



COMPLEX PROJECTS
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**CITY OF TORONTO
JEFFERSON COUNTY, OHIO**

MARA ROAD EXTENSION

ADDENDUM #1

JANUARY 5, 2023

THRASHER PROJECT #101-T30-11030

TO WHOM IT MAY CONCERN:

The following are clarifications and responses to questions posed by contractors for the above-referenced project. **No additional questions will be accepted after 10:00am on Friday, January 6, 2023.**

A. GENERAL

1. **Attachment 1** - the Bid Form (section 5.01, pages BID 3-6) has been revised. All items in red text have been updated. You must use the revised bid form when preparing your bid package for this project.

B. SPECIFICATIONS

1. **Attachment 2** - Specification 333101 PACKAGE GRINDER PUMP STATIONS Part 2.1, paragraphs A and B have been revised as follows:
 - A. Grinder pump assembly shall be pre-manufactured, simplex, semi-positive displacement, 1HP, 1725 rpm, 240 V, 1 phase grinder pump unit, in a 70-gallon HDPE tank. Also, station to include discharge connection, anti-siphon valve and check valve, controls, and alarm/disconnect panel.
 - B. Grinder pump assemblies shall be manufactured by Environmental/One Corporation, Model DH071/DR071 or approved equal.

C. DRAWINGS

Attachment 3 - the following sheets have been revised and are attached to this addendum. Please be sure to utilize the revised sheets when bidding and constructing the project.

REPLACE Sheets 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 36 included in this addendum.

D. QUESTIONS AND RESPONSES

QUESTION

1. *Please clarify the trench detail on sheet 13/50. The detail shows 5' limit of pavement replacement from centerline of pipe, but also shows 10' additional replacement on each side of trench.*

RESPONSE

The reference to 10' is a typo. The measurement has been revised to 1'.

QUESTION

2. *The advertisement states the bid bond rate at 10% and the project manual states 5% under article 8. Please clarify.*

RESPONSE

Attachment 4 - the Bid Bond has been changed to 10%. This has been updated in the bid book (C-200 Instructions to Bidders, page 7, section 8.01).

QUESTION

3. *Is there a Pre-Bid conference for the Mara Road Extension Project? In the specifications it mentions a non-mandatory pre-bid conference, but a date and time is not listed.*

RESPONSE

The site is accessible and there will not be a pre-bid conference.

QUESTION

4. *Item 63801300 is for 8" CL 52 DIP. Waterline notes on sheet 4 is for 8" PVC C900. Please clarify.*

RESPONSE

Plans have been revised to call for 6" C900.

QUESTION

5. *On drawing # 7 the plans show a 1-1/2" force main and a 2-inch air release, how are we to connect this?*

RESPONSE

Air release valve has been revised to 1 1/2".

QUESTION

6. *On drawing # 7 the plans show 5 air release valves and in the bid items there are only 1 each. How many of these are needed?*

RESPONSE

Quantity has been revised to 5 each.

QUESTION

7. *On drawing # 8 the plans show a 3/4" copper service line. How are we to be paid for this?*

RESPONSE

Per "3/4" Copper Service Branch" note on sheet 4, "This work is incidental to the water main and the contractor will not receive any additional compensation for this work."

QUESTION

8. *Are Nebo Drive and Titanium Way both usable for construction access roads?*

RESPONSE

Yes, both are suitable for construction access.

QUESTION

9. *The bid items call for a Catch Basin, No. 2-2B, where is this located on the plans?*

RESPONSE

This is shown on sheet 44 for use as the outlet structure in the detention basin.

QUESTION

10. *The detail for the grinder pump on page 40 shows us tying into an 1-1/2" force main, but on the plans, it shows separate force mains to each grinder pump. How are to install this?*

RESPONSE

The grinder pump for each house will be connected to its own 1 1/2" force main that will run up the hill and connect to the existing sanitary manhole at Sta. 11+50.62.

QUESTION

11. *What size is the existing waterline?*

RESPONSE

The existing waterline is 6”.

QUESTION

12. *On drawing # 8 there are 3 proposed mailboxes shown, is there a spec for these?*

RESPONSE

Note has been added to Sheet 4 for clarification.

QUESTION

13. *On drawing # 7 the water tie in shows the existing waterline ending and us tying into it. The detail shows a tee connecting to a valve, how is this tie in supposed to be installed?*

RESPONSE

There is an existing valve at the end of the existing waterline. The new waterline will be connected to the stub after this valve, then the valve opened once the proposed waterline is installed, tested, and approved.

QUESTION

14. *The model number for the sanitary sewer grinder pump stations are specified differently on the drawing details than the ones in the specs. Which is the correct model number being used for the project?*

RESPONSE

Specification have been revised to reflect model DH071/DR071.

QUESTION

15. *Where are the grinder pump stations getting power supply from? Is the contractor responsible to have these powered?*

RESPONSE

Contractor to provide power to the grinder pumps at each residence. Contractor to coordinate with homeowners in order to perform this work. All labor, materials, work, etc. required to perform this work shall be included in the lump sum bid price for Item 611 – Sanitary Sewer Grinder Pumps.

QUESTION

16. *Bid Item #41 has (22 SY) of 6" non-reinforced concrete pavement, Class QC MS? Besides a 2" pavement overlay in the existing Mara Road, is there any utility lines getting ran in the existing road that requires asphalt repair?*

RESPONSE

The 6" concrete pavement is for use on the proposed concrete aprons. Labels have been added to the plans.

QUESTION

17. *Does the owner know of any waste or barrow sites near project?*

RESPONSE

No, not at this time.

QUESTION

18. *What type of pipe is the proposed 8" Water Line supposed to be PVC C-900 off of the plans or Ductile Iron Class 52 off of the bid item schedule?*

RESPONSE

See response to question 4.

QUESTION

19. *Is the geotechnical report available for this project?*

RESPONSE

Attachment 5 - Yes, the geotechnical report has been included in this addendum.

QUESTION

20. *Is the power to the grinder pumps being supplied from the individual homes? Is it the contractor's responsibility to run the electric from the homes to the pumps?*

RESPONSE

See response to question 15.

QUESTION

21. *Article 4 paragraph 4.02 of the "Instructions to Bidders" indicates that a non-mandatory pre-bid meeting will be held. Is there a pre-bid meeting?*

RESPONSE

See response to question 3.

QUESTION

22. *Please verify that you are the proper contact to submit prebid questions. If not, please forward these questions to the correct contact and let us know who that contact is.*

RESPONSE

Questions can be sent to Brad Olinger at bolinger@thethrashergroup.com.

QUESTION

23. *Bidding documents were downloaded from QuestCDN but it appears that sealed bids are to be received in person. Can you please confirm that we are to print the bid book and turn in hard copies and not submit the bid via the QuestCDN Online Bidding.*

RESPONSE

Yes, each respective bidder must download the plans and specifications through QuestCDN and print the required bid forms to be used as outlined in Section C-200, Instructions to Bidders.

QUESTION

24. *Can the soil boring reports please be distributed to plan holders?*

RESPONSE

See response to question 19.

QUESTION

25. *Can the office calcs please be distributed to the plan holders?*

RESPONSE

No office calcs will be provided. Please see general summary for quantities.

QUESTION

26. *What is the estimated construction budget?*

RESPONSE

Attachment 6 - The Engineer's Estimate has been revised and is \$2,512,755.79. See attached page "EST-1".

QUESTION

27. *When conflicting each other, which specs do we follow Thrasher's or ODOT's?*

RESPONSE

When in conflict, ODOT's specifications shall be followed.

QUESTION

28. *Is the pavement detail on sheet #13 (for the asphalt replacement on Titanium Way) supposed to extend beyond the trench 10 feet or 10 inches on either side?*

RESPONSE

See response to question 1.

QUESTION

29. *Can a drawing be supplied with existing and proposed contours?*

RESPONSE

Contours beyond what is shown in the plans will not be provided. Please see cross sections for grading information.

QUESTION

30. *Can a drawing be supplied showing the total construction limits? Sheet 7/50, from Sta 13+00 to 16+00 the construction limits are off the sheet.*

RESPONSE

There is not sufficient room to show the extent of the construction limits on the sheet. Please see cross sections for grading information.

QUESTION

31. *Were soil borings taken? If so, please provide information.*

RESPONSE

See response to question 19.

QUESTION

32. *There are some on-site, survey stakes with Centerline marked, are these correct?*

RESPONSE

All construction survey is to be included in each bidder's bid price for each bid item. This is considered incidental to the work.

QUESTION

33. *There is a large pile of aggregate at the beginning of the project. What is to become of it?*

RESPONSE

The aggregate is the property of the City and will be moved prior to the construction of this project.

QUESTION

34. *There is no area within the construction limits for stockpiling topsoil. Where is the topsoil to be placed during construction?*

RESPONSE

Contractor to make use of area within construction limits to temporarily stockpile topsoil as needed.

QUESTION

35. *Can the existing treetops be chipped and incorporated into the fill?*

RESPONSE

No, only materials conforming to ODOT specification 703.16 may be used when Item 203 Embankment is specified.

QUESTION

36. *The bid quantities indicate 2,803 cy of fill needs to be imported to the site. Can the project be lowered to balance the cut/fill quantities? Or should we plan on importing the needed material? Was this cost included in the engineer's estimate?*

RESPONSE

The engineer's estimate accounts for all excavation to be removed from the site and all embankment to be brought to the site. Cut material may only be reused for embankment material if it conforms to ODOT specification 203.

QUESTION

37. *Sht 4/50, Waterline Notes – 8" PVC Waterline – The Plans and Bid Sheets call out Ductile Iron. Please clarify.*

RESPONSE

See response to question 4.

QUESTION

38. *Sht 7/50, The plans indicate 5 each - 2" Air Release Valves. Bid quantities are 1 each.*

RESPONSE

Air release valve has been revised to 1 ½". Quantity has been revised to 5 each.

QUESTION

39. *Sht 8/50, Approx. Sta 26+85, Rt. There is a power pole in the middle of the curb and gutter. Will this pole be relocated prior to construction?*

RESPONSE

Plans will be sent to utilities in order for the relocation to take place.

QUESTION

40. *Sht 8/50, the construction limits for the new sewer force mains on the landowner's property is 2'. Please explain how this is to be constructed.*

RESPONSE

Construction means and methods are the responsibility of the contractor. The City, the impacted property owner, and Thrasher will work with the successful contractor to accomplish the completion of the work.

QUESTION

41. *Who is to make the electrical tie-in for the new E/one grinder pumps? If it is the contractor, do all the homes have available space in their breaker boxes? Who will pay for the upgrades, if needed?*

RESPONSE

See response to question 15.

QUESTION

42. *Sht 13/50, Pavement Repair Detail – The Saw Cut is shown as 10' on either side of the trench. Is this correct?*

RESPONSE

See response to question 1.

QUESTION

43. *Sht 36/50, DR2 & DR3 indicate cut to reconstruct the driveways, but the plans do not indicate any cut slopes. Are these to be constructed without any slopes?*

RESPONSE

Drives are to be constructed per the drive profiles on sheet 36 and shoulders graded to tie into existing.

QUESTION

44. *There is no detail for the reconstruction of the driveways. What is the final surface?*

RESPONSE

Aprons are to be 6" non-reinforced concrete. The rest of the drive is to match existing material. Labels have been added to plans.

QUESTION

45. *Sht 8/50, The plans show proposed mailboxes. Please provide details and for these structures and pay item.*

RESPONSE

Note has been added to Sheet 4 for clarification.

QUESTION

46. *Sht 39/50, Is this sheet needed? No details pertain to this work.*

RESPONSE

Trench details shall be followed for the 1 ½” force mains.

QUESTION

47. *Sht 41/50, Shows a e/one DH071 or DR071. The specs call out GH091-96. Which is correct?*

RESPONSE

Specification have been revised to reflect model DH071/DR071.

QUESTION

48. *Are concrete ballast needed for the grinder pumps? Plans and Specs are unclear.*

RESPONSE

Per the geotechnical report, we do not expect the groundwater to impact the grinder pumps, so ballast should not be necessary.

QUESTION

49. *Bid Item 45, PVC Forcemain 1-1/2” SDR 35. This pipe size and classification does not exist. Please clarify.*

RESPONSE

Pay item has been revised to Item 611 – Conduit Misc.: 1 ½” Conduit, Type C, 707.34.

QUESTION

50. *Would a loaded triaxle be an approved alternate for the proof rolling in lieu of the roller specified in section 204.06?*

RESPONSE

ODOT specifications and requirements will be followed for the project.

QUESTION

51. *Drawings show proposed mailboxes. Are these new mailboxes or existing mailboxes to be relocated? Where would this item be paid under?*

RESPONSE

See response to question 45.

QUESTION

52. *ADS Barracuda system called out a type I water quality unit which is a S4 Barracuda. The detail shows a S8 Barracuda.*

RESPONSE

Pay item has been revised to Item 895 – Manufactured Water Quality Structure, Type 4.

QUESTION

53. *The 1-1/2 Force main is noted on the bid schedule as SDR35, do you want a different type of pipe for this force main?*

RESPONSE

See response to question 49.

QUESTION

54. *What is the size of the existing water main?*

RESPONSE

See response to question 11.

QUESTION

55. *Is there geotechnical information available for the Mara Road Extension project?*

RESPONSE

See response to question 19.

QUESTION

56. *Item 63811310 has (1) each for a 2” air release on the san fm. This has (5) 1 ½” FM pipes coming into this area. Are we to install 5 structures with 5 air release valves in them as shown on the detail or (5) 2” ARV in 1 structure. Please clarify.*

RESPONSE

See response to question 38.

QUESTION

57. *Please confirm the amount of the bond for this project. Page 2 of the Advertisement states 10%, but Article 8 of the Instructions to Bidders states 5%.*

RESPONSE

See response to question 2.

QUESTION

58. *Please provide Page BOR-8 for the bid.*

RESPONSE

Attachment 7 - BOR-8 has been attached to this addendum.

QUESTION

59. *Is there to be an aggregate layer under the curb and gutter so any water that would get to the aggregate base can get to the underdrain?*

RESPONSE

Yes, the curb shall be placed on an aggregate base that allows the water that gets to the base to get to the underdrain. The cost of this aggregate base shall be included in the unit bid price for Item 609 – Combination Curb and Gutter, Type 2.

QUESTION

60. *Is there a geotechnical report?*

RESPONSE

See response to question 19.

QUESTION

61. *Is the project considered unclassified excavation?*

RESPONSE

Excavation is per ODOT Item 203 Roadway Excavation and Embankment.

QUESTION

62. *There are Rock Outcrops (Typ.) called out on the plans and are seen visually in the field. Are the removal of these to be considered in the excavation cost? If there is more rock underground encountered when installing utilities is there an allowance for rock removal or is that on the contractor?*

RESPONSE

The removal of these rock outcroppings should be accounted for in the unit bid price for Item 203 Excavation. Please review the geotechnical report for any additional information regarding the presence of rock underground.

QUESTION

63. *Sheet BOR – 1 shows that we must include an Affidavit of Non-Collusion (BOR-8) but there is no sheet for BOR-8 included.*

RESPONSE

See response to question 58.

QUESTION

64. *Sheet BOR – 7 “Bidder’s Affidavit: Foreign Corporation” We are not familiar with this BOR. Could you please explain the intent of this form? Specifically I want to make sure we understand “... and the bidder has a designated statutory agent upon whom process against bidder corporation may be served within the State of Ohio.”*

RESPONSE

In order to bid on and construct the project, the bidder must be registered with the State of Ohio.

QUESTION

65. *Is there any information available concerning the existing septic tanks? Size, current fill volume?*

RESPONSE

We do not have information on the septic tanks.

QUESTION

66. *18" (Type B) Pipe is shown on the plans @ 163 LF, but not on the bid schedule.*

RESPONSE

Item 611 – 18” Conduit, Type B quantity has been revised to 782 FT.

QUESTION

67. *How many Half Height Headwalls are there? Just (1) for the 18" pipe in the retention pond area?*

RESPONSE

There are 3 half height headwalls in the plans. 1 for the 24” inlet to the detention basin, 1 for the 18” outlet for the detention basin, and 1 for the 12” outlet along Titanium Way.

QUESTION

68. *Sheet 3/50 Clearing and Grubbing - states that no tree or stumps specifically marked for removal within the limits of the project, however numerous trees need to be removed in the project limits from station 22+50 – 27+00. Is this the contractors responsibility for these removals?*

RESPONSE

The note is meant to convey that although there are no specific trees called out for removal, that the cost of all clearing and grubbing, trees included, shall be included in the lump sum bid price.

QUESTION

69. *Sheet 4/50 Utility Poles – Contractor shall contact and coordinate with utility owner for temporary support or relocation of existing utility poles closer than 7 feet of the proposed trench, who is responsible for payment to the Utility Owner?*

RESPONSE

The City will be responsible for payment for any utility relocations.

QUESTION

70. *Sheet 4/50 Gas Lines – For relocation of existing gas line or gas service line to be relocated by the respective owner of such utility, who is responsible for the payment to the Utility Owner?*

RESPONSE

See response to question 69.

QUESTION

71. *Temporary Field Office – is a field office required for the owner or owner reps?.*

RESPONSE

No field office will be required.

QUESTION

72. *ODOT 611 Spec – Is successful bidder required to follow ODOT 611 pipe spec?*

RESPONSE

Yes, this project will follow all ODOT specifications.

If you have any questions or comments, please feel free to contact me by 10:00 am on January 6, 2023. As a reminder, bids will be received until 1:30 p.m. on Wednesday, January 11, 2023, at the Municipal Building located at 416 Clark Street, Toronto, OH 43964. Good luck to everyone and thank you for your interest in the project.

Sincerely,

THE THRASHER GROUP, INC.



Brad Olinger, PE
Project Manager

**CITY OF TORONTO
JEFFERSON COUNTY, OHIO
MARA ROAD EXTENSION**

THRASHER PROJECT #101-T30-11030

BID FORM

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:
CITY OF TORONTO

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.

Addendum Date

_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the

cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

- F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
 - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 – BASIS OF BID

GENERAL

The Bidder shall take notice of and shall be responsible for any local or state taxes levied and applicable, and the cost for the same shall be included as part of the submitted Bid.

The total Bid cost stated includes a complete operating installation including furnishing and installation of any and all changes or additions in plans, piping, mechanical work, additional electrical work, accessories, controls, etc. necessary to accommodate alternative equipment systems or materials used in construction.

BID PROPOSAL

THE BIDDER AGREES TO PERFORM ALL REQUIRED WORK DESCRIBED IN THE DETAILED SPECIFICATIONS AND AS SHOWN ON THE PLANS FOR THE COMPLETE CONSTRUCTION AND PLACING IN SATISFACTORY OPERATION OF THE CONTRACT

The Project "Sequence of Construction" has been detailed in the Drawings and Specification Division 1, Project Summary, Section 1010, Part-2 Execution. The Bidder agrees to perform all the Work proposed for the total of the following Bid prices.

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

**PROPOSED
 MARA ROAD EXTENSION
 JEFFERSON COUNTY, OHIO**

BID SCHEDULE

ODOT							
Item #	ODOT #		DESCRIPTION	QTY.	UNIT	UNIT COST	COST
1	201	11000	Clearing & Grubbing	1	LS		
2	202	23000	Pavement Removed	176	SY		
3	202	53100	Mailbox Removed	3	EACH		
4	203	10000	Excavation	7,171	CY		
5	203	20000	Embankment	9,974	CY		
6	203	35110	Granular Material, Type B	362	CY		
7	204	10000	Subgrade Compaction	4,348	SY		
8	204	13000	Excavation of Subgrade	362	CY		
9	204	45000	Proof Rolling	2	HOUR		

ODOT							
Item #	ODOT #		DESCRIPTION	QTY.	UNIT	UNIT COST	COST
10	204	50000	Geotextile Fabric	1,087	SY		
11	608	52000	Curb Ramp	145	SF		
12	609	12000	Combination Curb & Gutter, Type 2	3,310	FT		
13	609	26000	Curb, Type 6	88	FT		
14	690	50100	Mailbox Support System, Single	3	EACH		
15	659	00300	Topsoil	1,394	CY		
16	659	00500	Seeding & Mulching, Class 1	12,553	SY		
17	659	14000	Repair Seeding & Mulching	628	SY		
18	659	15000	Inter-Seeding	628	SY		
19	659	20000	Commercial Fertilizer	1.7	TON		
20	659	31000	Lime	2.6	ACRE		
21	659	35000	Water	68	MGAL		
22	832	15000	Stormwater Pollution Prevention Plan	1	LS		
23	832	30000	Erosion Control	15,000	EACH		
24	895	10040	Manufactured Water Quality Structure, Type 4, in 96" Manhole	1	EACH		
25	601	32200	Rock Channel Protection, Type C with Filter	41	CY		
26	602	20000	Concrete Masonry	2	CY		
27	605	14000	6" Base Pipe Underdrains	3,103	FT		
28	611	00510	6" Conduit, Type F for Underdrain Outlets	80	FT		
29	611	01100	6" Conduit, Type C	14	FT		
30	611	04400	12" Conduit, Type B	879	FT		

ODOT							
Item #	ODOT #		DESCRIPTION	QTY.	UNIT	UNIT COST	COST
31	611	04600	12" Conduit, Type C	103	FT		
32	611	07400	18" Conduit, Type B	782	FT		
33	611	07600	18" Conduit, Type C	39	FT		
34	611	10600	24" Conduit, Type C	57	FT		
35	611	99574	Manhole, No. 3	2	EACH		
36	611	98150	Catch Basin, No. 3	16	EACH		
37	611	98470	Catch Basin, No. 2-2B	1	EACH		
38	301	46000	Asphalt Concrete Base, PG64-22	571	CY		
39	304	20000	Aggregate Base	411	CY		
40	407	20000	Non-Tracking Tack Coat	548	GAL		
41	441	50000	Asphalt Concrete Surface Course, Type 1, (448), PG64-22	302	CY		
42	441	50000	Asphalt Concrete Intermediate Course, Type 2, (448)	168	CY		
43	452	10050	6" Non-Reinforced Concrete Pavement, Class QC MS	22	SY		
44	452	13040	9" Non-Reinforced Concrete Pavement, Class QC MS	172	SY		
45	611	97910	Special – Sanitary Sewer Grinder Pumps	1	LS		
46	638	20736	1 1/2" Air Release Valve	5	EACH		
47	611	97400	Conduit Misc.: 1 1/2" Conduit, Type C, 707.34	7,490	FT		
48	202	62700	Septic Tank Removed – Cleaning & Demolishing	5	EACH		
49	638	01130	6" Water Main Polyvinyl Chloride Pipe and Fittings, AWWA C900, DR18	1,647	FT		
50	638	07800	6" Gate Valve & Valve Box	10	EACH		

ODOT							
Item #	ODOT #		DESCRIPTION	QTY.	UNIT	UNIT COST	COST
51	638	10200	6" Fire Hydrant	4	EACH		
52	630	08510	Street Name Sign Support, No. 2 Post	15.25	FT		
53	630	08600	Sign Post Reflector	1	EACH		
54	630	80100	Sign, Flat Sheet	6.25	SF		
55	630	80500	Sign, Double Faced, Street Name	2	EACH		
56	644	00500	Stop Line	9	FT		
57	644	01200	Parking Lot Stall Marking	30	FT		
58	614	11000	Maintaining Traffic	1	LS		
59	623	10000	Construction Layout Stakes & Surveying	1	LS		
60	624	10000	Mobilization	1	LS		

TOTAL BID ACTIVITY _____

NOTE: THE CONTRACTOR'S UNIT PRICES SHALL INCLUDE PURCHASE AND INSTALLATION, COMPLETE IN PLACE, PER BID ITEM IN ACCORDANCE WITH THE DETAILED SPECIFICATIONS.

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

METHOD OF AWARD

If at the time this contract is to be awarded, the lowest total bid submitted by a qualified, responsible Bidder does not exceed the amount of funds then estimated by the Owner, as available to finance the contract, the construction contract will be awarded. If such bids exceed such amount, the Owner may reject all bids.

The owner may award the contract for each Activity separately or on the Total Bid submitted by a qualified responsible Bidder less the amount(s) of the Deductive Alternate(s) subtracted in numerical order, as listed in the contract to produce the lowest bid within the funds available for financing.

- A. Unit prices have been computed in accordance with paragraph 13.03.A of the General Conditions.
- B. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 6 – TIME OF COMPLETION

- 6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

- 7.01 The following documents are submitted with and made a condition of this Bid:
 - A. Bid Opening Requirements
 - B. American Iron and Steel Requirements
 - C. Disadvantaged Business Enterprises (DBE) Utilization
 - D. EPA Contract Requirements

ARTICLE 8 – DEFINED TERMS

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

By:
[Signature]

[Printed name]
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:
[Signature]

[Printed name]

Title: _____

Submittal Date: _____

Address for giving notices:

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

Bidder's License No.: _____
(where applicable)

NOTE TO USER: Use in those states or other jurisdictions where applicable or required.

SECTION 333101 – SMALL PACKAGE SEWAGE GRINDER PUMP AND APPURTENANCES

PART 1 - General

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract Documents, including General and Supplementary Conditions, and all related Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The work in this section includes furnishing and installing package wastewater grinder pump units.

PART 2 - PRODUCTS

2.1 PACKAGE GRINDER PUMP STATIONS

- A. Grinder pump assembly shall be pre-manufactured, simplex, semi-positive displacement, 1HP, 1725 rpm, 240 V, 1 phase grinder pump unit, in a 70-gallon HDPE tank. Also, station to include discharge connection, anti-siphon valve and check valve, controls, and alarm/disconnect panel.
- B. Grinder pump assemblies shall be manufactured by Environmental/One Corporation, Model DH071/DR071 or approved equal.
- C. Contractor to supply one (1) spare pump which is capable of being installed in the simplex or duplex station.

2.2 CONCRETE ANTI-FLOATATION SLAB

- A. Subbase bedding for grinder station shall be as detailed on the construction plans.

PART 3 - EXECUTION

3.1 PIPING CONNECTIONS

3.2 ELECTRIC SERVICE AND CONTROLS

- A. Contractor shall install pump station control panels and transformers (supplied by the equipment manufacturer) and supply all wiring for power and alarm system as recommended by the manufacturer.

- B. Electrical wiring and alarm wiring shall be placed in separate (PVC) Schedule 40 conduit in underground installations. Conduits shall be watertight.
- C. All electrical workmanship and material shall meet or exceed the latest National Electric Code (NEC) requirements.

3.3 OPERATION AND MAINTENANCE

- A. Contractor shall furnish all labor and equipment for testing in accordance with manufacturers written instructions and start up training for the grinder stations by a representative of the equipment manufacturer for a minimum of 8 hours excluding travel time.
- B. Contractor shall furnish any spare parts per the equipment manufacturers written recommendation to the Engineer.
- C. Contractor shall furnish six bound copies of pump station operation and maintenance manuals.

END OF SECTION 333101

WATERLINE NOTES - 6" PVC WATERLINE

THE WATER MAIN ALIGNMENT SHALL CONFORM AS CLOSELY TO THE LINES SHOWN ON THE PLANS AS PERMISSIBLE. BENDS AND FITTINGS SHOWN IN THE PLAN PROVIDE A SUGGESTED METHOD OF ACCOMPLISHING THE INTENDED HORIZONTAL AND VERTICAL ALIGNMENT. HOWEVER, THE CONTRACTOR HAS THE OPTION OF USING ALTERNATE FITTINGS TO SATISFY THE ALIGNMENT SHOWN ON THE PLANS. CHANGES IN LINE AND GRADE OBTAINED BY DEFLECTIONS AT PIPE JOINTS SHALL BE NO GREATER THAN RECOMMENDED BY THE MANUFACTURER OF THE WATER PIPE.

THE CONTRACTOR SHALL PROVIDE ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY TO FURNISH AND INSTALL ALL NEW WATER MAINS INCLUDING ALL FITTINGS, BENDS, AND BRANCHES AS SHOWN ON THE PLANS, AS DIRECTED BY THE CITY REPRESENTATIVE. THE COST OF ALL SUCH ITEMS REQUIRED TO INSTALL THE PROPOSED WATERLINE SHALL BE CONSIDERED INCIDENTAL.

MAINTAIN A MINIMUM 18 INCH VERTICAL AND 10 FOOT HORIZONTAL CLEARANCE FROM OUTSIDE OF PIPE TO OUTSIDE OF PIPE BETWEEN WATER LINES AND SEWERS.

CONTRACTOR SHALL COORDINATE ALL WORK WITH THE CITY REPRESENTATIVE AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITIES. WATERLINE SHUTOFFS SHALL BE LIMITED TO A 4 HOUR DURATION UNLESS APPROVED OTHERWISE.

ALL PROPOSED WATERLINES SHALL HAVE A MINIMUM OF 4 FOOT OF COVER.

WATERLINE SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH AWWA C900 OR C905 AND DISINFECTED IN ACCORDANCE WITH AWWA C651.

A MINIMUM OF 35 PSI SHALL BE MAINTAINED TO THE CURB STOP DURING NORMAL OPERATING CONDITIONS.

BOOSTER PUMPS ARE NOT PERMITTED ON SERVICE CONNECTIONS.

WHERE THE WATERLINE CROSSES EXISTING GAS LINES, STORM SEWERS, CULVERTS, SANITARY SEWERS, OR ANY UNDERGROUND CONFLICTS, MAINTAIN A MINIMUM OF 18 INCHES VERTICAL CLEARANCE FROM THE OUTSIDE OF PIPE TO OUTSIDE OF PIPE. WHERE REQUIRED DUE TO THE ELEVATION OF THE EXISTING LINE, THE WATERLINE SHALL BE LOWERED IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS. NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK. THE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE FOR THE WATER LINE. COSTS FOR THIS SHALL INCLUDE ALL CROSSINGS REGARDLESS OF WHETHER THEY ARE SPECIFICALLY CALLED FOR ON THE PLANS OR NOT.

MAINTAIN A MINIMUM HORIZONTAL CLEARANCE OF 2 FEET OUTSIDE OF PIPE TO OUTSIDE OF PIPE WHERE WATERLINE RUNS PARALLEL TO AN EXISTING GAS LINE.

RESTRAIN ALL JOINTS WITHIN 40 FEET OF EACH SIDE OF ALL VALVES, FITTINGS, AND BENDS WITH MECHANICAL JOINT RESTRAINT. WHERE NOT FEASIBLE, PROVIDE CONCRETE REACTION (THRUST) BACKING AS SHOWN ON THE STANDARD DETAILS.

WATER SYSTEM COMPONENTS	
WATER LINE	6" PVC C900
SERVICE LINE	3/4" COPPER/2" PE
SADDLE	FORD
CORP STOP	FORD
GATE VALVE	MULLER
FIRE HYDRANT	WATEROUS PACER WB67 250

CONNECTION TO EXISTING WATERLINE

WHERE THE PLANS PROVIDE FOR A PROPOSED PIPE TO BE CONNECTED TO EXISTING PIPE, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE THE EXISTING PIPE BOTH AS TO LINE AND GRADE BEFORE BEGINNING TO LAY THE PROPOSED PIPE. THE CONTRACTOR SHALL PROVIDE THE NECESSARY FITTINGS AND ADAPTORS TO MAKE THE CONNECTION FOR ALL EXISTING AND PROVIDE FOR HORIZONTAL AND VERTICAL ALIGNMENT IN CLOSE CONFORMITY TO THE LINES AND GRADES SHOWN ON THE PLANS. CONNECTIONS BETWEEN EXISTING AND NEW PIPE SHALL BE PERFORMED WITH RESTRAINED COUPLING DESIGNED FOR THE PIPE MATERIAL CONNECTING TO.

FIELD ADJUSTMENTS

LOCATION OF WATER SERVICES, VALVES, AND HYDRANTS MAY BE FIELD ADJUSTED AS DIRECTED AND/OR APPROVED BY THE CITY OF TORONTO.

3/4" COPPER SERVICE BRANCH

THIS BID ITEM INCLUDES ALL MATERIALS, FITTINGS, VALVES, SUPPORTS, DISINFECTION AND TESTING, EXCAVATION, SEEDING AND MULCHING, DIRECTIONAL DRILLING/BORING (IF APPLICABLE), LABOR, SADDLES, CORPORATION STOPS, INSTALL/REMOVAL/ABANDONING OF EXISTING VALVES AND VALVE BOXES, AND ANY ADDITIONAL INCIDENTAL ITEMS NEEDED FOR COMPLETE INSTALLATION.

CONTRACTOR IS TO COORDINATE WITH EACH HOME OWNER TO INSTALL THE RESPECTIVE 3/4" COPPER SERVICE LINE AND PLACE A CURB STOP AT THE RIGHT-OF-WAY LINE ALONG PRIVATE PROPERTY. THE HOME OWNER WILL NEED TO EXTEND FROM THE CURB STOP TO THE HOUSE PLUMBING.

THE SERVICE LINES ARE SHOWN ON SHEET 8 AND 13 FOR APPROXIMATE LOCATION. THIS WORK IS INCIDENTAL TO THE WATER MAIN AND THE CONTRACTOR WILL NOT RECEIVE ANY ADDITIONAL COMPENSATION FOR THIS WORK.

UTILITY POLES

CONTRACTOR SHALL CONTACT AND COORDINATE WITH UTILITY OWNER FOR TEMPORARY SUPPORT OR RELOCATION OF EXISTING UTILITY POLE CLOSER THEN 7 FEET TO THE PROPOSED TRENCH.

GAS LINE

LOCATION OF ALL GAS LINES SHOWN ON THE PLANS ARE TO BE CONSIDERED APPROXIMATE AND THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY LOCATION OF GAS LINES DURING CONSTRUCTION.

GAS LINES ARE ASSUMED TO HAVE 3 FOOT COVER.

ANY RELOCATION OF EXISTING GAS LINES OR GAS SERVICE LINES ARE TO BE RELOCATED BY THE RESPECTIVE OWNER OF SUCH UTILITY.

SANITARY SEWER

WHERE SHOWN ON THE PLANS THE CONTRACTOR IS TO INSTALL THE SANITARY PUMP STATIONS AND FORCE MAINS. ADDITIONALLY THE CONTRACTOR WILL PUMP OUT THE EXISTING SEPTIC TANKS, CRUSH AND FILL SAID SEPTIC TANKS PER JEFFERSON COUNTY HEALTH DEPARTMENT REQUIREMENTS, AND CONNECT THE HOUSE PLUMBING TO THE NEWLY INSTALLED GRINDER PUMP STATION.

PROHIBITED CONSTRUCTION ACTIVITIES

CLOSING OFF OR OBSTRUCTING CLEAR ACCESS:
 - TO EMERGENCY VEHICLES AND FIRE PROTECTION EQUIPMENT
 - TO VEHICLES TO DRIVEWAYS OUTSIDE OF BUSINESS HOURS
 - TO ANY PUBLIC ALLEY OR ROADWAY WITHOUT PRIOR CONSENT OF APPROPRIATE OFFICIALS AND ENGINEERS

LOCATING SOIL STOCKPILES OR DISPOSING OF SOIL NEAR OR IN ENVIRONMENTALLY SENSITIVE AREAS SUCH AS FLOOD PLAINS, WATER BODIES, WETLANDS, OR DRAINAGE COURSES THERETO. EVEN WITH THE PERMISSION OF THE PROPERTY OWNERS.

DISPOSAL OF DEBRIS, WASTE, OR SOIL IN A WATER BODY, WETLAND, FLOOD PLAIN, DRAINAGE COURSE, OR UNSPECIFIED LOCATION.

DAMAGING VEGETATION OUTSIDE THE DESIGNATED CONSTRUCTION AREA AND EASEMENTS BY UNNECESSARY, CAPRICIOUS, OR IRRESPONSIBLE OPERATION OF EQUIPMENT.

DISCHARGING RUNOFF AND PUMPING WATER FROM TRENCHES OR OTHER EXCAVATION INTO ANY WATER BODIES, WETLANDS, STORM SEWER, OR DRAINAGE COURSES LEADING THERETO WITHOUT PROPERLY FILTERING OR SETTLING TO REMOVE SEDIMENT PRIOR TO RELEASE FROM THE DISTURBED AREAS.

RELEASING POLLUTANTS SUCH AS FUELS, LUBRICANTS, BITUMINOUS MATERIALS, CHEMICALS, DRILLING FLUIDS, SANITARY SEWER DISCHARGE OR OTHER HARMFUL WASTE IN A WATER WELL SOURCE WATER PROTECTION AREA INTO OR ALONG STREAMS, WETLANDS, WATER BODIES OR DRAINAGE COURSES.

OPEN BURNING OF DEBRIS.

PARKING OF MACHINERY OR VEHICLES, STORING FUEL, OR LUBRICANTS, LAYING DOWN COMPONENTS, AND STOCKPILING SOIL OR CONSTRUCTION MATERIAL ON PUBLIC OR PRIVATE PROPERTY NOT IDENTIFIED BY THE ENGINEER OR CITY REPRESENTATIVE FOR SUCH PURPOSES ON A SITE MAP IN THE PLAN SHEETS

RUNNING WELL POINT OR OR PUMP DISCHARGE LINES THROUGH PRIVATE PROPERTY OR PUBLIC PROPERTY AND RIGHTS-OF-WAY WITHOUT THE WRITTEN PERMISSION OF THE PROPERTY OWNER AND THE CONSENT OF THE ENGINEER, OR THE CITY REPRESENTATIVE.

SANITARY SEWER

WHERE SHOWN ON THE PLANS THE CONTRACTOR IS TO INSTALL THE SANITARY PUMP STATIONS AND FORCE MAINS. ADDITIONALLY THE CONTRACTOR WILL PUMP OUT THE EXISTING SEPTIC TANKS, CRUSH AND FILL SAID SEPTIC TANKS PER JEFFERSON COUNTY HEALTH DEPARTMENT REQUIREMENTS, AND CONNECT THE HOUSE PLUMBING TO THE NEWLY INSTALLED GRINDER PUMP STATION.

ITEM SPECIAL - MAILBOX SUPPORT

THIS WORK SHALL CONSIST OF FURNISHING AND ERECTING MAILBOX SUPPORTS AND ANY ASSOCIATED MOUNTING HARDWARE IN ACCORDANCE WITH PLAN DETAILS, AND ATTACHING AN OWNER-SUPPLIED MAILBOX AT LOCATIONS SPECIFIED IN THE PLAN, OR OTHERWISE ESTABLISHED BY THE ENGINEER.

WOOD POSTS SHALL BE NOMINAL 4 INCHES BY 4 INCHES SQUARE OR 4.5 INCHES DIAMETER ROUND, AND CONFORM TO 710.14.

STEEL POSTS SHALL BE NOMINAL PIPE SIZE 2 INCHES I.D., AND CONFORM TO AASHTO M 181.

ALL HARDWARE INCLUDING BUT NOT LIMITED TO PLATES, SCREWS, BOLTS, AND ETC. SHALL BE COMMERCIAL-GRADE GALVANIZED STEEL.

POSTS SHALL BE SET PER THE FIRST PARAGRAPH OF 606.03, AND SHALL IN NO INSTANCE BE ENCASED IN CONCRETE.

SUPPORT HARDWARE SHALL ACCOMMODATE EITHER A SINGLE OR A DOUBLE MAILBOX INSTALLATION, AND NO MORE THAN TWO BOXES MAY BE MOUNTED ON A SINGLE POST.

THE MAILBOX SHALL BE SECURELY AND NEATLY ATTACHED BY THE CONTRACTOR TO THE NEW SUPPORT. THE CONTRACTOR SHALL FURNISH ALL NECESSARY ATTACHMENT HARDWARE (NUTS, BOLTS, PLATES, SPACERS, AND WASHERS) AS NECESSARY TO ACCOMMODATE THE COMPLETE INSTALLATION.

IN THE ABSENCE OF A NEW BOX SUPPLIED BY THE OWNER, THE CONTRACTOR SHALL SALVAGE THE EXISTING BOX AND PLACE IT ON THE NEW SUPPORT. DUE CARE SHALL BE EXERCISED IN SUCH AN OPERATION, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING ANY BOX DAMAGED BY IMPROPER HANDLING ON HIS PART, AS JUDGED AND DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE LOCAL POST MASTER REGARDING THE TIMING OF THE MOVEMENT OF ANY MAILBOX TO A NEW LOCATION.

PAYMENT UNDER THIS ITEM SHALL BE LIMITED TO FINAL PERMANENT INSTALLATIONS. TEMPORARY INSTALLATIONS SHALL BE IN ACCORDANCE WITH 107.10. HOWEVER, THE SAME MATERIAL AND SIZE LIMITATIONS AS FOR PERMANENT INSTALLATIONS SHALL APPLY.

MAILBOX SUPPORTS, COMPLETE IN PLACE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH, FOR ITEM SPECIAL MAILBOX SUPPORT SYSTEM, (SINGLE) (DOUBLE).

ITEM	ITEM EXT	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
ROADWAY					
201	11000	LS		CLEARING AND GRUBBING	
202	23000	176	SY	PAVEMENT REMOVED	
202	53100	3	EACH	MAILBOX REMOVED	
203	10000	7,171	CY	EXCAVATION	
203	20000	9,974	CY	EMBANKMENT	
203	35110	362	CY	GRANULAR MATERIAL, TYPE B	3
204	10000	4,348	SY	SUBGRADE COMPACTION	
204	13000	362	CY	EXCAVATION OF SUBGRADE	3
204	45000	2	HOUR	PROOF ROLLING	3
204	50000	1,087	SY	GEOTEXTILE FABRIC	3
608	52000	145	SF	CURB RAMP	
609	12000	3,310	FT	COMBINATION CURB AND GUTTER, TYPE 2	
609	26000	88	FT	CURB, TYPE 6	
SPECIAL	69050100	3	EACH	MAILBOX SUPPORT SYSTEM, SINGLE	4
EROSION CONTROL					
659	00300	1,394	CY	TOPSOIL	
659	00500	12,553	SY	SEEDING AND MULCHING, CLASS 1	
659	14000	628	SY	REPAIR SEEDING AND MULCHING	
659	15000	628	SY	INTER-SEEDING	
659	20000	1.7	TON	COMMERCIAL FERTILIZER	
659	31000	2.6	ACRE	LIME	
659	35000	68	MGAL	WATER	
832	15000	LS		STORM WATER POLLUTION PREVENTION PLAN	
832	30000	15,000	EACH	EROSION CONTROL	
895	10040	1	EACH	MANUFACTURED WATER QUALITY STRUCTURE, TYPE 4, IN 96" MANHOLE	
DRAINAGE					
601	32200	41	CY	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER	
602	20000	2	CY	CONCRETE MASONRY	
605	14000	3,103	FT	6" BASE PIPE UNDERDRAINS	
611	00510	80	FT	6" CONDUIT, TYPE F FOR UNDERDRAIN OUTLETS	
611	01100	14	FT	6" CONDUIT, TYPE C	
611	04400	879	FT	12" CONDUIT, TYPE B	
611	04600	103	FT	12" CONDUIT, TYPE C	
611	07400	782	FT	18" CONDUIT, TYPE B	
611	07600	39	FT	18" CONDUIT, TYPE C	
611	10600	57	FT	24" CONDUIT, TYPE C	
611	99574	2	EACH	MANHOLE, NO. 3	
611	98150	16	EACH	CATCH BASIN, NO. 3	
611	98470	1	EACH	CATCH BASIN, NO. 2-2B	
PAVEMENT					
301	46000	571	CY	ASPHALT CONCRETE BASE, PG64-22	
304	20000	411	CY	AGGREGATE BASE	
407	20000	548	GAL	NON-TRACKING TACK COAT	
441	50000	302	CY	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22	
441	50300	168	CY	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)	
452	10050	22	SY	6" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC MS	
452	13040	172	SY	9" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC MS	

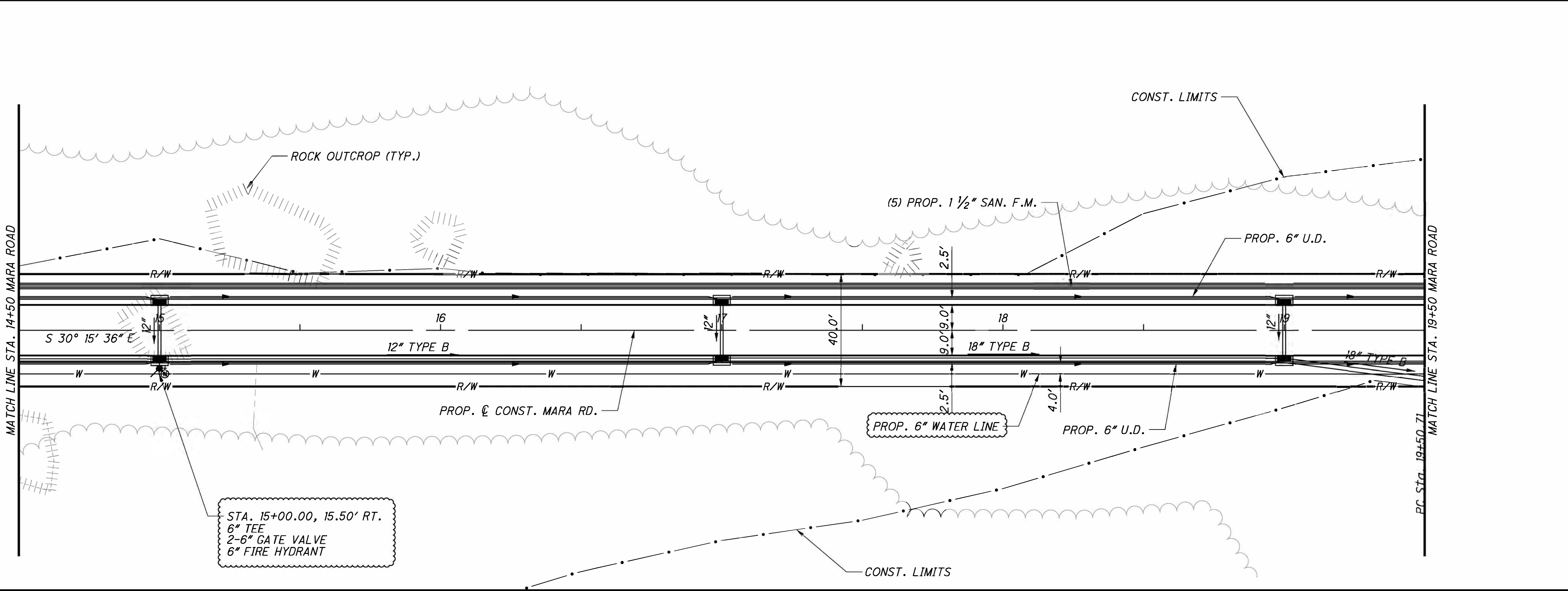
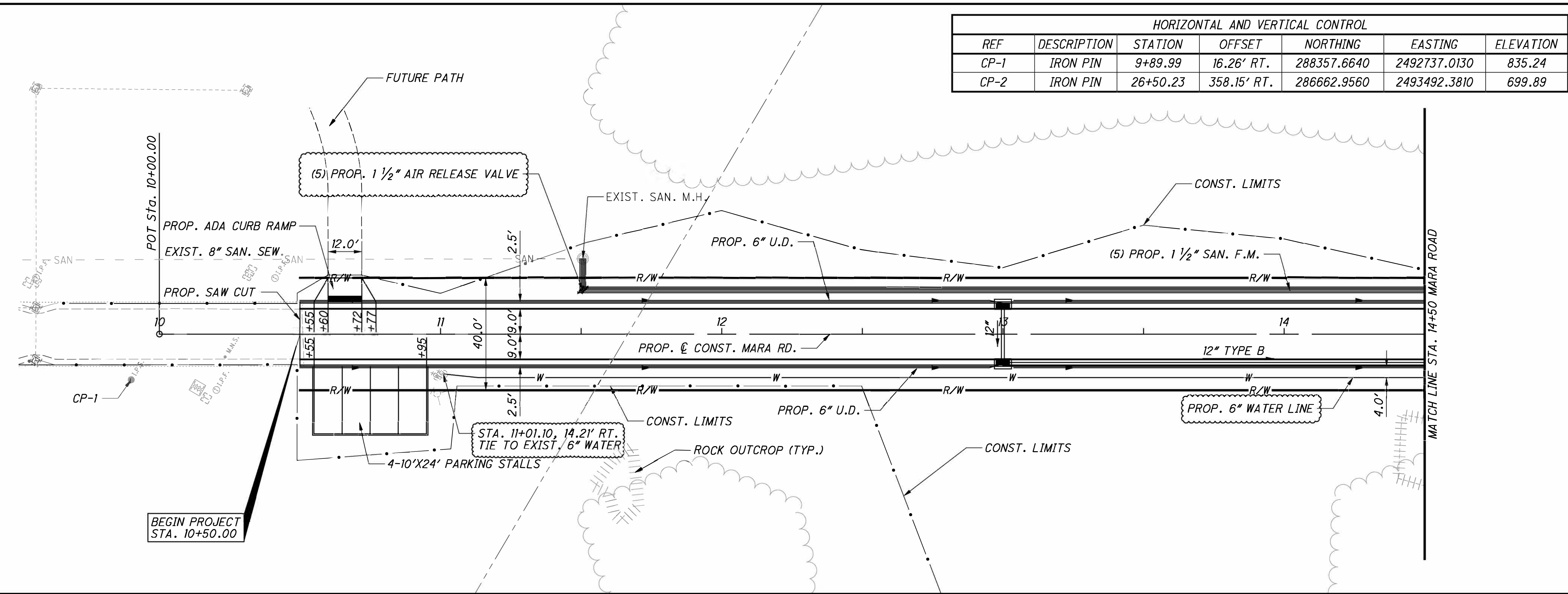
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GENERAL SUMMARY

MARA ROAD

ITEM	ITEM EXT	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
SANITARY SEWER					
SPECIAL	61197910	LS		SANITARY SEWER GRINDER PUMPS	
SPECIAL	63820736	5	EACH	1 1/2" AIR RELEASE VALVE	
611	97400	7,490	FT	CONDUIT, MISC.: 1-1/2" CONDUIT, TYPE C, 707.34	
202	62700	5	EACH	SEPTIC TANK REMOVED, CLEANING AND DEMOLISHING	
WATER WORK					
638	01130	1,647	FT	6" WATER MAIN POLYVINYL CHLORIDE PIPE AND FITTINGS, AWWA C900, DR18	
638	07800	10	EACH	6" GATE VALVE AND VALVE BOX	
638	10200	4	EACH	6" FIRE HYDRANT	
TRAFFIC CONTROL					
630	08510	15.25	FT	STREET NAME SIGN SUPPORT, NO. 2 POST	
630	08600	1	EACH	SIGN POST REFLECTOR	
630	80100	6.25	SF	SIGN, FLAT SHEET	
630	80500	2	EACH	SIGN, DOUBLE FACED, STREET NAME	3
644	00500	9	FT	STOP LINE	
644	01200	30	FT	PARKING LOT STALL MARKING	
INCIDENTALS					
614	11000	LS		MAINTAINING TRAFFIC	
623	10000	LS		CONSTRUCTION LAYOUT STAKES AND SURVEYING	
624	10000	LS		MOBILIZATION	

MARA ROAD	GENERAL SUMMARY					
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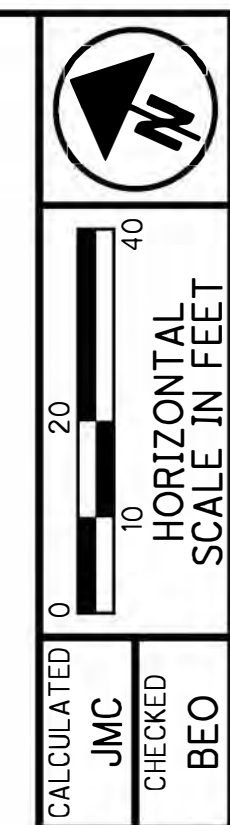
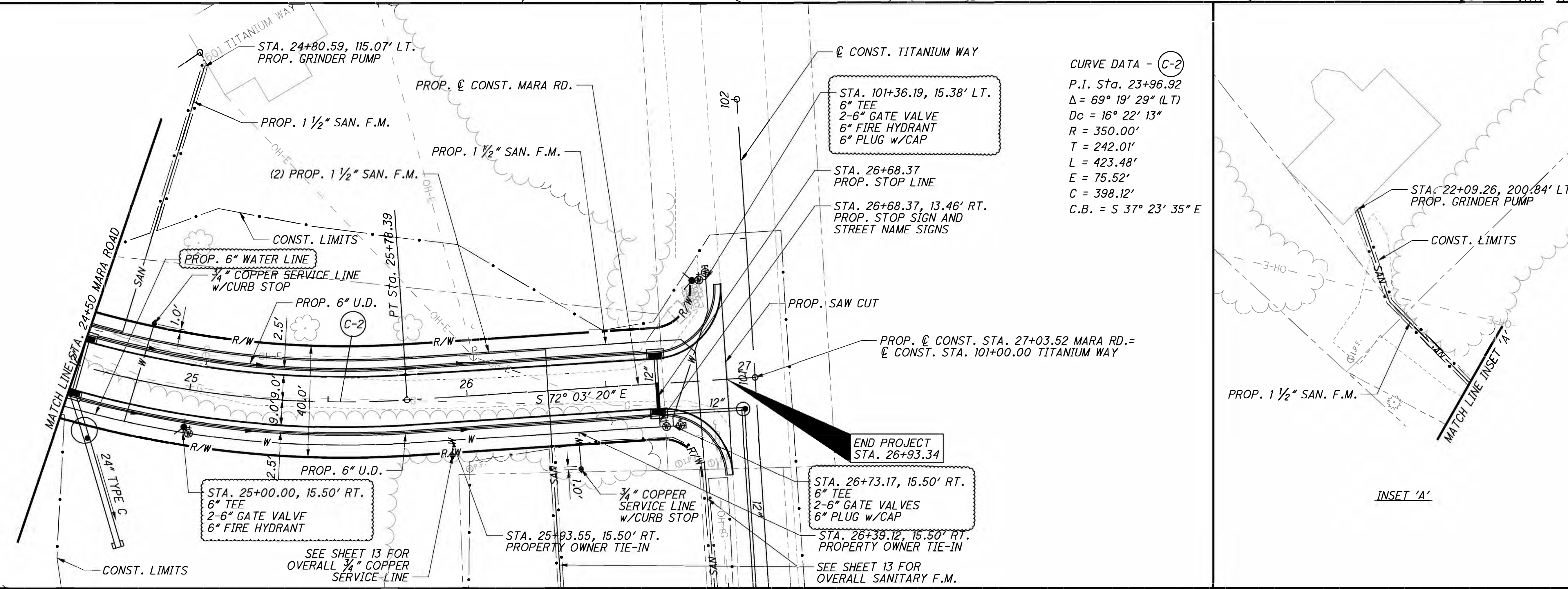
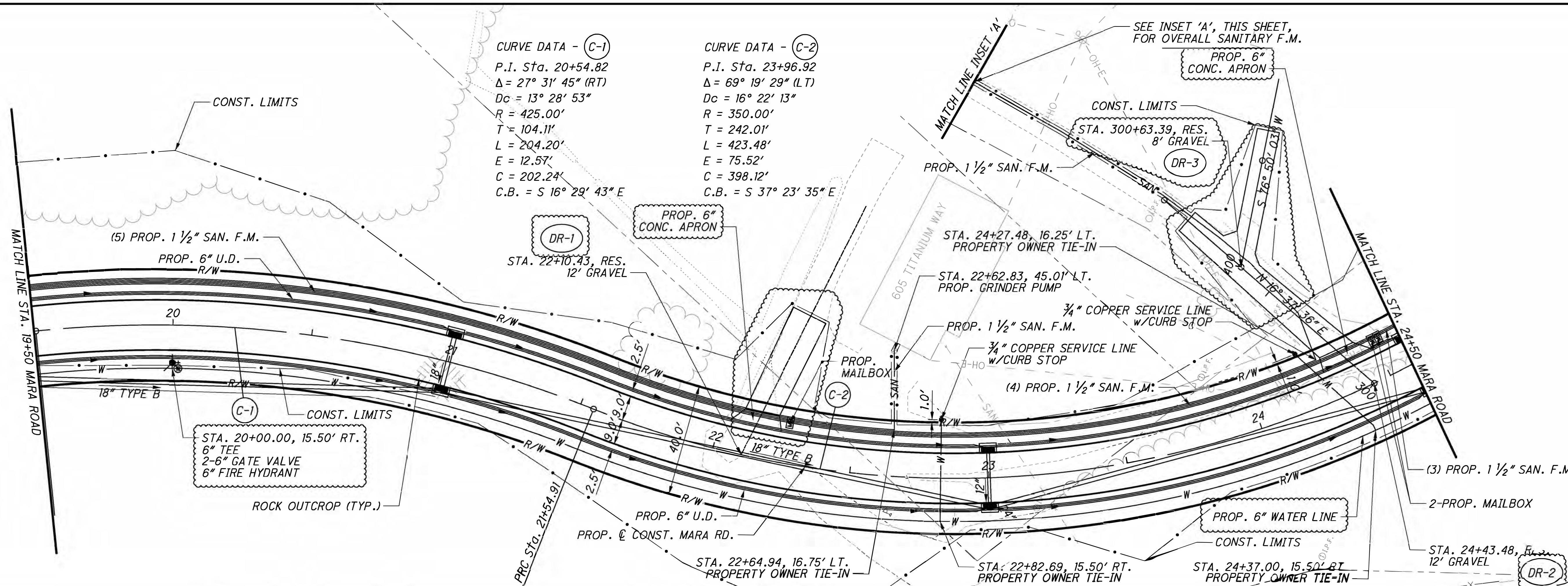
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PLAN/PLAN - MARA ROAD
STA. 10+00.00 TO STA. 19+50.00

MARA ROAD

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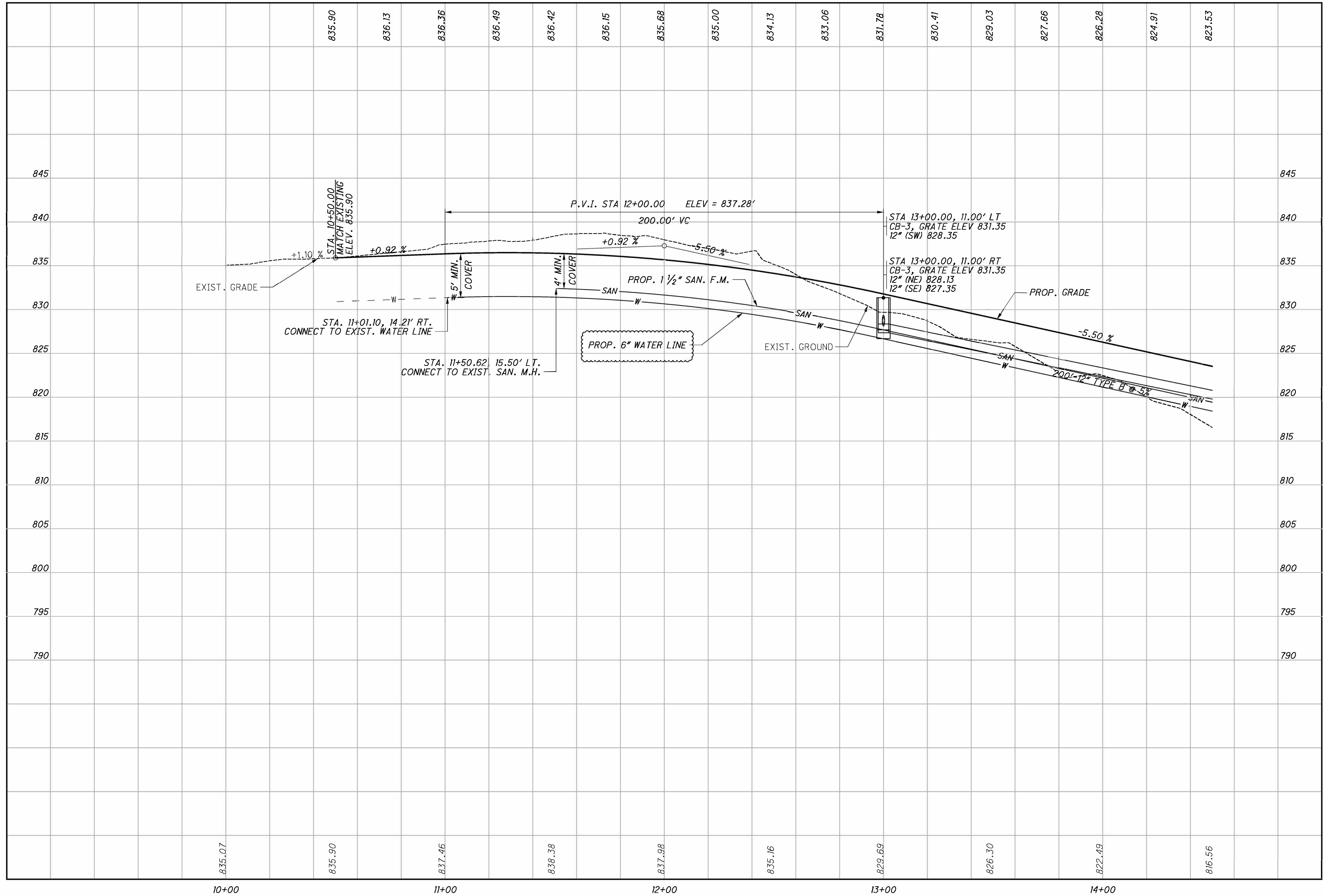


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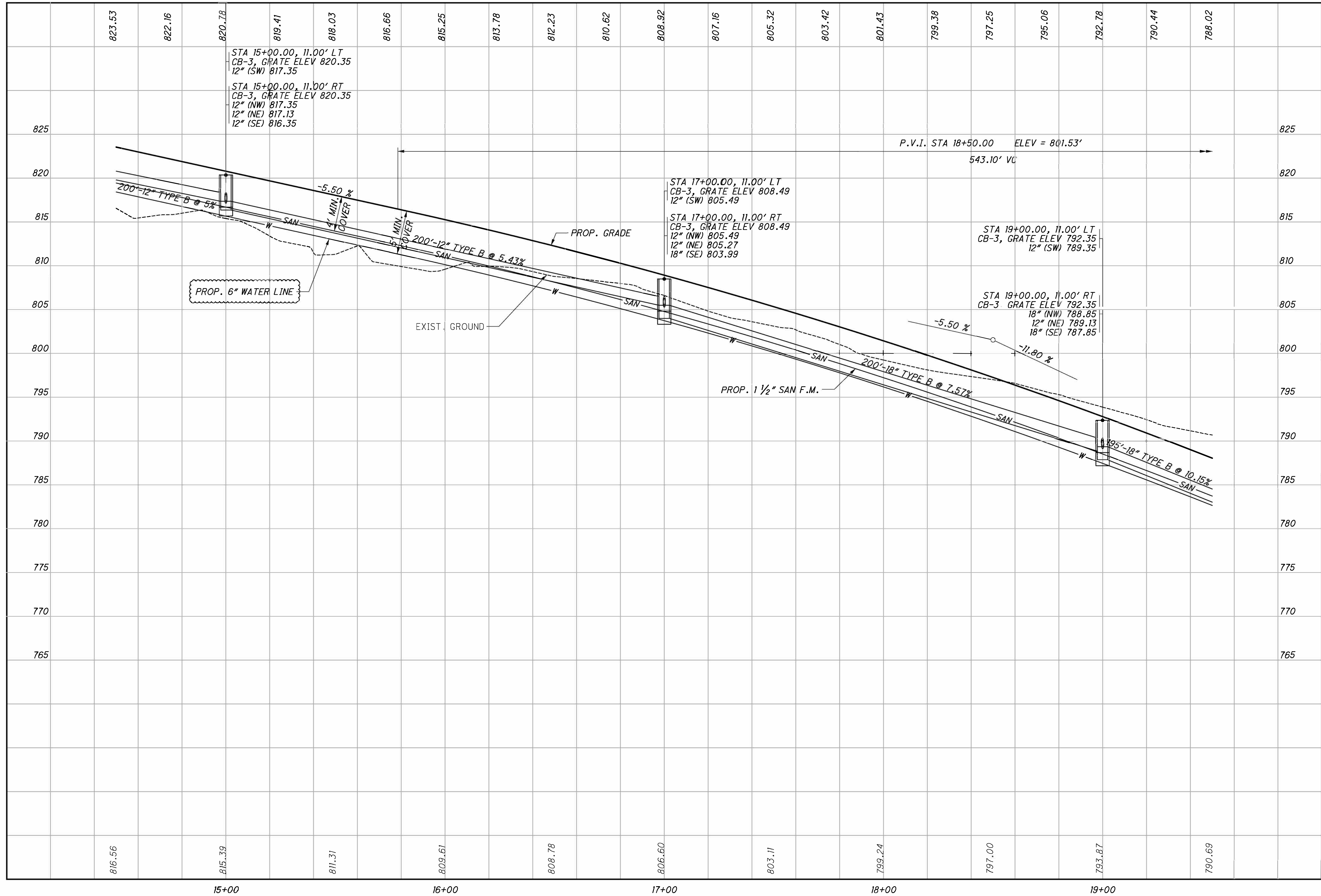


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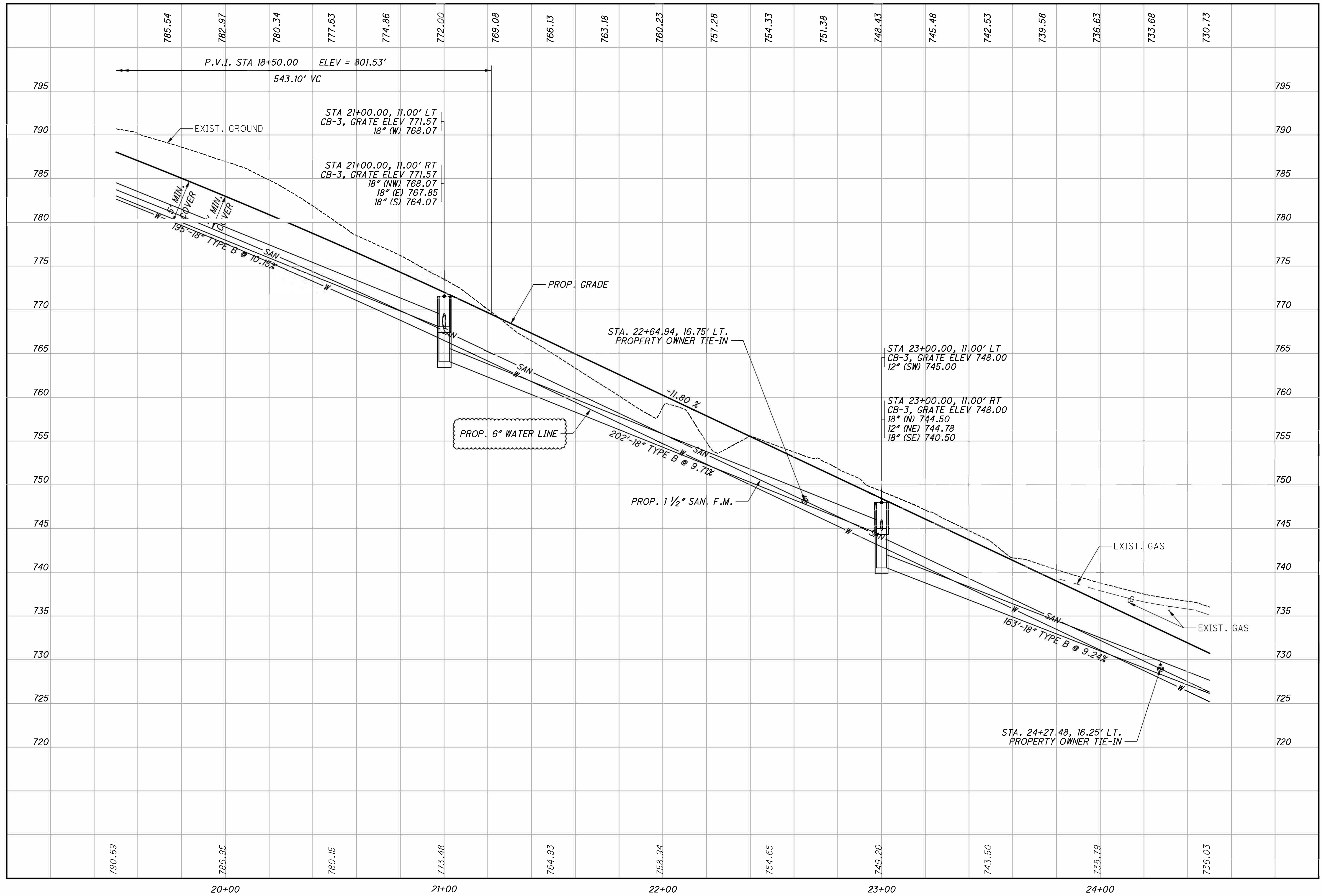
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MARA ROAD

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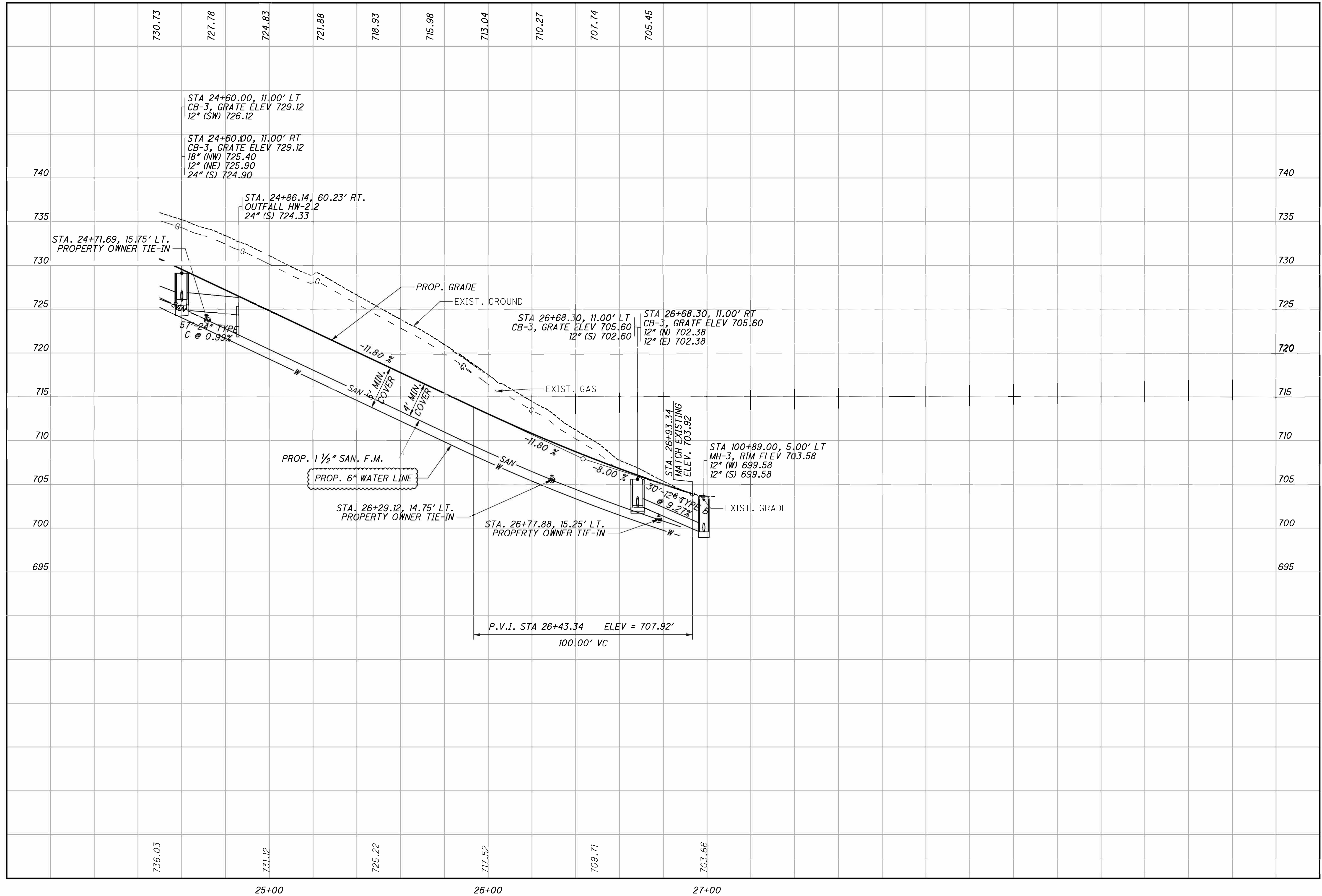


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MARA ROAD

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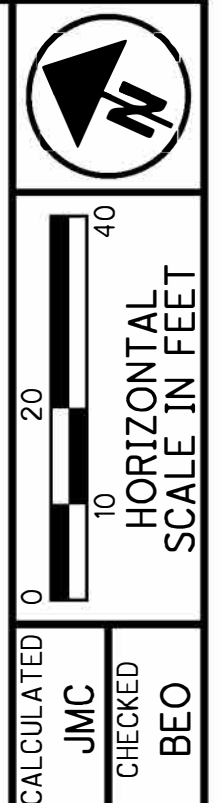
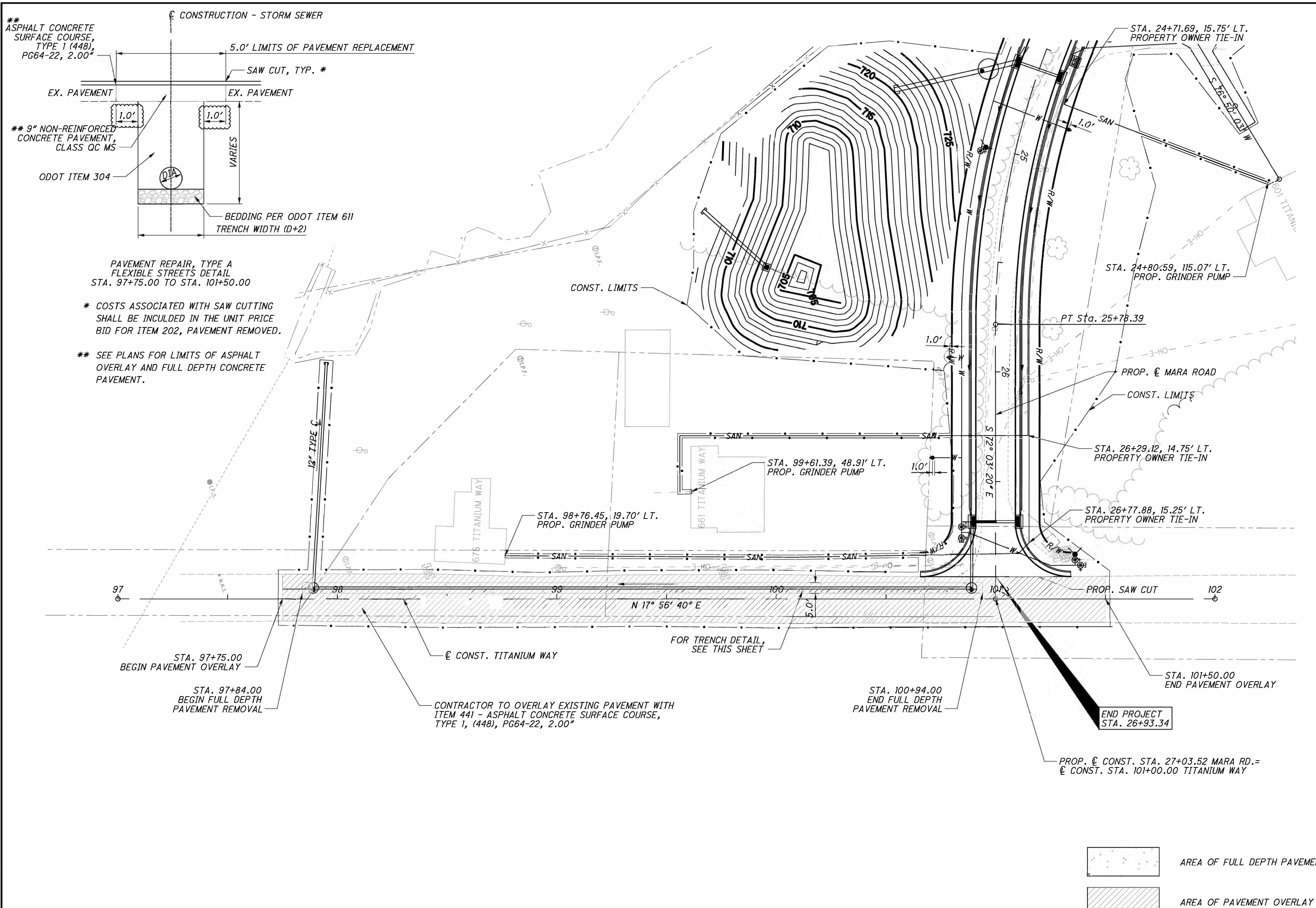
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**PROFILE - MARA ROAD
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MARA ROAD

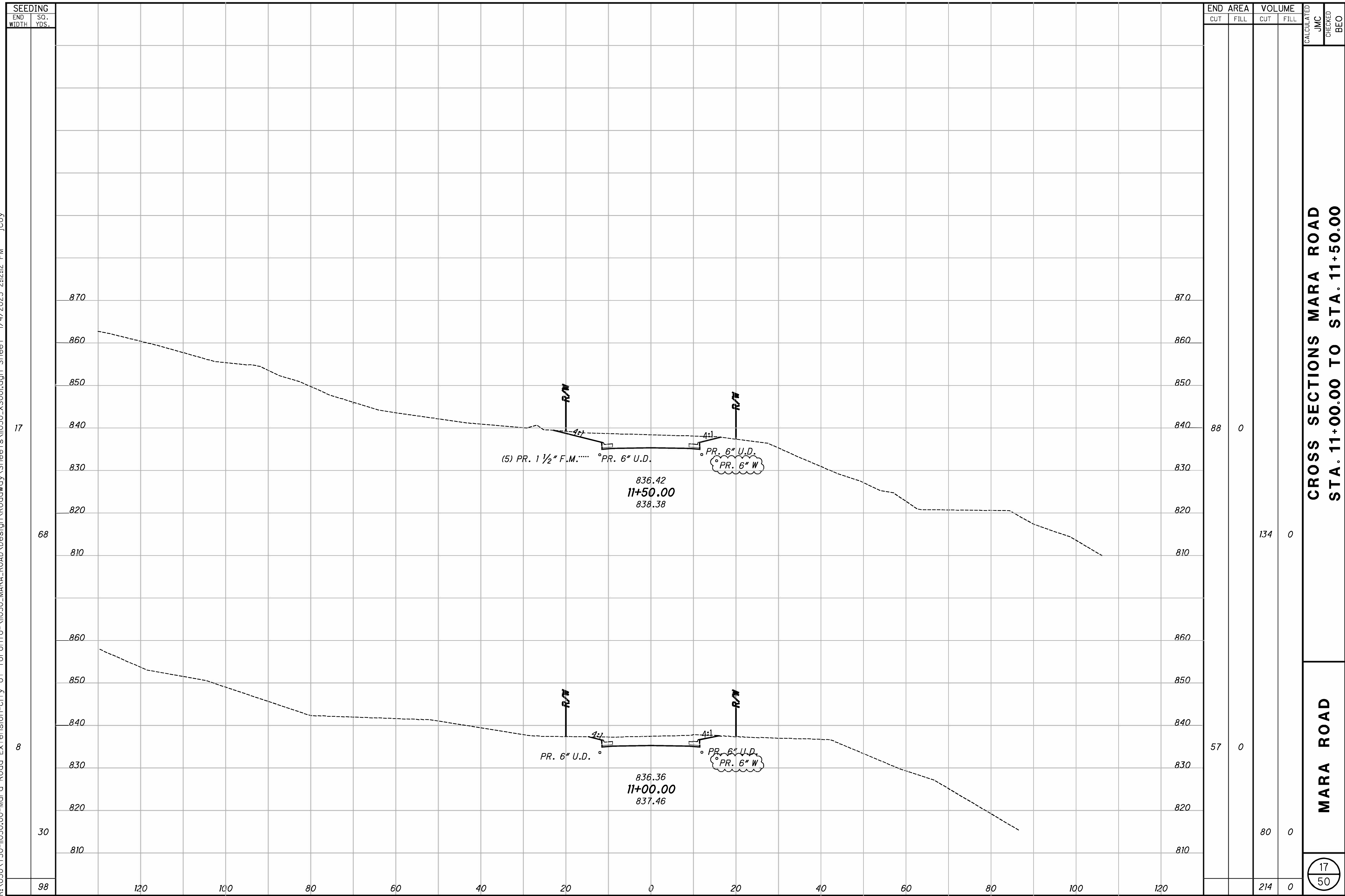
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PLAN VIEW - TITANIUM WAY
STA. 97+00.00 TO STA. 102+00.00

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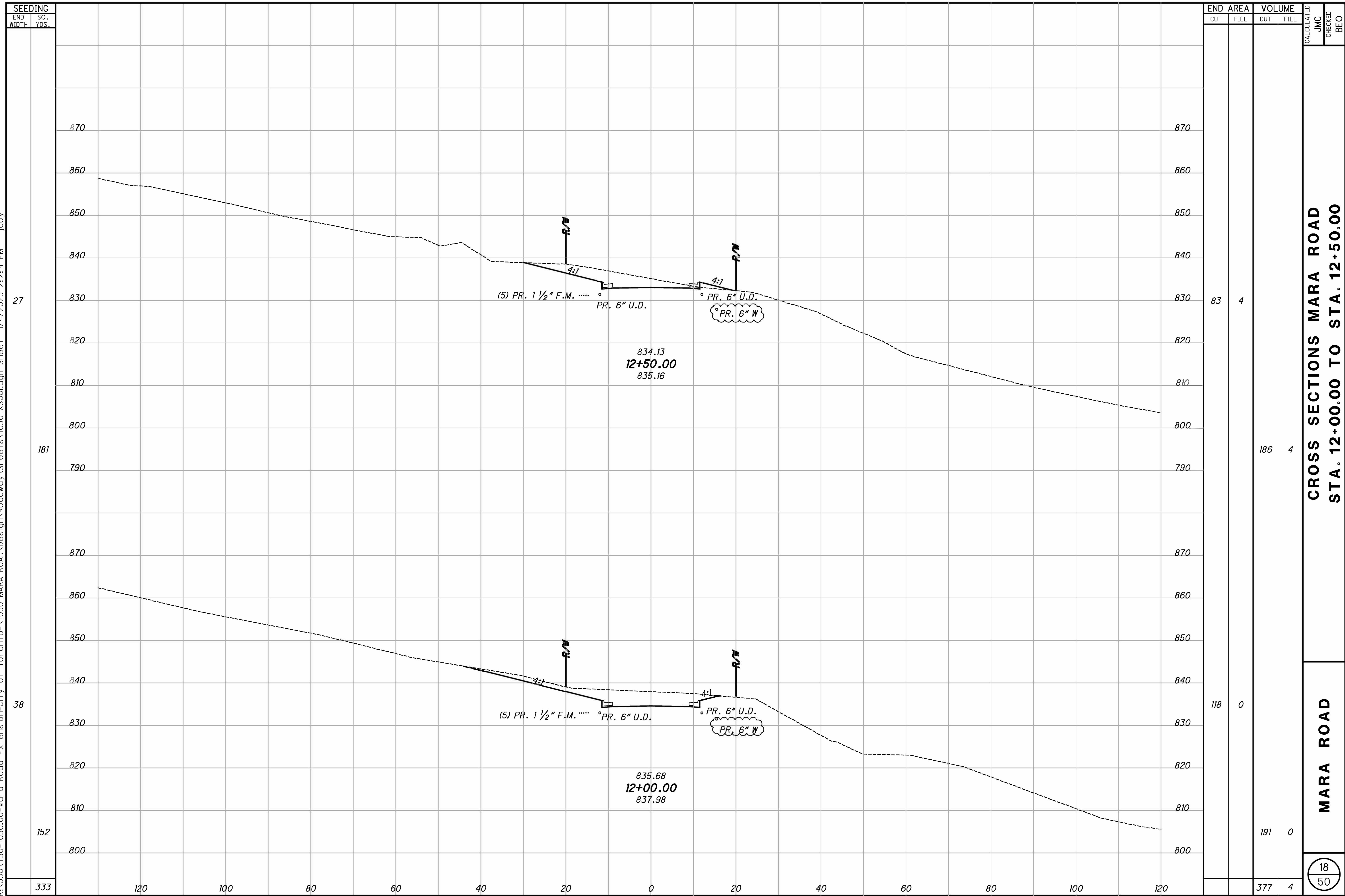


**CROSS SECTIONS MARA ROAD
STA. 11+00.00 TO STA. 11+50.00**

MARA ROAD

17
50

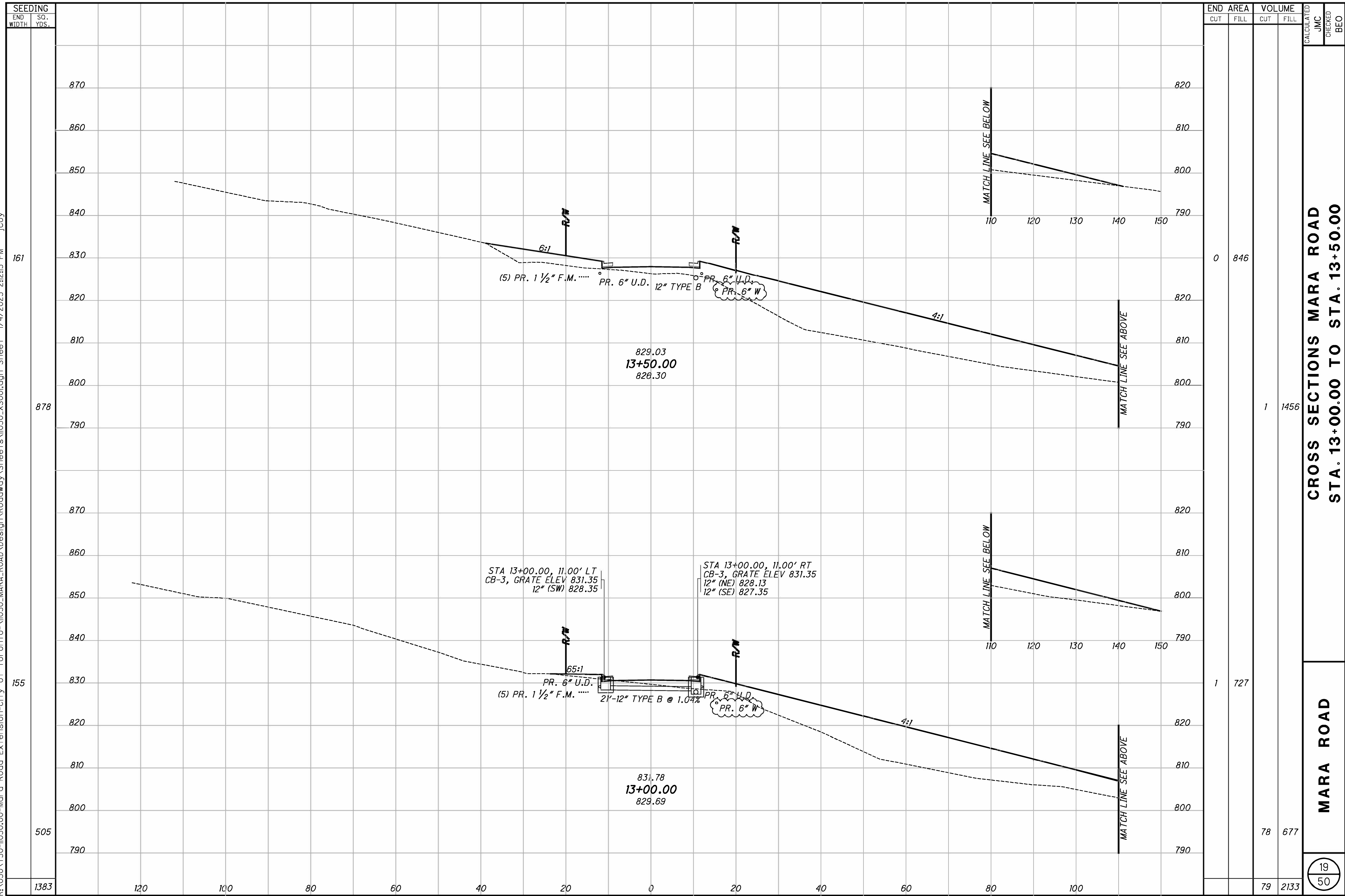
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333	120	100	80	60	40	20	0	20	40	60	80	100	120
27													
181													
38													
152													
377													

83	4	186	4
118	0	191	0
377	4		

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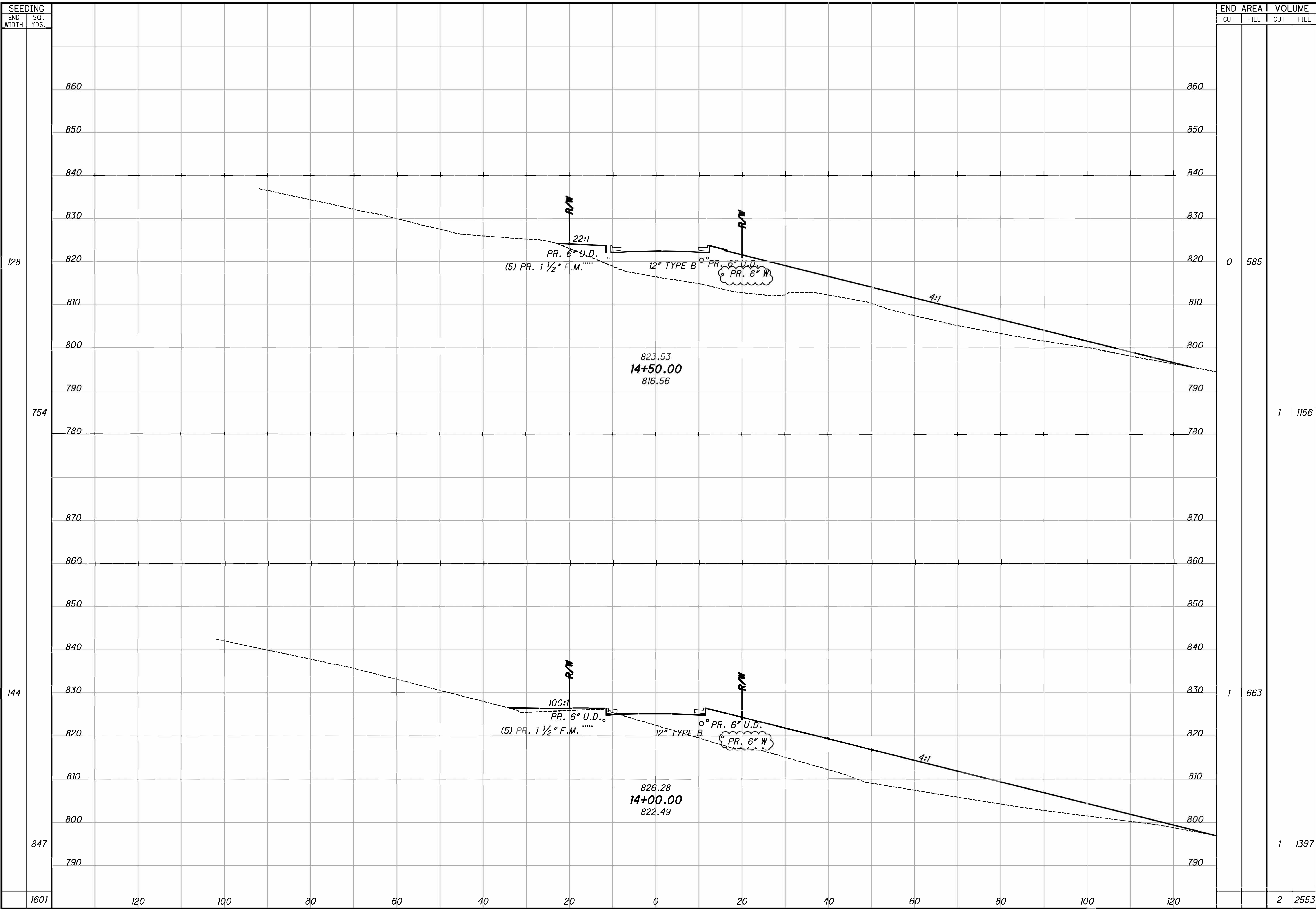
SEEDING	
END WIDTH	SO. YDS.
1383	
505	
155	
878	
161	

END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
0	846				
1		1456			
1	727				
		78	677		
		79	2133		

**CROSS SECTIONS MARA ROAD
STA. 13+00.00 TO STA. 13+50.00**

MARA ROAD

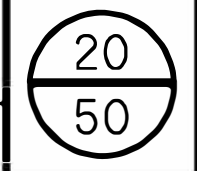
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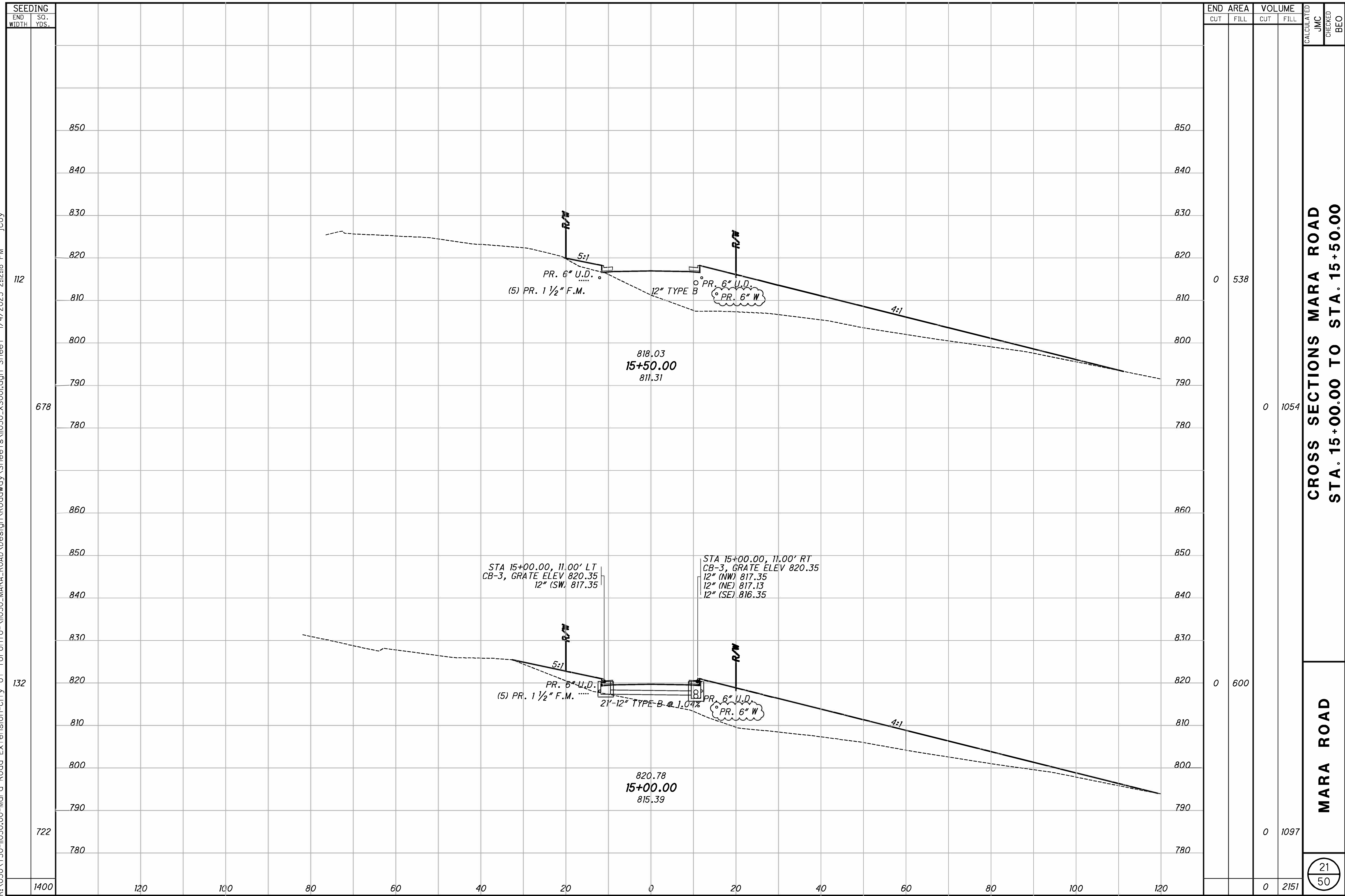
SEEDING		END AREA		VOLUME		CALCULATED	
END WIDTH	SO. YDS.	CUT	FILL	CUT	FILL	JMC	BEO
128		0	585				
754				1	1156		
144		1	663				
847				1	1397		
1601				2	2553		

**CROSS SECTIONS MARA ROAD
STA. 14+00.00 TO STA. 14+50.00**

MARA ROAD



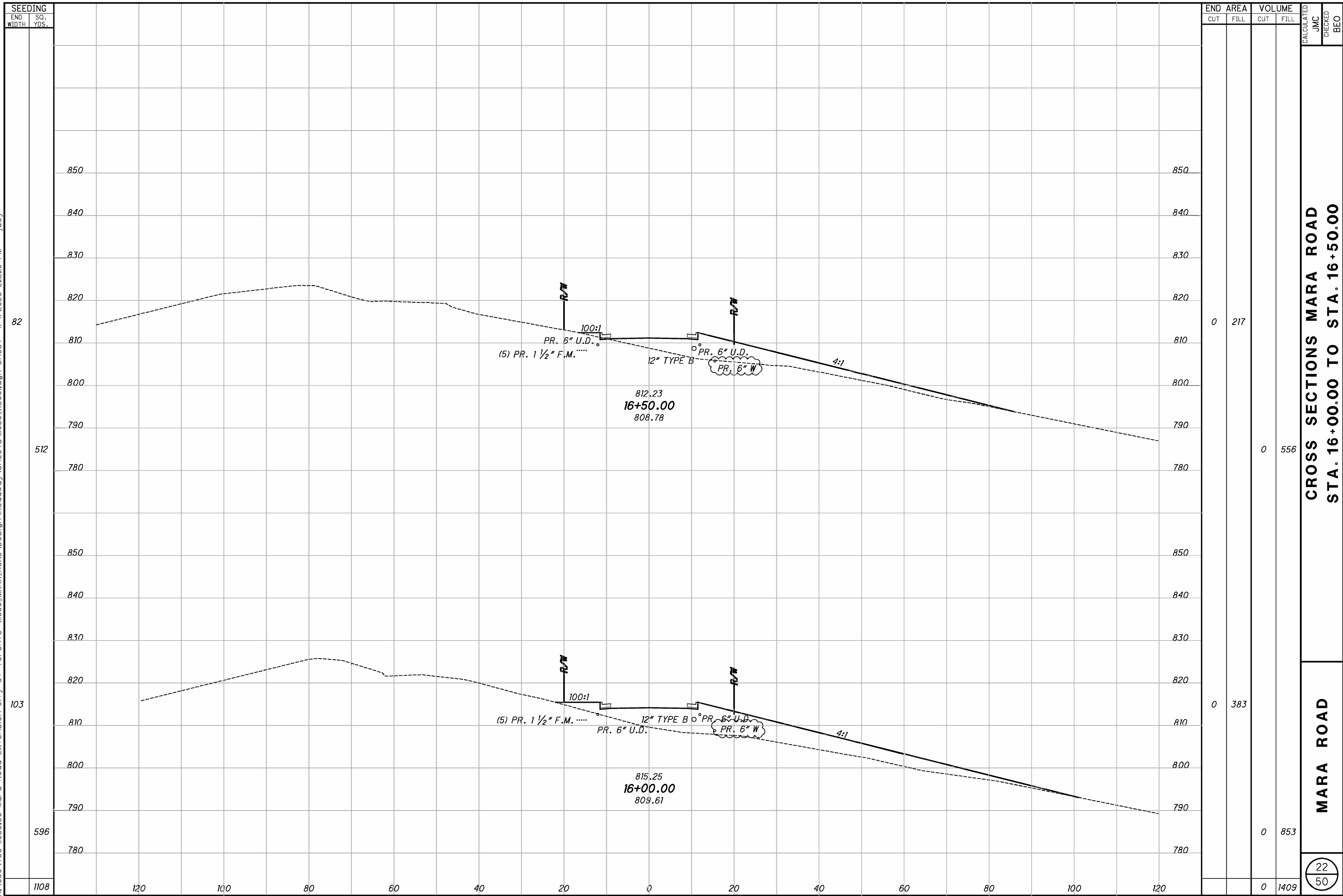
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**CROSS SECTIONS MARA ROAD
STA. 15+00.00 TO STA. 15+50.00**

MARA ROAD

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SEEDING	
END WIDTH	SO. YDS.
1108	
596	
103	
512	
82	

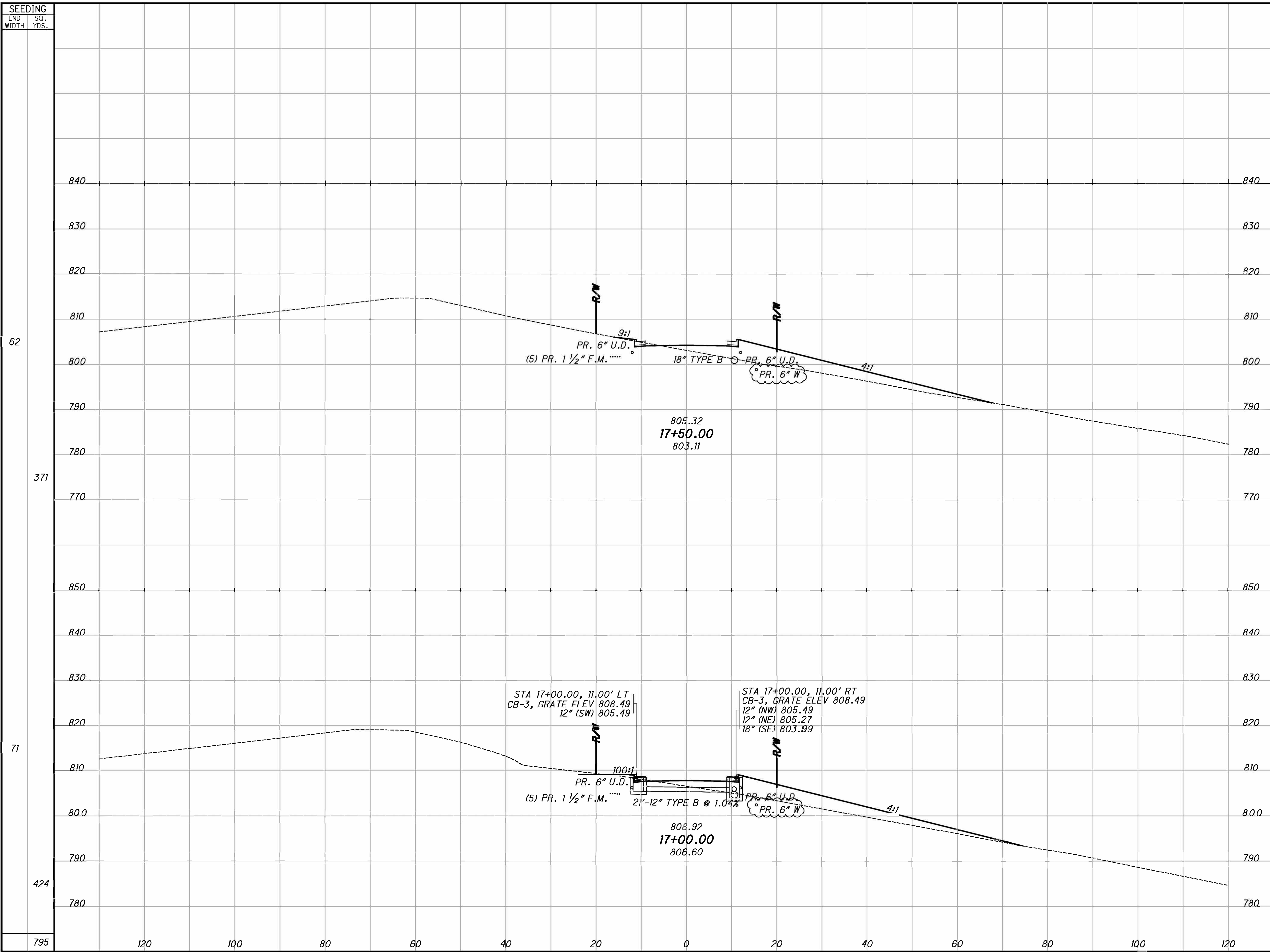
END AREA		VOLUME		CALCULATED	JMC	CHECKED	BEO
CUT	FILL	CUT	FILL				
0	217	0	556				
0	383	0	853				
0		0	1409				

**CROSS SECTIONS MARA ROAD
STA. 16+00.00 TO STA. 16+50.00**

MARA ROAD

22
50

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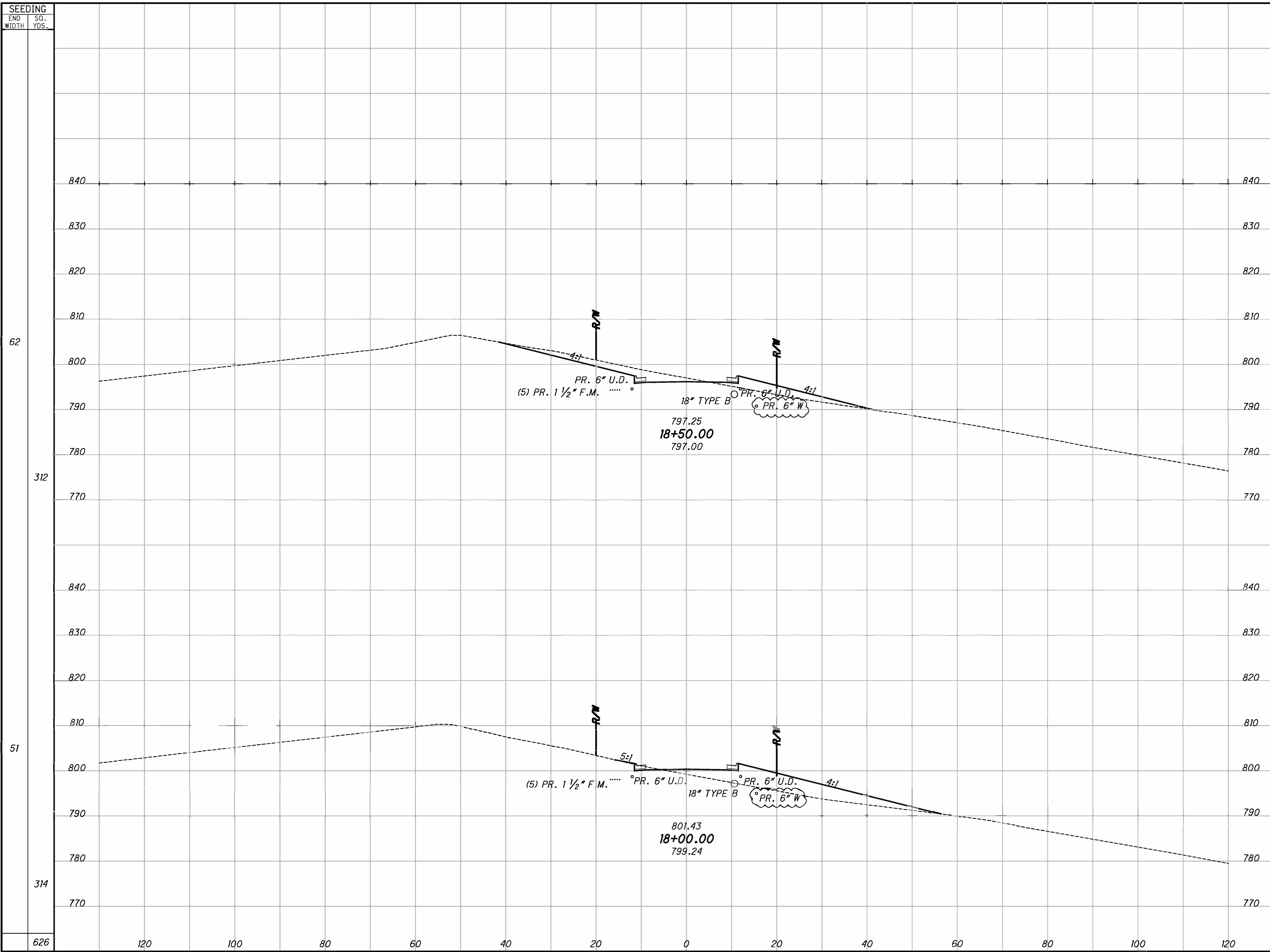
SEEDING		END AREA		VOLUME		CALCULATED	
END WIDTH	SO. YDS.	CUT	FILL	CUT	FILL	JMC	BEO
62		3	153				
371				5	290		
71		2	160				
424				2	349		
795		7	639				

**CROSS SECTIONS MARA ROAD
STA. 17+00.00 TO STA. 17+50.00**

MARA ROAD

23
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SEEDING	END AREA		VOLUME	
	CUT	FILL	CUT	FILL
62	55	46	55	175
312	4	143	6	274
626			61	449

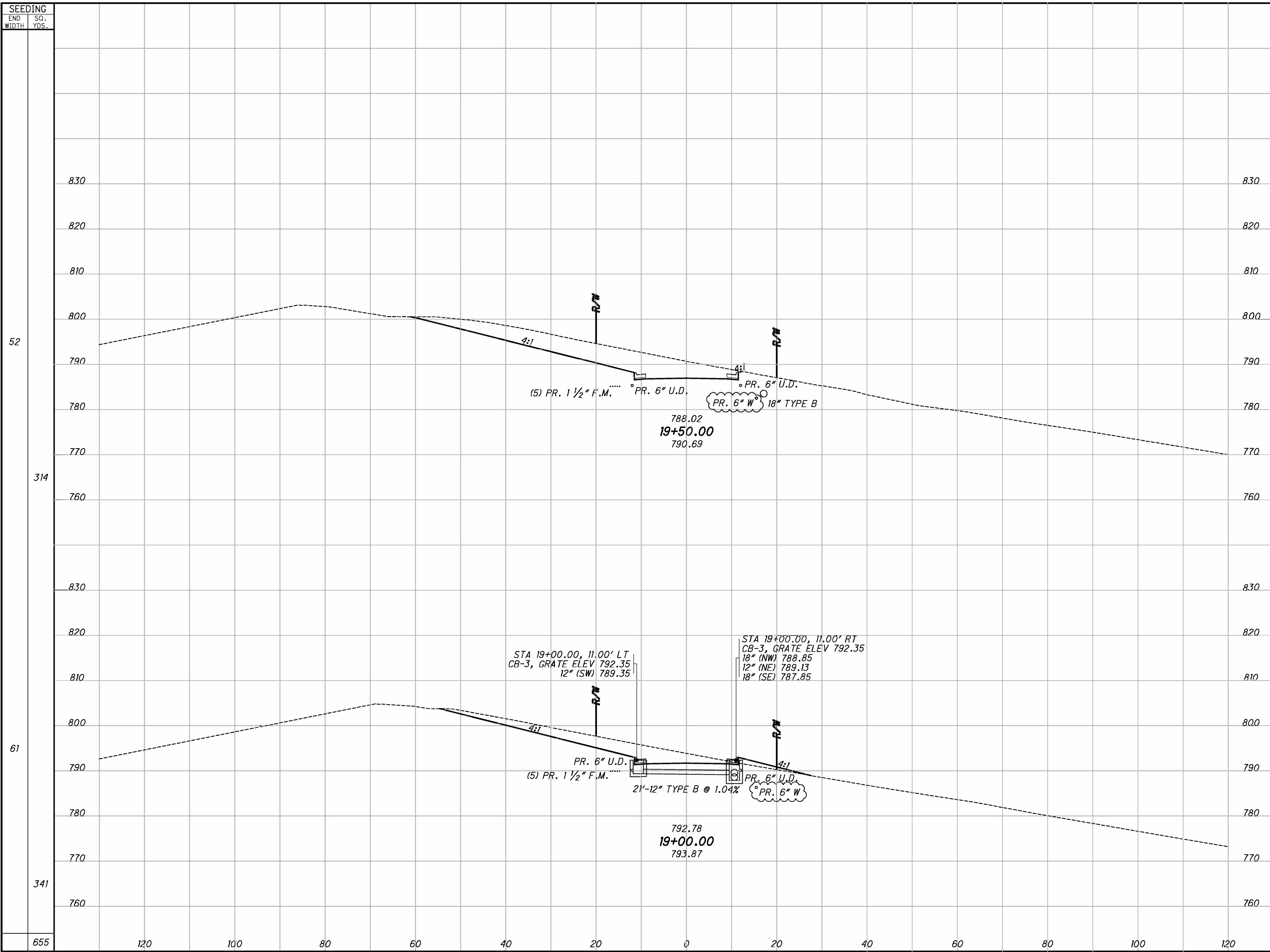
**CROSS SECTIONS MARA ROAD
STA. 18+00.00 TO STA. 18+50.00**

MARA ROAD

CALCULATED JMC
CHECKED BEC

24
50

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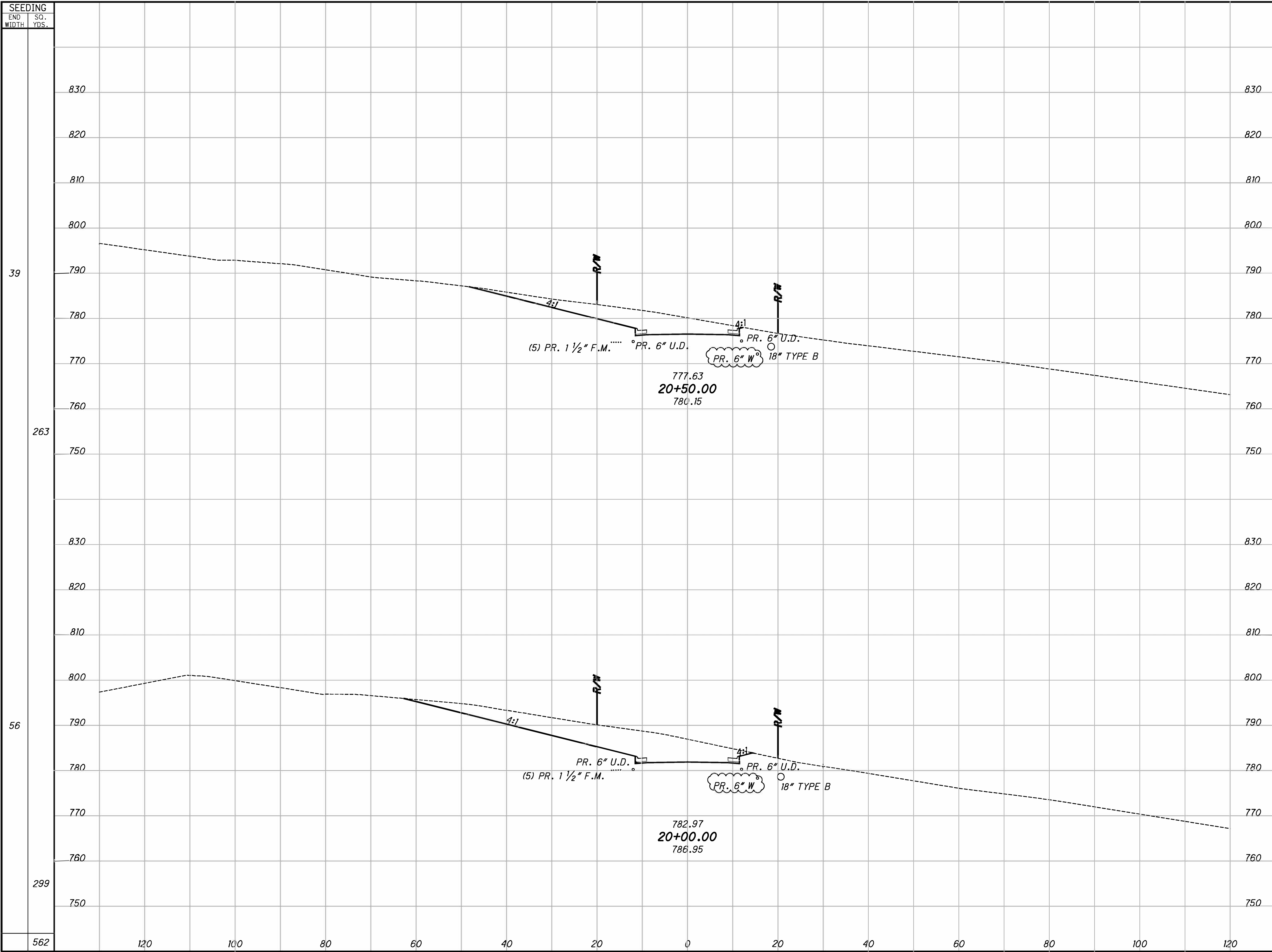
SEEDING		END AREA		VOLUME		CALCULATED	
END WIDTH	SO. YDS.	CUT	FILL	CUT	FILL	JMC	BEO
52		245	0				
314		347	9				
61		130	10				
341		171	52				
655		518	61				

CROSS SECTIONS MARA ROAD
STA. 19+00.00 TO STA. 19+50.00

MARA ROAD

25
50

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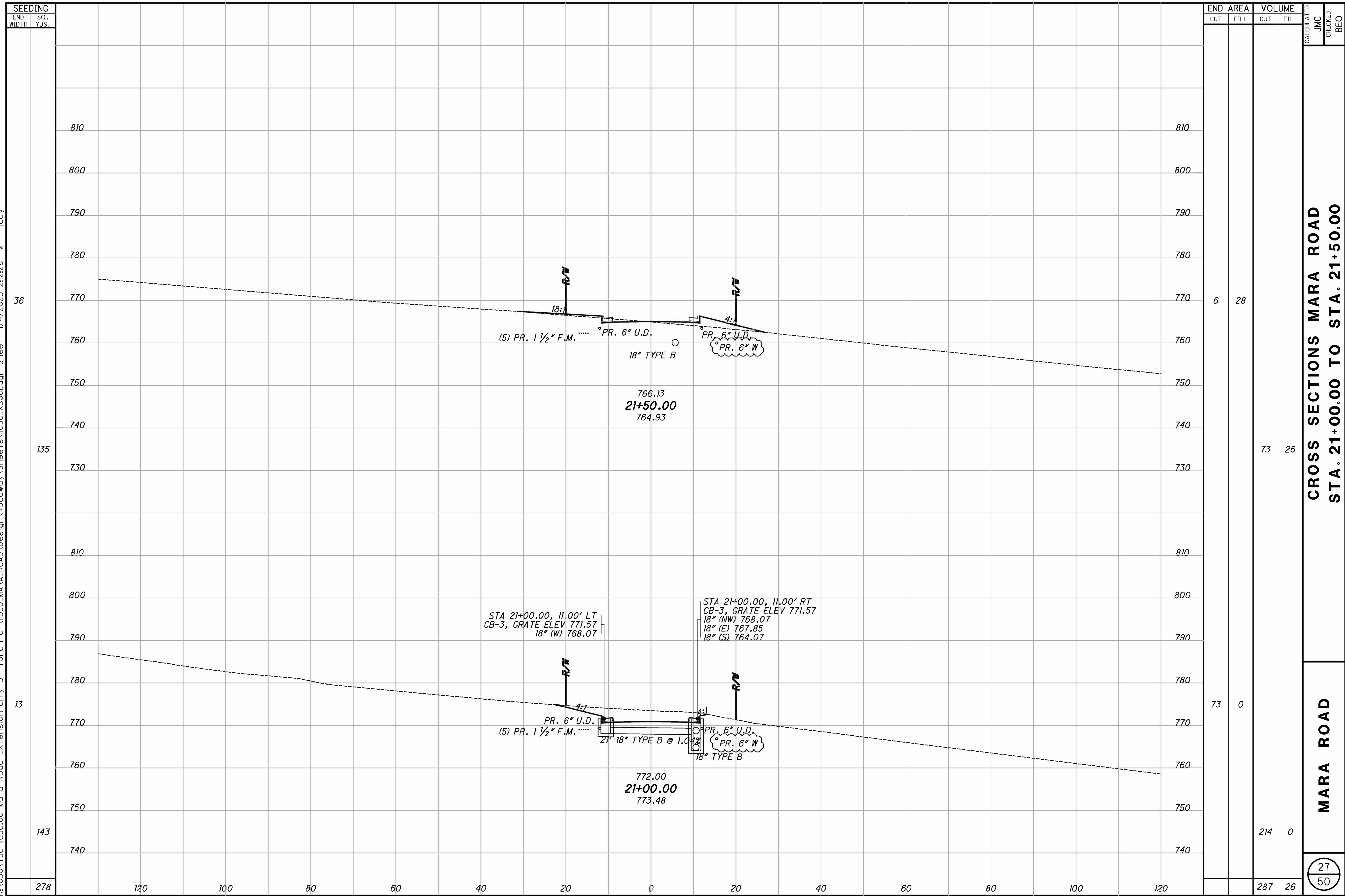
SEEDING	END AREA		VOLUME	
	CUT	FILL	CUT	FILL
39	158	0	407	0
263	282	0	488	0
56				
299				
562				

**CROSS SECTIONS MARA ROAD
STA. 20+00.00 TO STA. 20+50.00**

MARA ROAD

26
50

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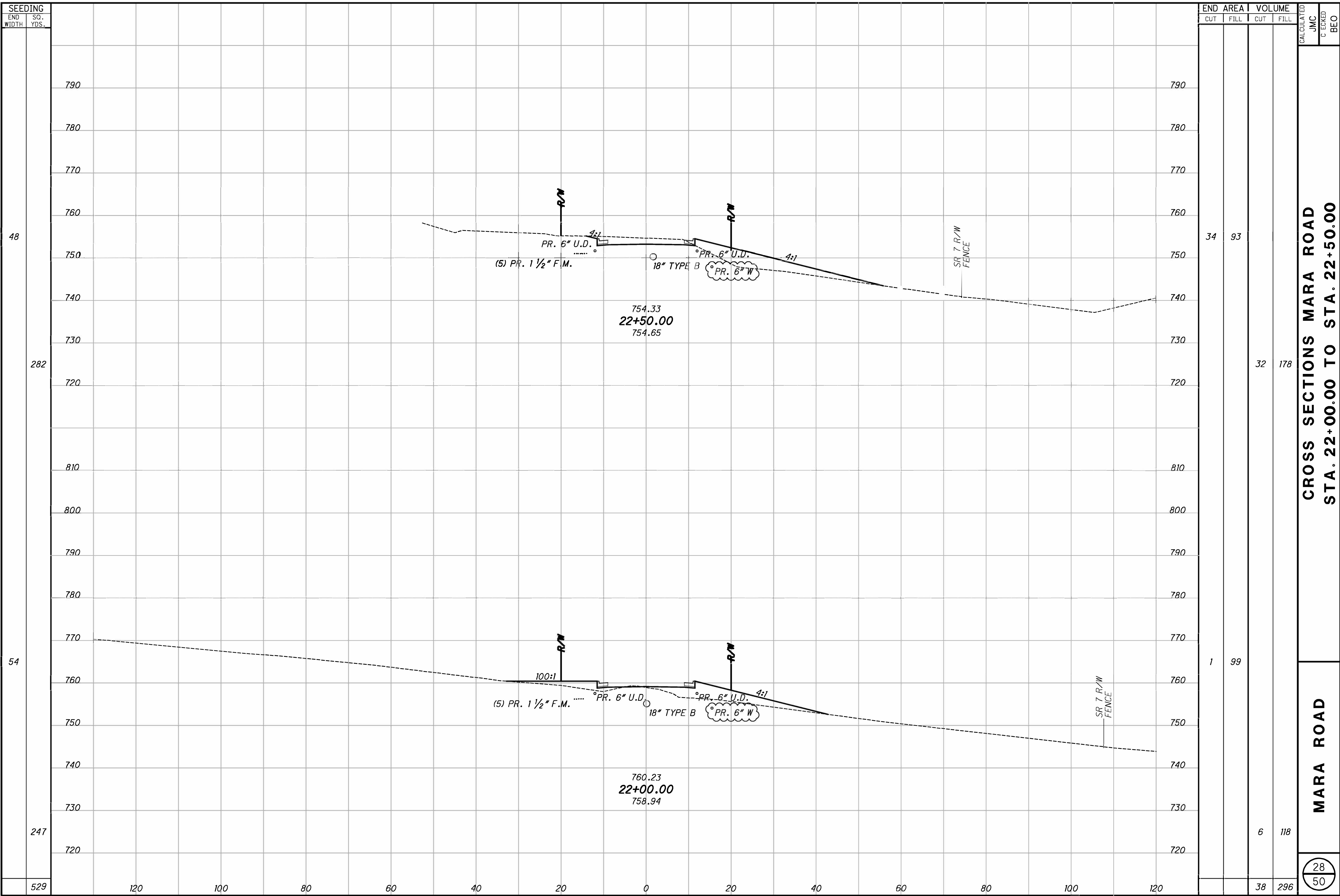


**CROSS SECTIONS MARA ROAD
STA. 21+00.00 TO STA. 21+50.00**

MARA ROAD

27
50

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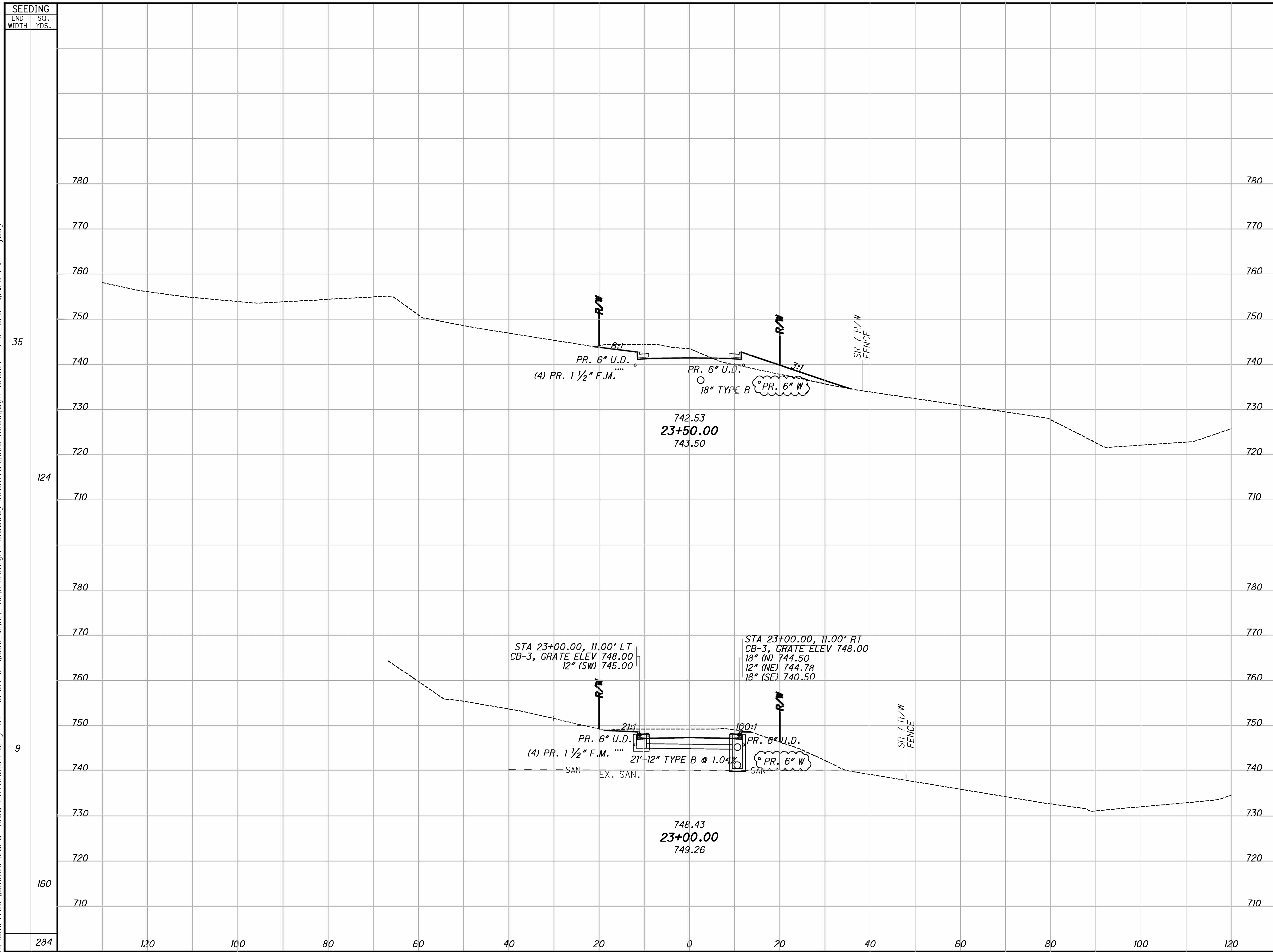
SEEDING		END AREA		VOLUME		CALCULATED	
END WIDTH	SO. YDS.	CUT	FILL	CUT	FILL	JMC	BEO
48		34	93				
282				32	178		
54		1	99				
247				6	118		
529				38	296		

**CROSS SECTIONS MARA ROAD
STA. 22+00.00 TO STA. 22+50.00**

MARA ROAD

28
50

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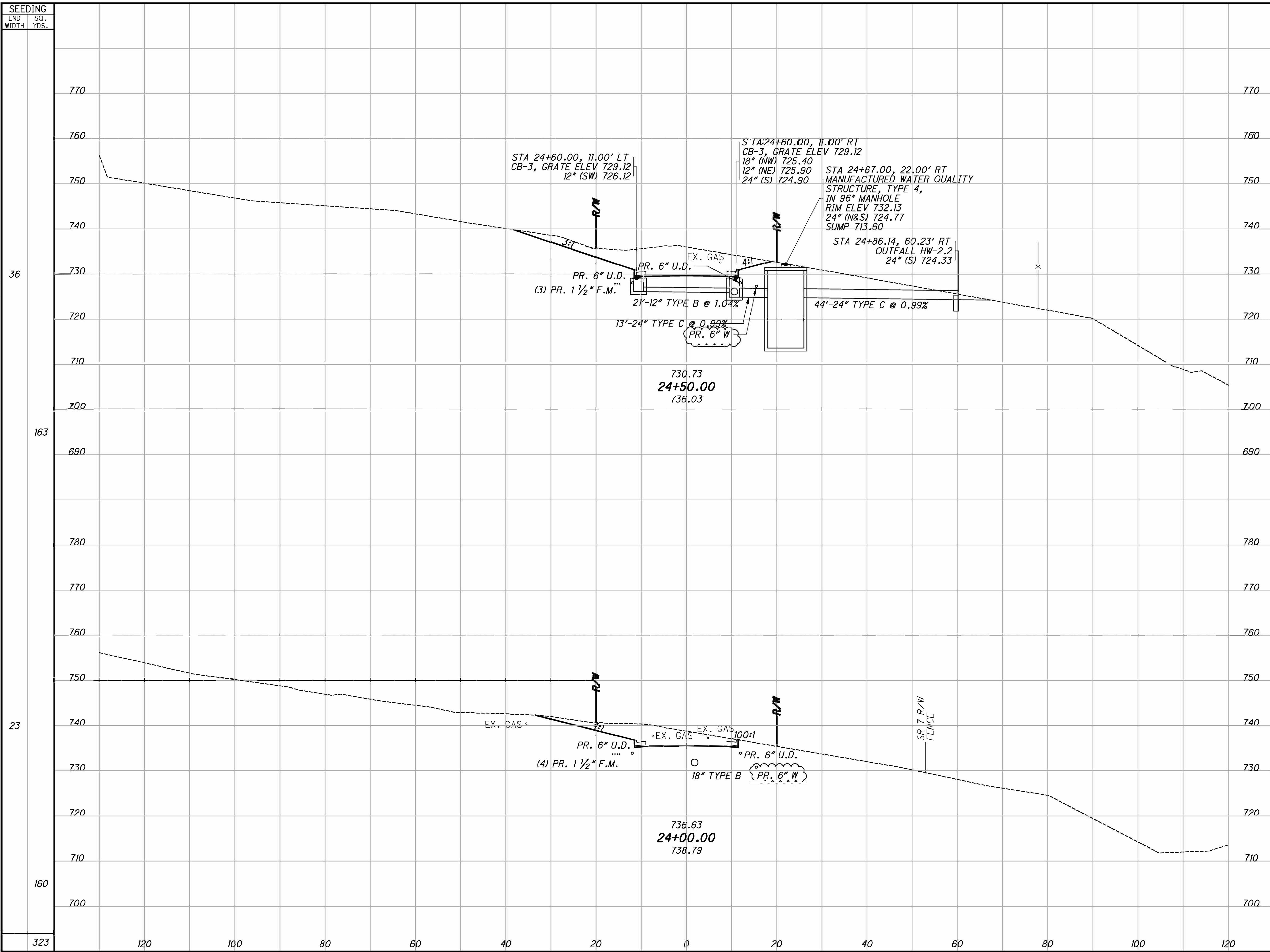
SEEDING		END AREA		VOLUME		CALCULATED		
END WIDTH	SO. YDS.	CUT	FILL	CUT	FILL	JMC	CHECKED	BEO
35		46	44					
124				88	41			
9		49	0					
160				77	86			
284				165	127			

CROSS SECTIONS MARA ROAD
STA. 23+00.00 TO STA. 23+50.00

MARA ROAD

29
50

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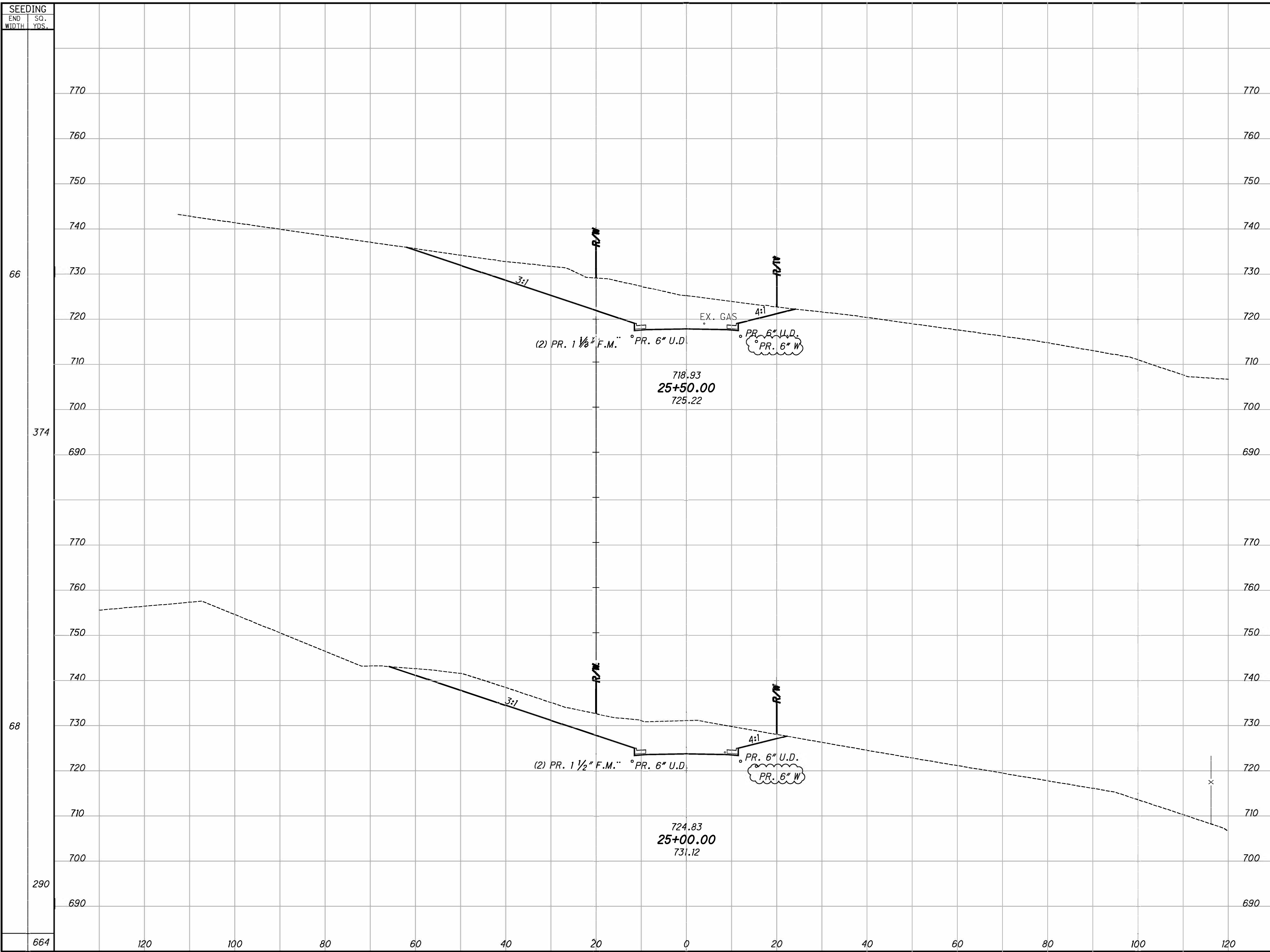
END AREA	VOLUME	CALCULATED		CHECKED	BEO
		CUT	FILL		
201	0				
289	0				
111	0				
145	41				
434	41				

**CROSS SECTIONS MARA ROAD
STA. 24+00.00 TO STA. 24+50.00**

MARA ROAD

30
50

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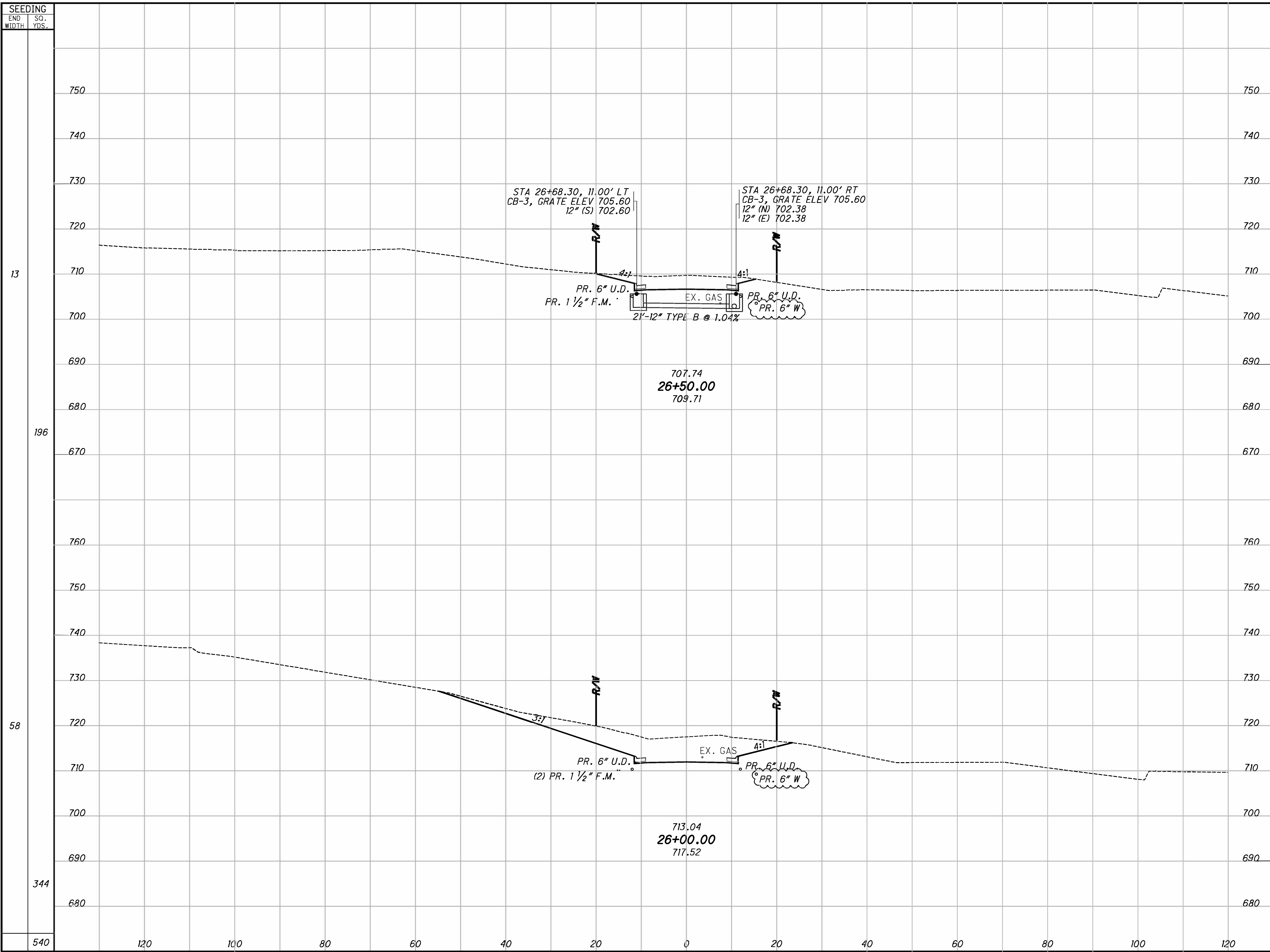
SEEDING		END AREA		VOLUME		CALCULATED	CHECKED	BEO
END WIDTH	SO. YDS.	CUT	FILL	CUT	FILL			
66		442	0					
374				768	0			
68		387	0					
290				544	0			
664				1312	0			

**CROSS SECTIONS MARA ROAD
STA. 25+00.00 TO STA. 25+50.00**

MARA ROAD

31
50

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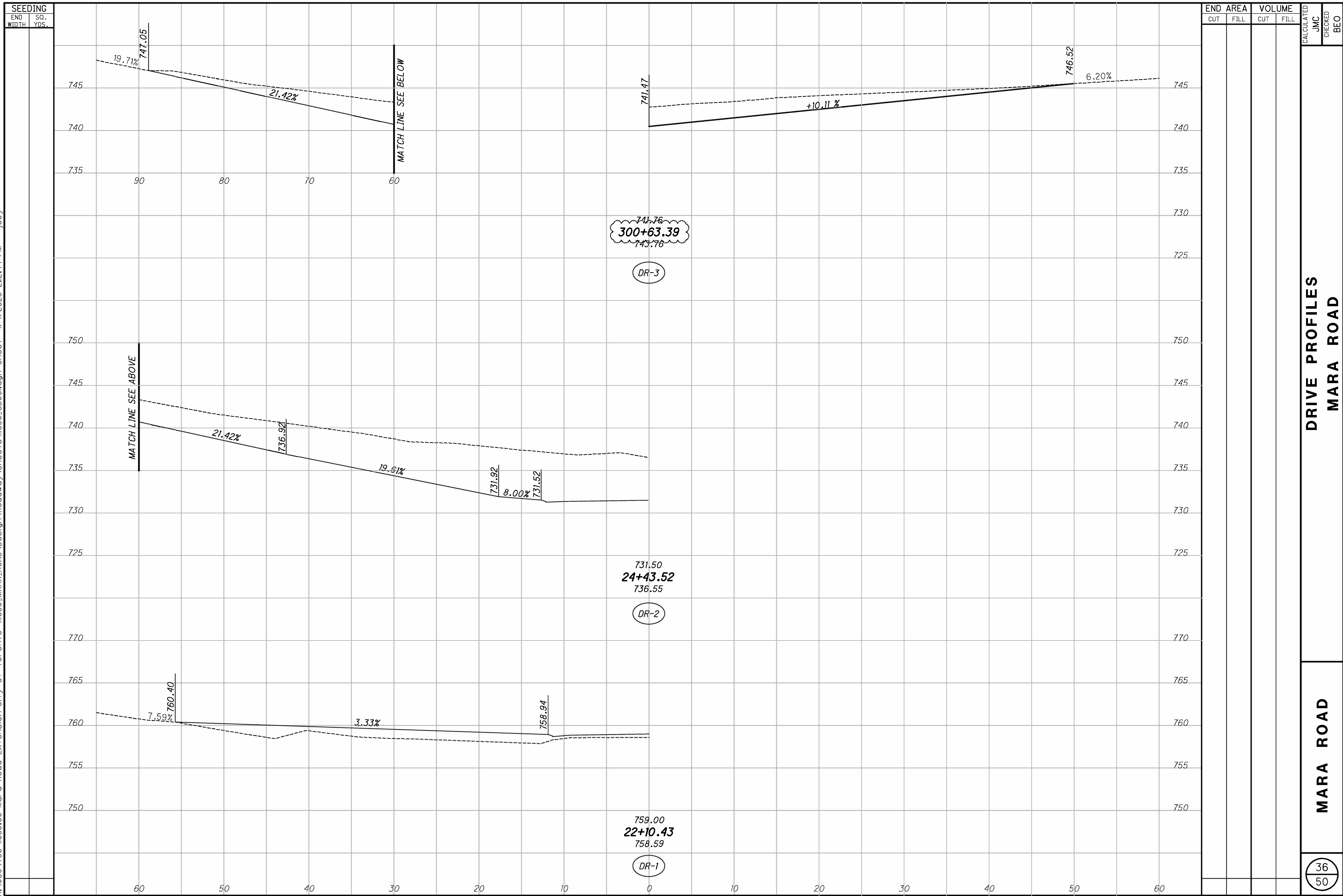


SEEDING	END AREA		VOLUME	
	CUT	FILL	CUT	FILL
13	79	0		
196			303	0
58	248	0		
344			639	0
540			942	0

**CROSS SECTIONS MARA ROAD
STA. 26+00.00 TO STA. 26+50.00**

MARA ROAD

32
50



DRIVE PROFILES
 MARA ROAD

MARA ROAD

INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

ARTICLE 1—DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

- 2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- 2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.
- 2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website, and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.04 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. **Only** Registered plan holders will receive Addenda issued by Owner.
- 2.05 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.
- 2.06 *Electronic Documents*
- A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.

1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader Version **[insert version number]** or later. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.
- B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.
- C. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.
 1. Electronic Documents that are available in native file format include:
 - a. **[List documents that will be made available to Contractor]**
 2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.
 3. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.
 4. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within (7) days of Owner's request, Bidder must submit the following information:
- A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.
 - B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.
 - C. Bidder's state or other contractor license number, if applicable.
 - D. Subcontractor and Supplier qualification information.

- E. Other required information regarding qualifications.
- 3.02 ~~Prospective Bidders must submit required information regarding their qualifications by [insert deadline for prequalification submittals]. Owner will review the submitted information to determine which contractors are qualified to bid on the Work. Owner will issue an Addendum listing those contractors that Owner has determined to be qualified to construct the project. Bids will only be accepted from listed contractors. The information that each prospective Bidder must submit to seek prequalification includes the following:~~
- ~~A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.~~
 - ~~B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.~~
 - ~~C. Prospective Bidder's state or other contractor license number, if applicable.~~
 - ~~D. Subcontractor and Supplier qualification information.~~
 - ~~E. Other required information regarding qualifications.~~
- 3.03 ~~Bidder is to submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:~~
- ~~A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.~~
 - ~~B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.~~
 - ~~C. Bidder's state or other contractor license number, if applicable.~~
 - ~~D. Subcontractor and Supplier qualification information.~~
 - ~~E. Other required information regarding qualifications.~~
- 3.04 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.05 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

ARTICLE 4—PRE-BID CONFERENCE (CHOOSE ONE AND STRIKETHROUGH REMAINING)

- 4.01 ~~A pre-bid conference will not be conducted for this Project.~~
- 4.02 A non-mandatory pre-bid conference will be held at the time and location indicated in the Advertisement or invitation to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference; however, attendance at this conference is not required to submit a Bid.
- 4.03 ~~A mandatory pre-bid conference will be held at the time and location indicated in the Advertisement or invitation to bid. Representatives of Owner and Engineer will be present to discuss the Project. Proposals will not be accepted from Bidders who do not attend the conference. It is each Bidder's responsibility to sign in at the pre-bid conference to verify its participation. Bidders must sign in using the name of the organization that will be submitting a Bid. A list of qualified Bidders that~~

~~attended the pre-bid conference and are eligible to submit a Bid for this Project will be issued in an Addendum.~~

- 4.04 ~~Information presented at the pre-Bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-Bid conference. Information presented, and statements made at the pre-bid conference will not be binding or legally effective unless incorporated in an Addendum.~~

ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER’S SAFETY PROGRAM; OTHER WORK AT THE SITE

5.01 *Site and Other Areas*

- A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

5.02 *Existing Site Conditions*

A. *Subsurface and Physical Conditions; Hazardous Environmental Conditions*

1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:
 - a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.
 - b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.
 - c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.
2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.
- ~~4. *Geotechnical Baseline Report/Geotechnical Data Report: The Bidding Documents contain a Geotechnical Baseline Report (GBR) and Geotechnical Data Report (GDR).*~~
 - ~~a. *As set forth in the Supplementary Conditions, the GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations (“Baseline Conditions”). The GBR is a Contract Document.*~~

- ~~b. The Baseline Conditions in the GBR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GBR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.~~
 - c. Nothing in the GBR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.
 - ~~d. As set forth in the Supplementary Conditions, the GDR is a Contract Document containing data prepared by or for the Owner in support of the GBR.~~
 - e. Engineer will provide a Geotechnical Report, if requested, after a waiver is signed. See Supplementary Conditions.
- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Other Site-related Documents*

- A. In addition to the documents regarding existing Site conditions referred to in Paragraph 5.02.A, the following other documents relating to conditions at or adjacent to the Site are known to Owner and made available to Bidders for reference:
1. **[List of other Site-related documents].**
- Owner will make copies of these other Site-related documents available to any Bidder on request.
- B. Owner has not verified the contents of these other Site-related documents, and Bidder may not rely on the accuracy of any data or information in such documents. Bidder is responsible for any interpretation or conclusion Bidder draws from the other Site-related documents.
 - C. The other Site-related documents are not part of the Contract Documents.
 - D. Bidders are encouraged to review the other Site-related documents, but Bidders will not be held accountable for any data or information in such documents. The requirement to review and take responsibility for documentary Site information is limited to information in (1) the Contract Documents and (2) the Technical Data.
 - E. No other Site-related documents are available.

5.04 *Site Visit and Testing by Bidders*

- A. Bidder is required to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.
- B. A Site visit is scheduled following the pre-bid conference. Maps to the Site will be available at the pre-Bid conference.
- C. A Site visit is scheduled for **[designate, date, time and location]**. ~~Maps to the Site will be made available upon request.~~

- D. Bidders visiting the Site are required to arrange their own transportation to the Site.
- E. All access to the Site other than during a regularly scheduled Site visit must be coordinated through the following Owner or Engineer contact for visiting the Site: **As indicated at Pre Bid Conference**. Bidder must conduct the required Site visit during normal working hours.
- F. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- G. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.
- H. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- I. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 *Owner's Safety Program*

- A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.06 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

- A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.
- B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

- 7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.
- 7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:
- A. Email Steve Hamit at shamit@thethrashergroup.com
- 7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.
- 7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **(10%)** percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents. **Bid security must be at least 10% of the Bidder's maximum Bid price.**
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

- 9.01 ~~The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.~~
- 9.02 ~~Bidder must set forth in the Bid the time by which Bidder must achieve Substantial Completion, subject to the restrictions established in Paragraph 13.07 of these Instructions. The Owner will take Bidder's time commitment regarding Substantial Completion into consideration during the evaluation of Bids, and it will be necessary for the apparent Successful Bidder to satisfy Owner that it will be able to achieve Substantial Completion within the time such Bidder has designated~~

~~in the Bid. [If applicable include the following: Bidder must also set forth in the Bid its commitments regarding the achievement of Milestones and readiness for final payment.] The Successful Bidder's time commitments will be entered into the Agreement or incorporated in the Agreement by reference to the specific terms of the Bid.~~

- 9.03 Contract Time(s) and Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10—SUBSTITUTE AND “OR EQUAL” ITEMS

- 10.01 ~~The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or “or equal” items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or “or equal” item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.~~
- 10.02 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those “or-equal” or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an “or-equal” or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer within 10 days of the issuance of the Advertisement for Bids or invitation to Bidders. Each such request must comply with the requirements of Paragraphs 7.05 and 7.06 of the General Conditions, and the review of the request will be governed by the principles in those paragraphs. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all registered Bidders. Bidders cannot rely upon approvals made in any other manner.
- 10.03 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder's sole risk.

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 11.01 ~~A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so by the Bidding Documents or in the Specifications. If a prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.~~
- 11.02 The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors or Suppliers proposed for the following portions of the Work within five days after Bid opening:
- A. **[List key categories of the Work. Depending on the Project this might include electrical, fire protection, major equipment items].**
- 11.03 If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given,

request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

- 11.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

ARTICLE 12—PREPARATION OF BID

- 12.01 The Bid Form is included with the Bidding Documents.
- A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
- B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."
- 12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.
- 12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.
- 12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.
- 12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.
- 12.06 A Bid by an individual must show the Bidder's name and official address.
- 12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.
- 12.08 All names must be printed in ink below the signatures.
- 12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.

- 12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.
- 12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.
- 12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13—BASIS OF BID

13.01 *Lump Sum*

- A. Bidders must submit a Bid on a lump sum basis as set forth in the Bid Form.

13.02 *Base Bid with Alternates*

- A. Bidders must submit a Bid on a lump sum basis for the base Bid and include a separate price for each alternate described in the Bidding Documents and as provided for in the Bid Form. The price for each alternate will be the amount added to or deleted from the base Bid if Owner selects the alternate.
- B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form.

13.03 *Sectional Bids*

- A. Bidders may submit a Bid on any individual section or any combination of sections, as set forth in the Bid Form.
- B. Submission of a Bid on any section signifies Bidder's willingness to enter into a Contract for that section alone at the price offered.
- C. If Bidder submits Bids on individual sections and a Bid based on a combination of those sections, such combined Bid need not be the sum of the Bids on the individual sections.
- D. Bidders offering a Bid on one or more sections must be capable of completing the Work covered by those sections within the time period stated in the Agreement.

13.04 *Cost Plus Fee Bids*

- ~~A. Bidders must submit a Bid on the Contractor's fee, which must be in addition to compensation for Cost of the Work. Such fee must be either (1) a fixed fee, (2) percentages of specified categories of costs, or (3) a percentage applicable to the Cost of the Work as a whole, as set forth in the Bid Form.~~
- ~~B. If the Contractor's fee, as set forth in the Bid Form, is to be based on percentages of categories of cost, or on a percentage applicable to the Cost of the Work as a whole, then Bidders must enter a maximum amount limiting the total fee if required by the Bid Form to do so.~~
- ~~C. Bidders must submit a Bid on the Guaranteed Maximum Price, setting a maximum amount on the compensable Cost of the Work plus Contractor's fee, if required by the Bid Form to do so.~~

13.05 *Unit Price*

- A. Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The “Bid Price” (sometimes referred to as the extended price) for each unit price Bid item will be the product of the “Estimated Quantity”, which Owner or its representative has set forth in the Bid Form, for the item and the corresponding “Bid Unit Price” offered by the Bidder. The total of all unit price Bid items will be the sum of these “Bid Prices”; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

13.06 *Allowances*

- A. For cash allowances the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

13.07 *Price Plus Time Bids*

- ~~A. The Owner will consider the time of Substantial Completion commitment made by the Bidder in the comparison of Bids.~~
- ~~B. Bidder must designate the number of days required to achieve Substantial Completion of the Work and enter that number in the Bid Form as the total number of calendar days to substantially complete the Work.~~
- ~~C. The total number of calendar days for Substantial Completion designated by Bidder must be less than or equal to a maximum of [number], but not less than the minimum of [number]. If Bidder purports to designate a time for Substantial Completion that is less than the allowed minimum, or greater than the allowed maximum, Owner will reject the Bid as nonresponsive.~~
- ~~D. The Agreement as executed will contain the Substantial Completion time designated in Successful Bidder's Bid, and the Contractor will be assessed liquidated damages at the rate stated in the Agreement for failure to attain Substantial Completion within that time.~~
- ~~E. Bidder must also designate the time in which it will achieve Milestones, and achieve readiness for final payment. Such time commitments must be consistent with the “Time of Substantial Completion” to which Bidder commits. The Agreement as executed will contain, as binding Contract Times, Successful Bidder's time commitments regarding Milestones, as applicable, and readiness for final payment.~~

ARTICLE 14—SUBMITTAL OF BID

- 14.01 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.
- 14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted,

the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to the location designated in the Advertisement.

- 14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

- 15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

- 16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.
- 16.02 ~~Bids will be opened privately.~~

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

- 18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.
- 18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.
- 18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of

the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

18.05 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner will announce to all bidders a “Base Bid plus alternates” budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.

C. For determination of the apparent low Bidder(s) when sectional bids are submitted, Bids will be compared on the basis of the aggregate of the Bids for separate sections and the Bids for combined sections that result in the lowest total amount for all of the Work.

D. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.

~~E. For the determination of the apparent low Bidder when cost plus fee bids are submitted, Bids will be compared on the basis of the Guaranteed Maximum Price set forth by Bidder on the Bid Form.~~

~~F. Bid prices will be compared after adjusting for differences in time of Substantial Completion (total number of calendar days to substantially complete the Work) designated by Bidders. The adjusting amount will be determined at the rate set forth in the Agreement for liquidated damages for failing to achieve Substantial Completion, or such other amount that Owner has designated in the Bid Form.~~

~~1. The method for calculating the lowest bid for comparison will be the summation of the Bid price shown in the Bid Form plus the product of the Bidder specified time of Substantial Completion in calendar days times the rate for liquidated damages [or other **Owner-designated daily rate**] in dollars per day.~~

~~2. This procedure is only used to determine the lowest bid for comparison and contractor selection purposes. The Contract Price for compensation and payment purposes remains the Bid price shown in the Bid Form.~~

18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for

those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

- 18.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 19—BONDS AND INSURANCE

- 19.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.
- 19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20—SIGNING OF AGREEMENT

- 20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 21—SALES AND USE TAXES

- 21.01 Owner is exempt from state sales and use taxes on materials and equipment to be incorporated in the Work. (Exemption will be provided upon execution of agreement). Said taxes must not be included in the Bid. Refer to Paragraph SC-7.10 of the Supplementary Conditions for additional information.

ARTICLE 22—CONTRACTS TO BE ASSIGNED



**GEOTECHNICAL INVESTIGATION
MARA ROAD EXTENSION
TORONTO, OHIO**

NGE PROJECT No. W22072

SUBMITTED TO:

**THE THRASHER GROUP, INC.
CANTON, OHIO**

SUBMITTED BY:

**NGE, LLC
ST. ALBANS, WEST VIRGINIA**

AUGUST 2022



August 9, 2022

Mr. Steven D. Hamit, PE, CPESC
The Thrasher Group, Inc.
400 3rd Street SE, Suite 309
Canton, OH 44702

Subject: Geotechnical Investigation
Mara Road Extension
Toronto, Ohio
NGE Project No. W22072

Dear Mr. Hamit:

In accordance with your request, we have performed a geotechnical investigation for the proposed improvements to the Mara Road Extension in Toronto, Ohio. Our services were performed in accordance with the scope of work outlined in our Proposal No. PW22554, dated March 21, 2022.

This report presents the results of the field investigation and laboratory testing performed to evaluate subsurface conditions and our conclusions and recommendations pertaining to the project's earthwork.

We appreciate the opportunity to assist you with this project. Please contact us if you have any questions concerning this report, or if we can provide any further assistance with this project.

Respectfully submitted,
NGE, LLC

A handwritten signature in black ink, appearing to read "Noah Stevens".

Noah Stevens, P.E.
Project Engineer



A handwritten signature in black ink, appearing to read "John E. Nottingham".

John E. Nottingham, P.E.
Principal Engineer

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APPENDIX A – Results of Laboratory Testing

APPENDIX B – Stability Analyses Output Sheets

APPENDIX C – Preliminary Cut and Fill Slope Cross Sections

APPENDIX D – USGS Slide Map

1.0 SCOPE OF SERVICES

The purpose of our investigation was to evaluate subsurface conditions and develop site earthwork recommendations for proposed improvements for the Mara Road Extension in Toronto, Ohio. The results of our geotechnical engineering evaluation are presented in the following report. Our scope of services included the following items:

- Engineering field work including site reconnaissance and drilling supervision.
- Drilling of 25 test borings (Borings B-1 through B-19 and B-21 through B-26) with standard penetration testing and sampling. A total of 27 test borings were originally planned; however, Borings B-20 and B-27 were eliminated due to access restrictions.
- Laboratory testing of selected soil samples.
- Preparation of a geotechnical engineering report including the following items:
 - Project description.
 - Test boring location plan.
 - Test boring logs providing details of subsurface conditions at each boring location including depth and descriptions of the various soil and bedrock layers encountered, standard penetration blow counts, and depth of any groundwater encountered.
 - A generalized description of subsurface conditions encountered.
 - Laboratory test results.
 - Our conclusions and recommendations for roadway grading and development. This work includes recommendations for fill embankment design and construction, and recommended cut slope configurations.

2.0 SITE & PROJECT DESCRIPTION

The roadway improvement project begins at the intersection of Mara Road and Nebo Drive in Toronto, Ohio. Mara Road will be improved from the intersection continuing southeast approximately 1,700 feet towards Titanium Way. During our site reconnaissance, our engineer noted that much of the ground surface is hummocky and has the appearance of old landslide areas. Two relatively recent slide areas and two seeps / springs were also noted near the beginning of the project. Review of USGS landslide mapping indicates the planned roadway alignment is within an area described as follows: "LANDSLIDE: Area of extensive hummocky ground caused by earthflow and earth and rock slump. Lacks clear evidence of active sliding. Relatively stable in natural, undisturbed state, generally not affected by small structures properly sited in areas away from the edge of the toe; can be reactivated by extensive, rapid excavation, loading, and changes in groundwater and surface water conditions." The landslide mapping is included in Appendix D.

Cut slopes up to about 18 feet high are proposed for the roadway improvements. Fill slopes up to 37 feet high are also proposed. Preliminary design drawings indicate cut and fill

slopes are configured at 4H:1V for Stations 10+50 to 23+00 and slopes are configured at 3H:1V from Station 23+50 to the end of the project. Figures 1 through 4 show the planned roadway alignment and test boring locations.

3.0 DRILLING & SAMPLING PROCEDURES

A total of 25 test borings with standard penetration testing and sampling were drilled to evaluate subsurface conditions at the site. The locations of the test borings were chosen by our engineer and staked in the field by a Thrasher survey crew. The boring locations are shown on Figures 1 through 4 in the back of this report.

The test borings were drilled to depths ranging from 25.8 to 41.5 feet using a track-mounted rotary drilling rig equipped with 3-1/4 inch I.D. hollow stem augers. Standard penetration testing (SPT) and sampling was performed in each of the borings at 2.5 to 5.0 ft. intervals to the boring termination depth. The standard penetration testing/sampling was performed in accordance with ASTM D-1586 procedures.

Standard penetration testing is performed by driving a 2.0 inch O.D. split-barrel sampler into the soil with a 140-lb. automatic hammer dropping a distance of 30 inches. The sampler is driven 18 inches into the soil in three 6-inch increments, and the number of hammer blows required to produce the last two 6-inch increments of penetration is termed the "standard penetration resistance" or "N-value". These values provide an indication of the consistency or relative density of the soil. A 1-3/8 inch diameter soil/rock sample was retrieved in conjunction with each penetration test. A representative portion of each sample was placed in an air-tight glass jar. Bulk bag samples were also collected from select boring locations for use in laboratory testing.

Upon completion of drilling, the test boring samples were delivered to our laboratory where they were examined by a geologist and geotechnical engineer. Soil and rock descriptions, standard penetration numbers, and other pertinent subsurface information are provided on the boring logs included in the back of this report (Figures 5 through 37).

4.0 SUBSURFACE CONDITIONS

Details of the subsurface conditions encountered in each test boring are shown on the boring logs (Figures 5 through 37). The boring logs represent our interpretation of the subsurface conditions based on examination of the split-spoon samples and observations made during drilling. The stratification lines indicated on the boring logs represent approximate boundaries between soil and rock types; however, the actual transition may be gradual. The conditions represented by the test borings should be considered applicable only at the boring locations. It should be assumed that the reported conditions might be different at other locations. The general subsurface conditions encountered in the test borings are described in the following report sections.

4.1 Soil Conditions

Apparent fill material was encountered up to a depth of 10.0 feet within Borings B-1, B-2, B-3, B-15, B-17, and B-19. The fill material consisted of brown silty to sandy clay with rock fragments. Colluvial soils were encountered beneath the fill in Borings B-1, B-2, B-3, B-15, B-

17, and B-19, and as the upper layer of soil within all other borings except B-24. The colluvial soils encountered at the site consisted predominantly of brown and gray silty to sandy clay with rock fragments. The colluvium extended to depths ranging from 5 to 31 feet below the existing ground surface. Colluvial soil deposits are formed by past downslope movement of soil and are indicative of old landslide and/or erosion activity. Colluvial soils are typically weaker and more slide prone than residual soil deposits. The colluvium extended to bedrock or the termination depth in Borings B-2, B-3, B-5, B-6, B-7, B-12, B-15, and B-18.

Natural soils were encountered as the upper soil layer within Boring B-24 and beneath the colluvium within all other borings except B-2, B-3, B-5, B-6, B-7, B-12, B-15, and B-18. The natural soils encountered at the site consisted primarily of silty to sandy clay and clayey to silty sand. Some sandy silt was also encountered within Borings B-22, B-23, and B-26. Neglecting surficial samples, standard penetration N-values obtained within the natural clay and silt soil generally ranged from 8 to 40 blows per foot (bpf), which is indicative of a stiff to hard soil consistency. N-values obtained within the sand ranged from 8 to over 50 bpf, indicative of a loose to very dense granular soil relative density.

Bedrock was encountered within all borings except Borings B-1, B-3, B-19, and B-21. The total soil overburden thickness encountered within these borings varied between 20 and 35 feet. Borings B-1, 3, 19, and 21 were terminated within the soil overburden at depths ranging from 26.5 to 41.5 feet below the existing ground surface. The clay soils encountered at this site were observed to be predominantly moderately plastic (CL/ML type soils) based on observation and laboratory testing of the recovered soil samples.

4.2 Results of Laboratory Testing

Laboratory testing of recovered soil specimens included natural moisture content, Atterberg liquid and plastic limits, and standard Proctor moisture-density testing. The results of the moisture content and Atterberg limit testing are shown on the boring logs. The results of the Atterberg limit testing are summarized in **Table 4.1** below. The results of individual laboratory tests are also included in Appendix A.

Table 4.1 – Summary of Laboratory Classification Testing

Test Boring, Sample and Depth	Atterberg Limits		Soil Description
	LL	PI	
B-3 / S-4 7.5-9.0 ft.	27	9	Brown SILTY to SANDY CLAY w/ rock fragments (CL)
B-4 / S-3 5.0-6.5 ft.	31	12	Brown SILTY to SANDY CLAY w/ rock fragments (CL)
B-6 / S-4 7.5-9.0 ft.	33	15	Gray SILTY CLAY (CL)
B-6 / S-5 10.0-11.5 ft.	29	10	Brown SILTY to SANDY CLAY w/ rock fragments (CL)
B-7 / S-5 10.0-11.5 ft.	27	8	Brown SILTY to SANDY CLAY w/ rock fragments (CL)
B-7 / S-7 15.0-16.5 ft.	29	10	Brown SILTY to SANDY CLAY w/ rock fragments (CL)

B-9 / S-3 5.0-6.5 ft.	25	8	Brown SILTY to SANDY CLAY w/ rock fragments (CL)
B-10 / S-4 7.5-9.0 ft.	34	14	Brown SILTY to SANDY CLAY w/ rock fragments (CL)
B-12 / S-3 5.0-6.5 ft.	30	11	Brown SILTY to SANDY CLAY (CL)
B-13 / S-2 2.5-4.0 ft.	28	10	Brown SILTY to SANDY CLAY w/ rock fragments (CL)
B-14 / S-3 5.0-6.5 ft.	28	11	Brown and gray SILTY to SANDY CLAY (CL)
B-16 / S-3 5.0-6.5 ft.	28	11	Brown SANDY CLAY w/ rock fragments (CL)
B-22 / S-3 5.0-6.5 ft.	29	11	Brown SANDY CLAY w/ rock fragments

4.3 Bedrock Conditions

Bedrock was encountered within all borings except Borings B-1, B-3, B-19, and B-21 which were terminated within the soil overburden at depths ranging from 26.5 to 41.5 feet below the existing ground surface. The total soil overburden thickness encountered within the other test borings varied between 20 and 35 feet. The bedrock strata encountered in the test borings consisted of very soft to medium hard shale and soft to hard sandstone.

4.4 Groundwater

Water was noted during drilling within Borings B-3, B-6, B-7, and B-14 at depths of 20.0, 12.5, 15.0, and 25.0 feet, respectively. Water was also noted upon completion within these borings at depths of 17.9, 28.4, 28.0, and 28.1 feet, respectively. All the remaining test borings were noted to be dry during drilling and following boring completion. As noted on Figures 1 and 2, some groundwater seeps/springs were also observed at the site. The presence or absence of water in the boreholes at the time of drilling does not necessarily mean that groundwater will or will not be present at other times or locations. Seasonal variations in rainfall will cause fluctuations in groundwater levels and influence the presence of water in upper soils.

5.0 CONCLUSIONS AND RECOMMENDATIONS

As previously discussed, during site reconnaissance our engineer noted that much of the ground surface is hummocky and has the appearance of old landslide areas. Two relatively recent slide areas and two seeps/springs were also noted near the beginning of the project. Review of USGS landslide mapping indicates most of the planned roadway alignment is within an area described as an old landslide. Also, most of the test borings encountered relatively deep colluvial soil deposits. Colluvial soils are typically lower strength and more slide prone than other soil deposit types.

After our assessment of the test boring results, site reconnaissance, and published landslide mapping, it is our opinion that this site has a high risk to undergo future slope stability problems during or after completion of the planned roadway earthwork. The grading recommendations provided in this report (i.e., using gentle cut and fill slopes with underdrains beneath new fill embankments) should aid in reducing the occurrence of instability; however,

some areas may still experience slips due to the overall past instability of the area. The risk of future instability will be highest in any areas where high groundwater conditions are present or develop in the future. Extra care should therefore be taken to collect and divert surface water away from the roadway and adjacent cut and fill slopes. Should isolated areas of the roadway experience instability during or after construction, measures to improve stability to the roadway would likely be needed possibly including one or a combination of the following:

- Over-excavation of slip soils and backfill with crushed stone or engineered fill.
- Construction of underdrains.
- Construction of buttress fills.
- Construction of retaining walls.

5.1 Site Preparation

All existing vegetation and topsoil located within the roadway grading limits should be stripped prior to beginning site grading. Any underground utility lines located in the developed area should be removed and/or relocated. All voids created by removal of underground items should be properly backfilled in accordance with Section 5.3 of this report.

The development of the roadway improvements should address surface drainage (see Section 5.4 for additional recommendations on underdrains and drainage). Appropriate drainage should be provided both during and after roadway grading is complete such that surface water does not become ponded or entrapped along the roadway.

Proof-rolling of soil subgrades using suitable construction equipment should be performed prior to placing fill. The proof-rolling will cause rutting and deformations of softer soils. Undercutting and replacement of excessive soft and/or wet soils should be performed for all areas at proposed subgrade elevation and in areas over which new fill will be placed. The proof-rolling operations should be inspected and documented by a qualified soils technician or engineer.

5.2 Cut and Excavation Recommendations

Cut slopes up to about 14 feet in height are proposed between stations 11+00 and 13+50 and stations 18+00 and 20+50. Cut slopes up to about 18 feet high are also planned between approximate station 23+00 and 27+00 of the roadway alignment. All other proposed cut slopes along the project alignment are minor (less than 5 feet in height). Most of the cut slopes are shown at a 4H:1V ratio, however, some of the cut slopes between stations 23+00 and 27+00 are inclined at a 3H:1V ratio. In order to achieve a slope stability factor of safety of at least 1.3, we recommend all cut slopes within soil be configured no steeper than a 4H:1V ratio wherever feasible.

All soil cut slopes should be mulched and seeded as soon as possible following grading work to reduce the occurrence of erosion and surficial slips. Our cut slope recommendations may need to be modified if certain conditions become evident during the site earthwork or following completion of grading work. NGE should be promptly consulted if any of the following conditions are observed either during construction or after construction completion:

1. Groundwater seeps or springs within soil cut slopes. The presence of groundwater seeps on a soil cut slope face indicates elevated groundwater levels and subsequent reduced slope stability. Small, isolated groundwater seeps or springs encountered within cut slope areas must be promptly collected with a permanent underdrain or the slope could become unstable. Any cut slope areas exhibiting significant groundwater seepage may have to be reconfigured at a flatter slope and/or the clay soil over-excavated and replaced with free draining crushed or shot rock to maintain adequate stability.
2. Old slip planes or slickensided surfaces (typically thin gray greasy layers) within the cut slope soils. The presence of such layers will require additional construction measures to maintain cut slope stability which may include undercutting of the slip plane and replacement with engineered fill and/or construction of a retaining structure.

Based on test borings drilled in planned cut areas, we expect that most of the soil strata encountered during grading work will consist of medium stiff to hard clayey and silty soils. All excavations should be sloped, shored, or braced in accordance with all applicable state, local, and federal requirements, including OSHA requirements for worker safety.

5.3 Fill and Backfill Recommendations

Fill embankments up to about 37 feet high are planned for the roadway project. The fill slopes are generally planned at a 4H:1V ratio. Prior to placement of fill, all vegetation and topsoil must be removed. Any soft and/or excessively moist soil areas encountered during clearing/grubbing or during fill placement should be undercut to a firm level at the direction of a qualified inspector. In order to reduce the risk of instability of fill embankments, the following measures are recommended:

1. The engineered fill embankments should be properly founded with a toe-key bench as specified in Section 5.3.2 of this report and illustrated on the typical sections in Appendix B.
2. The fill should not contain excessive organic material and/or an excessive amount of high plasticity clays and/or silts (CH/MH Type Soil).
3. The fill should be properly compacted to at least 95 percent of the standard Proctor maximum dry density with the soil moisture content within three percent of its optimum value.
4. All soft soils should be completely undercut from areas to receive side hill fill. Also, any old slip planes or slickensided surfaces (usually thin gray greasy clay layers) must also be undercut from any areas to receive fill.
5. In order to help ensure the fill does not become saturated after it is placed, bonding bench drains should be constructed at maximum 10 ft. vertical intervals as detailed on the typical section in Appendix B. Also, additional underdrains must be placed below fill material in any areas which exhibit signs of current or past groundwater seepage.

5.3.1 Fill Material Placement & Compaction

Soil fill material placed for this project can consist of onsite soil and broken rock material with a maximum particle size of 6 inches. Materials to be used in fill embankment construction must be free from excessive organic material or frozen soil. No fill should be placed on frozen material. Any frozen layers must be undercut and removed prior to placement of overlying fill embankment.

Soil fill should be placed in maximum 12-inch thick loose lifts. Each lift of fill should be compacted to at least 95 percent of the maximum dry density as determined by the standard Proctor laboratory test (ASTM D698). All fill material should be moisture conditioned to within three percentage points of the material's optimum moisture content as determined by the standard Proctor test. Compaction of fill should be accomplished using a minimum 20-ton static weight pad-foot roller. A sufficient number of field moisture/density tests should be performed on each lift of soil fill to verify and document that the required fill density is achieved.

Due to the cohesive, moderately plastic nature of the clayey soils present at this site, pumping conditions could develop during fill placement if the soil fill is subjected to excessive construction traffic and/or if the fill material is excessively moist. If pumping conditions should develop during fill placement, measures such as over-excavation and placement of stabilization fabric and/or a thick layer of rock fill may be necessary to facilitate proper fill compaction.

5.3.2 Side Hill Fill Slope Construction Measures

Sidehill fill slopes less than 10 feet in height should begin on a minimum 15 feet wide level bench (no minimum depth requirement) excavated into the existing firm soil. Fill slopes over 10 feet in height should be initiated by a 15-foot wide toe-key bench excavated to a minimum depth of 5 feet. The base of the toe-key bench should be extended below any soft soil encountered in the excavation. Details illustrating the recommended toe key bench configuration are provided in Appendix B.

The base of the toe-key bench should be inclined back into the slope. A collector drain should be installed at the back of the toe-key bench. This collector drain should consist of a heavy-duty perforated pipe covered with at least two feet of free-draining crushed limestone rock (AASHTO No. 57 stone). The perforated pipes should be connected to solid outlet pipes at a typical 100-foot interval and routed to appropriate outlet points below the fill slope toe. The crushed stone drainage blanket should be covered by an appropriate geotextile filter fabric manufactured to retain soil particles while allowing water to pass freely, such as Mirafi 140N.

Any slickensided layers (i.e., old slip planes usually gray in color) encountered within the soil during fill benching should be undercut as the fill progresses up the slope. A qualified engineering technician should observe all fill benching and watch for the presence of old slip planes, and/or groundwater seeps as fill placement proceeds. The contractor's equipment operators and superintendents should also be instructed to watch out for these conditions and take the appropriate action when encountered.

Following excavation of the toe key bench, and placement of the rock drainage blanket with drainage pipes, fill placement can begin. Fill placement should be initiated at the toe of the slope and proceed upward in uniform, level lifts. Each lift of fill should be keyed (benched) into

the hillside as the fill progresses. Bonding bench drains should be installed underlying the new fill at 10 foot vertical intervals. All finished fill slopes should be seeded and mulched as soon as practical to reduce the occurrence of slope erosion and minor slips.

5.4 Underdrains and Drainage

Underdrains must be provided to collect and drain any groundwater seeps encountered during construction and any suspected seasonal spring areas which are present in the engineered soil fill zone. We recommend underdrains be placed in trenches at least four feet deep below the base of the fill material. The underdrain trenches should have a minimum width of 24 inches and be constructed using a 6-inch diameter perforated pipe in the trench base. The trench and perforated pipe should be backfilled with No. 57 crushed stone wrapped in filter fabric (Mirafi 140N or approved equal). All underdrains should be routed to an appropriate outlet away from the fill. Any seepage observed during construction should be reported to **NGE**.

5.5 Slope Stability Analyses

Stability analyses of the proposed cut slopes and fill embankments were performed using the STABL computer program. We selected 10 cross-sections along the proposed roadway alignment (Stations 13+00, 14+50, 15+50, 17+00, 18+00, 19+50, 20+00, 20+50, 24+50, and 25+50). The analyses were performed on the proposed cut and fill slope configurations with the toe-key excavations for fill embankments as recommended herein. The stability analyses were conducted using circular failure arcs with factors of safety calculated using the modified Bishop's analysis method. Soil parameters used in the analyses were selected based upon results of the test borings, laboratory testing, anticipated fill types and placement procedures, and our experience with similar materials.

Results of the stability analyses indicate the fill embankments will have a slope stability factor of safety in the range of 1.2 to 1.6 for the sections analyzed. Cut slope stability factors of safety ranged from 1.1 to 1.5, assuming no shallow groundwater is present based on the conditions encountered in the test borings. Typically for secondary road construction, it is desired to have a minimum factor of safety for cut and fill slopes of 1.3. A summary of the stability analyses results is included in Table 5.1. Stability analysis output sheets are provided in Appendix B of this report.

Table 5.1 – Summary of Stability Analyses Results

Section Location	Cut or Fill Slope	Slope Inclination	Minimum Factor of Safety
13+00 RT	FILL	4H:1V	1.3
14+50 RT	FILL	4H:1V	1.2
15+50 RT	FILL	4H:1V	1.3
17+00 RT	FILL	4H:1V	1.3
18+00 RT	FILL	4H:1V	1.6

19+50 LT	CUT	4H:1V	1.5
20+00 LT	CUT	4H:1V	1.5
20+50 LT	CUT	4H:1V	1.5
24+50 LT	CUT	3H:1V	1.1
25+50 LT	CUT	3H:1V	1.1

6.0 CONSTRUCTION TESTING

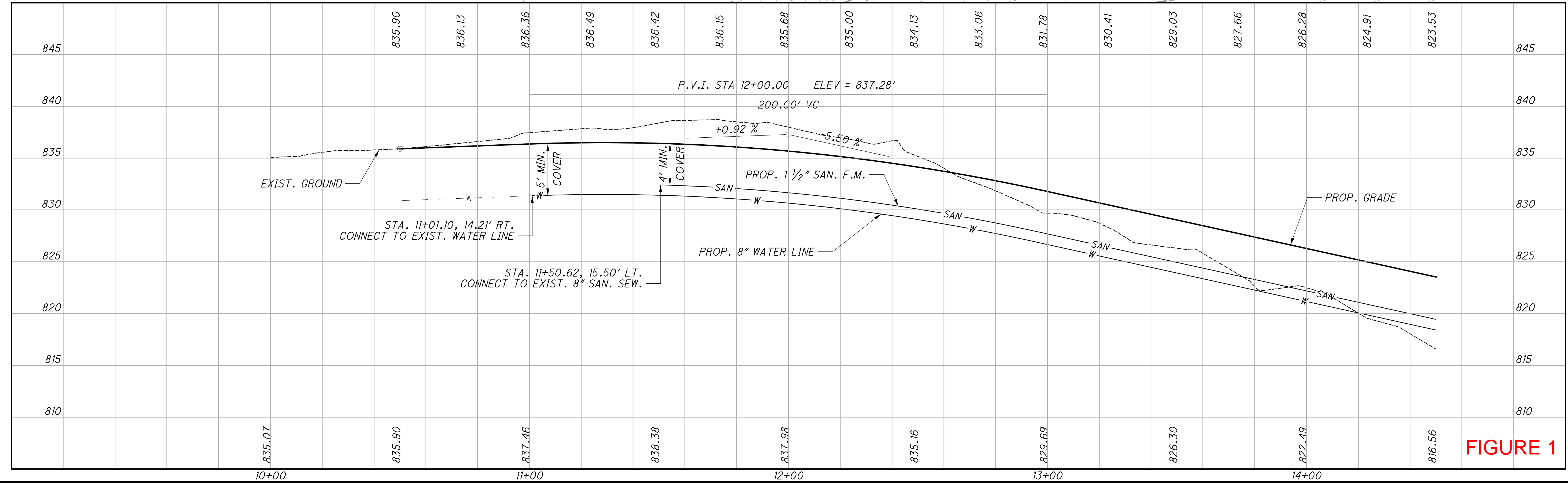
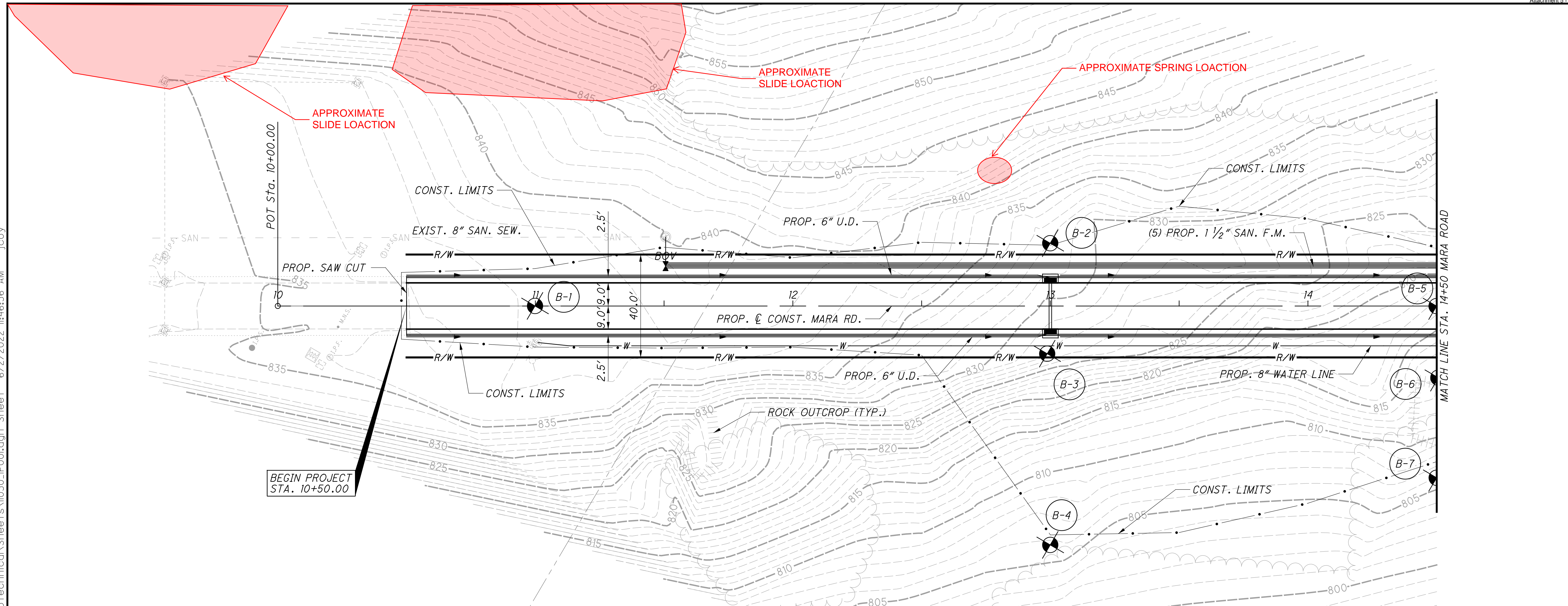
We recommend that a qualified geotechnical firm be retained by the owner to provide a comprehensive construction-testing program to assist the owner in determining that certain aspects of construction are being carried out in conformance with the applicable plans and specifications. This construction testing primarily includes foundation preparation for fill areas and testing of fill materials during placement.

7.0 REPORT LIMITATIONS

- This report has been prepared for the exclusive use of **The Thrasher Group, Inc.** for specific use on this site. All recommendations contained in this report have been made in accordance with generally accepted soil and foundation engineering practices in the area and at the time where the services were performed. No other warranties are implied or expressed.
- The scope of this investigation did not include an investigation to assess the potential for damage due to possible mine subsidence. Moreover, the scope of services represented by this report does not include an environmental assessment, or exploration for the presence or absence of wetlands, hazardous, or toxic material at the site.
- The analyses and recommendations submitted in this report are based, in part, upon the data obtained from a limited number of soil test borings. The nature and extent of variations in soil conditions between the borings may not become evident until construction. If variations then appear evident, it may be necessary to re-evaluate the recommendations of this report and provide additional recommendations.
- It is emphasized that the data and recommendations contained in this report are for design information purposes only and may not be sufficient to prepare accurate bids. Any conclusions drawn by contractors regarding subsurface conditions, quantities of unsuitable soils, presence and condition of rock, groundwater or methods and means of construction are at their sole risk.
- It is important that the geotechnical engineer be provided the opportunity to review the final construction plans and specifications to verify that the recommendations in this report are properly interpreted and incorporated in the design. If **NGE** is not afforded the opportunity to review and comment on the design plans, we can assume no responsibility for misinterpretation of our recommendations.

Figures

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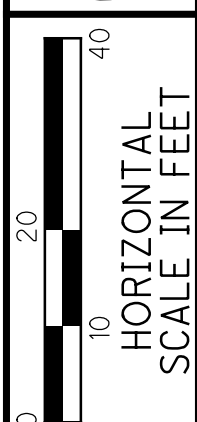
DRAWN JMC
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**SOIL BORINGS B-1 TO B-7
STA. 10+00.00 TO STA. 14+50.00**

MARA ROAD

2 / 5

FIGURE 1



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**SOIL BORINGS B-7 TO B-13
STA. 14+50.00 TO STA. 19+50.00**

MARA ROAD

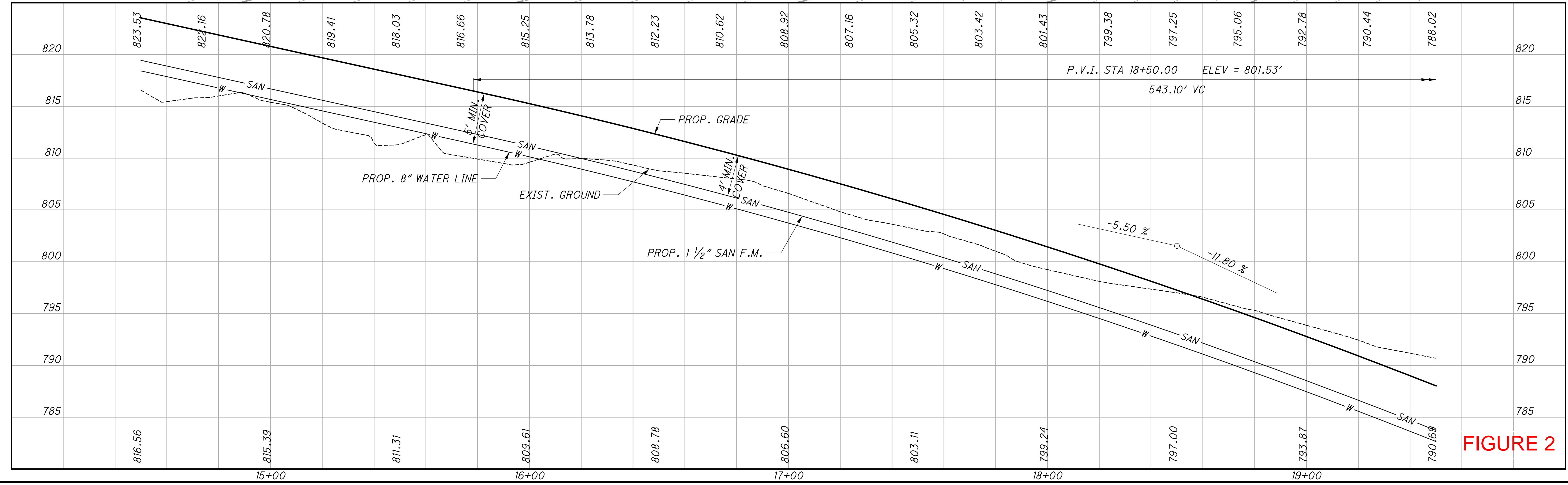
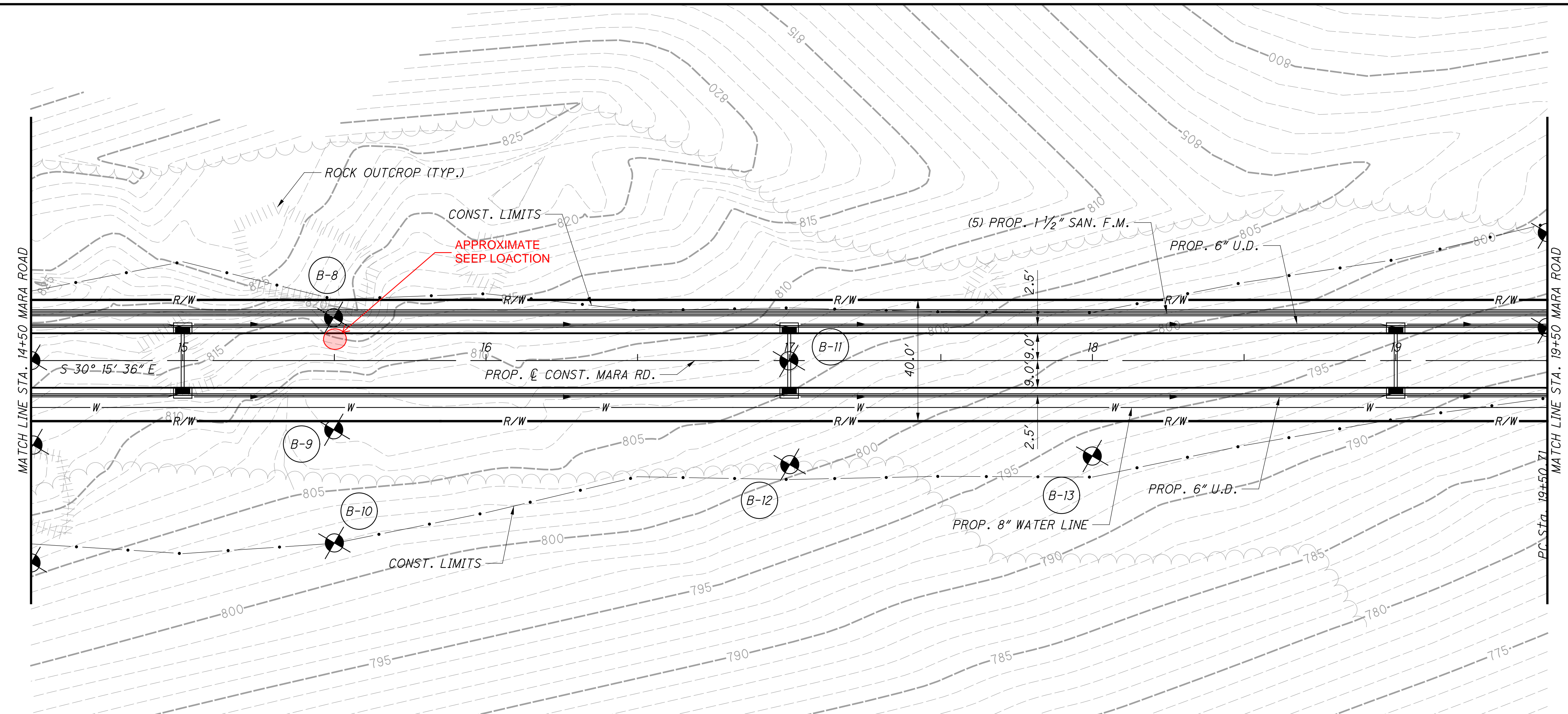
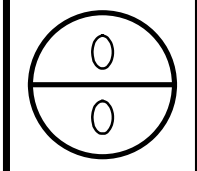
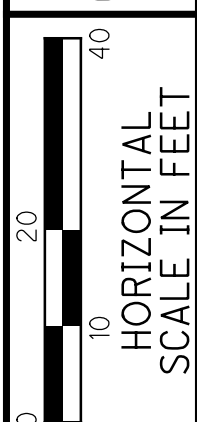


FIGURE 2

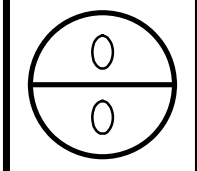
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**SOIL BORINGS B-14 TO B-24
STA. 19+50.00 TO STA. 24+50.00**

MARA ROAD



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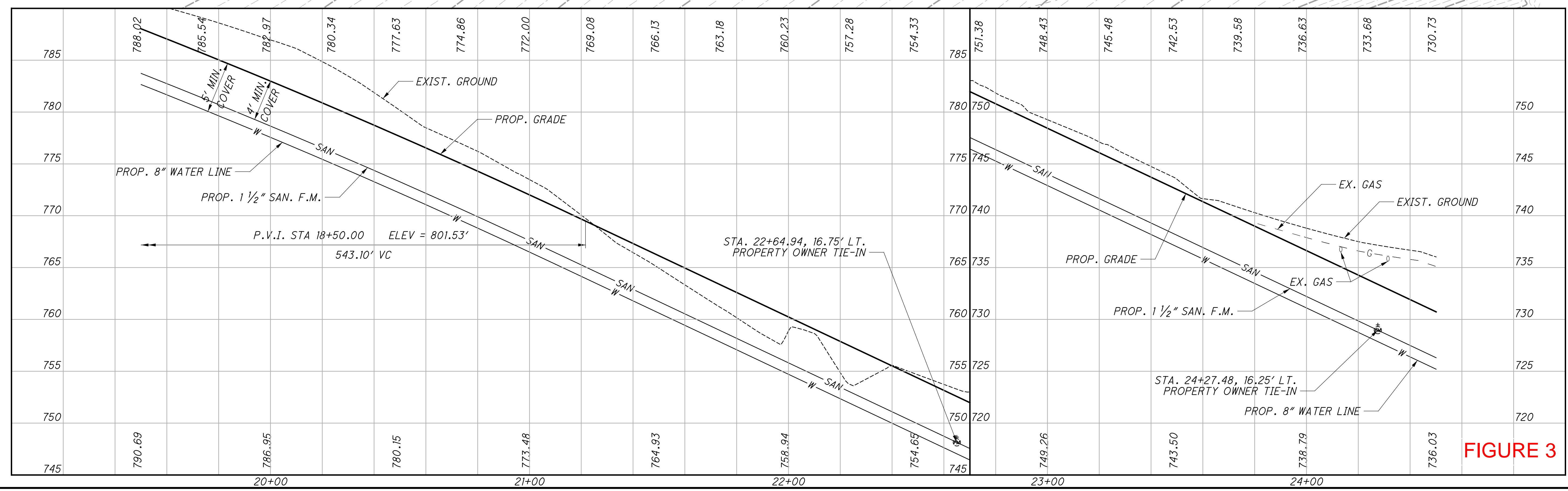
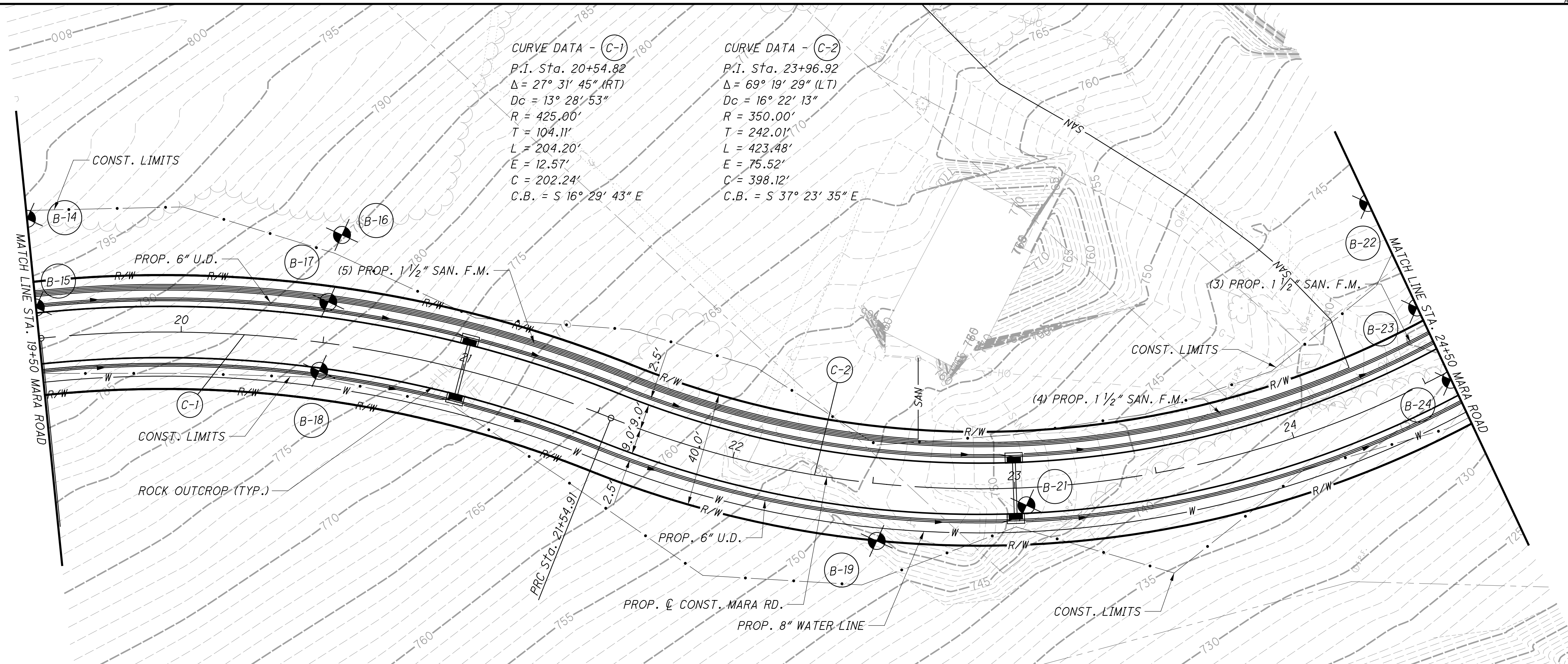
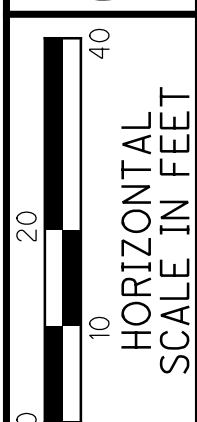


FIGURE 3

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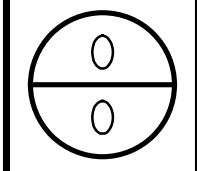


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SOIL BORINGS B-25 TO B-27
STA. 24+50.00 TO STA. 26+93.34

MARA ROAD

5 / 5



CURVE DATA - C-2
P.I. Sta. 23+96.92
 $\Delta = 69^\circ 19' 29''$ (LT)
 $D_c = 16^\circ 22' 13''$
 $R = 350.00'$
 $T = 242.01'$
 $L = 423.48'$
 $E = 75.52'$
 $C = 398.12'$
C.B. = S $37^\circ 23' 35''$ E

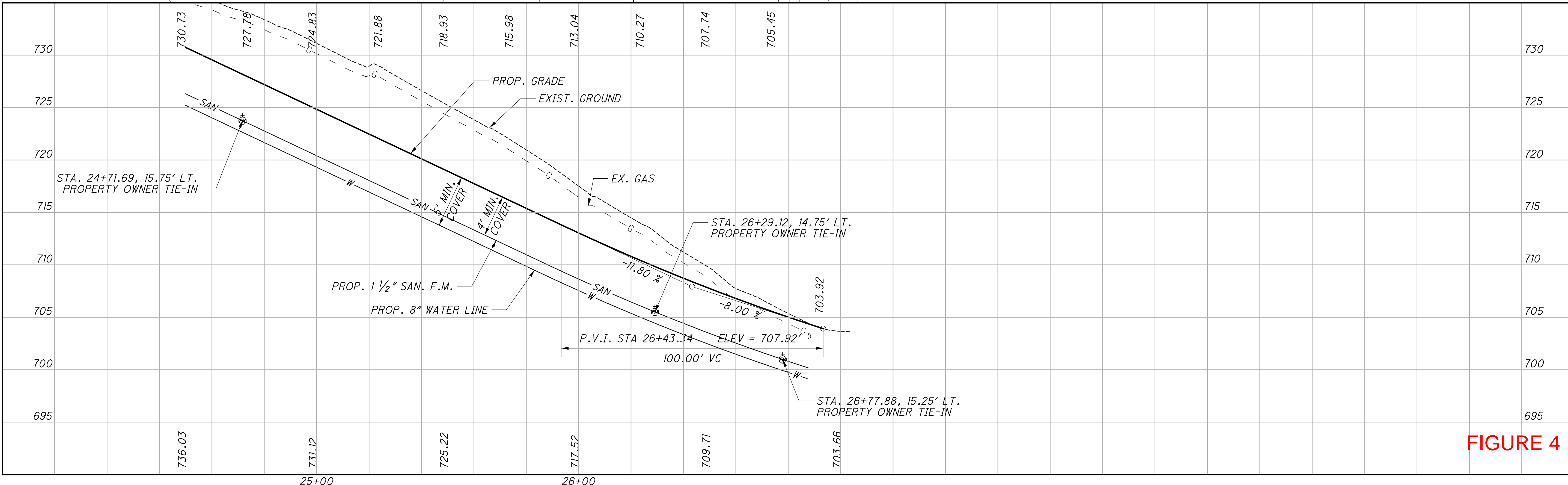
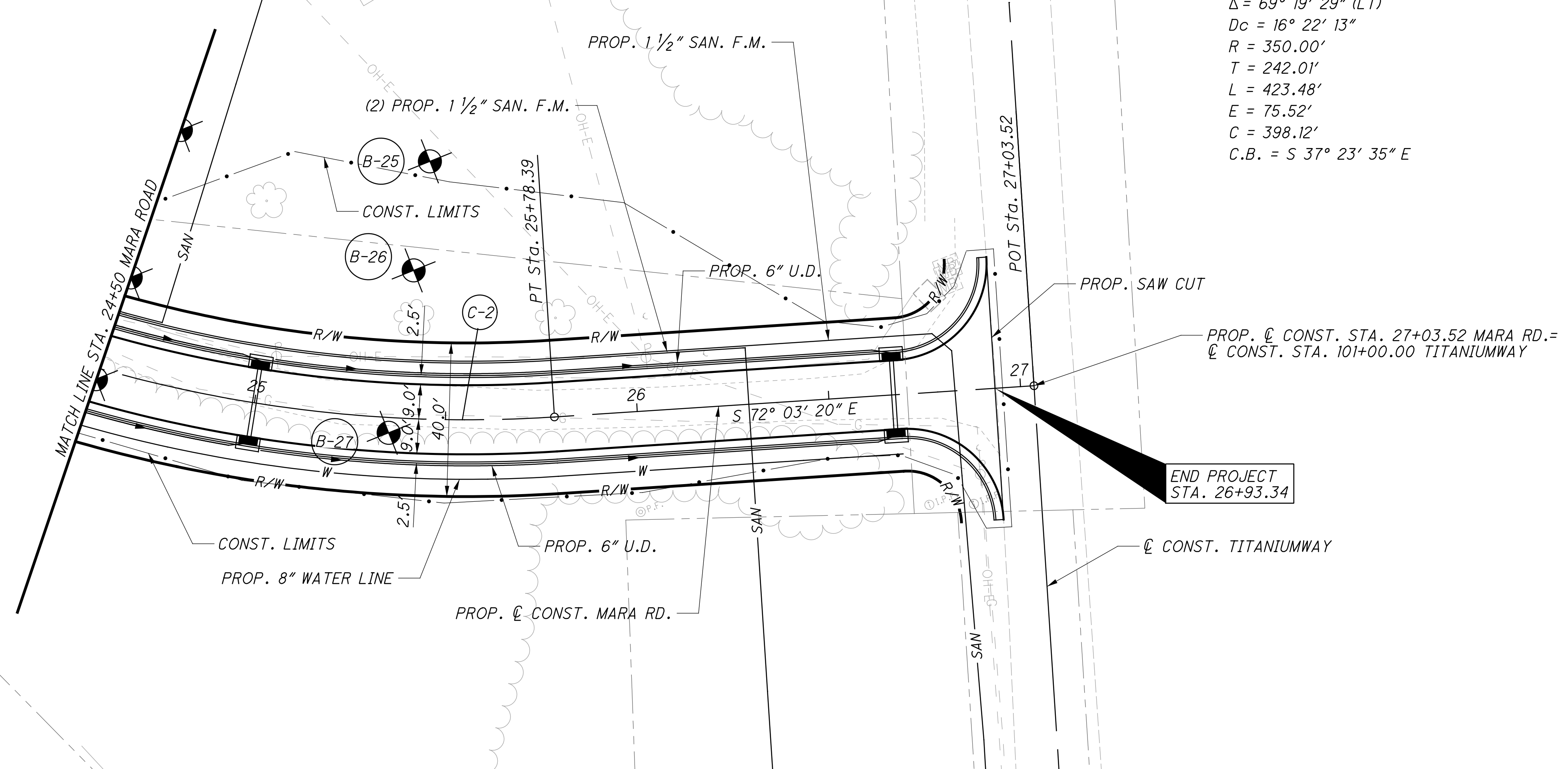
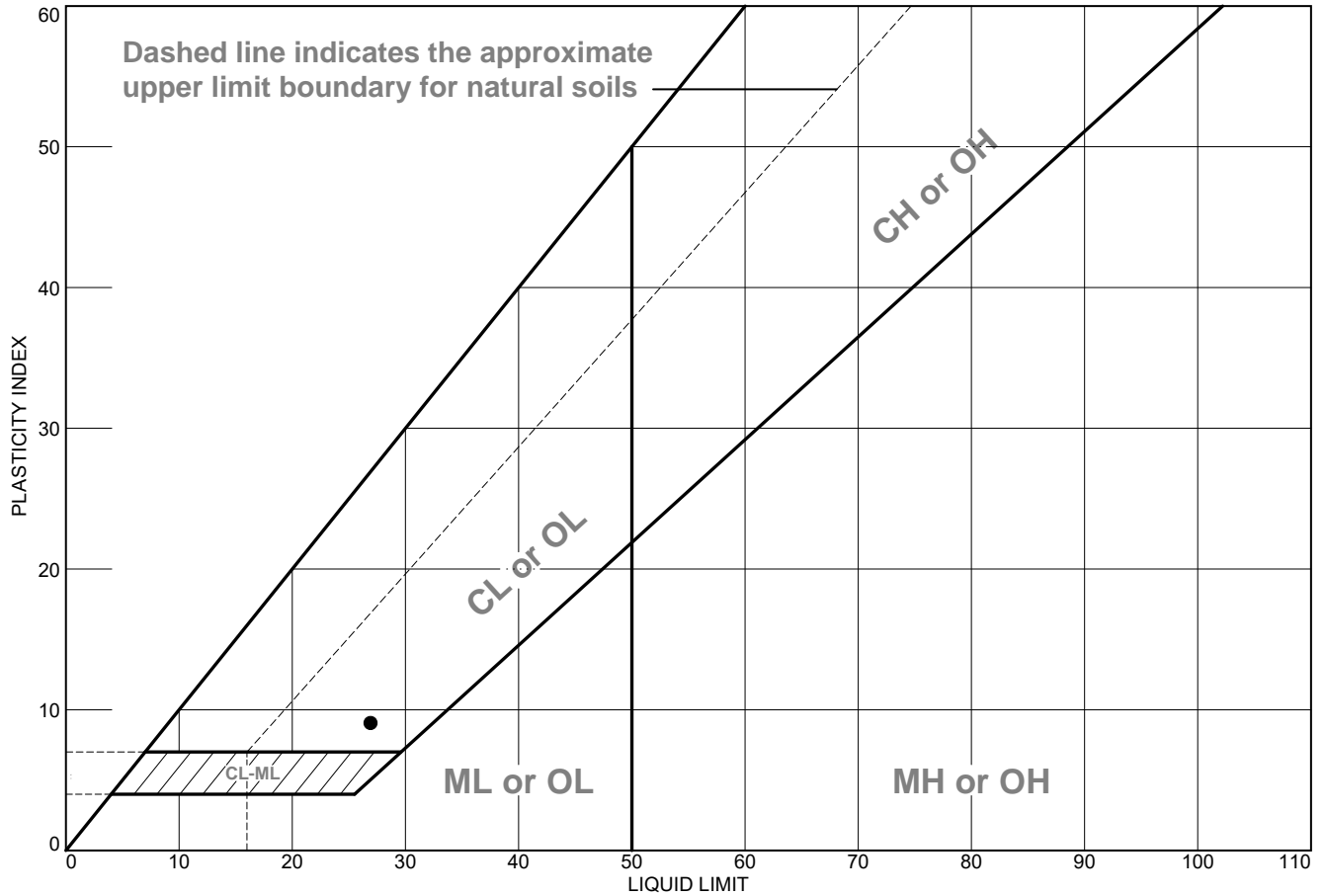


FIGURE 4

Appendix A

LIQUID AND PLASTIC LIMITS TEST REPORT



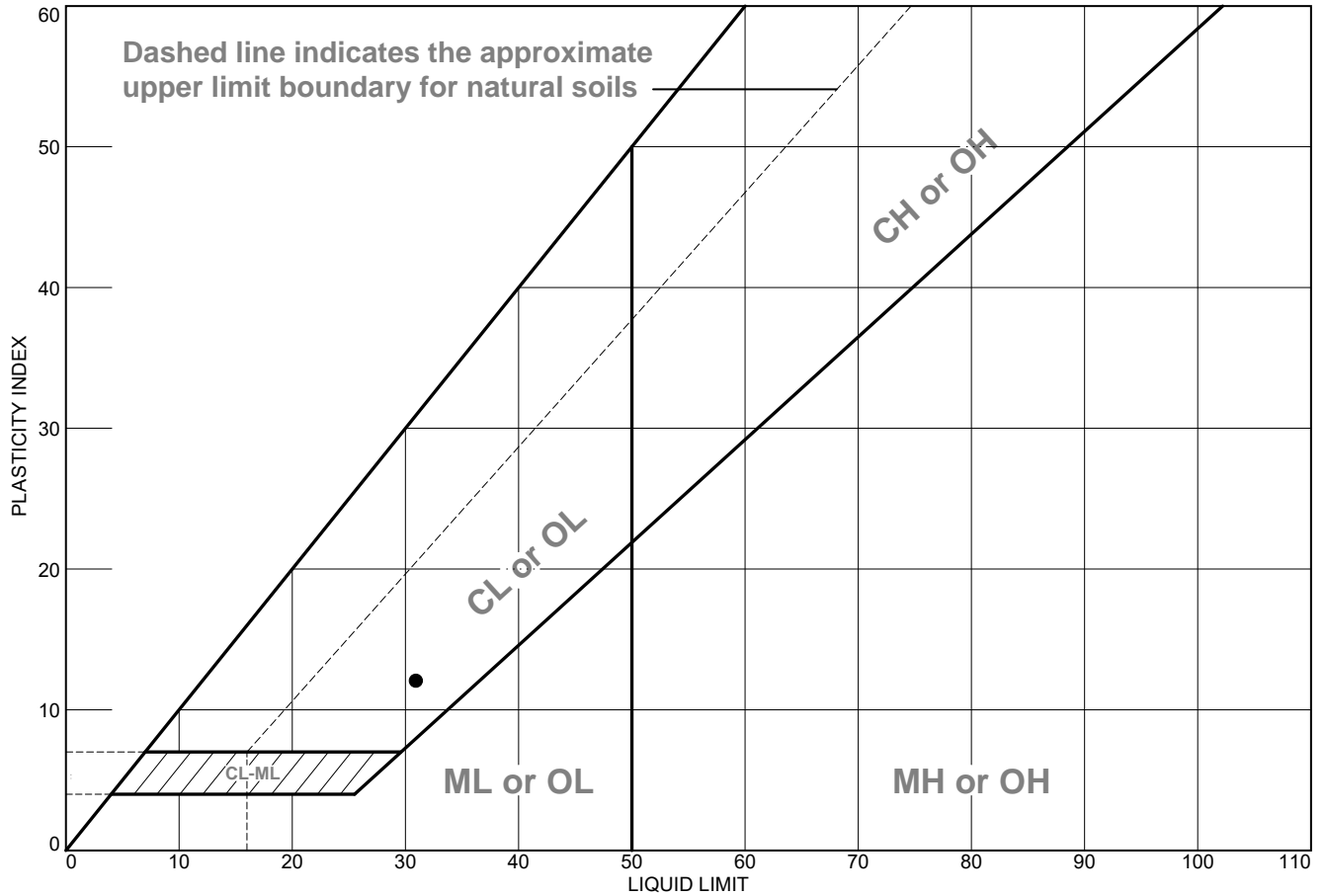
	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown SILTY to SANDY CLAY w/rock frags	27	18	9			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-3 Depth: 7.5 - 9.0 ft. Sample Number: 4</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: DP **Checked By:** CEM

LIQUID AND PLASTIC LIMITS TEST REPORT



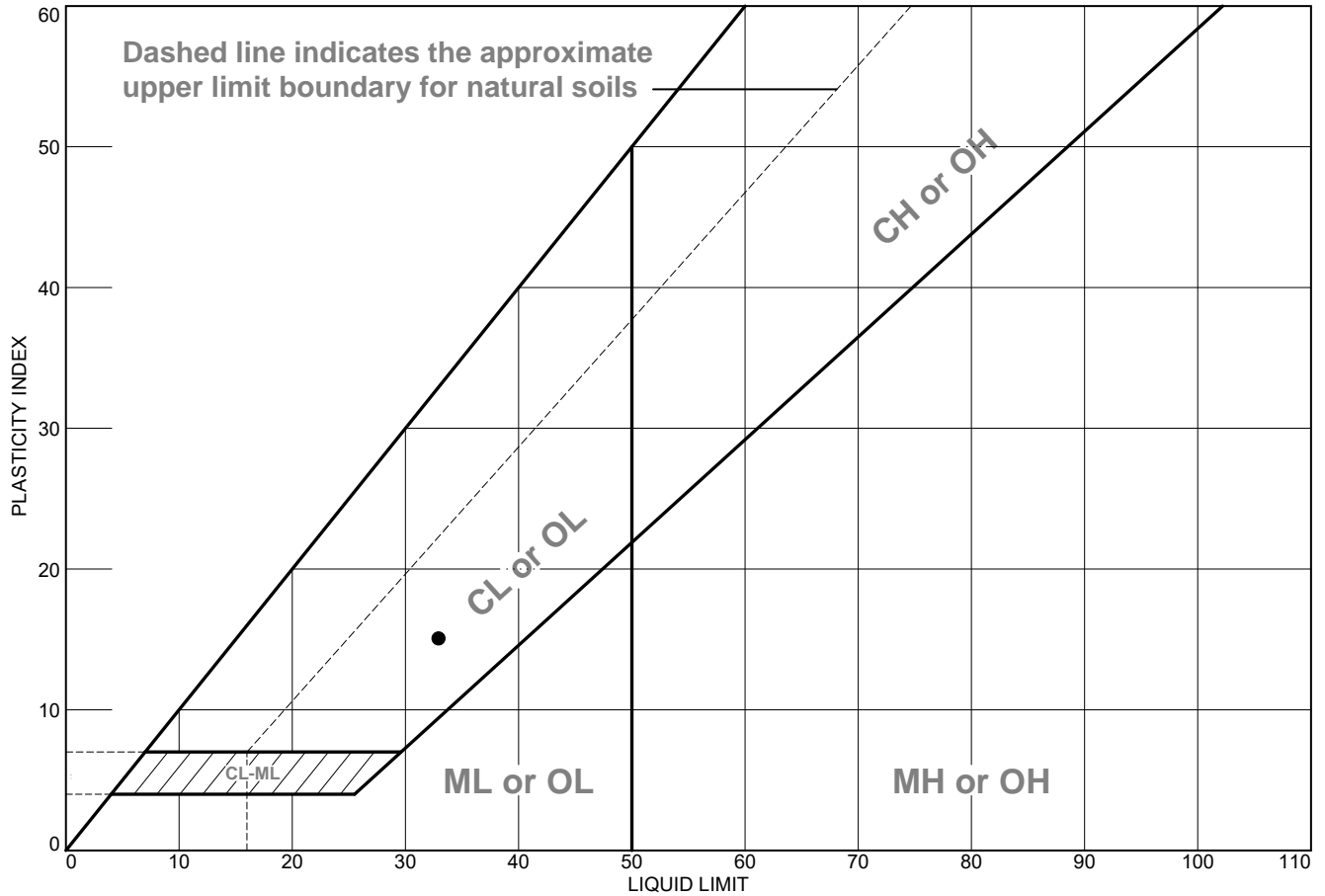
	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown SILTY to SANDY CLAY w/rock frags	31	19	12			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-4 Depth: 5.0 - 6.5 ft. Sample Number: 3</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: JCN **Checked By:** CEM

LIQUID AND PLASTIC LIMITS TEST REPORT



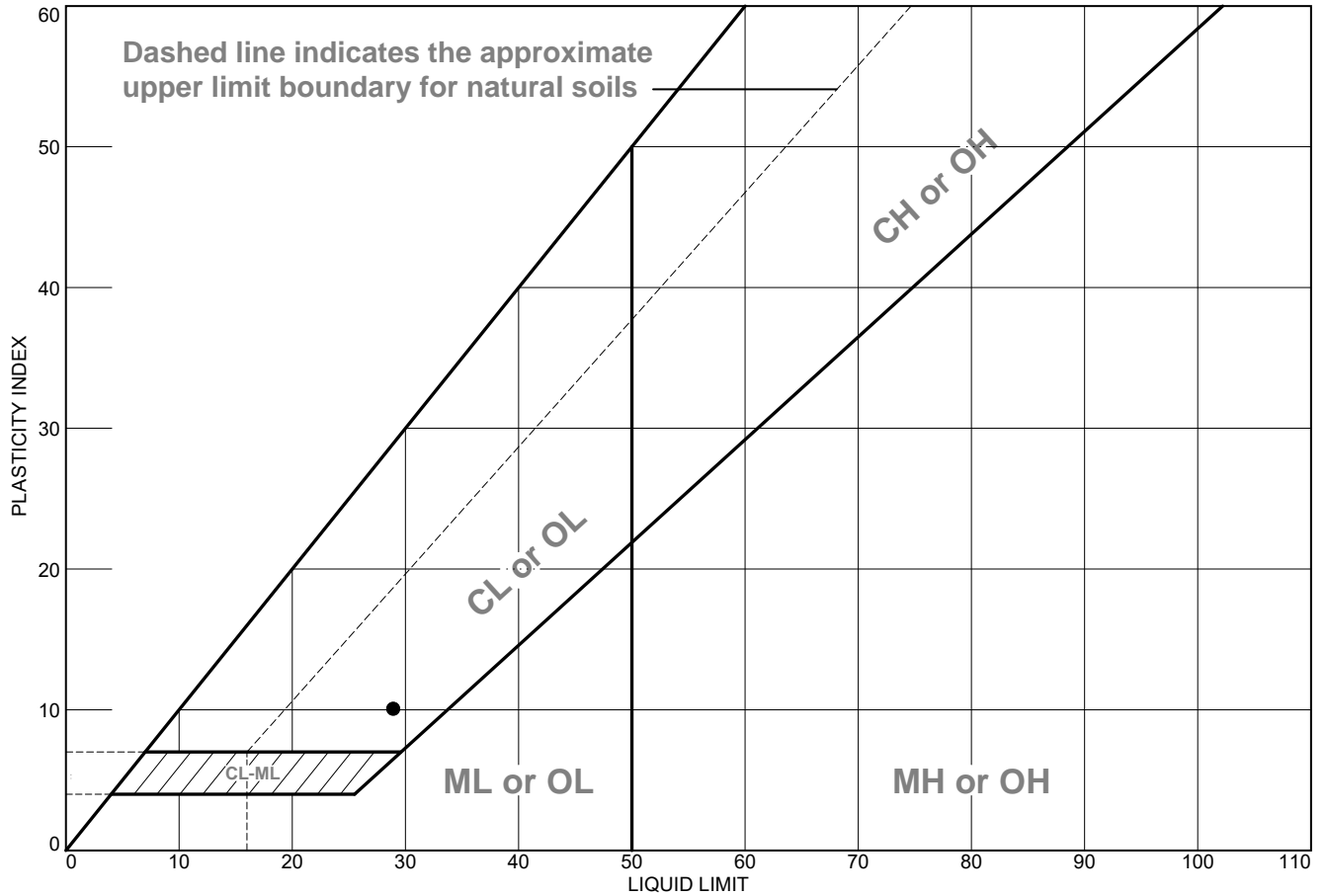
	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray SILTY CLAY	33	18	15			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-6 Depth: 7.5 - 9.0 ft. Sample Number: 4</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: DP _____ **Checked By:** CEM _____

LIQUID AND PLASTIC LIMITS TEST REPORT



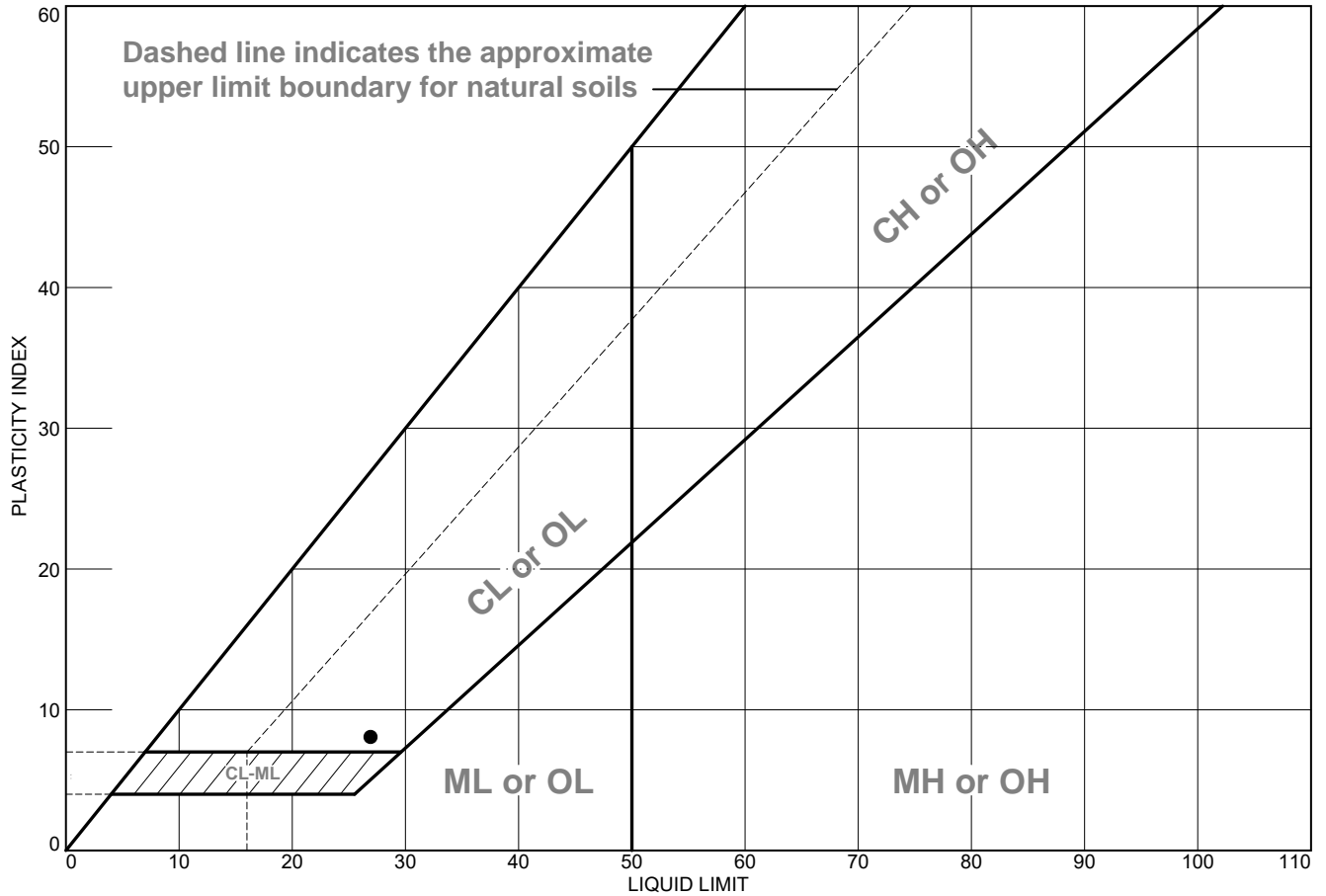
	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown SILTY to SANDY CLAY w/rock frags	29	19	10			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-6 Depth: 10.0 - 11.5 ft. Sample Number: 5</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: JCN **Checked By:** CEM

LIQUID AND PLASTIC LIMITS TEST REPORT



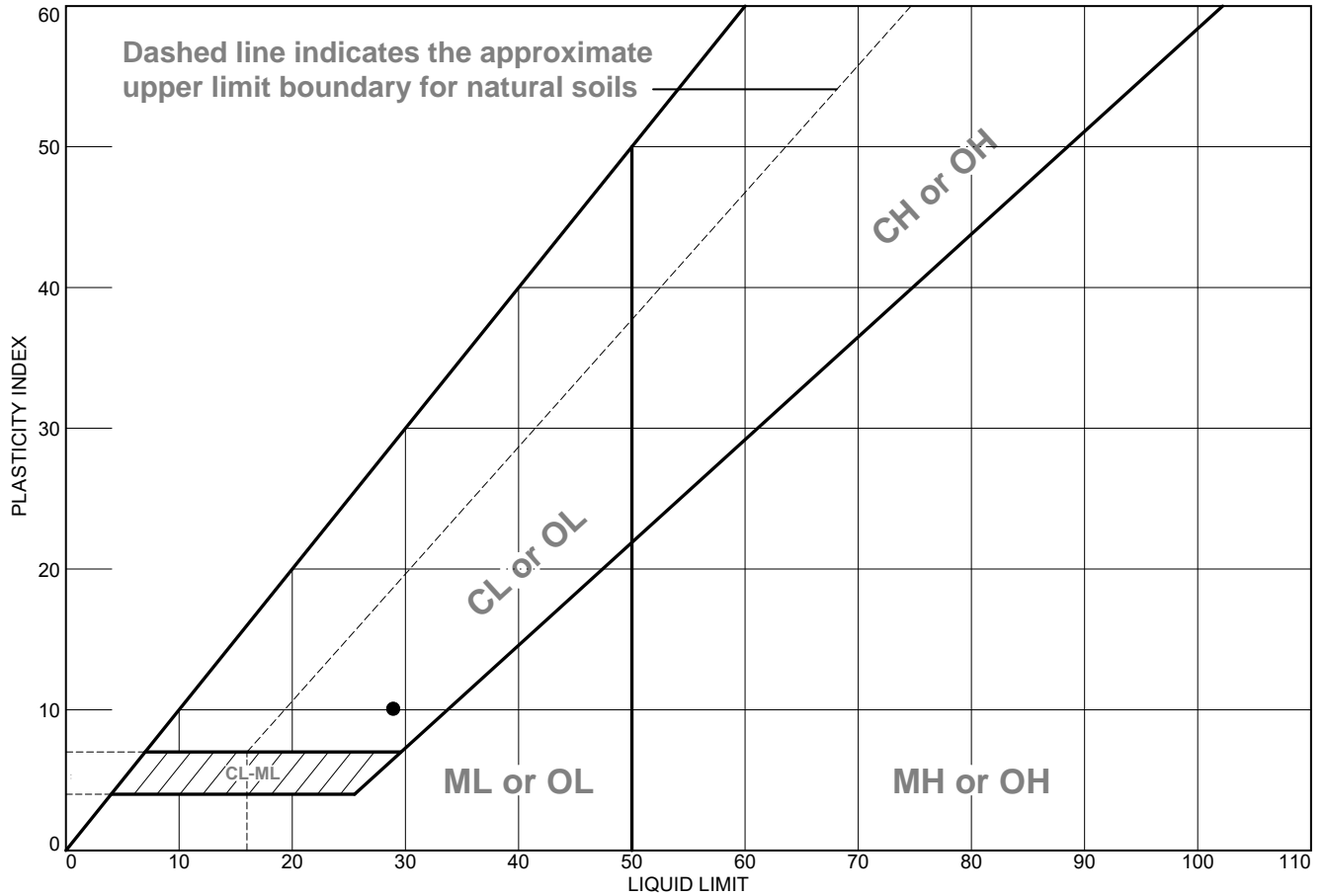
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●	Brown SILTY to SANDY CLAY w/rock frags	27	19	8			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-7 Depth: 10.0 - 11.5 ft. Sample Number: 5</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: JCN **Checked By:** CEM

LIQUID AND PLASTIC LIMITS TEST REPORT



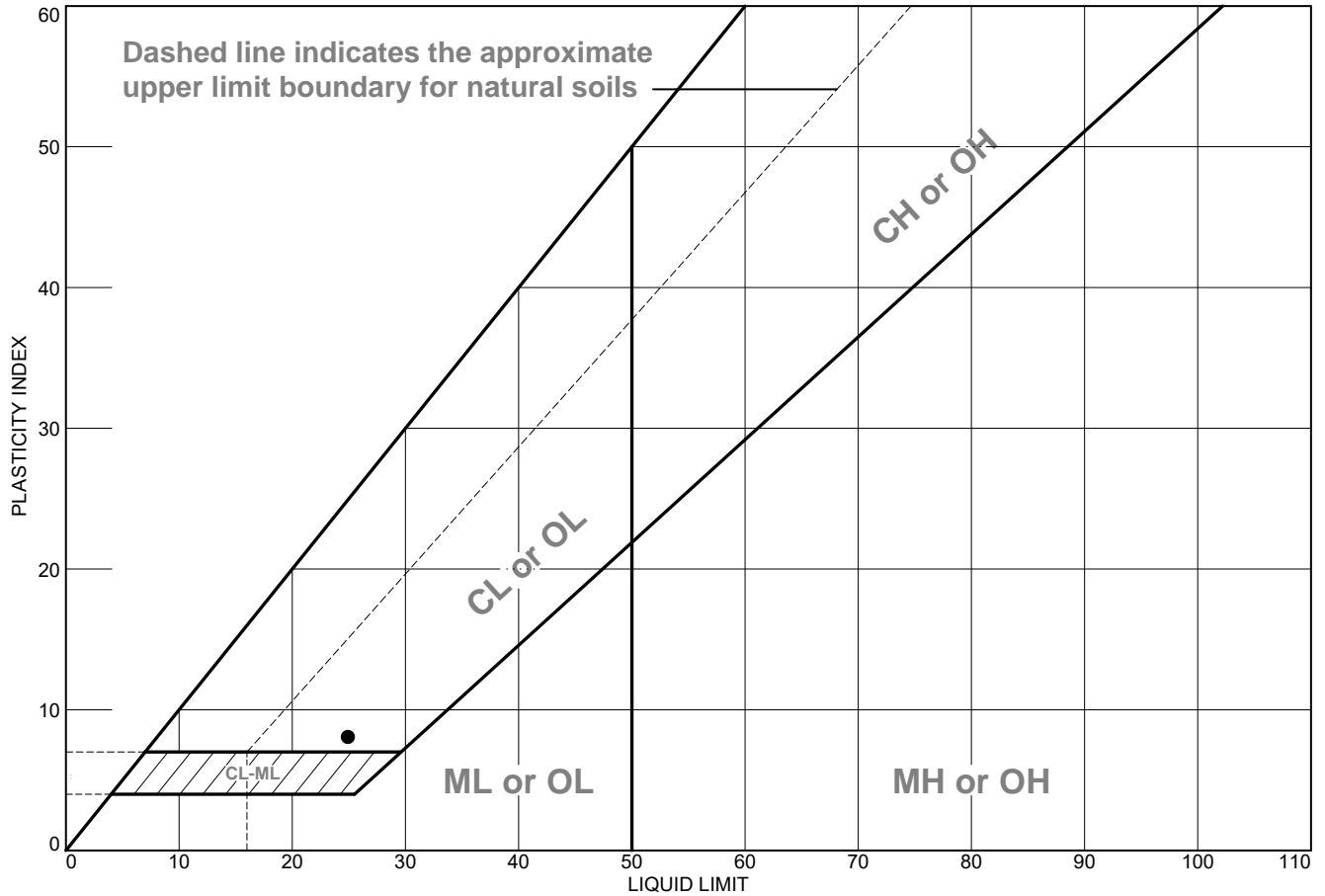
	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown SILTY to SANDY CLAY w/rock frags	29	19	10			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-7 Depth: 15.0 - 16.5 ft. Sample Number: 7</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: JCN **Checked By:** CEM

LIQUID AND PLASTIC LIMITS TEST REPORT



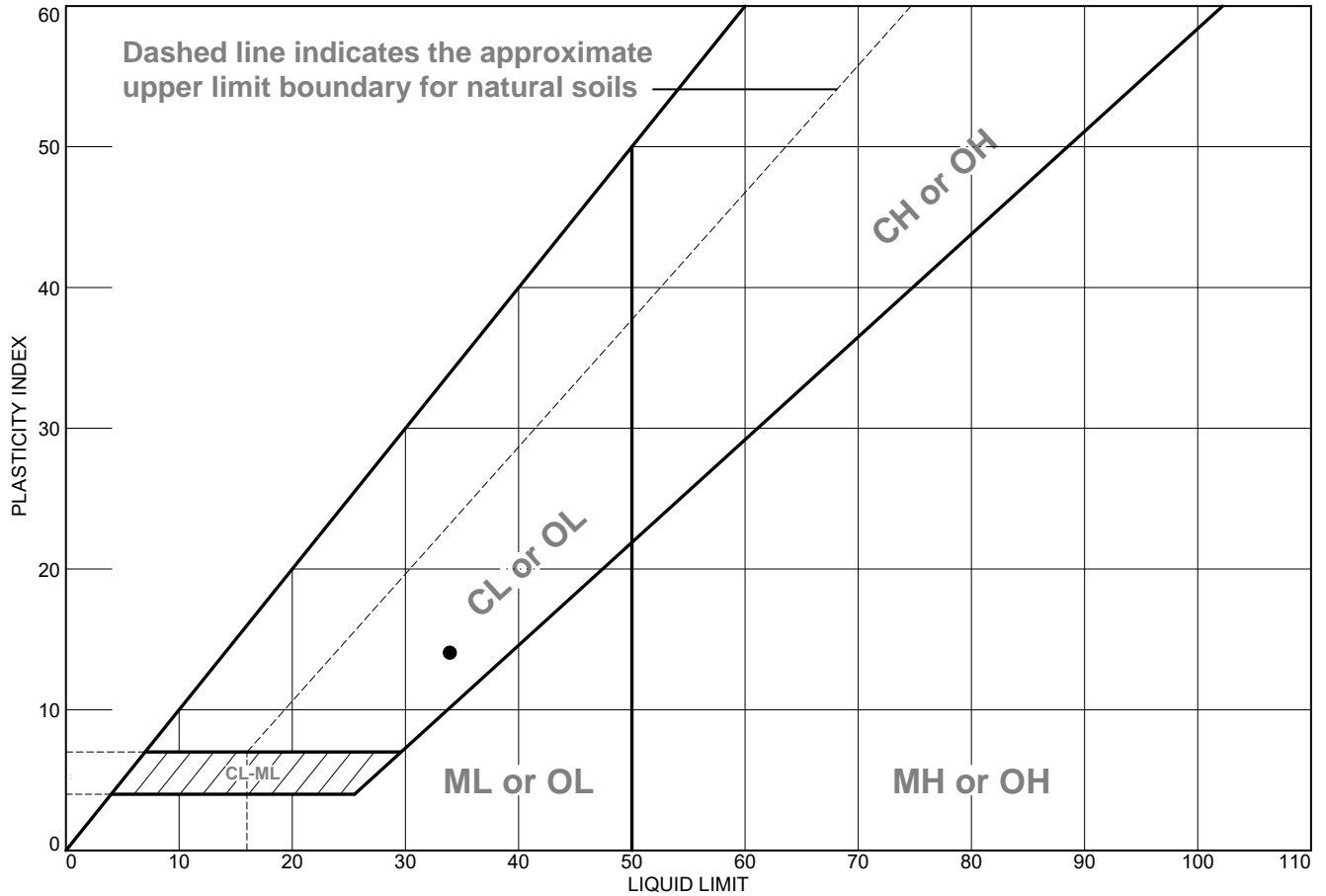
MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
● Brown SILTY to SANDY CLAY w/rock frags	25	17	8			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-9 Depth: 5.0 - 6.5 ft. Sample Number: 3</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: DP **Checked By:** CEM

LIQUID AND PLASTIC LIMITS TEST REPORT



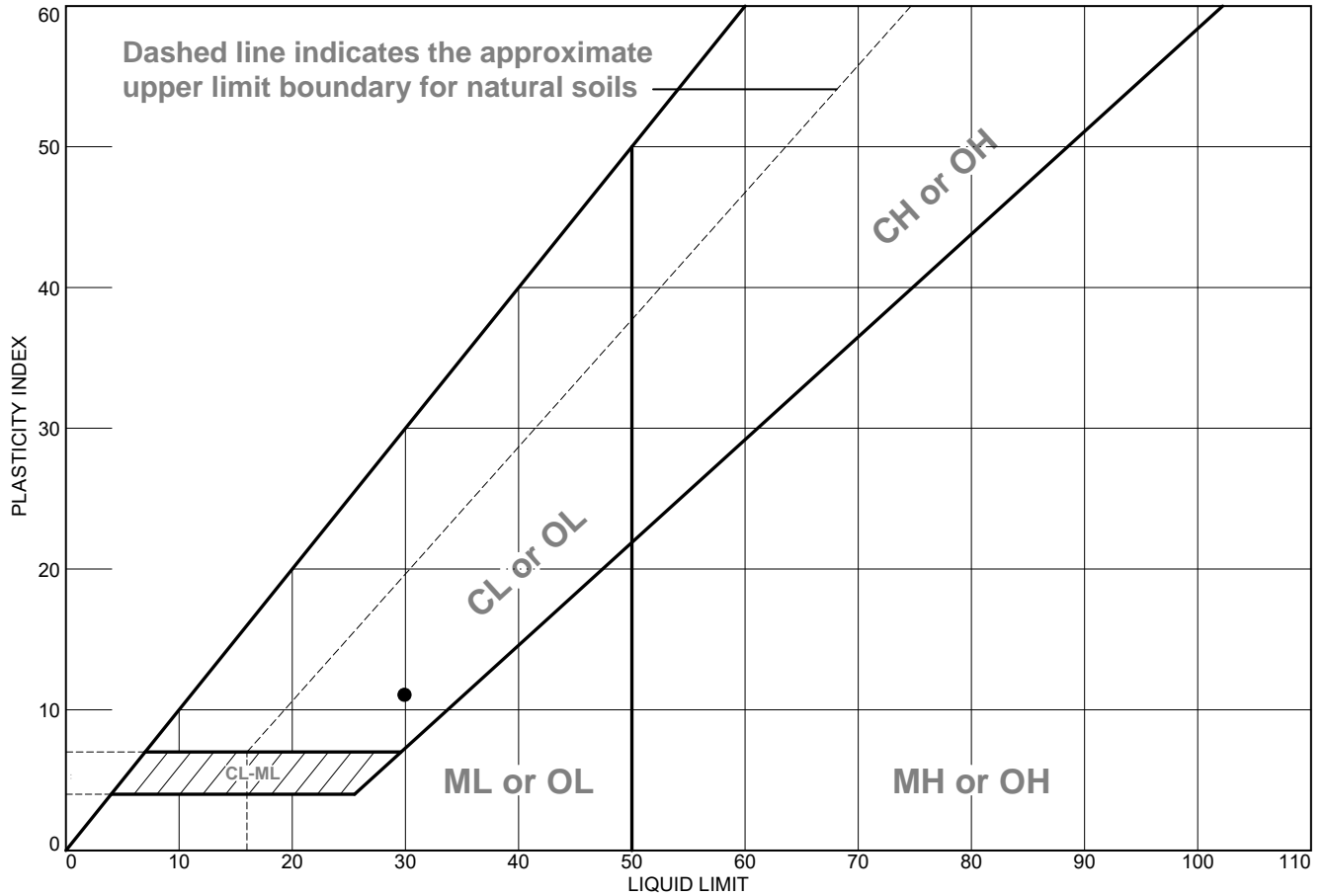
MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
● Brown SILTY to SANDY CLAY w/rock frags	34	20	14			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-10 Depth: 7.5 - 9.0 ft. Sample Number: 4</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: JCN **Checked By:** CEM

LIQUID AND PLASTIC LIMITS TEST REPORT



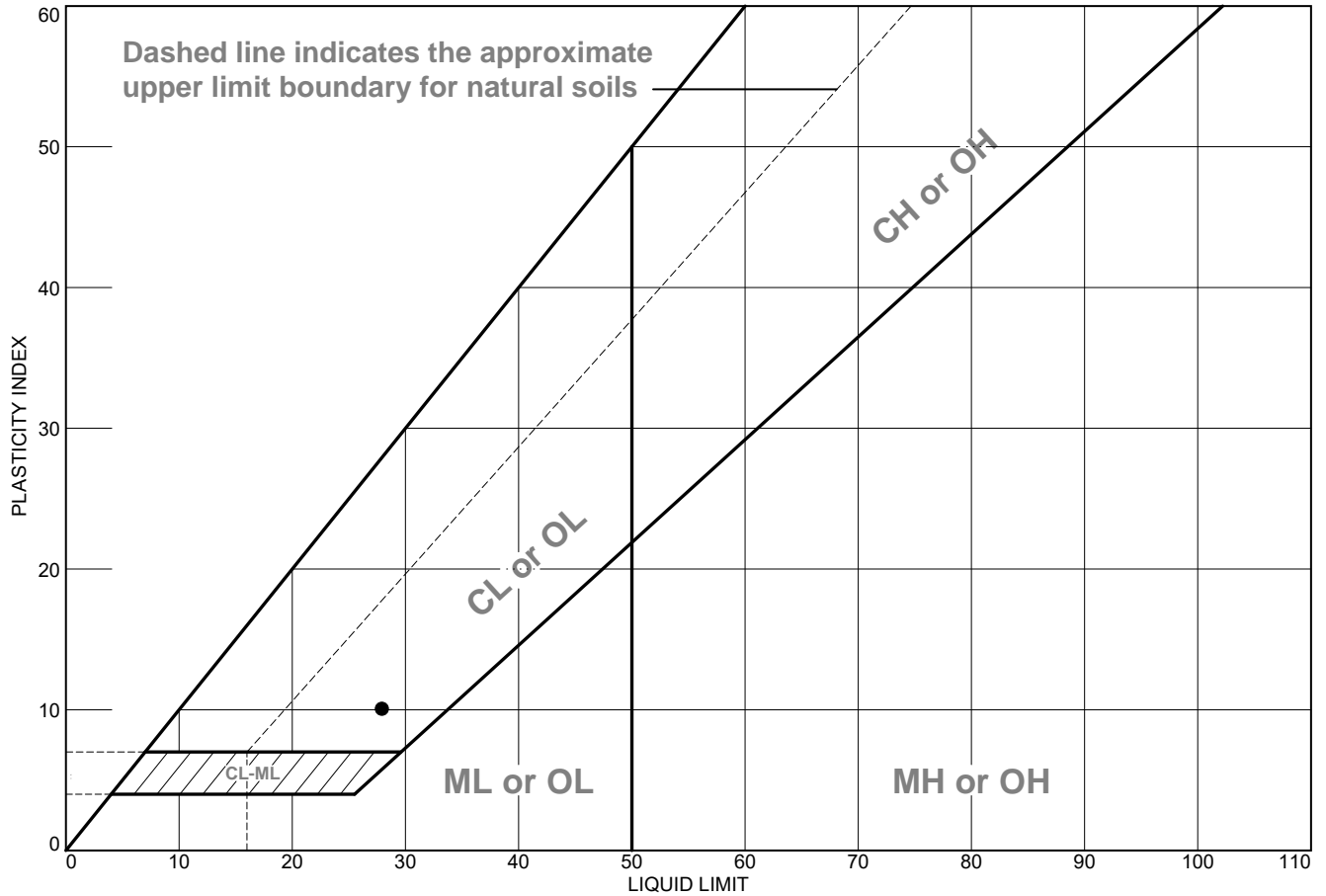
	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown SILTY to SANDY CLAY	30	19	11			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-12 Depth: 5.0 - 6.5 ft. Sample Number: 3</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: JCN **Checked By:** CEM

LIQUID AND PLASTIC LIMITS TEST REPORT



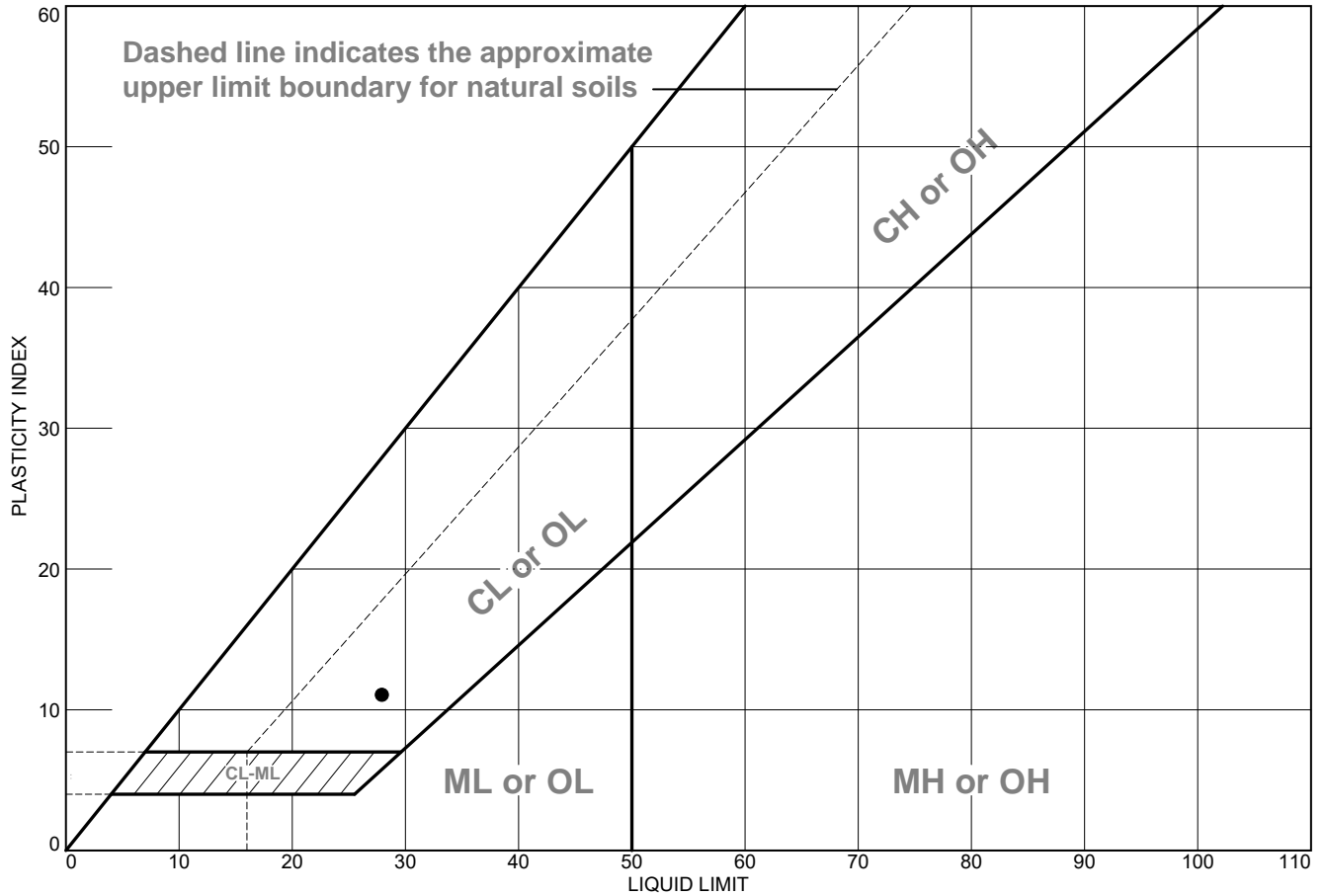
MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
● Brown SILTY to SANDY CLAY w/rock frags	28	18	10			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-13 Depth: 2.5 - 4.0 ft. Sample Number: 2</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: DP _____ **Checked By:** CEM _____

LIQUID AND PLASTIC LIMITS TEST REPORT



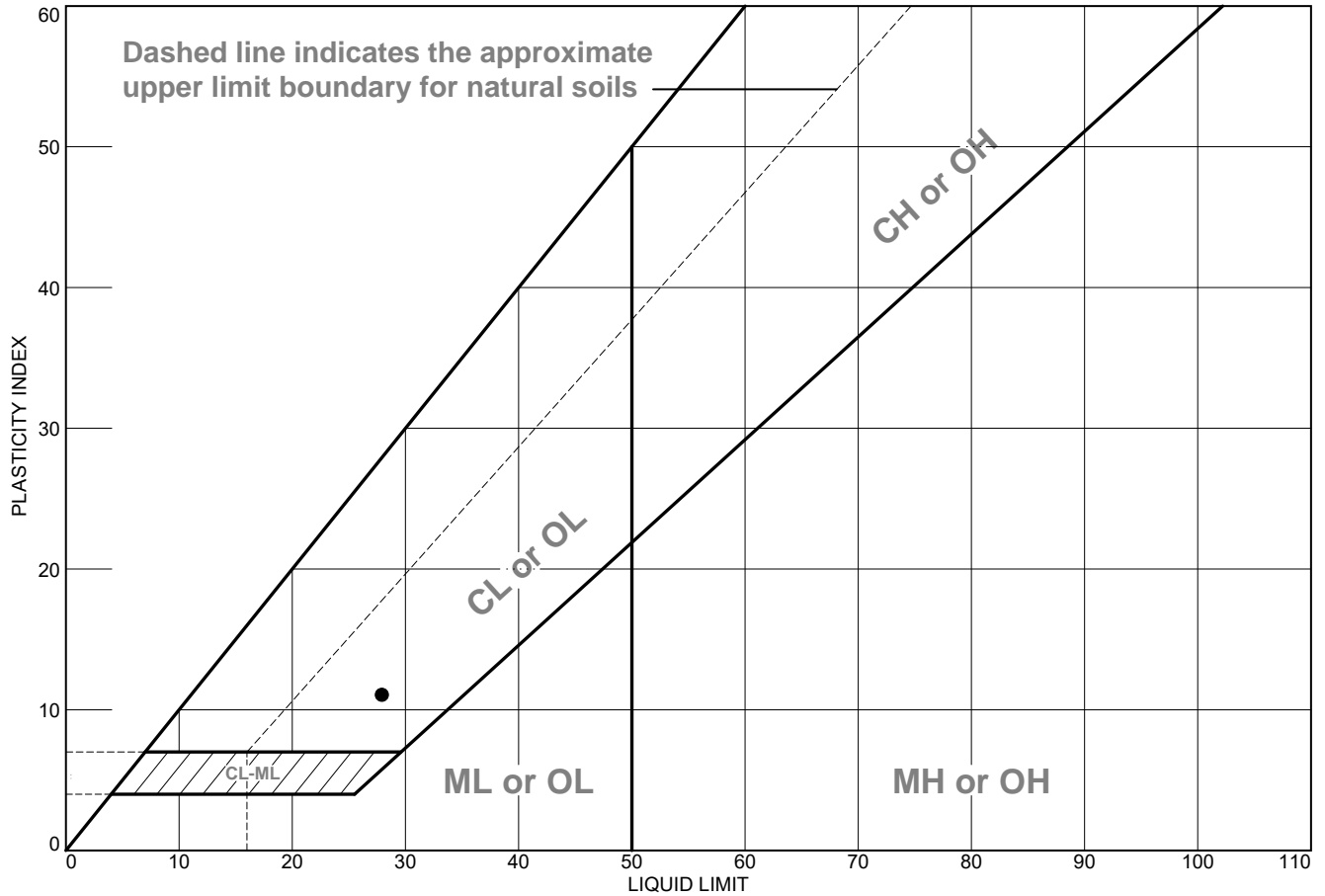
	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown and gray SILTY to SANDY CLAY	28	17	11			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-14 Depth: 5.0 - 6.5 ft. Sample Number: 3</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: DP **Checked By:** CEM

LIQUID AND PLASTIC LIMITS TEST REPORT



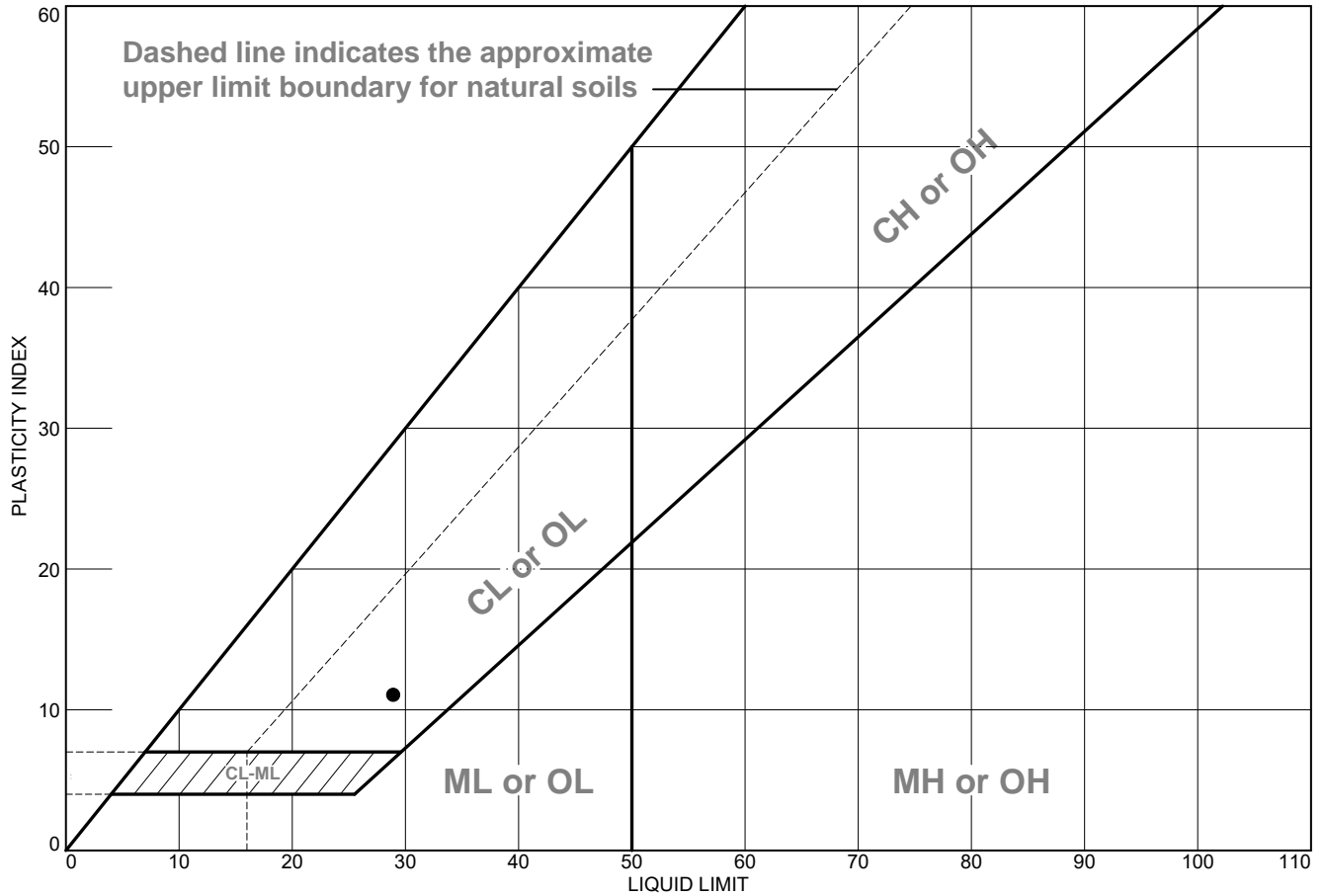
	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown SANDY CLAY w/rock frags	28	17	11			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-16 Depth: 5.0 - 6.5 ft. Sample Number: 3</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: DP _____ **Checked By:** CEM _____

LIQUID AND PLASTIC LIMITS TEST REPORT



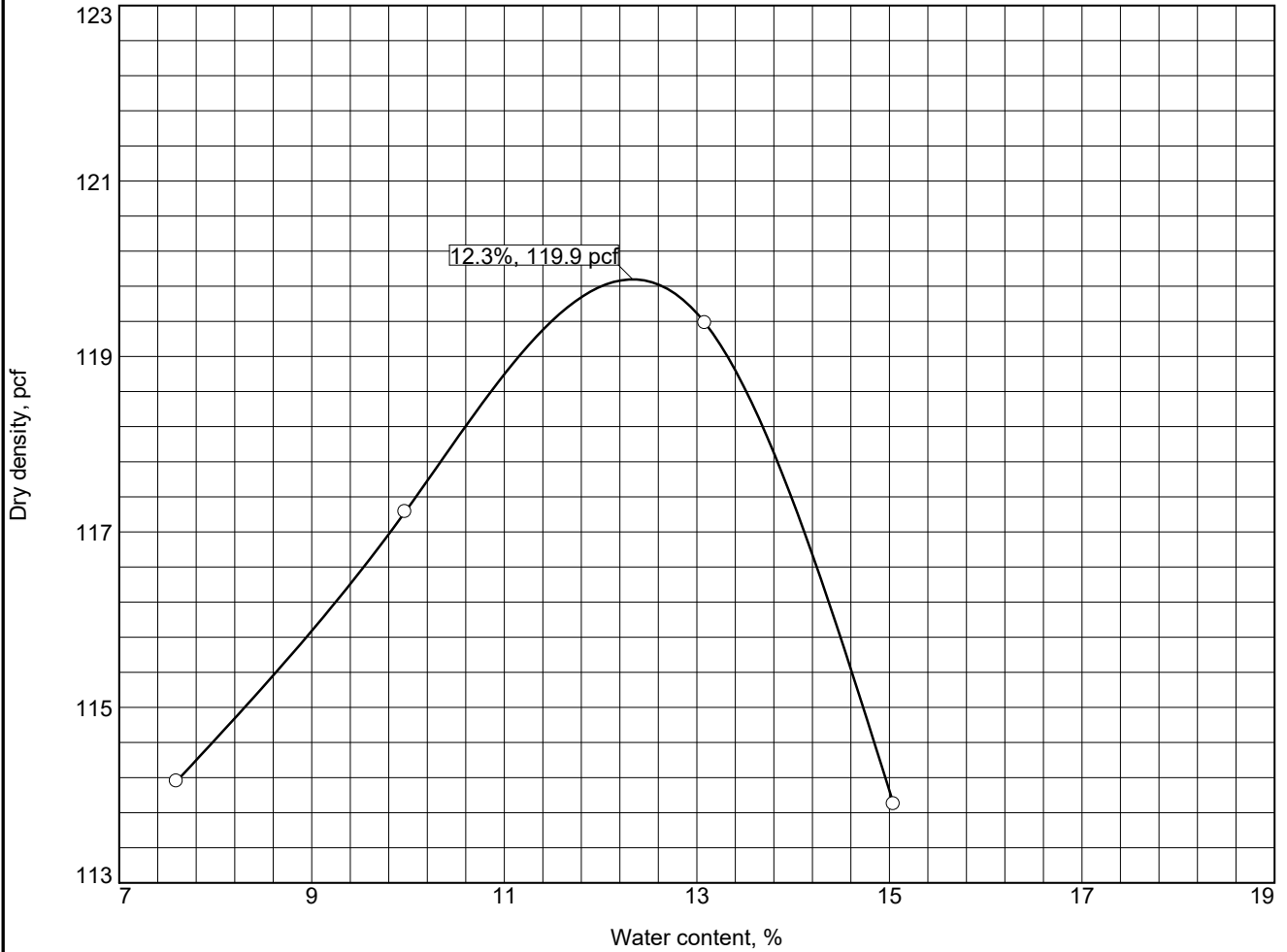
	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown SANDY CLAY w/rock frags	29	18	11			

<p>Project No. W22072 Client: Thrasher</p> <p>Project: Mara Road Extension</p> <p>● Source of Sample: B-22 Depth: 5.0 - 6.5 ft. Sample Number: 3</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: DP _____ **Checked By:** CEM _____

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method B Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
2.0 - 10.0 ft.			13.9				1.3	

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 119.9 pcf Optimum moisture = 12.3 %	Brown SANDY CLAY w/rock frags
Project No. W22072 Client: Thrasher Project: Mara Road Extension <input type="radio"/> Source of Sample: B-23 Sample Number: Bag NGE, LLC St. Albans, West Virginia	Remarks:

Figure

Tested By: JCN _____ Checked By: CEM _____



W22072
Mara Road Extension
MOISTURE CONTENT ANALYSIS SUMMARY

Boring No.	Sample Depth (ft.)	% Moisture	Boring No.	Sample Depth (ft.)	% Moisture
B-2	5-6.5	19.3%	B-14	5-6.5	15.3%
B-3	2.5-4	14.8%	B-15	0-1.5	7.4%
B-4	0-1.5	16.4%	B-15	2.5-4	12.3%
B-4	2.5-4	13.3%	B-15	5-6.5	14.2%
B-4	7.5-9	10.6%	B-15	7.5-9	13.4%
B-5	0-1.5	13.5%	B-16	5-6.5	10.5%
B-5	2.5-4	15.3%	B-17	0-1.5	11.1%
B-6	0-1.5	14.6%	B-17	2.5-4	9.2%
B-6	2.5-4	16.1%	B-17	5-6.5	14.1%
B-6	10-11.5	16.6%	B-17	7.5-9	9.8%
B-7	5-6.5	10.4%	B-18	0-1.5	12.3%
B-7	10-11.5	18.9%	B-18	5-6.5	12.1%
B-7	15-16.5	19.4%	B-19	0-1.5	21.6%
B-8	0-1.5	18.2%	B-19	2.5-4	17.3%
B-8	2.5-4	11.7%	B-19	5-6.5	15.1%
B-9	2.5-4	15.2%	B-21	0-1.5	15.0%
B-10	0-1.5	12.8%	B-21	2.5-4	18.4%
B-10	2.5-4	15.0%	B-21	7.5-9	11.7%
B-10	5-6.5	15.6%	B-22	0-1.5	19.5%
B-10	7.5-9	11.0%	B-22	2.5-4	19.9%
B-11	0-1.5	17.3%	B-23	0-1.5	31.4%
B-11	2.5-4	17.8%	B-23	2.5-4	15.6%
B-12	0-1.5	19.2%	B-23	5-6.5	13.7%
B-12	2.5-4	18.5%	B-23	7.5-9	18.3%
B-12	5-6.5	14.8%	B-23	10-11.5	16.8%
B-12	10-11.5	23.8%	B-24	0-1.5	29.5%
B-13	0-1.5	15.7%	B-24	5-6.5	14.2%
B-13	5-6.5	12.9%	B-25	0-1.5	10.3%
B-14	0-1.5	17.8%	B-25	2.5-4	15.5%
B-14	2.5-4	18.9%	B-26	0-1.5	23.5%



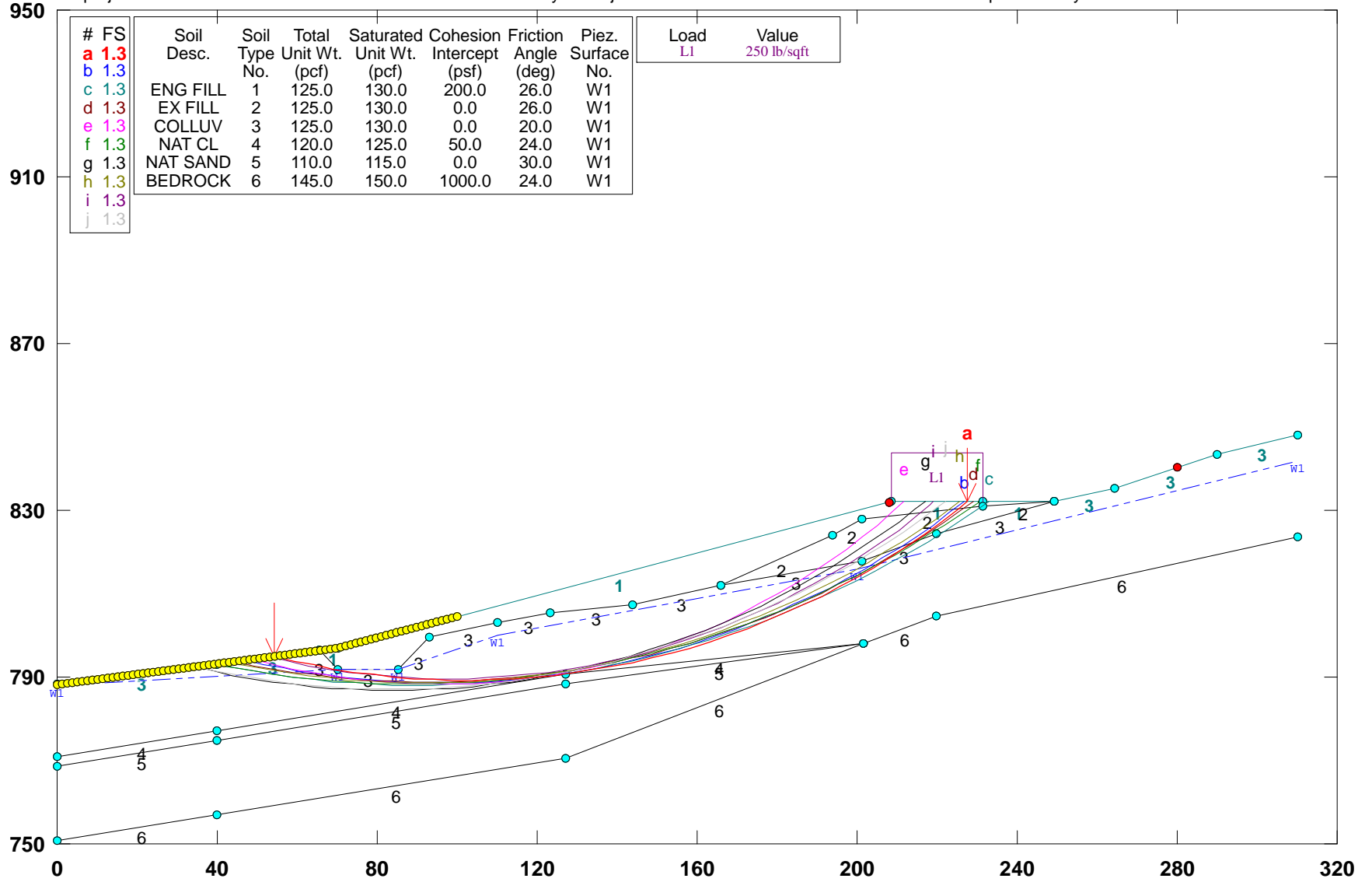
W22072
Mara Road Extension
MOISTURE CONTENT ANALYSIS SUMMARY

Boring No.	Sample Depth (ft.)	% Moisture	Boring No.	Sample Depth (ft.)	% Moisture
B-26	2.5-4	14.6%			
B-26	7.5-9	17.0%			
B-26	10-11.5	17.3%			

Appendix B

W22072 - MARA ROAD - STA 13+00 RT - 15' KEY 5' DEEP

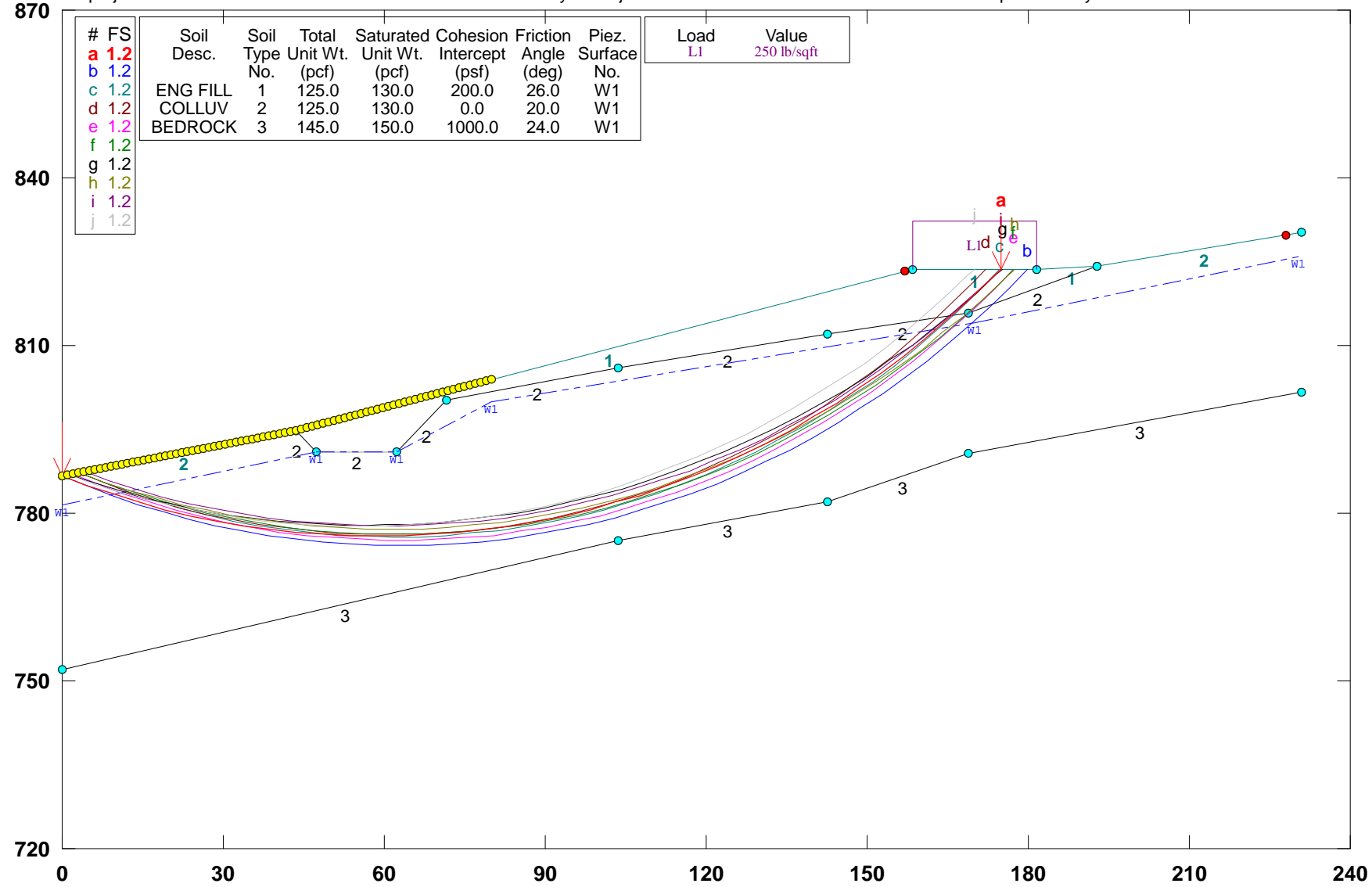
w:\projects\2022\w22072 - mara road extension - thrasher\stability\final - jen modified fill embankments with water\13+00 rt.pl2 Run By: Username 8/5/2022 02:44PM



STABL6H FSmin=1.3
 Safety Factors Are Calculated By The Modified Bishop Method

W22072 - MARA ROAD - STA 14+50 RT - 15' KEY 5' DEEP

w:\projects\2022\w22072 - mara road extension - thrasher\stability\final - jen modified fill embankments with water\14+50 rt.pl2 Run By: Username 8/5/2022 02:47PM



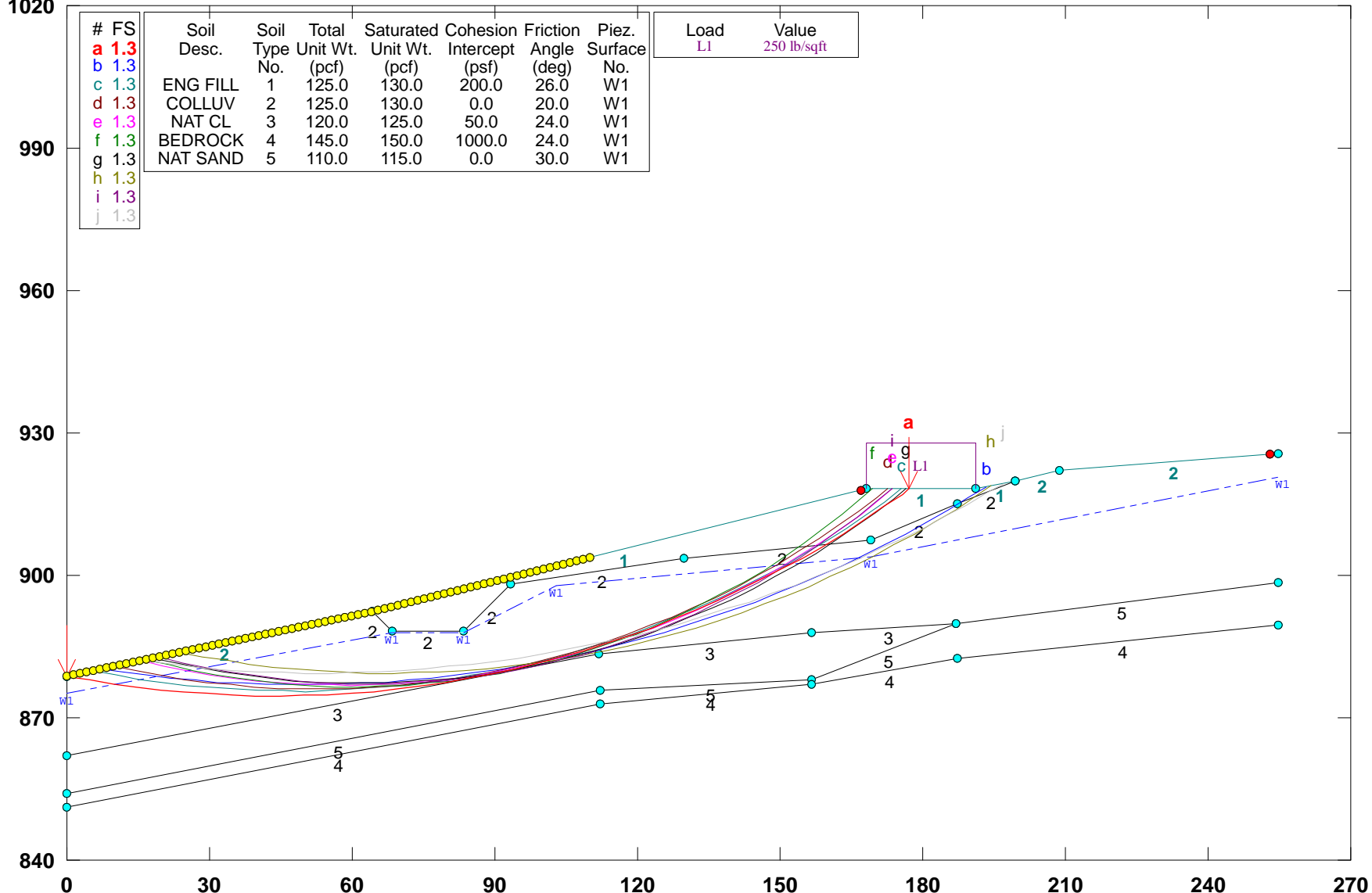
#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
a	1.2	ENG FILL	1	125.0	130.0	200.0	26.0	W1
b	1.2	COLLUV	2	125.0	130.0	0.0	20.0	W1
c	1.2	BEDROCK	3	145.0	150.0	1000.0	24.0	W1
d	1.2							
e	1.2							
f	1.2							
g	1.2							
h	1.2							
i	1.2							
j	1.2							

Load	Value
L1	250 lb/sqft

STABL6H FSmin=1.2
 Safety Factors Are Calculated By The Modified Bishop Method

W22072 - MARA ROAD - STA 15+50 RT - 15' KEY 5' DEEP

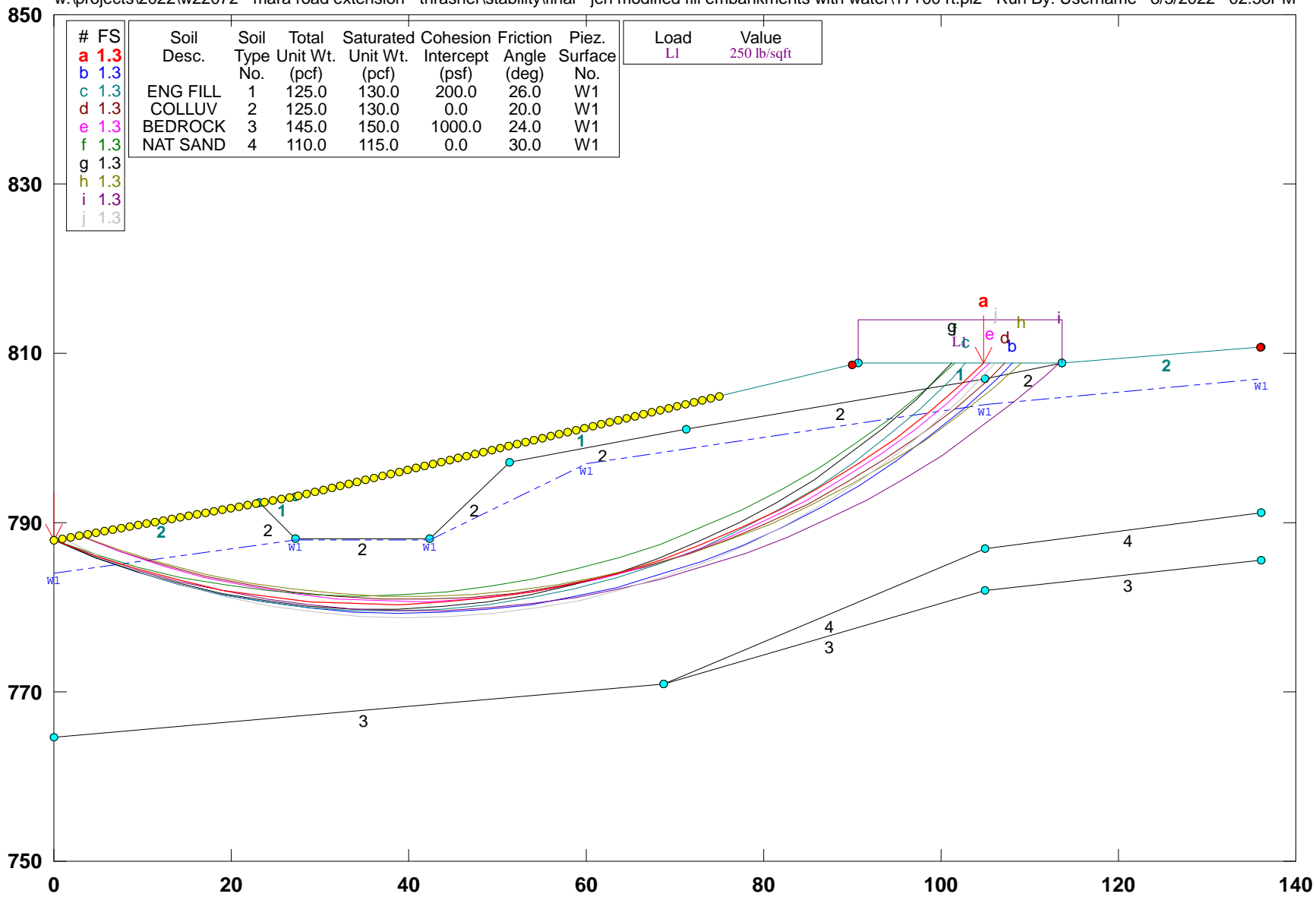
w:\projects\2022\w22072 - mara road extension - thrasher\stability\final - jen modified fill embankments with water\15+50 rt.pl2 Run By: Username 8/5/2022 02:53PM



STABL6H FSmin=1.3
 Safety Factors Are Calculated By The Modified Bishop Method

W22072 - MARA ROAD - STA 17+00 RT - 15' KEY 5' DEEP

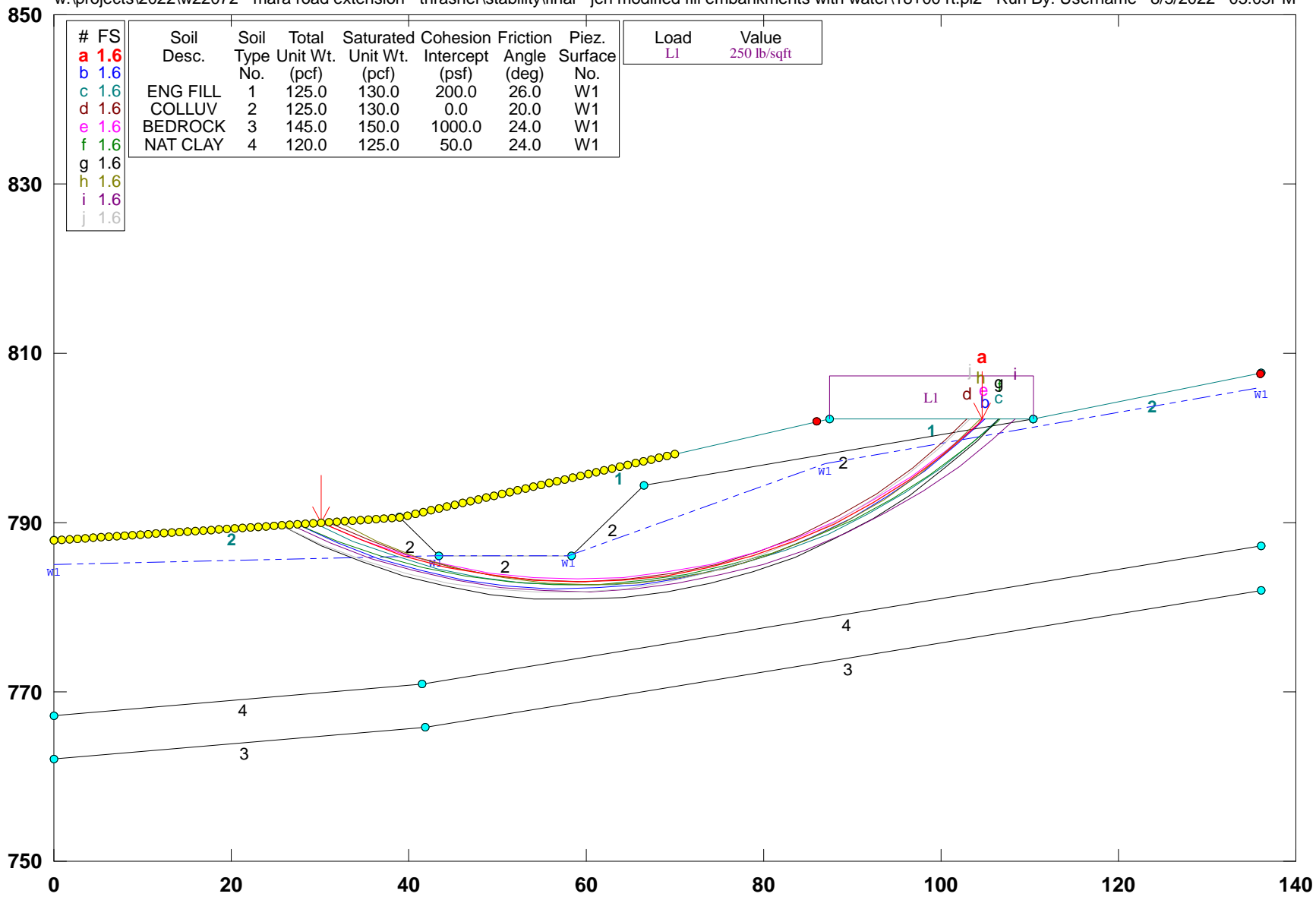
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STABL6H FSmin=1.3
 Safety Factors Are Calculated By The Modified Bishop Method

W22072 - MARA ROAD - STA 18+00 RT - 15' KEY 5' DEEP

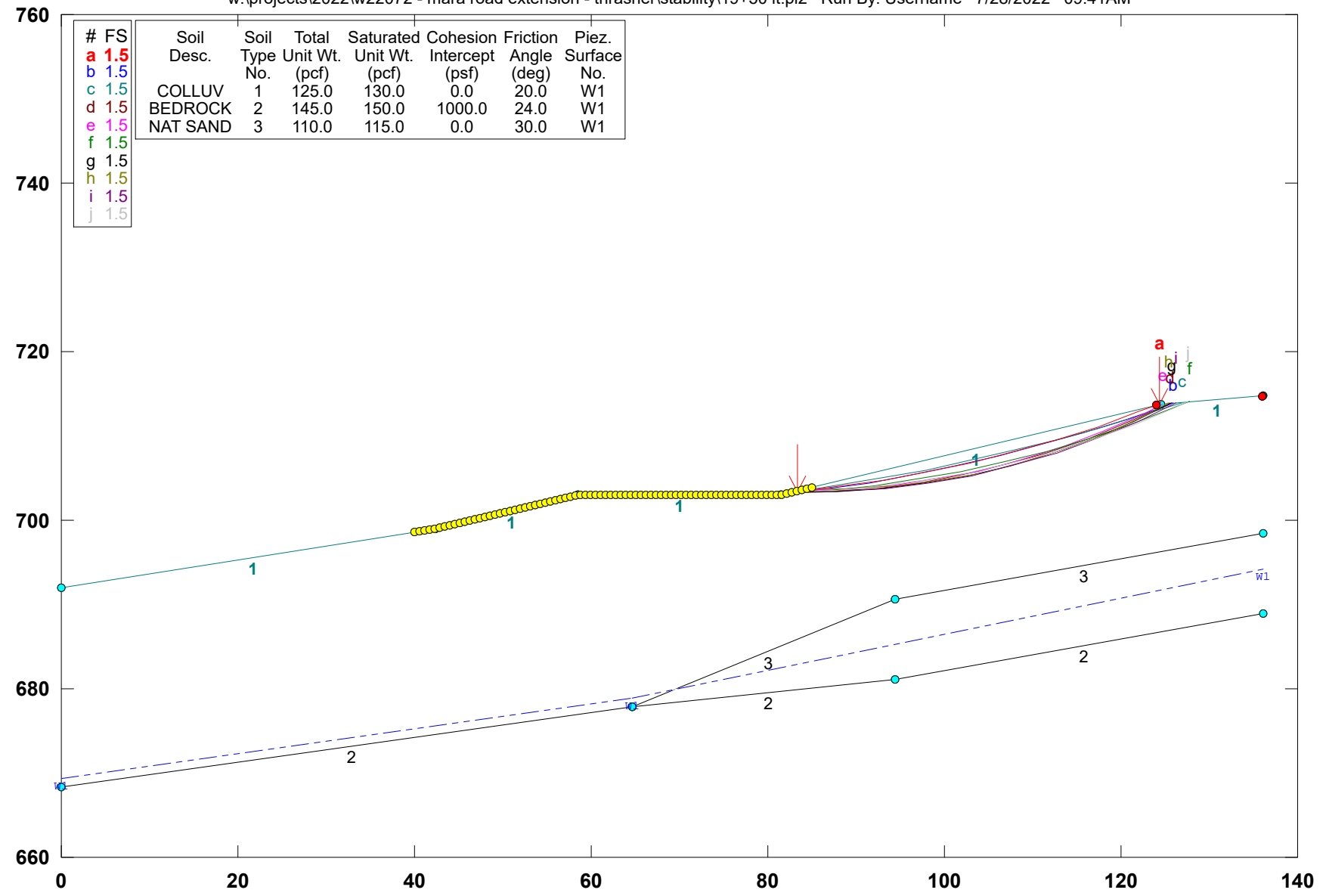
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STABL6H FSmin=1.6
 Safety Factors Are Calculated By The Modified Bishop Method

W22072 - MARA ROAD - STA 19+50 LT

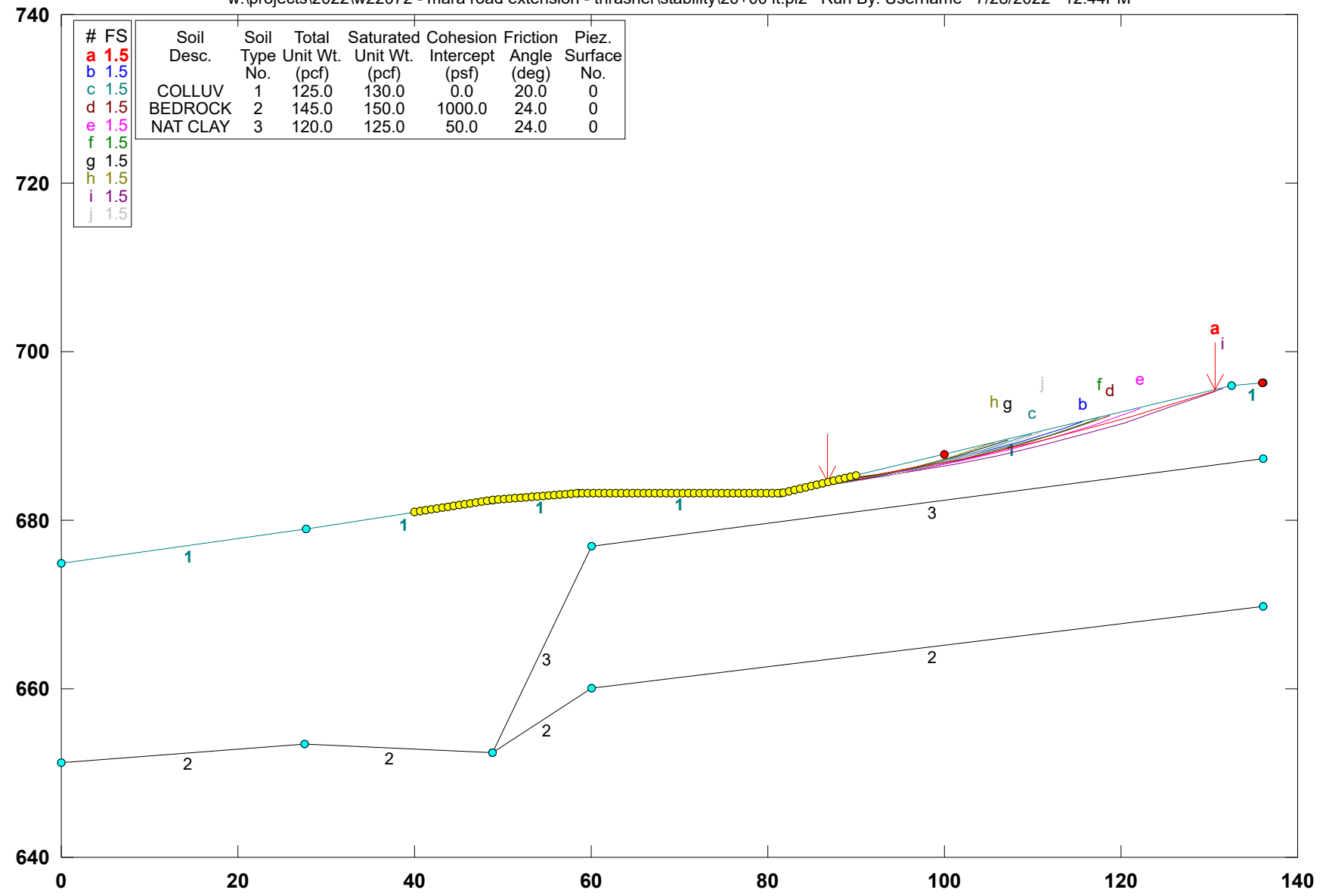
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STABL6H FSmin=1.5
 Safety Factors Are Calculated By The Modified Bishop Method

W22072 - MARA ROAD - STA 20+00 LT

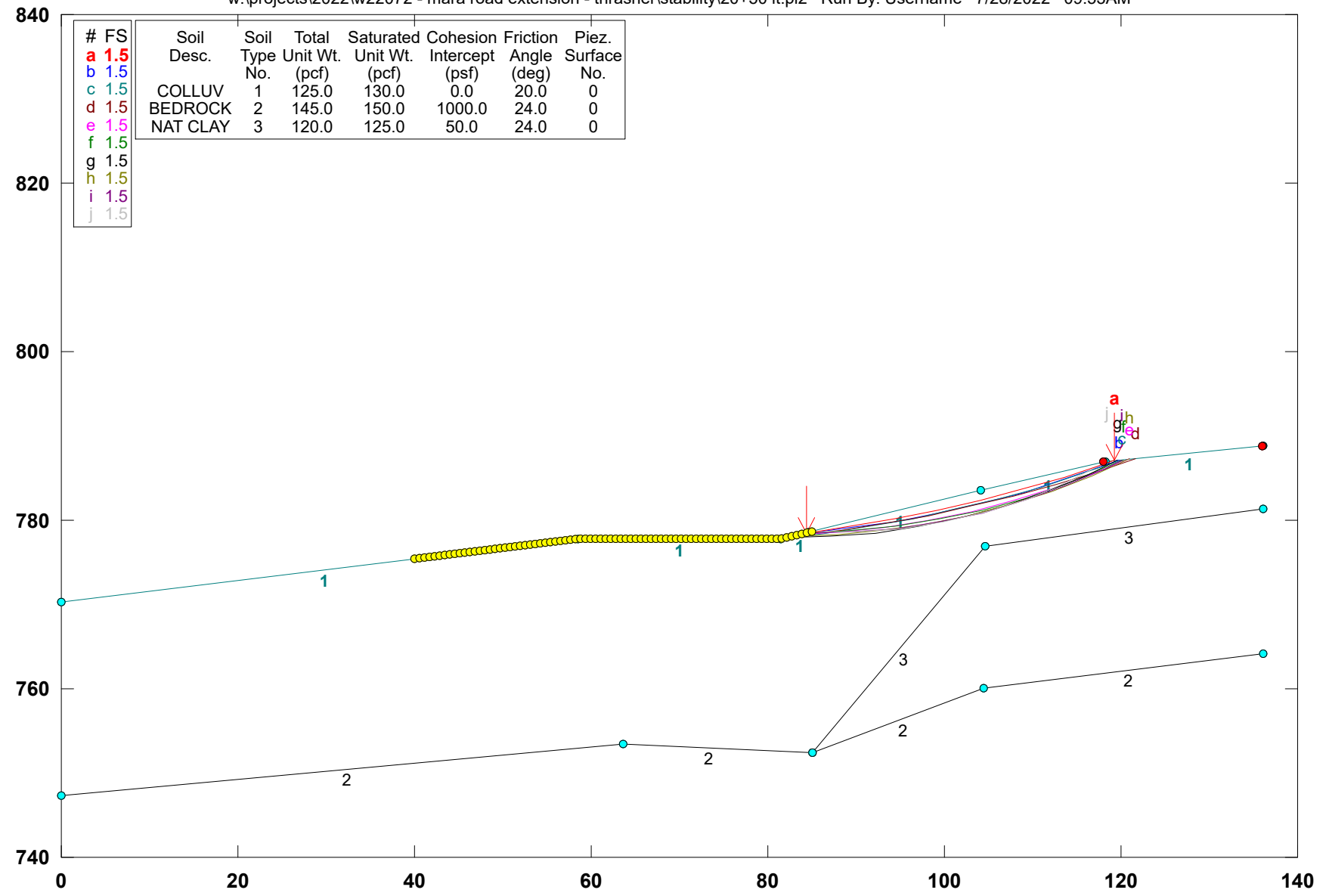
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STABL6H FSmin=1.5
 Safety Factors Are Calculated By The Modified Bishop Method

W22072 - MARA ROAD - STA 20+50 LT

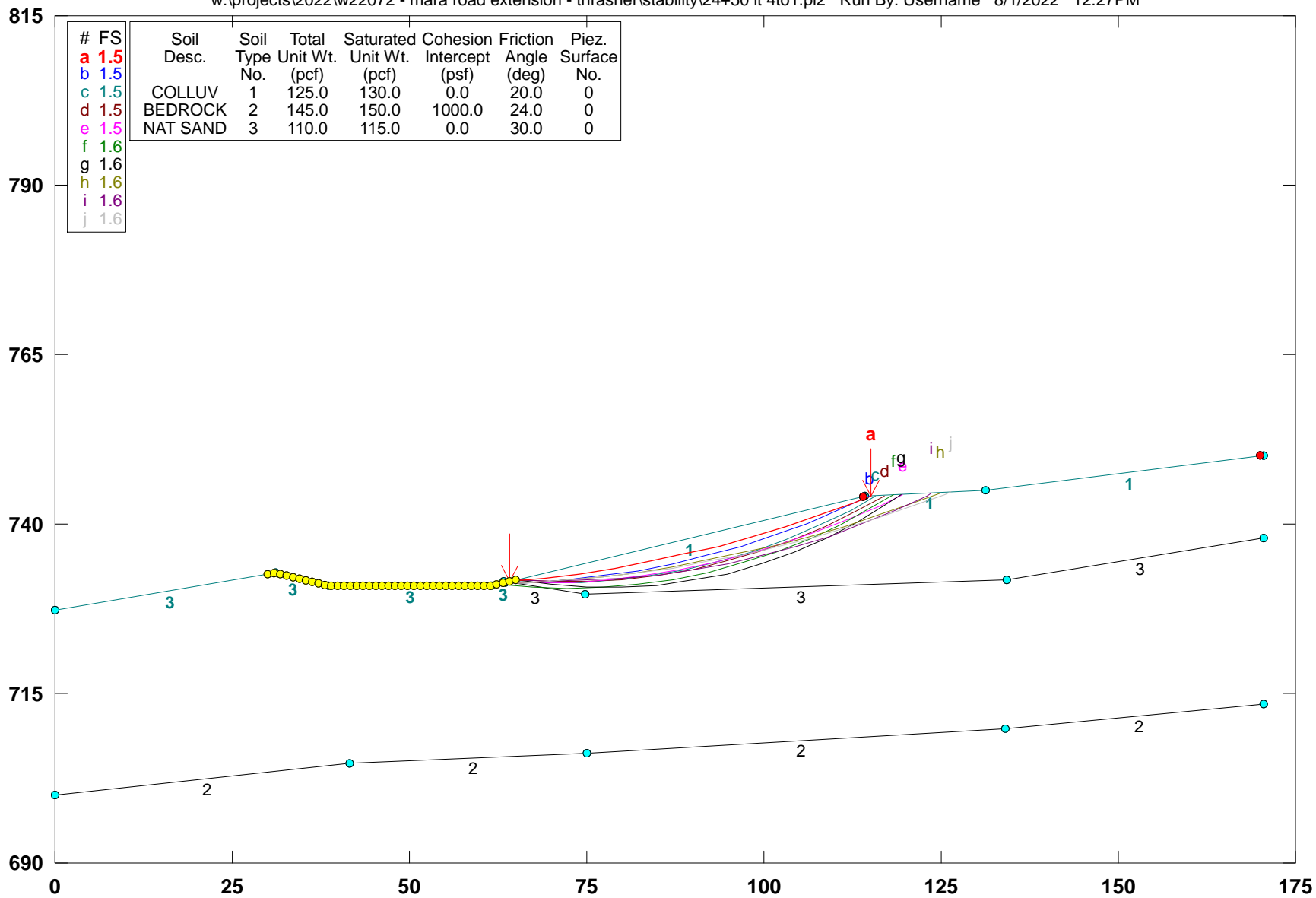
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STABL6H FSmin=1.5
 Safety Factors Are Calculated By The Modified Bishop Method

W22072 - MARA ROAD - STA 24+50 LT 4:1

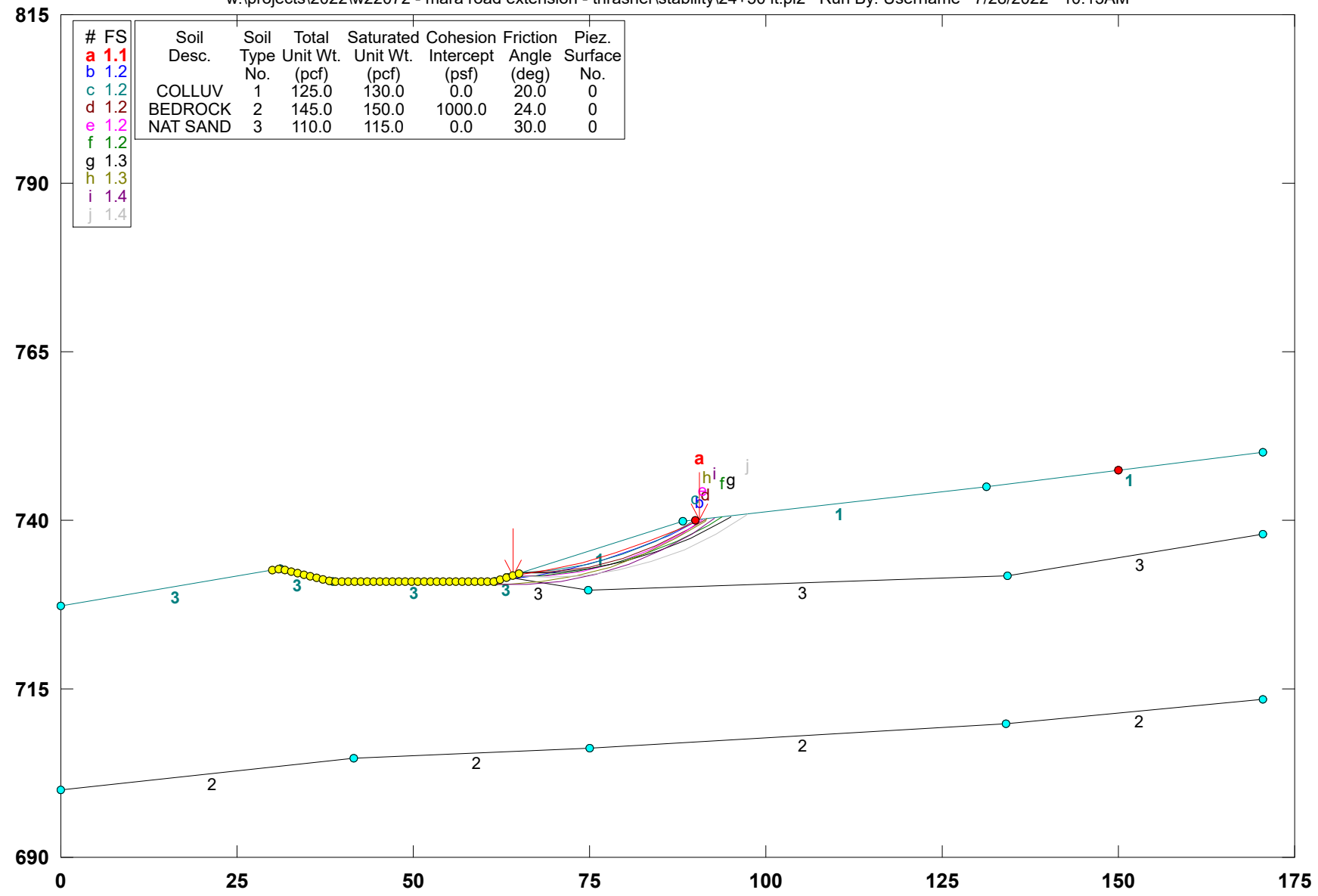
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STABL6H FSmin=1.5
 Safety Factors Are Calculated By The Modified Bishop Method

W22072 - MARA ROAD - STA 24+50 LT

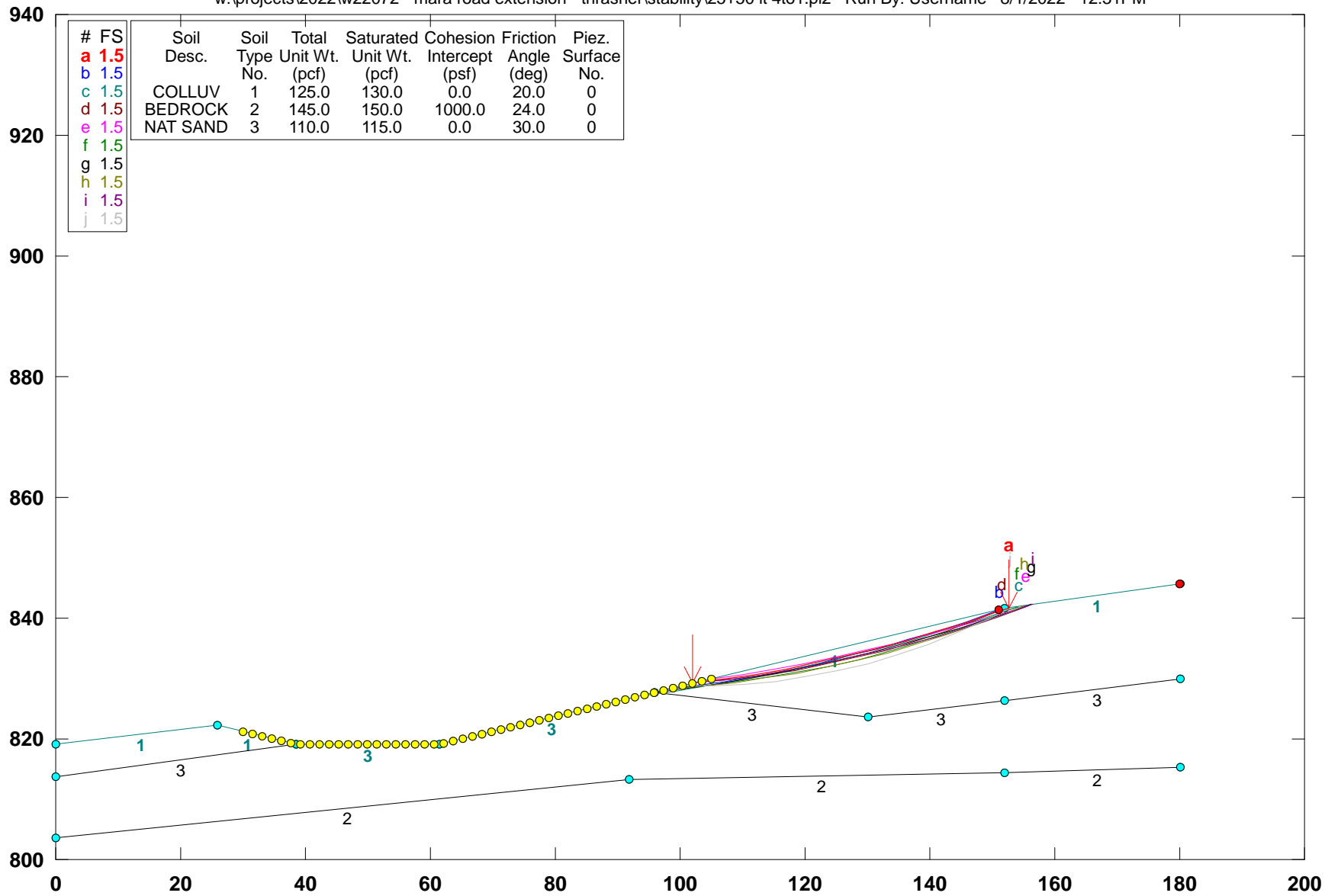
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STABL6H FSmin=1.1
 Safety Factors Are Calculated By The Modified Bishop Method

W22072 - MARA ROAD - STA 25+50 LT 4:1

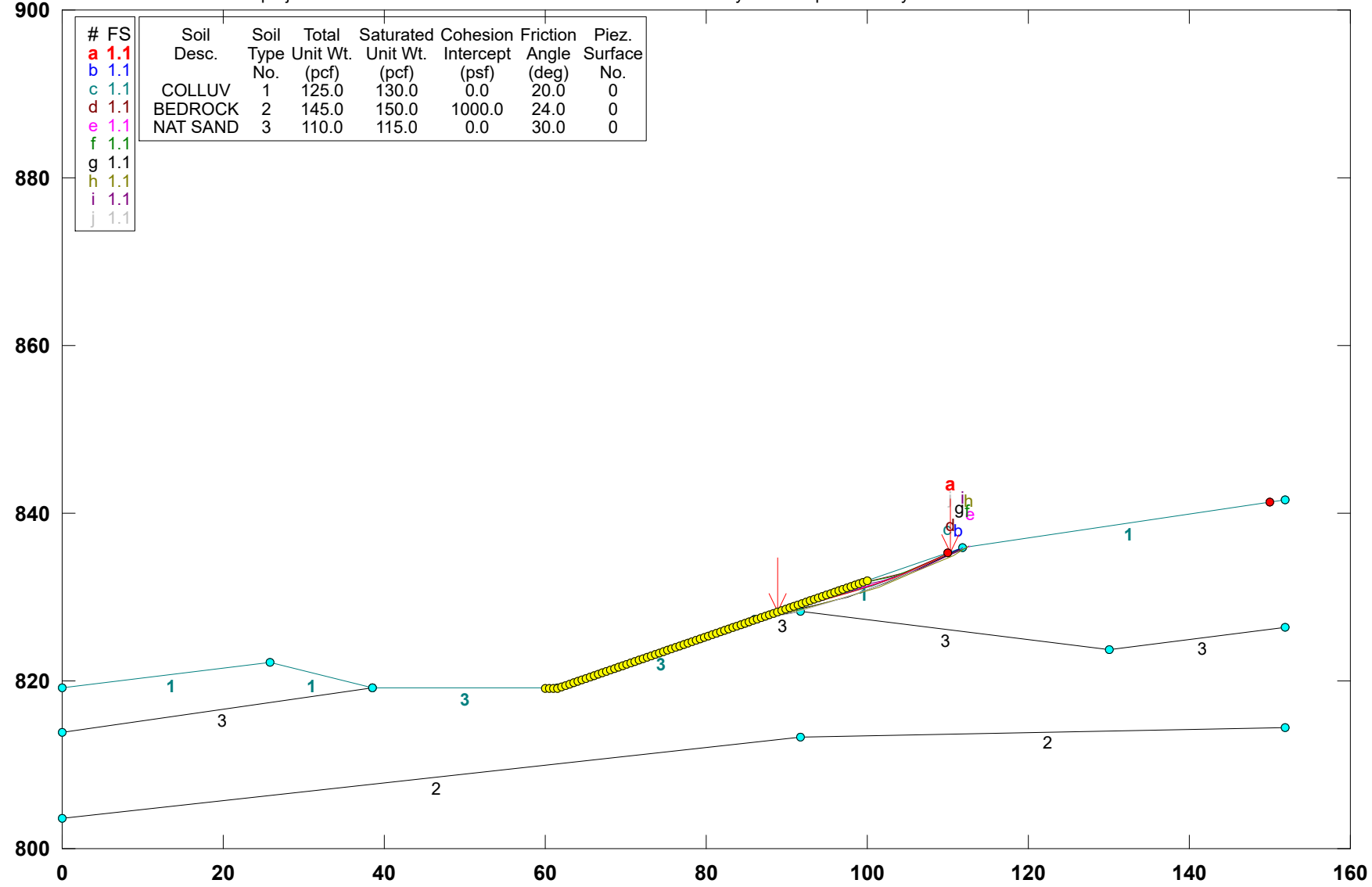
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STABL6H FSmin=1.5
 Safety Factors Are Calculated By The Modified Bishop Method

W22072 - MARA ROAD - STA 25+50 LT

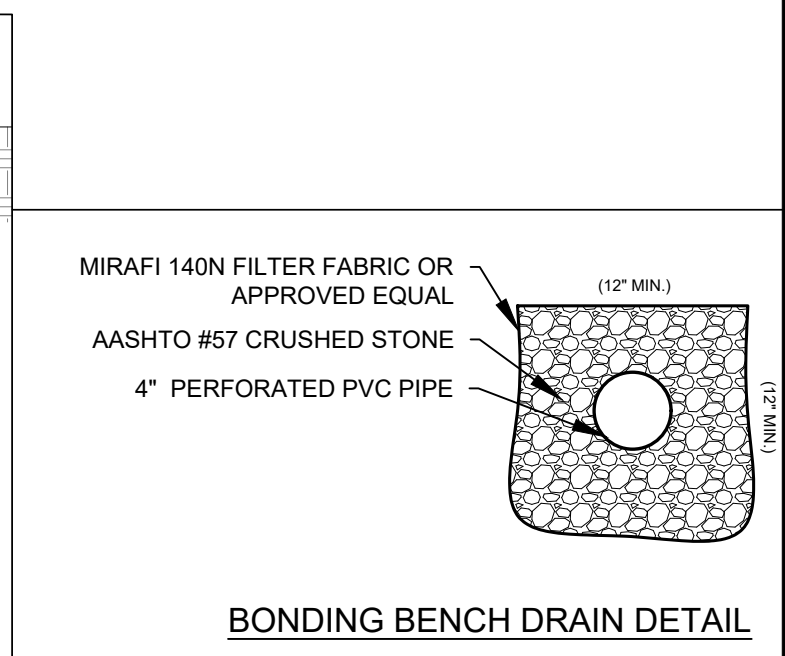
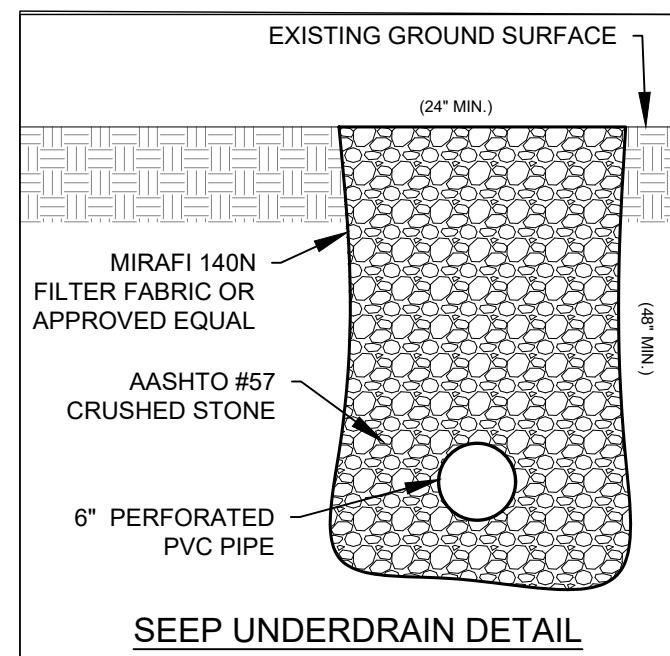
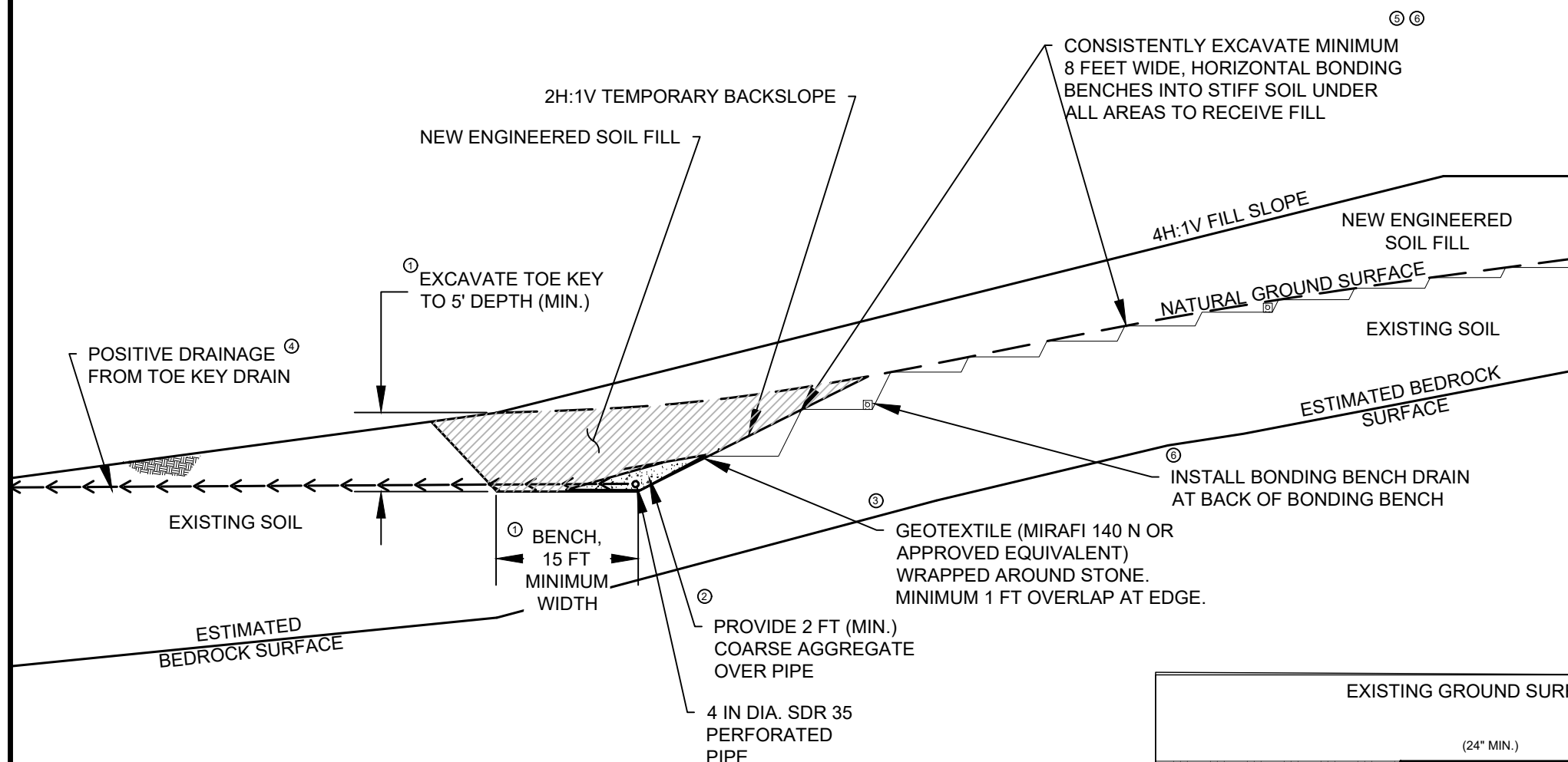
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STABL6H FSmin=1.1
 Safety Factors Are Calculated By The Modified Bishop Method

NOTES:

- EXCAVATE A MINIMUM 15 FEET WIDE FOUNDATION BENCH/TOE KEY BENEATH THE TOE OF THE FILL. THE TOE KEY SHOULD EXTEND TO A MINIMUM DEPTH OF 5 FEET. THE BASE OF THE TOE KEY MUST EXTEND BELOW ANY EXCESSIVELY SOFT SOIL IF PRESENT.
- DRAINAGE STONE SHOULD CONSIST OF AASHTO #57 COARSE AGGREGATE.
- DRAINAGE STONE SHOULD BE OVERLAIN BY A NON-WOVEN GEOTEXTILE FILTER FABRIC MANUFACTURED SPECIFICALLY FOR DRAINAGE APPLICATIONS (SUCH AS MIRAFI 140 N OR APPROVED EQUIVALENT).
- POSITIVE DRAINAGE MUST BE PROVIDED (GRAVITY PIPES OR TRENCH DRAINS) TO PREVENT WATER FROM BEING TRAPPED WITHIN THE DRAINAGE STONE MATERIAL. OUTLET DRAINS TO BE INSTALLED ON NO MORE THAN 100 FEET INTERVALS.
- ANY SLICKENSIDED LAYERS (i.e. OLD SLIP PLANES, TYPICALLY GRAY IN COLOR) ENCOUNTERED DURING FILL BENCHING SHALL BE COMPLETELY UNDERCUT (AT LEAST TO THE FILL SLOPE CREST) AND BACKFILLED WITH ENGINEERED FILL.
- BONDING BENCH DRAINS SHOULD BE CONSTRUCTED AT MAXIMUM 10 FT. VERTICAL INTERVALS WHEN BENCHING IN ROCK AND SOIL. BONDING BENCH DRAINS SHOULD BE CONSTRUCTED INTO STIFF/COMPETENT RESIDUAL SOIL OR BEDROCK. THE DRAINS SHOULD OUTLET VIA SOLID WALLED PIPES AT MAXIMUM 100 FT. INTERVALS. OUTLET PIPES CAN BE EXTENDED TO THE FACE OF THE PROPOSED FILL SLOPE OR CAN BE TIED INTO THE TOE KEY DRAIN. SEE BELOW FOR BONDING BENCH DRAIN DETAIL.
- ADDITIONAL UNDERDRAINS MUST ALSO BE CONSTRUCTED TO DRAIN ANY ISOLATED GROUNDWATER SEEPS ENCOUNTERED DURING CONSTRUCTION. SEE SEEP UNDERDRAIN DETAIL BELOW.



NO.	REVISION

PROJECT: MARA ROAD EXTENSION
CLIENT: THRASHER
SHEET: TYPICAL TOE KEY DETAIL 1 FILL SLOPES OVER 10 FEET HIGH

Project No. W22072
Drawn: NLS
Checked: --
Approved: --
Scale: NTS
Date: 8-2-22
CAD File # NA

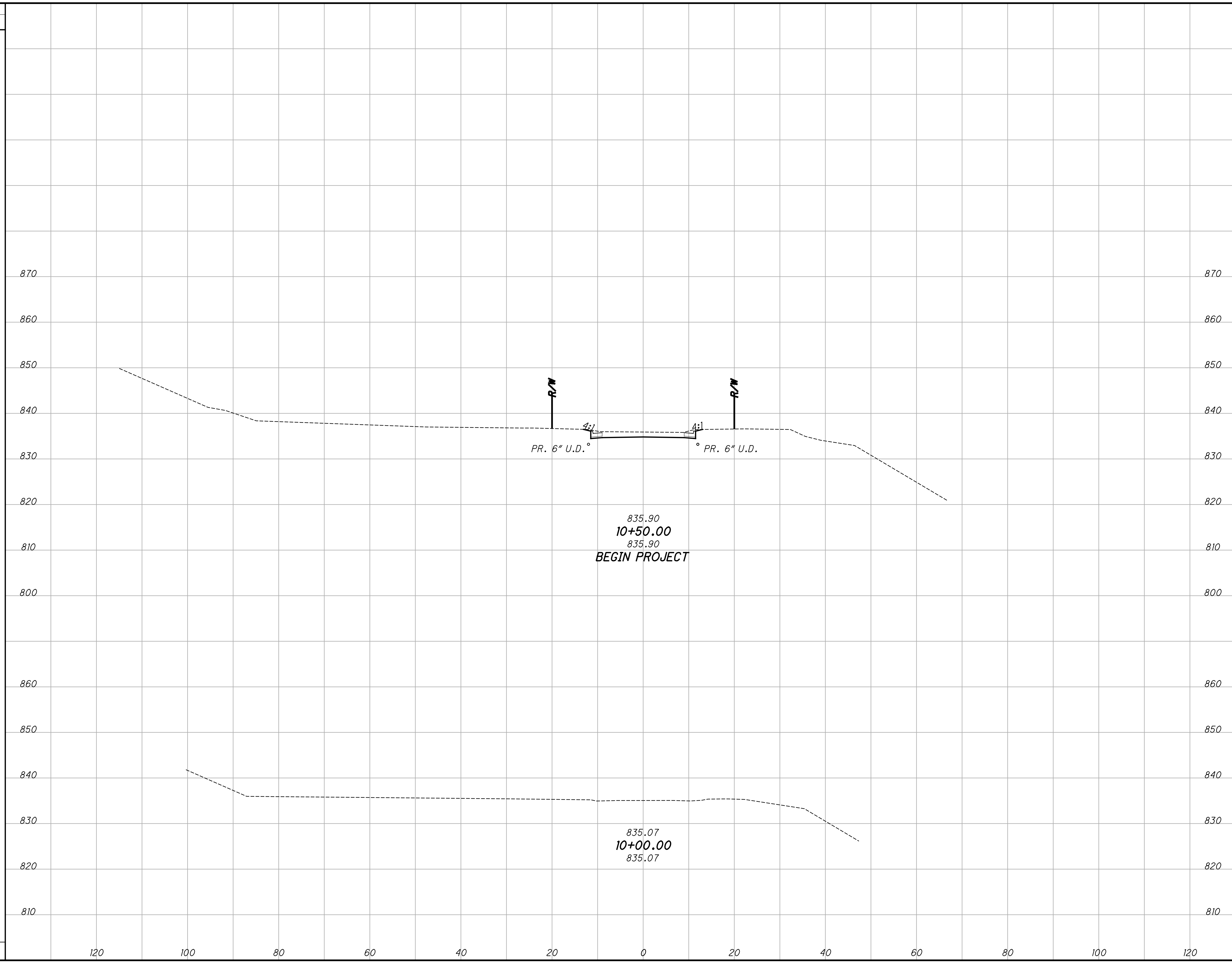
FIGURE No. B-1

NGE
 Geotechnical & Environmental Engineering Services
 650 MacCorkle Avenue West
 Suite 204, West Virginia 25177
 (304) 201-5180 FAX 201-5182
 www.ngeconsulting.com

Appendix C

R:\030\T30-1030.00-Mara_Road_Extension-City of Toronto-\1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS001.dgn_Sheet 7/20/2022 10:59:44 AM jcoy

SEEDING	
END WIDTH	SO. YDS.
0	



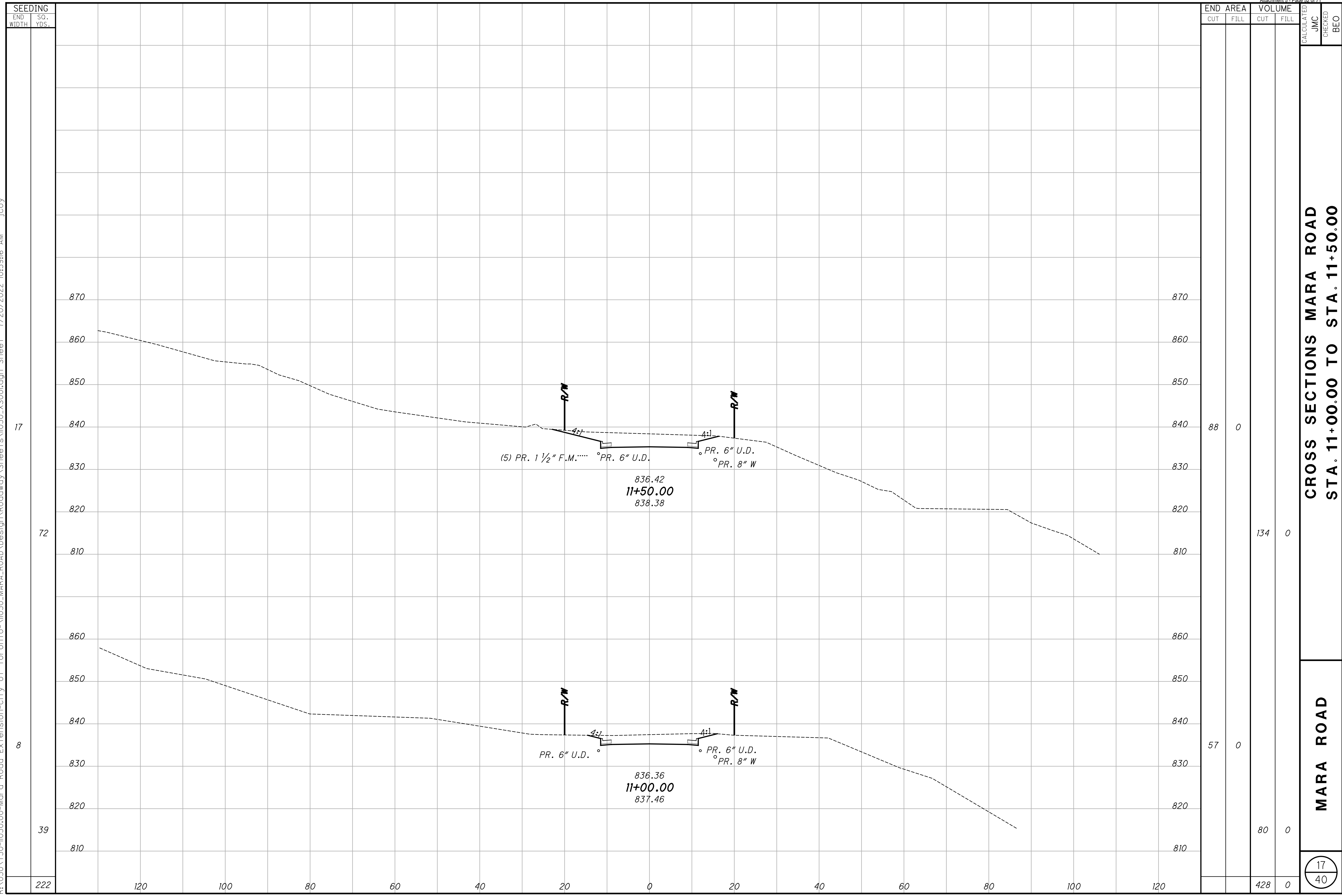
END AREA		VOLUME	
CUT	FILL	CUT	FILL
29	0	0	0

CALCULATED	CHECKED	BEO

**CROSS SECTIONS MARA ROAD
STA. 10+00.00 TO STA. 10+50.00**

MARA ROAD

R:\030\T30-1030.00-Mara Road Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn_Sheet 7/20/2022 10:59:16 AM jcoy



SEEDING	
END WIDTH	SO. YDS.
122	
120	
100	
80	
60	
40	
20	
0	
20	
40	
60	
80	
100	
120	

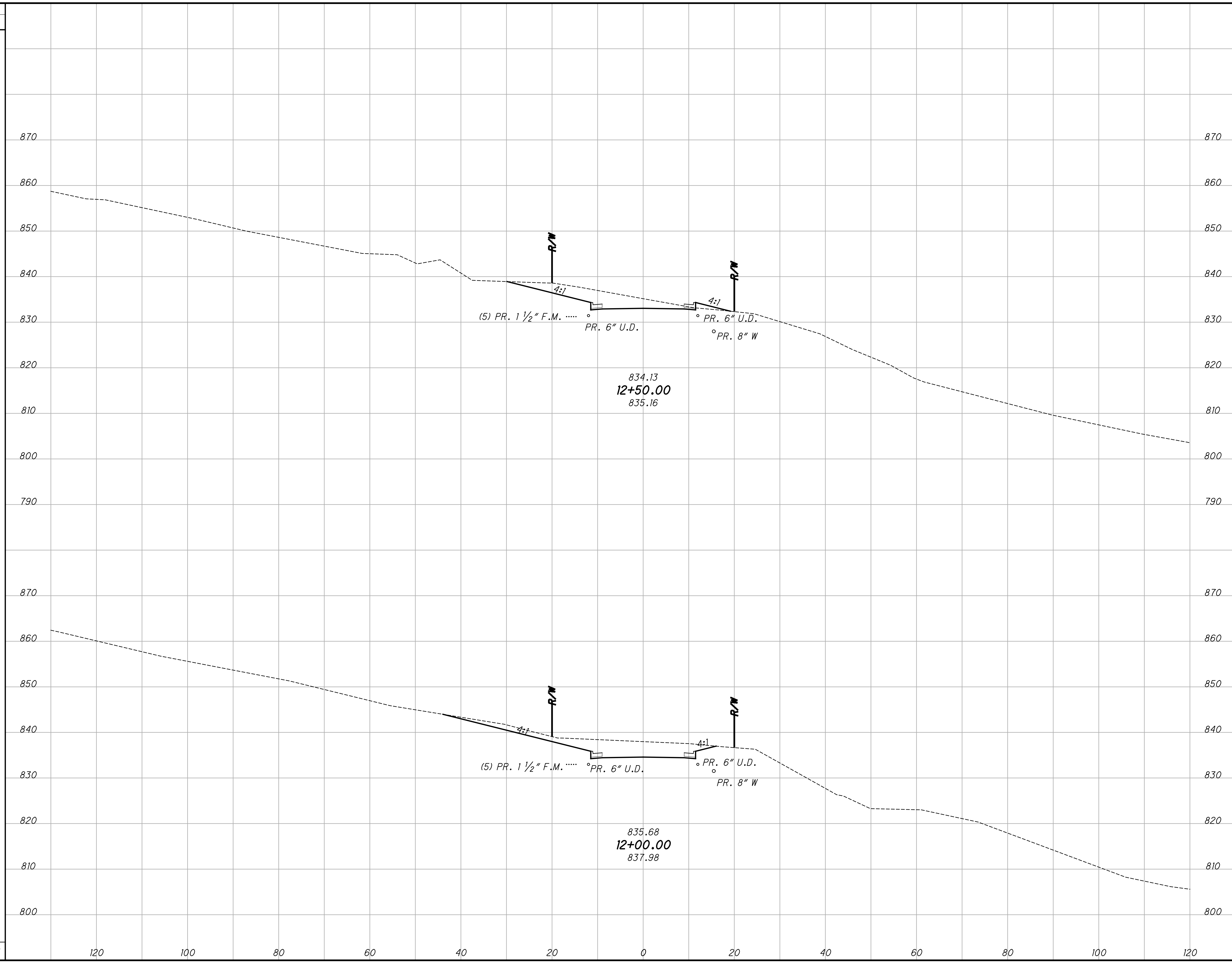
END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
88	0				
		134	0		
57	0				
		80	0		
		428	0		

**CROSS SECTIONS MARA ROAD
STA. 11+00.00 TO STA. 11+50.00**

MARA ROAD

R:\030\T30-1030-00-Mara_Road_Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn_Sheet 7/20/2022 10:59:17 AM jcoy

SEEDING	
END WIDTH	SO. YDS.
27	183
38	156
678	



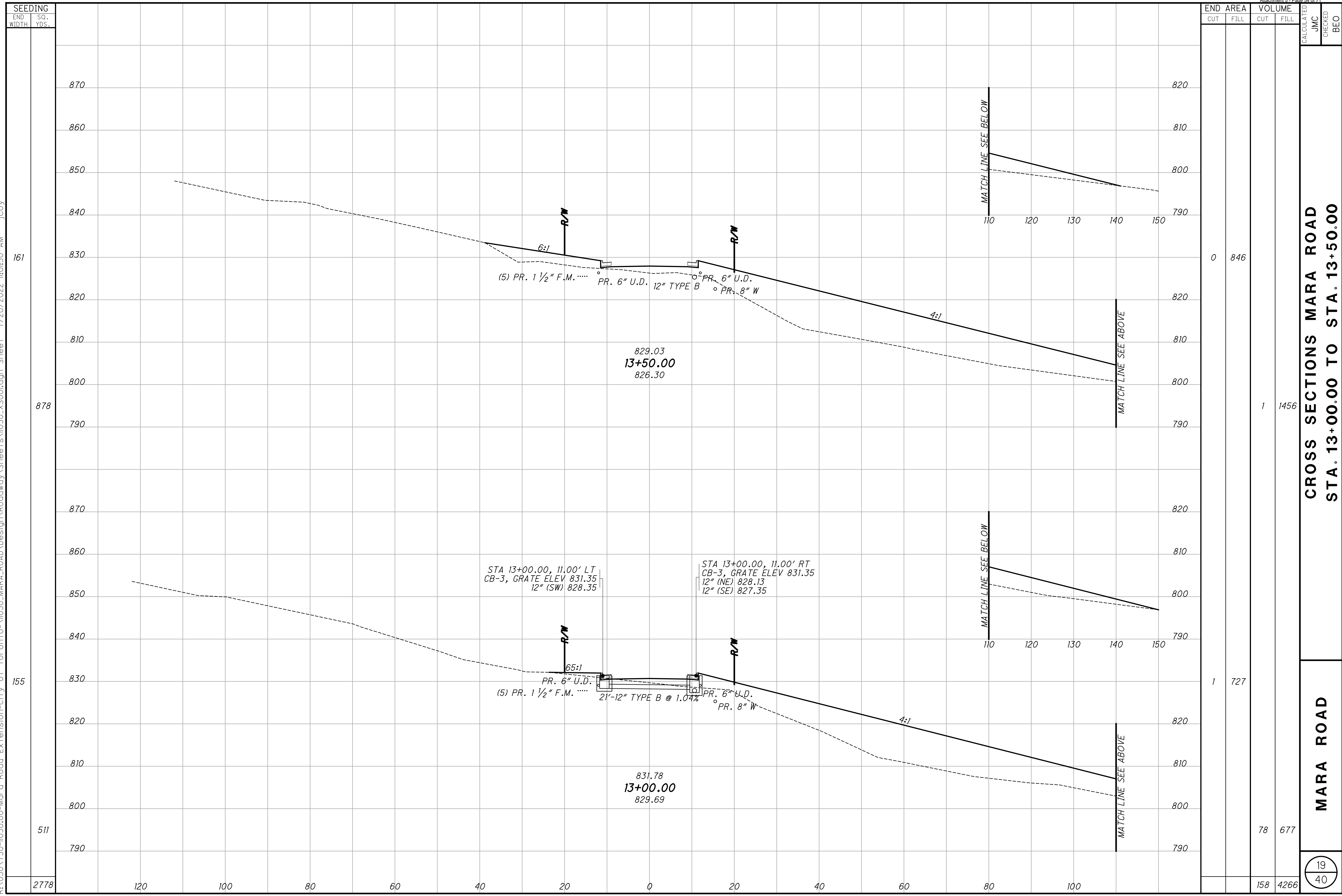
END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
83	4	186	4		
118	0	191	0		
		754	8		

**CROSS SECTIONS MARA ROAD
STA. 12+00.00 TO STA. 12+50.00**

MARA ROAD

18
40

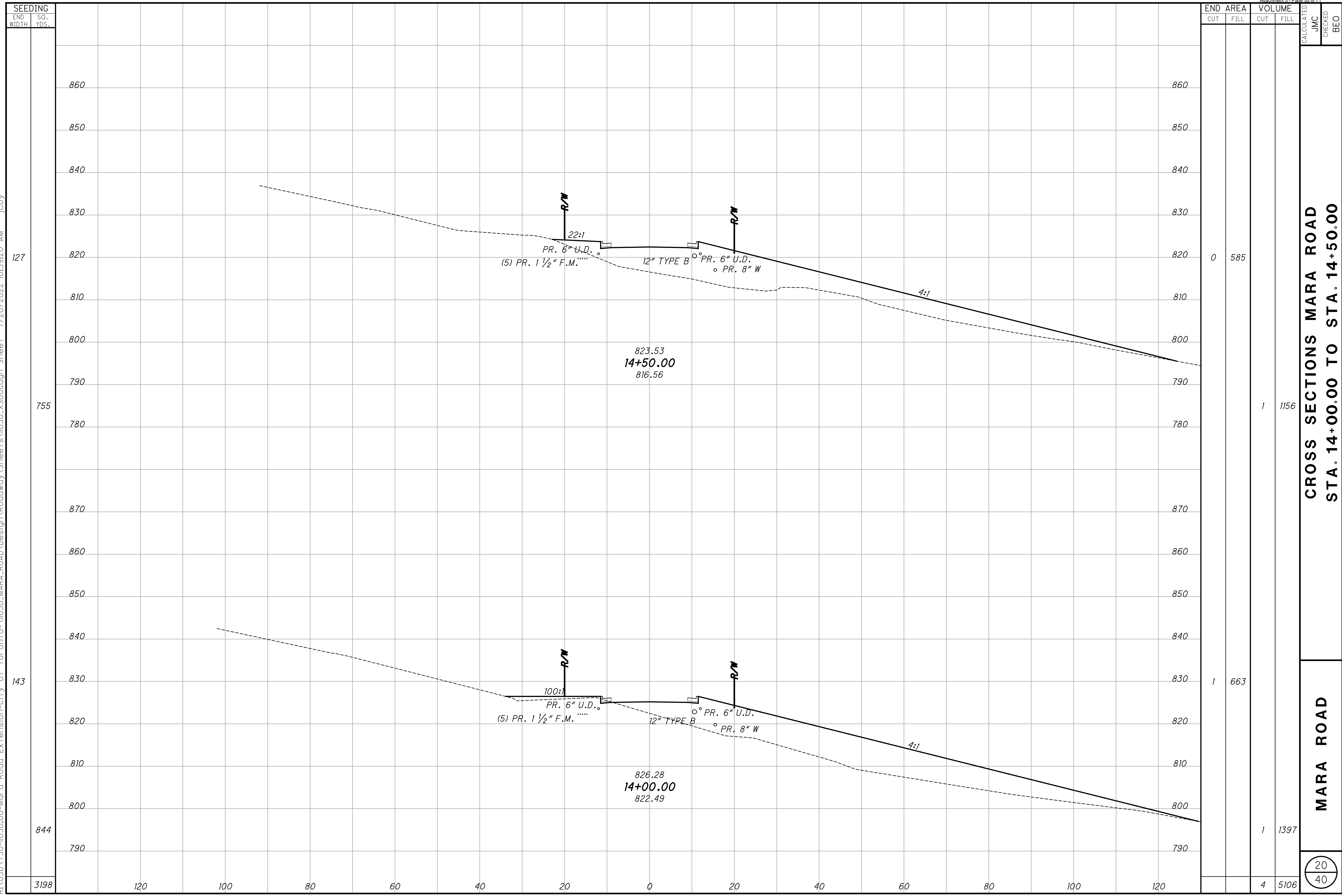
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**CROSS SECTIONS MARA ROAD
STA. 13+00.00 TO STA. 13+50.00**

MARA ROAD

R:\030\T30-1030.00-Mara Road Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn Sheet 7/20/2022 10:59:20 AM Jcoy

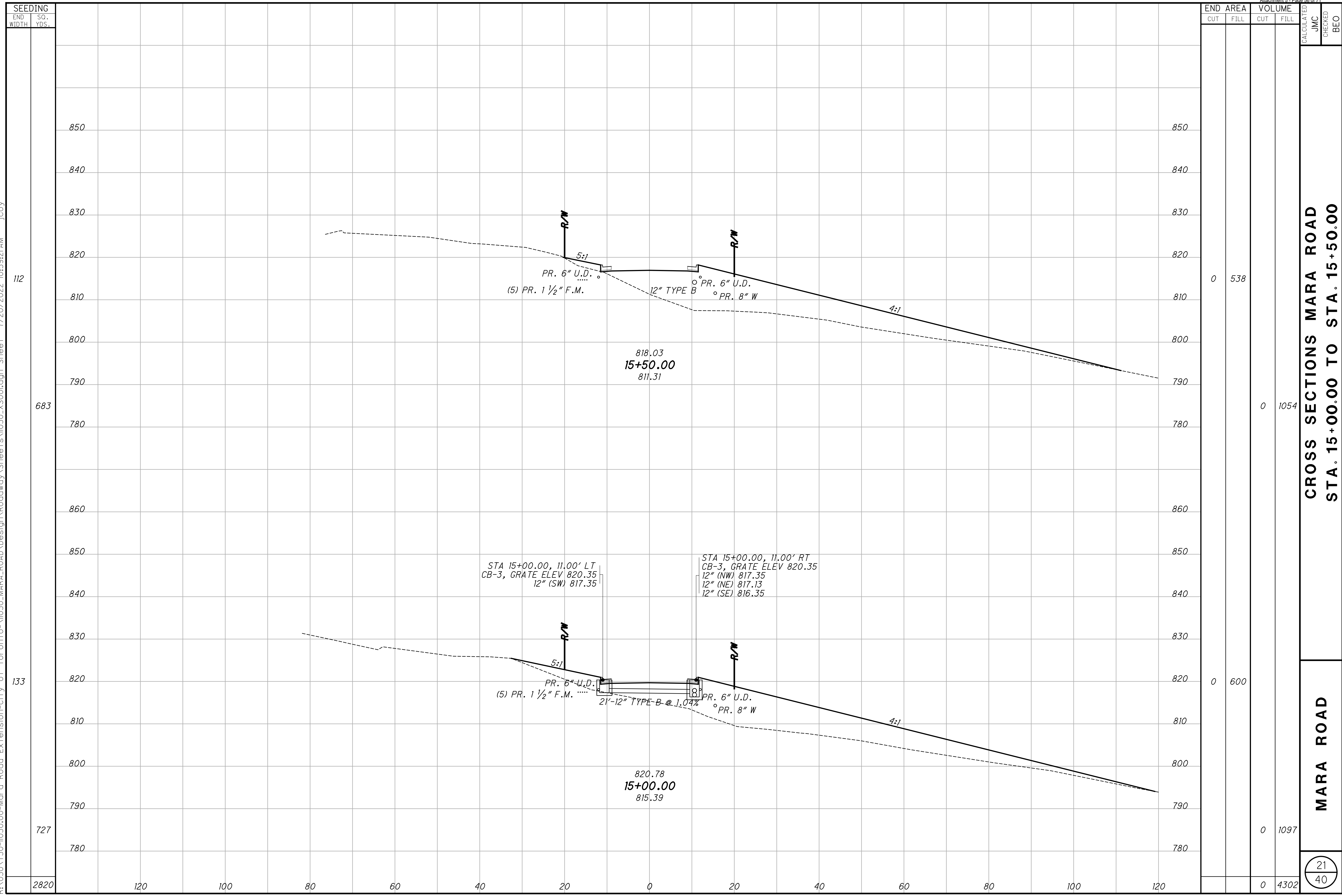


**CROSS SECTIONS MARA ROAD
STA. 14+00.00 TO STA. 14+50.00**

MARA ROAD

20
40

R:\030\T30-1030.00-Mara Road Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn_Sheet 7/20/2022 10:59:21AM Jcoy



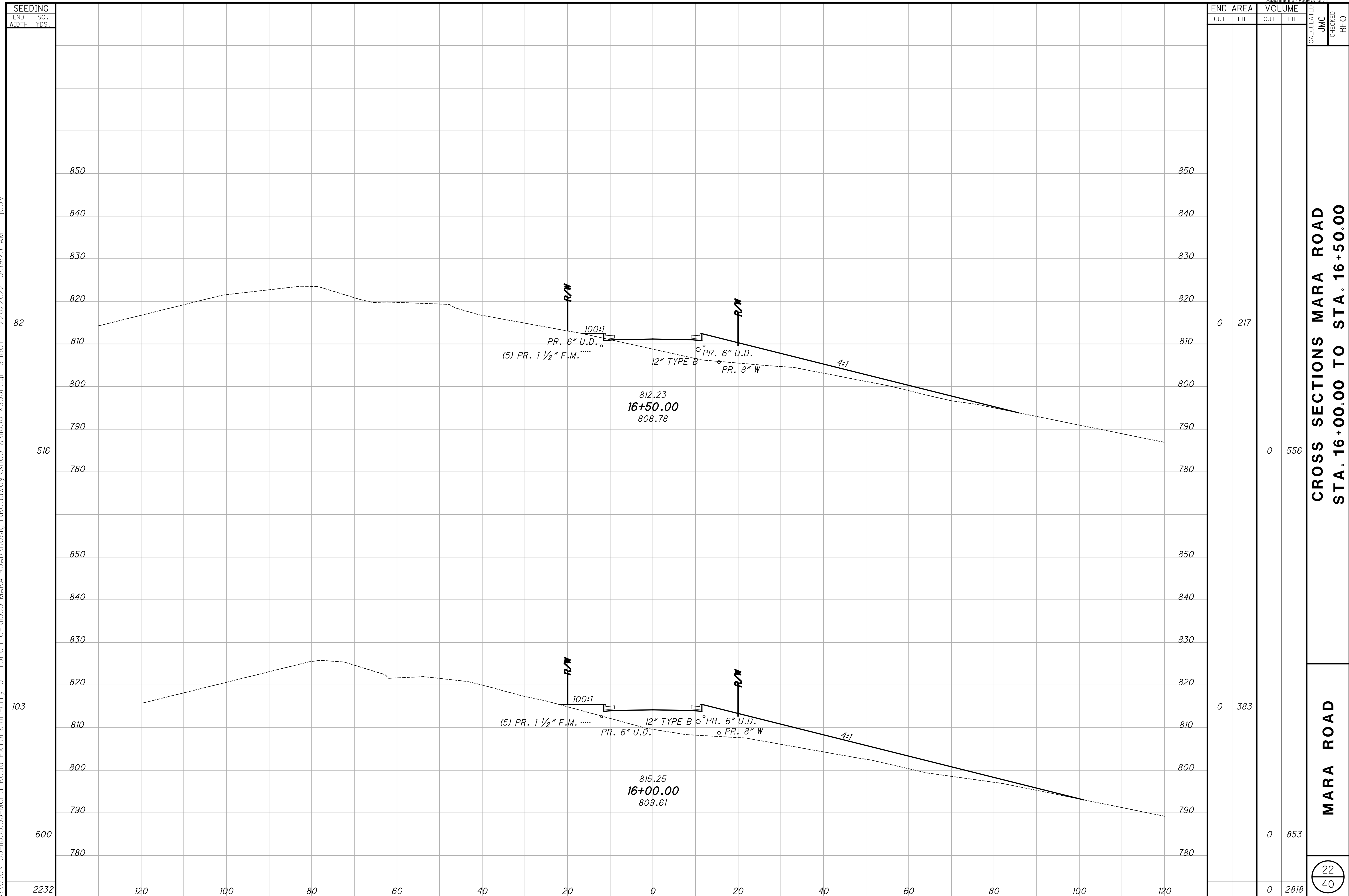
SEEDING	
END WIDTH	SO. YDS.
112	
683	
133	
727	
2820	

END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
0	538	0	1054		
0	600	0	1097		
0		0	4302		

**CROSS SECTIONS MARA ROAD
STA. 15+00.00 TO STA. 15+50.00**

MARA ROAD

R:\030\T30-1030-00-Mara_Road_Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn Sheet 7/20/2022 10:59:23 AM jcoy



SEEDING	
END WIDTH	SO. YDS.
2232	
600	
103	
516	
82	

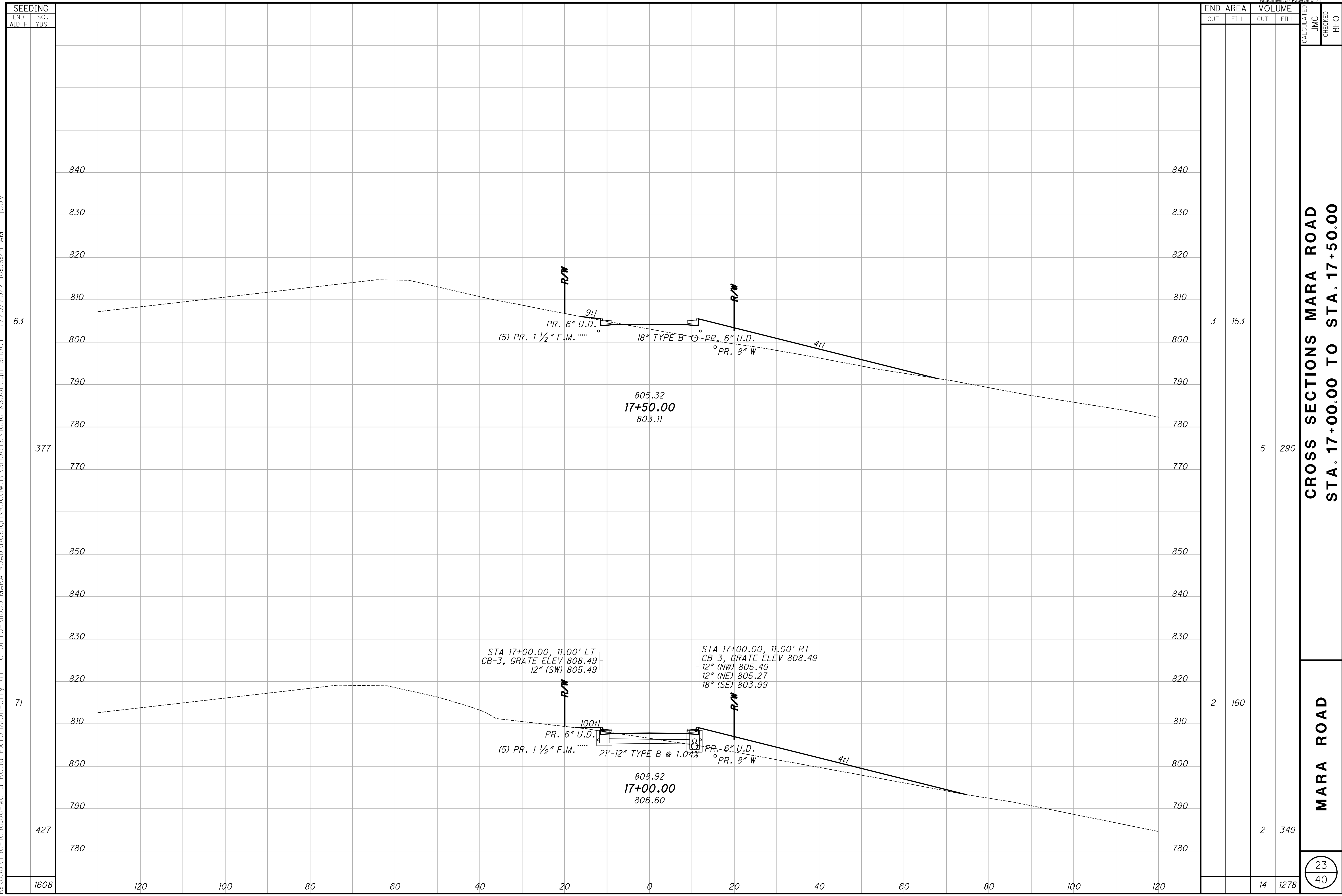
END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
0	217	0	556		
0	383	0	853		
0		0	2818		

**CROSS SECTIONS MARA ROAD
STA. 16+00.00 TO STA. 16+50.00**

MARA ROAD

22
40

R:\030\T30-1030-00-Mara_Road_Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn_Sheet 7/20/2022 10:59:24 AM jcoy



SEEDING	
END WIDTH	SO. YDS.
63	377
71	427
1608	

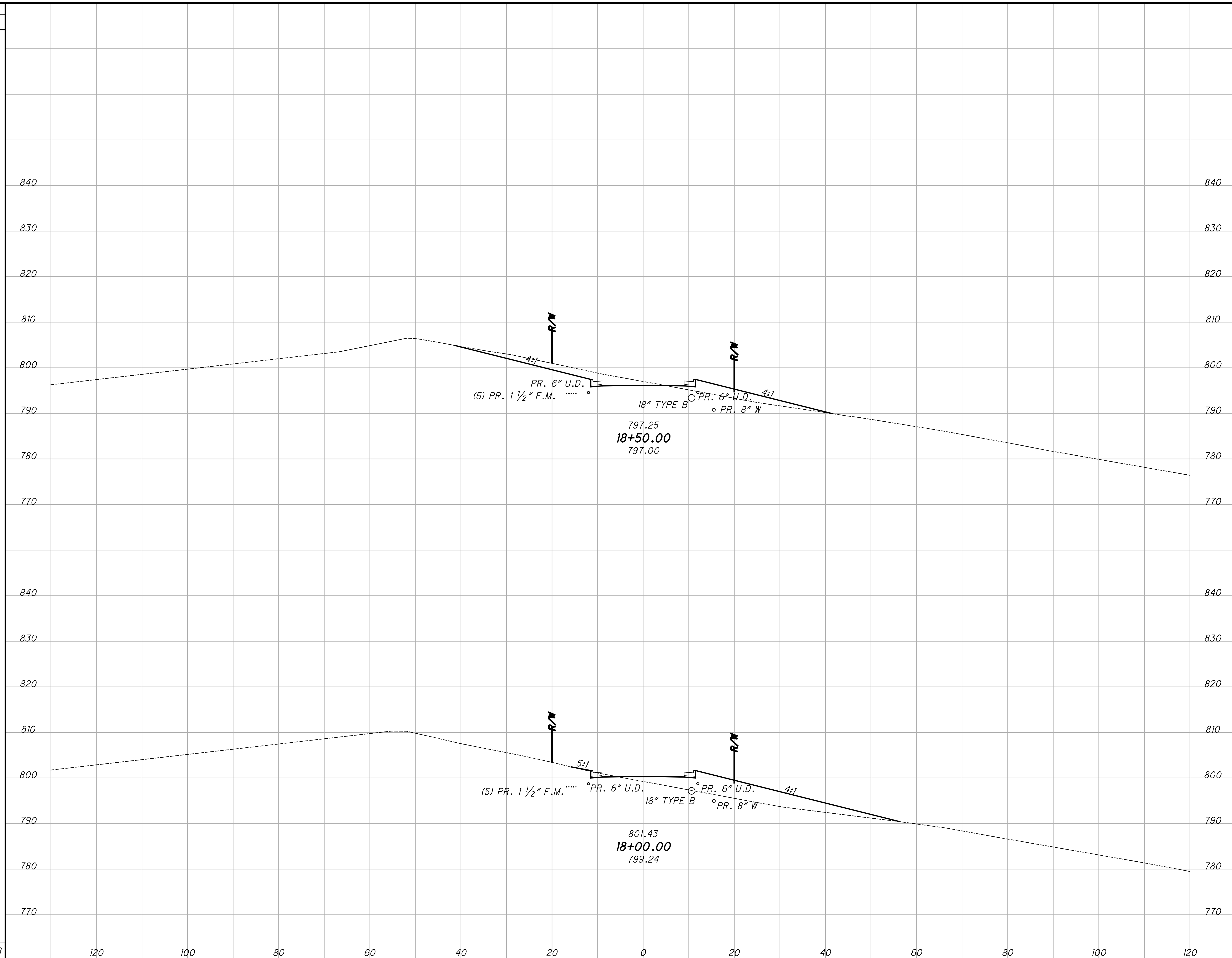
END AREA		VOLUME		CALCULATED	JMC	CHECKED	BEO
CUT	FILL	CUT	FILL				
3	153	5	290				
2	160	2	349				
14	1278						

**CROSS SECTIONS MARA ROAD
STA. 17+00.00 TO STA. 17+50.00**

MARA ROAD

R:\030\T30-1030-00-Mara Road Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_X500.dgn Sheet 7/20/2022 10:59:26 AM Jcoy

SEEDING	
END WIDTH	SO. YDS.
62	317
50	317
1268	

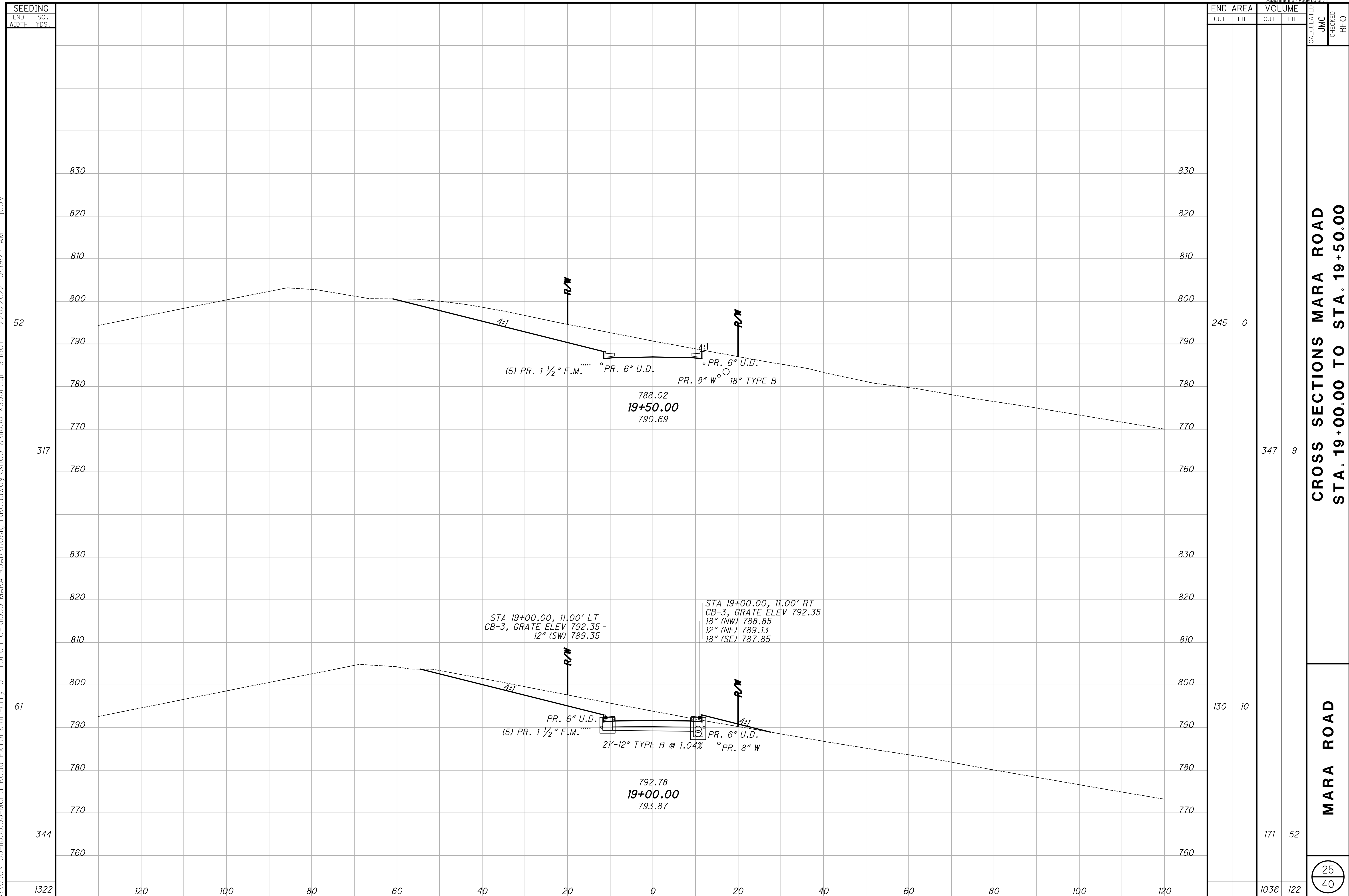


END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
55	46	55	175		
4	143	6	274		
		122	898		

**CROSS SECTIONS MARA ROAD
STA. 18+00.00 TO STA. 18+50.00**

MARA ROAD

R:\030\T30-1030-00-Mara_Road_Extension-City of Toronto\1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn Sheet 7/20/2022 10:59:27 AM jcoy



SEEDING	
END WIDTH	SO. YDS.
52	
317	
61	
344	
1322	

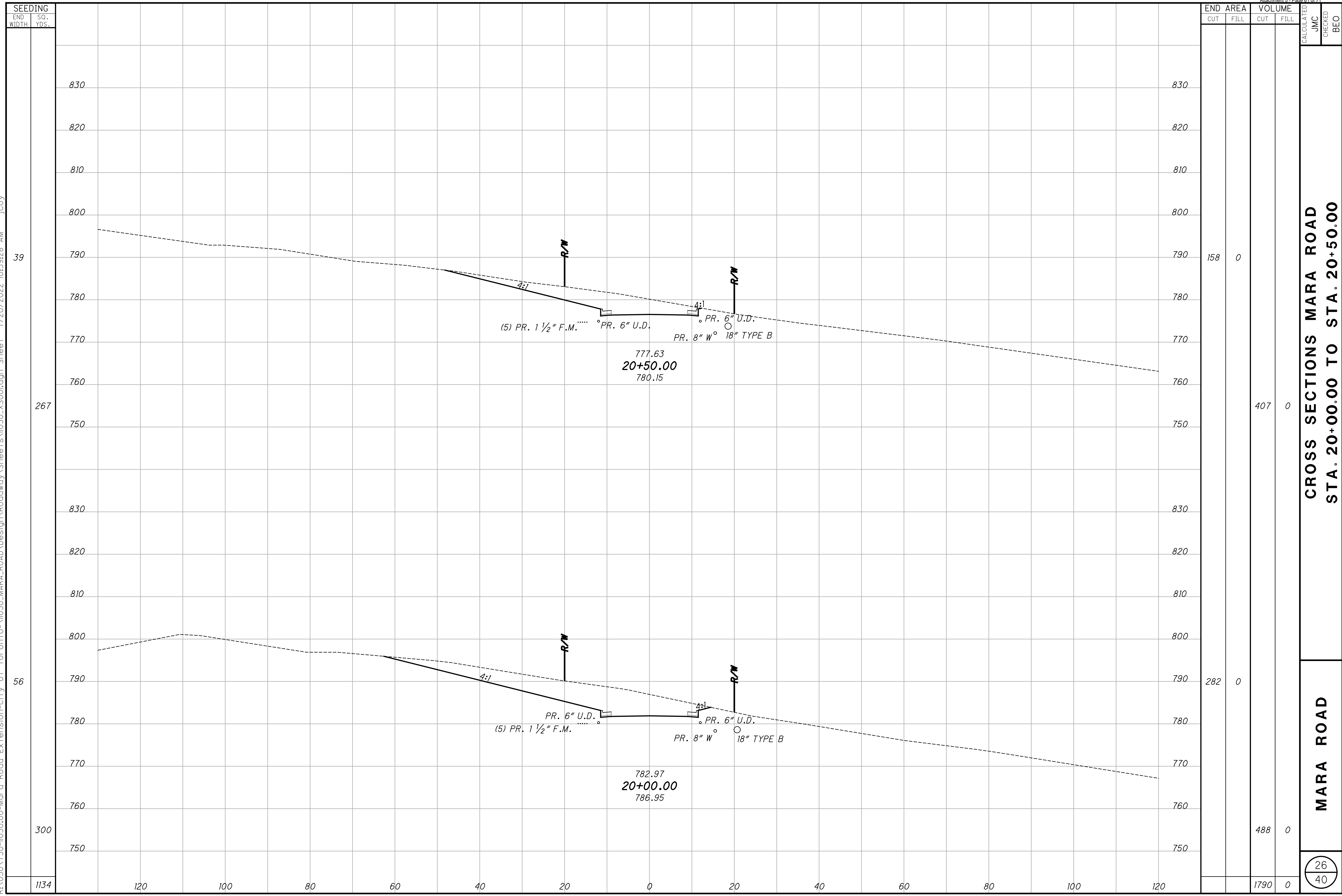
END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
245	0	347	9		
130	10	171	52		
		1036	122		

**CROSS SECTIONS MARA ROAD
STA. 19+00.00 TO STA. 19+50.00**

MARA ROAD

25
40

R:\030\T30-1030.00-Mara_Road_Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn_Sheet 7/20/2022 10:59:28 AM jcoy

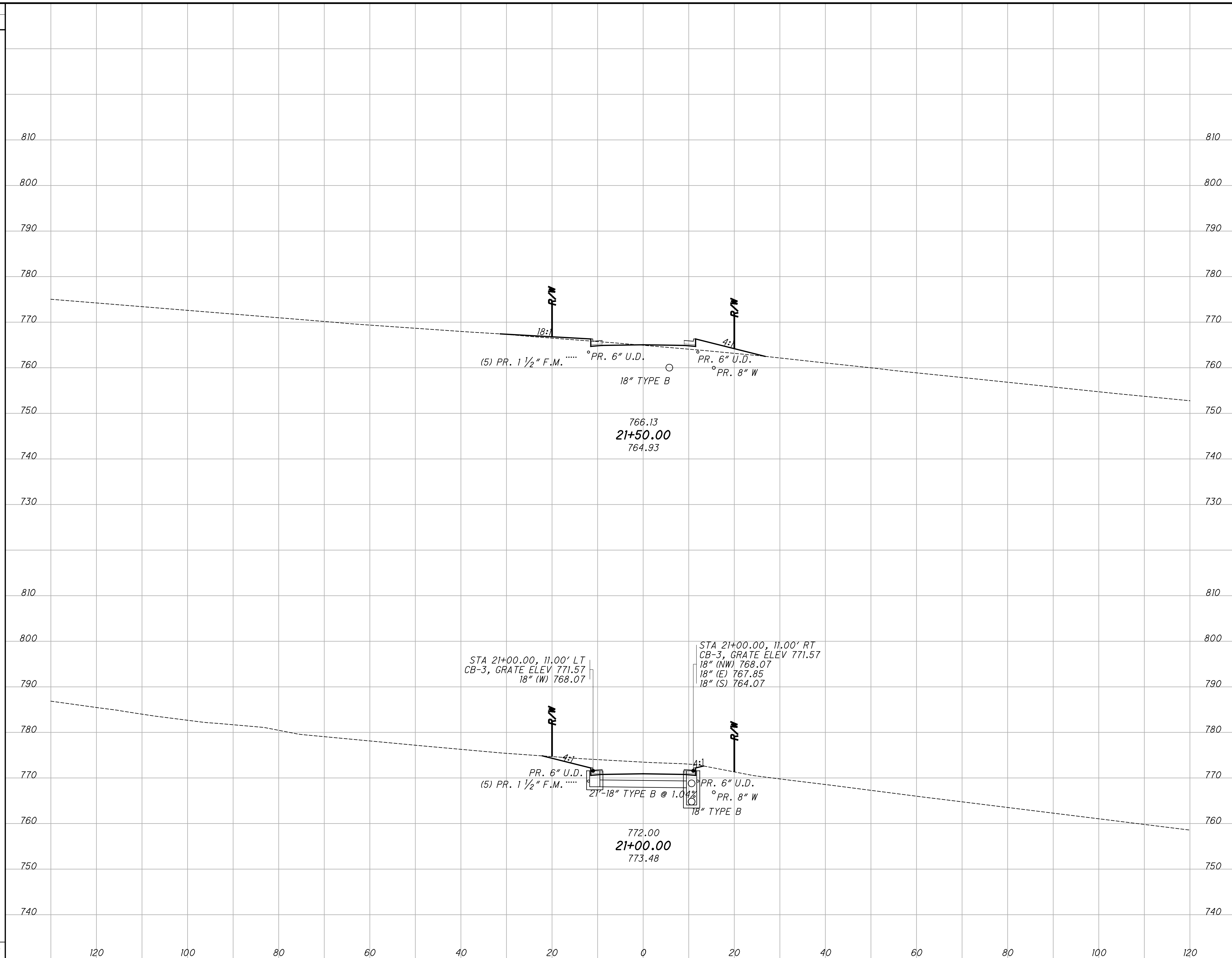


**CROSS SECTIONS MARA ROAD
STA. 20+00.00 TO STA. 20+50.00**

MARA ROAD

R:\030\T30-1030-00-Mara Road Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_X500.dgn_Sheet 7/20/2022 10:59:30 AM Jcoy

SEEDING	
END WIDTH	SO. YDS.
36	
139	
13	
150	
578	



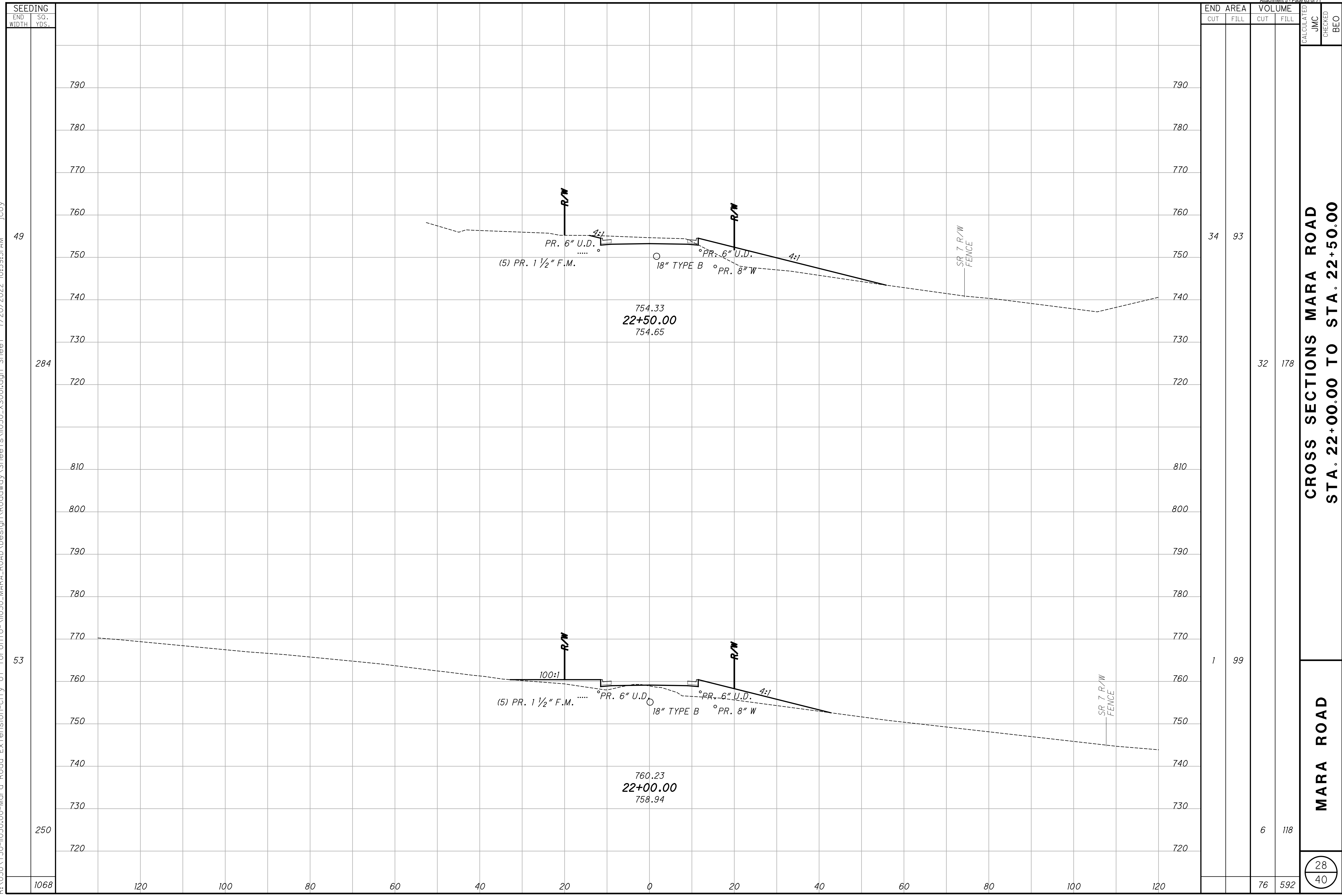
END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
6	28				
		73	26		
73	0				
		214	0		
		574	52		

**CROSS SECTIONS MARA ROAD
STA. 21+00.00 TO STA. 21+50.00**

MARA ROAD

27
40

R:\030\T30-1030-00-Mara_Road_Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn_Sheet 7/20/2022 10:59:31AM Jcoy



SEEDING	
END WIDTH	SO. YDS.
49	284
53	250
1068	

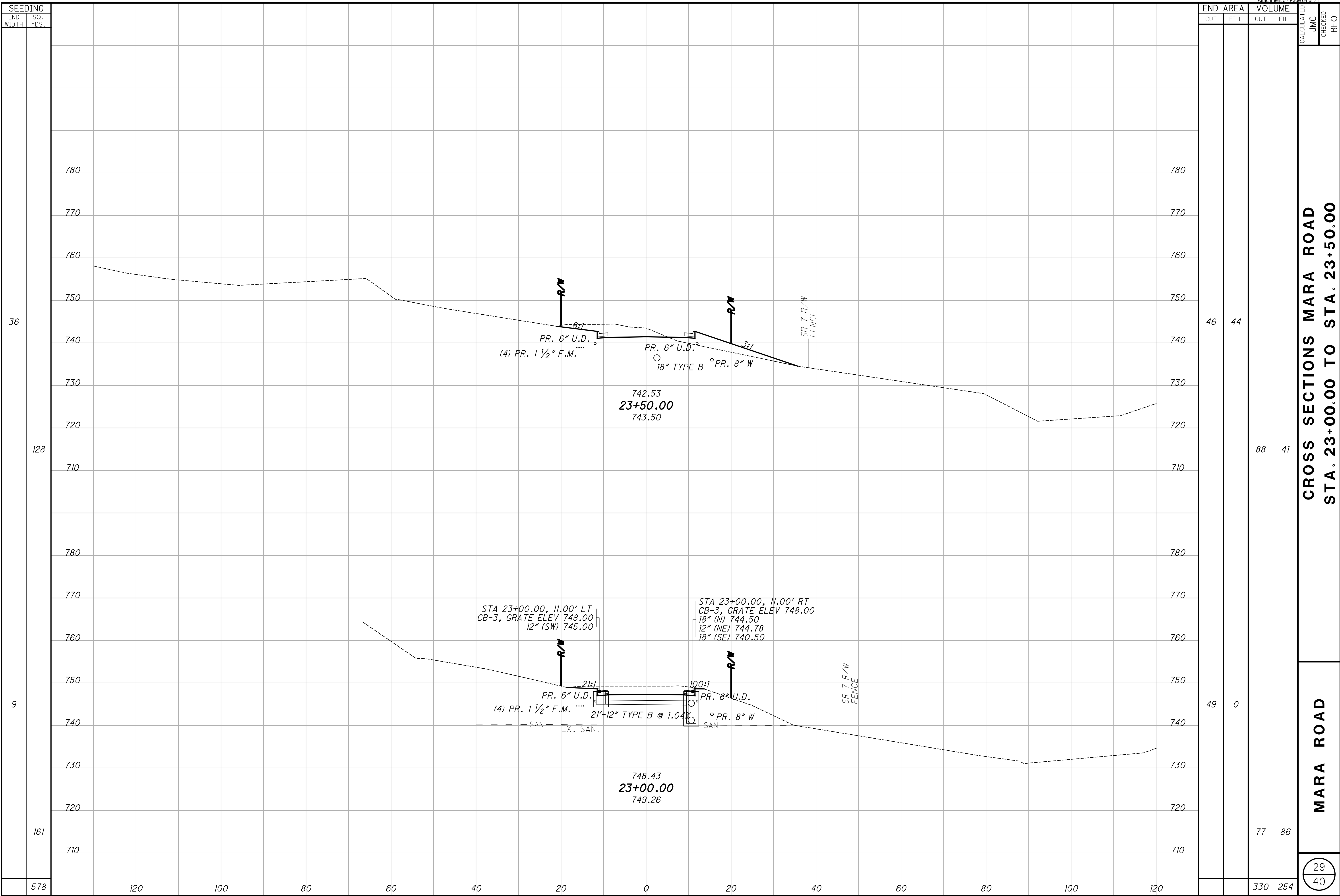
END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
34	93	32	178		
1	99	6	118		
		76	592		

**CROSS SECTIONS MARA ROAD
STA. 22+00.00 TO STA. 22+50.00**

MARA ROAD

28
40

R:\030\T30-1030.00-Mara_Road_Extension-City of Toronto\1030_MARA_ROAD\Design\Roadway\Sheets\1030_X500.dgn Sheet 7/20/2022 10:59:33 AM jcoy



SEEDING	
END WIDTH	SO. YDS.
36	
128	
9	
161	
578	

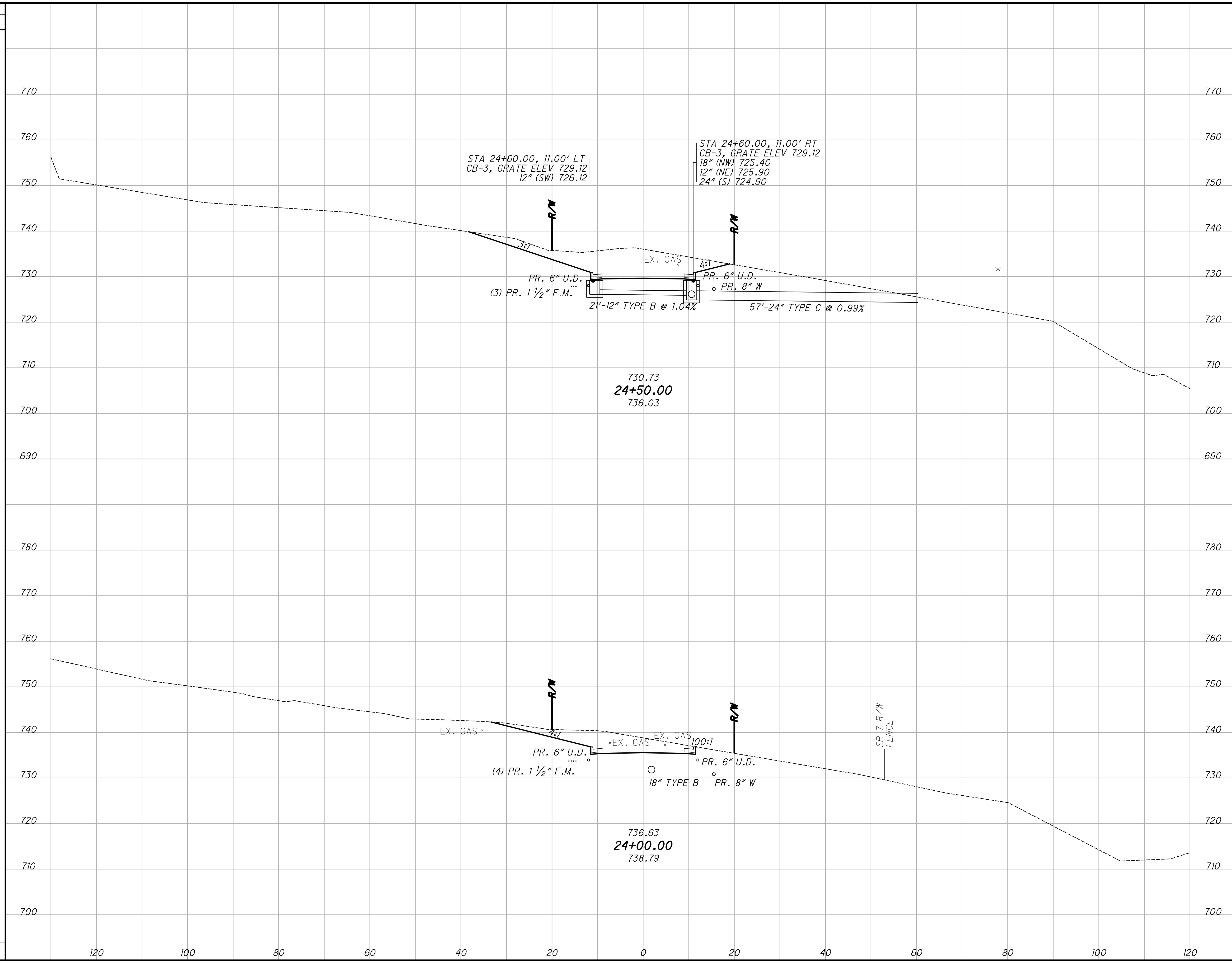
END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
46	44				
88	41				
49	0				
77	86				
330	254				

**CROSS SECTIONS MARA ROAD
STA. 23+00.00 TO STA. 23+50.00**

MARA ROAD

R:\030\T30-1030-00-Mara_Road_Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn_Sheet 7/20/2022 10:59:34 AM jcoy

SEEDING	
END WIDTH	SO. YDS.
36	166
23	166
664	



END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
201	0	289	0		
111	0	145	41		
		868	82		

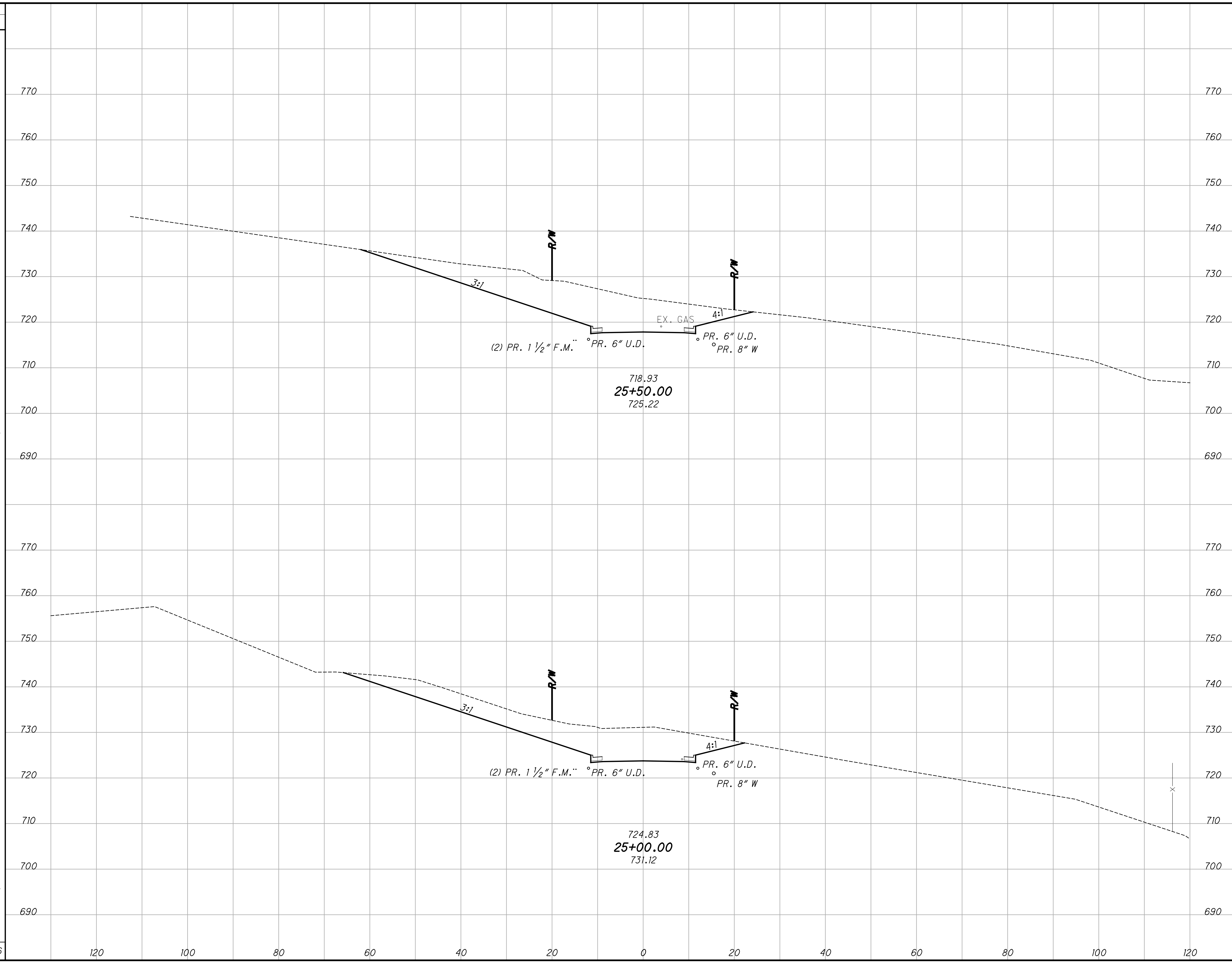
**CROSS SECTIONS MARA ROAD
STA. 24+00.00 TO STA. 24+50.00**

MARA ROAD

30
40

R:\030\T30-1030.00-Mara Road Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS001.dgn_Sheet 7/20/2022 10:59:36 AM Jcoy

SEEDING	
END WIDTH	SO. YDS.
66	66
373	373
68	68
295	295
1336	1336

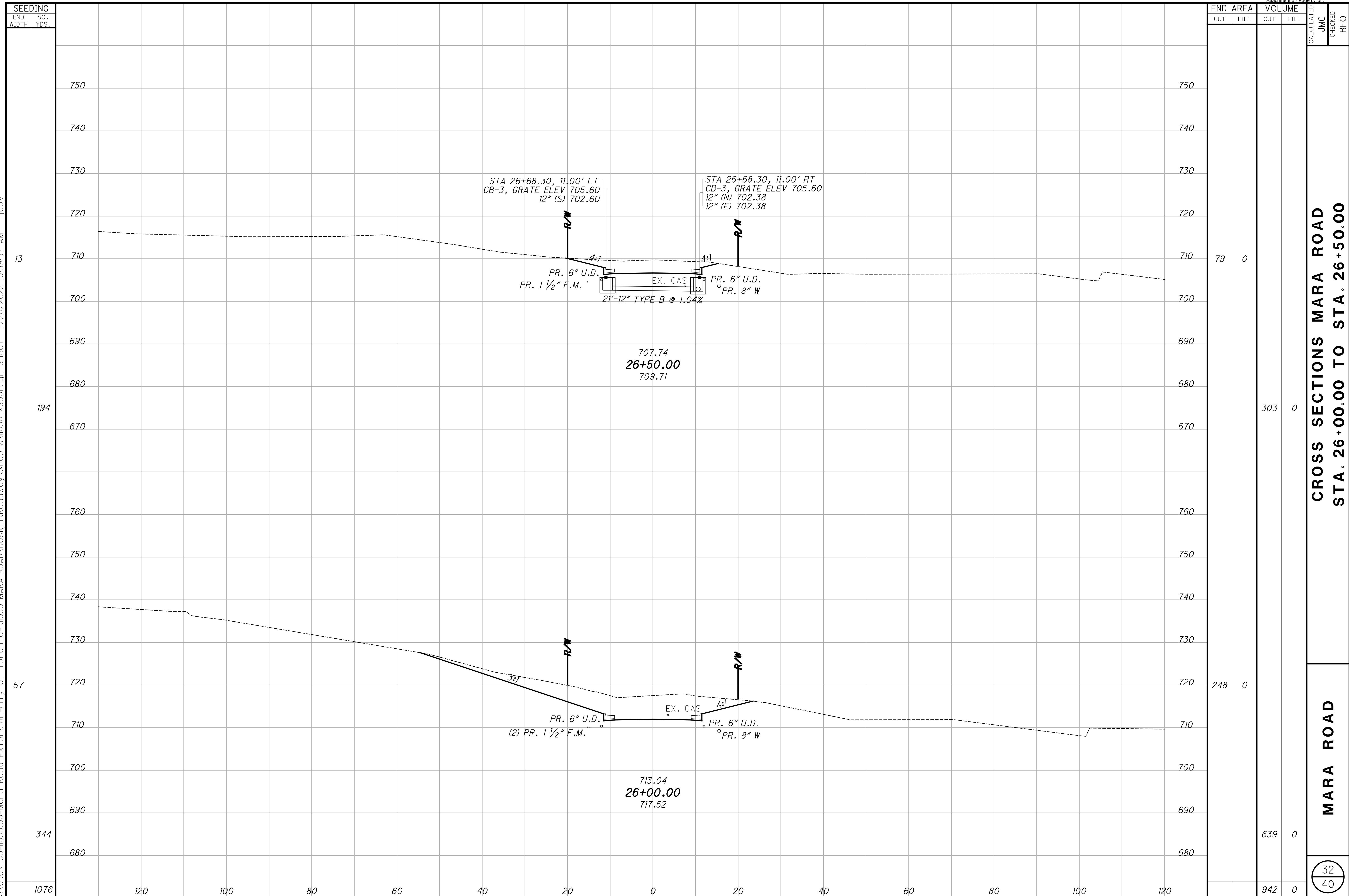


END AREA		VOLUME		CALCULATED JMC	CHECKED BEC
CUT	FILL	CUT	FILL		
442	0	768	0		
387	0	544	0		
		2624	0		

**CROSS SECTIONS MARA ROAD
STA. 25+00.00 TO STA. 25+50.00**

MARA ROAD

R:\030\T30-1030.00-Mara_Road_Extension-City of Toronto-1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn_Sheet 7/20/2022 10:59:37 AM jcoy



STA 26+68.30, 11.00' LT
CB-3, GRATE ELEV 705.60
12" (S) 702.60

STA 26+68.30, 11.00' RT
CB-3, GRATE ELEV 705.60
12" (N) 702.38
12" (E) 702.38

707.74
26+50.00
709.71

713.04
26+00.00
717.52

PR. 6" U.D.
PR. 1 1/2" F.M.

EX. GAS

21'-12" TYPE B @ 1.04%

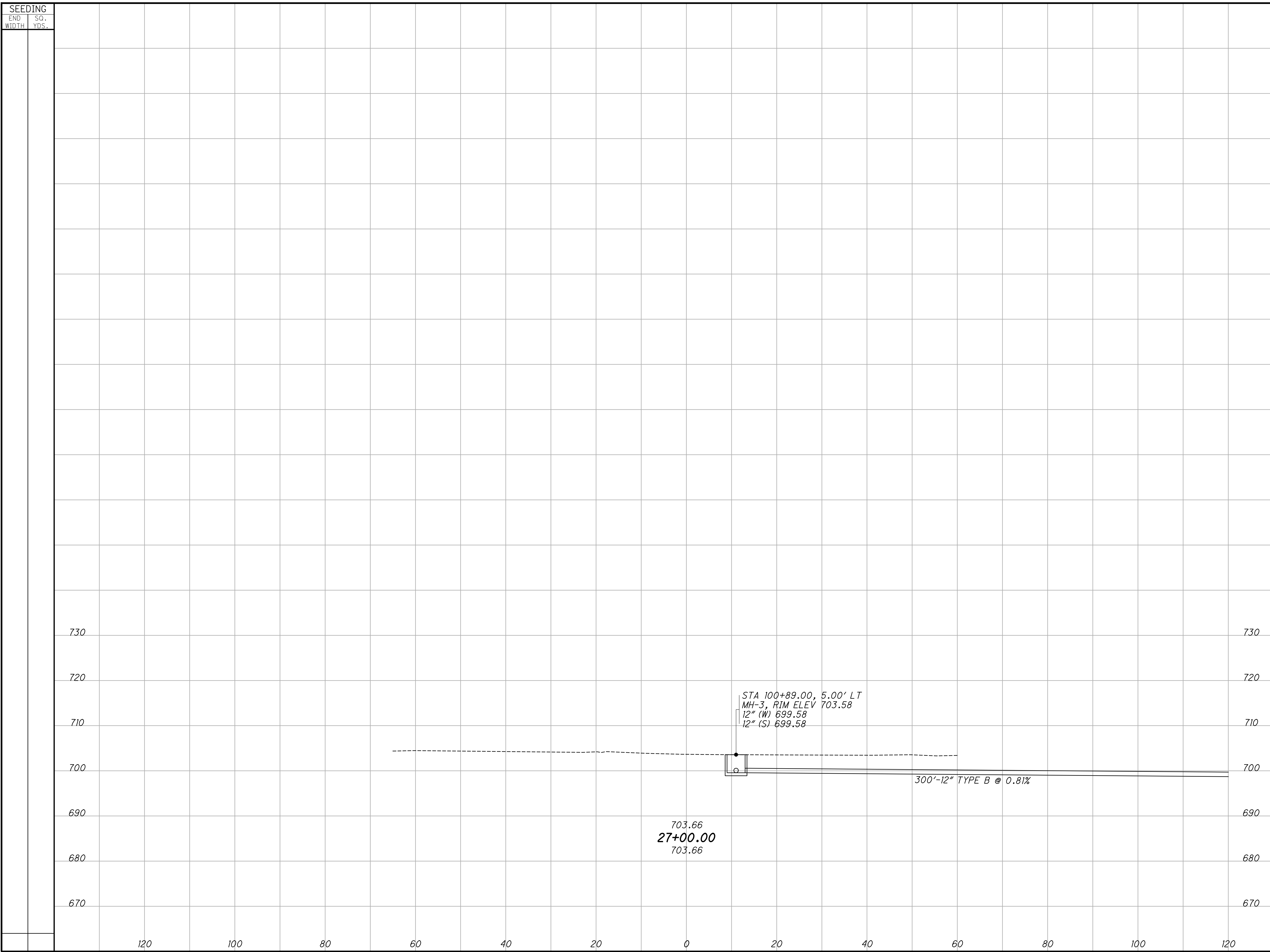
PR. 6" U.D.
PR. 8" W

PR. 6" U.D.
(2) PR. 1 1/2" F.M.

EX. GAS

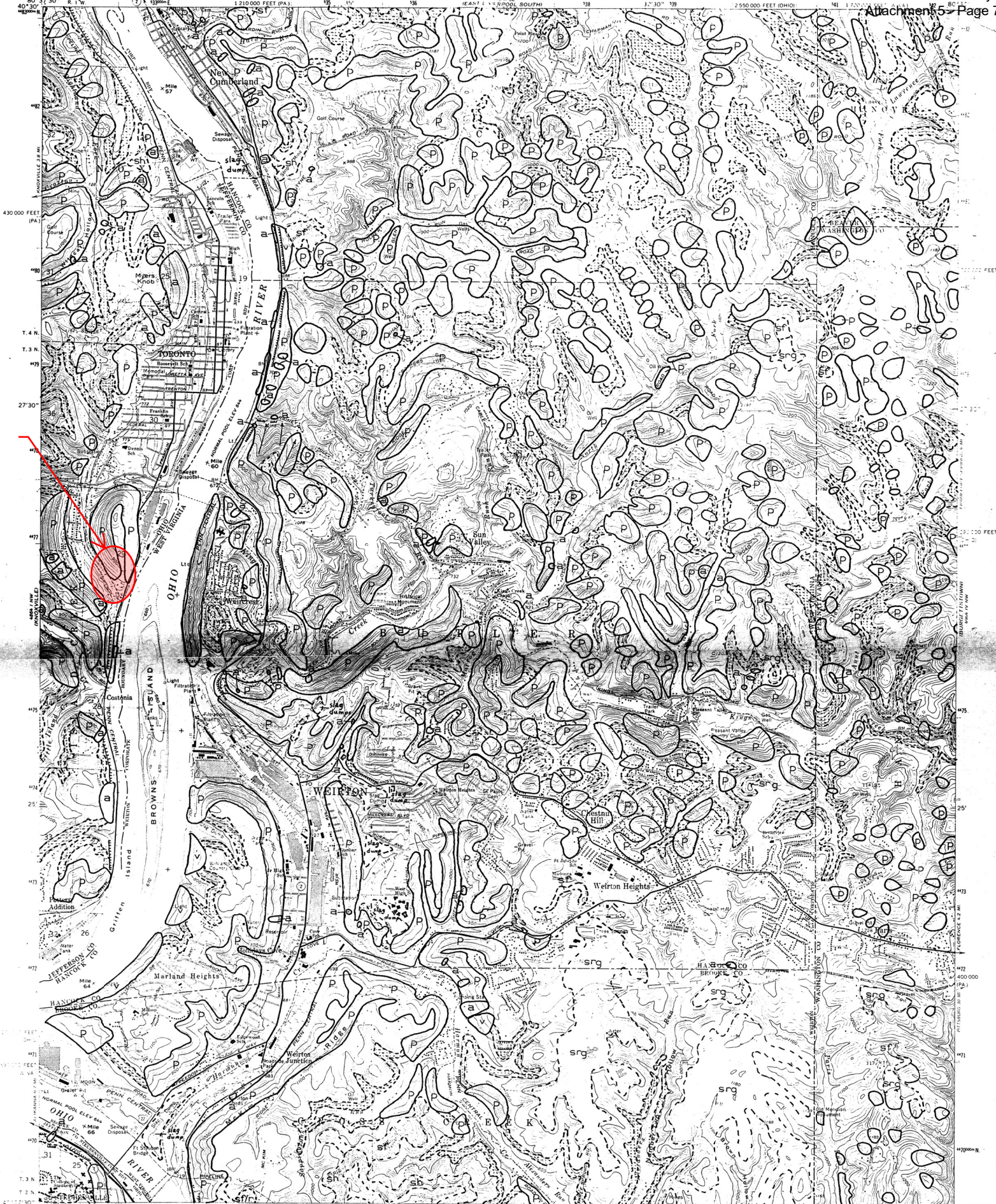
PR. 6" U.D.
PR. 8" W

P:\030\T30-1030-00-Mara Road Extension-City of Toronto-V1030_MARA_ROAD\Design\Roadway\Sheets\1030_XS00.dgn Sheet 7/20/2022 10:59:38 AM jcoy



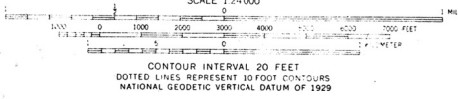
SEEDING		END AREA		VOLUME		CALCULATED		CHECKED		BEO
END WIDTH	SO. YDS.	CUT	FILL	CUT	FILL	JMC	CHECKED	BEO		
CROSS SECTIONS MARA ROAD STA. 27+00.00										
									MARA ROAD	
									33 40	

Appendix D



SITE
LOCATION

Mapped, edited and published by the Geological Survey
in cooperation with State of Ohio agencies
Control by USGS, USCAOS, and USCE
Topography by photogrammetric methods from aerial
photographs taken 1954. Field checked 1958. Revised
from aerial photographs taken 1966. Field checked 1968.
Polyconic projection. 1927 North American datum.
10,000-foot grid based on West Virginia coordinate system, north zone,
Pennsylvania coordinate system, south zone, and Ohio coordinate system,
north zone. 1000-meter Universal Transverse Mercator grid, zone
17, shown in blue.
Fine red dashed lines indicate selected fence and field lines where
generally visible on aerial photographs. This information is unchecked
the state boundary as shown represents the approximate position of the
low water line as determined from U. S. Corps of Engineers, Ohio River
charts, surveyed 1913, and supplementary information.



ROAD CLASSIFICATION
Primary highway, all weather, Light duty road, all weather,
hard surface, improved surface
Unimproved road, fair or dry
weather
U. S. Route State Route

**Landslides and related features interpreted
from aerial photographs:**
1:80,000 scale black and white 1976
1:60,000 scale black and white 1955
1:125,000 scale color infrared 1973

Photointerpretation and field check 1976.
This map has not been edited or reviewed
for conformity with Geological Survey
standards and nomenclature.

LANDSLIDES AND RELATED FEATURES

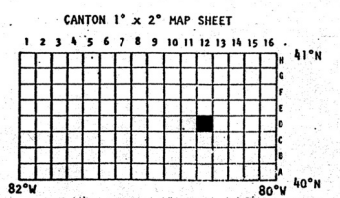
OF THE WEIRTON, OHIO-W.VA.-PA. QUADRANGLE
by
WILLIAM E. DAVIES and GREGORY C. OHLMACHER
1978
U. S. Geological Survey
OPEN FILE MAP 78-1057(0-12)

NOTE
Information shown is intended as a
general guide to ground conditions as of
the date of field check. Additional
landslides and rockfalls should be anticipated
in all map units. The map unit depicts
the dominant condition in the area
delineated and variations in slope stability
may occur at any point in the unit. This
map is suitable for general planning
purposes and as a supplement to more
detailed studies for site selection. The
map cannot be used as a substitute for
detailed geologic and engineering inves-
tigations to establish design and
construction criteria of specific sites.
Some symbols may not appear on this map because
the description is applicable to a series of maps.

- ACTIVE OR RECENTLY ACTIVE LANDSLIDE**
Complex landslide composed of earthflow, debris slide,
earth and rock slump. Identified from historical
records, and from scars, debris and other field evi-
dence. Ground extremely unstable; sliding accelerated
by excavation, loading and changes in drainage
conditions. May include areas with several active
slides too small to be shown separately. Questioned
where doubtful.
- LANDSLIDE**
Area of extensive hummocky ground caused by earthflow
and earth and rock slump. Lacks clear evidence of
active sliding. Relatively stable in natural, undistur-
bed state, generally not affected by small structures
properly sited in areas away from the edge of the toes;
can be reactivated by extensive, rapid excavation,
loading, and changes in ground water and surface water
conditions. Area of old landslide probably includes
recent ones not identified from field evidence or
otherwise documented. Upslope boundary of landslide
generally defined by modified scarp, but downslope
(toe) may be gradational and not well defined. Questioned
where doubtful.
- COLLUVIAL SLOPE**
Valley wall along major streams with slope as steep as
40° (85%); stony, clayey silt soil up to 50 ft.
(15 m) thick; commonly buttressed by a terrace or
bench at the toe of the slope; very susceptible
to sliding by cutting of toe area, removal of terrace
or bench, and overloading; landslide commonly acti-
vated without apparent cause.
- AREAS SUSCEPTIBLE TO DEBRIS FLOWS AND DEBRIS AVALANCHES**
Primarily shallow, narrow ravines and chutes with
accumulation of stony colluvium generally 10 ft. (3 m)
or less in thickness; susceptible to rapid movement
during intense rainfall. Most ravines designated
show evidence of former debris flows and avalanches.
Symbol - **a** - designates historical debris flow or
debris avalanche.

- AREAS SUSCEPTIBLE TO ROCKFALL**
Steep, locally vertical, natural and man-made
slopes and cliffs, 15 ft. (4.5 m) or higher,
formed dominantly of sandstone, limestone, sandy
shale, mudstone and claystone. Interbedded mud-
stone, claystone and shale weather rapidly leav-
ing sandstone and limestone rock faces unsupported.
 - COVE UNDERLAIN BY CLAY LAYER**
Rounded or U-shaped valley with steep concave
slope of valley floor (coves) and valley
heads underlain by clayey soils forming a
coherent layer generally 8 ft. (2.5 m) or less
in thickness. Zone of water commonly at the
base of the clay layer is under 2 to 8 ft. (0.6 -
2.5 m) artesian head. Clay soil is underlain by
claystone and shale. Clay slab moves as a coher-
ent mass up to 1 ft. (0.3 m) per year; very
susceptible to more rapid sliding when overloaded
by fill or structure and by excavations that break
the continuity of slope. Recent soil slips (earth
flows) as much as 40,000 square feet (3,700 square
meters) in size are common.
 - SOIL AND ROCK SUSCEPTIBLE TO LANDSLIDING**
Soil and rock similar to that involved in
landslides elsewhere in map area; primarily
areas underlain by claystone, mudstone and
shale associated with other rock types. Rock
weathers rapidly on exposure forming clayey soil
highly susceptible to sliding.
 - AREAS LEAST PRONE TO LANDSLIDES**
Map areas in which no patterns or symbols are
shown; primarily valley floors, ridge tops and
broad benches; modification by excavation and
fill may lead to local landslides.
- The first five digits of the open file number designate
the specific 1:250,000 scale map sheet of which this quadrangle
is a part. The last two digits designate the position of the
quadrangle in a subdivision of the 1:250,000 scale map based
on rows and tiers shown in the diagram to the right. The
location of this quadrangle is shown by the black square.

- MAN-MADE FEATURES**
Strip mines (combination of letter
symbols indicates complex formed of more
than one type of strip mine)
sh bench with high wall
sf furrowed with high wall
sd multiple furrows and multiple
benches
srg reclaimed by grading
sru reclaimed by secondary use
sh/r regraded in part, high wall
remains
Coal refuse banks
r identified on aerial photographs;
not classified in field check
rb not burnt nor on fire
rbb burnt
rbd burning
rbs sludge
Quarries
q quarry site
qub spoil bank, quarry waste
Gravel pits
g site of gravel pit
Slides in man-made features
a/f earth flow in fill
a/s earth flow in strip castings
a/r earth flow in coal refuse



W22072 Mara Road

Slide Map



NOTES

1. IMAGE AFTER GOOGLE EARTH.

DATE	NO.	REVISION

NGE
Engineering & Construction
Geotechnical & Environmental Engineering Services
650 MacCorkle Avenue West
Saint Albans, West Virginia 25177
(304) 201-5180 FAX 201-5182
www.ngeconsulting.com

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PROJECT: MARA ROAD EXTENSION
CLIENT: THRASHER
SHEET: LANDSLIDE MAP INSET

Project No.	W22072
Drawn:	NLS
Checked:	--
Approved:	--
Scale:	NTS
Date:	8-2-22
CAD File #	NA

ESTIMATE

The approximate work to be bid upon is described as follows:

This project will consist of approximately 1,643.34' of new asphalt roadway with curb and gutter along with storm sewer, underdrains, detention basin, sanitary sewer, pump stations, water line, and driveway approaches to extend the existing Mara Road to Titanium Way Road. Four parking spaces and a curb ramp have been provided for future use with a bike path. Pavement overlay for existing Mara and Nebo Roads.

The Engineer's estimate for cost of construction is: **\$2,512,755.79.**

AFFIDAVIT OF NON-COLLUSION

THIS AFFIDAVIT IS TO BE FILLED OUT AND EXECUTED BY THE BIDDER:
IF THE BID IS MADE BY A CORPORATION, THEN BY ITS
PROPERLY AUTHORIZED AGENT

State of Ohio, County of _____:

(Name of Authorized Individual Making Bid)

residing at _____, being duly

sworn does depose and say that _____
(Give Name of Bidder or Bidders)

(Business Address)

_____, and,

(Give Names and Addresses of All Other Persons, Firms or Corporations Interested in the Bid.)

_____ is or are the only person or persons interested with sharing in the profits of the herein contained Bid; that the said Bid is made without any connection or interest in the profits thereof with any other persons making any bid or proposal for said work; that said bid is on our part, in all respects fair and without collusion or fraud; and also that no member of, head of any department or Bureau, or employee therein, or any Officer of the City of Louisville is directly or indirectly interested therein.

(Signature of Authorized Individual Making Bid)

Subscribed and sworn to this _____ day of _____, 20____,

before _____
(Notary Public)