of Barnstable and Yarmouth

Dear Secretary Theoharides:

Thank you for the opportunity to provide comments on the above-referenced ENF. Commission staff believe that the ENF sufficiently details the project and incorporates necessary mitigation actions, such that no EIR or further MEPA review should be required.

- The *Cape Cod Regional Policy Plan* supports improving safety for walkers and bicycle riders (including crosswalks, sidewalks, bike lanes, and bike paths) throughout the region. The *Cape Cod Regional Transportation Plan* supports all phases of the CCRT extension as critical multi-modal projects to be completed in the region over the next 20 years.
- The proposed CCRT extension is a key element in working towards the goal of providing a regional bicycle connection from Woods Hole to Provincetown totaling 88 miles.
- The sidewalk extension from the rail trail connection to Willow Street is proposed to terminate at the MassDOT Maintenance Depot. An alternative which may provide an overall safer connection to the local network would be to extend the sidewalk to Ansel Hallet Road.
- Additionally, as part of this CCRT extension, consideration should be given for connectivity and constructability to a future connection to the planned multi-modal path connection on the west side of Willow Street/Yarmouth Road towards Barnstable. Details regarding this future path are included in the Hyannis Access Study (https://www.capecodcommission.org/our-work/hyannis-access/).
    - Such consideration should include the installation a new bicycle counting station on this segment of the rail trail extension, which would benefit the region. A potential location could be at the rail trail crossing on West Yarmouth Road.

Commission staff are available to discuss any questions you might have about the letter.

Sincerely,

Erin J Perry

Erin Perry
Deputy Director

Cc: Project File
Bryan Cordeiro, MassDOT., via email
Mark Ells, Barnstable Town Manager, via email
Elizabeth Jenkins, Director of Planning & Development, Town of Barnstable via email
Karen Greene, Director of Community Development, Town of Yarmouth via email
Barnstable Cape Cod Commission Representative via email
Yarmouth Cape Cod Commission Representative via email
Cape Cod Commission Chair via email
Cape Cod Commission Committee on Planning and Regulation Chair via email

2021-013 ACCEPTANCE OF FISCAL YEAR 2021 MASSTRAILS GRANT IN THE AMOUNT OF $180,950 FROM THE COMMONWEALTH OF MASSACHUSETTS FOR DESIGN OF THE CAPE COD RAIL TRAIL INTRO: 09/03/2020

Upon a motion duly made and seconded it was
RESOLVED: That the Town Council does hereby accept the Fiscal Year 2021 MassTrails Grant award in the amount of **$180,950** from the Commonwealth of Massachusetts Department of Conservation and Recreation for the purpose of design and permitting of the Cape Cod Rail Trail Phase 3 extension from Yarmouth to Mary Dunn Road in Barnstable Village, and that the Town Manager be authorized to contract for and expend the grant funds for the purpose stated herein.

2021-014 ACCEPTANCE OF FISCAL YEAR 2021 COASTAL POLLUTANT REMEDIATION GRANT IN THE AMOUNT OF $173,255.50 FROM THE COMMONWEALTH OF MASSACHUSETTS FOR CONSTRUCTION OF STORMWATER IMPROVEMENTS ON SOUTH COUNTY ROAD INTRO: 09/03/2020

Upon a motion duly made and seconded it was
RESOLVED: That the Town Council does hereby accept the Fiscal Year 2021 Coastal Pollutant Remediation Grant award in the amount of **$173,255.50** from the Commonwealth of Massachusetts Department of Coastal Zone Management for the purpose of constructing stormwater improvements along South County Road in Marstons Mills, and that the Town Manager be authorized to contract for and expend the grant funds for the purpose stated herein.

2021-015 ACCEPTANCE OF 2020 MASSACHUSETTS DREDGING GRANT IN THE AMOUNT OF $500,000 FROM THE COMMONWEALTH OF MASSACHUSETTS FOR THE DEAD NECK / SAMPSON'S ISLAND DREDGING PROJECT INTRO: 09/03/2020

Upon a motion duly made and seconded it was
RESOLVED: That the Town Council does hereby accept the 2020 Massachusetts Dredging Grant award in the amount of **$500,000.00** from the Commonwealth of Massachusetts Executive Office of Housing and Economic Development for the purpose of executing Phase 3 of the Dead Neck / Sampson's Island Dredging Project and that the Town Manager be authorized to contract for and expend the grant funds for the purpose stated herein.

2021-016 RESOLVE TO ACCEPT THE GRANT OF A ROADWAY IMPROVEMENTS EASEMENT FROM CAPE COD HOSPITAL FOR NEW TRAFFIC SIGNAL AT THE INTERSECTION ATTUCKS LANE AND WILKENS LANE INTRO: 09/03/2020

Upon a motion duly made and seconded it was
RESOLVED: that the Town accept the grant of a perpetual easement to the Town under the care, custody and control of its Department of Public Works for the construction, maintenance, repair and use of roadway improvements to support the construction of a new traffic signal at the intersection of Attucks Lane and Wilkens Lane from Cape Cod Hospital, as shown on a plan prepared by the Department of Public Works Survey Section dated February 10, 2020 and that the Town Manager is authorized to accept, sign deliver and record documents for the purposes set forth herein.

Additional Project Recommendations

Applications for the following list of projects are expected to be submitted to the Community Preservation Committee for consideration of funding from the Community Preservation Fund. Once the Community Preservation Committee has acted upon the request, an appropriation order will be presented to the Town Council for its consideration. Some of these projects may come forward for funding requests in FY 2022 and the others in FY 2023. These funding requests will fall outside of the Capital Program funding cycle.

LISTING OF CAPITAL IMPROVEMENT PROJECTS WITH POTENTIAL CPC FUNDING:			
DEPT	**PRIORITY**	**PROJECT TITLE**	**FY 2023**
CSD	4	Town Recreation Field Improvements Project – Bay Lane Ballfields	140,000
CSD	12	Osterville Playground	1,352,336
DPW	22	Cotuit Memorial Park Restoration	451,951
DPW	29	Cape Cod Rail Trail Ext. Shared Use Path	1,770,000
DPW	39	West Barnstable Railroad Depot Restoration	102,120
DPW	38	Zion Union Heritage Museum Improvements	457,390
		TOTAL CPC MATCHED PROJECTS	**$4,273,797**

PROJECT WAITING FOR COMPLETION OF MANAGEMENT PLAN:			
DEPT	**PRIORITY**	**PROJECT TITLE**	**FY 2023**
DPW	6	Ponds Solution Permitting and Implementation	$150,000

The project listed above will be presented to the Town Council for funding consideration once the management plan has been completed with a recommended solution and cost estimate.

Estimated Remaining Engineering Costs for Barnstable's Portion of Cape Cod Rail Trail Phase 3
10-24-2022

Item No.	Description	Cost	Comments
1	Pay outstanding VHB invoice dated 9/16/2022	$ 17,204.48	This fully expends the existing contract amount (Barnstable's portion), but additional engineering tasks remain to be performed.
2	Remaining contracted and additional engineering services	$128,800.00	See breakdown below.*
3	Legal fees for title certifications, easements, recording fees, etc.	$ 10,000.00	Assumed allowance.

Subtotal	$156,004.48
20% Contingency	$ 31,200.90
5% Project Management	$ 7,800.22
Total	$195,005.60
Rounded Total	$195,000.00

* Section 150 – Environmental
Additional services: updated CE checklist, wetland resource area delineation, Notice of Intent filing & supporting documents, coordination with DOT & NHESP on new rare species polygon
Barnstable cost: $20,600 **
Section 450 – 100% Highway Design
Additional services: updated Higgins Crowell parking lot geometry and drainage design
Barnstable cost: $1,900 **
Section 500 – Right of Way
Additional services: Easement layout plans for F&W parcels, coordination with F&W on easement definition and uses (drainage, sight line), written instrument for F&W parcels, dedication figures for permanent & temporary easement on Town owned parcel, anticipated 100% PROW revision 1 to achieve approval from DOT
Barnstable cost: $18,300 **
Section 750 – Final Bridge Design
Additional services: Comment resolution meeting on Jacobs/DOT Rail Division bridge plan review, respond to review comments and update bridge plans based on comments
Remaining contracted services: respond to 1st structural submission bridge plan comments, complete 2nd structural submission, finalize special provisions, finalize bridge/wall quantity cost estimate
Barnstable cost: $13,400 **
Section 800 – PS&E Submission
Additional services: MassDOT hosted utility field meeting to review utility relocations, preparation of updated utility plans for meeting, respond to PS&E 1st submission comments, submit final PS&E to DOT, review and respond to DOT Contracts Section comments/questions
Remaining contracted services: respond to 100% review comments, submit 1st PS&E to DOT
Barnstable cost: $41,100 **
Section 900 – Construction Engineering
Remaining contracted services: perform bid quantity review, attend pre-construction conference, review and respond to highway, traffic equipment, bridge & wall shop drawings, respond to Contractor questions, review & respond to RFIs, field visits to verify response to questions or RFIs, and attend DOT bi-weekly construction meetings as needed
Barnstable cost: $25,500 **
Direct expenses: $8,000
Total Barnstable cost: $128,800

** Note: Throughout this project, the engineering costs have been split between the Towns based on the percentage of project length in each Town, which roughly breaks down to a 30/70 split (Barnstable/Yarmouth).

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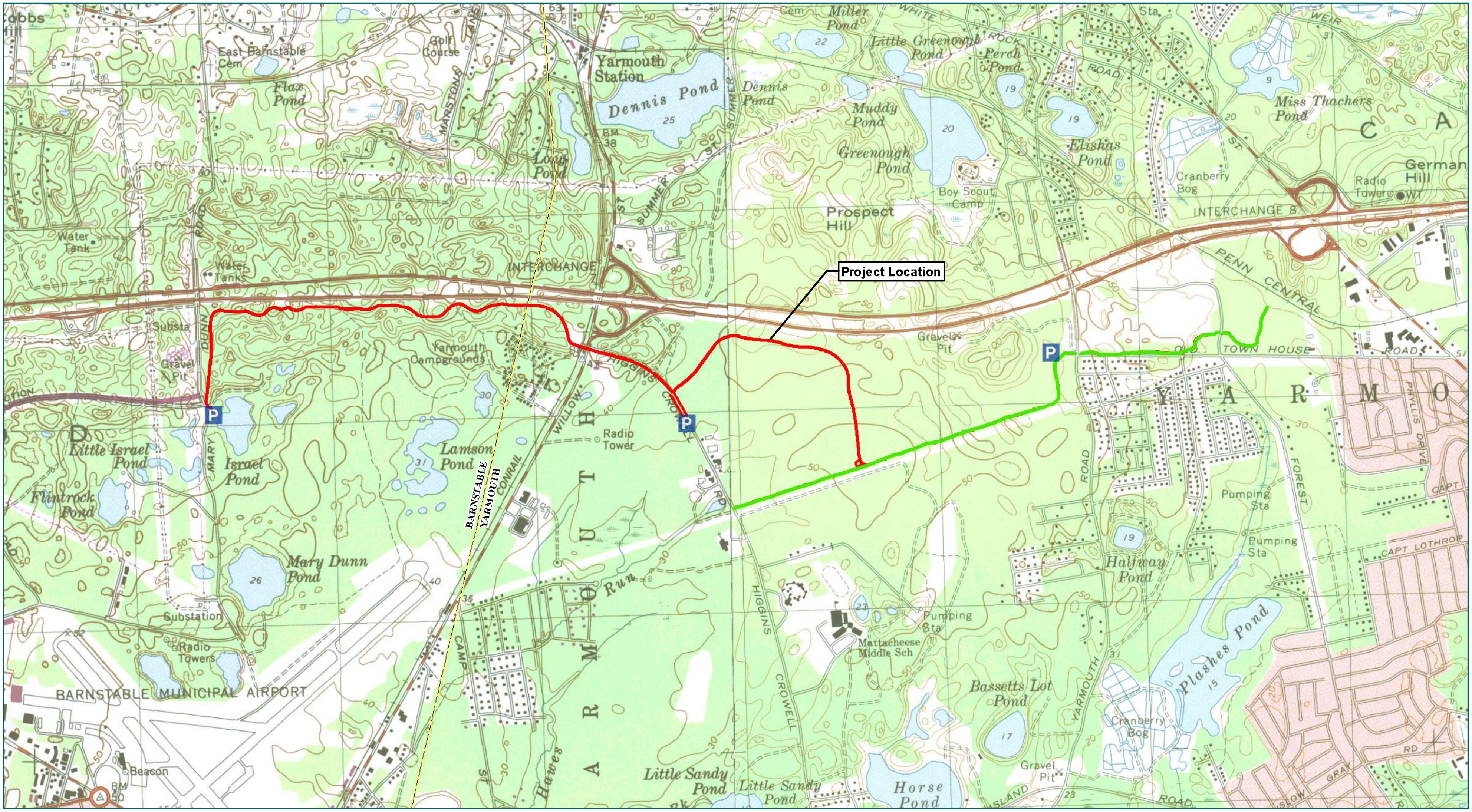

- New Alignment
- Existing Path Improvements
- P Parking Lot
- Town Boundaries

0 1,500 3,000 Feet

vhb Engineers | Scientists | Planners | Designers
101 Walnut Street, PO Box 9151, Watertown, MA 02471

Figure 1 – Site Location Map

Cape Cod Rail Trail Extension
Barnstable & Yarmouth, Massachusetts

Source Info: MassGIS USGS Quadrangle

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New Alignment

Existing Path Improvements

P Parking Lot

0 1,500 3,000 Feet

Engineers | Scientists | Planners | Designers
101 Walnut Street, PO Box 9151, Watertown, MA 02471

Figure 2 – Aerial Map

Cape Cod Rail Trail Extension
Barnstable & Yarmouth, Massachusetts

Source: Bing Maps

TOWN OF BARNSTABLE
COMMUNITY PRESERVATION ACT GRANT AGREEMENT

DRAFT

This Grant Agreement is made this ______ day of _______________, 2022, by and between the Town of Barnstable, through its Community Preservation Committee (hereinafter "Barnstable CPC" or "Grantor") with an address of 367 Main Street, Hyannis, MA 02601 and The Trustees of Reservations (hereinafter "the Trustees" or "Grantee") with an address of 200 High Street, Boston, MA 02110. The purpose of this Grant Agreement is to implement the following grant award:

Project Name: Accessible Paths and Children's Play Garden at Armstrong-Kelley Park

Project Description: Approved funding will be used towards two components of larger design improvements at the Armstrong-Kelley Park. The two components include the removal of existing non-ADA regulation boardwalks and the installation of accessible stone dust paths and the construction of a new, nature-based children's play area.

Project Location: Armstrong-Kelley Park, 675 Main Street, Osterville, MA, Map 141, Parcel, 038

This Grant Award is subject to the following terms and conditions:

1. Award. Subject to the terms of this Agreement, the Barnstable CPC agrees to award the Trustees the amount of two hundred and eighty-six thousand eight hundred and sixty-six dollars ($286,866) for the above referenced Project.

Comment [1]: Subject to approval by CPC at this time.

2. Project Application. The Project Application submitted to the Barnstable CPC, as amended by conditions of the CPC upon award, is incorporated into this Grant Agreement by reference.

3. Term. The purposes of this perpetual Recreation Restriction are to assure that the Premises, while permitting the acts and uses described in the Project Application attached herein, is to allow and maintain appropriate public access, and the insure property will be retained in perpetuity predominately in its natural, scenic and open condition; and require the maintenance of the pathways, signage and children's play area funded by this award.

   The term of this Grant Award for the construction of the project is 3 years from the date of the Town's execution of this Grant Agreement (the "Commencement Date"). All the work described in this Grant Agreement must be completed no later than 3 years after the Commencement Date, unless the Barnstable CPC grants an extension for good cause shown.

   Funds not utilized on the project must be returned to the Community Preservation Fund Reserve and will be made available for future appropriation to other recipients.

4. Recognition. The Trustees must acknowledge that Community Preservation funds were used as a funding source for the Project. This acknowledgement must appear in relevant print materials (e.g. press releases, brochures, advertisements, etc.) and referenced in presentations, interviews, and other commentary regarding the Project, as well as through signage as discussed in Section 5 herein.

5. Signage. The Trustees will include an acknowledgment of the use of Barnstable Community Preservation Act Funds for the Project in any permanent signage installed on-site once the Project is completed. Interpretive signage of the children's play area will invite active use.

6. Compliance with Laws and Agreement. The Trustees understands and agrees that projects funded through this Award are made pursuant to and must comply with the requirements of the Community Preservation Act, M.G.L. c. 44B. The Trustees also agree to comply with all requirements of this Grant Agreement.

7. Access. The Grantee shall allow the Grantor to access the Property to inspect the construction and to conduct observations of the progress of construction and implementation of the Project once complete. The Grantee shall also allow the Grantor's agents with notice to the Grantee access to the property annually to inspect the property to insure compliance with this agreement including the pathways, signage and children's play areas.

8. P ermits and Licenses. It is the obligation of the Trustees to obtain all permits and licenses necessary for the implementation of the project. No local permit or license is waived by the award of this Grant.
   The applicant is responsible for obtaining any and all necessary property and liability insurance, as applicable, to protect the project and the Town of Barnstable.

   During construction of the project the Trustees/Grantee shall file monthly reports of progress with the Grantor.

9. No Liability of Town. By making this award, the Town does not accept any liability whatsoever for any acts, omissions, or errors associated with the project. The Trustees agree to indemnify and defend the Town from all claims, suits or demands resulting from implementation of the project through the construction of the project and thereafter. This provision shall survive the expiration or termination of this Agreement.

10. No Assignment. This Grant Agreement may not be assigned by the Trustees without prior written agreement by the Barnstable CPC and Barnstable Town Council

11. Termination. In the event the Trustees fails to fulfill all obligations for the construction of the approved items in the Project Application under the terms of this Grant Agreement as determined by the Barnstable CPC, the Barnstable CPC shall have the right, in its sole discretion, to terminate that portion of this Grant Agreement upon written notice to the Trustees. Upon

receipt of said notice, the Trustees shall cease to incur additional expenses in connection with this Grant Agreement.

12. Entire Agreement. This Grant Agreement constitutes the entire agreement between the parties hereto and may be amended only in writing executed by both the Barnstable CPC and the Trustees with the approval of the Barnstable Town Council.

    Signatory below acknowledges and avers that they have the authority to execute this Grant Agreement on behalf of the Trustees.

Executed as of the date set forth above:

The Town of Barnstable,	The Trustees of Reservations,
___________________________	______________________________
____________________________	______________________________

Community Preservation Coalition
Preserving our past. Building our future.

6 Beacon Street, Suite 615
Boston, MA 02108
617-367-8998

January 4, 2023

Community Preservation Committee
Town of Barnstable
Barnstable Town Hall
367 Main St., Hyannis
Barnstable, MA 02601

Community Preservation Coalition Dues Notice

Annual membership dues.................. $7900.00

Please make checks payable to: Community Preservation Coalition

Please remit to our address:

Community Preservation Coalition
Attn: Stuart Saginor
6 Beacon Street, Suite 615
Boston, MA 02108

Contact the Community Preservation Coalition with any questions at 617-367-8998.

Form **W-9**
(Rev. August 2013)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See Specific Instructions on page 2.

Name (as shown on your income tax return)
The Trust for Public Land Action Fund

Business name/disregarded entity name, if different from above
Community Preservation Coalition, a program of The Conservation Campaign

Check appropriate box for federal tax classification:
☐ Individual/sole proprietor ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ ________

☑ Other (see instructions) ▶ 501 (C)(4) nonprofit organization

Exemptions (see instructions):
Exempt payee code (if any) ________
Exemption from FATCA reporting code (if any) ________

Address (number, street, and apt. or suite no.)
6 Beacon Street, Suite 615

Requester's name and address (optional)

City, state, and ZIP code
Boston, MA 02108

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Social security number
☐☐☐ – ☐☐ – ☐☐☐☐

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Employer identification number
0 4 – 3 5 1 5 3 4 1

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below), and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here **Signature of U.S. person ▶** Stuart Sager **Date ▶** 1-27-2021

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. The IRS has created a page on IRS.gov for information about Form W-9, at *www.irs.gov/w9*. Information about any future developments affecting Form W-9 (such as legislation enacted after we release it) will be posted on that page.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, payments made to you in settlement of payment card and third party network transactions, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and

4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct.

Note. If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.