

STATE OF VERMONT

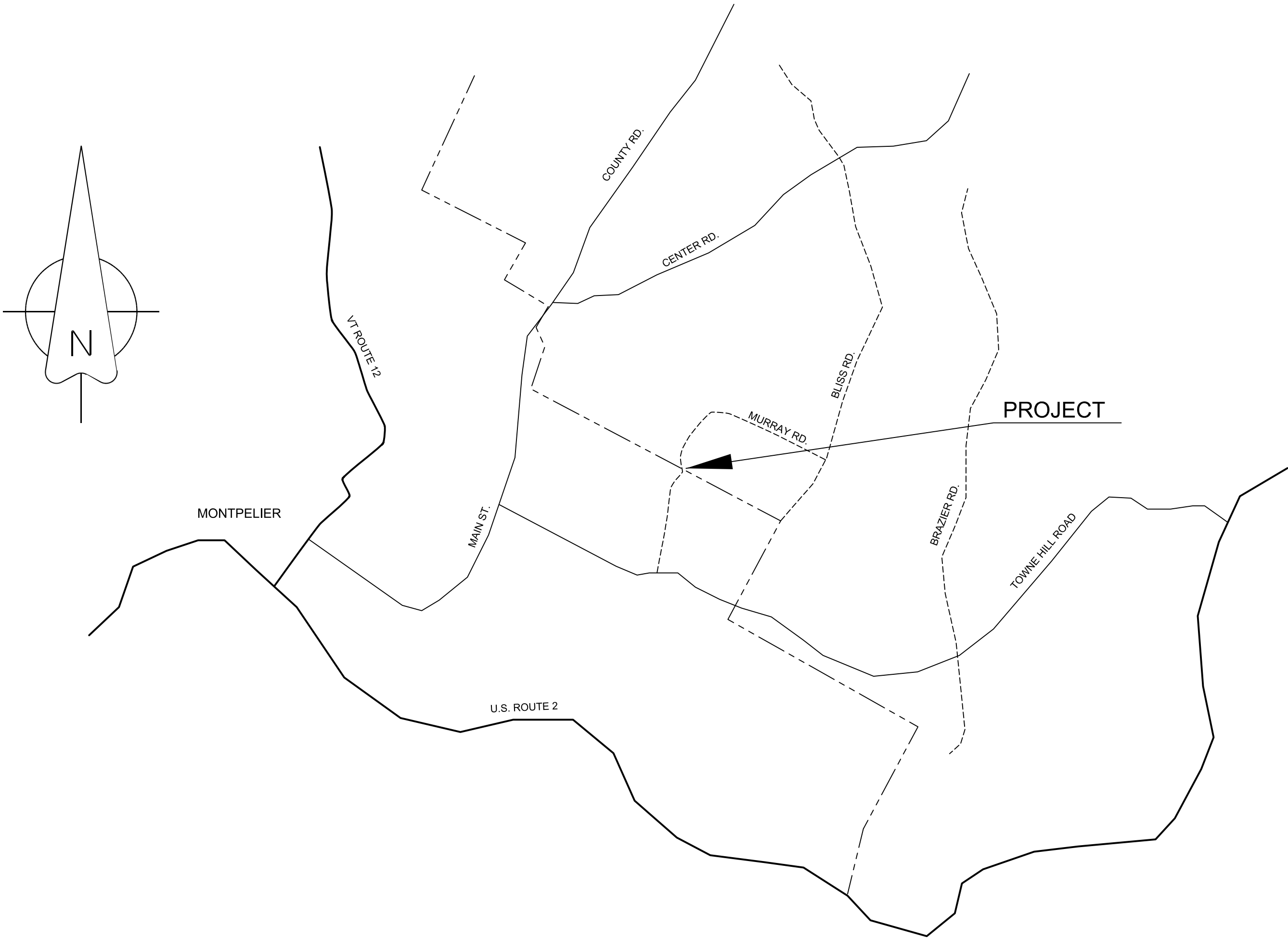
WASHINGTON COUNTY

TOWN OF EAST MONTPELIER

T.H. 47, Murray Road - Culvert Replacement & Upgrade

TH Structures Grant Program

FY 2016, Project BC-1701



Project plans prepared through joint efforts of the following:

Newton Technical Services, LLC
728 South Barre Road
Barre, VT 05641
(802) 476-6900

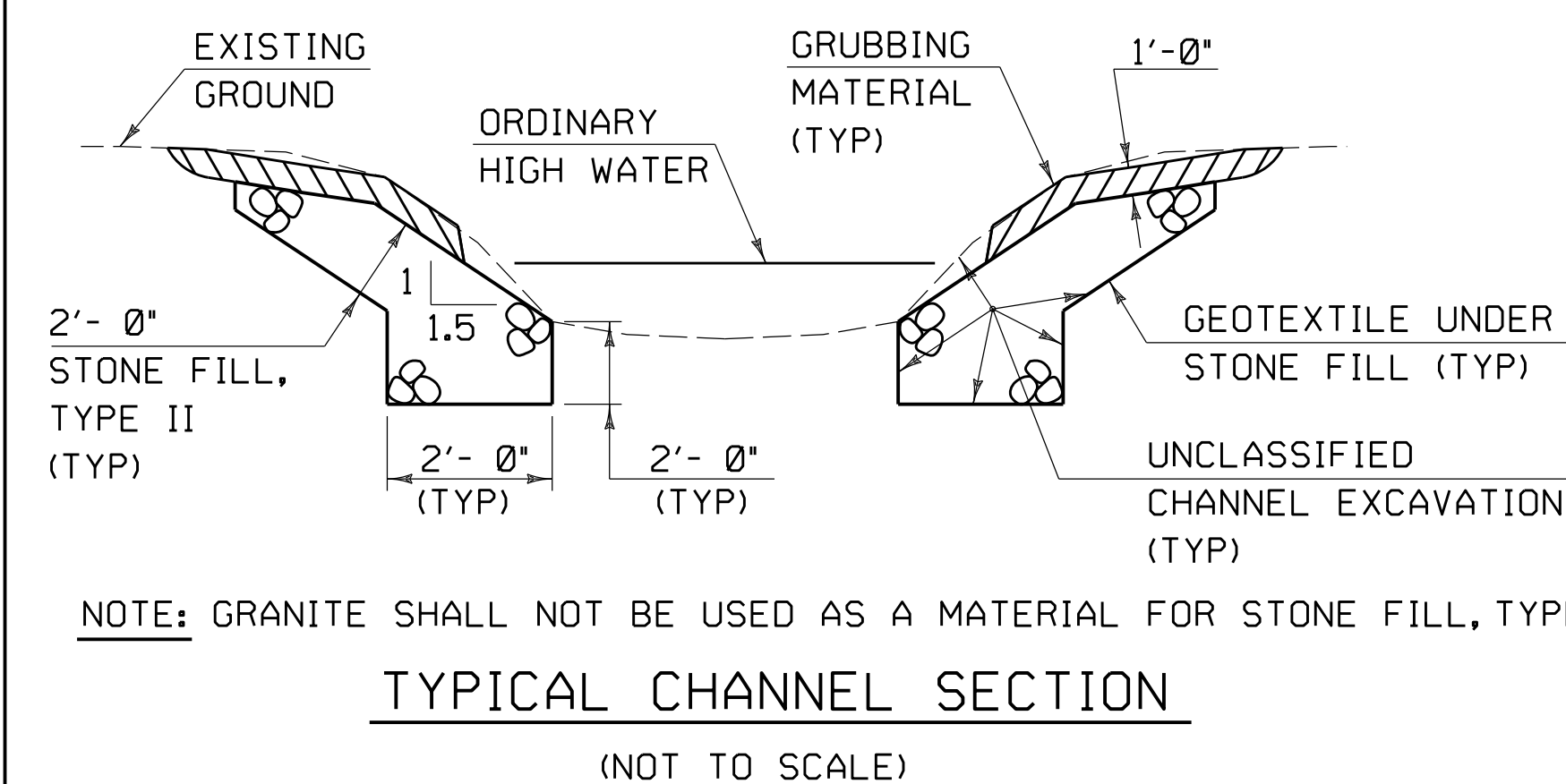
Contech Engineered Solutions LLC
9025 Centre Pointe Drive
West Chester, OH 45069

Chase & Chase Surveyors & Septic Designers, Inc.
301 North Main St., Suite 301
Barre, VT 05641
(802) 479-9636

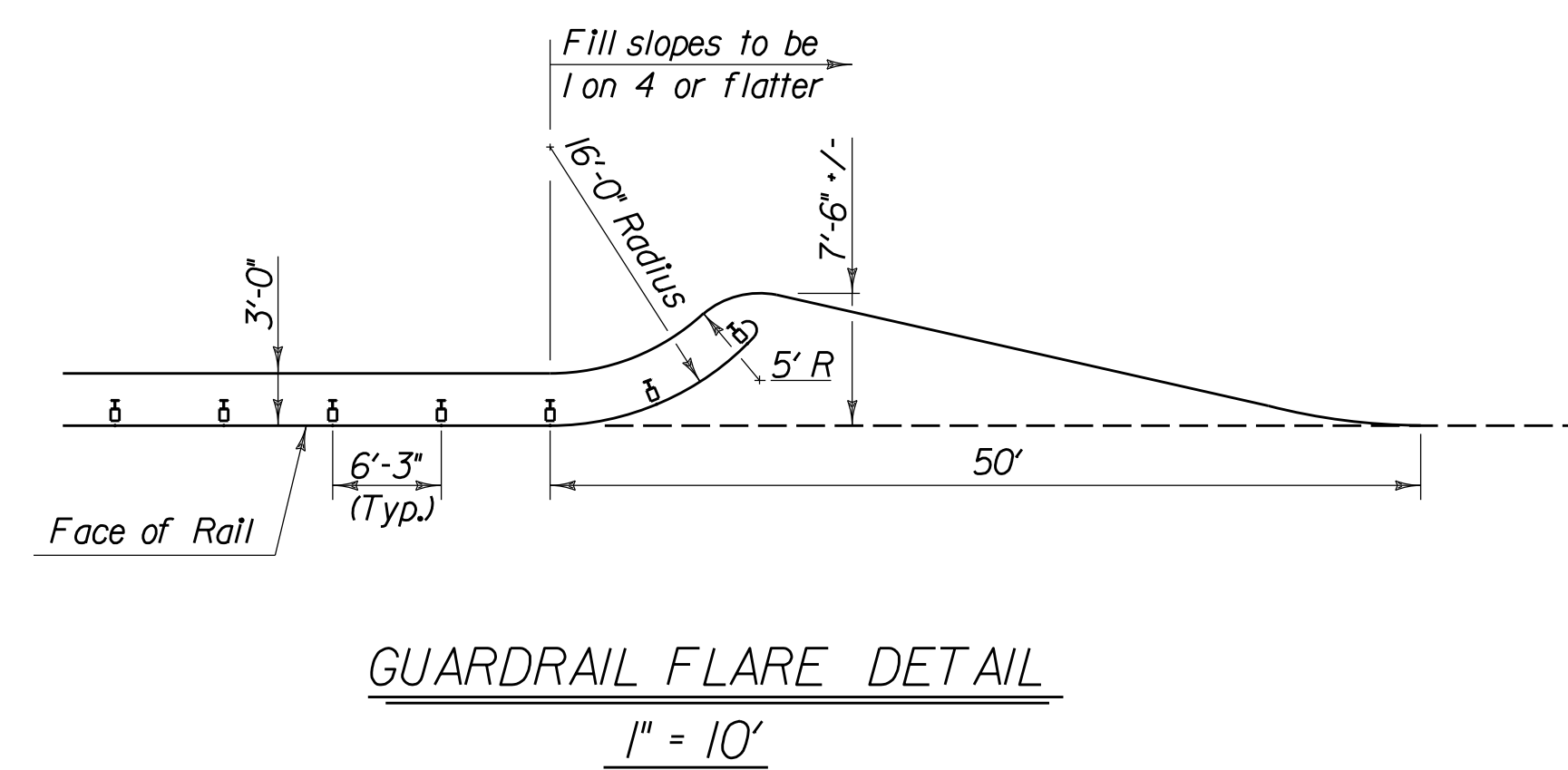
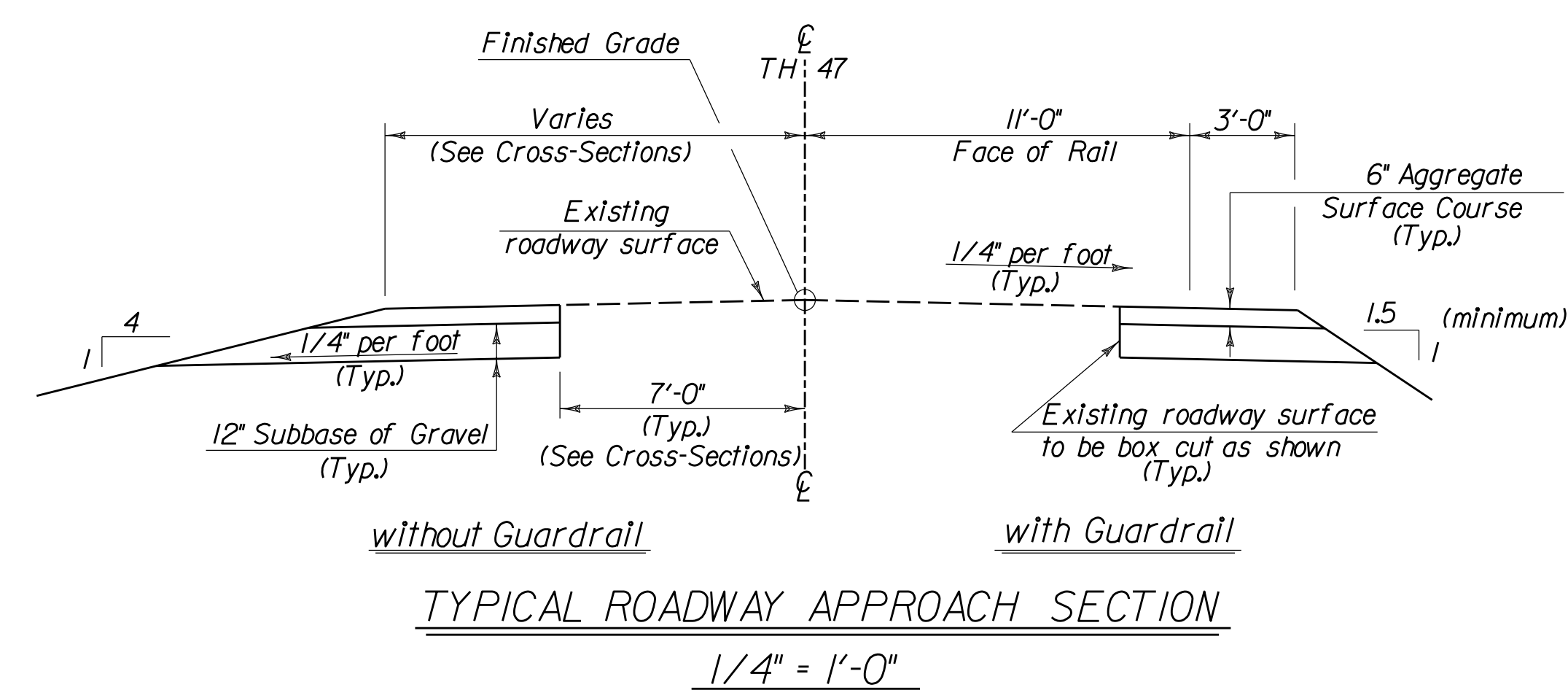
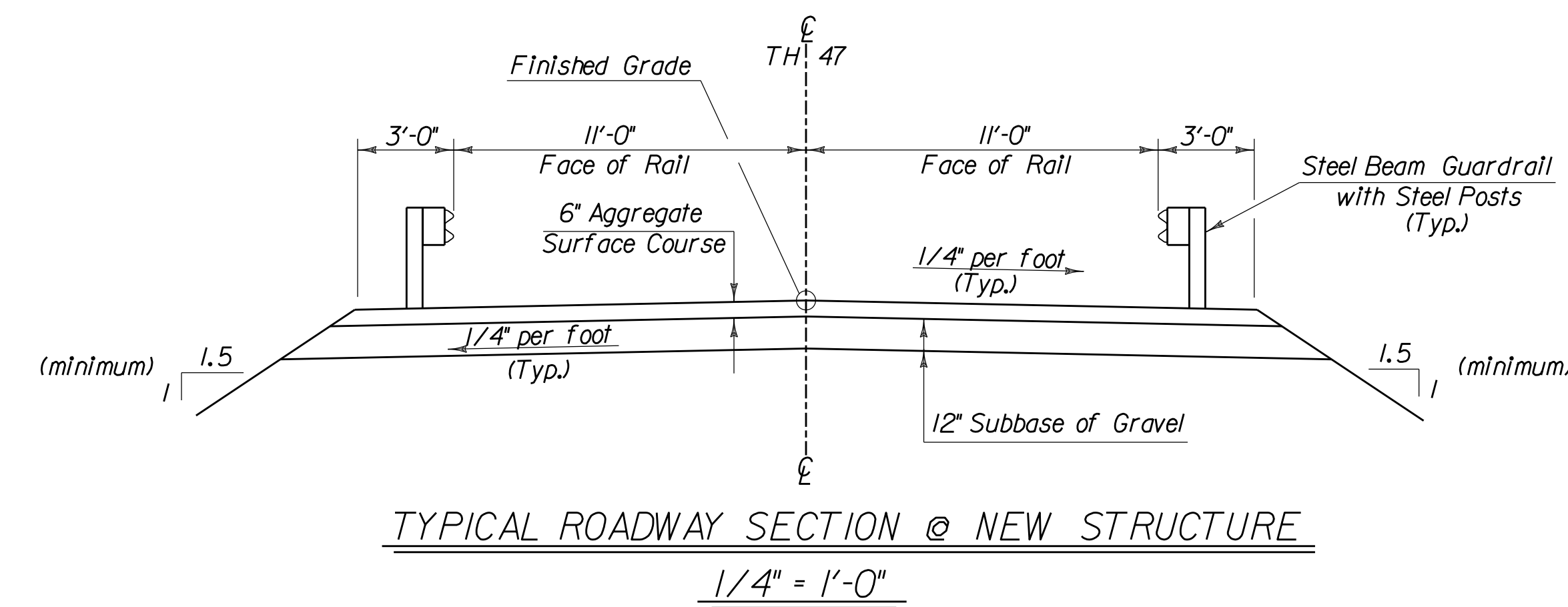
Index to Sheets

Sheet #	Title
1	Cover
2	Quantity Sheet, Typical Sections & Misc. Details
3	General Notes
4	Plan Sheet
5	Profile Sheet
6	Typ. Pipe Arch Section, Excavation & Backfill Details, Schematic Diagram & Timber Baffle Details
7 - 8	Culvert Manufacturer Details
9	Road & Stream Cross - Sections
10	Standards

	ESTIMATED QUANTITIES		
Item No.	Item Name	Unit	Total
201.10	Clearing and Grubbing Including Individual Trees and Stumps	LUMP SUM	1
203.15	Common Excavation	CY	115
203.27	Unclassified Channel Excavation	CY	25
204.25	Structure Excavation	CY	240
204.30	Granular Backfill for Structures	CY	230
301.15	Subbase of Gravel	CY	145
401.10	Aggregate Surface Course	CY	65
529.15	Removal of Structure	EACH	1
608.25	All Purpose Excavator Rental, Type I	HOURS	6
613.11	Stone Fill, Type II	CY	25
621.20	Steel Beam Guardrail, Galvanized	LF	283
621.206	Steel Beam Guardrail, Galvanized/Nested	LF	12.5
621.60	Anchor for Steel Beam Rail	EACH	4
621.80	Removal and Disposal of Guardrail	LF	145
635.11	Mobilization/Demobilization	LUMP SUM	1
641.10	Traffic Control	LUMP SUM	1
649.11	Geotextile for Roadbed Separator (for use under bed for new structure)	SY	89
649.31	Geotextile under Stone Fill	SY	48
651.40	Grubbing Material	SY	30
	Erosion Prevention and Sediment Control	LUMP SUM	1
	Temporary Stream Diversion	LUMP SUM	1
	Streambed Stone Fill, Type E2	CY	31
	10'-9" x 6'-10" x 46'-6" Aluminum Plate Pipe Arch * (See note below)	—————	—————
	Assembly of New Structure (includes furnishing/shaping timber baffles)	LUMP SUM	1
	Installation of New Structure	LUMP SUM	1
	Turf Establishment (Seed, Fertilizer, Mulch, etc.)	LUMP SUM	1



SEEDING FORMULA				
% WT.	LBS./A.	NAME	PUR %	GERM %
37.5	22.5	CREEPING RED FESCUE	98	85
37.5	22.5	TALL FESCUE	95	90
5.0	3.0	RED TOP	95	90
15.0	9.0	BIRDSFOOT TREFOIL	98	85
5.0	3.0	ANNUAL RYEGRASS	95	85
100.0	60.0			



NO.		REVISIONS		BY	DATE	DES DWN June 2016	SCALE As Noted	Town of East Montpelier Murray Road – T.H. 47 TH Structures Grant Program FY 2016, Project BC - 1701	Quantity Sheet, Typical Sections and Miscellaneous Details	Newton Technical Services, LLC 728 South Barre Road Barre, VT 05641 (802) 476-6900	Chase & Chase Surveyors & Septic Designers, Inc. 301 North Main St., Suite 301 Barre, VT 05641 (802) 479-9636	SHEET 2 OF 10

GENERAL NOTES

1. All work shall be carried out in accordance with the Vermont Agency of Transportation Standard Specifications for Construction dated 2011 and approved by the Federal Highway Administration on July 20, 2011, including all subsequent revisions and revised specifications.
2. Any work done shall also comply with the latest version of the State of Vermont Standards for Town Highway Maintenance and Grading Guidelines and any other highway-related policies and guidelines as adopted by the Town of East Montpelier.
3. The Contractor is responsible for contacting Dig-Safe and locating any underground utilities prior to any work being done.
4. The Contractor is advised that all in-stream work shall be accomplished between the dates of July 1 and October 1, 2017 as stated in the permit issued September 1, 2016 by the Vermont Agency of Natural Resources, Department of Environmental Conservation.
5. Town Highway 47 will be closed to traffic during the project; the road can be closed for a period of time not exceeding twenty-one (21) calendar days. The Town will notify all parties involved, i.e. residents, school system, emergency services, the adjacent municipality, etc. prior to the actual closing of the road. The Town will also notify those involved when the project is completed and the road can be reopened to traffic.
6. The Contractor shall furnish, erect and maintain the required signs and barricades to inform the public that the road is closed to traffic during construction and to direct traffic accordingly. Signs that may be appropriate to use include "ROAD WORK AHEAD", and "ROAD CLOSED".
7. All signs and/or barricades, etc. that are used shall be in compliance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). If any signs are to be mounted on posts, the Contractor is responsible for contacting Dig-Safe and locating any underground utilities prior to installing any posts. All costs associated with this work shall be subsidiary to the Item, Traffic Control.
8. In an effort to prevent erosion and to control sediment, the Contractor is required to provide all necessary temporary erosion control measures. Any silt fence installed by the Contractor will be removed by the Town once the project has stabilized. The costs associated with providing all erosion prevention and sediment control measures shall be included in the Item, Erosion Prevention and Sediment Control.
9. The cost of cutting and removing any trees, stumps, brush or other material that is within the project limits shall be covered under the Item, Clearing and Grubbing, including individual trees and stumps. If so desired, any trees removed that are suitable for firewood shall be cut into reasonable lengths, piled and left on the project for the respective landowner; otherwise all such material shall become the property of the Contractor and removed from the project.
10. No borings have been taken nor have any test holes been done at this site.
11. The existing 48" reinforced concrete culvert will become the property of the Contractor and either be removed from the site or properly disposed of.
12. The Contractor is responsible for providing any temporary diversion of the stream that is required and, for maintaining that diversion until no longer needed. The Contractor is also responsible for ensuring that all in-stream work is accomplished within the timeframe outlined in the Stream Alteration Permit and in a de-watered channel, i.e. "in the dry". Performing that work may result in using either a temporary channel, a bypass culvert, sandbags, a cofferdam system and pumps or a combination of each. Despite which method or combination of methods that are used, the cost of this work shall fall under the Item, Temporary Stream Diversion and all work shall comply with the Agency of Natural Resources, Department of Environmental Conservation General Permit issued for the project.
13. The Town will purchase the new aluminum pipe arch, headwalls, wingwalls and the balance of the components and have them delivered to the project. The Contractor is responsible for unloading and storage of the material on the project.
14. The new pipe arch, headwalls, and wingwalls are shipped as a series of straight and curved plates; all plates are corrugated and a set of approved shop drawings showing how the components are assembled comes with the material. All components, including wale beams, baffles, anchors and anchor rods will need to be assembled and the Contractor is required to submit a price for assembling all the components involved. In addition, the Contractor will furnish seven, 4" x 12" x 10'-0" pieces of hemlock that will be used as timber baffles in the structure. The Supplier will furnish pieces of structural aluminum and all necessary hardware to attach the baffles to the invert of the structure. The Contractor will be required to trim and shape the baffles as necessary, field drill the invert (if necessary) and the baffles, supply the galvanized lag bolts and washers to attach the baffles to the support brackets, and then bolt all material in place. All of this work will fall under the Item, Assembly of New Structure and shall also include any other necessary field drilling and/or fabrication, etc. that is required. The Supplier will also submit a price for assembly, and the Town will decide whether they want the Contractor or the Supplier to assemble the components.
15. The bed for the new structure shall be undercut 1'-0" as shown on the plans; geotextile fabric meeting the requirements of Item 649.11 Geotextile for Roadbed Separator shall be placed on that excavated surface and the area backfilled and compacted with material meeting the requirements of Item 204.30, Granular Backfill for Structures.
16. If the new structure is not assembled in place, the Contractor shall be responsible for furnishing the necessary equipment and rigging capable of safely and adequately lifting and setting all of the components to the line and grade shown on the plans. All costs associated with this work shall be included in the Item, Installation of New Structure.
17. Once the new structure is installed and the baffles are in place, but prior to having the entire roof section bolted in place, the Contractor is required to fill the invert to a depth of 2'-0" with material meeting the requirements of Streambed Stone Fill, Type E2 as required by ANR's River Management Engineer. The material specifications for that material are included in the plans and a quantity of that material is included in the project's quantities. Care shall be taken not to damage either the new structure or the baffles during the process.
18. Once installed in place, and if necessary and/or required by the Town, the Contractor shall be responsible for trimming the height of the aluminum headwall and/or wingwall panels to an elevation that fits the finished project; this work shall be accomplished prior to the caps being installed on either the headwall or wingwall panels. If the Contractor is selected to do the assembly work, this work shall also fall under the Item, Assembly of New Structure; otherwise it will be considered subsidiary to all other items on the project.
19. The new structure shall be backfilled and compacted per VT Agency of Transportation Specification 601.08. Lifts of backfill material shall be brought up evenly and compacted on both sides of the box culvert; at no time shall the depth of the backfill on one side of the box culvert be any higher than 2 feet than the lift on the other side. Material used for backfilling shall be clean, free-draining granular material meeting the VT AOT Material Specification 704.08.
20. The new structure shall have a minimum of 4' of cover over the top of it prior to any construction equipment being allowed to cross over the structure.
21. Stone Fill, Type II shall be used to protect any disturbed channel banks or roadway slopes at the inlet and outlet of the new structure. NOTE: Granite shall not be used as a material for Stone Fill, Type II. Stone Fill shall be placed on Geotextile Fabric for Stone Fill and shall be placed up to a height of at least one foot above the top of the opening but it shall not constrict the channel, or the opening of the structure.
22. All excess, suitable material from the excavation shall be used to construct the fill slopes on the project. Newly constructed fill slopes shall be as shown on the plans and have a minimum slope of 1 on 1 1/2 (1 vertical to 1 1/2 horizontal) unless shown otherwise. If there is any excess material remaining, it shall first be offered to the town; if they don't want it, it shall become the property of the Contractor and be disposed of in an approved manner.
23. The Contractor shall remove the existing guardrail and it shall remain the property of the Town of East Montpelier.
24. The Contractor shall take all necessary precautions to avoid the spreading of any invasive species (Japanese knotweed, buckthorn, etc.) found on the project, or in any material removed from the jobsite.

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				DRAW KKJ	June 2016	As Noted	General Notes			
				CHECK DWN						
				APPRO						

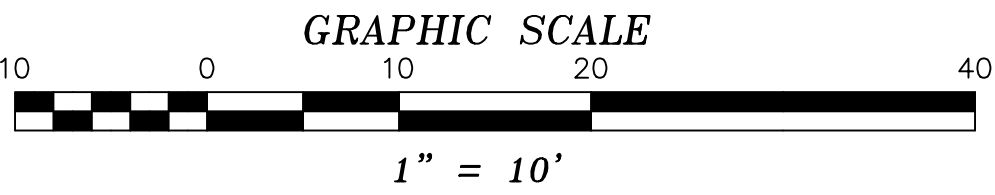
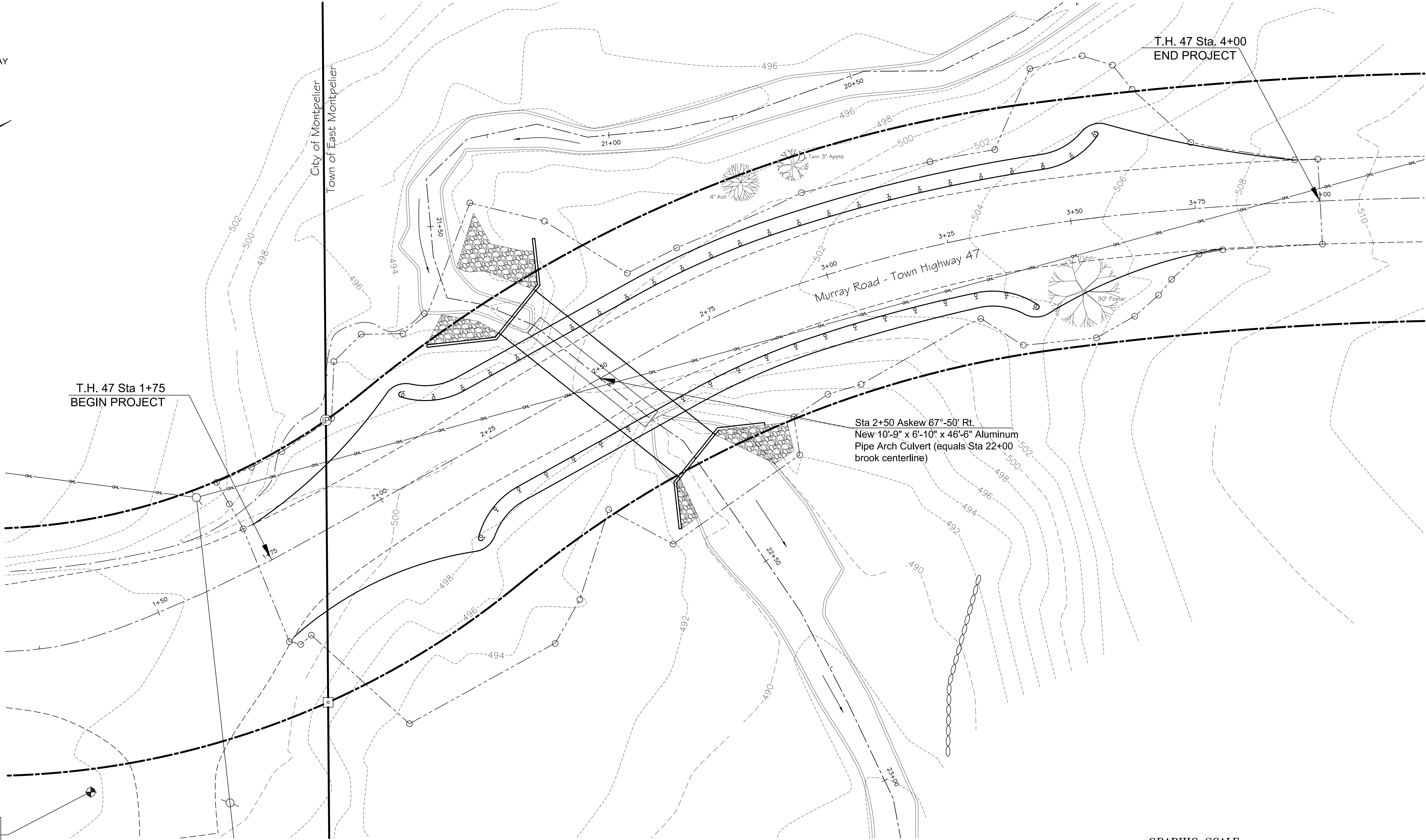
- LEGEND:
- ROAD RIGHT OF WAY LINE
 - APPROX. PROPERTY LINE
 - EDGE OF GRAVEL
 - IRON PIPE FOUND (DIA. , HT.)
 - GRANITE BOUND FOUND
 - UTILITY POLE
 - EXISTING 2-FOOT CONTOUR
 - EXISTING 10' CONTOUR
 - LIMITS OF WORK IN CUT
 - LIMITS OF WORK IN FILL
 - EDGE OF FINISHED ROADWAY

Item 621.20 Steel Beam Guardrail, Galvanized
LT. RT.
Sta 2+14.5 - Sta 2+37.5 Sta 2+14.5 - Sta 3+40.3
Sta 2+50 - Sta 3+57

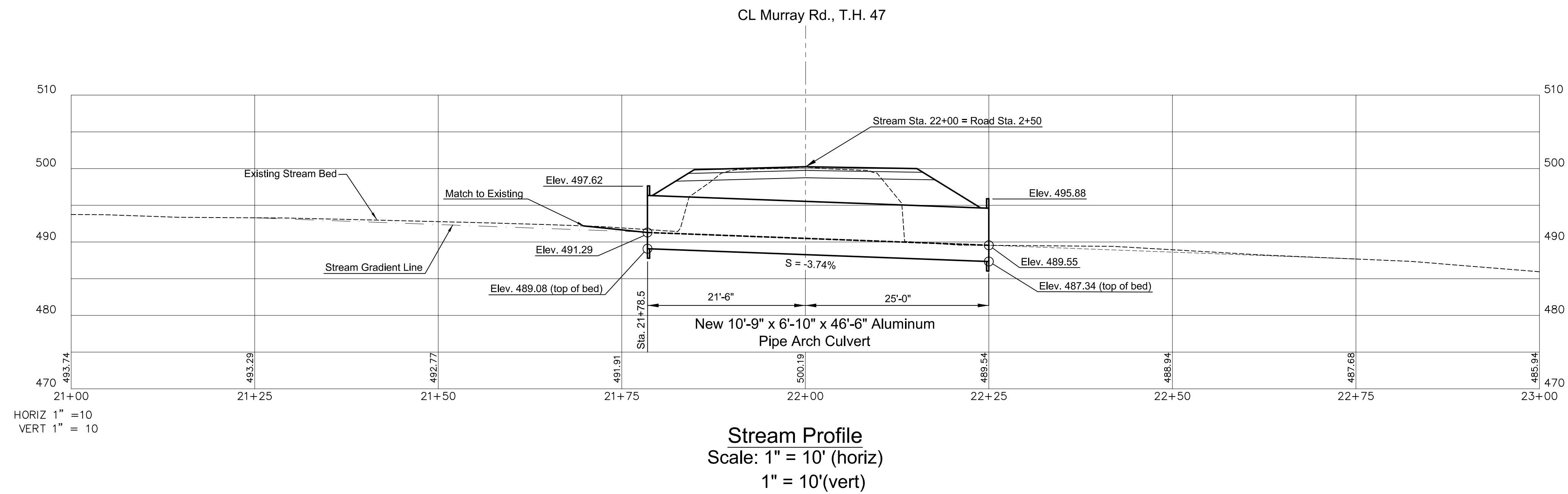
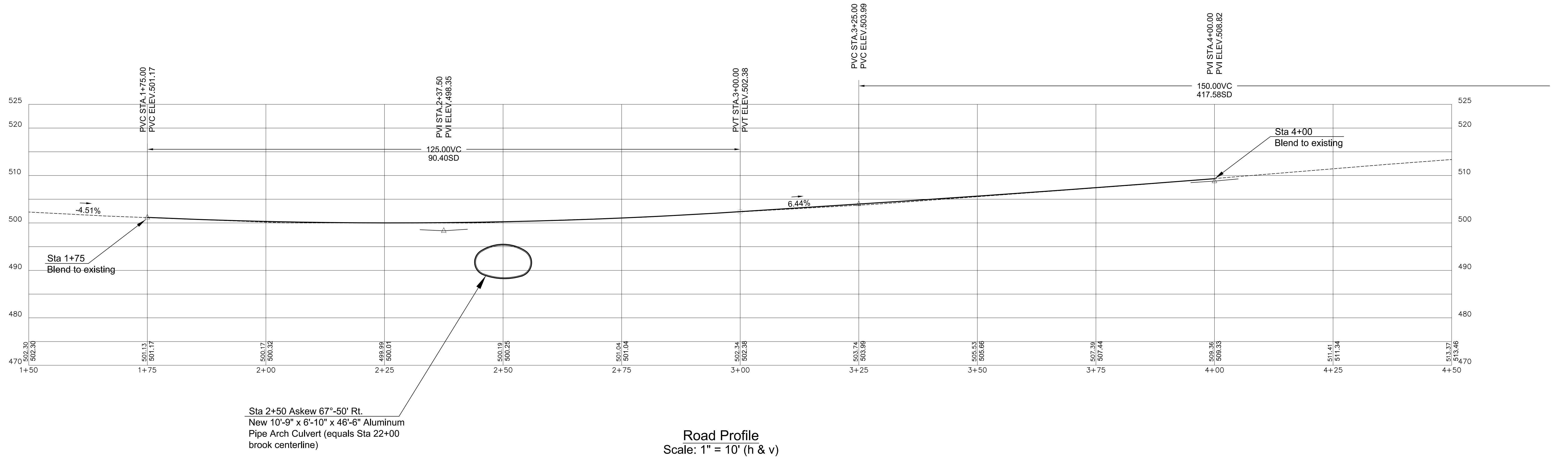
Item 621.206 Steel Beam Guardrail, Galvanized/Nested
LT. RT.
Sta 2+37.5 - Sta 2+50

Remove 30" Poplar
RT.
Sta. 3+51

Item 621.60 Anchor for Steel Beam Guardrail
LT. RT.
Sta. 2+20 Sta. 2+20
Sta. 3+51 Sta. 3+33.3

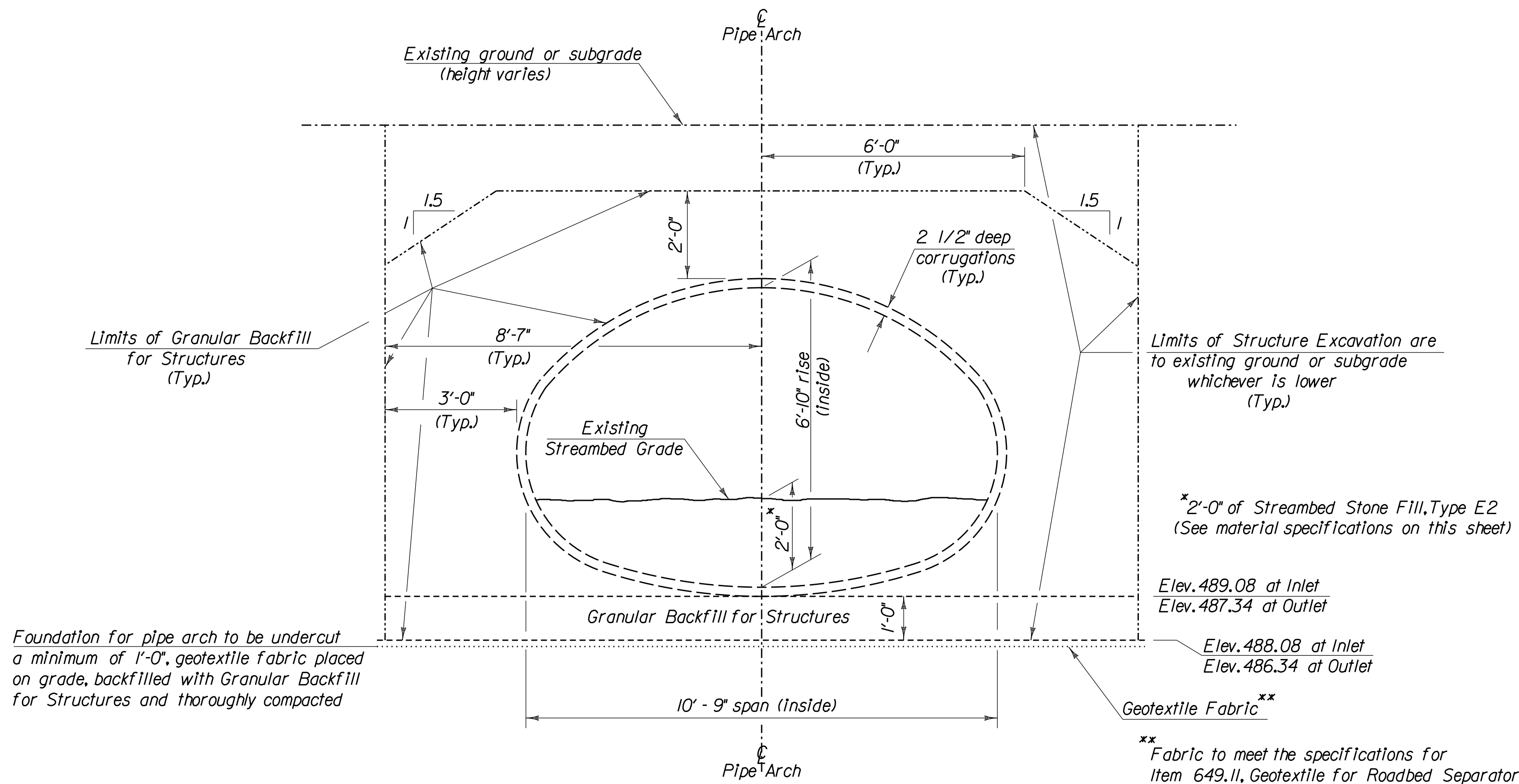


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				DWN	02/28/17	1" = 10'					
				KKJ							
				DWN							
				APPD							



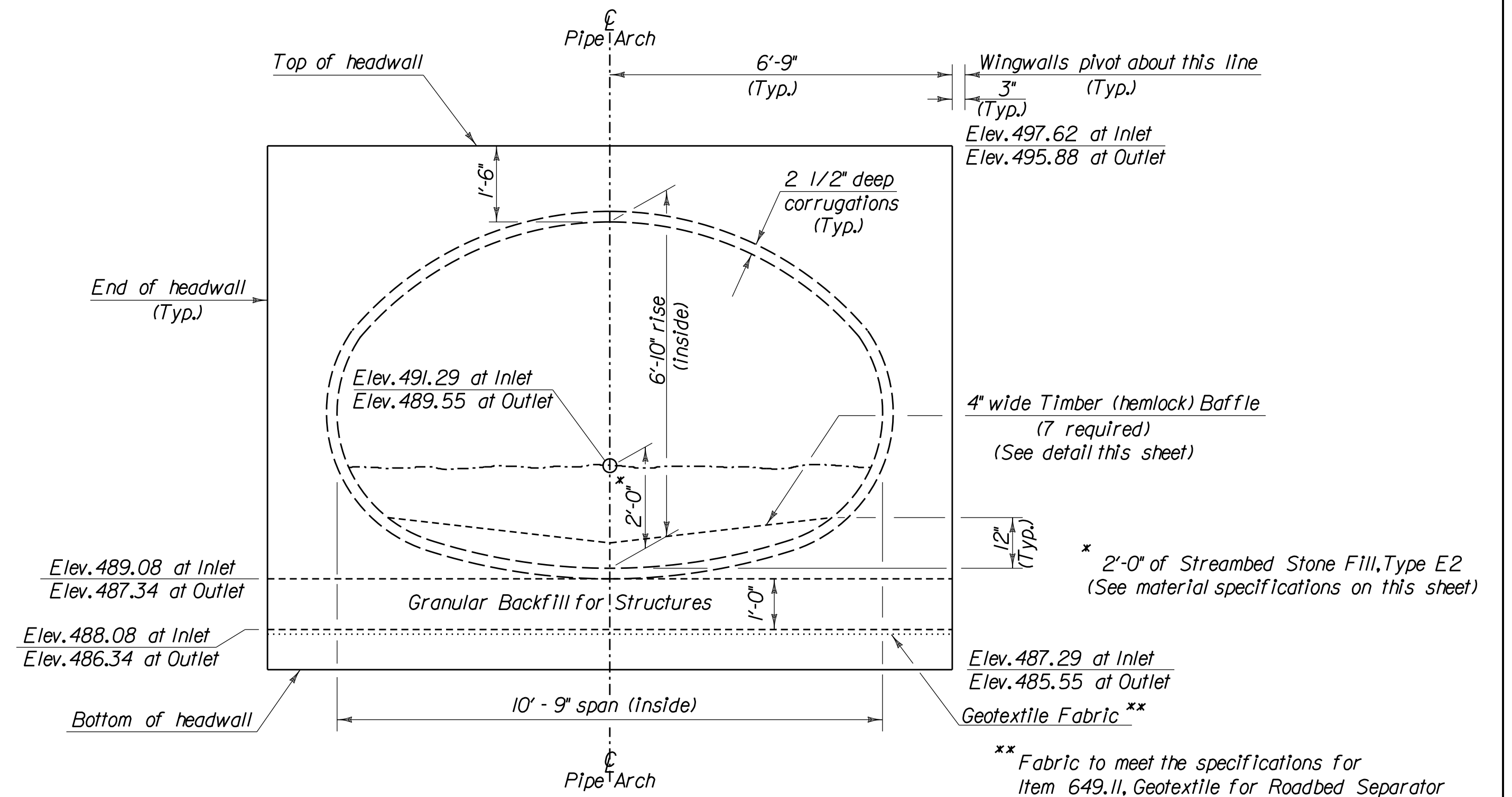
HORIZ 1" = 20'
VERT 1" = 20'

NO.				REVISIONS				BY	DATE	DES	DWN	DATE 02/28/17	SCALE As noted	Town of East Montpelier Murray Road - T.H. 47 TH Structures Grant Program FY 2016, Project BC-1701	Profile Sheet	Newton Technical Services, LLC 728 South Barre Road Barre, VT 05641 (802) 476-6900	Chase & Chase Surveyors & Septic Designers, Inc. 301 North Main St., Suite 301 Barre, VT 05641 (802) 479-9636	SHEET 5 OF 10
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								CHK	DWN									
								APPD										



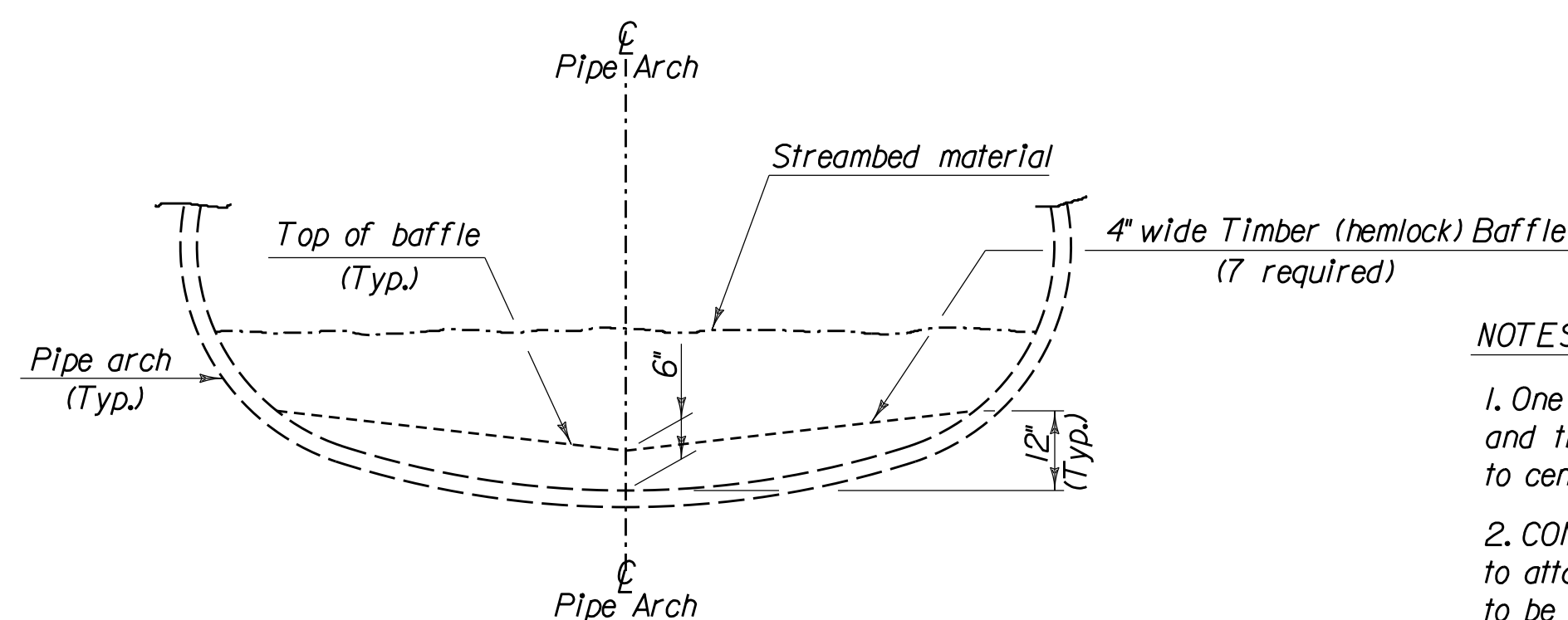
LIMITS OF EXCAVATION and BACKFILL for PIPE ARCH

1/2" = 1'-0"



INSTALLATION DETAILS AND ELEVATIONS

1/2" = 1'-0"

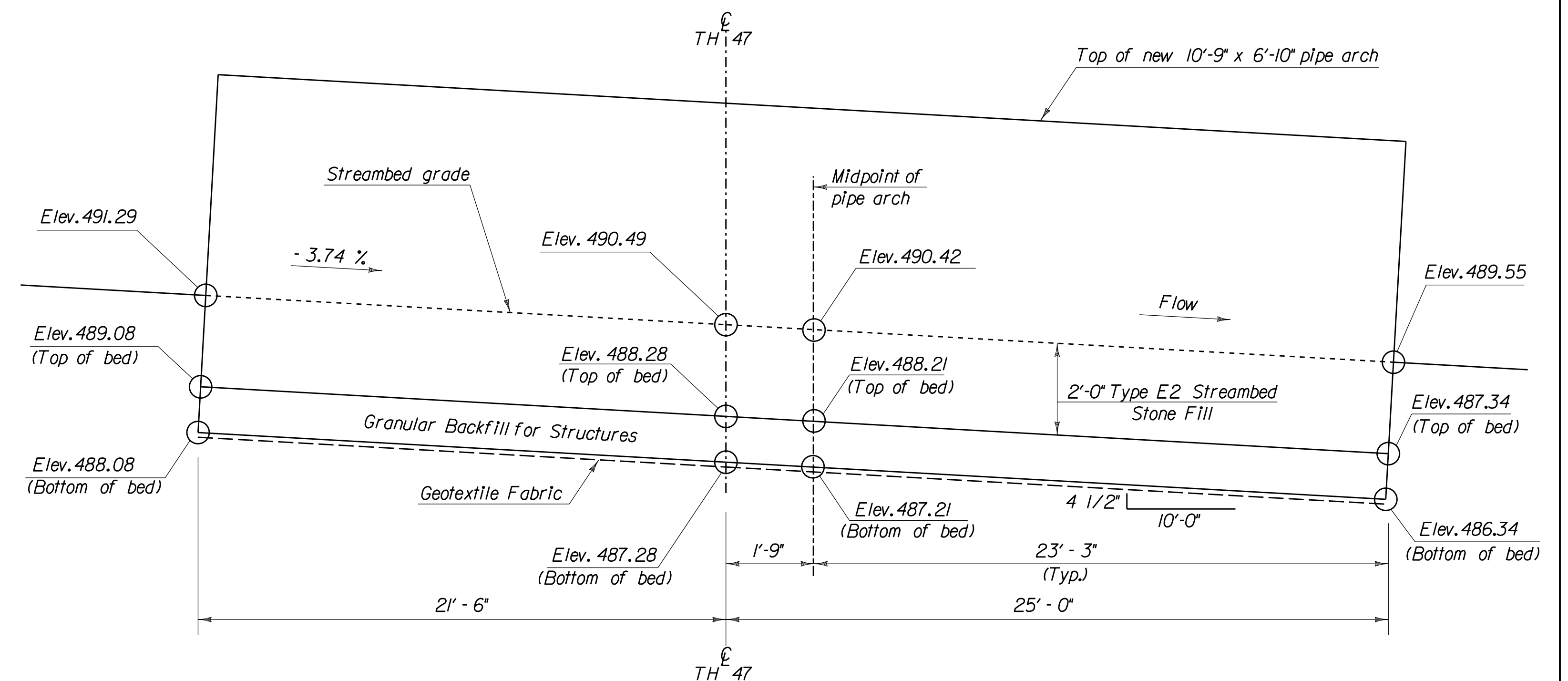


TIMBER BAFFLE DETAILS

1/2" = 1'-0"

NOTES:

1. One baffle to be placed at each end of the structure, and the other 5 to be placed no more than 8' center to center along the invert of the pipe arch
2. CONTECH to furnish brackets and all hardware to attach baffles to the invert of the pipe arch. Brackets to be installed on the downstream side of the baffle.
3. Contractor to furnish timber baffles and hardware to attach them to the brackets; the baffles, all work involved in shaping the baffles, any field drilling required, and installation of the baffles shall be included under the item, Assembly of New Structure.
4. Specifications for Type E2 Streambed Stone Fill: The longest dimension of the stone shall be at least 24 inches, and at least 50 percent of the volume of the stone in place shall have a least dimension of 18 inches, and at least 25 percent of the particles shall have a maximum dimension of 2 inches and be well-graded material.

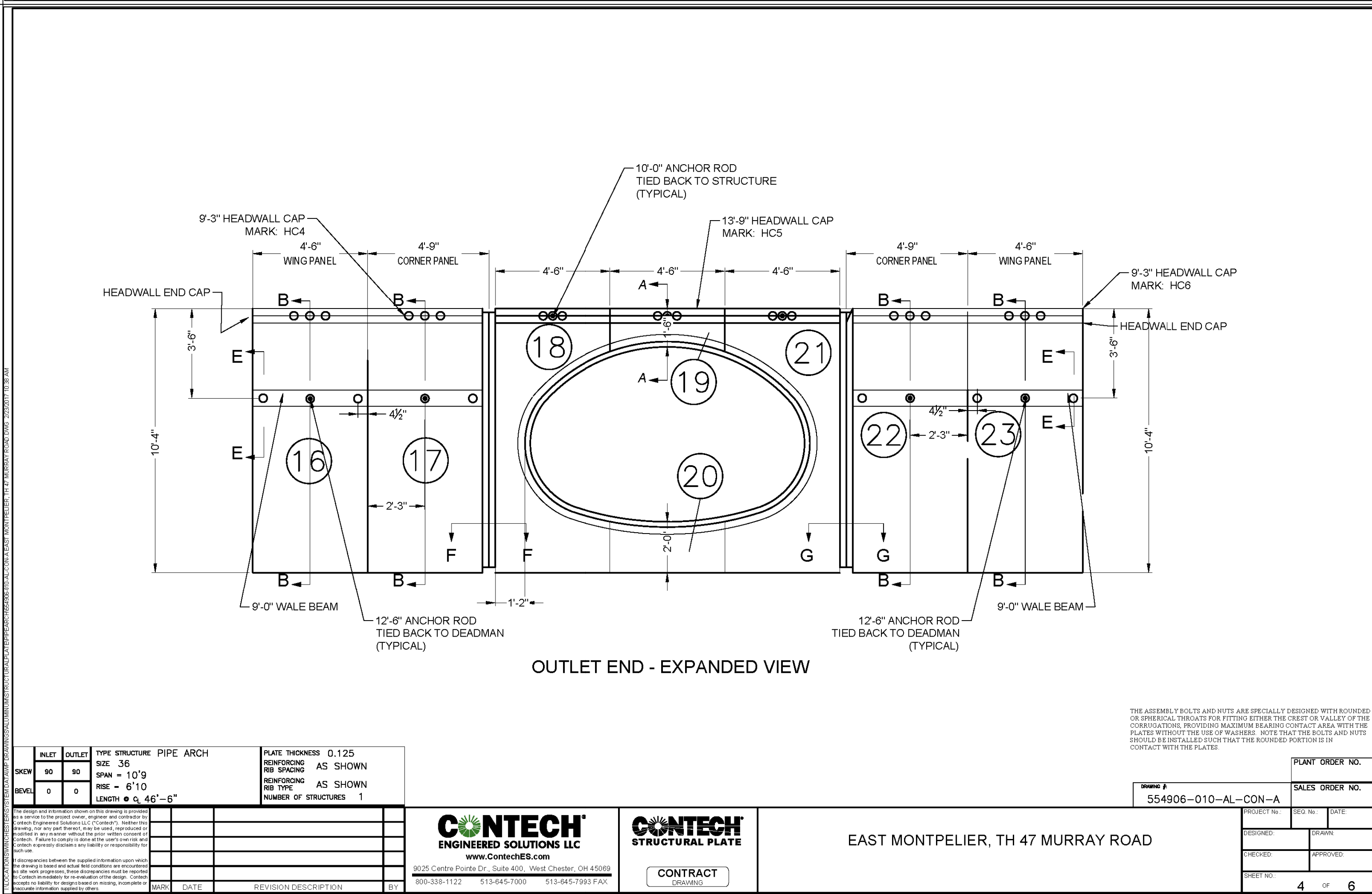
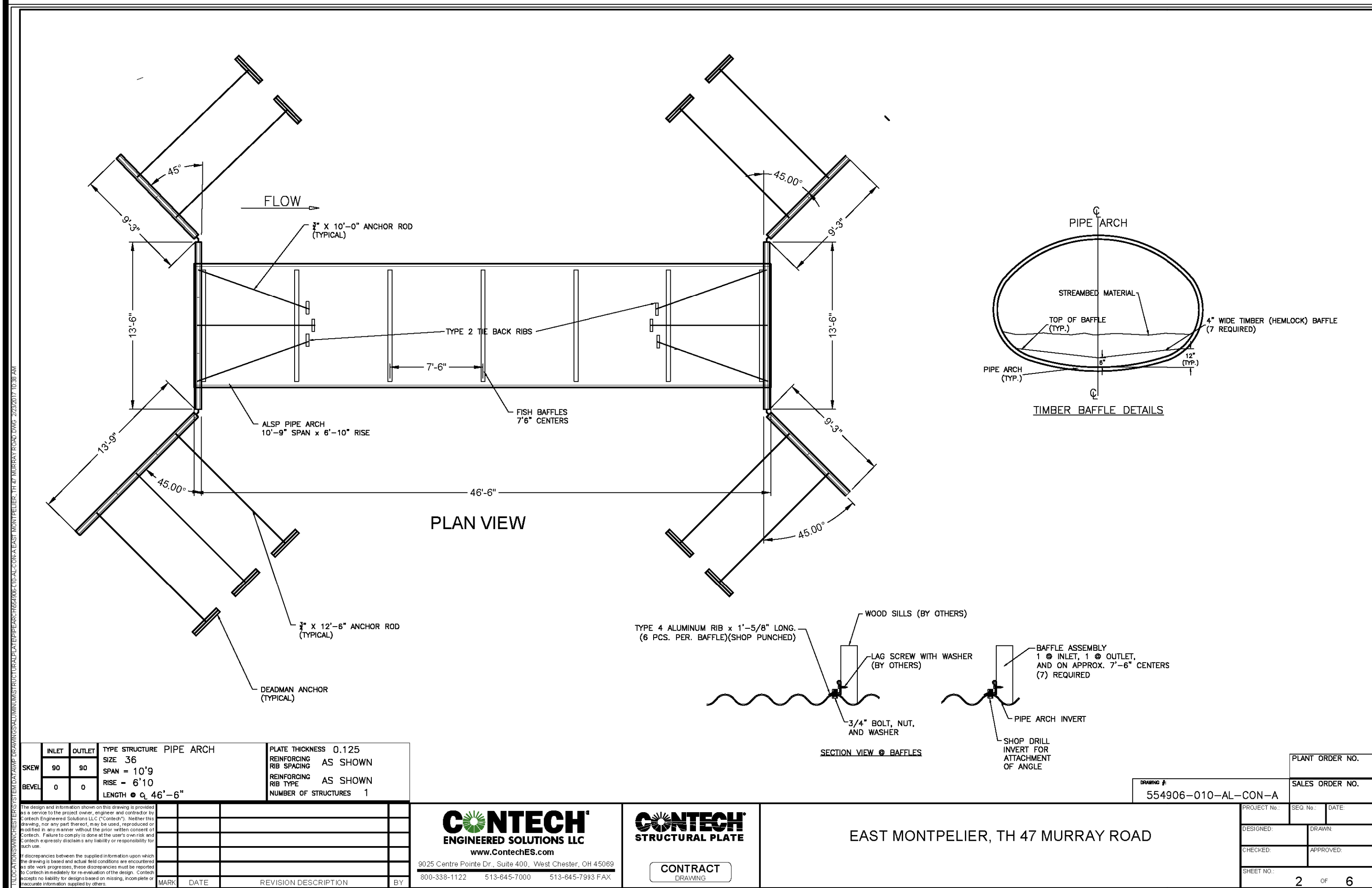
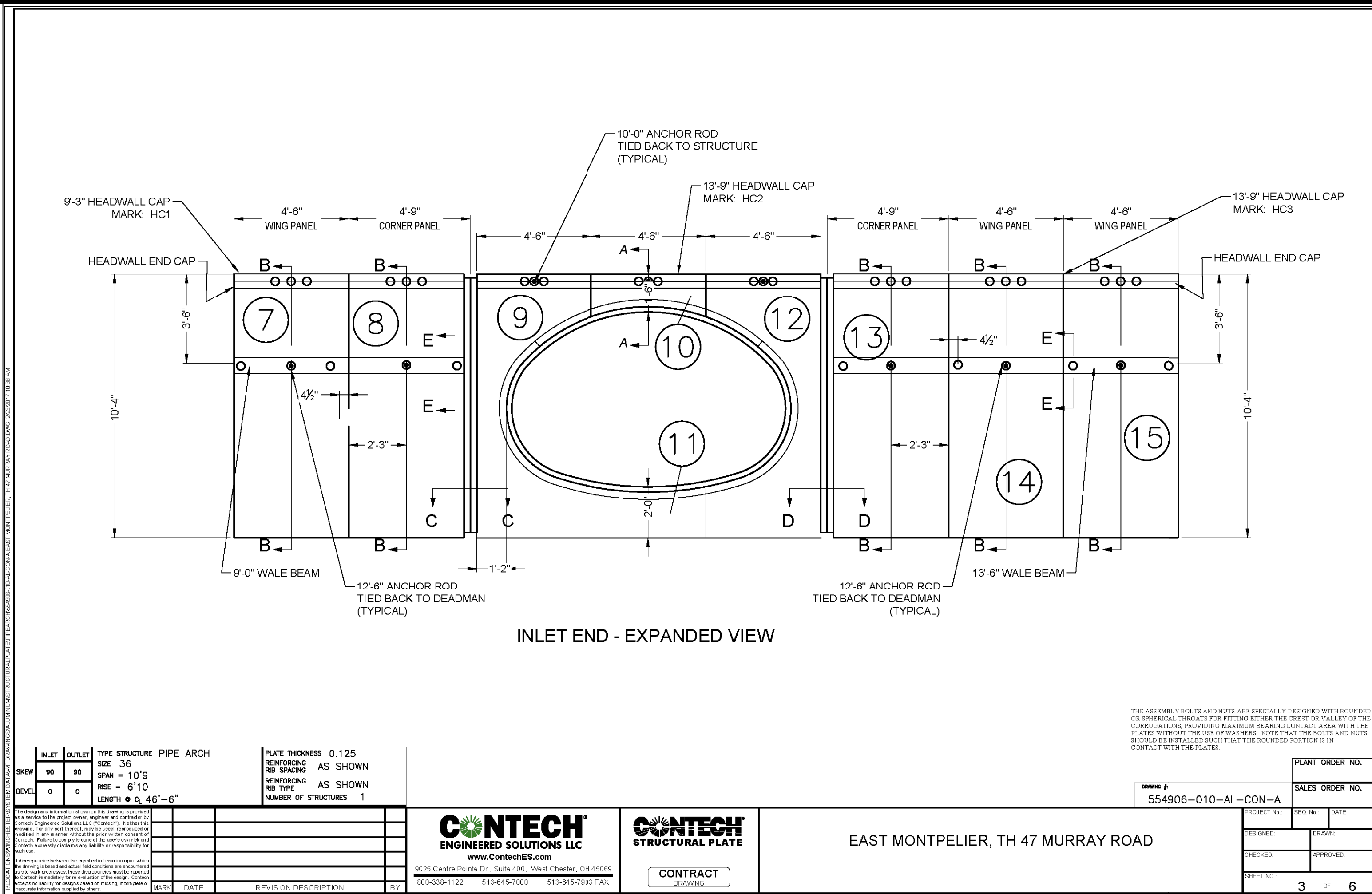
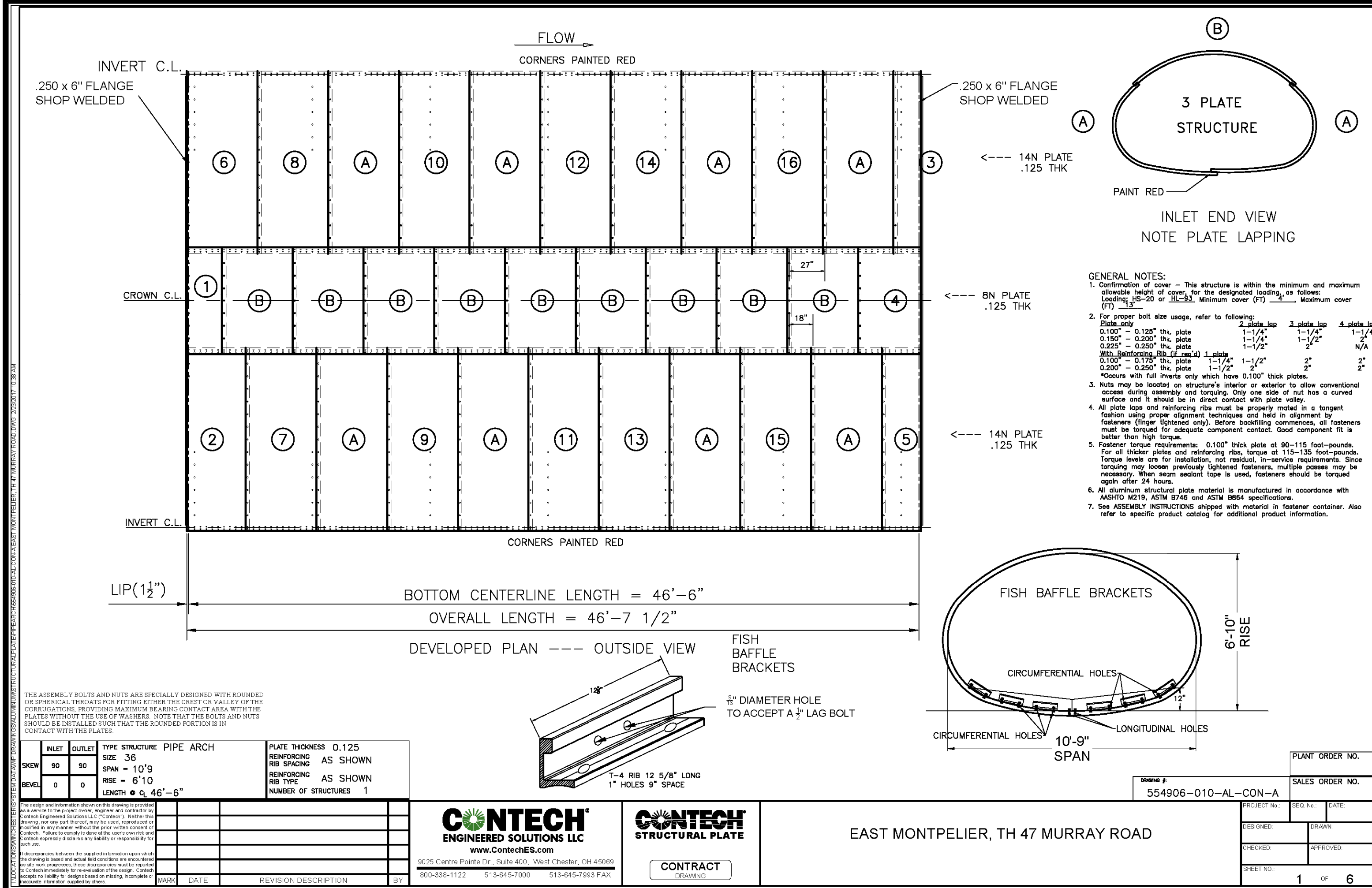


SCHEMATIC DIAGRAM WITH ELEVATIONS

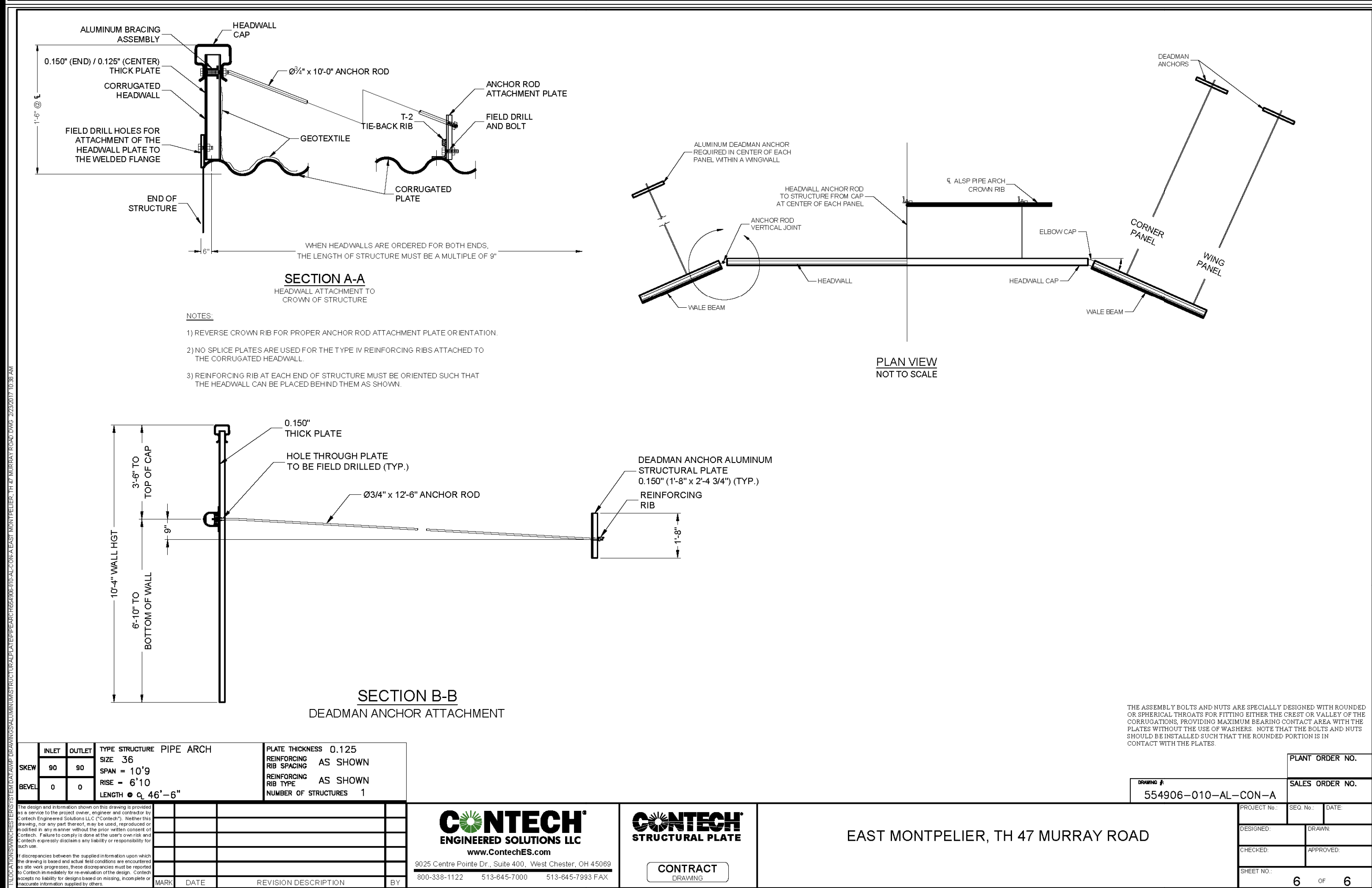
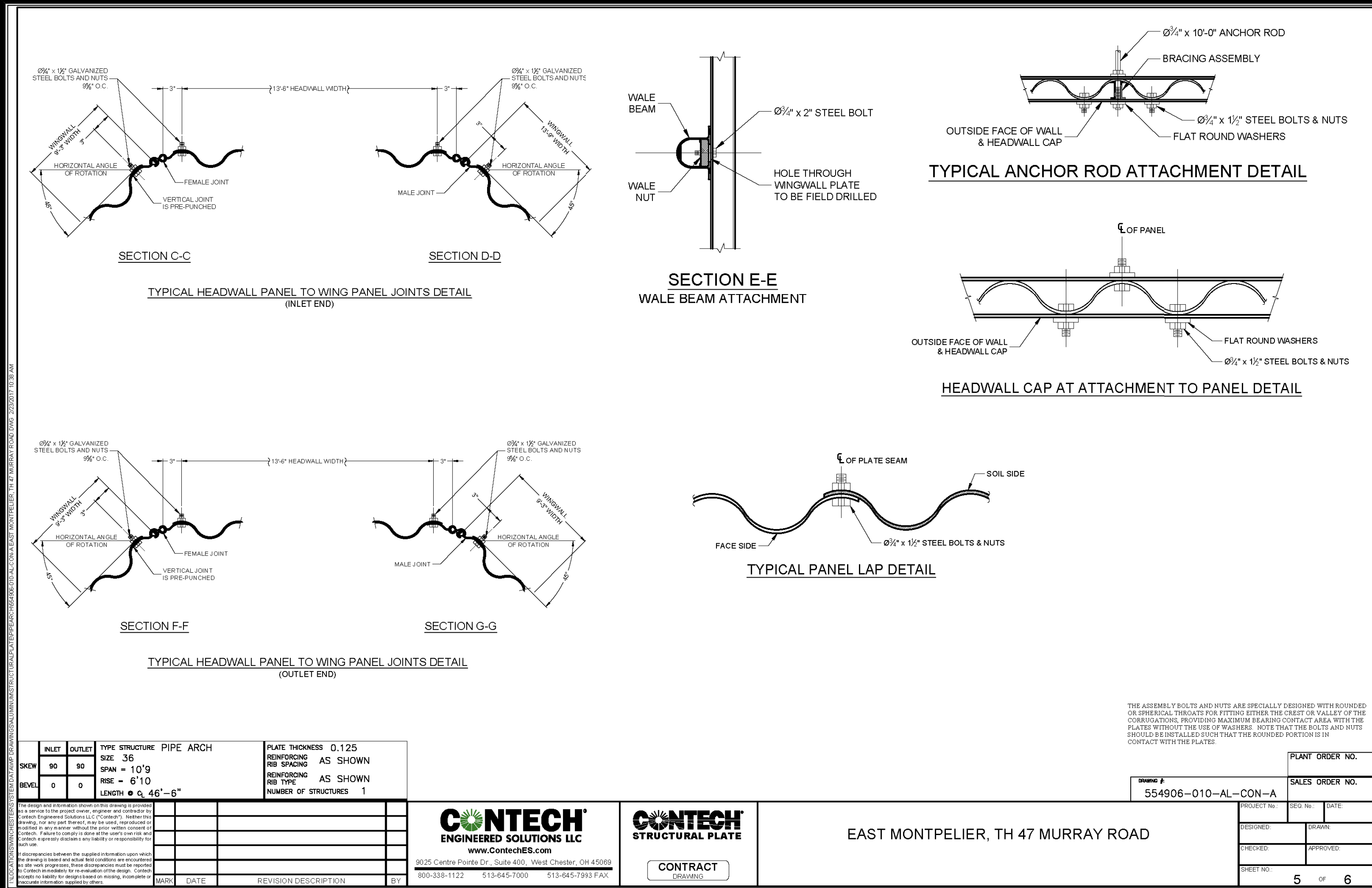
Not to Scale

(Note: Headwalls not shown for clarity)

NO.	REVISIONS	BY	DATE	DES DWN	DATE	SCALE	Town of East Montpelier Murray Road - T.H. 47 TH Structures Grant Program FY 2016, Project BC - 1701	Typical Pipe Arch Section, Excavation and Backfill Details, Schematic Diagram with Elevations, and Timber Baffle Details	Newton Technical Services, LLC 728 South Barre Road Barre, VT 05641 (802) 476-6900	Chase & Chase Surveyors & Septic Designers, Inc. 301 North Main St., Suite 301 Barre, VT 05641 (802) 479-9636	SHEET 6 OF 10
				DRN KKJ	June 2016	As Noted					
				CHK DWN							
				APPD							

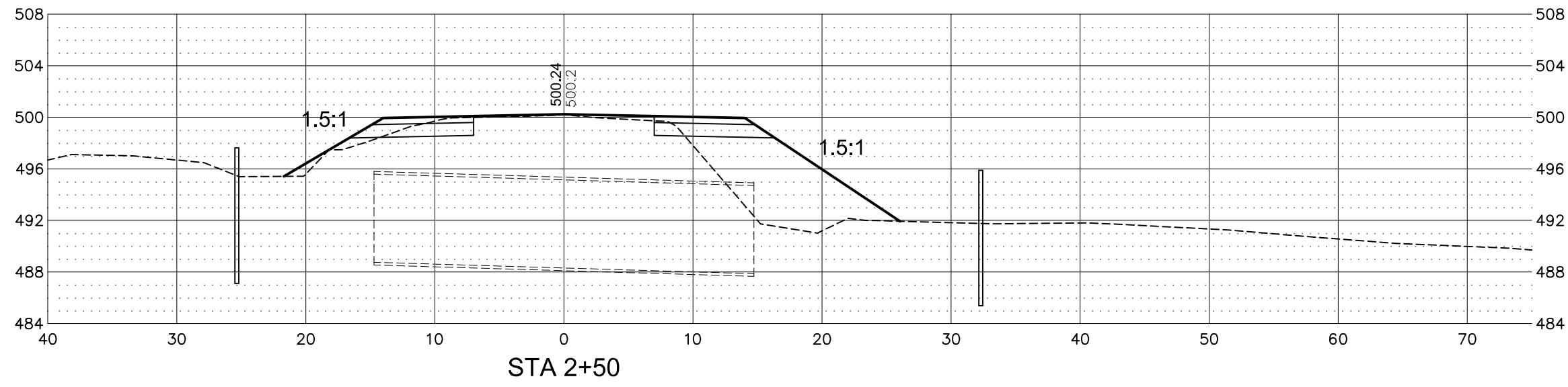


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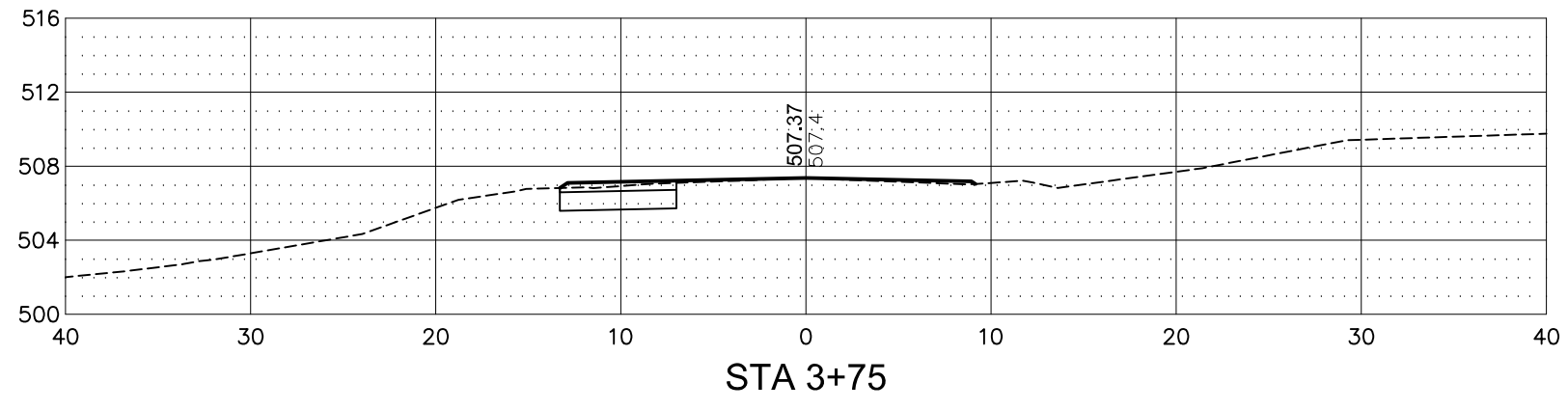


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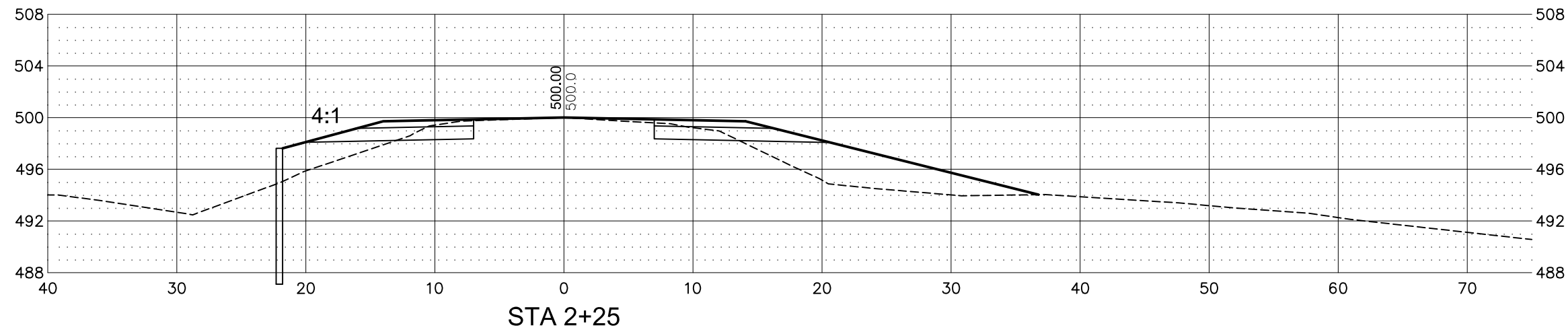
Sta 2+50 Lt.
End Steel Beam Guardrail/Nested
Begin Steel Beam Guardrail



Sta 2+62.5 Rt.
End Steel Beam Guardrail/Nested
Begin Steel Beam Guardrail

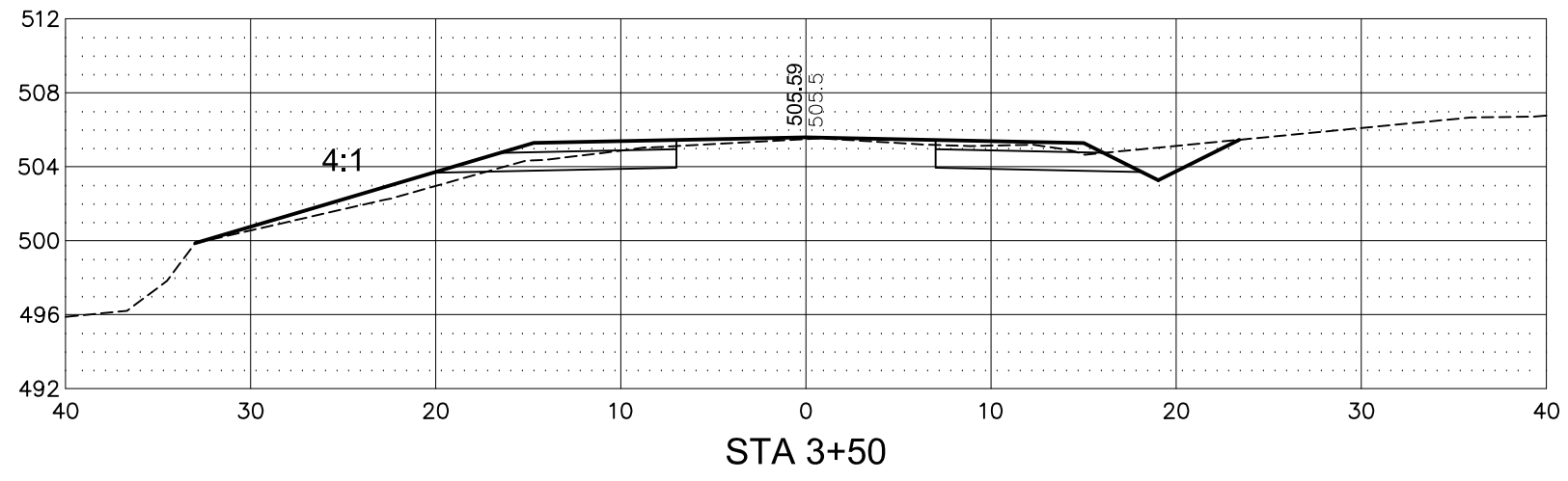


Sta 2+37.5 Lt.
End Steel Beam Guardrail
Begin Steel Beam Guardrail/Nested



Sta 3+57 Lt.
End Steel Beam Guardrail

Sta 3+51
Anchor for Steel Beam Guardrail

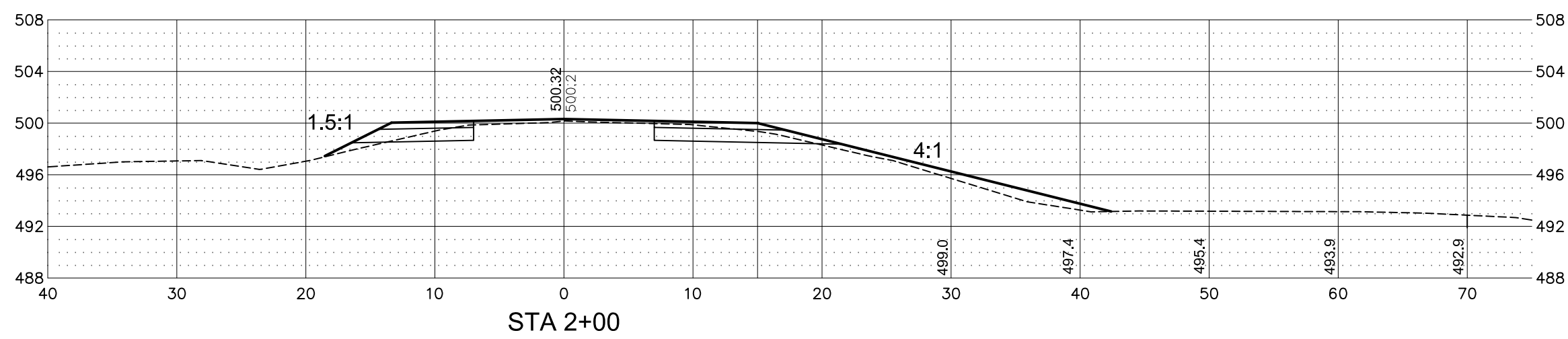


Sta. 2+20 Lt.
Anchor for Steel Beam Guardrail

Sta. 2+20 Rt.
Anchor for Steel Beam Guardrail

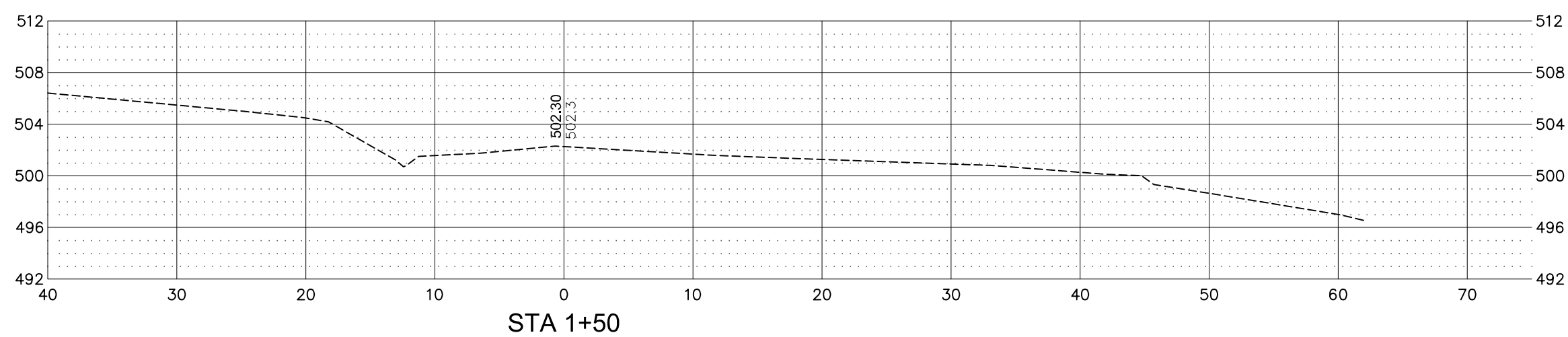
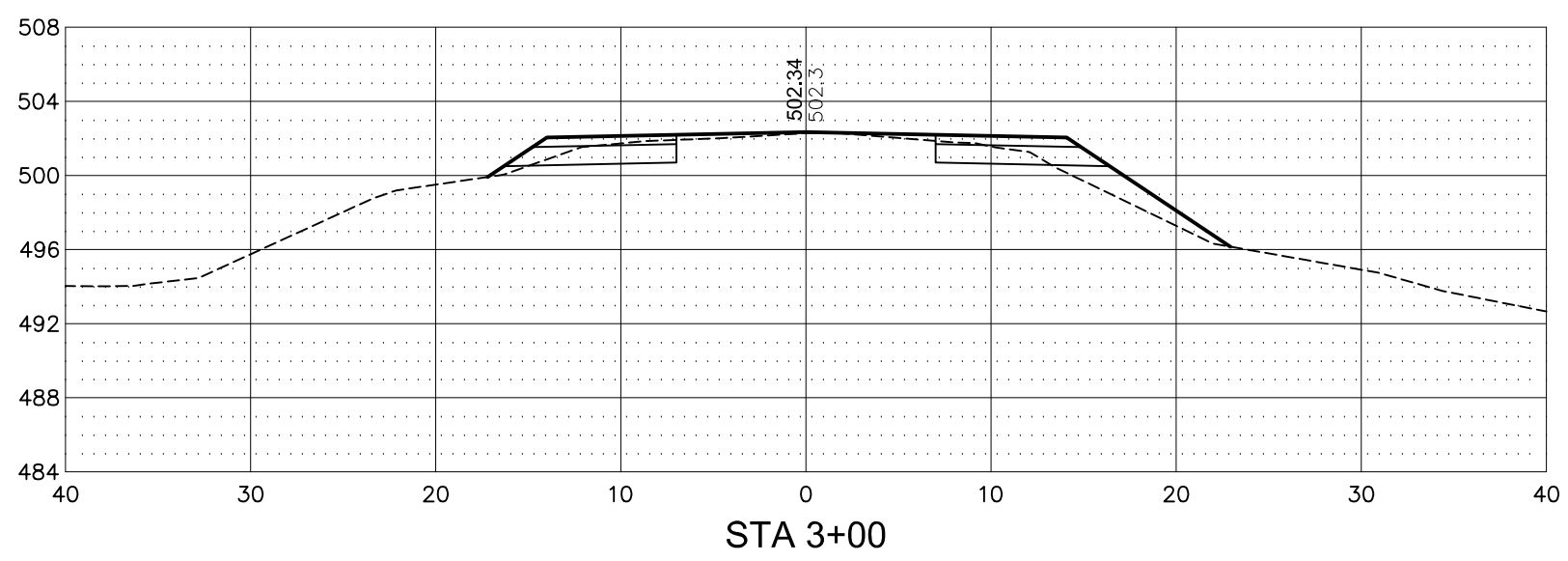
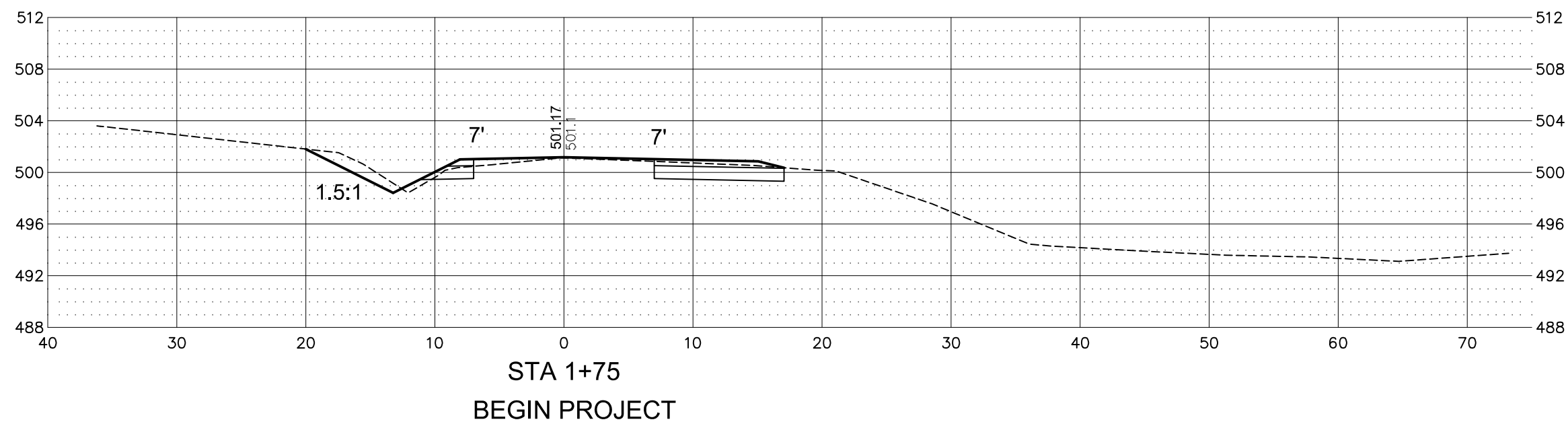
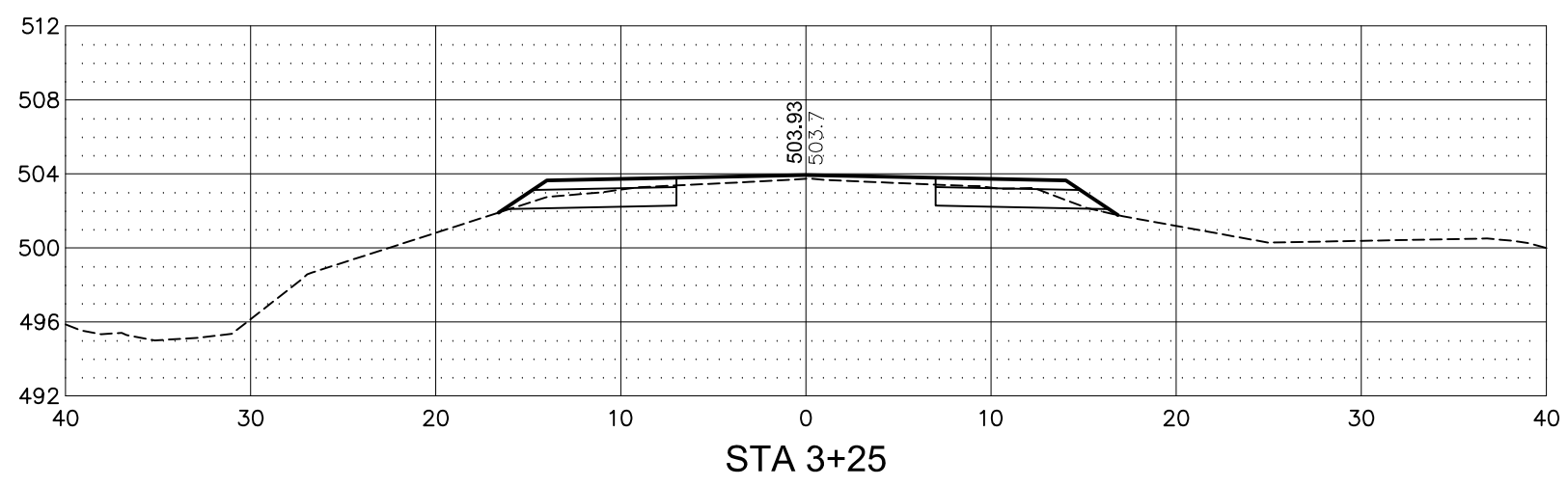
Sta 2+14.5 Lt.
Begin Steel Beam Guardrail

Sta 2+14.5 Rt.
Begin Steel Beam Guardrail

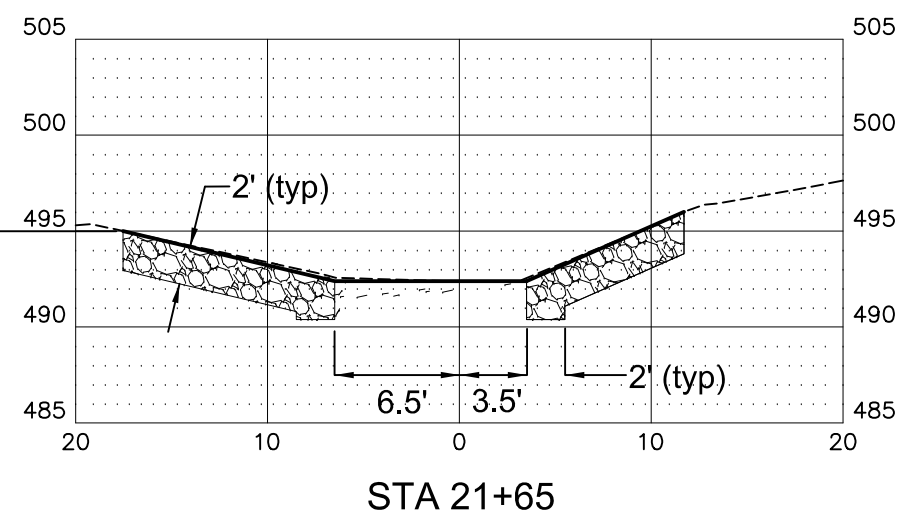
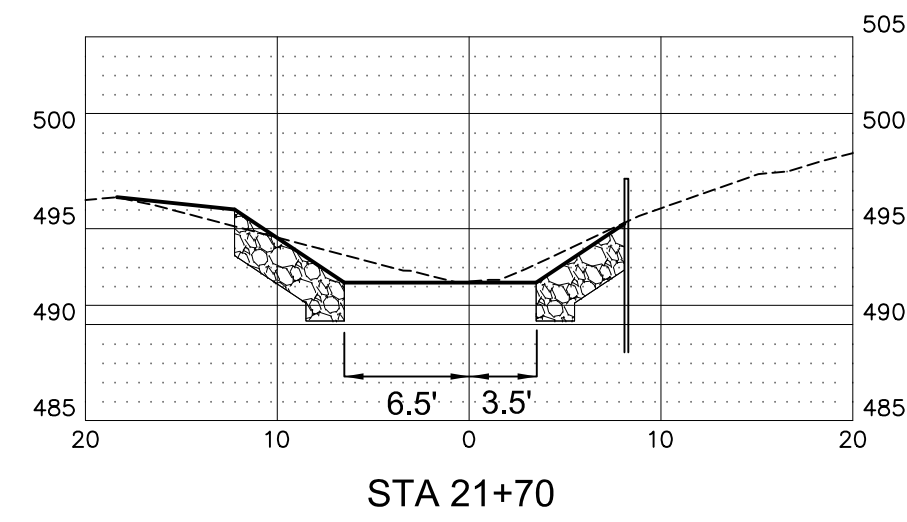
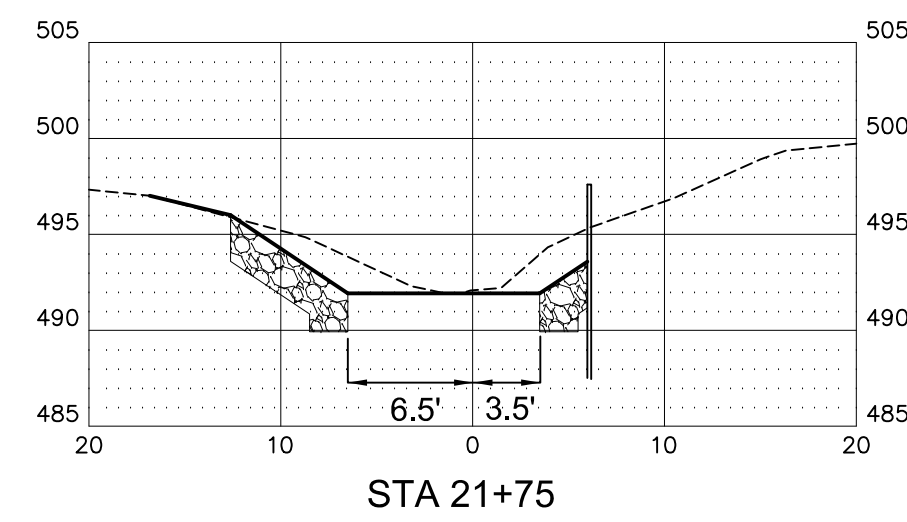
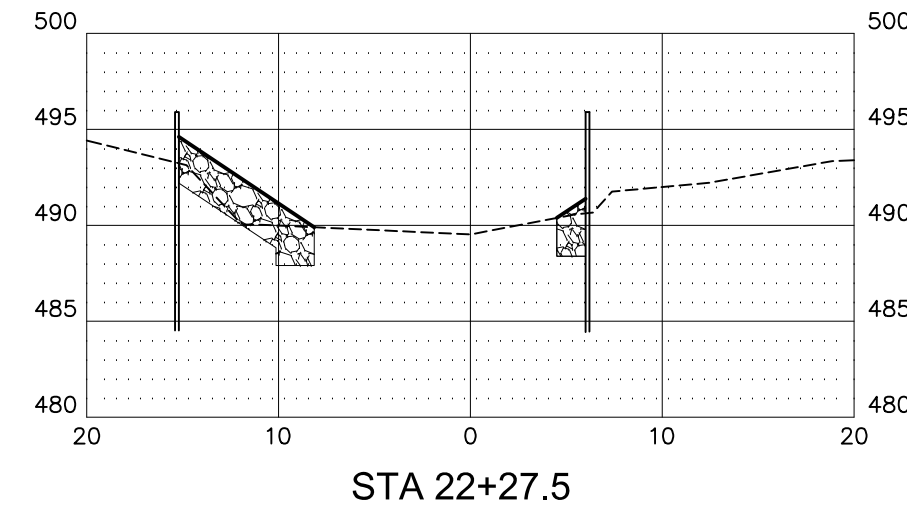
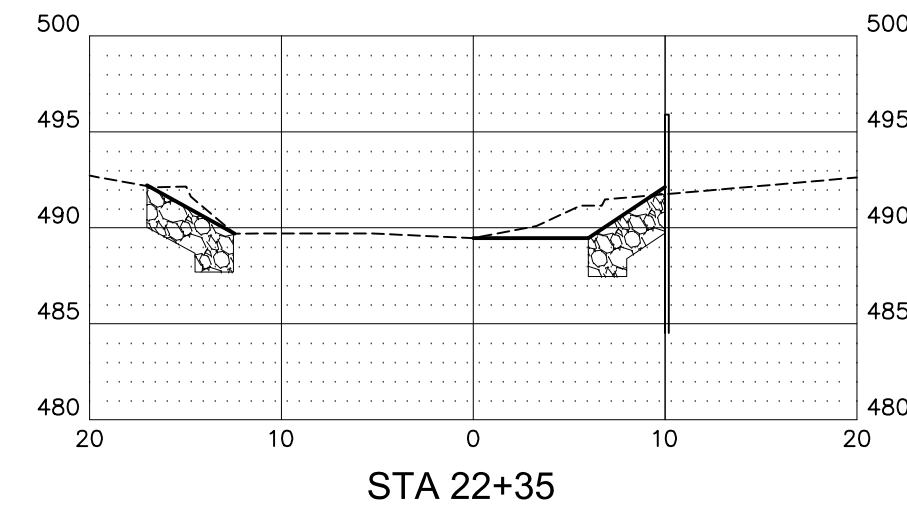


Sta 3+40.3 Rt.
End Steel Beam Guardrail

Sta. 3+33.3 Rt.
Anchor for Steel Beam Guardrail



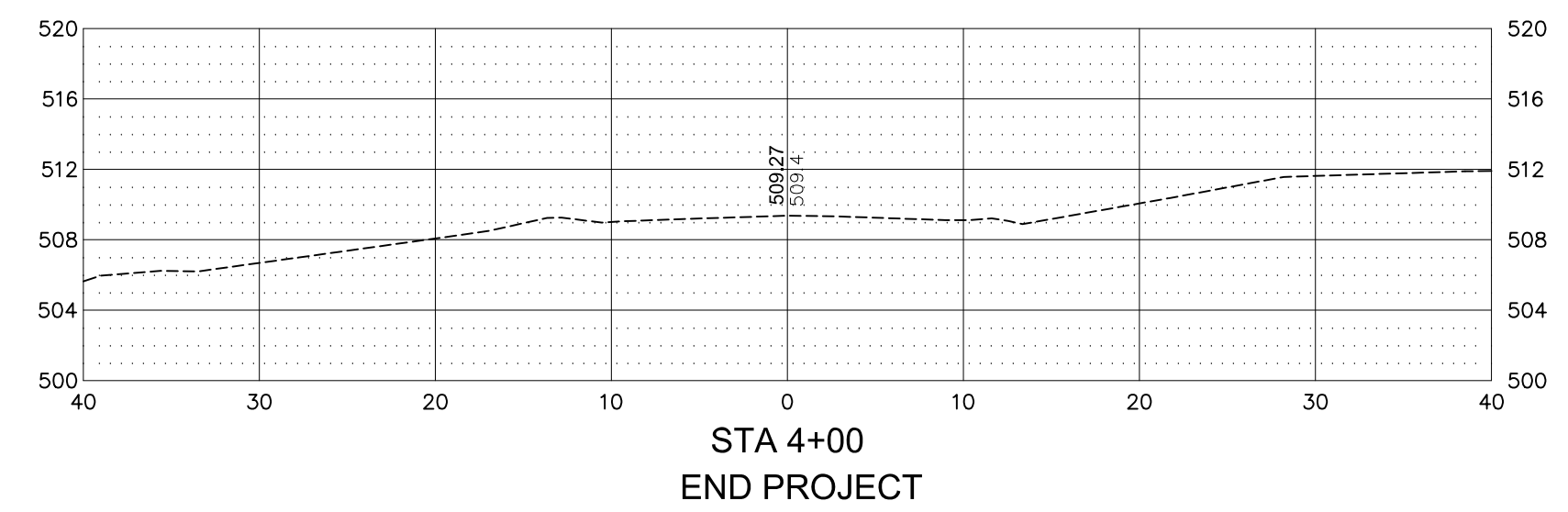
ROADWAY CROSS-SECTIONS



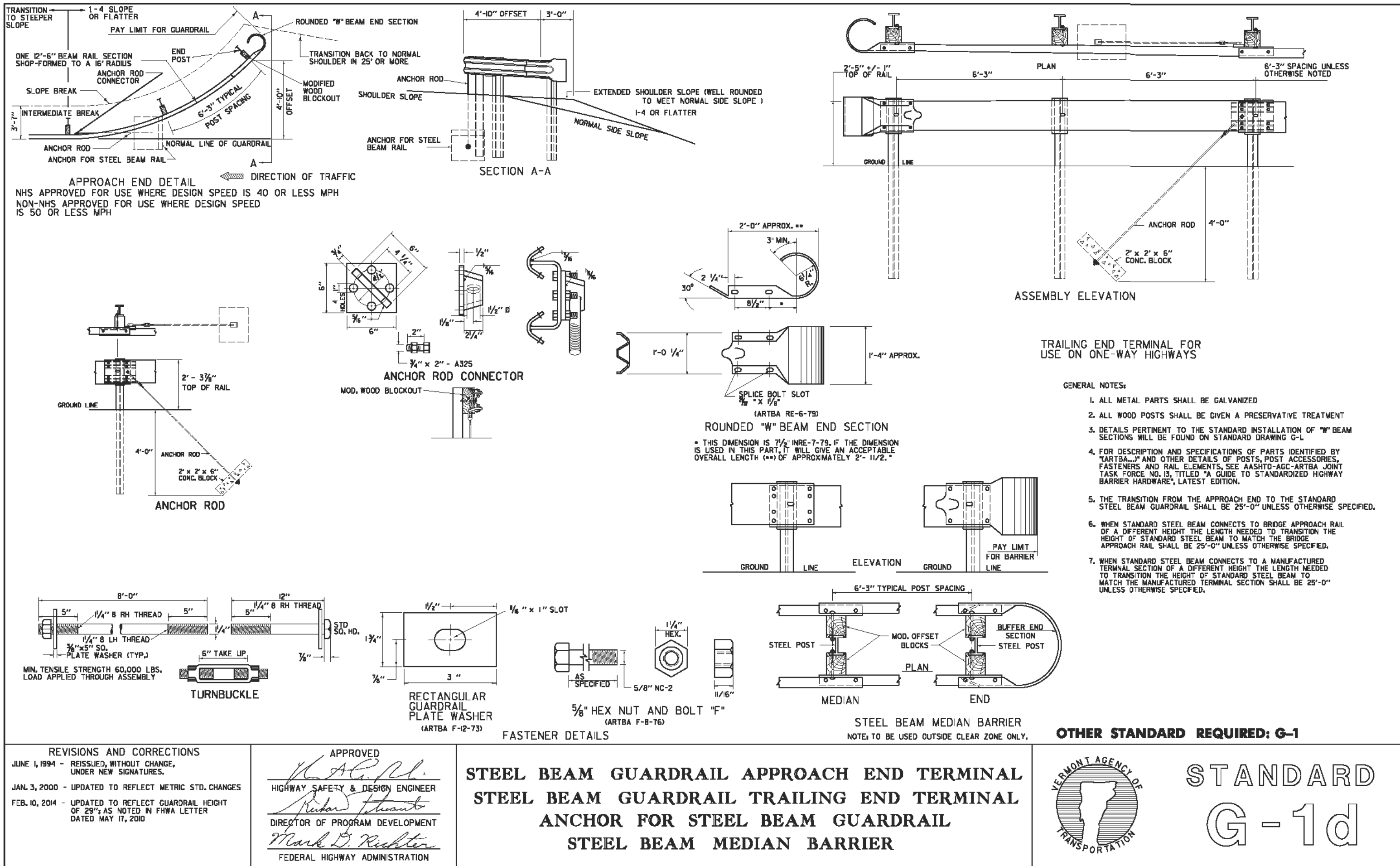
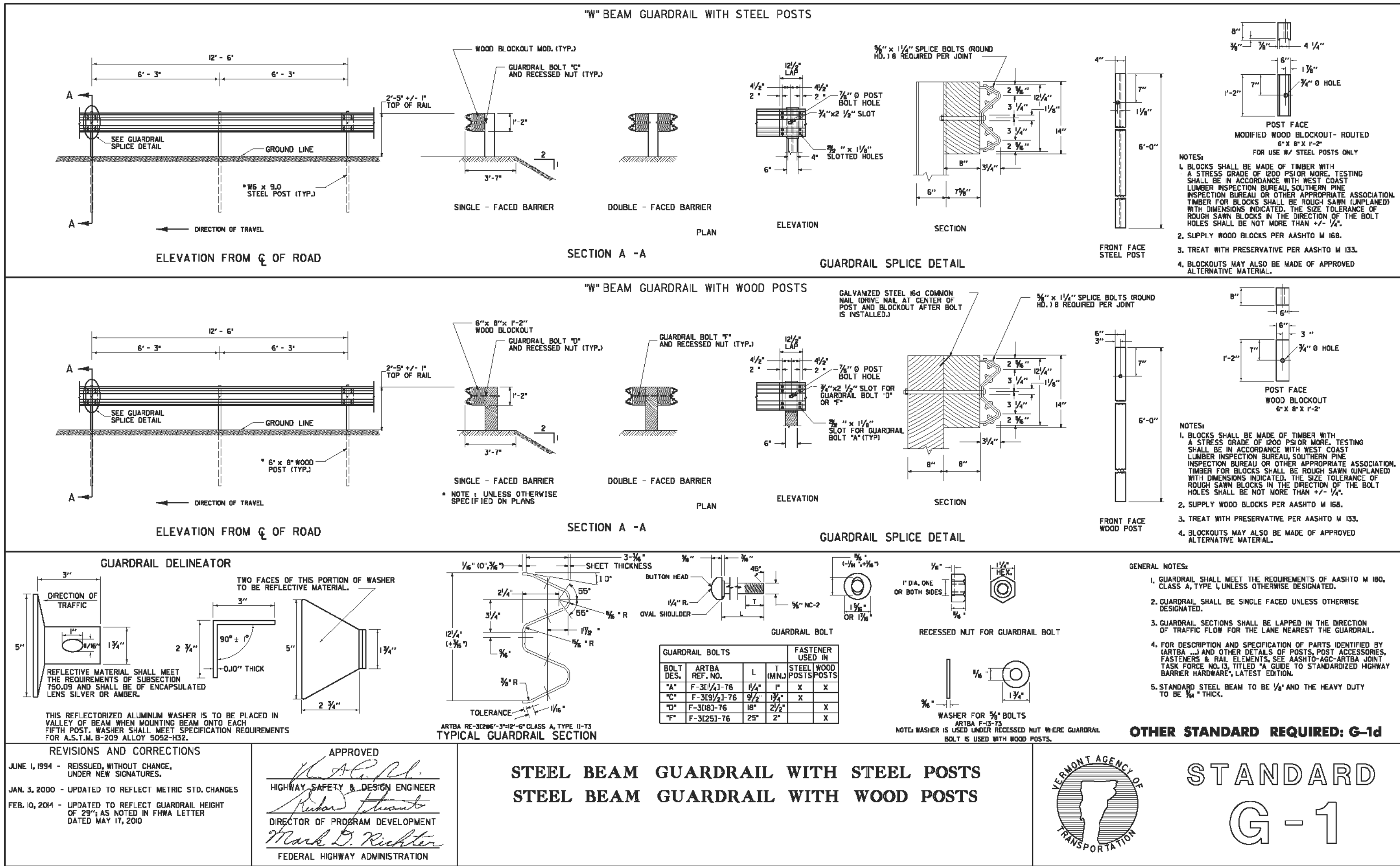
STREAM CROSS-SECTIONS

1 - 1 1/2 slopes except
@ Sta 21+65

Top of Stone Fill @ Elev. 496.0
unless otherwise shown



NO.		REVISIONS		BY	DATE	DES	DWN	DATE	SCALE	Town of East Montpelier Murray Road - T.H. 47 TH Structures Grant Program FY 2016, Project BC-1701		Road & Stream Cross-Sections		Newton Technical Services, LLC 728 South Barre Road Barre, VT 05641 (802) 476-6900		Chase & Chase Surveyors & Septic Designers, Inc. 301 North Main St., Suite 301 Barre, VT 05641 (802) 479-9636		SHEET 9 OF 10	
						DRN	KKJ	02/28/17	1" = 10' (H & V)										
						CHK	DWN												
						APPD													



NO.	REVISIONS	BY	DATE	DES	DWN	DATE	SCALE	Town of East Montpelier Murray Road - T.H. 47 TH Structures Grant Program FY 2016, Project BC-1701	Standards	Newton Technical Services, LLC 728 South Barre Road Barre, VT 05641 (802) 476-6900	Chase & Chase Surveyors & Septic Designers, Inc. 301 North Main St., Suite 301 Barre, VT 05641 (802) 479-9636	SHEET 10 OF 10
				DRN	KKJ	02/28/17	Not to scale					
				CHK	DWN							
				APPD								