REQUEST FOR PROPOSALS
FOR
TROY SCHOOL DISTRICT 2025 SITE IMPROVEMENTS PAVING PROJECTS

RFP #2425-01

TROY SCHOOL DISTRICT
Attention: Jennifer Vente
Administration Building
4400 Livernois Road
Troy, Michigan 48098
Telephone: (248) 823-4000
Fax: (248) 823-4013
Email: jvente@troy.k12.mi/us

I. OVERVIEW

1.1. PURPOSE

The purpose of the Request For Proposals ("RFP") is for Troy School District (the "School District") to obtain proposals from qualified contractors for RFP Number 2425-01 – 2025 Troy School District Site Improvements Paving Projects. (the "Work"). This work is located at Transportation Center, Morse Elementary School, Leonard Elementary School, and Athens High School.

1.2. SELECTION TIMELINE

NOTE*:* Throughout the remainder of this RFP, a prospective contractor is referred to as the "Contractor."

The School District's anticipated timeline for its selection process is:

Issuance of this RFP	November 19, 2024
There is no Pre-Proposal Meeting	
Deadline for written Requests For Clarifications	4 pm local time, November 27, 2024
DUE DATE FOR PROPOSALS	**11:00 a.m. Local Time, December 9, 2024**
School District's Consideration of the Contract	January 21, 2025
Commencement of Work	June 9, 2025
School Completion of Work	August 15, 2025

PLEASE NOTE: The School District reserves the right, in its sole and absolute discretion, to make modifications to the above selection timeline as it determines to be in its best interest.

II. SUBMISSION OF PROPOSALS

2.1. PROPOSAL SUBMISSION DEADLINE AND REQUIREMENTS

The Due Date for receipt of Proposals is:

Monday, December 9, 2024 at 11:00 a.m Local Time (the "Due Date")

2.1.1. Sealed proposals should be submitted through Buildingconnect.com with the following link: https://app.buildingconnected.com/public/5cc9d7f637c1a90018cb55dc. No physical bids will be accepted in person or via delivery service.

2.1.2. Late Proposals: Each Contractor is responsible for submission of its Proposal. Proposals or Proposal revisions received after the Due Date will not be accepted or considered. The School District is not liable for any delivery or postal delays.

2.1.3. Returned Proposals: All Proposals received after the Due Date will be unopened and made available to the respective Contractor for pick-up, at its sole cost and expense.

2.1.4. Signed Original Proposal: Each Proposal must be signed by an authorized member of the Contractor's firm. This member should be the highest-ranking officer at the local level. NO ORAL, FAX, or E-MAILED Proposals will be accepted. Each Proposal must be submitted on the Proposal Forms attached to this RFP.

2.1.5. **Opening of Proposals:** At the Due Date stated above and with the following virtual link: meet.google.com/npw-bxrm-sot or phone number (470) 705-4554 PIN 591 295 737#, all submitted Proposals shall be publicly opened and read aloud. Any interested parties may attend. No immediate decision will be rendered.

2.1.6. **E-Mail Clarifications:** The School District intends to communicate with Contractors via e-mail (e.g., RFP clarifications and addenda). Except for the delivery of the Proposal itself, references in this RFP to "written" form of communications include e-mail.

2.1.7. **Additional Requests For Clarification:** Prospective Contractors may request that the School District clarify information contained in this RFP. All such requests must be made in writing via email. The School District will attempt to provide a written response to all written Requests For Clarification within five (5) business days after the receipt of such request. The School District will not respond to any Request For Clarification received after **4 p.m. on November 27, 2024**. Requests For Clarification and inquiries must be made via e-mail. All Requests For Clarification must be directed to Jennifer Vente at jvente@troy.k12.mi.us. (Subject Line: _____ RFP Request For Clarification). No response will be made to any oral questions. All questions and answers will be posted on the School District's website. It is each Contractor's responsibility to check the School District's website prior to the RFP Due Date to ensure that it has received all of the information, including, but not limited to, all Addenda to this RFP.

2.1.8. **Restrictions On Communication:** From the issue date of this RFP until a Contractor is selected and the selection announced, a prospective Contractor shall not communicate about the subject of this RFP or a Contractor's Proposal with the School District, its Board of Education, or any individual member, administrators, faculty, staff, students, employees, or its Construction Manager, if any, except for additional Requests For Clarification in accordance with Paragraph 2.1.7 above, or as otherwise required by applicable law.

2.1.9. **Addenda to the RFP:** If it becomes necessary to revise any part of this RFP, notice of the revision will be e-mailed to all parties that requested a copy of this RFP. All addenda will be issued through the School District's website and all addenda shall become a part of this RFP. Each Contractor must in its Proposal, to avoid any miscommunication, acknowledge all addenda which it has received, but the failure of a Contractor to receive, or acknowledge receipt of, any addendum shall not relieve the Contractor of the responsibility for complying with the terms thereof.

2.1.10. **RFP/Proposal Information Controlling:** The School District intends that all Contractors shall have equal access to information relative to this RFP, and that this RFP contains adequate information. No information communicated, either verbally or in writing, to or from a Contractor shall be effective unless confirmed by written communication contained in an addendum to this RFP, a Request For Clarification or other written response thereto, or in the Proposal.

2.1.11. Finality of Decision: Any decision made by the School District, including the Contractor selection, shall be final.

2.1.12. Reservation of Rights: The School District reserves the right, in its sole and absolute discretion (for this provision and all other provisions contained in this RFP), to accept or reject, in whole or in part, any or all Proposals with or without cause. The School District further reserves the right to waive any irregularity or informality in the RFP process or any Proposal, and the right to award the Contract to other than the Contractor(s) submitting the best financial Proposal (low bidder). The School District reserves the right to request additional information from any or all Contractors. The School District reserves the right to select one or more Contractors to perform the Work on behalf of the School District. In the event the Contractor's Proposal is accepted by the School District and the Contractor asserts exceptions, special considerations or conditions after acceptance, the School District, in its sole and absolute discretion, reserves the right to reject the Proposal and award the Contract to another contractor.

2.1.13. Release of Claims: Each Contractor by submitting its Proposal releases the School District from any and all claims arising out of, and related to, this RFP process and selection of a Contractor.

2.1.14. Contractor Bears Proposal Costs: A recipient of this RFP is responsible for any and all costs and liabilities incurred by it or others acting on its behalf in preparing or submitting a Proposal, or otherwise responding to this RFP, or any negotiations incidental to its Proposal or this RFP.

2.1.15. Irrevocability of Proposals: All Proposals submitted shall not be withdrawn and shall be irrevocable for a minimum period of ninety (90) calendar days following the Due Date for receipt of Proposals set forth above.

2.1.16. Collusive Bidding: The Contractor certifies that its Proposal is made without any previous understanding, agreement, or connection with any person, firm or corporation making a Proposal for the same Work and is in all respects fair, without outside control, collusion, fraud, or otherwise illegal action.

2.2 PROPOSAL REQUIREMENTS AND FORMAT

This outlines the information that must be provided by each Contractor and the required format for its Proposal. Any Proposal not providing the required information, or not conforming to the format specified, may be disqualified on that basis. Please also refer to Sections 2.1, 4.1, and 4.2 of this RFP for additional Proposal requirements. Attached to this RFP is a form of contract under which the Work requested under this RFP shall be provided by the successful Contractor (the "Contract" and referred to throughout the Contract as the "Agreement") (See also Section 3.1 of this RFP). The Contract contains many details relative to the Work requested by the School District, the terms and conditions under which the Work shall be provided by the Contractor, and should be reviewed carefully by each Contractor prior to submitting a Proposal.

Any exceptions to the terms and conditions contained in this RFP or the form of Contract attached to this RFP, or any other special considerations or conditions requested or required by the Contractor MUST be specifically enumerated by the Contractor and be submitted as part of its Proposal, together with an explanation as to the reason such terms and conditions of the RFP or form of Contract cannot be met by, or, in the Contractor's opinion, are not applicable to, the Contractor. The Contractor shall be required and expected to meet the specifications and requirements as set forth in this RFP and the form of Contract in their entirety, except to the extent exceptions or special considerations or conditions are expressly set forth in the Contractor's Proposal and those exceptions or special considerations or conditions are expressly accepted by the School District. All Pricing factors must be clearly indicated in the Proposal Forms provided as part of the Contractor's Proposal.

Each Proposal must include, at a minimum, the following:

2.2.1 A detailed list setting forth any exceptions to this RFP and/or the Contract, or other special considerations or conditions of the Contractor, including explanations of such exceptions or the reason such terms and conditions of the RFP or form of Contract cannot be met by, or on the Contractor's opinion are not applicable to, the Contractor.

2.2.2 References – Each Proposal must include detailed evidence that the Contractor is currently providing Work for other K-12 public school districts or educational institutions. The Contractor must provide this information, including contact names, addresses, phone numbers, and type and scope of work provided. This should include school districts of similar size and scope as the School District.

2.2.3 Evidence of the Contractor's ability to provide adequate insurance coverages as required by this RFP and the Contract to protect the interests of the Contractor and the School District.

2.2.4 Demonstrate that the Contractor understands and will comply with all regulatory laws, codes, and requirements of any Local, State, and Federal law that apply to the requirements and obligations under this RFP and the Contract.

2.2.5 A completed Proposal Pricing Form provided as **ATTACHMENT A**.

2.2.6 A completed Familial Disclosure Affidavit provided as **ATTACHMENT B**.

2.2.7 A completed Iran Economics Sanctions Act Affidavit of Compliance provided as **ATTACHMENT C**.

2.2. SPECIFICATIONS

#	Description	Pages
310516	Soils and Aggregates	6
311000	Site Clearing	4
312213	Rough Grading	4
312316	Excavation	3
312317	Trenching	4
312323	Fill	3
312513	Erosion Controls	3
321216	Asphalt Paving	7
321313	Concrete Paving	12
321723	Pavement Markings	5
329113	Soil Preparation	2
329119	Landscape Grading	2
329219	Seeding	6
330513	Manholes and Structures	6
334100	Storm Utility Drainage and Piping	5
334600	Subdrainage	2
N/A	Chip Seal	3

2.3. DRAWINGS

#	Description	Date
N/A	Cover Sheet	11/8/24
Transportation Center		
C-1.1	Topographic Survey and Demolition Plan	11/8/24
C-2.1	Engineering Plan	11/8/24
C-3.1	Grading and Erosion Control Plan	11/8/24
Morse Elementary School		
C-1.2	Topographic Survey and Demolition Plan	11/8/24
C-2.2	Engineering Plan	11/8/24
C-3.2	Grading and Erosion Control Plan	11/8/24
Leonard Elementary School		
C-1.3	Topographic Survey and Demolition Plan	11/8/24
C-1.3A	Topographic Survey and Demolition Plan	11/8/24
C-2.3	Engineering Plan	11/8/24
C-2.3A	Engineering Plan	11/8/24
C-3.3	Grading and Erosion Control Plan	11/8/24
C-3.3A	Grading and Erosion Control Plan	11/8/24
Athens High School		
C-1.4	Topographic Survey and Demolition Plan	11/8/24
C-2.4	Dimension and Engineering Plan	11/8/24
C-2.5	Loop Road and Bus Loop Engineering Plan	11/8/24
C-3.4	Grading and Erosion Control Plan	11/8/24
C-3.5	Service Grading and SESC Plan	11/8/24
Notes and Details		
C-4.0	Notes and Details	11/8/24
C-4.1	Notes and Details	11/8/24
C-4.2	Notes and Details	11/8/24
Troy Standard Details		
D	SESC Details	April 2019
E	Standard Storm Details	April 2019
Barnard Elementary School		
C-1.0	Drainage Improvement Plan	11/8/2024

2.4. SCOPE OF WORK CLARIFICATIONS

1. The work at the Transportation Center west of the retention pond can be started on May 5, 2025
2. The parking lot work at Athens High School can be started on May 27, 2025.
3. All electrical work shall be excluded from this project
4. The drive work at Athens High School shall be completed in 2 phases; north and west drive. The bidder shall include all traffic control devices to close the Wattles and John R. Road entrance when completing the phases. One of these entrances shall open at all times.

III. CONTRACTUAL OBLIGATIONS

3.1. FORM OF CONTRACT

3.1.1. Form of Contract: This is a Request For Proposals only. Proposals will be treated as offers to enter into the Contract (as defined above) with the School District. The School District and successful Contractor shall memorialize their contractual relationship and obligations using the form of Contract attached hereto as **ATTACHMENT D**. The Contract contains many details relative to the Work required under this RFP, as well as the terms and conditions under which the Work shall be provided by the successful Contractor. The Contract should be reviewed carefully by each Contractor prior to submitting a Proposal. Any exceptions to the terms and conditions contained in the Contract, or any other special considerations or conditions requested or required by the Contractor relative to this RFP or the form of Contract shall be expressly/specifically enumerated by the Contractor and be submitted as part of its Proposal, together with an explanation as to the reason such terms and conditions cannot be met by, or, in the Contractor's opinion are not applicable to, the Contractor, provided however, that exceptions or special conditions of the Contractor will not be binding upon the School District unless those exceptions or special conditions are expressly accepted by the School District, and incorporated into the final Contract. Following the selection of the successful Contractor by the School District, the Contract will be finalized by the parties. The below sections contain information relative to selected provisions of the Contract and/or the expectations of the School District relative to the provision of the Work.

3.1.1.1. Familial Disclosure Affidavit: All Contractors must provide familial disclosure in compliance with MCL 380.1267 and attach this information to its Proposal. The Proposal must be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the owner and/or any employee of the Contractor and any member of the School District's Board of Education or the School District's Superintendent. The School District will not accept a Proposal that does not include this sworn and notarized disclosure statement. The Familial Disclosure Affidavit is attached to this RFP as **ATTACHMENT B**.

3.1.1.2. Iran Economic Sanctions Act: In accordance with Michigan Public Act No. 517 of 2012, all Proposals must be accompanied by a sworn and notarized statement certifying that the Contractor is not an Iran Linked Business. The School District will not accept a Proposal that does not include this sworn and notarized statement. The Affidavit of Compliance – Iran Economic Sanctions Act is attached to this RFP as **ATTACHMENT C**.

3.1.1.3. **Bid Security:** Contractors must submit with its Proposal bid security in the form of a Bid Bond issued by a qualified surety or certified check/money order in an amount of five percent (5%) of the Proposal ("Bid Security"). Failure to include this Bid Security with the Contractor's Proposal will result in the rejection of your Proposal. If a Bid Bond is posted by a Contractor, it shall be from a Treasury Surety licensed to do business in the State of Michigan, and the attorney-in-fact who executes the Bid Bond on behalf of the Contractor shall attach a certified, current copy of its power of attorney. In the event a certified check/money order is submitted, it shall be made payable to "Troy School District." The School District shall not be liable for any interest earned thereon. The Bid Security shall be forfeited as liquidated damages, and not as a penalty, if the Contractor withdraws its Proposal after the Due Date for submission of Proposals or, upon acceptance of its Proposal by the School District, the Contractor fails to execute the form of Contract acceptable to the School District, substantially evidencing and incorporating this RFP and its Proposal and fails to provide the required Performance Bond and/or Payment Bond, if any, and the required insurance certificates, within fifteen (15) days of an award of a Contract to the Contractor. Bid Bonds shall be duly executed by the Contractor, as principal and by a surety that is properly licensed and authorized to do business in the state in which the Work is to be performed. All sureties providing bonds for this Project must be listed in the latest version of the Department of Treasury's Circular 570, entitled "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies", with the bond amount less than or equal to the underwriting limitation, and/or have an A.M. best rating of A- or better. Bid Security shall be returned to all non-successful Contractors within a reasonable time after the award of a Contract and execution of a Contract by the successful Contractor. The bid bond can be included with the proposal as submitted through Buildingconnected.com. If the bid security is a certified check/money order, this must be delivered to the following address: 1140 Rankin Street, Troy, MI 48083 prior to the bid due date and time.

3.1.1.4. **Performance Bond**: Successful Contractors whose Proposals are $50,000 or more will be required to furnish Performance and Payment Bonds, in a form satisfactory to the School District, in the amount of 100% of its Proposal by a Treasury-listed Surety licensed to do business in the State of Michigan, and the attorney-in-fact who executed the Performance and Payment Bonds on behalf of the Contractor shall attach a certified, current copy of its power of attorney. The cost of the Bonds shall be included in each Proposal.

3.1.1.5. **Governing Law**: The Contract shall be governed by and construed in accordance with the laws of the State of Michigan. The parties hereby agree to the exclusive jurisdiction and venue of courts sitting in Oakland County, Michigan.

3.1.1.6. **General Indemnification**: Contractor shall indemnify, defend and hold harmless the School District, its Board of Education, its Board Members, in their official and individual capacities, its administrators, employees, agents, contractors, successors and assignees, from and against any and all claims, counter claims, suits, debts, demands, actions, judgments, liens, costs, expenses, damages, injuries and liabilities, including actual attorney's fees and actual expert witness fees arising out of or in connection with Contractor's performance of the Contract and/or from Contractor's violation of any of the terms of the Contract, including, but not limited to: (i) the negligent acts or willful misconduct of the Contractor, its officers, directors, employees, successors, assignees, contractors and agents; (ii) any breach of the terms of the Contract by the Contractor, its officers, directors, employees, successors, assignees, contractors and agents; (iii) any violation or breach of any applicable Federal, State or local law, rule, regulation, ordinance, policy and/or licensing and permitting requirements applicable to the Contract; or (iv) any breach of any representation or warranty by the Contractor, its officers, directors, employees, successors, assignees, contractors and agents under the Contract. The Contractor shall notify the School District by certified mail, return receipt requested, immediately upon actual knowledge of any claim, suit, action, or proceeding for which Troy School District may be entitled to indemnification under the Contract. This paragraph shall survive the expiration or earlier termination of the Contract.

3.1.1.7. **Compliance With Laws**: Contractor shall comply with any and all applicable federal, state, and local laws, rules, ordinances, policies, and regulations, including any licensing and permitting requirements, under the Contract. Contractor, including its personnel, employees, contractors, consultants, and agents shall be responsible for knowing the School District's policies concerning appropriate behavior of persons in School District facilities and, on School District properties, including for example, the prohibitions of sexual harassment and smoking, and shall comply with all such policies. Contractor represents and warrants to the School District that it shall at all times be in compliance with any and all applicable federal and state laws, rules, ordinances, policies and regulations, and licensing and permitting requirement applicable to the Contract. Contractor shall indemnify, defend, and hold School District harmless from any liability from its failure to so comply.

3.1.1.8. **Right to Terminate on Breach**: Each party shall have, in addition to all other remedies available to it, the right to terminate the Contract immediately upon written notice to the other party that the other party has committed a material breach of any of its obligations herein and such material party has committed a material breach of any of its obligations herein and such material breach shall not have been cured or corrected within ten (10) days following written notice of the same. Furthermore, if the School District must regularly request that the Contractor cure breaches of the Contract, such circumstances shall be grounds for termination of the Contract for cause, even if each breach on its own would not be material.

i. **Events Upon Termination:** Upon termination of the Contract by either party for Breach or default of the other party, each party shall be entitled to exercise any other right, remedy or privilege which may be available to it under applicable law or proceed by appropriate court action to enforce the terms of the Contract or to recover damages for the breach of the Contract. Upon termination of the Contract, the Contractor shall immediately provide the School District with any and all drawings and documentation regarding the Work. In the event of termination, title to all supplies, materials, equipment or products purchased by the Contractor for integration into the Work shall pass to the School District, and Contractor shall deliver possession of said supplies, materials, equipment or products to the School District at a location to be designated by the School District.

3.1.1.9. **Pricing**: Prices quoted are to be F.O.B. to Troy School District. All purchases Prices shall be net; including transportation, insurance and delivery charges fully prepaid by the successful Contractor to destinations indicated in the Proposal.

3.1.1.10. **Taxes**: This project is NOT exempt from taxes.

3.1.1.11. **Proposal Withdrawal**: Contractors may withdraw its Proposals any time before the Due Date. Proposals may not be withdrawn for at least 90 days after the Due Date.

3.1.1.12. **Competition**: The name of a model, manufacturer, or brand in this RFP shall not be considered as exclusive of other brands. Brands and models specified in this RFP are preferred. The School District expects all supplies, materials, equipment, or products bid by a Contractor to meet or exceed the Specifications set forth in this RFP. Further, it is the School District's intent that this RFP permit competition. Accordingly, the use of any patent, proprietary name, or manufacturer's name is for demonstrative purposes only and is not intended to curtail competition. Whenever any supplies, material, equipment, or products requested in this RFP are specified by patent, proprietary name or by the name of the manufacturer, unless stated differently, such specification shall be considered as if followed by the words "or comparable equivalent," whether or not such words appear. The School District in its sole and absolute discretion, shall have the right to determine if the proposed equivalent products/brands submitted by the Contractor meet the Specifications contained in this RFP and possess equivalent and/or better qualities. It is the Contractor's responsibility to notify the School District in writing if any Specifications or suggested comparable equivalent products/brands require clarification by the School District prior to the Due Date for Proposals. Any and all deviations from Specifications must be noted on the Proposal Form.

IV. PROPOSAL

4.1. PROPOSAL FORMS

Each Contractor shall submit its Proposal using the Proposal Pricing Form attached hereto as **ATTACHMENT A**, along with any other information required by this RFP or deem necessary and appropriate by the Contractor for evaluation of its Proposal.

4.2. PROPOSAL CHECKLIST

In addition to the Proposal Pricing Form and any information required under Section 4.1 above, please attach copies of the following documents to your Proposal:

4.2.1. Proposal Pricing Form and detailed list setting forth any exceptions to the RFP and/or Contract, or other special considerations or conditions of the Contractor, including explanations of such exceptions or the reason such terms and conditions of the RFP or form of Contract cannot be met by, or are not applicable to, the Contractor.

4.2.2. List of Contractor's References (K-12 references preferred) with which Contractor has contracted to perform Work or services similar to the Work described herein. The Contractor must provide this information, including contact names, addresses, phone numbers, and type and scope of Work/services provided.

4.2.3. Contractor's Verification of addenda to the RFP, if any.

4.2.4. Evidence of the Contractor's ability to provide adequate insurance coverages as required by this RFP and the Contract to protect the interests of the Contractor and the School District.

4.2.5. A completed Familial Disclosure Affidavit, which is attached hereto as **ATTACHMENT B**.

4.2.6. A completed Iran Sanctions Act Affidavit of Compliance, which is attached hereto as **ATTACHMENT C**.

ATTACHMENT A

PROPOSAL PRICING FORM

CONTRACTOR INFORMATION:

CONTRACTOR'S NAME: _____

CONTACT PERSON: _____

ADDRESS: _____

CITY/STATE: _____

TELEPHONE NUMBER: _____

FAX NUMBER: _____

E-MAIL ADDRESS: _____

A. CONTRACTOR PRICING

BASE BID

Project #1 – Morse and Leonard Elementary Schools

Morse Elementary School

Base Bid Amount:	$	_____
Bond Amount:	$	_____
Allowance Amount:	$	5,000.00
Permit Allowance Amount:	$	5,500.00
Undercut Allowance of 350 Cubic Yards Amount:	$	_____
4" Drain Tile Allowance of 250 Lineal Feet Amount:	$	_____
Morse Elementary School Total:	$	_____

Leonard Elementary School

Base Bid Amount:	$	_____
Bond Amount:	$	_____
Allowance Amount:	$	5,000.00
Permit Allowance Amount:	$	5,500.00
Undercut Allowance of 250 Cubic Yards Amount:	$	_____
4" Drain Tile Allowance of 325 Lineal Feet Amount:	$	_____
Allowance: Remove & Replace 245 Square Feet of 4" Concrete Sidewalk:	$	_____
Allowance: Remove, Salvage & Reinstall 2 Benches:	$	_____
Leonard Elementary School Total:	$	_____
Project #1 Morse & Leonard Elementary Schools Total:	$	_____

Project #2 Transportation Center

Base Bid Amount:	$	_____
Bond Amount:	$	_____
Allowance Amount:	$	10,000.00
Permit Allowance Amount:	$	5,500.00
Undercut Allowance of 965 Cubic Yards Amount:	$	_____
4" Drain Tile Allowance of 500 Lineal Feet Amount:	$	_____
Full Depth Asphalt Repair Allowance of 16,500 Square Feet of 5" 2EML:	$	_____
Asphalt Leveling Coarse Allowance of 382 Tons:	$	_____
Project #2 Transportation Center Total:	$	_____

Project #3 Athens High School

Base Bid Amount:	$	_____
Bond Amount:	$	_____
Allowance Amount:	$	12,500.00
Permit Allowance Amount:	$	5,500.00
Undercut Allowance of 1,035 Cubic Yards Amount:	$	_____
4" Drain Tile Allowance of 175 Lineal Feet Amount:	$	_____
Full Depth Asphalt Repair Allowance of 17,500 Square Feet of 5" 2EML:	$	_____
Additional Pavement Aggregate Base Material Allowance of 575 Cubic Yards:	$	_____
Project #3 Athens High School Total:	$	_____

Project #4 Barnard Elementary School

Base Bid Amount:	$	_____
Bond Amount:	$	_____
Allowance Amount:	$	5,000.00
Project #4 Barnard Elementary School Total:	$	_____
Combine Bid Total Base Bid Projects _____:	$	_____
Combine Bid Total Base Bid Projects _____:	$	_____

ALTERNATE #1 – TRANSPORTATION CENTER
Provide aggregate lot in the northwest corner of the property.

Alternate #1 Bid Amount: $ _____

Alternate #1 Bond Amount: $ _____

Grand Total Alternate #1 - $ _____

ALTERNATE #2 – LEONARD ELEMENTARY SCHOOL
Remove and replace concrete sidewalk as detailed on sheets C-1.3 (A) and C-2.3 (A).

Alternate #2 Amount: $ _____

Alternate #2 Bond Amount: $ _____

Grand Total Alternate #2 - $ _____

ALTERNATE #3 – MORSE ELEMENTARY SCHOOL
Provide heavy-duty concrete drive approaches (820 square feet) and thickened concrete sidewalk across the approaches (290 square feet) in lieu of heavy-duty asphalt. Refer to details on sheet C-4.1

Alternate #3 Bid Amount: $ _____

Alternate #3 Bond Amount: $ _____

Grand Total Alternate #1 - $ _____

UNIT PRICING

Description	**Units**	**Unit Price**
Remove Sidewalk	SF	$ _____
Remove Asphalt Pavement	SF	$ _____
Remove Concrete Pavement	SF	$ _____
Remove Curbing	LF	$ _____
Sawcut Pavement	LF	$ _____
Cold Milling Bituminous Surface (2”)	SF	$_____
Mill and Pave 24” Wide Butt Joint	SF	$ _____
Excavation and Disposal of Unsuitable Soil Prior to Proof Roll/Compaction	CY	$ _____
Backfill with Suitable Fill from Excavation Depth to Subgrade Elevation (CIP)	CY	$ _____

UNIT PRICING CONT.

Description	**Units**	**Unit Price**
Subgrade Undercutting	CY	$ _____
4” HDPE Single Walled Underdrain with Sock	LF	$ _____
6” HDPE Single Walled Underdrain with Sock	LF	$ _____
6” PVC SDR 26 Storm Sewer	LF	$ _____
8” PVC SDR 26 Storm Sewer	LF	$ _____
10” PVC SDR 26 Storm Sewer	LF	$ _____
12” RCP Storm Sewer	LF	$ _____
15” RCP Storm Sewer	LF	$ _____
18” RCP Storm Sewer	LF	$ _____
24” RCP Storm Sewer	LF	$ _____
Adjust Fire Hydrant	EA	$ _____
Adjust Utility Manhole/Catch Basin (12-Inches or Less)	EA	$ _____
Adjust Non Manhole Utility Structure (12-Inches or Less)	EA	$ _____
Reconstruct Utility Manhole/Catch Basin (After 1st 12-Inches)	VF	$ _____
Replace Manhole/Catch Basin Frame and Cover	EA	$ _____
Replace Non-Manhole Utility Cover/Box	EA	$ _____
6” MDOT 3,500 Concrete Curb & Gutter (18” Wide) w/4” Agg. Base	LF	$ _____
4” MDOT 3,500 Mountable Concrete Curb & Gutter (18” Wide) w/4” Agg. Base	LF	$ _____
6” MDOT 3,500 Integral Concrete Sidewalk & Curb w/4” Sand Base	SF	$ _____
4” MDOT 3,500 Concrete Sidewalk w/4” Sand Base	SF	$ _____
8” MDOT 3,500 Concrete Pavement	SY	$ _____
2” MDOT 5EML Asphalt Overlay	SY	$ _____
4” MDOT 5EML/4ELM Asphalt Pavement	SY	$ _____
5” MDOT 2EML Asphalt Pavement	SY	$ _____
6” 21AA Crushed Limestone Aggregate (CIP)	SY	$ _____

UNIT PRICING CONT.

Description	**Units**	**Unit Price**
8" 21AA Crushed Limestone Aggregate (CIP)	SY	$ _____
10" 21AA Crushed Limestone Aggregate (CIP)	SY	$ _____
1" x 3" Crushed Concrete Aggregate (CIP)	SY	$ _____
Double Chip Seal	SF	$ _____
Asphalt Joint & Crack Routing & Sealing	LF	$_____
6" Steel Bollard – Concrete Filled	EA	$ _____
Parking Lot Striping (2 coats)	LF	$ _____
Parking Lot Symbols (Arrows, Stop, Etc.) (2 coats)	LF	$ _____
Cross Walk Hatching (2 coats)	EA	$ _____
Add Parking Lot Striping (2 coats)	LF	$ _____
Add Parking Symbols (2 coats)	EA	$ _____
Signage (Stop, Yield, PED Crossing, Etc.) with Post Only	EA	$ _____
Signage (Stop, Yield, PED Crossing, Etc.) with Post/Bollard	EA	$ _____
ADA Sign with Post/Bollard	EA	$ _____
Tensar Tri-Axial Geo-Grid	SF	$ _____

NOTE: Unit prices are for work items to be added or removed from the contract

B. ACKNOWLEDGEMENT OF ADDENDA TO RFP

The Contractor acknowledges receipt of the following addenda:

Addendum Number _____dated_____

Addendum Number _____dated_____

Addendum Number _____dated_____

The undersigned understands that the School District reserves the right to accept or reject in whole or in part any and all Proposals, to waive informalities and irregularities therein, and to award the Contract to other than the Contractor(s) submitting the best financial Proposal (low bidder) and to award the Contract to one (1) or more Contractors in the School District's sole and absolute discretion.

If award is made to our firm based upon our Proposal, we agree to enter into the attached form of Contract with the School District to furnish the Work in strict accordance with this Request For Proposal, the Contract, and our Proposal.

My signature certifies that the Proposal as submitted complies with all terms and conditions as set forth in this Request For Proposal and the Contract, unless specifically enumerated as an exception as part of our Proposal.

I hereby certify that I am authorized to sign as a Representative for the firm.

CONTRACTOR HEREBY SUBMITS THIS PROPOSAL PRICING FORM IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE RFP.

Name of Contractor:_____

_____
(Signature/Principal)

_____
(Name Printed)

Date: _____

ATTACHMENT B

FAMILIAL DISCLOSURE AFFIDAVIT

The undersigned, the owner or authorized officer of _____ (the "Contractor"), pursuant to the familial disclosure requirement provided in the Troy School District's (the "School District") Request For Proposals For RFP Number 2425-01 – Troy School District 2025 Site Improvements Paving Projects, hereby represents and warrants that, except as provided below, no familial relationships exist between the owner or any employee of the Contractor, and any member of the Board of Education of the School District or the Superintendent of the School District. A list of the School District's Board of Education Members and its Superintendent may be found at http://www.troy.k12.mi.us

List any Familial Relationships:

CONTRACTOR:

_____

By: _____

Its: _____

STATE OF _____)
)ss.
COUNTY OF _____)

This instrument was acknowledged before me on the _____ day of _____, 20__, by _____.

_____

, Notary Public

_____ County, _____

My Commission Expires:_____

Acting in the County of :_____

ATTACHMENT C

IRAN ECONOMIC SANCTIONS ACT AFFIDAVIT OF COMPLIANCE
Michigan Public Act No. 517 of 2012

The undersigned, the owner or authorized officer of the below-named contractor ("Contractor"), pursuant to the compliance certification requirement provided in the Troy School District's (the "School District") Request For Proposals For RFP Number 2425-01 Troy School District 2025 Site Improvements Paving Projects (the "RFP"), hereby certifies, represents and warrants that the Contractor (including its officers, directors, and employees) is not an "Iran linked business" within the meaning of the Iran Economic Sanctions Act, Michigan Public Act No. 517 of 2012 (the "Act"), and that in the event Contractor is awarded a contract as a result of the aforementioned RFP, the Contractor will not become an "Iran linked business" at any time during the course of performing any Work under the Contract.

The Contractor further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than $250,000.00 or 2 times the amount of the contract or proposed contract for which the false certification was made, whichever is greater, the cost of the School District's investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on a request for proposal for three (3) years from the date that it is determined that the person has submitted the false certification.

CONTRACTOR:

_____
Name of Contractor

By: _____

Its: _____

Date: _____

STATE OF _____)
)ss.
COUNTY OF _____)

This instrument was acknowledged before me on the _____ day of _____, 20__, by _____.

_____
, Notary Public

_____ County, _____

My Commission Expires:_____

Acting in the County of _____

ATTACHMENT D

CONTRACT

CONTRACT

I. This Contract ("Contract") is made on _____, 20__ ("Effective Date"), between **TROY SCHOOL DISTRICT**, a Michigan public school district ("School District"), whose address is 4400 Livernois Road, Troy, Michigan 48098 and _____, a _____ ("Contractor"), whose address is _____. The School District and Contractor may each be referred to herein as a "Party" and collectively as the "Parties."

RECITALS

A. The School District issued a Request For Proposal For _____ dated _____, as amended by [INSERT ADDENDA BY NAME AND DATE HERE] (collectively the "RFP"), the purpose of which was to solicit proposals from qualified contractors to furnish to the School District all of the materials and labor required to _____ identified in the RFP in accordance with the terms and conditions contained in the RFP and the Specifications attached thereto (the "Work").

B. In response to the RFP, the Contractor submitted to the School District a Proposal dated _____, to perform the Work contemplated by the RFP.

C. The Parties have, in accordance with the provisions of the RFP, conducted negotiations concerning the Contractor's Proposal to the RFP. The Contractor's Proposal together with written clarifications of the Parties, if any, are attached hereto, incorporated by reference, and marked as **Exhibit A** (collectively referred to as the "Proposal").

D. Pursuant to the terms of the RFP, the Contractor is required to enter into a written contract in accordance with the School District's written acceptance of its Proposal.

E. The Parties agree that certain terms, conditions, and provisions of the RFP and the Proposal must be further clarified and that certain additional terms and conditions need to be expressly set forth by way of this Contract.

NOW THEREFORE, in consideration of the foregoing and the mutual covenants set forth herein, the Parties agree as follows:

- **1. RESTATEMENT CONSTITUTES THE CONTRACT**

(a) Incorporation By Reference. The object of this Contract is to formalize in one document the complete agreement between the Parties, and to do so by specifically incorporating by reference into this Contract the RFP, the Proposal, and other related documents, and by including certain additional necessary or appropriate Contract terms, particularly where the Contract terms agreed to by the Parties during the RFP negotiation process do not correspond with the RFP and/or the Proposal.

(b) Order of Precedence. The Contract Documents, which are all incorporated herein by reference, include the following:

This Contract, including all Attachments hereto;
The RFP, including the Specifications attached thereto; and
Contractor's Proposal.

To the extent that the terms and conditions of the Contract Documents are in conflict, the terms and conditions shall be interpreted in the above-referenced order from 1 to 3. However, the Parties also agree that where there is not a conflict between any of the terms and conditions contained in the above-referenced Contract Documents, all of the Contract Documents shall be binding upon both Parties, except to the extent the exceptions contained in the Contractor's Proposal are not expressly accepted by the School District in writing and incorporated into this Contract.

2. TERM AND TERMINATION

(a) This Agreement shall commence as of the Effective Date and all Work hereunder shall be completed no later than _____ and shall be in compliance with the Project Schedule attached hereto as **Exhibit B**.

(b) Each Party shall have, in addition to all other remedies available to it, the right to terminate this Contract upon written notice to the other Party that the other Party has committed a material breach of any of its obligations herein and such material breach shall not have been cured or corrected within ten (10) days following written notice of the same. Furthermore, in addition to the rights of the School District under this Paragraph if the School District must regularly request that the Contractor to cure breaches of this Contract, such circumstances shall be grounds for termination of this Contract for cause, even if each breach on its own would not be material. Upon termination of this Contract by the School District for breach or default of the Contractor pursuant to this Paragraph, the School District shall be entitled to exercise any other right, remedy, or privilege which may be available to it under applicable law or proceed by appropriate court action to enforce the terms of the Contract or to recover damages for the breach of this Contract. If this Contract is terminated in accordance with any of the provisions contained herein, all rights of the Contractor under this Contract shall cease. Regardless of the basis for termination, the School District shall neither be liable to, nor obligated to pay, the Contractor for any incidental or consequential damages or lost profits, or costs incurred for Work not actually performed.

(c) Notwithstanding anything contained herein to the contrary, the School District may terminate this Contract at any time and for any reason or no reason at all upon written notice to the Contractor.

3. WARRANTY

The Contractor warrants and represents that its Work, will be in accordance with all applicable federal, state, and local laws and regulations for a minimum of two (2) years from completion of the Work.

4. INSURANCE

The Contractor shall maintain, at its expense, during the term of this Contract the following insurance:

(a) Worker's Compensation Insurance with statutory limits and Employer's Liability Insurance with a minimum limit of $1,000,000 each occurrence.

(b) Comprehensive General Liability Insurance with a minimum combined single limit of $1,000,000 per occurrence and $3,000,000 in the aggregate, in the same amount made for bodily injury and property damage. The policy is to include products and completed operations, cross liability, broad form property damage, independent bidders, and contractual liability coverage. The policy shall be endorsed to provide thirty (30) days written notice to the School District of any material change of coverage, cancellation, or non-renewal of coverage.

(c) If Subcontractors are likely to be used, the Comprehensive General Liability policy shall include coverage for independent contractors.

(d) Automobile Liability insurance covering all owned, hired, and non-owned vehicles with personal protection insurance and property insurance to comply with the provisions of the Michigan no-fault Insurance Law, including residual liability insurance with a minimum combined single limit of $1,000,000 each occurrence of bodily injury and property damage.

(e) All insurance policies shall be issued by companies licensed to do business in the State of Michigan. The companies issuing the policies must be domestic (on-shore) companies and have an A-rating by AM Best.

(f) The Contractor shall be responsible for payment of all deductibles contained in any insurance policy required in this Contract.

(g) Other requirements: Evidence of your insurance coverages, required herein, is to be provided to the School District and must indicate:

1. A Best's rating for each of your insurance carrier at A-VII or better,
2. "Troy School District" is endorsed as an additional insured on the General Liability policies.
3. All consultants must be listed as additional insured.

5. CONTRACTOR'S COMPENSATION

Based upon the School District's RFP and the Contractor's Proposal, the School District shall pay the Contractor for its Work as follows:

_____

_____

6. MISCELLANEOUS

(a) Notices. All notices hereunder shall be in writing and shall be effective when sent by facsimile or electronic mail (provided, however, that any notice which could materially affect the rights of either Party shall also be sent by courier as provided herein) or a nationally known courier service such as DHL or Federal Express, addressed to the addresses written below, or to such other address as either Party may have last designated in writing in the manner herein provided. Such notice shall be deemed given when received, but in any event no later than four (4) days after sent by the internationally known courier. All notices shall be sent to the following address:

If to the Contractor:

_____

_____

_____

Attention: _____

Copy To: _____

_____

_____

_____

If to the School District: Troy School District
4400 Livernois Road
Troy, Michigan 48098

(b) Assignment. This Contract and any other interest herein may not be assigned or transferred, in whole or in part, by either Party without the prior written consent of the other Party, which consent shall not be unreasonably withheld, and any assignment or transfer without such consent shall be null and void. This Contract shall be binding upon the successors, and subject to the above, assigns of either Party.

(c) Severability. If any provision of this Contract is held invalid or unenforceable, the remainder of this Contract shall nevertheless remain in full force and effect. If any provision is held invalid or unenforceable with respect to particular circumstances, it shall nevertheless remain in full force and effect in all other circumstances.

(d) Independent Contractor; No Joint Venture. It is expressly agreed that Contractor is acting hereunder as an independent contractor and under no circumstances shall any of the employees of either Party be deemed the employees of the other for any purpose. This Contract shall not be construed as authority for either Party to act for the other Party in any agency or other capacity or to make commitments of any kind for the account of, or on behalf of, the other Party, except to the extent, and for the purposes, expressly provided for and set forth herein, and no partnership or joint venture is created hereby.

(e) Modifications. No provision of this Contract or any Exhibit hereto may be modified without the prior written consent of both Parties.

(f) Captions. The captions used in this Contract are for convenience only and shall not affect in any way the meaning or interpretation of the provisions of this Contract.

(g) Governing Law. This Contract shall be construed in accordance with, and its performance governed by, the laws of the State of Michigan. The Parties hereby agree to the exclusive jurisdiction and venue of courts sitting in Oakland County, Michigan.

(h) Taxes. Contractor is responsible for sales taxes and any other applicable taxes related to the Work provided under this Contract.

(i) Entire Agreement. This Contract and all Exhibits and documents incorporated herein by reference constitute the entire agreement between the Parties, and supersedes all previous agreements, whether written or oral.

IN WITNESS WHEREOF, the undersigned have caused this Contract to be duly executed on the dates indicated below.

CONTRACTOR:	**SCHOOL DISTRICT:**
By: _____	By: _____
Its: _____	Its: _____
Date: _____	Date: _____

EXHIBIT A

WRITTEN CLARIFICATIONS

EXHIBIT B

PROJECT SCHEDULE

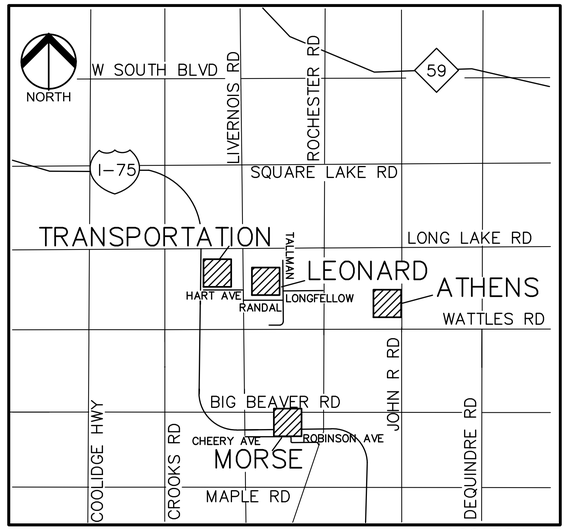
CONSTRUCTION PLANS

2025 TSD SITE IMPROVEMENTS

TROY, OAKLAND COUNTY, MICHIGAN

STATE OF MICHIGAN
ROBERT SCOTT ROCHON
License No. 6201046143
LICENSED PROFESSIONAL ENGINEER

PERMIT / APPROVAL SUMMARY		
DATE SUBMITTED	DATE APPROVED	PERMIT / APPROVAL



LOCATION MAP
NO SCALE

INDEX OF DRAWINGS	
NUMBER	TITLE
	COVER SHEET
	TRANSPORTATION
C-1.1	TOPOGRAPHIC SURVEY AND DEMOLITION PLAN
C-2.1	ENGINEERING PLAN
C-3.1	GRADING AND EROSION CONTROL PLAN
	MORSE
C-1.2	TOPOGRAPHIC SURVEY AND DEMOLITION PLAN
C-2.2	ENGINEERING PLAN
C-3.2	GRADING AND EROSION CONTROL PLAN
	LEONARD
C-1.3	TOPOGRAPHIC SURVEY AND DEMOLITION PLAN
C-1.3A	TOPOGRAPHIC SURVEY AND DEMOLITION PLAN
C-2.3	ENGINEERING PLAN
C-2.3A	ENGINEERING PLAN
C-3.3	GRADING AND EROSION CONTROL PLAN
	ATHENS
C-1.4	TOPOGRAPHIC SURVEY AND DEMOLITION PLAN
C-2.4	DIMENSION AND ENGINEERING PLAN
C-2.5	LOOP ROAD AND BUS LOOP ENGINEERING PLAN
C-3.4	GRADING AND EROSION CONTROL PLAN
C-4.0	NOTES AND DETAILS
C-4.1	NOTES AND DETAILS
C-4.2	NOTES AND DETAILS
D	TROY SESC DETAILS
E	TROY STORM SEWER DETAILS

DESIGN TEAM

OWNER

TROY SCHOOL DISTRICT
1140 RANKIN DRIVE
TROY, MI 48083
CONTACT: ROB CARSON
PHONE: 248.823.4067
EMAIL: RCARSON@TROY.K12.MI.US

CIVIL ENGINEER

PEA GROUP
1849 POND RUN
AUBURN HILLS, MI 48326
CONTACT: ROBERT ROCHON, P.E.
PHONE: (248) 689-9090 EXT. 1161
FAX: (248) 689-1044
EMAIL: RROCHON@PEAGROUP.COM

PEA GROUP

REVISIONS	
DESCRIPTION	DATE
ORIGINAL ISSUE DATE	11/8/2024

PEA GROUP 2025 TSD SITE IMPROVEMENTS | PEA JOB NO. 2024-0963| CONSTRUCTION PLANS

DEMOLITION QUANTITIES:

MILL AND REMOVE ASPHALT 2"	50,758 SF
REMOVE ASPHALT	9,786 SF
REMOVE CONCRETE AND BASE	1,683 SF
REMOVE CONCRETE SIDEWALK AND BASE	677 SF
SAWCUT PAVEMENT	537 LF
REMOVAL AND STOCKPILE GRAVEL 3"	14,054 SF
REMOVE VEGETATION, TOPSOIL & SUBGRADE	3,485 SF
REMOVE AND SALVAGE FENCE	190 LF
REMOVE AND SALVAGE GUARD RAIL	197 LF
REMOVE GUARD POST	4 EA.

ALT BID QUANTITIES:

REMOVE AND SALVAGE FENCE	143 LF
CLEAR AND GRUBBING	0.25 AC
REMOVE VEGETATION, TOPSOIL, AND SUBGRADE	11,137 SF

REFERENCE DRAWINGS:

PEA JOB NO. 2022-1281 & 2020-403

ELECTRIC	DTE ELECTRIC MAP 316-396, DATED 09/18/2023
CABLE	AT&T MAP A1, DATED 09/15/2023
FIBER OPTIC	FIBER LINK MAP, EMAIL DATED 09/11/2023
WATER MAIN	CITY OF TROY MAP, EMAIL DATED 09/08/2023
SANITARY SEWER	CITY OF TROY MAP, EMAIL DATED 09/08/2023
STORM SEWER	CITY OF TROY MAP, EMAIL DATED 09/08/2023

BENCHMARKS:

(GPS DERIVED - NAVD88)

BM #300
MAG NAIL IN THE NORTH FACE OF A LIGHT POLE LOCATED ON THE NORTH SIDE OF HART AVENUE, APPROX. 160' EAST FROM THE ENTRANCE.
ELEV. - 708.55

BM #301
DIMPLE ON FLANGE ARROW ON A HYDRANT LOCATED APPROX. 10' NORTH OF THE BUS WASH BUILDING.
ELEV. - 709.69

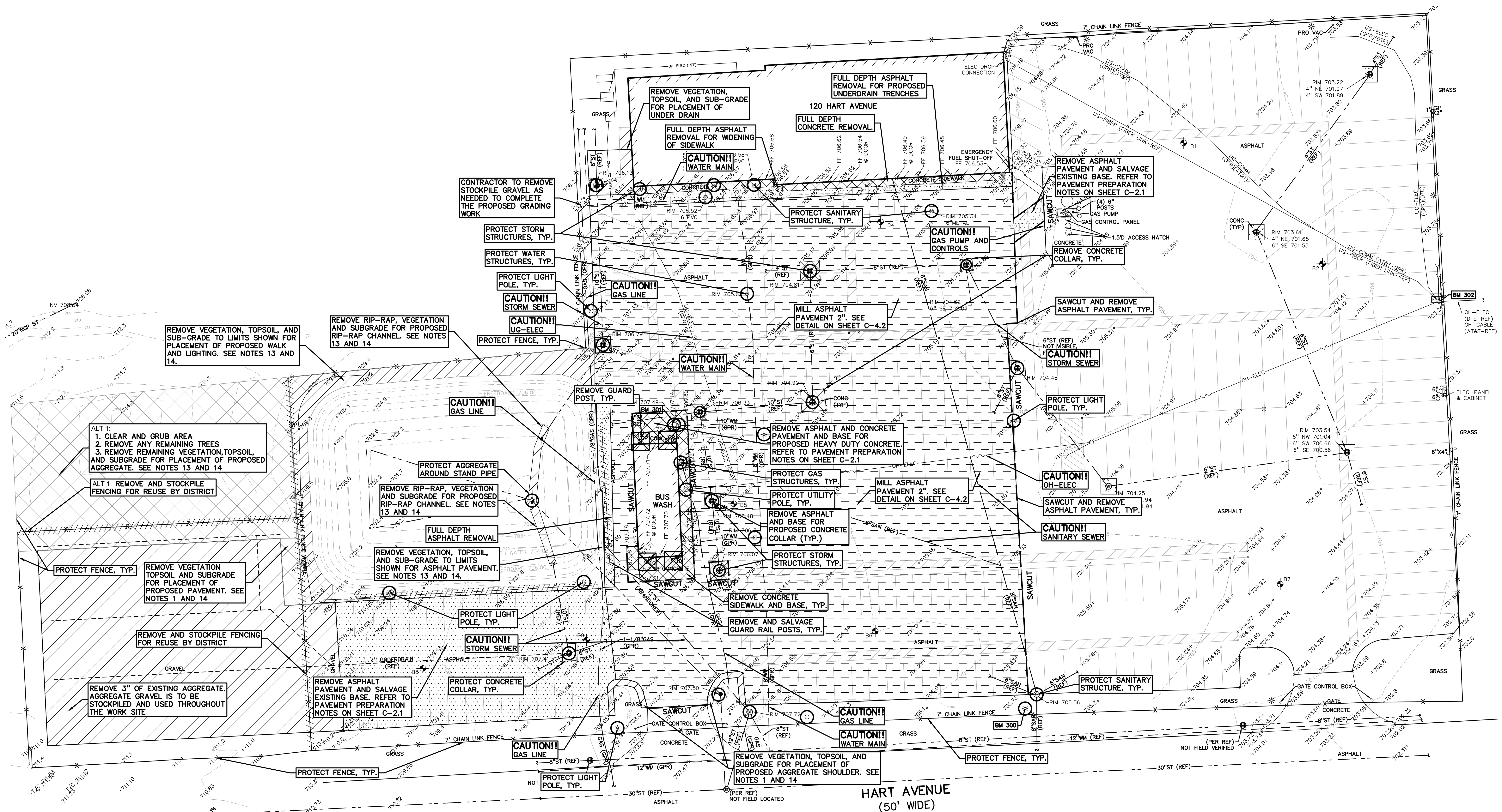
BM #302
SET BENCH TIE IN THE WEST FACE OF A POWER POLE LOCATED ON THE EAST SIDE OF THE PARKING LOT.
ELEV. - 704.67

LEGEND:

Symbol	Description
—OH—ELEC	EX. OH. ELEC, POLE & GUY WIRE
—UG—CATV	EX. U.G. CABLE TV & PEDESTAL
UG—COMM	EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
—UG—ELEC	EX. U.G. ELEC,MANHOLE & METER
	EX. GAS LINE
GAS	EX. GAS VALVE & GAS LINE MARKER
	EX. TRANSFORMER & IRRIGATION VALVE
	EX. WATER MAIN
	EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
WSO	EX. WATER VALVE BOX & SHUTOFF
	EX. SANITARY SEWER
	EX. SANITARY CLEANOUT & MANHOLE
	EX. COMBINED SEWER MANHOLE
	EX. STORM SEWER
	EX. CLEANOUT, MANHOLE & CULVERT
	EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
Y.D.	EX. YARD DRAIN, ROOF DRAIN & DOWNSPOUT
	EX. UNIDENTIFIED STRUCTURE
GP	EX. MAILBOX, SIGN & GUARD POST
	EX. LIGHT POLE & YARD LIGHT
	EX. FENCE
	EX. GUARD RAIL
	EX. DEC. TREE, CONIFEROUS TREE & SHRUB
724	EX. TREE TAG, & TREE LINE
+696.91	EX. SPOT ELEVATION
670	EX. CONTOUR
	SOIL BORING
	IRON FOUND / SET
	NAIL FOUND / NAIL & CAP SET
	BRASS PLUG SET
	MONUMENT FOUND / SET
	SECTION CORNER FOUND

DEMOLITION LEGEND:

- ITEM TO BE PROTECTED
- ITEM TO BE REMOVED
- CURB/FENCE REMOVAL
- CONCRETE PAVEMENT AND SIDEWALK REMOVAL
- AREA OR ITEMS TO BE REMOVED
- ASPHALT MILL AND OVERLAY
- ASPHALT PAVEMENT REMOVAL
- AGGREGATE REMOVAL
- ALT #1 REMOVAL
- UTILITY REMOVAL
- ABANDON UTILITY
- TREE REMOVAL
- SAWCUT LINE



GENERAL DEMOLITION NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT:

1. ALL MATERIAL TO BE REMOVED, WHETHER SPECIFICALLY NOTED IN THE PLANS OR NOT, SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AND DISPOSED OF OFF–SITE IN A LEGAL MANNER. NO ON–SITE BURY OR BURN PITS SHALL BE ALLOWED.
2. ALL DEMOLITION WORK SHALL CONFORM TO ALL LOCAL CODES AND ORDINANCES.
3. STAGING/PHASING OF DEMOLITION AND CONSTRUCTION IS TO BE COORDINATED WITH THE OWNER AND THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. SPECIFIC DEMOLITION ITEMS HAVE BEEN INDICATED ON THE PLANS AS A GUIDE TO THE GENERAL SCOPE OF THE WORK. IT IS INTENDED THAT THESE ITEMS SHALL BE COMPLETELY REMOVED BY THE CONTRACTOR ABOVE AND BELOW GROUND, UNLESS SPECIFICALLY NOTED OTHERWISE, AND THAT DEMOLITION WILL INCLUDE BUT WILL NOT NECESSARILY BE LIMITED TO THESE ITEMS. CONTRACTOR SHALL VISIT SITE TO VERIFY EXISTING CONDITIONS AND EXTENTS OF THE DEMOLITION THAT WILL BE REQUIRED PRIOR TO SUBMITTING A BID.
5. REMOVE ALL STRUCTURES DESIGNATED FOR REMOVAL ACCORDING TO THE DEMOLITION PLAN. THIS INCLUDES FOUNDATIONS, CONCRETE, ASPHALT, TREES, ETC.
6. THE CONTRACTOR SHALL, AS A MINIMUM, PROVIDE TREE PROTECTION FENCING AROUND EXISTING TREES TO BE SAVED THAT ARE WITHIN 15 FEET OF CONSTRUCTION ACTIVITIES AND AS INDICATED IN THE PLANS OR PER LOCAL AGENCY REQUIREMENTS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN UP, NOISE, DUST CONTROL, STREET SWEEPING AND HOURS OF OPERATION IN ACCORDANCE WITH THE LOCAL CODES.
8. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BARRICADES, SIGNAGE, MARKINGS, LIGHTS AND OTHER TRAFFIC CONTROL DEVICES TO PROTECT THE WORK ZONE AND SAFELY MAINTAIN TRAFFIC PER AGENCY REQUIREMENTS AND IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF SIGNS AND SUPPORTS WITHIN THE WORK AREA, AS NECESSARY TO FACILITATE CONSTRUCTION. SIGNS SHALL BE PROTECTED OR STOCKPILED FOR REUSE AS SPECIFIED IN THE PLANS OR AS REQUIRED BY THE AGENCY HAVING JURISDICTION. THE CONTRACTOR SHALL REPLACE ANY DAMAGED SIGNS AND SUPPORTS AT NO ADDITIONAL COST TO OWNER.
10. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANIES TO CONFIRM THAT UTILITY LEADS HAVE BEEN TAKEN OUT OF SERVICE PRIOR TO DEMOLITION.
11. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE 811/ONE CALL UTILITY LOCATING CENTER, PRIVATE UTILITY LOCATOR, THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
12. CONTRACTOR SHALL REFER TO THE "REPORT ON GEOTECHNICAL PAVEMENT INVESTIGATION" PREPARED BY G2 CONSULTING GROUP DATED 10/3/23
13. TOPSOIL REMOVED DURING DEMOLITION DEMOLITION/MASS GRADING OPERATIONS AS DEEMED ACCEPTABLE BY ENGINEER, 3RD PARTY TESTING COMPANY, AND/OR OWNER TO BE STOCKPILED ON SITE AND REUSED FOR RESTORATION AREAS.
14. EXISTING SUBGRADE REMOVED DEMOLITION/MASS GRADING OPERATIONS AS DEEMED ACCEPTABLE BY ENGINEER, 3RD PARTY TESTING COMPANY, AND/OR OWNER SHALL BE STOCKPILED ON SITE AND REUSED FOR GENERAL FILL AND/OR RE–GRADING OF THE POND.
15. RIP–RAP REMOVED DURING THE DEMOLITION/MASS GRADING OPERATIONS AS DEEMED ACCEPTABLE BY ENGINEER, 3RD PARTY TESTING COMPANY, AND/OR OWNER TO BE STOCK PILED AND REUSED FOR RIP–RAP CHANNEL.
16. ALL ITEMS TO BE SALVAGED, STOCKPILED AND REUSED BY THE OWNER SHALL BE STORED AT THE LOCATION COORDINATED WITH THE OWNER.

PEA GROUP
t: 844.813.2949
www.peagroup.com

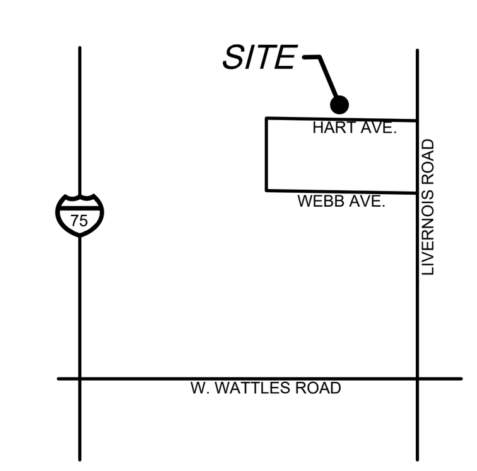
STATE OF MICHIGAN
ROBERT SCOTT KOCHON
License No. 6201046143
LICENSED PROFESSIONAL ENGINEER

NORTH

0 15 30 60
SCALE: 1" = 30'

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT

TROY SCHOOLS
1140 RANKIN DRIVE
TROY, MI 48083

PROJECT TITLE

TRANSPORTATION CENTER
120 HART AVE, TROY, MI

REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE

TOPOGRAPHIC SURVEY AND DEMOLITION PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:

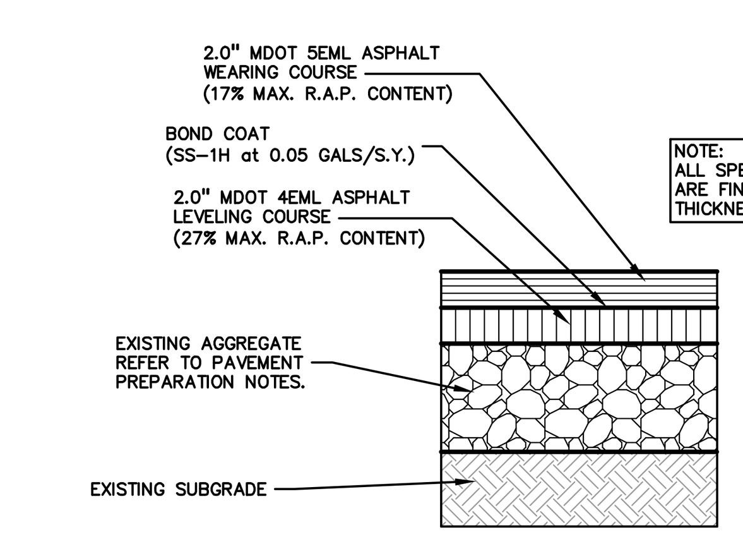
C-1.1

AGGREGATE BASE NOTE:
THIS PAVEMENT SECTION DESIGN ASSUMES THE USE OF MDOT 21AA CRUSHED LIMESTONE BASE MATERIAL THAT MEETS THE REQUIREMENTS OF MDOT STANDARD SPECIFICATION SECTION 902 FOR AGGREGATES. IF CRUSHED CONCRETE AGGREGATE BASE IS PROPOSED IN LIEU OF THE SPECIFIED CRUSHED LIMESTONE MATERIAL, PEA GROUP WILL REQUIRE A MINIMUM 25% INCREASE IN BASE THICKNESS. HOWEVER, IF TESTING DOCUMENTATION IS PROVIDED TO PEA GROUP THAT SHOWS THAT THE CRUSHED CONCRETE MATERIAL MEETS ALL REQUIREMENTS OF MDOT SPECIFICATION SECTION 902, THEN THE 25% INCREASE IN THICKNESS MAY BE REEVALUATED.

ASPHALT MATERIAL NOTES:
HOT-MIX ASPHALT MIXTURES UTILIZING RECYCLED ASPHALT PAVEMENT (RAP) MUST MEET MDOT SPECIAL PROVISION 12SP501(E). THE BINDER GRADE FOR THIS WORK IS PG64-28. IF ASPHALT MIXES CONTAINING RAP ARE TO BE SUPPLIED FOR THIS PROJECT, THE ASPHALT BINDER MUST BE REVISED PER MDOT 'TIER 1' OR 'TIER 2' REQUIREMENTS (RAP CONTENT UP TO 27% MAXIMUM). TIER 3 MIXES ARE NOT ACCEPTABLE ON THIS PROJECT. AN ASPHALT MIX DESIGN FOR ALL SPECIFIED MIXES SHOULD BE FORWARDED TO PEA GROUP FOR REVIEW PRIOR TO CONSTRUCTION

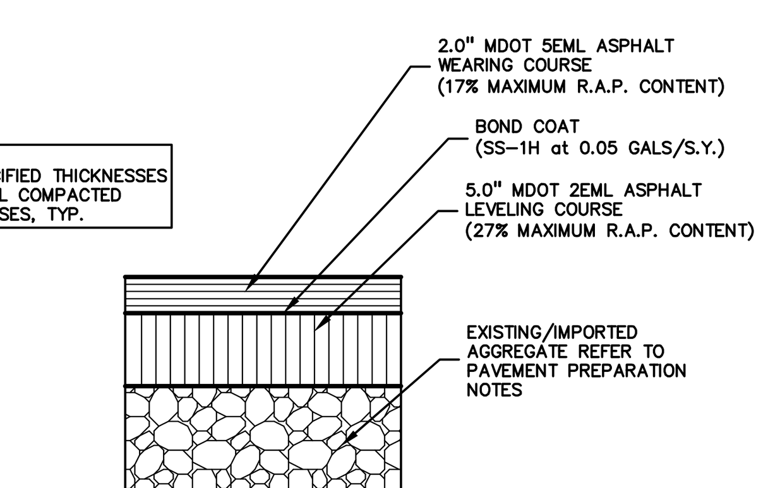
ASPHALT MIX DESIGN CHART

COMMERCIAL ADT 0–300	COMMERCIAL ADT 301–1000	COMMERCIAL ADT 1001–3400	COMMERCIAL ADT ≥3401	APPLICATION RATE (LB/YD²), MINIMUM – MAXIMUM	COURSE APPLICATION
2EL	2EML	2EMH	2EH	435–550	BASE
3EL	3EML	3EMH	3EH	330–410	BASE AND/OR LEVELING
4EL	4EML	4EMH	4EH	220–275	LEVELING AND/OR TOP
5EL	5EML	5EMH	5EH	165–220	TOP
PG 58-28	PG 64-28	PG 64-28	PG 70-28P		

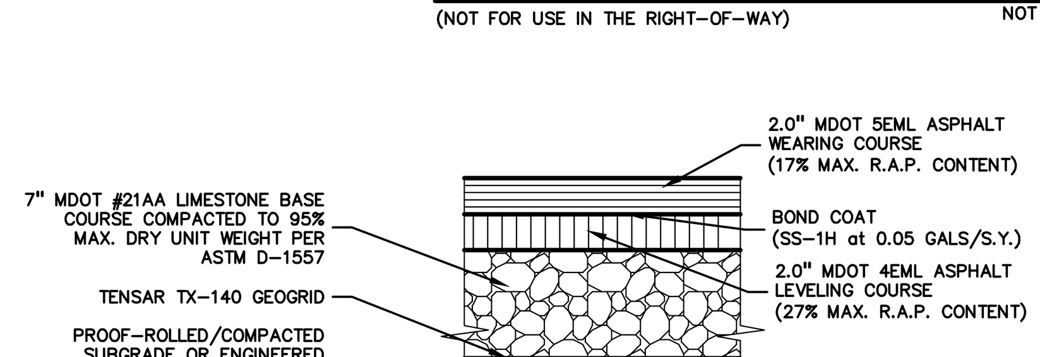


NOTE: ALL SPECIFIED THICKNESSES ARE FINAL COMPACTED THICKNESSES, TYP.

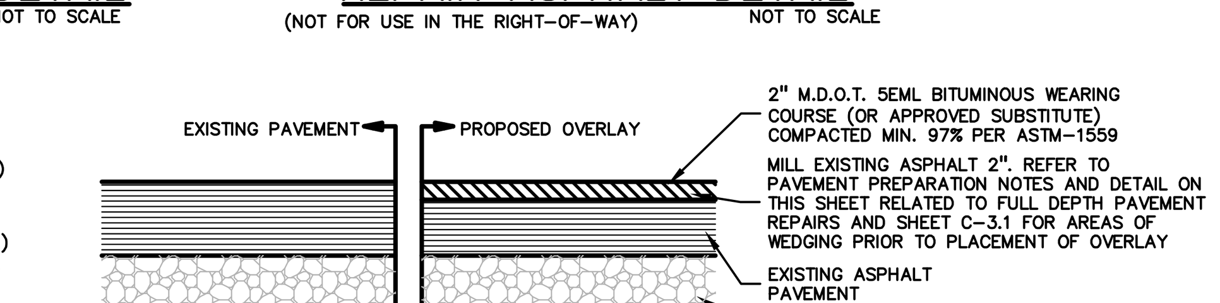
STANDARD DUTY ASPHALT DETAIL
(NOT FOR USE IN THE RIGHT-OF-WAY) NOT TO SCALE



HEAVY DUTY AND FULL DEPTH REPAIR ASPHALT DETAIL
(NOT FOR USE IN THE RIGHT-OF-WAY) NOT TO SCALE



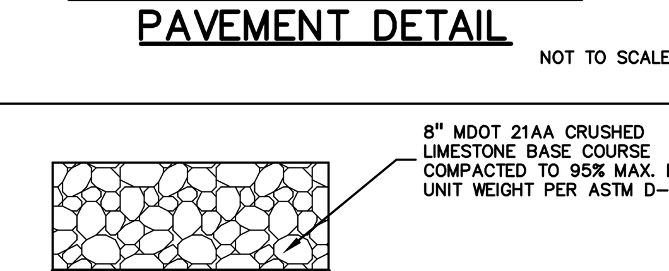
FULL DEPTH UTILITY LOT PAVEMENT DETAIL
NOT TO SCALE



NOTE:

1. PRIOR TO OVERLAY, ENTIRE AREA SHALL BE SWEPT & CLEANED OF DEBRIS.
2. CONTRACTOR SHALL PROVIDE LABOR AND MATERIALS. MATERIALS AND INSTALLATION SHALL CONFORM TO LATEST MDOT 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION.
3. ALL MILLED ASPHALT SHALL BE DISPOSED OFF-SITE.

MILL AND OVERLAY ASPHALT DETAIL
NOT TO SCALE



AGGREGATE NOTE:
THIS PAVEMENT SECTION DESIGN ASSUMES THE USE OF MDOT 21AA CRUSHED LIMESTONE BASE MATERIAL THAT MEETS THE REQUIREMENTS OF MDOT STANDARD SPECIFICATION SECTION 902 FOR AGGREGATES. IF CRUSHED CONCRETE AGGREGATE IS PROPOSED IN LIEU OF THE SPECIFIED CRUSHED LIMESTONE MATERIAL, PEA GROUP WILL REQUIRE A MINIMUM 25% INCREASE IN THICKNESS. HOWEVER, IF TESTING DOCUMENTATION IS PROVIDED TO PEA GROUP THAT SHOWS THAT THE CRUSHED CONCRETE MATERIAL MEETS ALL REQUIREMENTS OF MDOT SPECIFICATION SECTION 902, THEN THE 25% INCREASE IN THICKNESS MAY BE REEVALUATED.

ALT #1 AGGREGATE LOT DETAIL
NOT TO SCALE

MAIN LOT:	
4" CONCRETE SIDEWALK	3,187 S.F.
8" CONCRETE PAVEMENT	693 S.F.
GUARDRAIL	508 L.F.
GRAVEL SHOULDER	240 S.F.
GUARD POST	4 E.A.
2" ASPHALT PAVEMENT	50,134 S.F.
HEAVY DUTY ASPHALT	1,691 S.F.
CONCRETE COLLAR	471 S.F.
FULL DEPTH ASPHALT REPAIR ALLOWANCE (5" 2EML)	16,500 S.F.
UNDERCUT ALLOWANCE	625 C.Y.
UNDERCUT 4" DRAIN TILE ALLOWANCE	400 L.F.
4" HDPE UNDERDRAIN	276 L.F.
6" PVC SDR 26 STORM PIPE	150 L.F.
LEVELING COURSE WEDGING ALLOWANCE (VARYING THICKNESS)	382 TONS
RIP RAP CHANNEL	280 S.F.
WEST LOT:	
4" ASPHALT PAVEMENT	9,015 S.F.
UNDERCUT ALLOWANCE	100 C.Y.
UNDERCUT 4" DRAIN TILE ALLOWANCE	100 L.F.
CONCRETE COLLAR	64 S.F.
UTILITY LOT:	
4" ASPHALT PAVEMENT	14,275 S.F.
GEOGRID (TENSAR TX-140)	315 S.F.
7" 21AA AGGREGATE	315 S.F.
SALVAGED AGGREGATE	129 C.Y.
ENGINEERING QUANTITIES:	
ADJUST/RECONSTRUCT STORM STRUCTURE	9 EA.
10" END SECTION	1 EA.
ALT #1:	
8" 21AA CRUSHED LIMESTONE	9,858 S.F.
SUBGRADE UNDERCUT ALLOWANCE	240 C.Y.

PAVEMENT PREPARATION NOTES: UTILITY PARKING LOT

1. PAVEMENT PREPARATION SHALL FOLLOW THE PROCESS SUMMARIZED BELOW:
   - 1.1. REMOVE AND STOCKPILE THE EXISTING AGGREGATE BASE TO THE THICKNESS CALLED FOR IN THE PLANS AND FOR THE PROPOSED THICKNESS OF ASPHALT TO BE PLACED. ANY EXISTING BASE MATERIAL REMOVED TO ACHIEVE THIS ELEVATION WILL BE PART OF THE EARTHWORKS FOR THE PAVING OPERATION, WILL NOT BE PAID FOR SEPARATELY AND/OR CONSIDERED PART OF THE SUBGRADE UNDERCUTTING PAY ITEM THAT WILL BE INCLUDED IN THE BASE BID FOR THE WORK.
   - 1.2. THE UNDERLYING AGGREGATE SHOULD BE PROOF COMPACTED WITH A VIBRATORY ROLLER AND AREAS THAT REMAIN UNSTABLE SHOULD BE UNDERCUT AND REPLACED WITH MDOT 21AA CRUSHED LIMESTONE. UNDERCUTS SHALL ONLY GO TO THE DEPTH OF THE EXISTING GEOGRID AND THE CONTRACTOR SHALL TAKE ALL MEANS NECESSARY TO NOT DAMAGE THE EXISTING GEOGRID.
   - 1.3. UNDERCUTS SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF STABILIZATION IS NECESSARY.
   - 1.4. TO MINIMIZE INSTABILITY AND UNDERCUTS, THE BASE SHALL NOT BE LEFT EXPOSED TO PRECIPITATION AND CONSTRUCTION OPERATIONS AND SHOULD BE PERFORMED DURING THE SUMMER MONTHS TO ENSURE DRY, WARM, WEATHER.
   - 1.5. BACKFILL THE INITIAL PORTION OF THE UNDERCUT WITH THE SALVAGED AGGREGATE BASE PER THE PLANS, SPECS AND GEOTECHNICAL REPORT.
2. ALL ENGINEERED FILL SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY DETERMINED BY THE MODIFIED PROCTOR (ASTM D1557) METHOD OF TESTING. ALL ENGINEERED FILL MATERIAL SHALL BE PLACED AND COMPACTED AT APPROXIMATELY THE OPTIMUM MOISTURE CONTENT. FROZEN MATERIAL SHALL NOT BE USED AS FILL, NOR SHOULD FILL BE PLACED ON A FROZEN SUBGRADE.
3. THE QUANTITY FOR 'UNDERCUT" TO THE GEOGRID ELEVATION SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL VOLUME OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED ON THE BID PACKAGE.

PAVEMENT PREPARATION NOTES: MAIN PARKING LOT

1. PAVEMENT PREPARATION SHALL FOLLOW THE PROCESS SUMMARIZED BELOW:
   - 1.1. MILL THE EXISTING PAVEMENT TO THE UNIFORM DEPTH CALLED FOR IN THE PLANS.
   - 1.2. PROOF ROLL EXISTING PAVEMENT, BASE, AND SUBGRADE PER PLANS, SPECIFICATIONS AND GEOTECHNICAL REPORT.
   - 1.3. FOR THE FULL DEPTH PATCHES, THE ASPHALT PAVEMENT MUST BE SAW-CUT A MINIMUM 2 FEET LATERALLY FROM THE DISTRESSED AREA TO BE REMOVED. THE UNDERLYING AGGREGATE SHOULD BE PROOF COMPACTED WITH A VIBRATORY ROLLER AND AREAS THAT REMAIN UNSTABLE SHOULD BE UNDERCUT AND REPLACED WITH MDOT 21AA CRUSHED LIMESTONE.
   - 1.4. UNDERCUTS SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
   - 1.5. TO MINIMIZE INSTABILITY AND UNDERCUTS, THE OPEN AREAS OF BASE AND/OR SUBGRADE SHALL NOT BE LEFT EXPOSED TO PRECIPITATION AND CONSTRUCTION OPERATIONS AND SHOULD BE PERFORMED DURING THE SUMMER MONTHS TO ENSURE DRY, WARM, WEATHER. ADDITIONALLY, THE SUBGRADE MAY BECOME UNSTABLE UNDER REPEATED LOADING OF CONSTRUCTION TRAFFIC; THEREFORE, CONSTRUCTION EQUIPMENT SHOULD BE LIMITED ON THE EXPOSED SUBGRADE.
   - 1.6. BACKFILL THE INITIAL PORTION OF THE UNDERCUT WITH THE SALVAGED AGGREGATE BASE AND THEN COMPLETE THE BACKFILL PROCESS WITH IMPORTED MDOT 21AA CRUSHED LIMESTONE AGGREGATE PER THE PLANS, SPECIFICATIONS AND GEOTECHNICAL REPORT.
   - 1.7. REPLACE THE ASPHALT PAVEMENT WITHIN THE FULL DEPTH PATCH AREAS TO BE 5" IN THICKNESS CONSISTING OF MDOT 2EML BASE COURSE. PRIOR TO PLACING THE FULL-DEPTH PATCH, A BITUMINOUS TACK COAT SHOULD BE APPLIED TO THE SIDES OF THE SAW-CUT PAVEMENT. ADDITIONALLY, AFTER MILLING AND FULL DEPTH PATCHING, AS REQUIRED, A BITUMINOUS TACK COAT MUST BE PLACED PRIOR TO PLACEMENT OF THE OVERLAY (TOP) COURSE AND/OR ASPHALT WEDGING AREAS.
   - 1.8. PLACE THE ASPHALT PAVEMENT WEDGING AREAS IN ORDER TO ACHIEVE A UNIFORM 2" THICK OVERLAY (TOP) COURSE PER THE PLANS, SPECIFICATIONS AND GEOTECHNICAL REPORT. THE WEDGING AREAS TO CONSIST OF MDOT 3EML LEVELING COURSE. A BITUMINOUS TACK COAT MUST BE PLACED PRIOR TO PLACEMENT OF THE OVERLAY (TOP) COURSE.
2. THE QUANTITY FOR THE ASPHALT PAVEMENT REMOVAL AND REPLACEMENT PORTION OF THE 'FULL DEPTH PATCHES" SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL AREA OF IN PLACE PAVEMENT PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
3. SUBGRADE UNDERCUT SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. UNDERCUT EXCAVATIONS SHALL BE BACKFILLED WITH MDOT 21AA DENSE GRADED AGGREGATE PLACED IN AN ENGINEERED MANNER. LIFT THICKNESS SHALL NOT EXCEED 9 INCHES. THE USE OF TRI-AXIAL GEOGRID MAY BE USED TO REDUCE UNDERCUT DEPTHS, AS APPROVED BY THE DISTRICT AND PER THE UNIT PRICE PROVIDED WITH THE CONTRACTORS BID.
4. ALL ENGINEERED FILL SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY DETERMINED BY THE MODIFIED PROCTOR (ASTM D1557) METHOD OF TESTING. ALL ENGINEERED FILL MATERIAL SHALL BE PLACED AND COMPACTED AT APPROXIMATELY THE OPTIMUM MOISTURE CONTENT. FROZEN MATERIAL SHALL NOT BE USED AS FILL, NOR SHOULD FILL BE PLACED ON FROZEN SUBGRADE.
5. THE QUANTITY FOR 'SUBGRADE UNDERCUT" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL VOLUME OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
6. SUBGRADE UNDERCUT DRAIN TILE SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
7. THE QUANTITY FOR 'SUBGRADE UNDERCUT DRAIN TILE (4")" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL FOOTAGE OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
8. THE QUANTITY FOR THE ASPHALT PAVEMENT PORTION OF THE 'ASPHALT PAVEMENT WEDGING AREAS" SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL VOLUME OF IN PLACE PAVEMENT PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.

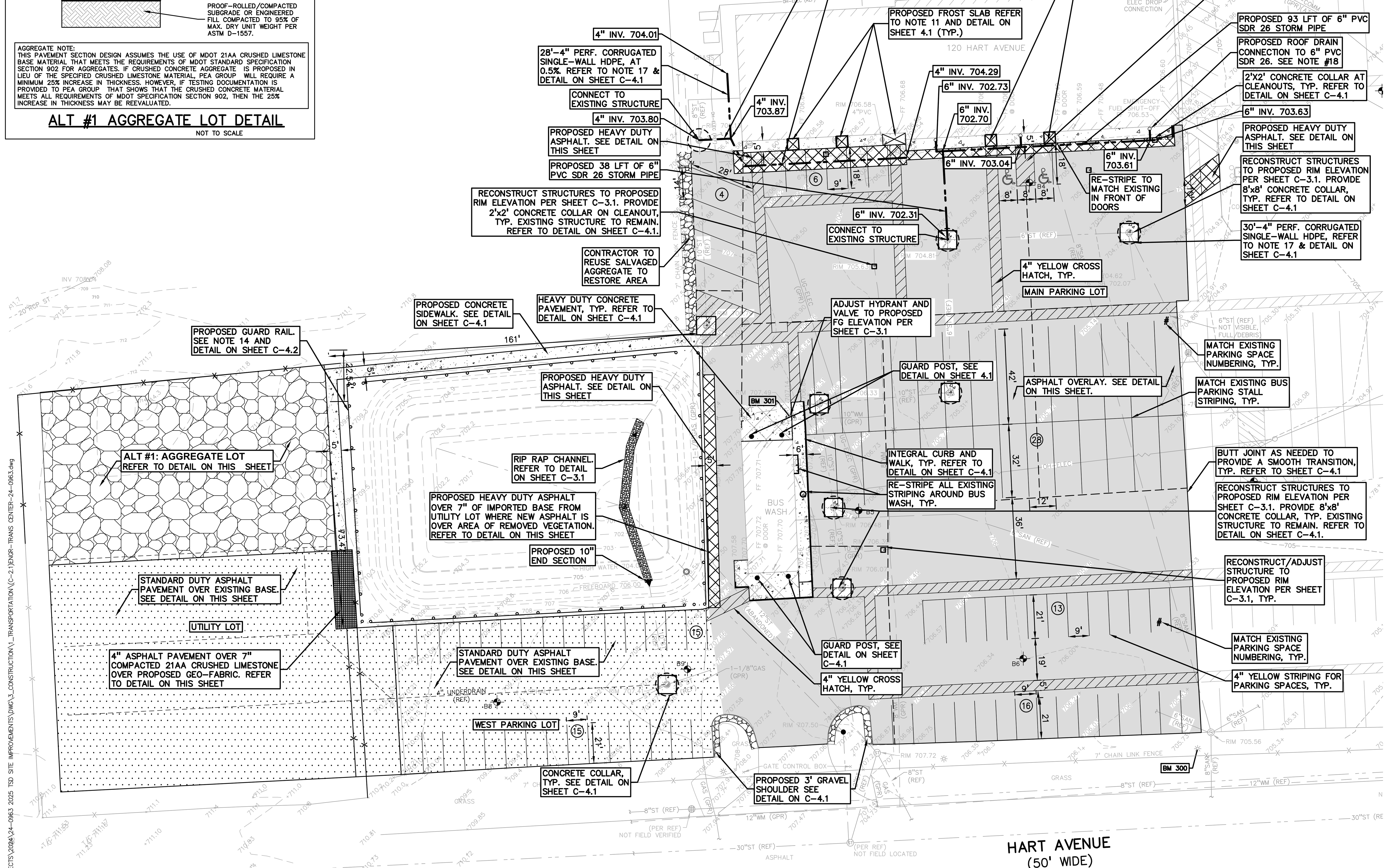
PAVEMENT PREPARATION NOTES: WEST PARKING LOT

1. PAVEMENT PREPARATION SHALL FOLLOW THE PROCESS SUMMARIZED BELOW:
   - 1.1. AS PART OF THE PAVEMENT REMOVAL, REMOVE THE EXISTING PAVEMENT AND ANY AGGREGATE BASE REQUIRED FOR THE PROPOSED THICKNESS OF ASPHALT/CONCRETE PAVEMENT TO BE PLACED. ANY EXISTING BASE MATERIAL REMOVED TO ACHIEVE THIS ELEVATION WILL BE PART OF THE EARTHWORKS FOR THE PAVING OPERATION, WILL NOT BE PAID FOR SEPARATELY AND/OR CONSIDERED PART OF THE SUBGRADE UNDERCUTTING PAY ITEM AND WILL BE INCLUDED IN THE BASE BID OF THE WORK.
   - 1.2. ANY OF THE EXISTING AGGREGATE BASE REMOVED TO ACHIEVE THE THICKNESS OF THE PROPOSED PAVEMENT, AS DESCRIBED IN ITEM 1.1, AND DEEMED ACCEPTABLE BY A QUALIFIED ENGINEERING TECHNICIAN SHALL BE STOCKPILED FOR RE-USE IN THE PAVEMENT OPERATION. THIS INCLUDES ROUGHLY 129 CYDS OF AGGREGATE BEING REMOVED FROM THE UTILITY LOT PRIOR TO PLACING THE PROPOSED PAVEMENT IN THAT AREA.
   - 1.3. PROOF ROLL EXISTING BASE AND SUBGRADE PER PLANS, SPECIFICATIONS AND GEOTECHNICAL REPORT.
   - 1.4. DETERMINE AREAS THAT FAIL THE PROOF ROLL. SUBGRADE UNDERCUTS SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
   - 1.5. TO MINIMIZE SUBGRADE INSTABILITY AND UNDERCUTS, THE SUBGRADE SHALL NOT BE LEFT EXPOSED TO PRECIPITATION AND CONSTRUCTION OPERATIONS AND SHOULD BE PERFORMED DURING THE SUMMER MONTHS TO ENSURE DRY, WARM, WEATHER. ADDITIONALLY, THE SUBGRADE MAY BECOME UNSTABLE UNDER REPEATED LOADING OF CONSTRUCTION TRAFFIC; THEREFORE, CONSTRUCTION EQUIPMENT SHOULD BE LIMITED ON THE EXPOSED SUBGRADE.
   - 1.6. BACKFILL THE INITIAL PORTION OF THE UNDERCUT WITH THE SALVAGED AGGREGATE BASE AND THEN COMPLETE THE BACKFILL PROCESS WITH IMPORTED MDOT 21AA CRUSHED LIMESTONE AGGREGATE PER THE PLANS, SPECS AND GEOTECHNICAL REPORT.
2. SUBGRADE UNDERCUT SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. UNDERCUT EXCAVATIONS SHALL BE BACKFILLED WITH MDOT 21AA DENSE GRADED AGGREGATE PLACED IN AN ENGINEERED MANNER. LIFT THICKNESS SHALL NOT EXCEED 9 INCHES. THE USE OF TRI-AXIAL GEOGRID MAY BE USED TO REDUCE UNDERCUT DEPTHS, AS APPROVED BY THE DISTRICT AND PER THE UNIT PRICE PROVIDED WITH THE CONTRACTORS BID.
3. ALL ENGINEERED FILL SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY DETERMINED BY THE MODIFIED PROCTOR (ASTM D1557) METHOD OF TESTING. ALL ENGINEERED FILL MATERIAL SHALL BE PLACED AND COMPACTED AT APPROXIMATELY THE OPTIMUM MOISTURE CONTENT. FROZEN MATERIAL SHALL NOT BE USED AS FILL, NOR SHOULD FILL BE PLACED ON A FROZEN SUBGRADE.
4. THE QUANTITY FOR 'SUBGRADE UNDERCUT" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL VOLUME OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
5. SUBGRADE UNDERCUT DRAIN TILE SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
6. THE QUANTITY FOR 'SUBGRADE UNDERCUT DRAIN TILE (4")" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL FOOTAGE OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
7. THE IMPORTING, ADDING, FINE GRADING AND COMPACTING ADDITIONAL PAVEMENT AGGREGATE BASE MATERIAL (MDOT 21AA CRUSHED LIMESTONE) REQUIRED TO ACHIEVE THE PROPOSED TOP OF BASE ELEVATIONS AND PRIOR TO PLACING THE ASPHALT PAVEMENT WILL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE THE VOLUME OF ADDITIONAL MATERIAL REQUIRED PER THE PROJECT PLANS.
8. THE QUANTITY FOR IMPORTING, ADDING, FINE GRADING, AND COMPACTING ADDITIONAL PAVEMENT AGGREGATE BASE MATERIAL (MDOT 21AA CRUSHED LIMESTONE) REQUIRED TO ACHIEVE THE PROPOSED TOP OF BASE ELEVATIONS AND PRIOR TO PLACING THE ASPHALT PAVEMENT FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID AND THE EARTHWORK CALCULATIONS COMPLETED BY THE CONTRACTOR DURING THE BIDDING PROCESS. AS PART OF THE EARTHWORK CALCULATIONS, THE CONTRACTOR SHALL ASSUME THAT THE VOLUME OF 2" OF MATERIAL ACROSS THE ENTIRE AREA WILL BE REMOVED WITH THE PAVEMENT AND/OR CONSIDERED UN-USABLE BY THE QUALIFIED ENGINEERING TECHNICIAN AND NEED TO BE REPLACED WITH IMPORTED MDOT 21AA CRUSHED LIMESTONE,.

EARTHWORK BALANCING NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPORTING OR EXPORTING ALL MATERIALS AS REQUIRED TO PROPERLY GRADE THIS PROJECT TO THE FINISHED ELEVATIONS SHOWN ON THE APPROVED PLANS. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION OF CUT AND FILL QUANTITIES AND ALLOW FOR REMOVAL OF EXCESS OR IMPORTATION OF ADDITIONAL MATERIAL AT NO ADDITIONAL COST TO THE OWNER.

NOTES:

1. CONTRACTOR TO VERIFY ALL QUANTITIES SHOWN ON THE PLANS. ANY DEVIATIONS TO THE PLAN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF THE SCHOOL DISTRICT AND PEA GROUP, IN WRITING PER THE BID PACKAGE, FOR VERIFICATION PRIOR TO BIDDING.
2. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, CENTER OF MANHOLE/CATCH BASIN UNLESS OTHERWISE NOTED.
3. DOWEL INTO EXISTING CURB AND GUTTER 9" WITH EPOXY COATED #4 BAR CONTINUOUS BETWEEN EXISTING AND PROPOSED CURBING.
4. CONTRACTOR TO FIELD VERIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION INCLUDING BUT NOT LIMITED TO: SITE LIGHTING, FIBER LINES, ETC.
5. REFER TO THE NOTES AND DETAILS SHEET FOR ADDITIONAL INFORMATION.
6. CONTRACTOR TO REINSTALL AND/OR REPLACE SIGNS AND POSTS PER DETAILS ON SHEET C-4.0.
7. FOR THE SIX (6) CATCH BASINS LOCATED IN THE WORK AREA; BIDDERS ARE TO INCLUDE RECONSTRUCTION OF THESE STRUCTURES (GREATER THAN 12-INCHES IN DEPTH FROM THE RIM ELEVATION OF REPAIR WORK) IN THE BASE BID. THE SUCCESSFUL BIDDER WILL BE PAID FOR REPAIRING EACH STRUCTURE BASED ON THE ACTUAL DEPTH OF REPAIR WITH EITHER STRUCTURAL ADJUSTMENT (WITHIN TOP 12-INCHES OF RIM ELEVATION) OR STRUCTURAL RECONSTRUCTION (GREATER THAN 12-INCHES IN DEPTH) PER THE UNIT PRICES PROVIDED IN THE BID PACKAGE AND THE SCOPE OF WORK DETERMINED AND APPROVED PRIOR TO THE WORK COMMENCING. REPLASTERING OF THE ENTIRE STRUCTURE SHALL BE INCLUDED IN THE UNIT PRICE FOR BOTH STRUCTURAL ADJUSTMENT AND STRUCTURAL RECONSTRUCTION.
8. A THICKENED EDGE OF ASPHALT PER THE DETAIL ON SHEET C-4.2 OF THE PLANS SHALL BE LOCATED WHERE CALLED FOR IN THE PLAN. BIDDERS SHALL INCREASE THE QUANTITIES FOR THIS ITEM ACCORDINGLY IN THE BASE BID.
9. SURFACE COURSE SHALL BE PLACED ACROSS THE FUTURE PAVEMENT AREA AT THE SAME TIME.
10. CONTRACTOR TO REPLACE AREAS OF ASPHALT PAVEMENT SURROUNDING CONCRETE COLLARS WITH FULL DEPTH ASPHALT PAVEMENT AND BASE AS NEEDED. COST NOT TO BE PAID SEPARATELY BUT INCLUDED IN THE PAY ITEM OF THE CONTRACT.
11. BIDDERS ARE TO ASSUME THAT ALL STOOPS WILL BE REPLACED WITH A FROST SLAB PER THE PLANS. IF DURING CONSTRUCTION IT IS DETERMINED THAT THE EXISTING STOOP IS A FROST SLAB THEN IT WILL REMAIN IN PLACE AND THE SCHOOL BOARD WILL BE CREDITED PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
12. CONTRACTOR TO REUSE SALVAGED GUARDRAIL AND POSTS AND PROVIDE NEW MDOT TYPE "A" GUARDRAIL, POSTS AND END SHOES PER THE DETAILS ON SHEET C-4.1.
13. THE ROUGHLY 129 CYDS OF AGGREGATE BEING REMOVED FROM THE UTILITY LOT PRIOR TO PLACING THE PROPOSED PAVEMENT IN THAT AREA WILL BE FACTORED INTO THE EARTHWORK CALCULATIONS AS BEING USED ON SITE FIRST AND PRIOR TO NEEDING TO IMPORT ANY 21AA CRUSHED LIMESTONE FOR AGGREGATE PAVEMENT BASE, AGGREGATE SHOULDERS, AGGREGATE BACKFILL. AND/OR THE PROPOSED AGGREGATE LOT UNDER ALTERNATE #1.
14. CONTRACTOR SHALL REFER TO THE "REPORT ON GEOTECHNICAL PAVEMENT INVESTIGATION" PREPARED BY G2 CONSULTING GROUP DATED 10/03/2023
15. DURING PAVEMENT REMOVAL IN THIS AREA CONTRACTOR IS TO VERIFY HOW EXISTING ROOF DOWNSPOUTS CONNECT INTO THE SITE STORM SYSTEM AND PROTECT IT DURING THE DEMOLITION, GRADING, UTILITY AND PAVING OPERATIONS. IF THE EXISTING SYSTEM CONNECTING THE ROOF DOWNSPOUTS TO THE SITE STORM SYSTEM IS IN CONFLICT WITH THE PROPOSED WORK THEN CONTRACTOR IS TO CONNECT THE ROOF DOWNSPOUTS TO THE THE PROPOSED UNDER DRAIN ALONG THE SOUTH SIDE OF THE BUILDING.
16. CONTRACTOR TO MATCH THE EXISTING PVC CONNECTORS USED ON WEST PORTION OF THE BUILDING FOR THE PURPOSED CONNECTIONS.



S:\PROJECTS\2024\24-0963 2025 TSD SITE IMPROVEMENTS\DWG\3_CONSTRUCTION\1_TRANSPORTATION\(C-2.1)ENGR-TRANS CENTER-24-0963.dwg

LEGEND:

STD DUTY / HEAVY DUTY / R.O.W. ONLY	CONCRETE PAVEMENT
2" OVERLAY / STANDARD DUTY / HEAVY DUTY	ASPHALT PAVEMENT
	GRAVEL
	WETLAND
	CONCRETE CURB AND GUTTER
	REVERSE GUTTER PAN
	SETBACK LINE
	SIGN
	LIGHTPOLE
	FENCE
	GUARD RAIL

ALT BID #1 SUBGRADE UNDERCUTTING NOTES:

1. TO MINIMIZE SUBGRADE INSTABILITY AND UNDERCUTS, THE SUBGRADE SHALL NOT BE LEFT EXPOSED TO PRECIPITATION AND CONSTRUCTION OPERATIONS AND SHOULD BE PERFORMED DURING THE SUMMER MONTHS TO ENSURE DRY, WARM, WEATHER. ADDITIONALLY, THE SUBGRADE MAY BECOME UNSTABLE UNDER REPEATED LOADING OF CONSTRUCTION TRAFFIC; THEREFORE, CONSTRUCTION EQUIPMENT SHOULD BE LIMITED ON THE EXPOSED SUBGRADE.
2. SUBGRADE UNDERCUT SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. UNDERCUT EXCAVATIONS SHALL BE BACKFILLED WITH MDOT 21AA DENSE GRADED AGGREGATE PLACED IN AN ENGINEERED MANNER. LIFT THICKNESS SHALL NOT EXCEED 9 INCHES. THE USE OF TRI-AXIAL GEOGRID MAY BE USED TO REDUCE UNDERCUT DEPTHS, AS APPROVED BY THE DISTRICT AND PER THE UNIT PRICE PROVIDED WITH THE CONTRACTORS BID.
3. THE QUANTITY FOR 'SUBGRADE UNDERCUT" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL VOLUME OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
4. ALL ENGINEERED FILL SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY DETERMINED BY THE MODIFIED PROCTOR (ASTM D1557) METHOD OF TESTING. ALL ENGINEERED FILL MATERIAL SHALL BE PLACED AND COMPACTED AT APPROXIMATELY THE OPTIMUM MOISTURE CONTENT. FROZEN MATERIAL SHALL NOT BE USED AS FILL, NOR SHOULD FILL BE PLACED ON A FROZEN SUBGRADE.

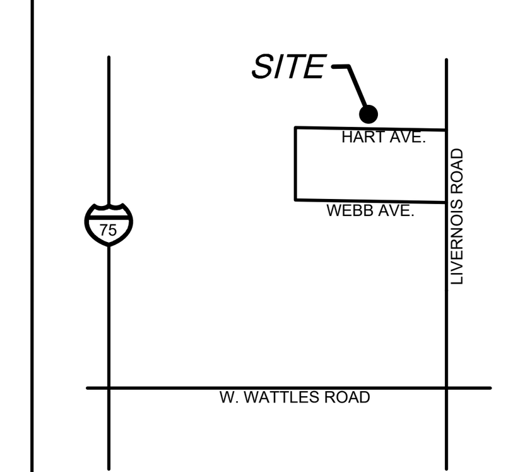
PEA GROUP
t: 844.813.2949
www.peagroup.com
STATE OF MICHIGAN ROBERT SCOTT KOCHON License No. 6201046143 LICENSED PROFESSIONAL ENGINEER

NORTH

0 15 30 60
SCALE: 1" = 30'

811 Know what's **below.** Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
TROY SCHOOLS
1140 RANKIN DRIVE
TROY, MI 48083

PROJECT TITLE
TRANSPORTATION CENTER
120 HART AVE, TROY, MI

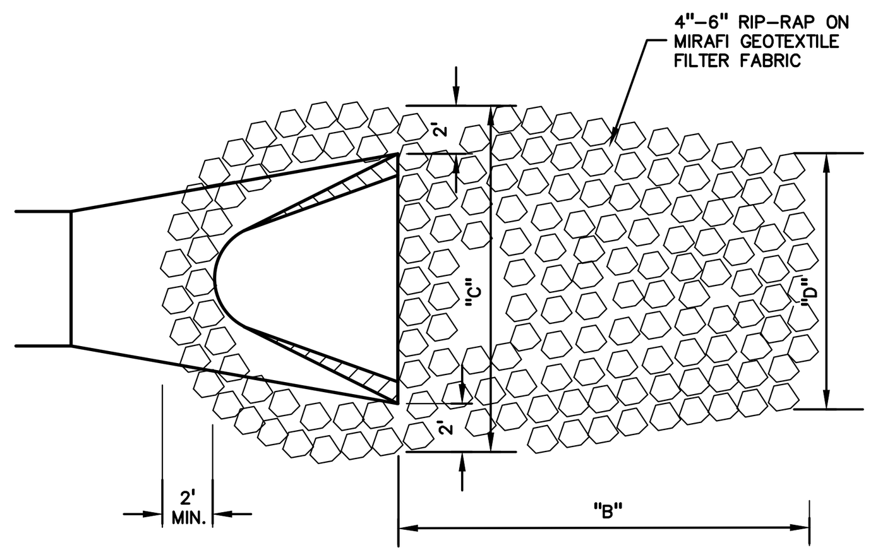
REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
ENGINEERING PLAN

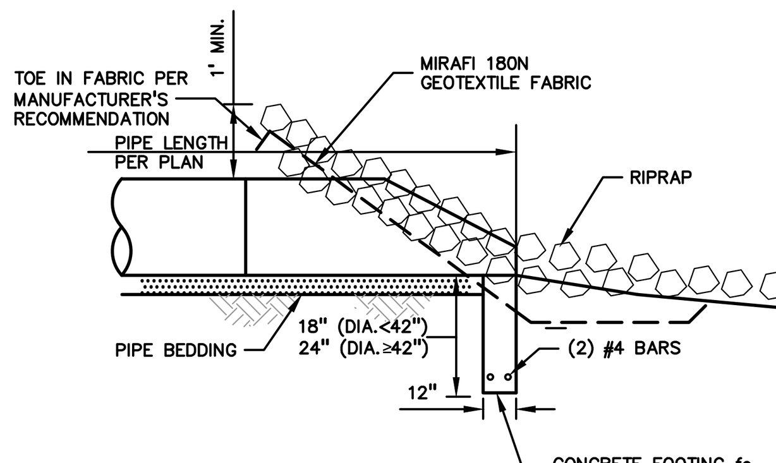
PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-2.1



PLAN VIEW

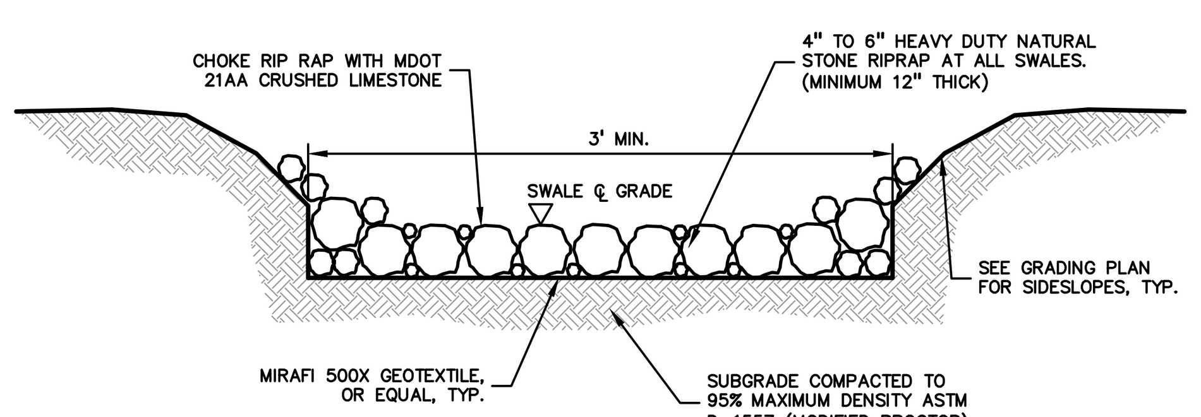
PIPE DIAMETER	"B"	"C"	"D"	SQUARE YARDS
12"	5'–0"	6'–6"	3'–0"	8.0
15"	5'–0"	7'–0"	3'–0"	8.5
18"	5'–0"	7'–6"	3'–6"	9.2
21"	5'–6"	8'–0"	4'–0"	10.7
24"	6'–0"	8'–6"	4'–6"	12.4



PROFILE VIEW

END SECTION & RIPRAP DETAIL

NOT TO SCALE



RIPRAP LINED SWALE

NOT TO SCALE

SOIL EROSION MAINTENANCE SCHEDULE AND NOTES:

1. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT BY:

   ROB CARSON
   TROY SCHOOL DISTRICT
   1140 RANKIN
   TROY, OAKLAND COUNTY, MICHIGAN
   248–823–4067

2. IF ANY DAMAGE HAS OCCURRED AS A RESULT OF STORM WATER DISCHARGE FROM THE SITE, THE FOLLOWING STEPS SHALL BE IMPLEMENTED.
3. ANY DEBRIS OR DIRT ON ANY PAVED AREA RESULTING FROM CONSTRUCTION TRAFFIC SHALL BE CLEANED IN A PROMPT MANNER BY THE CONTRACTOR. THE CONSTRUCTION DRIVE SHALL BE CLEANED AT THE END OF EACH DAY.
4. ALL DIRT AND MUD TRACKED ONTO PAVED AREAS SHALL BE REMOVED BY THE CONTRACTOR DAILY BY SCRAPING. STREET SWEEPING IS REQUIRED WEEKLY.
5. SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT UP SEDIMENT WHEN THE SEDIMENT HEIGHT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR REBACKFILL THE SILTATION FENCE SHOULD IT FALL OR BE DAMAGED DURING CONSTRUCTION.
6. INLET FILTER MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY ACCUMULATED SILT OR OTHER DEBRIS. THE REMOVAL OF SILT SHOULD BE WITH THE USE OF A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTERS CAN NOT BE CLEANED OR ARE DAMAGED, THEN THE FABRIC MUST BE REPLACED.
7. CONTRACTOR TO PROVIDE WATER TRUCK TO WATER DOWN THE SITE ON A DAILY BASIS AS REQUIRED TO MAINTAIN DUST CONTROL.
8. IF HIGH GROUNDWATER IS ANTICIPATED OR ENCOUNTERED DURING CONSTRUCTION A DEWATERING PLAN MUST BE SUBMITTED TO THE CITY ENGINEERING DIVISION FOR REVIEW.

EROSION CONTROL QUANTITIES:

EROSION CONTROL BLANKET	478 S.Y.
SILT SACKS	9 EA.
INLET FILTER	1 EA.
LAWN RESTORATION	427 S.Y.
SILT FENCE	1,170 L.F.
EMBANKMENT RESTORATION	571 S.Y.

SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION

1. SEE CITY OF TROY SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL SOIL EROSION CONTROL RELATED DETAILS.
2. PLACE SILT FENCE & INSTALL INLET FILTERS ON EXISTING STORM SEWER STRUCTURES, ACCORDING TO PLANS.
3. INSTALL TEMPORARY CRUSHED CONCRETE ACCESS DRIVE AT ALL CONSTRUCTION ENTRANCES. (80'x24'x8" W/MINIMUM OF 1"–3" CRUSHED CONCRETE – NO FINES).
4. REMOVE CURB, PAVEMENT, TREES, ETC. AS DIRECTED ON THE DEMOLITION PLAN.
5. STRIP AND STOCKPILE TOPSOIL FOR RESTORATION REQUIREMENTS.
6. DISPOSE OF ALL EXCESS, UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO BURN OR BURY PITS ALLOWED.
7. UNSUITABLE MATERIALS CONSIST OF, BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING: CONCRETE, ASPHALT, TREES, BRUSH, STUMPS, ROOTS, OR OTHER MISCELLANEOUS DEBRIS OR TRASH.
8. MASS GRADE THE SITE IN ACCORDANCE WITH THE PLANS.
9. INSTALL HYDROSEED AS SHOWN ON THE PLAN WITHIN 5 DAYS OF COMPLETION OF MASS GRADING OR WHENEVER DISTURBED AREAS WILL REMAIN UNCHANGED FOR 30 DAYS OR GREATER. MINIMUM 3"–4" TOPSOIL WILL BE USED WHERE VEGETATION IS REQUIRED.
10. COMPLETE ROUGH GRADING OF SITE. PLACE INLET FILTERS AT ALL INLETS AND CATCH BASINS, AS SHOWN.
11. FINISH GRADE AND PAVE SITE AS PROPOSED TO DRAIN TO STORM SEWER SYSTEM. REPAIR INLET FILTERS AS REQUIRED.
12. APPLY TOPSOIL, HYDROSEED TO ALL DISTURBED AREAS UPON COMPLETION OF GRADING. THE CONTRACTOR SHALL STAGE CONSTRUCTION ACTIVITIES IN ORDER TO MINIMIZE THE EXPOSURE OF UNSTABILIZED AREAS.
13. CLEAN PAVEMENT AND STORM SEWERS. REMOVE SILT FENCE AND TREE PROTECTION FENCE, AND INLET FILTERS ONCE VEGETATION HAS BEEN ESTABLISHED.
14. ALL DIRT AND MUD TRACKED ONTO PUBLIC ROADS SHALL BE REMOVED DAILY.
15. INLETS/CATCH BASINS TO BE CLEANED AFTER WEARING COARSE OF ASPHALT AND STRIPING HAS BEEN PLACED

SEQUENCE OF CONSTRUCTION:

START DAY	END DAY	
1	2	INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES, SILT FENCES, INLET PROTECTION, ETC. AS NECESSARY.
1	90	MAINTAIN A 25' BUFFER OF VEGETATION AROUND PERIMETER OF SITE WHERE POSSIBLE.
1	5	STRIP AND STOCKPILE TOPSOIL AS REQUIRED RESTORATION. ALL STOCKPILES MUST BE GRADED AND SEEDED.
5	15	REMOVE ALL PAVEMENT, CURB, UTILITIES, ETC. AS REQUIRED TO INSTALL THE PROPOSED WORK AS SHOWN ON THE TOPOGRAPHIC SURVEY AND DEMOLITION PLAN.
10	15	DISPOSE OF ALL EXCESS/UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO ON–SITE BURN OR BURY PITS ALLOWED.
30	40	ROUGH GRADE SITE. SEED AND MULCH BLANKETS MUST BE INSTALLED AS SHOWN WITHIN 5 DAYS OF FINAL GRADE. REPAIR AND/OR RE–INSTALL ANY TEMPORARY SOIL EROSION CONTROL MEASURES THAT WERE DAMAGED DURING GRADING OPERATIONS.
15	90	TEMPORARY SEEDING MUST BE PROVIDED IN AREAS NOT TO BE WORKED ON FOR 15 DAYS OR LONGER.
40	50	FINE GRADE SITE AND PREPARE FOR SITE PAVING OPERATIONS.
50	80	INSTALL ALL PAVEMENT, SIDEWALKS, CURBING AS PROPOSED. IF PERMANENT LANDSCAPING IS NOT TO BE INSTALLED SOON AFTER PAVING IS COMPLETE, ALL AREAS WITHIN 20 FEET OF BACK OF CURB MUST BE TEMPORARILY SEEDED. REPAIR INLET PROTECTION, SILT FENCE AND ANY OTHER DAMAGED SOIL EROSION CONTROL MEASURES AS NECESSARY.
80	89	FINAL GRADE, REDISTRIBUTE STOCKPILED TOPSOIL, ESTABLISH VEGETATION AND INSTALL ALL PERMANENT LANDSCAPING IN ALL DISTURBED AREAS NOT BUILT.
88	90	CLEAN PAVEMENT AND REMOVE ALL TEMPORARY SOIL EROSION CONTROL MEASURES. RE–ESTABLISH VEGETATION AS REQUIRED.
90	90	REMOVE SEDIMENTATION CONTROLS ONCE ENTIRE SITE HAS BEEN PERMANENTLY STABILIZED.

GENERAL SITE CONDITIONS:

1. ACCORDING TO THE GEOTECHNICAL INVESTIGATION BY G2 CONSULTING GROUP, LLC DATED OCTOBER 3, 2023, THE SITE CONSISTS OF THE FOLLOWING SOIL TYPES:

   SANDY CLAY FILL WITH ORGANIC MATERIAL

2. TOTAL DISTURBED AREA = ± 3.2 ACRES
3. N.P.D.E.S. NOTICE OF COVERAGE IS NOT REQUIRED
4. NEAREST WATER COURSE: STURGIS DRAIN LOCATED ±2400 FEET EAST OF THE SITE.

EARTHWORK BALANCING NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPORTING OR EXPORTING ALL MATERIALS AS REQUIRED TO PROPERLY GRADE THIS PROJECT TO THE FINISHED ELEVATIONS SHOWN ON THE APPROVED PLANS. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION OF CUT AND FILL QUANTITIES AND ALLOW FOR REMOVAL OF EXCESS OR IMPORTATION OF ADDITIONAL MATERIAL AT NO ADDITIONAL COST TO THE OWNER.

NOTE:

1. PER THE "SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION" NOTES THE SUCCESSFUL BIDDER TO THE CLEAN THE STORM SEWER. THIS CLEANING SHALL INCLUDE CLEANING OUT THE STRUCTURES AND ENTIRE SEWER RUNS BETWEEN STRUCTURES USING HYDRAULICALLY PROPELLED, HIGH–VELOCITY JET, OR MECHANICALLY POWERED EQUIPMENT. SELECTION OF THE EQUIPMENT USED SHALL BE BASED ON THE CONDITIONS OF LINES AT THE TIME THE WORK COMMENCES. THE EQUIPMENT AND METHODS SELECTED SHALL BE SATISFACTORY TO THE SCHOOL DISTRICT'S REPRESENTATIVE. THE EQUIPMENT SHALL BE CAPABLE OF REMOVING DIRT, GREASE, ROCKS, SAND, AND OTHER MATERIALS AND OBSTRUCTIONS FROM THE SEWER LINES AND MANHOLES. IF CLEANING OF AN ENTIRE SECTION CANNOT BE SUCCESSFULLY PERFORMED FROM ONE MANHOLE, THE EQUIPMENT SHALL BE SET UP ON THE OTHER MANHOLE AND CLEANING AGAIN ATTEMPTED. IF, AGAIN, SUCCESSFUL CLEANING CANNOT BE PERFORMED OR THE EQUIPMENT FAILS TO TRAVERSE THE ENTIRE MANHOLE SECTION, IT WILL BE ASSUMED THAT A MAJOR BLOCKAGE EXISTS AND THE CLEANING EFFORT SHALL BE ABANDONED.
2. PER THE PROJECT SPECIFICATIONS; PRIOR TO THE PLACEMENT OF TOPSOIL THE SUCCESSFUL BIDDER TO SCHEDULE AN INSPECTION BY THE SCHOOL DISTRICT OR PEA GROUP TO CONFIRM THAT THE GRADE IS AT THE PROPER ELEVATION WHERE THE MINIMUM DEPTH OF TOPSOIL CAN BE PLACED THROUGHOUT THE AREA.
3. CONTRACTOR TO FIELD VERIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION INCLUDING BUT NOT LIMITED TO: SITE LIGHTING, FIBER LINES, ETC.

SYMBOLS: EROSION CONTROL:

- (SP–2) SILT FENCE
- (SI–2A) LOW POINT INLET FILTER
- (SI–3) RYCB INLET FILTER
- (E–9) EROSION CONTROL BLANKET
- LAWN RESTORATION

REFER TO THE TROY SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL DEVICE DETAILS.

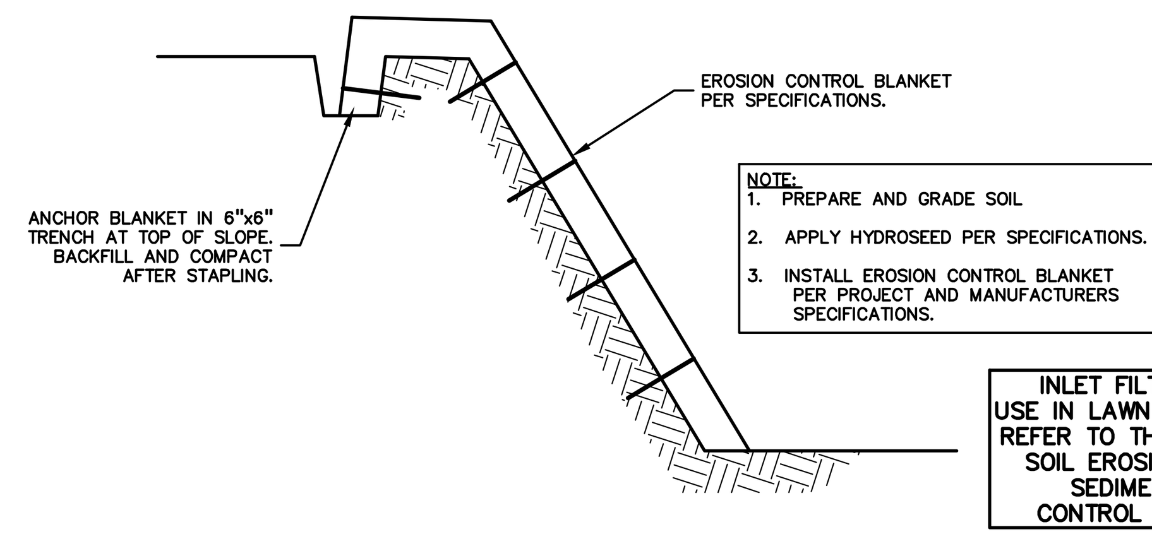
GRADING LEGEND:

+696.91	EXISTING SPOT ELEVATION
622.50	PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
670	EXISTING CONTOUR
922	PROPOSED CONTOUR
	PROPOSED REVERSE GUTTER PAN
	PROPOSED RIDGE LINE
	PROPOSED SWALE/DITCH
	APPROXIMATE LIMITS OF WEDGING

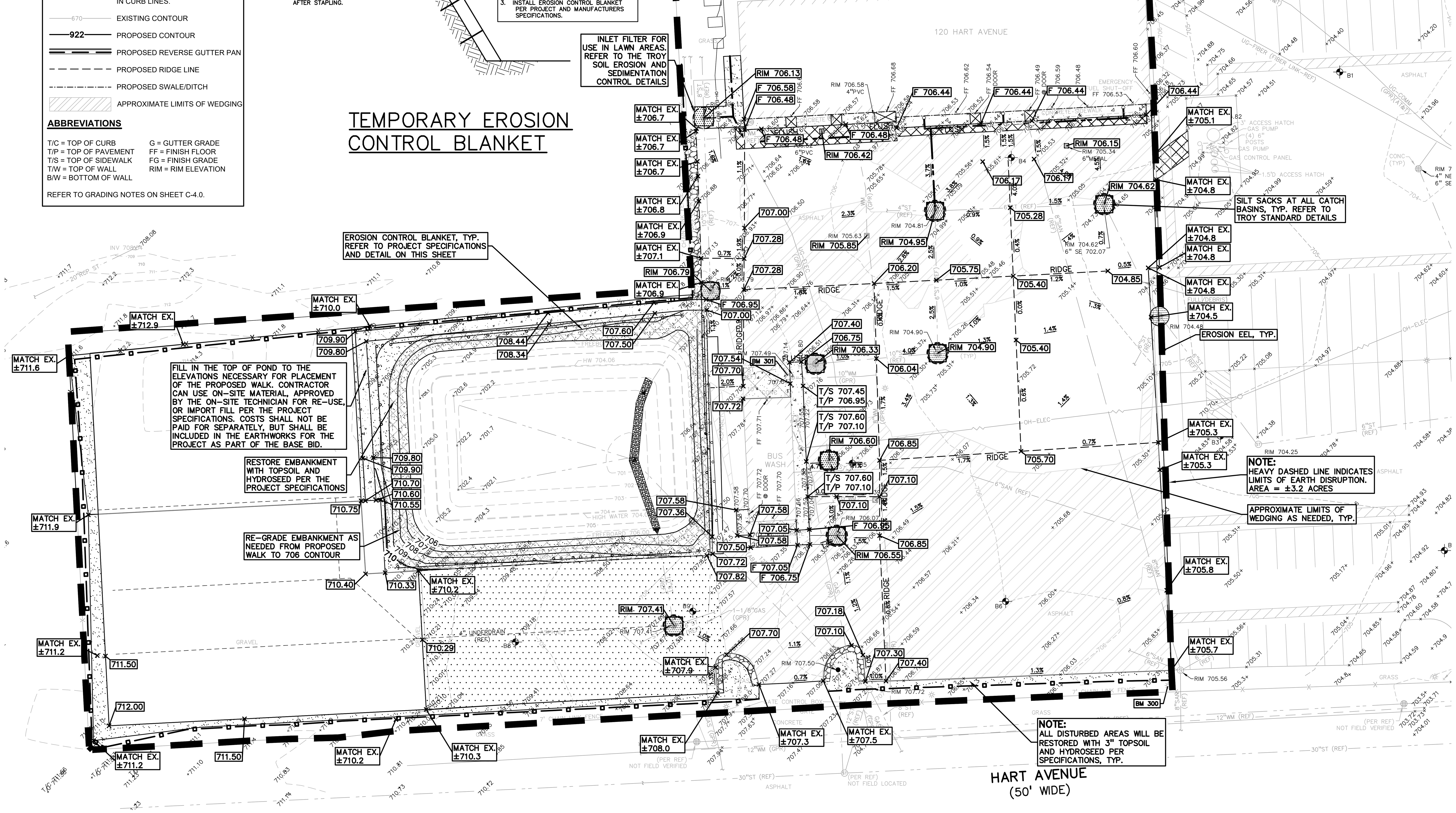
ABBREVIATIONS

T/C = TOP OF CURB
T/P = TOP OF PAVEMENT
T/S = TOP OF SIDEWALK
T/W = TOP OF WALL
B/W = BOTTOM OF WALL
G = GUTTER GRADE
FF = FINISH FLOOR
FG = FINISH GRADE
RIM = RIM ELEVATION

REFER TO GRADING NOTES ON SHEET C-4.0.



TEMPORARY EROSION CONTROL BLANKET



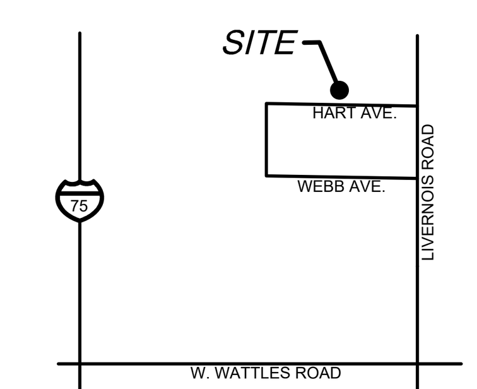
NORTH

0 15 30 60

SCALE: 1" = 30'

Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



PEA GROUP
t: 844.813.2949
www.peagroup.com

CLIENT

TROY SCHOOLS
1140 RANKIN DRIVE
TROY, MI 48083

PROJECT TITLE

TRANSPORTATION CENTER
120 HART AVE, TROY, MI

REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

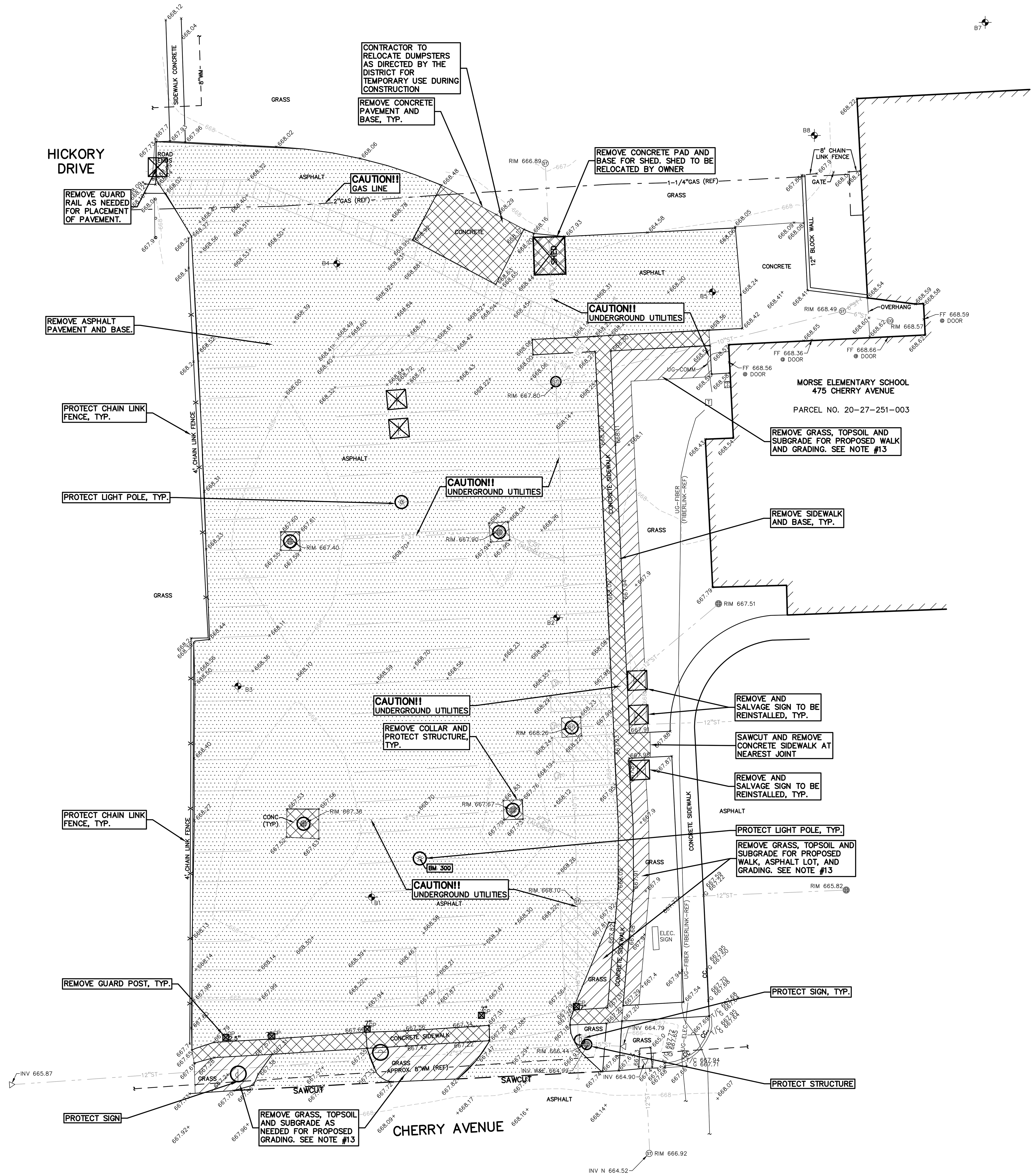
DRAWING TITLE

GRADING AND SESC PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:

C-3.1



GENERAL DEMOLITION NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT:

1. ALL MATERIAL TO BE REMOVED, WHETHER SPECIFICALLY NOTED IN THE PLANS OR NOT, SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AND DISPOSED OF OFF-SITE IN A LEGAL MANNER. NO ON-SITE BURY OR BURN PITS SHALL BE ALLOWED.
2. ALL DEMOLITION WORK SHALL CONFORM TO ALL LOCAL CODES AND ORDINANCES.
3. STAGING/PHASING OF DEMOLITION AND CONSTRUCTION IS TO BE COORDINATED WITH THE OWNER AND THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. SPECIFIC DEMOLITION ITEMS HAVE BEEN INDICATED ON THE PLANS AS A GUIDE TO THE GENERAL SCOPE OF THE WORK. IT IS INTENDED THAT THESE ITEMS SHALL BE COMPLETELY REMOVED BY THE CONTRACTOR ABOVE AND BELOW GROUND, UNLESS SPECIFICALLY NOTED OTHERWISE, AND THAT DEMOLITION WILL INCLUDE BUT WILL NOT NECESSARILY BE LIMITED TO THESE ITEMS. CONTRACTOR SHALL VISIT SITE TO VERIFY EXISTING CONDITIONS AND EXTENTS OF THE DEMOLITION THAT WILL BE REQUIRED PRIOR TO SUBMITTING A BID.
5. REMOVE ALL STRUCTURES DESIGNATED FOR REMOVAL ACCORDING TO THE DEMOLITION PLAN. THIS INCLUDES FOUNDATIONS, CONCRETE, ASPHALT, TREES, ETC.
6. THE CONTRACTOR SHALL, AS A MINIMUM, PROVIDE TREE PROTECTION FENCING AROUND EXISTING TREES TO BE SAVED THAT ARE WITHIN 15 FEET OF CONSTRUCTION ACTIVITIES AND AS INDICATED IN THE PLANS OR PER LOCAL AGENCY REQUIREMENTS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN UP, NOISE, DUST CONTROL, STREET SWEEPING AND HOURS OF OPERATION IN ACCORDANCE WITH THE LOCAL CODES.
8. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BARRICADES, SIGNAGE, MARKINGS, LIGHTS AND OTHER TRAFFIC CONTROL DEVICES TO PROTECT THE WORK ZONE AND SAFELY MAINTAIN TRAFFIC PER AGENCY REQUIREMENTS AND IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF SIGNS AND SUPPORTS WITHIN THE WORK AREA, AS NECESSARY TO FACILITATE CONSTRUCTION. SIGNS SHALL BE PROTECTED OR STOCKPILED FOR REUSE AS SPECIFIED IN THE PLANS OR AS REQUIRED BY THE AGENCY HAVING JURISDICTION. THE CONTRACTOR SHALL REPLACE ANY DAMAGED SIGNS AND SUPPORTS AT NO ADDITIONAL COST TO OWNER.
10. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANIES TO CONFIRM THAT UTILITY LEADS HAVE BEEN TAKEN OUT OF SERVICE PRIOR TO DEMOLITION.
11. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE 811/ONE CALL UTILITY LOCATING CENTER, PRIVATE UTILITY LOCATOR, THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
12. CONTRACTOR SHALL REFER TO THE "REPORT ON GEOTECHNICAL PAVEMENT INVESTIGATION" PREPARED BY G2 CONSULTING GROUP DATED 9/28/2023.
13. TOPSOIL REMOVED DURING DEMOLITION DEMOLITION/MASS GRADING OPERATIONS AS DEEMED ACCEPTABLE BY ENGINEER, 3RD PARTY TESTING COMPANY, AND/OR OWNER TO BE STOCKPILED ON SITE AND REUSED FOR RESTORATION AREAS.

LEGEND:

- EX. OH. ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC,MANHOLE & METER
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT, MANHOLE & CULVERT
- EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
- EX. YARD DRAIN, ROOF DRAIN & DOWNSPOUT
- EX. UNIDENTIFIED STRUCTURE
- EX. MAILBOX, SIGN & GUARD POST
- EX. LIGHT POLE & YARD LIGHT
- EX. FENCE
- EX. GUARD RAIL
- EX. DEC. TREE, CONIFEROUS TREE & SHRUB
- EX. TREE TAG, & TREE LINE
- EX. SPOT ELEVATION
- EX. CONTOUR
- SOIL BORING
- IRON FOUND / SET
- NAIL FOUND / NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND / SET
- SECTION CORNER FOUND
- (R) (M) (C) RECORDED / MEASURED / CALCULATED

REFERENCE DRAWINGS:

PEA JOB NO. 2012-144

WATER MAIN	CITY OF TROY MAP, EMAIL DATED 09/08/2023
SANITARY SEWER	CITY OF TROY MAP, EMAIL DATED 09/08/2023
STORM SEWER	CITY OF TROY MAP, EMAIL DATED 09/08/2023
FIBER OPTIC	FIBER LINK MAP, EMAIL DATED 9/11/2023
ELECTRIC	HAVE NOT RECEIVED MAP AS OF 09/13/2023

BENCHMARKS:

(GPS DERIVED - NAVD88)

BM #300
SOUTHEAST ANCHOR BOLT ON A LIGHT POLE LOCATED WEST OF THE SCHOOL IN THE PARKING LOT, FIRST POLE NORTH OF CHERRY AVENUE.
ELEV. - 671.54

BM #301
BENCH TIE IN THE NORTH FACE OF A UTILITY POLE LOCATED AT THE SOUTHWEST CORNER OF CHERRY AVENUE & ROBINWOOD DRIVE.
ELEV. - 667.56

DEMOLITION LEGEND:

- ITEM TO BE PROTECTED
- ITEM TO BE REMOVED
- CURB/FENCE REMOVAL
- CONCRETE PAVEMENT AND SIDEWALK REMOVAL
- AREA OR ITEMS TO BE REMOVED
- UTILITY REMOVAL
- ABANDON UTILITY
- ASPHALT REMOVAL
- TREE REMOVAL
- SAWCUT LINE

DEMOLITION QUANTITIES:

REMOVE ASPHALT	37,050 SF
REMOVE CONCRETE AND BASE	2,873 SF
SAWCUT PAVEMENT	96 LF
REMOVE AND SALVAGE SIGN AND POST	5 EA
REMOVE VEGETATION, TOPSOIL, AND SUBGRADE	2,155 SF
REMOVE GUARDRAIL	13 LF

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE "X", AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.

PEA GROUP
t: 844.813.2949
www.peagroup.com

NORTH

0 10 20 40
SCALE: 1" = 20'

Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT
TROY SCHOOLS
1140 RANKIN DRIVE
TROY, MI 48083

PROJECT TITLE
MORSE ELEMENTARY SCHOOL
475 CHERRY AVE.
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

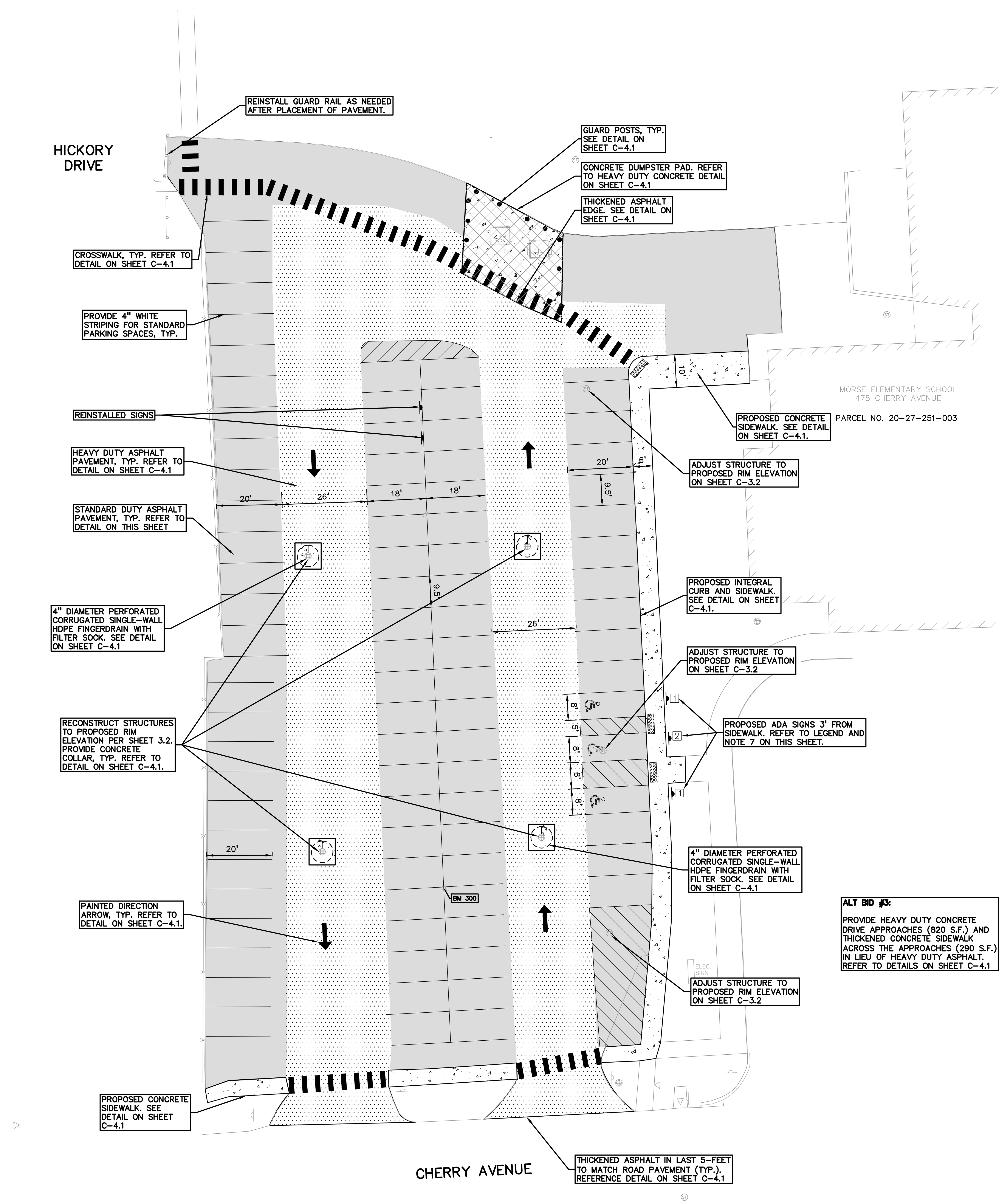
REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
TOPOGRAPHIC SURVEY AND DEMOLITION PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-1.2



ALT BID #3:
PROVIDE HEAVY DUTY CONCRETE DRIVE APPROACHES (820 S.F.) AND THICKENED CONCRETE SIDEWALK ACROSS THE APPROACHES (290 S.F.) IN LIEU OF HEAVY DUTY ASPHALT. REFER TO DETAILS ON SHEET C-4.1

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE "X", AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.

SIGN LEGEND:
'BARRIER FREE PARKING' SIGN [1]
'VAN ACCESSIBLE' SIGN [2]
REFER TO DETAIL SHEET FOR SIGN DETAILS

SIDEWALK RAMP LEGEND:
CURB DROP ONLY
REFER TO DETAIL SHEET C-4.0 FOR STANDARD RAMP AND DETECTABLE WARNING DETAILS

UTILITY LEGEND:
- EX. OH. ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC,MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND, & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- PROPOSED WATER MAIN
- PROPOSED HYDRANT AND GATE VALVE
- PROPOSED TAPPING SLEEVE, VALVE & WELL
- PROPOSED POST INDICATOR VALVE
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY CLEANOUT & MANHOLE
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER CLEANOUT & MANHOLE
- PROPOSED CATCH BASIN, INLET & YARD DRAIN

PAVING QUANTITIES:

4" ASPHALT PAVEMENT	21,552 S.F.
5" ASPHALT PAVEMENT	15,945 S.F.
8" 21AA AGGREGATE	21,552 S.F.
10" 21AA AGGREGATE	15,945 S.F.
CONCRETE DUMPSTER PAD	842 S.F.
CONCRETE SIDEWALK	1,941 S.F.
CONCRETE COLLARS	256 S.F.
SUBGRADE UNDERCUT ALLOWANCE	350 C.Y.
SUBGRADE UNDERCUT DRAIN TILE (4") ALLOWANCE	250 L.F.

ENGINEERING QUANTITIES:

ADJUST/RECONSTRUCT STORM STRUCTURE	4 EA.
4" HDPE PERF. UNDERDRAIN	260 L.F.
GUARD POST	10 EA.
REINSTALLED GUARDRAIL	13 L.F.

NOTES:

1. CONTRACTOR TO VERIFY ALL QUANTITIES SHOWN ON THE PLANS. ANY DEVIATIONS TO THE PLAN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF THE SCHOOL DISTRICT AND PEA GROUP, IN WRITING PER THE BID PACKAGE, FOR VERIFICATION PRIOR TO BIDDING.
2. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, CENTER OF MANHOLE/CATCH BASIN UNLESS OTHERWISE NOTED.
3. DOWEL INTO EXISTING CURB AND GUTTER 9" WITH EPOXY COATED #4 BAR CONTINUOUS BETWEEN EXISTING AND PROPOSED CURBING.
4. CONTRACTOR TO FIELD VERIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION INCLUDING BUT NOT LIMITED TO: SITE LIGHTING, FIBER LINES, ETC.
5. REFER TO NOTES AND DETAIL SHEETS FOR ON SITE PAVING DETAILS.
6. CONTRACTOR TO REMOVE AND REPLACE SIGNS AND POSTS PER DETAILS ON SHEET C-4.0. ALL SIGNS AND ANY POSTS IN GOOD CONDITION SHALL BE RETURNED TO THE OWNER. ALL POSTED DAMAGED OR IN OTHERWISE POOR CONDITION, SHALL BE DISPOSED OF AT NO ADDITIONAL COST TO THE OWNER.
7. FOR THE FOUR (4) CATCH BASINS LOCATED IN THE WORK AREA; BIDDERS ARE TO INCLUDE RECONSTRUCTION OF THESE STRUCTURES (GREATER THAN 12-INCHES IN DEPTH FROM THE RIM ELEVATION OF REPAIR WORK) IN THE BASE BID. THE SUCCESSFUL BIDDER WILL BE PAID FOR REPAIRING EACH STRUCTURE BASED ON THE ACTUAL DEPTH OF REPAIR WITH EITHER STRUCTURAL ADJUSTMENT (WITHIN TOP 12-INCHES OF RIM ELEVATION) OR STRUCTURAL RECONSTRUCTION (GREATER THAN 12-INCHES IN DEPTH) PER THE UNIT PRICES PROVIDED IN THE BID PACKAGE AND THE SCOPE OF WORK DETERMINED AND APPROVED PRIOR TO THE WORK COMMENCING. REPLASTERING OF THE ENTIRE STRUCTURE SHALL BE INCLUDED IN THE UNIT PRICE FOR BOTH STRUCTURAL ADJUSTMENT AND STRUCTURAL RECONSTRUCTION.
8. A THICKENED EDGE OF ASPHALT PER THE DETAIL ON SHEET C-4.1 OF THE PLANS SHALL BE LOCATED WHERE CALLED FOR IN THE PLAN. BIDDERS SHALL INCREASE THE QUANTITIES FOR THIS ITEM ACCORDINGLY IN THE BASE BID.
9. ALL PROPOSED ADA RAMPS SHALL HAVE TRUNCATED DOMES. PLASTIC OR METAL STYLE DOMES ARE BOTH ACCEPTABLE.
10. CONTRACTOR SHALL REFER TO THE "REPORT ON GEOTECHNICAL PAVEMENT INVESTIGATION" PREPARED BY G2 CONSULTING DATED 09/28/2023

LEGEND:
- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

PAVEMENT PREPARATION NOTES:

1. PAVEMENT PREPARATION SHALL FOLLOW THE PROCESS SUMMARIZED BELOW:

1.1. AS PART OF THE PAVEMENT REMOVAL, REMOVE THE EXISTING PAVEMENT AND ANY AGGREGATE BASE REQUIRED FOR THE PROPOSED THICKNESS OF ASPHALT/CONCRETE PAVEMENT TO BE PLACED. ANY EXISTING BASE MATERIAL REMOVED TO ACHIEVE THIS ELEVATION WILL BE PART OF THE EARTHWORKS FOR THE PAVING OPERATION, WILL NOT BE PAID FOR SEPARATELY AND/OR CONSIDERED PART OF THE SUBGRADE UNDERCUTTING PAY ITEM AND WILL BE INCLUDED IN THE BASE BID FOR THE WORK.

1.2. ANY OF THE EXISTING AGGREGATE BASE REMOVED TO ACHIEVE THE THICKNESS OF THE PROPOSED PAVEMENT, AS DESCRIBED IN ITEM 1.1, AND DEEMED ACCEPTABLE BY A QUALIFIED ENGINEERING TECHNICIAN SHALL BE STOCKPILED FOR RE-USE IN THE PAVEMENT OPERATION.

1.3. PROOF ROLL EXISTING BASE AND SUBGRADE PER PLANS, SPECIFICATIONS AND GEOTECH REPORT.

1.4. DETERMINE AREAS THAT FAIL THE PROOF ROLL. UNDERCUTS SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.

1.5. TO MINIMIZE INSTABILITY AND UNDERCUTS, THE AGGREGATE BASE SHALL NOT BE LEFT EXPOSED TO PRECIPITATION AND CONSTRUCTION OPERATIONS AND SHOULD BE PERFORMED DURING THE SUMMER MONTHS TO ENSURE DRY, WARM, WEATHER. ADDITIONALLY, THE SUBGRADE MAY BECOME UNSTABLE UNDER REPEATED LOADING OF CONSTRUCTION TRAFFIC; THEREFORE, CONSTRUCTION EQUIPMENT SHOULD BE LIMITED ON THE EXPOSED SUBGRADE.

1.6. BACKFILL THE INITIAL PORTION OF THE UNDERCUT WITH THE SALVAGED AGGREGATE BASE AND THEN COMPLETE THE BACKFILL PROCESS WITH IMPORTED MDOT 21AA CRUSHED LIMESTONE AGGREGATE PER THE PLANS, SPECIFICATIONS AND GEOTECH REPORT.

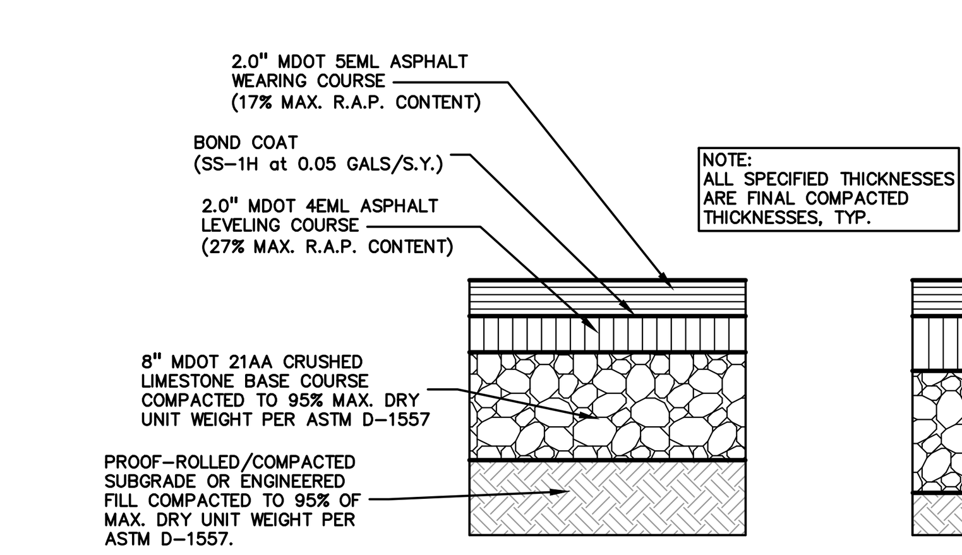
2. UNDERCUT SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. UNDERCUT EXCAVATIONS SHALL BE BACKFILLED WITH MDOT 21AA DENSE GRADED AGGREGATE PLACED IN AN ENGINEERED MANNER. LIFT THICKNESS SHALL NOT EXCEED 9 INCHES. THE USE OF TRI-AXIAL GEOGRID MAY BE USED TO REDUCE UNDERCUT DEPTHS, AS APPROVED BY THE DISTRICT AND PER THE UNIT PRICE PROVIDED WITH THE CONTRACTORS BID.
2. ALL ENGINEERED FILL SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY DETERMINED BY THE MODIFIED PROCTOR (ASTM D1557) METHOD OF TESTING. ALL ENGINEERED FILL MATERIAL SHALL BE PLACED AND COMPACTED AT APPROXIMATELY THE OPTIMUM MOIUSTURE CONTENT. FROZEN MATERIAL SHALL NOT BE USED AS FILL, NOR SHOULD FILL BE PLACED ON FROZEN SUBGRADE.
3. THE QUANTITY FOR "UNDERCUT" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL VOLUME OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
4. UNDERCUT DRAIN TILE SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
5. THE QUANTITY FOR "UNDERCUT DRAIN TILE (4")" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL FOOTAGE OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
6. THE IMPORTING, ADDING, FINE GRADING AND COMPACTING ADDITIONAL PAVEMENT AGGREGATE BASE MATERIAL (MDOT 21AA CRUSHED LIMESTONE) REQUIRED TO ACHIEVE THE PROPOSED TOP OF BASE ELEVATIONS AND PRIOR TO PLACING THE ASPHALT PAVEMENT WILL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE THE VOLUME OF ADDITIONAL MATERIAL REQUIRED PER THE PROJECT PLANS.
7. THE QUANTITY FOR IMPORTING, ADDING, FINE GRADING AND COMPACTING ADDITIONAL PAVEMENT AGGREGATE BASE MATERIAL (MDOT 21AA CRUSHED LIMESTONE) REQUIRED TO ACHIEVE THE PROPOSED TOP OF BASE ELEVATIONS AND PRIOR TO PLACING THE ASPHALT PAVEMENT FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID AND THE EARTHWORK CALCULATIONS COMPLETED BY THE CONTRACTOR DURING THE BIDDING PROCESS. AS PART OF THE EARTHWORK CALCULATIONS, THE CONTRACTOR SHALL ASSUME THAT THE VOLUME OF 2" OF MATERIAL ACROSS THE ENTIRE AREA WILL BE REMOVED WITH THE PAVEMENT AND/OR CONSIDERED UN-USABLE BY THE QUALIFIED ENGINEERING TECHNICIAN AND NEED TO BE REPLACED WITH IMPORTED MDOT 21AA CRUSHED LIMESTONE.

AGGREGATE BASE NOTE:
THIS PAVEMENT SECTION DESIGN ASSUMES THE USE OF MDOT 21AA CRUSHED LIMESTONE BASE MATERIAL THAT MEETS THE REQUIREMENTS OF MDOT STANDARD SPECIFICATION SECTION 902 FOR AGGREGATES. IF CRUSHED CONCRETE AGGREGATE BASE IS PROPOSED IN LIEU OF THE SPECIFIED CRUSHED LIMESTONE MATERIAL, PEA GROUP WILL REQUIRE A MINIMUM 25% INCREASE IN BASE THICKNESS. HOWEVER, IF TESTING DOCUMENTATION IS PROVIDED TO PEA GROUP THAT SHOWS THAT THE CRUSHED CONCRETE MATERIAL MEETS ALL REQUIREMENTS OF MDOT SPECIFICATION SECTION 902, THEN THE 25% INCREASE IN THICKNESS MAY BE REEVALUATED.

ASPHALT MATERIAL NOTES:
HOT-MIX ASPHALT MIXTURES UTILIZING RECYCLED ASPHALT PAVEMENT (RAP) MUST MEET MDOT SPECIAL PROVISION 12SP501(E). THE BINDER GRADE FOR THIS WORK IS PG64-28. IF ASPHALT MIXES CONTAINING RAP ARE TO BE SUPPLIED FOR THIS PROJECT, THE ASPHALT BINDER MUST BE REVISED PER MDOT 'TIER 1' OR 'TIER 2' REQUIREMENTS (RAP CONTENT UP TO 27% MAXIMUM). TIER 3 MIXES ARE NOT ACCEPTABLE ON THIS PROJECT. AN ASPHALT MIX DESIGN FOR ALL SPECIFIED MIXES SHOULD BE FORWARDED TO PEA GROUP FOR REVIEW PRIOR TO CONSTRUCTION

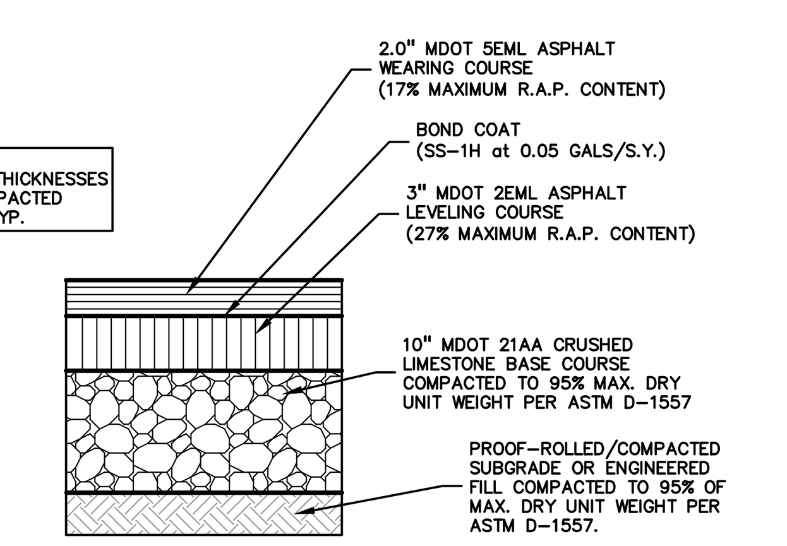
ASPHALT MIX DESIGN CHART

COMMERCIAL ADT 0-300	COMMERCIAL ADT 301-1000	COMMERCIAL ADT 1001-3400	COMMERCIAL ADT ≥3401	APPLICATION RATE (LB/YD²), MINIMUM - MAXIMUM	COURSE APPLICATION
2EL	2EML	2EMH	2EH	435-550	BASE
3EL	3EML	3EMH	3EH	330-410	BASE AND/OR LEVELING
4EL	4EML	4EMH	4EH	220-275	LEVELING AND/OR TOP
5EL	5EML	5EMH	5EH	165-220	TOP
PG 58-28	PG 64-28	PG 64-28	PG 70-28P		



NOTE:
ALL SPECIFIED THICKNESSES ARE FINAL COMPACTED THICKNESSES, TYP.

STANDARD DUTY ASPHALT DETAIL
(NOT FOR USE IN THE RIGHT-OF-WAY) NOT TO SCALE



HEAVY DUTY ASPHALT DETAIL
(NOT FOR USE IN THE RIGHT-OF-WAY) NOT TO SCALE

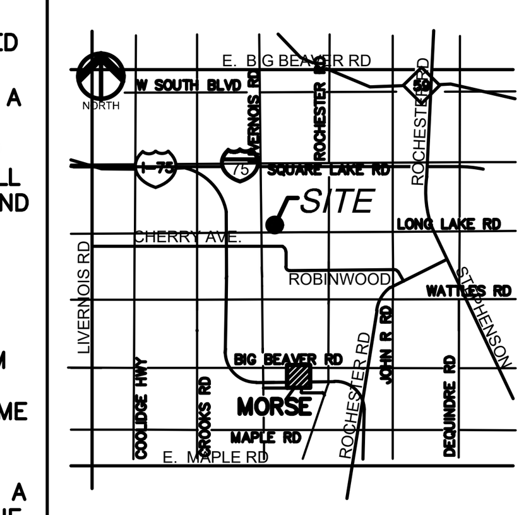
PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN
ROBERT SCOTT KOCHON
License No. 6201046143
LICENSED PROFESSIONAL ENGINEER

NORTH
0 10 20 40
SCALE: 1" = 20'

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
TROY SCHOOLS
1140 RANKIN DRIVE
TROY, MI 48083

PROJECT TITLE
MORSE ELEMENTARY SCHOOL
475 CHERRY AVE.
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

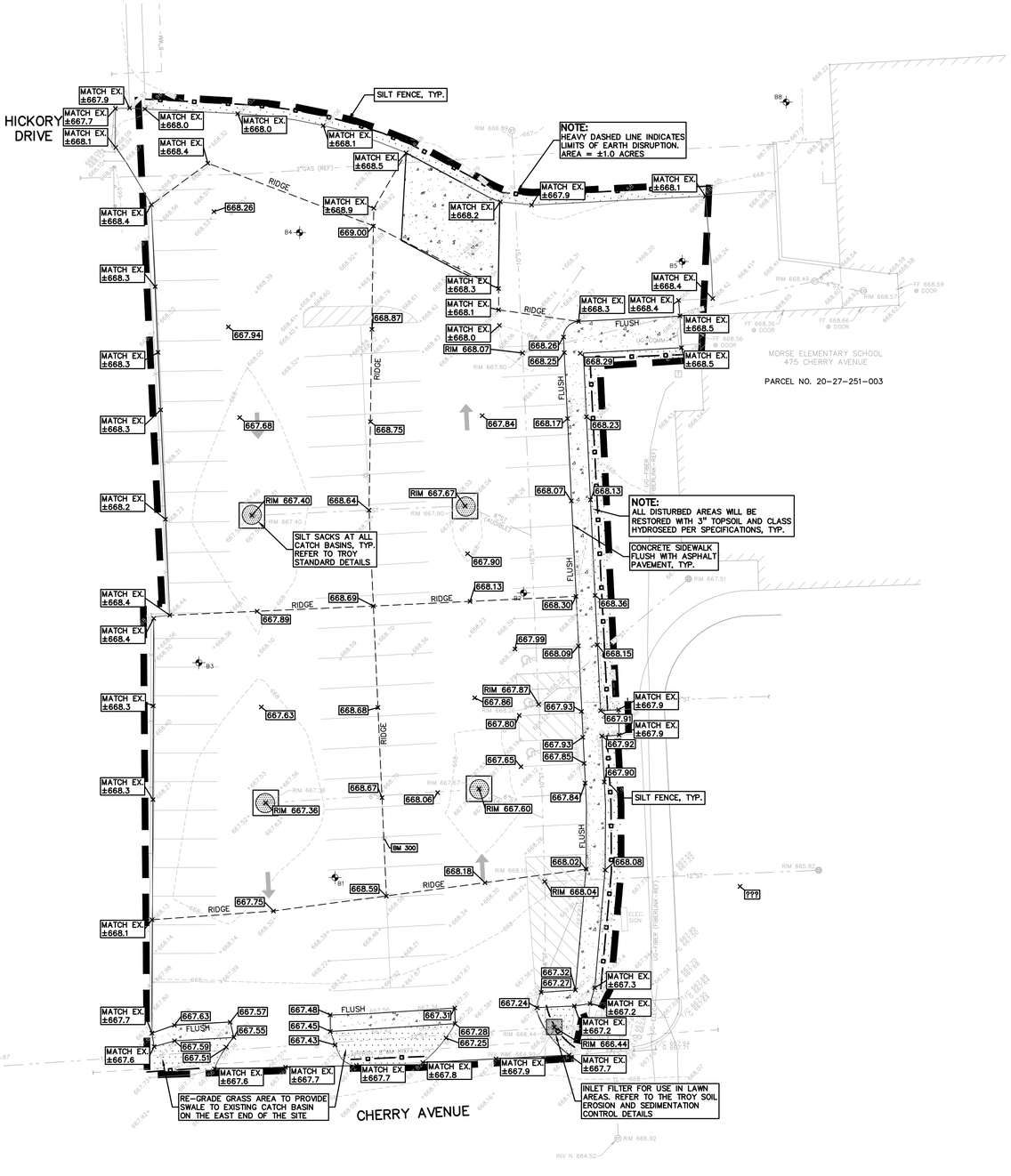
REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
ENGINEERING PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-2.2



GRADING LEGEND:

- EXISTING SPOT ELEVATION
- 622.50 — PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- 670 — EXISTING CONTOUR
- 922 — PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

T/C = TOP OF CURB	G = GUTTER GRADE
T/P = TOP OF PAVEMENT	FF = FINISH FLOOR
T/S = TOP OF SIDEWALK	FG = FINISH GRADE
T/W = TOP OF WALL	RIM = RIM ELEVATION
B/W = BOTTOM OF WALL	

REFER TO GRADING NOTES ON SHEET C-4.0.

SYMBOLS: EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
- (SI-3) RYCB INLET FILTER
- (SP-9) TEMPORARY STONE ACCESS DRIVE
- (E-9) EROSION CONTROL BLANKET
- (E-7) RIPRAP
- TEMPORARY SEED AND MULCH

REFER TO O.C.W.R.C. SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL DEVICE DETAILS.

EROSION CONTROL QUANTITIES:

SILT FENCE	456 LF
INLET FILTER	1 EA.
SILT SACK	4 EA.
LAWN RESTORATION	237 SY

SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION

1. SEE CITY OF TROY SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL SOIL EROSION CONTROL RELATED DETAILS.
2. PLACE SILT FENCE & INSTALL INLET FILTERS ON EXISTING STORM SEWER STRUCTURES, ACCORDING TO PLANS.
3. INSTALL TEMPORARY CRUSHED CONCRETE ACCESS DRIVE AT ALL CONSTRUCTION ENTRANCES. (60'x24'x8" W/MINIMUM OF 1"–3" CRUSHED CONCRETE – NO FINES).
4. REMOVE CURB, PAVEMENT, TREES, ETC. AS DIRECTED ON THE DEMOLITION PLAN.
5. STRIP AND STOCKPILE TOPSOIL FOR RESTORATION REQUIREMENTS.
6. DISPOSE OF ALL EXCESS, UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO BURN OR BURY PITS ALLOWED.
7. UNSUITABLE MATERIALS CONSIST OF, BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING: CONCRETE, ASPHALT, TREES, BRUSH, STUMPS, ROOTS, OR OTHER MISCELLANEOUS DEBRIS OR TRASH.
8. MASS GRADE THE SITE IN ACCORDANCE WITH THE PLANS.
9. INSTALL HYDROSEED AS SHOWN ON THE PLAN WITHIN 5 DAYS OF COMPLETION OF MASS GRADING OR WHENEVER DISTURBED AREAS WILL REMAIN UNCHANGED FOR 30 DAYS OR GREATER. MINIMUM 3"–4" TOPSOIL WILL BE USED WHERE VEGETATION IS REQUIRED.
10. COMPLETE ROUGH GRADING OF SITE. PLACE INLET FILTERS AT ALL INLETS AND CATCH BASINS, AS SHOWN.
11. FINISH GRADE AND PAVE SITE AS PROPOSED TO DRAIN TO STORM SEWER SYSTEM. REPAIR INLET FILTERS AS REQUIRED.
12. APPLY TOPSOIL, HYDROSEED TO ALL DISTURBED AREAS UPON COMPLETION OF GRADING. THE CONTRACTOR SHALL STAGE CONSTRUCTION ACTIVITIES IN ORDER TO MINIMIZE THE EXPOSURE OF UNSTABILIZED AREAS.
13. CLEAN PAVEMENT AND STORM SEWERS. REMOVE SILT FENCE AND TREE PROTECTION FENCE, AND INLET FILTERS ONCE VEGETATION HAS BEEN ESTABLISHED.
14. ALL DIRT AND MUD TRACKED ONTO PUBLIC ROADS SHALL BE REMOVED DAILY.
15. INLETS/CATCH BASINS TO BE CLEANED AFTER WEARING COARSE OF ASPHALT AND STRIPING HAS BEEN PLACED

SOIL EROSION MAINTENANCE SCHEDULE AND NOTES:

1. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT BY:

   ROB CARSON
   TROY SCHOOL DISTRICT
   1140 RANKIN
   TROY, OAKLAND COUNTY, MICHIGAN
   248-823-4067
2. IF ANY DAMAGE HAS OCCURRED AS A RESULT OF STORM WATER DISCHARGE FROM THE SITE, THE FOLLOWING STEPS SHALL BE IMPLEMENTED.
3. ANY DEBRIS OR DIRT ON ANY PAVED AREA RESULTING FROM CONSTRUCTION TRAFFIC SHALL BE CLEANED IN A PROMPT MANNER BY THE CONTRACTOR. THE CONSTRUCTION DRIVE SHALL BE CLEANED AT THE END OF EACH DAY.
4. ALL DIRT AND MUD TRACKED ONTO PAVED AREAS SHALL BE REMOVED BY THE CONTRACTOR DAILY BY SCRAPING. STREET SWEEPING IS REQUIRED WEEKLY.
5. SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT UP SEDIMENT WHEN THE SEDIMENT HEIGHT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR REBACKFILL THE SILTATION FENCE SHOULD IT FALL OR BE DAMAGED DURING CONSTRUCTION.
6. INLET FILTER MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY ACCUMULATED SILT OR OTHER DEBRIS. THE REMOVAL OF SILT SHOULD BE WITH THE USE OF A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTERS CAN NOT BE CLEANED OR ARE DAMAGED, THEN THE FABRIC MUST BE REPLACED.
7. CONTRACTOR TO PROVIDE WATER TRUCK TO WATER DOWN THE SITE ON A DAILY BASIS AS REQUIRED TO MAINTAIN DUST CONTROL.
8. IF HIGH GROUNDWATER IS ANTICIPATED OR ENCOUNTERED DURING CONSTRUCTION A DEWATERING PLAN MUST BE SUBMITTED TO THE CITY ENGINEERING DIVISION FOR REVIEW.

GENERAL SITE CONDITIONS:

1. ACCORDING TO THE GEOTECHNICAL INVESTIGATION BY G2 CONSULTING GROUP, LLC DATED SEPTEMBER 28, 2023, THE SITE CONSISTS OF THE FOLLOWING SOIL TYPES:

   NATIVE LOOSE TO MEDIUM COMPACT GRANULAR SOILS, CONSISTING OF SAND, SILTY SAND AND SANDY GRAVEL
2. TOTAL DISTURBED AREA = ±1.00 ACRES
3. N.P.D.E.S. NOTICE OF COVERAGE IS NOT REQUIRED
4. NEAREST WATER COURSE: SPENCER DRAIN LOCATED ±1400 FEET SOUTHWEST OF THE SITE

NOTE:

1. PER THE 'SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION' NOTES THE SUCCESSFUL BIDDER TO THE CLEAN THE STORM SEWER. THIS CLEANING SHALL INCLUDE CLEANING OUT THE STRUCTURES AND ENTIRE SEWER RUNS BETWEEN STRUCTURES USING HYDRAULICALLY PROPELLED, HIGH-VELOCITY JET, OR MECHANICALLY POWERED EQUIPMENT. SELECTION OF THE EQUIPMENT USED SHALL BE BASED ON THE CONDITIONS OF LINES AT THE TIME THE WORK COMMENCES. THE EQUIPMENT AND METHODS SELECTED SHALL BE SATISFACTORY TO THE SCHOOL DISTRICT'S REPRESENTATIVE. THE EQUIPMENT SHALL BE CAPABLE OF REMOVING DIRT, GREASE, ROCKS, SAND, AND OTHER MATERIALS AND OBSTRUCTIONS FROM THE SEWER LINES AND MANHOLES. IF CLEANING OF AN ENTIRE SECTION CANNOT BE SUCCESSFULLY PERFORMED FROM ONE MANHOLE, THE EQUIPMENT SHALL BE SET UP ON THE OTHER MANHOLE AND CLEANING AGAIN ATTEMPTED. IF, AGAIN, SUCCESSFUL CLEANING CANNOT BE PERFORMED OR THE EQUIPMENT FAILS TO TRAVERSE THE ENTIRE MANHOLE SECTION, IT WILL BE ASSUMED THAT A MAJOR BLOCKAGE EXISTS AND THE CLEANING EFFORT SHALL BE ABANDONED.
2. PER THE PROJECT SPECIFICATIONS; PRIOR TO THE PLACEMENT OF TOPSOIL THE SUCCESSFUL BIDDER TO SCHEDULE AN INSPECTION BY THE SCHOOL DISTRICT OR PEA GROUP TO CONFIRM THAT THE GRADE IS AT THE PROPER ELEVATION WHERE THE MINIMUM DEPTH OF TOPSOIL CAN BE PLACED THROUGHOUT THE AREA.
3. CONTRACTOR TO FIELD VERIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION INCLUDING BUT NOT LIMITED TO: SITE LIGHTING, FIBER LINES, ETC.

SEQUENCE OF CONSTRUCTION:

START DAY	END DAY	
1	90	INSTALL CRUSHED CONCRETE ACCESS APPROACH AT SITE ROAD APPROACH.
1	90	INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES, SILT FENCES, INLET PROTECTION, ETC. AS NECESSARY.
1	120	MAINTAIN A 25' BUFFER OF VEGETATION AROUND PERIMETER OF SITE WHERE POSSIBLE.
1	15	REMOVE ALL VEGETATION, TREES AND BRUSH FROM THE PROPOSED CONSTRUCTION AREA UNLESS MARKED TO REMAIN. STRIP AND STOCKPILE TOPSOIL AS REQUIRED. ALL STOCKPILES MUST BE GRADED AND SEEDED.
5	14	REMOVE ALL PAVEMENT, CURB, UTILITIES, ETC. AS REQUIRED TO INSTALL THE PROPOSED WORK AS SHOWN ON THE TOPOGRAPHIC SURVEY AND DEMOLITION PLAN.
5	14	DISPOSE OF ALL EXCESS/UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO ON-SITE BURN OR BURY PITS ALLOWED.
14	28	ROUGH GRADE SITE. SEED AND MULCH BLANKETS MUST BE INSTALLED AS SHOWN WITHIN 5 DAYS OF FINAL GRADE. REPAIR AND/OR RE-INSTALL ANY TEMPORARY SOIL EROSION CONTROL MEASURES THAT WERE DAMAGED DURING GRADING OPERATIONS.
28	60	INSTALL SITE UTILITIES (STORM SEWER, SANITARY SEWER, WATER MAIN ETC.). INSTALL INLET PROTECTION AT ALL PROPOSED CATCH BASINS.
28	90	TEMPORARY SEEDING MUST BE PROVIDED IN AREAS NOT TO BE WORKED ON FOR 15 DAYS OR LONGER.
70	80	FINE GRADE SITE AND PREPARE FOR SITE PAVING OPERATIONS.
80	110	INSTALL ALL PAVEMENT, SIDEWALKS, CURBING AS PROPOSED. IF PERMANENT LANDSCAPING IS NOT TO BE INSTALLED SOON AFTER PAVING IS COMPLETE, ALL AREAS WITHIN 20 FEET OF BACK OF CURB MUST BE TEMPORARILY SEEDED. REPAIR INLET PROTECTION, SILT FENCE AND ANY OTHER DAMAGED SOIL EROSION CONTROL MEASURES AS NECESSARY.
90	119	FINAL GRADE, REDISTRIBUTE STOCKPILED TOPSOIL, ESTABLISH VEGETATION AND INSTALL ALL PERMANENT LANDSCAPING IN ALL DISTURBED AREAS NOT BUILT.
118	120	CLEAN PAVEMENT AND REMOVE ALL TEMPORARY SOIL EROSION CONTROL MEASURES. RE-ESTABLISH VEGETATION AS REQUIRED.
120	120	REMOVE SEDIMENTATION CONTROLS ONCE ENTIRE SITE HAS BEEN PERMANENTLY STABILIZED.

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.

PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN — ROBERT SCOTT KOCION — License No. 6201046143 — REGISTERED PROFESSIONAL ENGINEER

NORTH

0 10 20 40
SCALE: 1" = 20'

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE LOCATIONS AND ELEVATIONS AND ARE NOT GUARANTEED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT
TROY SCHOOLS
1140 RANKIN DRIVE
TROY, MI 48083

PROJECT TITLE
MORSE ELEMENTARY SCHOOL
475 CHERRY AVE.
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
GRADING AND SESC PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-3.2

S:\PROJECTS\2024\24-0963 2025 TSD SITE IMPROVEMENTS\CIVIL\3_CONSTRUCTION\3_MORSE\C-3.2 GRADE ESC-20250424_MORSE.dwg

BENCHMARKS:
(GPS DERIVED - NAVD88)

BM #300
ARROW ON FLANGE OF A HYDRANT LOCATED ON THE WEST SIDE OF TALLMAN DRIVE, ACROSS FROM NORTH SIDE OF THURBER DRIVE.
ELEV. - 677.86

BM #301
(PER PEA JOB NO. 2022-1281)
ARROW ON A HYDRANT LOCATED ON THE EAST SIDE OF THE BACK NORTH PARKING LOT, APPROX. 152' NORTHEAST FROM THE NORTHWEST BUILDING CORNER.
ELEV. - 680.91

DEMOLITION QUANTITIES:

REMOVE ASPHALT	27,995 S.F.
REMOVE CONCRETE SIDEWALK AND BASE	2,539 S.F.
REMOVE CONCRETE PAVEMENT AND BASE	1,031 S.F.
REMOVE CURBING	1,540 L.F.
REMOVE STORM PIPE	10 L.F.
REMOVE STORM STRUCTURE	1 EA.
REMOVE AND SALVAGE SIGN & POST	5 EA.
REMOVE VEGETATION, TOPSOIL, AND SUBGRADE	3,969 S.F.
SAWCUT PAVEMENT	117 L.F.

ALLOWANCE:

REMOVE CONCRETE WALK	252 S.F.
REMOVE AND SALVAGE BENCH	2 EA.

LEGAL DESCRIPTION:

PARCEL ID 20-15-326-001
Land in the City of Troy, Oakland County County, Michigan, described as follows:

T2N, R11E, SEC 15 E 60 FT OF S 448.03 FT OF NW 1/4, ALSO PART OF SW 1/4 BEG AT CEN OF SEC, TH S 00-42-10 W 400 FT, TH N 89-27-25 W 1261.80 FT, TH NELY ALG CEN LINE OF STURGIS DRAIN 411 FT MORE OR LESS TO E & W 1/4 LINE, TH S 89-27-25 E 1166.90 FT TO BEG EXC PART OF NW 1/4, ALSO PART OF NE 1/4 OF SW 1/4 BEG AT CEN OF SEC, TH N 00-32-35 E 448.03 FT, TH N 89-27-25 W 60 FT, TH S 00-32-35 W 448.03 FT, TH S 00-42-10 W 400 FT, TH S 89-27-25 E 60 FT, TH N 00-42-10 W ALG N & S 1/4 LINE TO BEG 11.72 A

REFERENCE DRAWINGS:

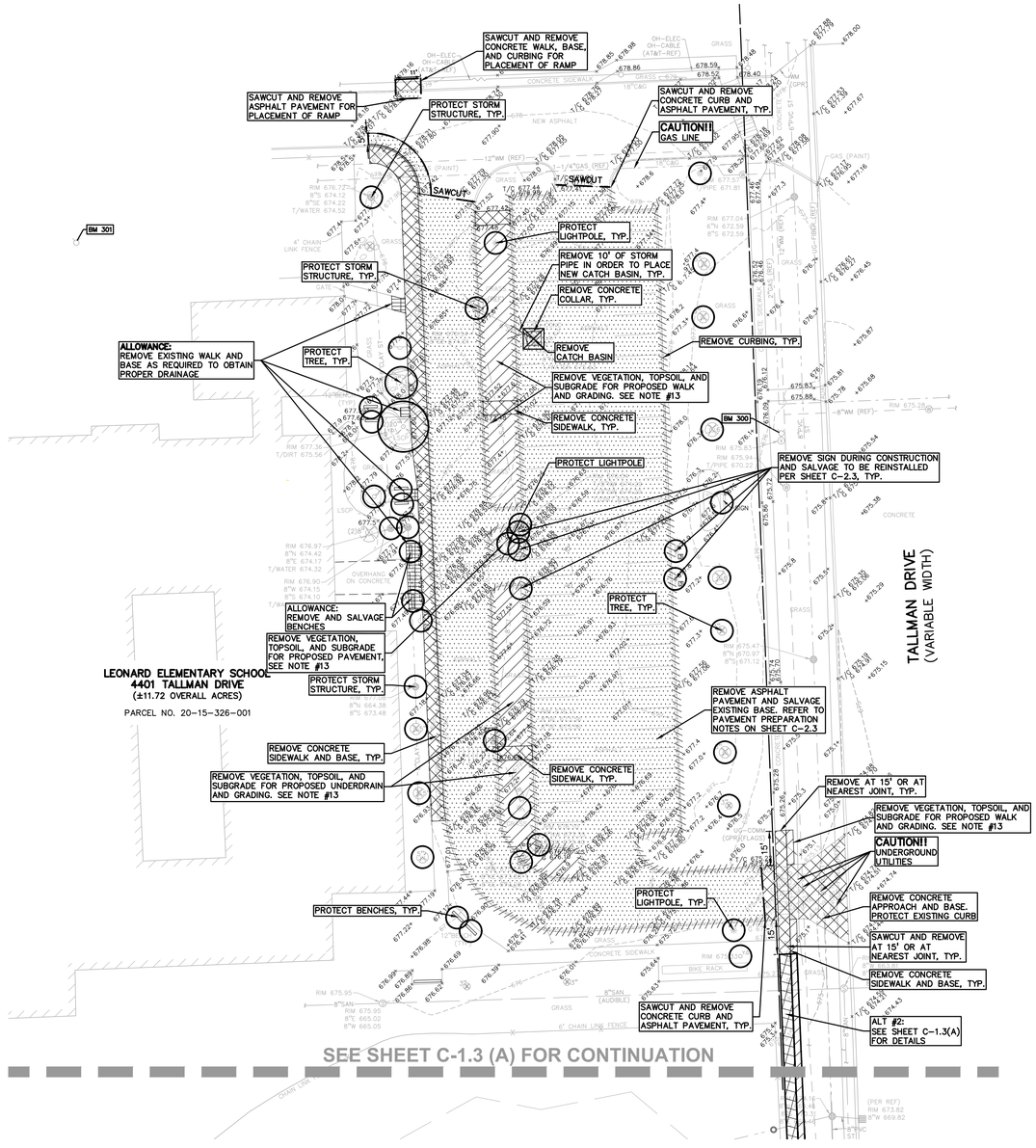
TOPOGRAPHIC SURVEY, LEONARD ELEMENTARY SCHOOL, PEA JOB NO. 2022-1281, DATED 11/10/2022

DEMOLITION LEGEND:

ITEM TO BE PROTECTED
ITEM TO BE REMOVED
CURB/FENCE REMOVAL
CONCRETE PAVEMENT AND SIDEWALK REMOVAL
AREA OR ITEMS TO BE REMOVED
UTILITY REMOVAL
ABANDON UTILITY
ASPHALT REMOVAL
TREE REMOVAL
SAWCUT LINE
ALLOWANCE AREA

LEGEND:

EX. OH. ELEC, POLE & GUY WIRE
EX. U.G. CABLE TV & PEDESTAL
EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
EX. U.G. ELEC.MANHOLE & METER
EX. GAS LINE
EX. GAS VALVE & GAS LINE MARKER
EX. TRANSFORMER & IRRIGATION VALVE
EX. WATER MAIN
EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
EX. WATER VALVE BOX & SHUTOFF
EX. SANITARY SEWER
EX. SANITARY CLEANOUT & MANHOLE
EX. COMBINED SEWER MANHOLE
EX. STORM SEWER
EX. CLEANOUT, MANHOLE & CULVERT
EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
EX. YARD DRAIN, ROOF DRAIN & DOWNSPOUT
EX. UNIDENTIFIED STRUCTURE
EX. MAILBOX, SIGN & GUARD POST
EX. LIGHT POLE & YARD LIGHT
EX. FENCE
EX. GUARD RAIL
EX. DEC. TREE, CONIFEROUS TREE & SHRUB
EX. TREE TAG, & TREE LINE
EX. SPOT ELEVATION
EX. CONTOUR
IRON FOUND / SET
NAIL FOUND / NAIL & CAP SET
BRASS PLUG SET
MONUMENT FOUND / SET
SECTION CORNER FOUND
(R) (M) (C) RECORDED / MEASURED / CALCULATED



GENERAL DEMOLITION NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT:

1. ALL MATERIAL TO BE REMOVED, WHETHER SPECIFICALLY NOTED IN THE PLANS OR NOT, SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AND DISPOSED OF OFF-SITE IN A LEGAL MANNER. NO ON-SITE BURY OR BURN PITS SHALL BE ALLOWED.
2. ALL DEMOLITION WORK SHALL CONFORM TO ALL LOCAL CODES AND ORDINANCES.
3. STAGING/PHASING OF DEMOLITION AND CONSTRUCTION IS TO BE COORDINATED WITH THE OWNER AND THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. SPECIFIC DEMOLITION ITEMS HAVE BEEN INDICATED ON THE PLANS AS A GUIDE TO THE GENERAL SCOPE OF THE WORK. IT IS INTENDED THAT THESE ITEMS SHALL BE COMPLETELY REMOVED BY THE CONTRACTOR ABOVE AND BELOW GROUND, UNLESS SPECIFICALLY NOTED OTHERWISE, AND THAT DEMOLITION WILL INCLUDE BUT WILL NOT NECESSARILY BE LIMITED TO THESE ITEMS. CONTRACTOR SHALL VISIT SITE TO VERIFY EXISTING CONDITIONS AND EXTENTS OF THE DEMOLITION THAT WILL BE REQUIRED PRIOR TO SUBMITTING A BID.
5. REMOVE ALL STRUCTURES DESIGNATED FOR REMOVAL ACCORDING TO THE DEMOLITION PLAN. THIS INCLUDES FOUNDATIONS, FOOTINGS CONCRETE, ASPHALT, TREES, ETC.
6. THE CONTRACTOR SHALL, AS A MINIMUM, PROVIDE TREE PROTECTION FENCING AROUND EXISTING TREES TO BE SAVED THAT ARE WITHIN 15 FEET OF CONSTRUCTION ACTIVITIES AND AS INDICATED IN THE PLANS OR PER LOCAL AGENCY REQUIREMENTS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN UP, NOISE, DUST CONTROL, STREET SWEEPING AND HOURS OF OPERATION IN ACCORDANCE WITH THE LOCAL CODES.
8. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BARRICADES, SIGNAGE, MARKINGS, LIGHTS AND OTHER TRAFFIC CONTROL DEVICES TO PROTECT THE WORK ZONE AND SAFELY MAINTAIN TRAFFIC PER AGENCY REQUIREMENTS AND IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF SIGNS AND SUPPORTS WITHIN THE WORK AREA, AS NECESSARY TO FACILITATE CONSTRUCTION. SIGNS SHALL BE PROTECTED OR STOCKPILED FOR REUSE AS SPECIFIED IN THE PLANS OR AS REQUIRED BY THE AGENCY HAVING JURISDICTION. THE CONTRACTOR SHALL REPLACE ANY DAMAGED SIGNS AND SUPPORTS AT NO ADDITIONAL COST TO OWNER.
10. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANIES TO CONFIRM THAT UTILITY LEADS HAVE BEEN TAKEN OUT OF SERVICE PRIOR TO DEMOLITION.
11. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE 811/ONE CALL UTILITY LOCATING CENTER, PRIVATE UTILITY LOCATOR, THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
12. CONTRACTOR SHALL REFER TO THE "REPORT ON GEOTECHNICAL PAVEMENT INVESTIGATION" PREPARED BY G2 CONSULTING GROUP DATED 09/23/2024
13. TOPSOIL REMOVED DURING DEMOLITION DEMOLITION/MASS GRADING OPERATIONS AS DEEMED ACCEPTABLE BY ENGINEER, 3RD PARTY TESTING COMPANY, AND/OR OWNER TO BE STOCKPILED ON SITE AND REUSED FOR RESTORATION AREAS.

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.

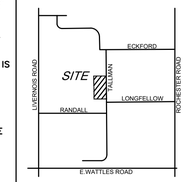
PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN — ROBERT SCOTT KOCHON — License No. 6201046143 — REGISTERED PROFESSIONAL ENGINEER

NORTH
0 15 30 60
SCALE: 1" = 30'

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS MADE OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
TSD BUILDING AND GROUNDS
1140 RANKIN
TROY, MICHIGAN 48083

PROJECT TITLE
LEONARD ELEMENTARY SCHOOL
4401 TALLMAN DRIVE
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
TOPOGRAPHIC SURVEY AND DEMOLITION PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-1.3

S:\PROJECTS\2024\24-0963 2025 TSD SITE IMPROVEMENTS\PWCS_CONSTRUCTION\2_LEONARD\C-1.3(TOPO DEMO 24-0963.dwg

REFERENCE DRAWINGS:
TOPOGRAPHIC SURVEY, LEONARD ELEMENTARY SCHOOL, PEA JOB NO. 2022-1281, DATED 11/10/2022

ALT #2:

REMOVE CONCRETE WALK	2,207 S.F.
REMOVE VEGETATION, TOPSOIL, AND SUBGRADE	1,543 S.F.

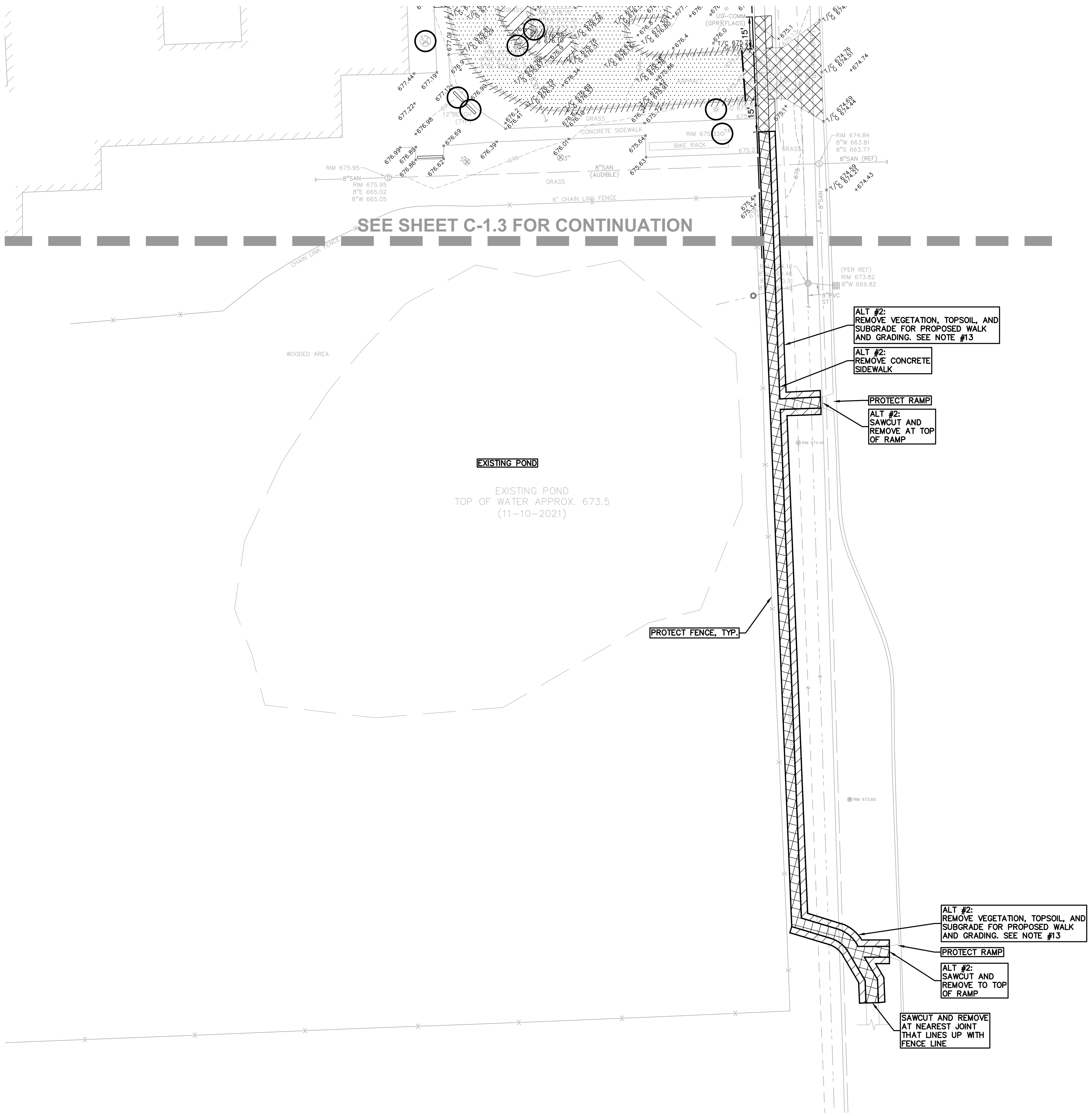
LEGAL DESCRIPTION:
PARCEL ID 20-15-326-001
Land in the City of Troy, Oakland County County, Michigan, described as follows:

T2N, R11E, SEC 15 E 60 FT OF S 448.03 FT OF NW 1/4, ALSO PART OF SW 1/4 BEG AT CEN OF SEC, TH S 00-42-10 W 400 FT, TH N 89-27-25 W 1261.80 FT, TH NELY ALG CEN LINE OF STURGIS DRAIN 411 FT MORE OR LESS TO E & W 1/4 LINE, TH S 89-27-25 E 1166.90 FT TO BEG EXC PART OF NW 1/4, ALSO PART OF NE 1/4 OF SW 1/4 BEG AT CEN OF SEC, TH N 00-32-35 E 448.03 FT, TH N 89-27-25 W 60 FT, TH S 00-32-35 W 448.03 FT, TH S 00-42-10 W 400 FT, TH S 89-27-25 E 60 FT, TH N 00-42-10 W ALG N & S 1/4 LINE TO BEG 11.72 A

BENCHMARKS:
(GPS DERIVED - NAVD88)

BM #300
ARROW ON FLANGE OF A HYDRANT LOCATED ON THE WEST SIDE OF TALLMAN DRIVE, ACROSS FROM NORTH SIDE OF THURBER DRIVE.
ELEV. - 677.86

BM #301
(PER PEA JOB NO. 2022-1281)
ARROW ON A HYDRANT LOCATED ON THE EAST SIDE OF THE BACK NORTH PARKING LOT, APPROX. 152' NORTHEAST FROM THE NORTHWEST BUILDING CORNER.
ELEV. - 680.91



GENERAL DEMOLITION NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT:

1. ALL MATERIAL TO BE REMOVED, WHETHER SPECIFICALLY NOTED IN THE PLANS OR NOT, SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AND DISPOSED OF OFF-SITE IN A LEGAL MANNER. NO ON-SITE BURY OR BURN PITS SHALL BE ALLOWED.
2. ALL DEMOLITION WORK SHALL CONFORM TO ALL LOCAL CODES AND ORDINANCES.
3. STAGING/PHASING OF DEMOLITION AND CONSTRUCTION IS TO BE COORDINATED WITH THE OWNER AND THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. SPECIFIC DEMOLITION ITEMS HAVE BEEN INDICATED ON THE PLANS AS A GUIDE TO THE GENERAL SCOPE OF THE WORK. IT IS INTENDED THAT THESE ITEMS SHALL BE COMPLETELY REMOVED BY THE CONTRACTOR ABOVE AND BELOW GROUND, UNLESS SPECIFICALLY NOTED OTHERWISE, AND THAT DEMOLITION WILL INCLUDE BUT WILL NOT NECESSARILY BE LIMITED TO THESE ITEMS. CONTRACTOR SHALL VISIT SITE TO VERIFY EXISTING CONDITIONS AND EXTENTS OF THE DEMOLITION THAT WILL BE REQUIRED PRIOR TO SUBMITTING A BID.
5. REMOVE ALL STRUCTURES DESIGNATED FOR REMOVAL ACCORDING TO THE DEMOLITION PLAN. THIS INCLUDES FOUNDATIONS, CONCRETE, ASPHALT, TREES, ETC.
6. THE CONTRACTOR SHALL, AS A MINIMUM, PROVIDE TREE PROTECTION FENCING AROUND EXISTING TREES TO BE SAVED THAT ARE WITHIN 15 FEET OF CONSTRUCTION ACTIVITIES AND AS INDICATED IN THE PLANS OR PER LOCAL AGENCY REQUIREMENTS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN UP, NOISE, DUST CONTROL, STREET SWEEPING AND HOURS OF OPERATION IN ACCORDANCE WITH THE LOCAL CODES.
8. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BARRICADES, SIGNAGE, MARKINGS, LIGHTS AND OTHER TRAFFIC CONTROL DEVICES TO PROTECT THE WORK ZONE AND SAFELY MAINTAIN TRAFFIC PER AGENCY REQUIREMENTS AND IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF SIGNS AND SUPPORTS WITHIN THE WORK AREA, AS NECESSARY TO FACILITATE CONSTRUCTION. SIGNS SHALL BE PROTECTED OR STOCKPILED FOR REUSE AS SPECIFIED IN THE PLANS OR AS REQUIRED BY THE AGENCY HAVING JURISDICTION. THE CONTRACTOR SHALL REPLACE ANY DAMAGED SIGNS AND SUPPORTS AT NO ADDITIONAL COST TO OWNER.
10. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANIES TO CONFIRM THAT UTILITY LEADS HAVE BEEN TAKEN OUT OF SERVICE PRIOR TO DEMOLITION.
11. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE 811/ONE CALL UTILITY LOCATING CENTER, PRIVATE UTILITY LOCATOR, THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
12. CONTRACTOR SHALL REFER TO THE "REPORT ON GEOTECHNICAL PAVEMENT INVESTIGATION" PREPARED BY G2 CONSULTING GROUP DATED 09/23/2024
13. TOPSOIL REMOVED DURING DEMOLITION DEMOLITION/MASS GRADING OPERATIONS AS DEEMED ACCEPTABLE BY ENGINEER, 3RD PARTY TESTING COMPANY, AND/OR OWNER TO BE STOCKPILED ON SITE AND REUSED FOR RESTORATION AREAS.

LEGEND:
- EX. OH. ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC,MANHOLE & METER
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT, MANHOLE & CULVERT
- EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
- EX. YARD DRAIN, ROOF DRAIN & DOWNSPOUT
- EX. UNIDENTIFIED STRUCTURE
- EX. MAILBOX, SIGN & GUARD POST
- EX. LIGHT POLE & YARD LIGHT
- EX. FENCE
- EX. GUARD RAIL
- EX. DEC. TREE, CONIFEROUS TREE & SHRUB
- EX. TREE TAG, & TREE LINE
- EX. SPOT ELEVATION
- EX. CONTOUR
- IRON FOUND / SET
- NAIL FOUND / NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND / SET
- SECTION CORNER FOUND
- (R) (M) (C) RECORDED / MEASURED / CALCULATED

DEMOLITION LEGEND:
- ITEM TO BE PROTECTED
- ITEM TO BE REMOVED
- CURB/FENCE REMOVAL
- CONCRETE PAVEMENT AND SIDEWALK REMOVAL
- AREA OR ITEMS TO BE REMOVED
- UTILITY REMOVAL
- ABANDON UTILITY
- ASPHALT REMOVAL
- TREE REMOVAL
- SAWCUT LINE
- ALLOWANCE AREA

PEA GROUP
t: 844.813.2949
www.peagroup.com

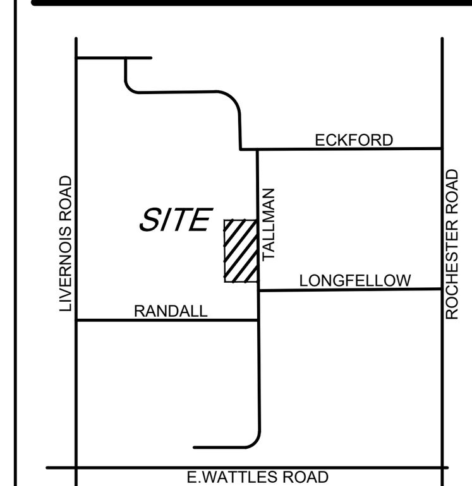
STATE OF MICHIGAN
ROBERT SCOTT ROCHON
License No. 6201046143
LICENSED PROFESSIONAL ENGINEER

NORTH

0 15 30 60
SCALE: 1" = 30'

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
TSD BUILDING AND GROUNDS
1140 RANKIN
TROY, MICHIGAN 48083

PROJECT TITLE
LEONARD ELEMENTARY SCHOOL
4401 TALLMAN DRIVE
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
TOPOGRAPHIC SURVEY AND DEMOLITION PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-1.3 (A)

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.

PAVEMENT PREPARATION NOTES:

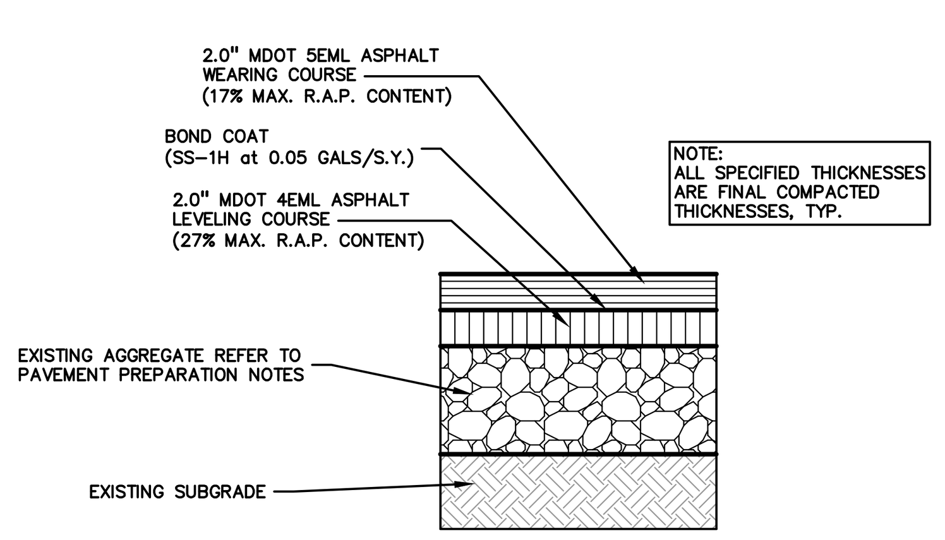
1. PAVEMENT PREPARATION SHALL FOLLOW THE PROCESS SUMMERIZED BELOW:
   1.1. REMOVE AND STOCKPILE THE EXISTING AGGREGATE BASE FOR RE-USE IN THE PAVEMENT OPERATION. EXCAVATE THE EXISTING BASE UP TO 2-INCHES ABOVE THE SUBGRADE TO REDUCE THE CHANCE FOR CONTAMINATION. ALL AGGREGATE 2 INCHES AND LESS ABOVE THE SUBGRADE IS TO BE REMOVED AND HAULED OFF WITH NEW AGGREGATE BEING PLACED BACK TO THE EXISTING ELEVATION AS PART OF THE SUBGRADE UNDERCUTING PAY ITEM.
   1.2. PROOFROLL EXISTING BASE AND SUBGRADE PER PLANS, SPECS, AND GEOTECH REPORT.
   1.3. DETERMINE AREAS THAT FAIL THE PROOFROLL. SUBGRADE UNDERCUTS SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
   1.4. TO MINIMIZE SUBGRADE INSTABILITY AND UNDERCUTS, THE SUBGRADE SHALL NOT BE LEFT EXPOSED TO PRECIPITATION AND CONSTRUCTION OPERATIONS AND SHOULD BE PERFORMED DURING THE SUMMER MONTHS TO ENSURE DRY, WARM, WEATHER. ADDITIONALLY, THE SUBGRADE MAY BECOME UNSTABLE UNDER REPEATED LOADING OF CONSTRUCTION TRAFFIC; THEREFORE, CONSTRUCTION EQUIPMENT SHOULD BE LIMITED ON THE EXPOSED SUBGRADE.
   1.5. BACKFILL THE INITIAL PORTION OF THE UNDERCUT WITH THE SALVAGED AGGREGATE BASE AND THEN COMPLETE THE BACKFILL PROCESS WITH IMPORTED MDOT 21AA CRUSHED LIMESTONE AGGREGATE PER THE PLANS, SPECS AND GEOTECH REPORT.
2. SUBGRADE UNDERCUT SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. UNDERCUT EXCAVATIONS SHALL BE BACKFILLED WITH MDOT 21AA DENSE GRADED AGGREGATE PLACED IN AN ENGINEERED MANNER. LIFT THICKNESS SHALL NOT EXCEED 9 INCHES. THE USE OF TRI-AXIAL GEOGRID MAY BE USED TO REDUCE UNDERCUT DEPTHS, AS APPROVED BY THE DISTRICT AND PER THE UNIT PRICE PROVIDED WITH THE CONTRACTORS BID.
3. ALL ENGINEERED FILL SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY DETERMINED BY THE MODIFIED PROCTOR (ASTM D1557) METHOD OF TESTING. ALL ENGINEERED FILL MATERIAL SHALL BE PLACED AND COMPACTED AT APPROXIMATELY THE OPTIMUM MOIUSTURE CONTENT. FROZEN MATERIAL SHALL NOT BE USED AS FILL, NOR SHOULD FILL BE PLACED ON A FROZEN SUBGRADE.
4. THE QUANTITY FOR "SUBGRADE UNDERCUT" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL VOLUME OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
5. SUBGRADE UNDERCUT DRAIN TILE SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
6. THE QUANTITY FOR "SUBGRADE UNDERCUT DRAIN TILE (4")" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL FOOTAGE OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
7. THE IMPORTING, ADDING, FINE GRADING AND COMPACTING ADDITIONAL PAVEMENT AGGREGATE BASE MATERIAL (MDOT 21AA CRUSHED LIMESTONE) REQUIRED TO ACHIEVE THE PROPOSED TOP OF BASE ELEVATIONS AND PRIOR TO PLACING THE ASPHALT PAVEMENT WILL BE EVALUATED BY A QULIFIED ENGINEERING TECHNICIAN TO DETERMINE THE VOLUME OF ADDITIONAL MATERIAL REQUIRED PER THE PROJECT PLANS.
8. THE QUANTITY FOR IMPORTING, ADDING, FINE GRADING AND COMPACTING ADDITIONAL PAVEMENT AGGREGATE BASE MATERIAL (MDOT 21AA CRUSHED LIMESTONE) REQUIRED TO ACHIEVE THE PROPOSED TOP OF BASE ELEVATIONS AND PRIOR TO PLACING THE ASPHALT PAVEMENT FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID AND THE EARTHWORK CALCULATIONS COMPLETED BY THE CONTRACTOR DURING THE BIDDING PROCESS. AS PART OF THE EARTHWORK CALCULATIONS, THE CONTRACTOR SHALL ASSUME THAT THE VOLUME OF 2" OF MATERIAL ACROSS THE ENTIRE AREA WILL BE REMOVED WITH THE PAVEMENT AND/OR CONSIDERED UN-USABLE BY THE QUALIFIED ENGINEERING TECHNICIAN AND NEED TO BE REPLACED WITH IMPORTED MDOT 21AA CRUSHED LIMESTONE.

AGGREGATE BASE NOTE:
THIS PAVEMENT SECTION DESIGN ASSUMES THE USE OF MDOT 21AA CRUSHED LIMESTONE BASE MATERIAL THAT MEETS THE REQUIREMENTS OF MDOT STANDARD SPECIFICATION SECTION 902 FOR AGGREGATES. IF CRUSHED CONCRETE AGGREGATE BASE IS PROPOSED IN LIEU OF THE SPECIFIED CRUSHED LIMESTONE MATERIAL, PEA GROUP WILL REQUIRE A MINIMUM 25% INCREASE IN BASE THICKNESS. HOWEVER, IF TESTING DOCUMENTATION IS PROVIDED TO PEA GROUP THAT SHOWS THAT THE CRUSHED CONCRETE MATERIAL MEETS ALL REQUIREMENTS OF MDOT SPECIFICATION SECTION 902, THEN THE 25% INCREASE IN THICKNESS MAY BE REEVALUATED.

ASPHALT MATERIAL NOTES:
HOT-MIX ASPHALT MIXTURES UTILIZING RECYCLED ASPHALT PAVEMENT (RAP) MUST MEET MDOT SPECIAL PROVISION 12SP501(E). THE BINDER GRADE FOR THIS WORK IS PG64-28. IF ASPHALT MIXES CONTAINING RAP ARE TO BE SUPPLIED FOR THIS PROJECT, THE ASPHALT BINDER MUST BE REVISED PER MDOT 'TIER 1' OR 'TIER 2' REQUIREMENTS (RAP CONTENT UP TO 27% MAXIMUM). TIER 3 MIXES ARE NOT ACCEPTABLE ON THIS PROJECT. AN ASPHALT MIX DESIGN FOR ALL SPECIFIED MIXES SHOULD BE FORWARDED TO PEA GROUP FOR REVIEW PRIOR TO CONSTRUCTION

ASPHALT MIX DESIGN CHART

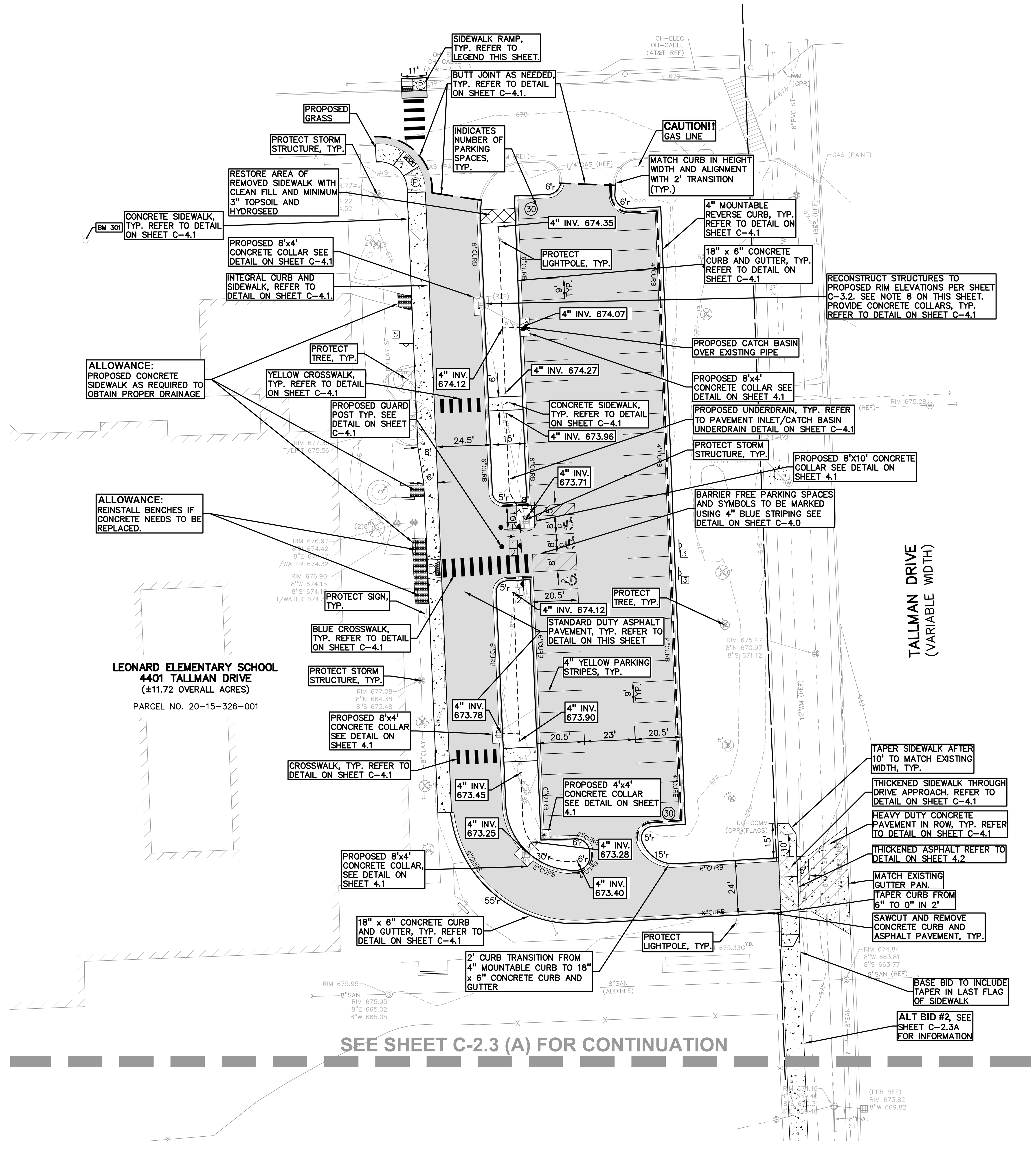
COMMERCIAL ADT 0–300	COMMERCIAL ADT 301–1000	COMMERCIAL ADT 1001–3400	COMMERCIAL ADT ≥3401	APPLICATION RATE (LB/YD²), MINIMUM – MAXIMUM	COURSE APPLICATION
2EL	2EML	2EMH	2EH	435–550	BASE
3EL	3EML	3EMH	3EH	330–410	BASE AND/OR LEVELING
4EL	4EML	4EMH	4EH	220–275	LEVELING AND/OR TOP
5EL	5EML	5EMH	5EH	165–220	TOP
PG 58-28	PG 64-28	PG 64-28	PG 70-28P		



STANDARD DUTY ASPHALT DETAIL
(NOT FOR USE IN THE RIGHT-OF-WAY) NOT TO SCALE

S:\PROJECTS\2024\24-0963 2025 TSD SITE IMPROVEMENTS\DWG\3_CONSTRUCTION\3_LEONARD\(C-2.3)ENGR-LEONARD 24-0963.dwg

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.



PAVING QUANTITIES:

18" CURB AND GUTTER	840 LF
4" MOUNTABLE CURB	335 LF
4" CONCRETE SIDEWALK	2,470 SF
CONCRETE COLLAR FOR CATCH BASIN	224 SF
4" ASPHALT PAVEMENT	26,680 SF
HEAVY DUTY CONCRETE PAVEMENT	736 SF
THICKENED SIDEWALK AT APPROACH	194 SF
BUTT JOINT	80 LF
UNDERCUT ALLOWANCE	246 CY
UNDERCUT DRAIN TILE (4") ALLOWANCE	325 LF

ENGINEERING QUANTITIES:

ADJUST/RECONSTRUCT STORM STRUCTURE	5 EA
4' CATCH BASIN OVER EXISTING PIPE	1 EA
4" HDPE PERF. UNDERDRAIN	300 LF

ALLOWANCE:

4" CONCRETE SIDEWALK	245 SF
REINSTALL BENCH	2 EA

LEGEND:

CONCRETE PAVEMENT (STD DUTY, HEAVY DUTY, R.O.W. ONLY)
ASPHALT PAVEMENT (STD DUTY, HEAVY DUTY, DEEP STRENGTH)
GRAVEL
WETLAND
CONCRETE CURB AND GUTTER
REVERSE GUTTER PAN
SETBACK LINE
SIGN
LIGHTPOLE
FENCE
GUARD RAIL

SIGN LEGEND:

'BARRIER FREE PARKING' SIGN	1
' VAN ACCESSIBLE' SIGN	2
'TRAVELING TEACHER' SIGN	3
'YEILD' SIGN	4
'NO PARKING STOPPING OR STANDING' SIGN	5

REFER TO DETAIL SHEET FOR SIGN DETAILS

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE P' (P)
SIDEWALK RAMP 'TYPE F' (F)
REFER TO DETAIL SHEET C-4.0 FOR STANDARD RAMP AND DETECTABLE WARNING DETAILS

NOTES:

1. CONTRACTOR TO VERIFY ALL QUANTITIES SHOWN ON THE PLANS. ANY DEVIATIONS TO THE PLAN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF THE SCHOOL DISTRICT AND PEA GROUP, IN WRITING PER THE BID PACKAGE, FOR VERIFICATION PRIOR TO BIDDING.
2. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, CENTER OF MANHOLE/CATCH BASIN UNLESS OTHERWISE NOTED.
3. DOWEL INTO EXISTING CURB AND GUTTER 9" WITH EPOXY COATED #4 BAR CONTINUOUS BETWEEN EXISTING AND PROPOSED CURBING.
4. REFER TO NOTES AND DETAIL SHEET FOR ON SITE PAVING DETAILS.
5. CONTRACTOR TO FIELD VERIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION INCLUDING BUT NOT LIMITED TO: SITE LIGHTING, FIBER LINES, ETC.
6. CONTRACTOR TO REMOVE AND REPLACE SIGNS AND POSTS PER DETAIL ON SHEET C-4.0. ALL SIGNS AND ANY POSTS IN GOOD CONDITION SHALL BE RETURNED TO THE OWNER. ALL POSTS DAMAGED OR OTHERWISE NOT IN A USABLE CONDITION SHALL BE DISPOSED OF AT NO ADDITIONAL COST TO THE OWNER.
7. FOR THE FIVE (5) CATCH BASINS LOCATED IN THE WORK AREA; BIDDERS ARE TO INCLUDE RECONSTRUCTION OF THESE STRUCTURES (GREATER THAN 12-INCHES IN DEPTH FROM THE RIM ELEVATION OF REPAIR WORK) IN THE BASE BID. THE SUCCESSFUL BIDDER WILL BE PAID FOR REPAIRING EACH STRUCTURE BASED ON THE ACTUAL DEPTH OF REPAIR WITH EITHER STRUCTURAL ADJUSTMENT (WITHIN TOP 12-INCHES OF RIM ELEVATION) OR STRUCTURAL RECONSTRUCTION (GREATER THAN 12-INCHES IN DEPTH) PER THE UNIT PRICES PROVIDED IN THE BID PACKAGE AND THE SCOPE OF WORK DETERMINED AND APPROVED PRIOR TO THE WORK COMMENCING. REPLASTERING OF THE ENTIRE STRUCTURE SHALL BE INCLUDED IN THE UNIT PRICE FOR BOTH STRUCTURAL ADJUSTMENT AND STRUCTURAL RECONSTRUCTION.
8. A THICKENED EDGE OF ASPHALT PER THE DETAIL ON SHEET C-4.1 OF THE PLANS SHALL BE LOCATED WHERE CALLED FOR IN THE PLAN. BIDDERS SHALL INCREASE THE QUANTITIES FOR THIS ITEM ACCORDINGLY IN THE BASE BID.
9. ALL PROPOSED ADA RAMPS SHALL HAVE TRUNCATED DOMES. PLASTIC OR METAL STYLE DOMES ARE BOTH ACCEPTABLE.
10. CONTRACTOR SHALL REFER TO THE "REPORT ON GEOTECHNICAL PAVEMENT INVESTIGATION" PREPARED BY G2 CONSULTING DATED 09/23/2024

PEA GROUP
t: 844.813.2949
www.peagroup.com

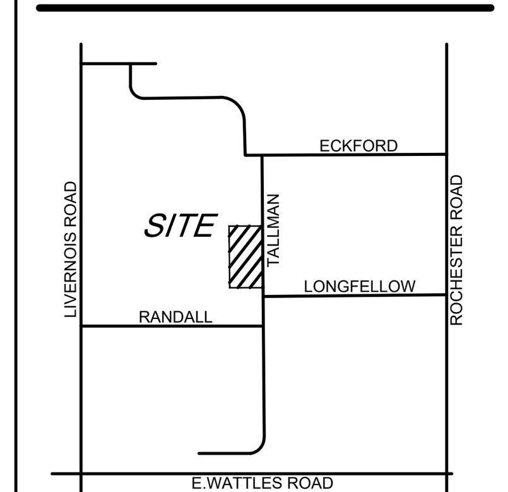
STATE OF MICHIGAN ROBERT SCOTT ROCHON LICENSED PROFESSIONAL ENGINEER License No. 6201046143

NORTH

SCALE: 1" = 30' (0 15 30 60)

Know what's below. Call before you dig. 811

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
TSD BUILDING AND GROUNDS
1140 RANKIN
TROY, MICHIGAN 48083

PROJECT TITLE
LEONARD ELEMENTARY SCHOOL
4401 TALLMAN DRIVE
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
ENGINEERING PLAN

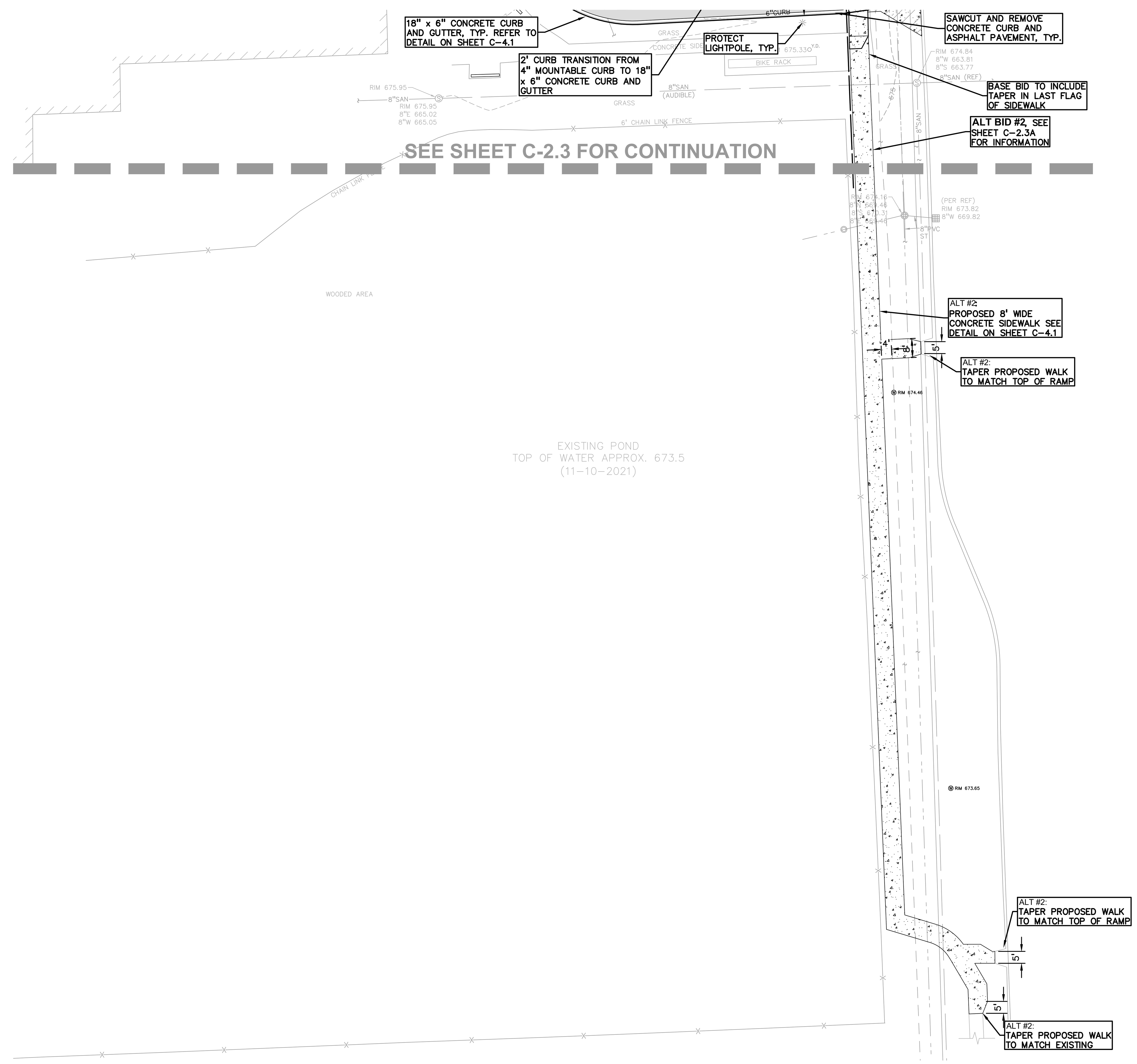
PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-2.3

PAVEMENT PREPARATION NOTES:

1. PAVEMENT PREPARATION SHALL FOLLOW THE PROCESS SUMMERIZED BELOW:
   - 1.1. REMOVE AND STOCKPILE THE EXISTING AGGREGATE BASE FOR RE-USE IN THE PAVEMENT OPERATION. EXCAVATE THE EXISTING BASE UP TO 2-INCHES ABOVE THE SUBGRADE TO REDUCE THE CHANCE FOR CONTAMINATION. ALL AGGREGATE 2 INCHES AND LESS ABOVE THE SUBGRADE IS TO BE REMOVED AND HAULED OFF WITH NEW AGGREGATE BEING PLACED BACK TO THE EXISTING ELEVATION AS PART OF THE SUBGRADE UNDERCUTING PAY ITEM.
   - 1.2. PROOFROLL EXISTING BASE AND SUBGRADE PER PLANS, SPECS, AND GEOTECH REPORT.
   - 1.3. DETERMINE AREAS THAT FAIL THE PROOFROLL. SUBGRADE UNDERCUTS SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
   - 1.4. TO MINIMIZE SUBGRADE INSTABILITY AND UNDERCUTS, THE SUBGRADE SHALL NOT BE LEFT EXPOSED TO PRECIPITATION AND CONSTRUCTION OPERATIONS AND SHOULD BE PERFORMED DURING THE SUMMER MONTHS TO ENSURE DRY, WARM, WEATHER. ADDITIONALLY, THE SUBGRADE MAY BECOME UNSTABLE UNDER REPEATED LOADING OF CONSTRUCTION TRAFFIC; THEREFORE, CONSTRUCTION EQUIPMENT SHOULD BE LIMITED ON THE EXPOSED SUBGRADE.
   - 1.5. BACKFILL THE INITIAL PORTION OF THE UNDERCUT WITH THE SALVAGED AGGREGATE BASE AND THEN COMPLETE THE BACKFILL PROCESS WITH IMPORTED MDOT 21AA CRUSHED LIMESTONE AGGREGATE PER THE PLANS, SPECS AND GEOTECH REPORT.
2. SUBGRADE UNDERCUT SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. UNDERCUT EXCAVATIONS SHALL BE BACKFILLED WITH MDOT 21AA DENSE GRADED AGGREGATE PLACED IN AN ENGINEERED MANNER. LIFT THICKNESS SHALL NOT EXCEED 9 INCHES. THE USE OF TRI-AXIAL GEOGRID MAY BE USED TO REDUCE UNDERCUT DEPTHS, AS APPROVED BY THE DISTRICT AND PER THE UNIT PRICE PROVIDED WITH THE CONTRACTORS BID.
3. ALL ENGINEERED FILL SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY DETERMINED BY THE MODIFIED PROCTOR (ASTM D1557) METHOD OF TESTING. ALL ENGINEERED FILL MATERIAL SHALL BE PLACED AND COMPACTED AT APPROXIMATELY THE OPTIMUM MOIUSTURE CONTENT. FROZEN MATERIAL SHALL NOT BE USED AS FILL, NOR SHOULD FILL BE PLACED ON A FROZEN SUBGRADE.
4. THE QUANTITY FOR "SUBGRADE UNDERCUT" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL VOLUME OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
5. SUBGRADE UNDERCUT DRAIN TILE SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
6. THE QUANTITY FOR "SUBGRADE UNDERCUT DRAIN TILE (4")" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL FOOTAGE OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
7. THE IMPORTING, ADDING, FINE GRADING AND COMPACTING ADDITIONAL PAVEMENT AGGREGATE BASE MATERIAL (MDOT 21AA CRUSHED LIMESTONE) REQUIRED TO ACHIEVE THE PROPOSED TOP OF BASE ELEVATIONS AND PRIOR TO PLACING THE ASPHALT PAVEMENT WILL BE EVALUATED BY A QULIFIED ENGINEERING TECHNICIAN TO DETERMINE THE VOLUME OF ADDITIONAL MATERIAL REQUIRED PER THE PROJECT PLANS.
8. THE QUANTITY FOR "ADD AGGREGATE TO EXISTING BASE" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL VOLUME OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.



ALT BID #2:	
4" CONCRETE SIDEWALK	3,614 SF

LEGEND:

- STD DUTY / HEAVY DUTY / R.O.W. ONLY — CONCRETE PAVEMENT
- STD DUTY / HEAVY DUTY / DEEP STRENGTH — ASPHALT PAVEMENT
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

SIGN LEGEND:

- 'BARRIER FREE PARKING' SIGN — 1
- ' VAN ACCESSIBLE' SIGN — 2
- 'BUS DROP OFF-NO PARKING' SIGN — 3
- 'YEILD' SIGN — 4
- 'NO PARKING STOPPING OR STACKING' SIGN — 5

REFER TO DETAIL SHEET FOR SIGN DETAILS

SIDEWALK RAMP LEGEND:

- SIDEWALK RAMP 'TYPE P' — (P)
- SIDEWALK RAMP 'TYPE F' — (F)
- SIDEWALK RAMP 'TYPE M' — (M)

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

NOTES:

1. CONTRACTOR TO VERIFY ALL QUANTITIES SHOWN ON THE PLANS. ANY DEVIATIONS TO THE PLAN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF THE SCHOOL DISTRICT AND PEA GROUP, IN WRITING PER THE BID PACKAGE, FOR VERIFICATION PRIOR TO BIDDING.
2. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, CENTER OF MANHOLE/CATCH BASIN UNLESS OTHERWISE NOTED.
3. REFER TO NOTES AND DETAIL SHEET FOR ON SITE PAVING DETAILS.
4. CONTRACTOR TO FIELD VERIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION INCLUDING BUT NOT LIMITED TO: SITE LIGHTING, FIBER LINES, ETC.

PEA GROUP
t: 844.813.2949
www.peagroup.com

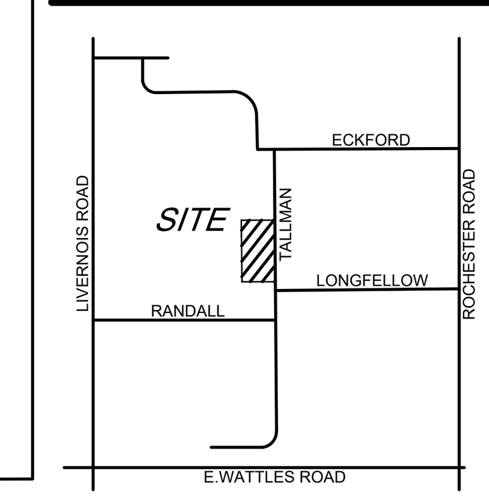
STATE OF MICHIGAN — ROBERT SCOTT ROCHON — License No. 6201046143 — LICENSED PROFESSIONAL ENGINEER

NORTH

0 15 30 60
SCALE: 1" = 30'

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
TSD BUILDING AND GROUNDS
1140 RANKIN
TROY, MICHIGAN 48083

PROJECT TITLE
LEONARD ELEMENTARY SCHOOL
4401 TALLMAN DRIVE
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

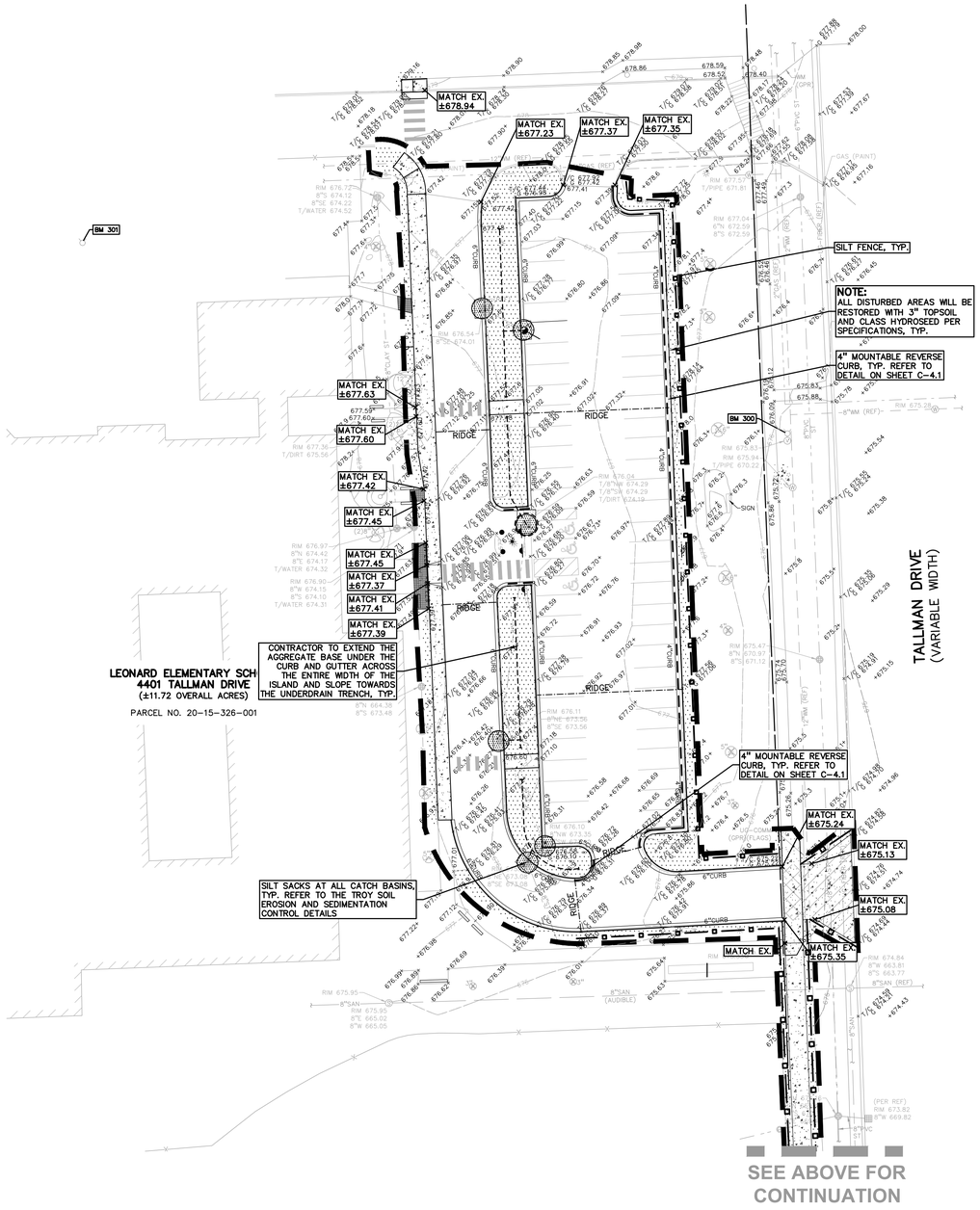
REVISIONS

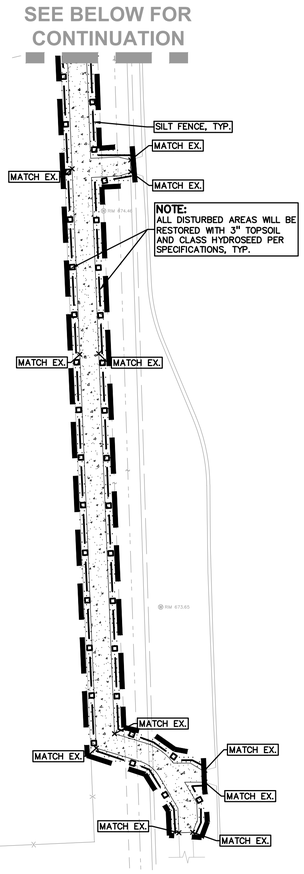
ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
ENGINEERING PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-2.3 (A)





FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.

EROSION CONTROL QUANTITIES:

SILT FENCE	483 L.F.
SILT SACK	6 EA.
LAWN RESTORATION	790 S.Y.

ALT BID #2:

SILT FENCE	900 L.F.
LAWN RESTORATION	294 S.Y.

GENERAL SITE CONDITIONS:

1. ACCORDING TO THE GEOTECHNICAL INVESTIGATION BY G2 CONSULTING GROUP, LLC DATED SEPTEMBER 23, 2024, THE SITE CONSISTS OF THE FOLLOWING SOIL TYPES:
   SILTY CLAY FILL WITH ORGANIC MATERIAL
2. TOTAL DISTURBED AREA = ±1.2 ACRES
3. N.P.D.E.S. NOTICE OF COVERAGE IS NOT REQUIRED
4. NEAREST WATER COURSE: STURGIS DRAIN LOCATED ±530 FEET WEST OF THE SITE

SYMBOLS: EROSION CONTROL:

(SP-2) SILT FENCE
(SI-2A) LOW POINT INLET FILTER
LAWN RESTORATION AREA

REFER TO THE TROY SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL DEVICE DETAILS.

EARTHWORK BALANCING NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPORTING OR EXPORTING ALL MATERIALS AS REQUIRED TO PROPERLY GRADE THIS PROJECT TO THE FINISHED ELEVATIONS SHOWN ON THE APPROVED PLANS. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION OF CUT AND FILL QUANTITIES AND ALLOW FOR REMOVAL OF EXCESS OR IMPORTATION OF ADDITIONAL MATERIAL AT NO ADDITIONAL COST TO THE OWNER.

SOIL EROSION MAINTENANCE SCHEDULE AND NOTES:

1. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT BY:
   ROB CARSON
   TROY SCHOOL DISTRICT
   1140 RANKIN
   TROY, OAKLAND COUNTY, MICHIGAN
   248-823-4067
2. IF ANY DAMAGE HAS OCCURRED AS A RESULT OF STORM WATER DISCHARGE FROM THE SITE, THE FOLLOWING STEPS SHALL BE IMPLEMENTED.
3. ANY DEBRIS OR DIRT ON ANY PAVED AREA RESULTING FROM CONSTRUCTION TRAFFIC SHALL BE CLEANED IN A PROMPT MANNER BY THE CONTRACTOR. THE CONSTRUCTION DRIVE SHALL BE CLEANED AT THE END OF EACH DAY.
4. ALL DIRT AND MUD TRACKED ONTO PAVED AREAS SHALL BE REMOVED BY THE CONTRACTOR DAILY BY SCRAPING. STREET SWEEPING IS REQUIRED WEEKLY.
5. SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT UP SEDIMENT WHEN THE SEDIMENT HEIGHT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR REBACKFILL THE SILTATION FENCE SHOULD IT FALL OR BE DAMAGED DURING CONSTRUCTION.
6. INLET FILTER MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY ACCUMULATED SILT OR OTHER DEBRIS. THE REMOVAL OF SILT SHOULD BE WITH THE USE OF A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTERS CAN NOT BE CLEANED OR ARE DAMAGED, THEN THE FABRIC MUST BE REPLACED.
7. CONTRACTOR TO PROVIDE WATER TRUCK TO WATER DOWN THE SITE ON A DAILY BASIS AS REQUIRED TO MAINTAIN DUST CONTROL.
8. IF HIGH GROUNDWATER IS ANTICIPATED OR ENCOUNTERED DURING CONSTRUCTION A DEWATERING PLAN MUST BE SUBMITTED TO THE CITY ENGINEERING DIVISION FOR REVIEW.

NOTE:

1. PER THE 'SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION' NOTES THE SUCCESSFUL BIDDER TO THE CLEAN THE STORM SEWER. THIS CLEANING SHALL INCLUDE CLEANING OUT THE STRUCTURES AND ENTIRE SEWER RUNS BETWEEN STRUCTURES USING HYDRAULICALLY PROPELLED, HIGH-VELOCITY JET, OR MECHANICALLY POWERED EQUIPMENT. SELECTION OF THE EQUIPMENT USED SHALL BE BASED ON THE CONDITIONS OF LINES AT THE TIME THE WORK COMMENCES. THE EQUIPMENT AND METHODS SELECTED SHALL BE SATISFACTORY TO THE SCHOOL DISTRICT'S REPRESENTATIVE. THE EQUIPMENT SHALL BE CAPABLE OF REMOVING DIRT, GREASE, ROCKS, SAND, AND OTHER MATERIALS AND OBSTRUCTIONS FROM THE SEWER LINES AND MANHOLES. IF CLEANING OF AN ENTIRE SECTION CANNOT BE SUCCESSFULLY PERFORMED FROM ONE MANHOLE, THE EQUIPMENT SHALL BE SET UP ON THE OTHER MANHOLE AND CLEANING AGAIN ATTEMPTED. IF, AGAIN, SUCCESSFUL CLEANING CANNOT BE PERFORMED OR THE EQUIPMENT FAILS TO TRAVERSE THE ENTIRE MANHOLE SECTION, IT WILL BE ASSUMED THAT A MAJOR BLOCKAGE EXISTS AND THE CLEANING EFFORT SHALL BE ABANDONED.
2. PER THE PROJECT SPECIFICATIONS: PRIOR TO THE PLACEMENT OF TOPSOIL THE SUCCESSFUL BIDDER TO SCHEDULE AN INSPECTION BY THE SCHOOL DISTRICT OR PEA GROUP TO CONFIRM THAT THE GRADE IS AT THE PROPER ELEVATION WHERE THE MINIMUM DEPTH OF TOPSOIL CAN BE PLACED THROUGHOUT THE AREA.
3. CONTRACTOR TO FIELD VERIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION INCLUDING BUT NOT LIMITED TO: SITE LIGHTING, FIBER LINES, ETC.

SEQUENCE OF CONSTRUCTION:

START DAY	END DAY	
1	2	INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES, SILT FENCES, INLET PROTECTION, ETC. AS NECESSARY.
1	90	MAINTAIN A 25' BUFFER OF VEGETATION AROUND PERIMETER OF SITE WHERE POSSIBLE.
1	5	STRIP AND STOCKPILE TOPSOIL AS REQUIRED RESTORATION. ALL STOCKPILES MUST BE GRADED AND SEEDED.
5	15	REMOVE ALL PAVEMENT, CURB, UTILITIES, ETC. AS REQUIRED TO INSTALL THE PROPOSED WORK AS SHOWN ON THE TOPOGRAPHIC SURVEY AND DEMOLITION PLAN.
10	15	DISPOSE OF ALL EXCESS/UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO ON-SITE BURN OR BURY PITS ALLOWED.
30	40	ROUGH GRADE SITE. SEED AND MULCH BLANKETS MUST BE INSTALLED AS SHOWN WITHIN 5 DAYS OF FINAL GRADE. REPAIR AND/OR RE-INSTALL ANY TEMPORARY SOIL EROSION CONTROL MEASURES THAT WERE DAMAGED DURING GRADING OPERATIONS.
15	90	TEMPORARY SEEDING MUST BE PROVIDED IN AREAS NOT TO BE WORKED ON FOR 15 DAYS OR LONGER.
40	50	FINE GRADE SITE AND PREPARE FOR SITE PAVING OPERATIONS.
50	80	INSTALL ALL PAVEMENT, SIDEWALKS, CURBING AS PROPOSED. IF PERMANENT LANDSCAPING IS NOT TO BE INSTALLED SOON AFTER PAVING IS COMPLETE, ALL AREAS WITHIN 20 FEET OF BACK OF CURB MUST BE TEMPORARILY SEEDED. REPAIR INLET PROTECTION, SILT FENCE AND ANY OTHER DAMAGED SOIL EROSION CONTROL MEASURES AS NECESSARY.
80	89	FINAL GRADE, REDISTRIBUTE STOCKPILED TOPSOIL, ESTABLISH VEGETATION AND INSTALL ALL PERMANENT LANDSCAPING IN ALL DISTURBED AREAS NOT BUILT.
88	90	CLEAN PAVEMENT AND REMOVE ALL TEMPORARY SOIL EROSION CONTROL MEASURES. RE-ESTABLISH VEGETATION AS REQUIRED.
90	90	REMOVE SEDIMENTATION CONTROLS ONCE ENTIRE SITE HAS BEEN PERMANENTLY STABILIZED.

GRADING LEGEND:

- 606.91 — EXISTING SPOT ELEVATION
- 622.50 — PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- 670 — EXISTING CONTOUR
- 922 — PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

T/C = TOP OF CURB	G = GUTTER GRADE
T/P = TOP OF PAVEMENT	FF = FINISH FLOOR
T/S = TOP OF SIDEWALK	FG = FINISH GRADE
T/W = TOP OF WALL	RIM = RIM ELEVATION
B/W = BOTTOM OF WALL	

REFER TO GRADING NOTES ON SHEET C-4.0.

SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION

1. SEE CITY OF TROY SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL SOIL EROSION CONTROL RELATED DETAILS.
2. PLACE SILT FENCE & INSTALL INLET FILTERS ON EXISTING STORM SEWER STRUCTURES, ACCORDING TO PLANS.
3. INSTALL TEMPORARY CRUSHED CONCRETE ACCESS DRIVE AT ALL CONSTRUCTION ENTRANCES. (80'x24'x8" W/MINIMUM OF 1"-3" CRUSHED CONCRETE - NO FINES).
4. REMOVE CURB, PAVEMENT, TREES, ETC. AS DIRECTED ON THE DEMOLITION PLAN.
5. STRIP AND STOCKPILE TOPSOIL FOR RESTORATION REQUIREMENTS.
6. DISPOSE OF ALL EXCESS, UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO BURN OR BURY PITS ALLOWED.
7. UNSUITABLE MATERIALS CONSIST OF, BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING: CONCRETE, ASPHALT, TREES, BRUSH, STUMPS, ROOTS, OR OTHER MISCELLANEOUS DEBRIS OR TRASH.
8. MASS GRADE THE SITE IN ACCORDANCE WITH THE PLANS.
9. INSTALL HYDROSEED AS SHOWN ON THE PLAN WITHIN 5 DAYS OF COMPLETION OF MASS GRADING OR WHENEVER DISTURBED AREAS WILL REMAIN UNCHANGED FOR 30 DAYS OR GREATER. MINIMUM 3"-4" TOPSOIL WILL BE USED WHERE VEGETATION IS REQUIRED.
10. COMPLETE ROUGH GRADING OF SITE. PLACE INLET FILTERS AT ALL INLETS AND CATCH BASINS, AS SHOWN.
11. FINISH GRADE AND PAVE SITE AS PROPOSED TO DRAIN TO STORM SEWER SYSTEM. REPAIR INLET FILTERS AS REQUIRED.
12. APPLY TOPSOIL, HYDROSEED TO ALL DISTURBED AREAS UPON COMPLETION OF GRADING. THE CONTRACTOR SHALL STAGE CONSTRUCTION ACTIVITIES IN ORDER TO MINIMIZE THE EXPOSURE OF UNSTABILIZED AREAS.
13. CLEAN PAVEMENT AND STORM SEWERS. REMOVE SILT FENCE AND TREE PROTECTION FENCE, AND INLET FILTERS ONCE VEGETATION HAS BEEN ESTABLISHED.
14. ALL DIRT AND MUD TRACKED ONTO PUBLIC ROADS SHALL BE REMOVED DAILY.
15. INLETS/CATCH BASINS TO BE CLEANED AFTER WEARING COARSE OF ASPHALT AND STRIPING HAS BEEN PLACED

PEA GROUP
t: 844.813.2949
www.peagroup.com

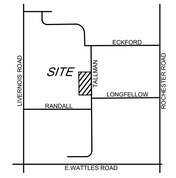
STATE OF MICHIGAN — ROBERT SCOTT KOCHON — License No. 6201046143 — REGISTERED PROFESSIONAL ENGINEER

NORTH

0 15 30 60
SCALE: 1" = 30'

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE AND NOT NECESSARILY COMPLETE OR ACCURATE OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
TSD BUILDING AND GROUNDS
1140 RANKIN
TROY, MICHIGAN 48083

PROJECT TITLE
LEONARD ELEMENTARY SCHOOL
4401 TALLMAN DRIVE
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

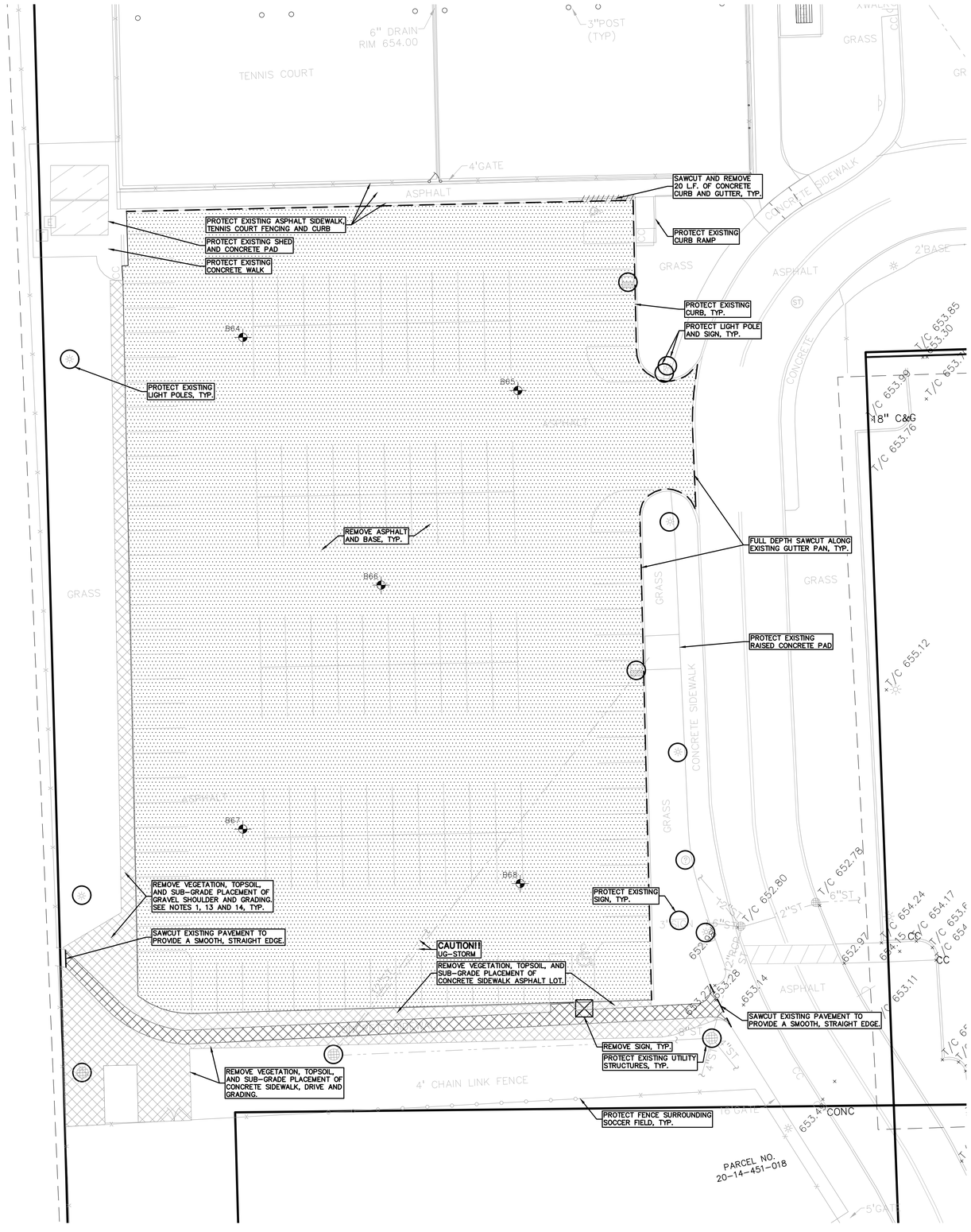
REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
GRADING AND SOIL EROSION PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-3.3



FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.

S:\PROJECTS\2024\24-0963 2025 TSD SITE IMPROVEMENTS\DWG\3_CONSTRUCTION\4_ATHENS\C-1-1(TPO) DEMO-ATHENS-24-0963.dwg

GENERAL DEMOLITION NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT:

1. ALL MATERIAL TO BE REMOVED, WHETHER SPECIFICALLY NOTED IN THE PLANS OR NOT, SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AND DISPOSED OF OFF-SITE IN A LEGAL MANNER. NO ON-SITE BURY OR BURN PITS SHALL BE ALLOWED.
2. ALL DEMOLITION WORK SHALL CONFORM TO ALL LOCAL CODES AND ORDINANCES.
3. STAGING/PHASING OF DEMOLITION AND CONSTRUCTION IS TO BE COORDINATED WITH THE OWNER AND THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. SPECIFIC DEMOLITION ITEMS HAVE BEEN INDICATED ON THE PLANS AS A GUIDE TO THE GENERAL SCOPE OF THE WORK. IT IS INTENDED THAT THESE ITEMS SHALL BE COMPLETELY REMOVED BY THE CONTRACTOR ABOVE AND BELOW GROUND, UNLESS SPECIFICALLY NOTED OTHERWISE, AND THAT DEMOLITION WILL INCLUDE BUT WILL NOT NECESSARILY BE LIMITED TO THESE ITEMS. CONTRACTOR SHALL VISIT SITE TO VERIFY EXISTING CONDITIONS AND EXTENTS OF THE DEMOLITION THAT WILL BE REQUIRED PRIOR TO SUBMITTING A BID.
5. REMOVE ALL STRUCTURES DESIGNATED FOR REMOVAL ACCORDING TO THE DEMOLITION PLAN. THIS INCLUDES FOUNDATIONS, FOOTINGS CONCRETE, ASPHALT, TREES, ETC.
6. THE CONTRACTOR SHALL, AS A MINIMUM, PROVIDE TREE PROTECTION FENCING AROUND EXISTING TREES TO BE SAVED THAT ARE WITHIN 15 FEET OF CONSTRUCTION ACTIVITIES AND AS INDICATED IN THE PLANS OR PER LOCAL AGENCY REQUIREMENTS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN UP, NOISE, DUST CONTROL, STREET SWEEPING AND HOURS OF OPERATION IN ACCORDANCE WITH THE LOCAL CODES.
8. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BARRICADES, SIGNAGE, MARKINGS, LIGHTS AND OTHER TRAFFIC CONTROL DEVICES TO PROTECT THE WORK ZONE AND SAFELY MAINTAIN TRAFFIC PER AGENCY REQUIREMENTS AND IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF SIGNS AND SUPPORTS WITHIN THE WORK AREA, AS NECESSARY TO FACILITATE CONSTRUCTION. SIGNS SHALL BE PROTECTED OR STOCKPILED FOR REUSE AS SPECIFIED IN THE PLANS OR AS REQUIRED BY THE AGENCY HAVING JURISDICTION. THE CONTRACTOR SHALL REPLACE ANY DAMAGED SIGNS AND SUPPORTS AT NO ADDITIONAL COST TO OWNER.
10. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANIES TO CONFIRM THAT UTILITY LEADS HAVE BEEN TAKEN OUT OF SERVICE PRIOR TO DEMOLITION.
11. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE 811/ONE CALL UTILITY LOCATING CENTER, PRIVATE UTILITY LOCATOR, THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
12. CONTRACTOR SHALL REFER TO THE "REPORT ON GEOTECHNICAL INVESTIGATION" PREPARED BY G2 CONSULTING GROUP DATED 11/7/2024
13. TOPSOIL REMOVED DURING DEMOLITION DEMOLITION/MASS GRADING OPERATIONS AS DEEMED ACCEPTABLE BY ENGINEER, 3RD PARTY TESTING COMPANY, AND/OR OWNER TO BE STOCKPILED ON SITE AND REUSED FOR RESTORATION AREAS.
14. EXISTING SUBGRADE REMOVED DEMOLITION/MASS GRADING OPERATIONS AS DEEMED ACCEPTABLE BY ENGINEER, 3RD PARTY TESTING COMPANY, AND/OR OWNER SHALL BE STOCKPILED ON SITE AND REUSED FOR GENERAL FILL AND/OR RE-GRADING OF THE POND.
15. ALL ITEMS TO BE SALVAGED, STOCKPILED AND REUSED BY THE OWNER SHALL BE STORED AT THE LOCATION COORDINATED WITH THE OWNER.

DEMOLITION QUANTITIES:

REMOVE ASPHALT AND BASE:	51,571 SF
REMOVE CONCRETE SIDEWALK:	1,207 SF
SAWCUT PAVEMENT:	535 LF
REMOVE SIGN AND POST:	1 EA
REMOVE VEGETATION, TOPSOIL, AND SUBGRADE:	4,498 SF
REMOVE CONCRETE CURB AND GUTTER:	20 LF

LEGEND:

- EX. OH, ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC,MANHOLE & METER
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT, MANHOLE & CULVERT
- EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
- EX. YARD DRAIN, ROOF DRAIN & DOWNSPOUT
- EX. UNIDENTIFIED STRUCTURE
- EX. MAILBOX, SIGN & GUARD POST
- EX. LIGHT POLE & YARD LIGHT
- EX. FENCE
- EX. GUARD RAIL
- EX. DEC. TREE, CONIFEROUS TREE & SHRUB
- EX. TREE TAG, & TREE LINE
- EX. SPOT ELEVATION
- EX. CONTOUR
- SOIL BORING
- IRON FOUND / SET
- NAIL FOUND / NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND / SET
- SECTION CORNER FOUND
- (R) (M) (C) RECORDED / MEASURED / CALCULATED

REFERENCE DRAWINGS:

PEA JOB NO. 2012-144

WATER MAIN	CITY OF TROY MAP, EMAIL DATED 09/08/2023
SANITARY SEWER	CITY OF TROY MAP, EMAIL DATED 09/08/2023
STORM SEWER	CITY OF TROY MAP, EMAIL DATED 09/08/2023
FIBER OPTIC	FIBER LINK MAP, EMAIL DATED 9/11/2023
ELECTRIC	HAVE NOT RECEIVED MAP AS OF 09/13/2023

BENCHMARKS:

(GPS DERIVED - NAVD88)

BM #300
SOUTHEAST ANCHOR BOLT ON A LIGHT POLE LOCATED WEST OF THE SCHOOL IN THE PARKING LOT, FIRST POLE NORTH OF CHERRY AVENUE..
ELEV. - 671.54

BM #301
BENCH TIE IN THE NORTH FACE OF A UTILITY POLE LOCATED AT THE SOUTHWEST CORNER OF CHERRY AVENUE & ROBINWOOD DRIVE.
ELEV. - 667.56

DEMOLITION LEGEND:

- ITEM TO BE PROTECTED
- ITEM TO BE REMOVED
- CURB/FENCE REMOVAL
- CONCRETE PAVEMENT AND SIDEWALK REMOVAL
- AREA OR ITEMS TO BE REMOVED
- UTILITY REMOVAL
- ABANDON UTILITY
- ASPHALT REMOVAL
- TREE REMOVAL
- SAWCUT LINE

PEA GROUP
t: 844.813.2949
www.peagroup.com

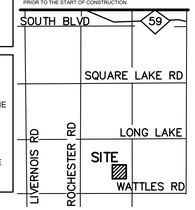
STATE OF MICHIGAN
ROBERT SCOTT KOCION
License No. 6201046143
REGISTERED PROFESSIONAL ENGINEER

NORTH

0 10 20 40
SCALE: 1" = 20'

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE LOCATIONS AND ARE NOT WARRANTEED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
TSD BUILDING AND GROUNDS
1140 RANKIN
TROY, MICHIGAN 48083

PROJECT TITLE
ATHENS HIGH SCHOOL
4333 JOHN R. ROAD
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

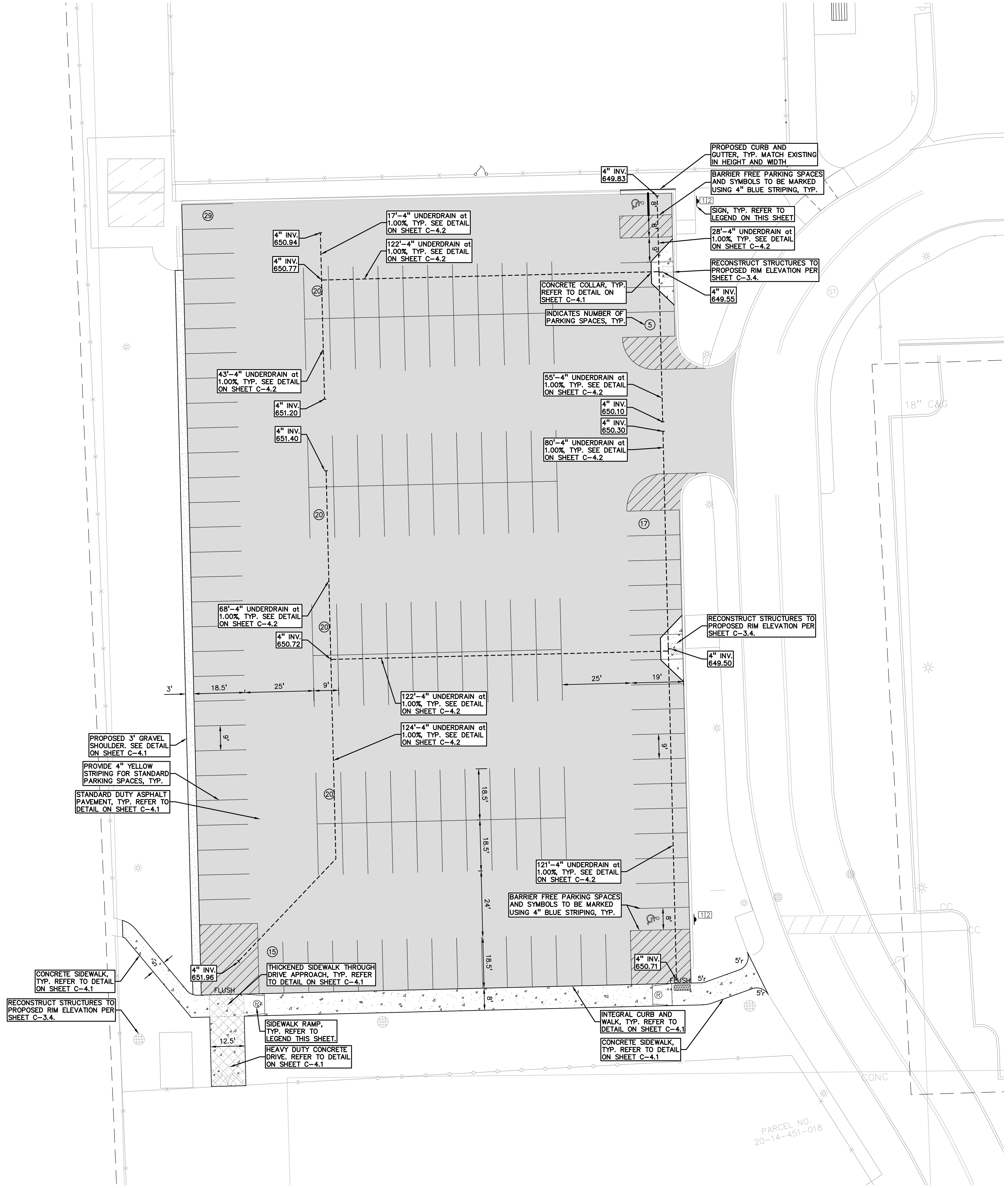
REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
TOPOGRAPHIC SURVEY AND DEMOLITION PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	CR
DES.	JW

DRAWING NUMBER:
C-1.4



FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.

UTILITY LEGEND:

- EX. OH. ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC,MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND, & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- PROPOSED WATER MAIN
- PROPOSED HYDRANT AND GATE VALVE
- PROPOSED TAPPING SLEEVE, VALVE & WELL
- PROPOSED POST INDICATOR VALVE
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY CLEANOUT & MANHOLE
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER CLEANOUT & MANHOLE
- PROPOSED CATCH BASIN, INLET & YARD DRAIN

PAVING QUANTITIES:	
4" ASPHALT PAVEMENT	51,675 S.F.
8" CONCRETE PAVEMENT	415 S.F.
CONCRETE SIDEWALK	1,762 S.F.
CONCRETE COLLARS	256 S.F.
GRAVEL	788 S.F.
ENGINEERING QUANTITIES:	
ADJUST/RECONSTRUCT STORM STRUCTURE	3 EA.
4" HDPE SUBGRADE UNDERDRAIN	780 L.F.
ALLOWANCE:	
SUBGRADE UNDERCUT	385 C.Y.
SUBGRADE UNDERCUT DRAIN TILE (4")	175 L.F.
IMPORTED 21AA CRUSHED LIMESTONE (CIP)	575 C.Y.

SIGN LEGEND:

'BARRIER FREE PARKING' SIGN 1

'VAN ACCESSIBLE' SIGN 2

REFER TO DETAIL SHEET FOR SIGN DETAILS

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R' Ⓡ

REFER TO DETAIL SHEET C-4.0 FOR STANDARD RAMP AND DETECTABLE WARNING DETAILS

NOTES:

1. CONTRACTOR TO VERIFY ALL QUANTITIES SHOWN ON THE PLANS. ANY DEVIATIONS TO THE PLAN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF THE SCHOOL DISTRICT AND PEA GROUP, IN WRITING PER THE BID PACKAGE, FOR VERIFICATION PRIOR TO BIDDING.
2. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, CENTER OF MANHOLE/CATCH BASIN UNLESS OTHERWISE NOTED.
3. DOWEL INTO EXISTING CURB AND GUTTER 9" WITH EPOXY COATED #4 BAR CONTINUOUS BETWEEN EXISTING AND PROPOSED CURBING.
4. CONTRACTOR TO FIELD VERIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION INCLUDING BUT NOT LIMITED TO: SITE LIGHTING, FIBER LINES, ETC.
5. REFER TO NOTES AND DETAIL SHEETS FOR ON SITE PAVING DETAILS.
6. CONTRACTOR TO REMOVE AND REPLACE SIGNS AND POSTS PER DETAILS ON SHEET C-4.0. ALL SIGNS AND ANY POSTS IN GOOD CONDITION SHALL BE RETURNED TO THE OWNER. ALL POSTED DAMAGED OR IN OTHERWISE POOR CONDITION, SHALL BE DISPOSED OF AT NO ADDITIONAL COST TO THE OWNER.
7. FOR THE THREE (3) CATCH BASINS IN THE WORK AREA; BIDDERS ARE TO INCLUDE RECONSTRUCTION OF THESE STRUCTURES (GREATER THAN 12-INCHES IN DEPTH FROM THE RIM ELEVATION OF REPAIR WORK) IN THE BASE BID. THE SUCCESSFUL BIDDER WILL BE PAID FOR REPAIRING EACH STRUCTURE BASED ON THE ACTUAL DEPTH OF REPAIR WITH EITHER STRUCTURAL ADJUSTMENT (WITHIN TOP 12-INCHES OF RIM ELEVATION) OR STRUCTURAL RECONSTRUCTION (GREATER THAN 12-INCHES IN DEPTH) PER THE UNIT PRICES PROVIDED IN THE BID PACKAGE AND THE SCOPE OF WORK DETERMINED AND APPROVED PRIOR TO THE WORK COMMENCING. REPLASTERING OF THE ENTIRE STRUCTURE SHALL BE INCLUDED IN THE UNIT PRICE FOR BOTH STRUCTURAL ADJUSTMENT AND STRUCTURAL RECONSTRUCTION.
8. A THICKENED EDGE OF ASPHALT PER THE DETAIL ON SHEET C-4.1 OF THE PLANS SHALL BE LOCATED WHERE CALLED FOR IN THE PLAN. BIDDERS SHALL INCREASE THE QUANTITIES FOR THIS ITEM ACCORDINGLY IN THE BASE BID.
9. ALL PROPOSED ADA RAMPS SHALL HAVE TRUNCATED DOMES. YELLOW PLASTIC OR METAL STYLE DOMES ARE BOTH ACCEPTABLE.
10. CONTRACTOR SHALL REFER TO THE "REPORT ON GEOTECHNICAL PAVEMENT INVESTIGATION" PREPARED BY G2 CONSULTING DATED 11/7/2024

LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

PAVEMENT PREPARATION NOTES:

1. PAVEMENT PREPARATION SHALL FOLLOW THE PROCESS SUMMARIZED BELOW:
   1.1. AS PART OF THE PAVEMENT REMOVAL, REMOVE THE EXISTING PAVEMENT AND ANY AGGREGATE BASE REQUIRED FOR THE PROPOSED THICKNESS OF ASPHALT/CONCRETE PAVEMENT TO BE PLACED. ANY EXISTING BASE MATERIAL REMOVED TO ACHIEVE THIS ELEVATION WILL BE PART OF THE EARTHWORKS FOR THE PAVING OPERATION, WILL NOT BE PAID FOR SEPARATELY AND/OR CONSIDERED PART OF THE SUBGRADE UNDERCUTTING PAY ITEM AND WILL BE INCLUDED IN THE BASE BID OF THE WORK.
   1.2. ANY OF THE EXISTING AGGREGATE BASE REMOVED TO ACHIEVE THE THICKNESS OF THE PROPOSED PAVEMENT, AS DESCRIBED IN ITEM 1.1, AND DEEMED ACCEPTABLE BY A QUALIFIED ENGINEERING TECHNICIAN SHALL BE STOCKPILED FOR RE-USE IN THE PAVEMENT OPERATION. THIS INCLUDES ROUGHLY 129 CYDS OF AGGREGATE BEING REMOVED FROM THE UTILITY LOT PRIOR TO PLACING THE PROPOSED PAVEMENT IN THAT AREA.
   1.3. PROOF ROLL EXISTING BASE AND SUBGRADE PER PLANS, SPECIFICATIONS AND GEOTECHNICAL REPORT.
   1.4. DETERMINE AREAS THAT FAIL THE PROOF ROLL. SUBGRADE UNDERCUTS SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
   1.5. TO MINIMIZE SUBGRADE INSTABILITY AND UNDERCUTS, THE SUBGRADE SHALL NOT BE LEFT EXPOSED TO PRECIPITATION AND CONSTRUCTION OPERATIONS AND SHOULD BE PERFORMED DURING THE SUMMER MONTHS TO ENSURE DRY, WARM, WEATHER. ADDITIONALLY, THE SUBGRADE MAY BECOME UNSTABLE UNDER REPEATED LOADING OF CONSTRUCTION TRAFFIC; THEREFORE, CONSTRUCTION EQUIPMENT SHOULD BE LIMITED ON THE EXPOSED SUBGRADE.
   1.6. BACKFILL THE INITIAL PORTION OF THE UNDERCUT WITH THE SALVAGED AGGREGATE BASE AND THEN COMPLETE THE BACKFILL PROCESS WITH IMPORTED MDOT 21AA CRUSHED LIMESTONE AGGREGATE PER THE PLANS, SPECS AND GEOTECHNICAL REPORT.
2. SUBGRADE UNDERCUT SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. UNDERCUT EXCAVATIONS SHALL BE BACKFILLED WITH MDOT 21AA DENSE GRADED AGGREGATE PLACED IN AN ENGINEERED MANNER. LIFT THICKNESS SHALL NOT EXCEED 9 INCHES. THE USE OF TRI-AXIAL GEOGRID MAY BE USED TO REDUCE UNDERCUT DEPTHS, AS APPROVED BY THE DISTRICT AND PER THE UNIT PRICE PROVIDED WITH THE CONTRACTORS BID.
3. ALL ENGINEERED FILL SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY DETERMINED BY THE MODIFIED PROCTOR (ASTM D1557) METHOD OF TESTING. ALL ENGINEERED FILL MATERIAL SHALL BE PLACED AND COMPACTED AT APPROXIMATELY THE OPTIMUM MOISTURE CONTENT. FROZEN MATERIAL SHALL NOT BE USED AS FILL, NOR SHOULD FILL BE PLACED ON A FROZEN SUBGRADE.
4. THE QUANTITY FOR "SUBGRADE UNDERCUT" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL VOLUME OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
5. SUBGRADE UNDERCUT DRAIN TILE SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
6. THE QUANTITY FOR "SUBGRADE UNDERCUT DRAIN TILE (4")" FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL FOOTAGE OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
7. THE IMPORTING, ADDING, FINE GRADING AND COMPACTING ADDITIONAL PAVEMENT AGGREGATE BASE MATERIAL (MDOT 21AA CRUSHED LIMESTONE) REQUIRED TO ACHIEVE THE PROPOSED TOP OF BASE ELEVATIONS AND PRIOR TO PLACING THE ASPHALT PAVEMENT WILL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE THE VOLUME OF ADDITIONAL MATERIAL REQUIRED PER THE PROJECT PLANS.
8. THE QUANTITY FOR IMPORTING, ADDING, FINE GRADING, AND COMPACTING ADDITIONAL PAVEMENT AGGREGATE BASE MATERIAL (MDOT 21AA CRUSHED LIMESTONE) REQUIRED TO ACHIEVE THE PROPOSED TOP OF BASE ELEVATIONS AND PRIOR TO PLACING THE ASPHALT PAVEMENT FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID AND THE EARTHWORK CALCULATIONS COMPLETED BY THE CONTRACTOR DURING THE BIDDING PROCESS. AS PART OF THE EARTHWORK CALCULATIONS, THE CONTRACTOR SHALL ASSUME THAT THE VOLUME OF 2" OF MATERIAL ACROSS THE ENTIRE AREA WILL BE REMOVED WITH THE PAVEMENT AND/OR CONSIDERED UN-USABLE BY THE QUALIFIED ENGINEERING TECHNICIAN AND NEED TO BE REPLACED WITH IMPORTED MDOT 21AA CRUSHED LIMESTONE,.

PEA GROUP
t: 844.813.2949
www.peagroup.com

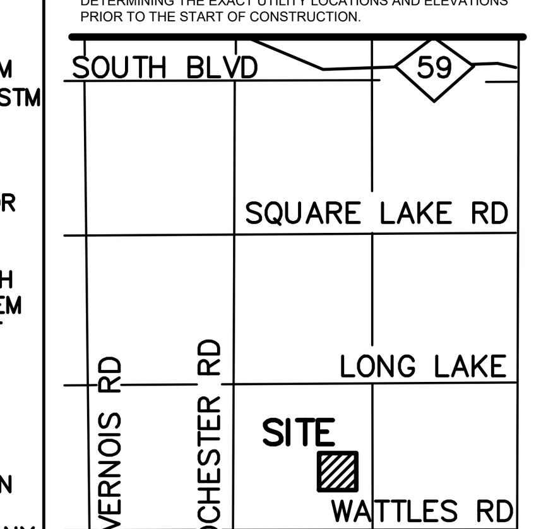
STATE OF MICHIGAN — ROBERT SCOTT ROCHON — License No. 6201046143 — LICENSED PROFESSIONAL ENGINEER

NORTH

SCALE: 1" = 20'

Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
TSD BUILDING AND GROUNDS
1140 RANKIN
TROY, MICHIGAN 48083

PROJECT TITLE
ATHENS HIGH SCHOOL
4333 JOHN R. ROAD
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

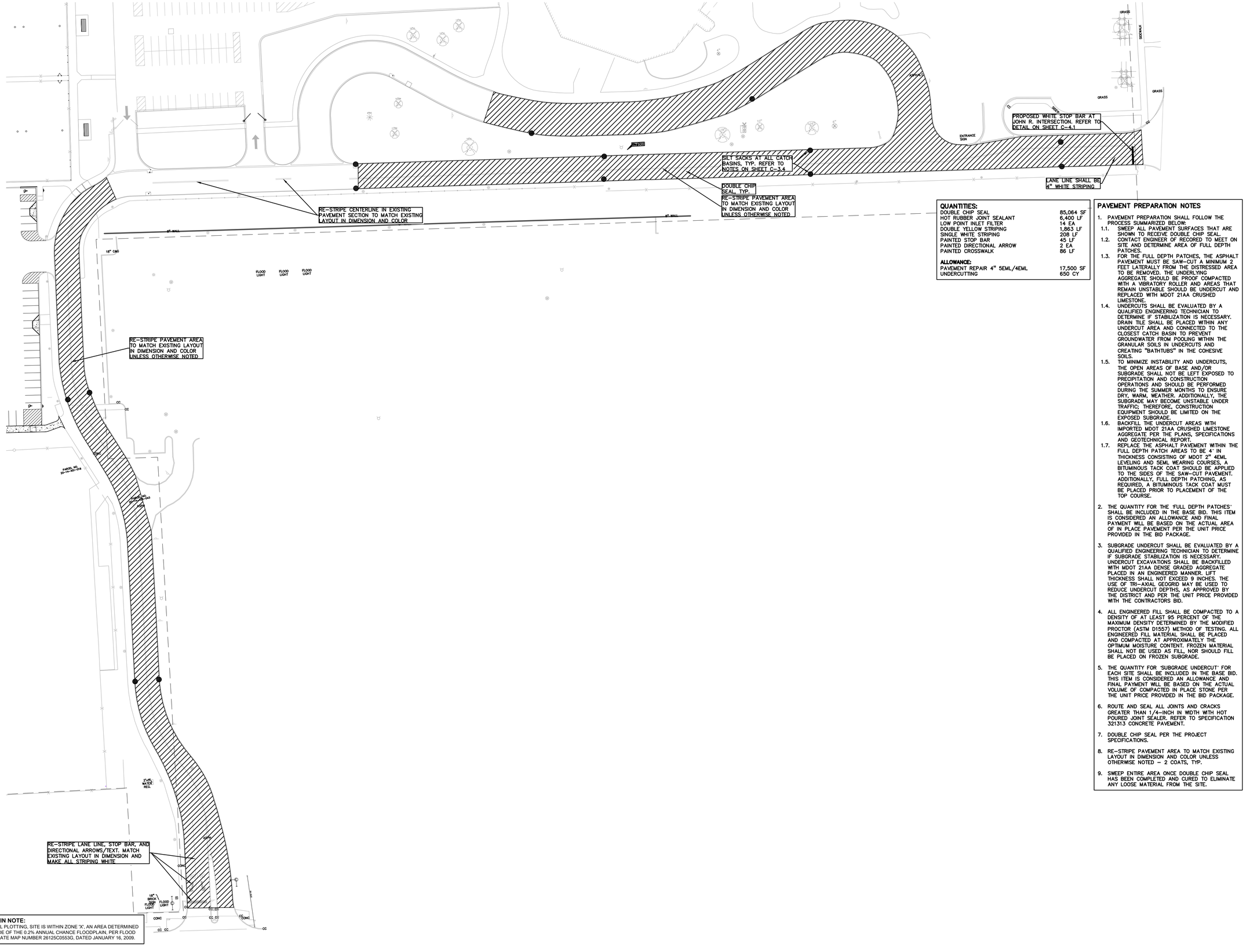
REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
DIMENSION AND ENGINEERING PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	CR
DES.	JW

DRAWING NUMBER:
C-2.4



FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.

S:\PROJECTS\2024\24-0963 2025 TSD SITE IMPROVEMENTS\DWG\3_CONSTRUCTION\4_ATHENS\C-2.5(ENGR-ATHENS-24-0963).dwg

QUANTITIES:

DOUBLE CHIP SEAL	85,064 SF
HOT RUBBER JOINT SEALANT	6,400 LF
LOW POINT INLET FILTER	14 EA
DOUBLE YELLOW STRIPING	1,863 LF
SINGLE WHITE STRIPING	208 LF
PAINTED STOP BAR	45 LF
PAINTED DIRECTIONAL ARROW	2 EA
PAINTED CROSSWALK	86 LF
ALLOWANCE:	
PAVEMENT REPAIR 4" 5EML/4EML	17,500 SF
UNDERCUTTING	650 CY

PAVEMENT PREPARATION NOTES

1. PAVEMENT PREPARATION SHALL FOLLOW THE PROCESS SUMMARIZED BELOW:
   - 1.1. SWEEP ALL PAVEMENT SURFACES THAT ARE SHOWN TO RECEIVE DOUBLE CHIP SEAL.
   - 1.2. CONTACT ENGINEER OF RECORED TO MEET ON SITE AND DETERMINE AREA OF FULL DEPTH PATCHES.
   - 1.3. FOR THE FULL DEPTH PATCHES, THE ASPHALT PAVEMENT MUST BE SAW-CUT A MINIMUM 2 FEET LATERALLY FROM THE DISTRESSED AREA TO BE REMOVED. THE UNDERLYING AGGREGATE SHOULD BE PROOF COMPACTED WITH A VIBRATORY ROLLER AND AREAS THAT REMAIN UNSTABLE SHOULD BE UNDERCUT AND REPLACED WITH MDOT 21AA CRUSHED LIMESTONE.
   - 1.4. UNDERCUTS SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF STABILIZATION IS NECESSARY. DRAIN TILE SHALL BE PLACED WITHIN ANY UNDERCUT AREA AND CONNECTED TO THE CLOSEST CATCH BASIN TO PREVENT GROUNDWATER FROM POOLING WITHIN THE GRANULAR SOILS IN UNDERCUTS AND CREATING "BATHTUBS" IN THE COHESIVE SOILS.
   - 1.5. TO MINIMIZE INSTABILITY AND UNDERCUTS, THE OPEN AREAS OF BASE AND/OR SUBGRADE SHALL NOT BE LEFT EXPOSED TO PRECIPITATION AND CONSTRUCTION OPERATIONS AND SHOULD BE PERFORMED DURING THE SUMMER MONTHS TO ENSURE DRY, WARM, WEATHER. ADDITIONALLY, THE SUBGRADE MAY BECOME UNSTABLE UNDER TRAFFIC; THEREFORE, CONSTRUCTION EQUIPMENT SHOULD BE LIMITED ON THE EXPOSED SUBGRADE.
   - 1.6. BACKFILL THE UNDERCUT AREAS WITH IMPORTED MDOT 21AA CRUSHED LIMESTONE AGGREGATE PER THE PLANS, SPECIFICATIONS AND GEOTECHNICAL REPORT.
   - 1.7. REPLACE THE ASPHALT PAVEMENT WITHIN THE FULL DEPTH PATCH AREAS TO BE 4" IN THICKNESS CONSISTING OF MDOT 2" 4EML LEVELING AND 5EML WEARING COURSES. A BITUMINOUS TACK COAT SHOULD BE APPLIED TO THE SIDES OF THE SAW-CUT PAVEMENT. ADDITIONALLY, FULL DEPTH PATCHING, AS REQUIRED, A BITUMINOUS TACK COAT MUST BE PLACED PRIOR TO PLACEMENT OF THE TOP COURSE.
2. THE QUANTITY FOR THE 'FULL DEPTH PATCHES' SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL AREA OF IN PLACE PAVEMENT PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
3. SUBGRADE UNDERCUT SHALL BE EVALUATED BY A QUALIFIED ENGINEERING TECHNICIAN TO DETERMINE IF SUBGRADE STABILIZATION IS NECESSARY. UNDERCUT EXCAVATIONS SHALL BE BACKFILLED WITH MDOT 21AA DENSE GRADED AGGREGATE PLACED IN AN ENGINEERED MANNER. LIFT THICKNESS SHALL NOT EXCEED 9 INCHES. THE USE OF TRI-AXIAL GEOGRID MAY BE USED TO REDUCE UNDERCUT DEPTHS, AS APPROVED BY THE DISTRICT AND PER THE UNIT PRICE PROVIDED WITH THE CONTRACTORS BID.
4. ALL ENGINEERED FILL SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY DETERMINED BY THE MODIFIED PROCTOR (ASTM D1557) METHOD OF TESTING. ALL ENGINEERED FILL MATERIAL SHALL BE PLACED AND COMPACTED AT APPROXIMATELY THE OPTIMUM MOISTURE CONTENT. FROZEN MATERIAL SHALL NOT BE USED AS FILL, NOR SHOULD FILL BE PLACED ON FROZEN SUBGRADE.
5. THE QUANTITY FOR 'SUBGRADE UNDERCUT' FOR EACH SITE SHALL BE INCLUDED IN THE BASE BID. THIS ITEM IS CONSIDERED AN ALLOWANCE AND FINAL PAYMENT WILL BE BASED ON THE ACTUAL VOLUME OF COMPACTED IN PLACE STONE PER THE UNIT PRICE PROVIDED IN THE BID PACKAGE.
6. ROUTE AND SEAL ALL JOINTS AND CRACKS GREATER THAN 1/4-INCH IN WIDTH WITH HOT POURED JOINT SEALER. REFER TO SPECIFICATION 321313 CONCRETE PAVEMENT.
7. DOUBLE CHIP SEAL PER THE PROJECT SPECIFICATIONS.
8. RE-STRIPE PAVEMENT AREA TO MATCH EXISTING LAYOUT IN DIMENSION AND COLOR UNLESS OTHERWISE NOTED – 2 COATS, TYP.
9. SWEEP ENTIRE AREA ONCE DOUBLE CHIP SEAL HAS BEEN COMPLETED AND CURED TO ELIMINATE ANY LOOSE MATERIAL FROM THE SITE.

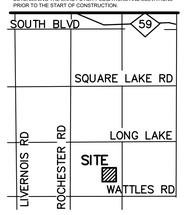
PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN
ROBERT SCOTT KOCHON
License No. 6201046143
REGISTERED PROFESSIONAL ENGINEER

NORTH
0 25 50 100
SCALE: 1" = 50'

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ONLY APPROXIMATE THE LOCATIONS AND ELEVATIONS PREDICTED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
TSD BUILDING AND GROUNDS
1140 RANKIN
TROY, MICHIGAN 48083

PROJECT TITLE
ATHENS HIGH SCHOOL
4333 JOHN R. ROAD
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

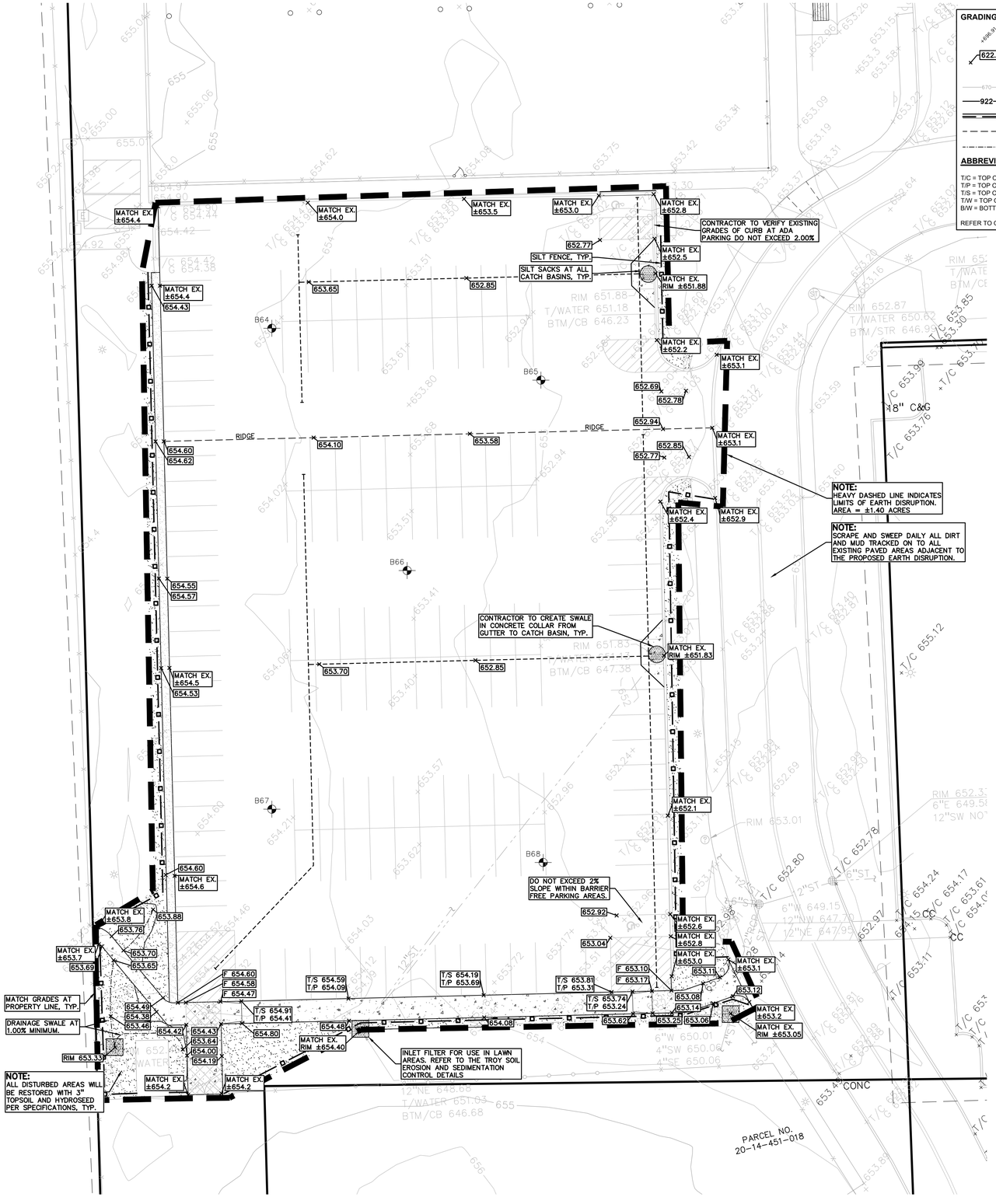
REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
LOOP ROAD AND BUS LOOP ENGINEERING PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	CR
DES.	JW

DRAWING NUMBER:
C-2.5



FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.

S:\PROJECTS\2024\24-0963 2025 TSD SITE IMPROVEMENTS\DWG_CONSTRUCTION\24_ATHENS\[C-3.4GRADE_ATHENS-24-0963.dwg

GRADING LEGEND:

- +696.91 — EXISTING SPOT ELEVATION
- 622.50 — PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- 670 — EXISTING CONTOUR
- 922 — PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

T/C = TOP OF CURB	G = GUTTER GRADE
T/P = TOP OF PAVEMENT	FF = FINISH FLOOR
T/S = TOP OF SIDEWALK	FG = FINISH GRADE
T/W = TOP OF WALL	RIM = RIM ELEVATION
B/W = BOTTOM OF WALL	

REFER TO GRADING NOTES ON SHEET C-4.0.

SYMBOLS: EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
- (SI-3) RYCB INLET FILTER
- (SP-9) TEMPORARY STONE ACCESS DRIVE
- (E-9) EROSION CONTROL BLANKET
- (E-7) RIPRAP
- TEMPORARY SEED AND MULCH

REFER TO O.C.W.R.C. SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL DEVICE DETAILS.

EROSION CONTROL QUANTITIES:

SILT FENCE	784 LF
INLET FILTER	2 EA.
LOW POINT INLET FILTER	2 EA.
LAWN RESTORATION	545 SY

SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION

1. SEE CITY OF TROY SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL SOIL EROSION CONTROL RELATED DETAILS.
2. PLACE SILT FENCE & INSTALL INLET FILTERS ON EXISTING STORM SEWER STRUCTURES, ACCORDING TO PLANS.
3. INSTALL TEMPORARY CRUSHED CONCRETE ACCESS DRIVE AT ALL CONSTRUCTION ENTRANCES. (80'x24'x8" W/MINIMUM OF 1"–3" CRUSHED CONCRETE – NO FINES).
4. REMOVE CURB, PAVEMENT, TREES, ETC. AS DIRECTED ON THE DEMOLITION PLAN.
5. STRIP AND STOCKPILE TOPSOIL FOR RESTORATION REQUIREMENTS.
6. DISPOSE OF ALL EXCESS, UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO BURN OR BURY PITS ALLOWED.
7. UNSUITABLE MATERIALS CONSIST OF, BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING: CONCRETE, ASPHALT, TREES, BRUSH, STUMPS, ROOTS, OR OTHER MISCELLANEOUS DEBRIS OR TRASH.
8. MASS GRADE THE SITE IN ACCORDANCE WITH THE PLANS.
9. INSTALL HYDROSEED AS SHOWN ON THE PLAN WITHIN 5 DAYS OF COMPLETION OF MASS GRADING OR WHENEVER DISTURBED AREAS WILL REMAIN UNCHANGED FOR 30 DAYS OR GREATER. MINIMUM 3"–4" TOPSOIL WILL BE USED WHERE VEGETATION IS REQUIRED.
10. COMPLETE ROUGH GRADING OF SITE. PLACE INLET FILTERS AT ALL INLETS AND CATCH BASINS, AS SHOWN.
11. FINISH GRADE AND PAVE SITE AS PROPOSED TO DRAIN TO STORM SEWER SYSTEM. REPAIR INLET FILTERS AS REQUIRED.
12. APPLY TOPSOIL, HYDROSEED TO ALL DISTURBED AREAS UPON COMPLETION OF GRADING. THE CONTRACTOR SHALL STAGE CONSTRUCTION ACTIVITIES IN ORDER TO MINIMIZE THE EXPOSURE OF UNSTABILIZED AREAS.
13. CLEAN PAVEMENT AND STORM SEWERS. REMOVE SILT FENCE AND TREE PROTECTION FENCE, AND INLET FILTERS ONCE VEGETATION HAS BEEN ESTABLISHED.
14. ALL DIRT AND MUD TRACKED ONTO PUBLIC ROADS SHALL BE REMOVED DAILY.
15. INLETS/CATCH BASINS TO BE CLEANED AFTER WEARING COARSE OF ASPHALT AND STRIPING HAS BEEN PLACED

SOIL EROSION MAINTENANCE SCHEDULE AND NOTES:

1. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT BY:

   ROB CARSON
   TROY SCHOOL DISTRICT
   1140 RANKIN
   TROY, OAKLAND COUNTY, MICHIGAN
   248–823–4067

2. IF ANY DAMAGE HAS OCCURRED AS A RESULT OF STORM WATER DISCHARGE FROM THE SITE, THE FOLLOWING STEPS SHALL BE IMPLEMENTED.
3. ANY DEBRIS OR DIRT ON ANY PAVED AREA RESULTING FROM CONSTRUCTION TRAFFIC SHALL BE CLEANED IN A PROMPT MANNER BY THE CONTRACTOR. THE CONSTRUCTION DRIVE SHALL BE CLEANED AT THE END OF EACH DAY.
4. ALL DIRT AND MUD TRACKED ONTO PAVED AREAS SHALL BE REMOVED BY THE CONTRACTOR DAILY BY SCRAPING. STREET SWEEPING IS REQUIRED WEEKLY.
5. SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT UP SEDIMENT WHEN THE SEDIMENT HEIGHT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR REBACKFILL THE SILTATION FENCE SHOULD IT FALL OR BE DAMAGED DURING CONSTRUCTION.
6. INLET FILTER MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY ACCUMULATED SILT OR OTHER DEBRIS. THE REMOVAL OF SILT SHOULD BE WITH THE USE OF A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTERS CAN NOT BE CLEANED OR ARE DAMAGED, THEN THE FABRIC MUST BE REPLACED.
7. CONTRACTOR TO PROVIDE WATER TRUCK TO WATER DOWN THE SITE ON A DAILY BASIS AS REQUIRED TO MAINTAIN DUST CONTROL.
8. IF HIGH GROUNDWATER IS ANTICIPATED OR ENCOUNTERED DURING CONSTRUCTION A DEWATERING PLAN MUST BE SUBMITTED TO THE CITY ENGINEERING DIVISION FOR REVIEW.

GENERAL SITE CONDITIONS:

1. ACCORDING TO THE GEOTECHNICAL INVESTIGATION BY G2 CONSULTING GROUP, LLC DATED NOVEMBER 7, 2024, THE SITE CONSISTS OF THE FOLLOWING SOIL TYPES:

   LOOSE SILTY SAND FILL UNDERLAIN BY STIFF TO HARD SILTY CLAY FILL
2. TOTAL DISTURBED AREA = ±1.40 ACRES
3. N.P.D.E.S. NOTICE OF COVERAGE IS NOT REQUIRED
4. NEAREST WATER COURSE: BIG BEAVER CREEK LOCATED ±1400 FEET NORTH OF THE SITE

NOTE:

1. PER THE 'SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION' NOTES THE SUCCESSFUL BIDDER TO THE CLEAN THE STORM SEWER. THIS CLEANING SHALL INCLUDE CLEANING OUT THE STRUCTURES AND ENTIRE SEWER RUNS BETWEEN STRUCTURES USING HYDRAULICALLY PROPELLED, HIGH–VELOCITY JET, OR MECHANICALLY POWERED EQUIPMENT. SELECTION OF THE EQUIPMENT USED SHALL BE BASED ON THE CONDITIONS OF LINES AT THE TIME THE WORK COMMENCES. THE EQUIPMENT AND METHODS SELECTED SHALL BE SATISFACTORY TO THE SCHOOL DISTRICT'S REPRESENTATIVE. THE EQUIPMENT SHALL BE CAPABLE OF REMOVING DIRT, GREASE, ROCKS, SAND, AND OTHER MATERIALS AND OBSTRUCTIONS FROM THE SEWER LINES AND MANHOLES. IF CLEANING OF AN ENTIRE SECTION CANNOT BE SUCCESSFULLY PERFORMED FROM ONE MANHOLE, THE EQUIPMENT SHALL BE SET UP ON THE OTHER MANHOLE AND CLEANING AGAIN ATTEMPTED. IF, AGAIN, SUCCESSFUL CLEANING CANNOT BE PERFORMED OR THE EQUIPMENT FAILS TO TRAVERSE THE ENTIRE MANHOLE SECTION, IT WILL BE ASSUMED THAT A MAJOR BLOCKAGE EXISTS AND THE CLEANING EFFORT SHALL BE ABANDONED.
2. PER THE PROJECT SPECIFICATIONS; PRIOR TO THE PLACEMENT OF TOPSOIL THE SUCCESSFUL BIDDER TO SCHEDULE AN INSPECTION BY THE SCHOOL DISTRICT OR PEA GROUP TO CONFIRM THAT THE GRADE IS AT THE PROPER ELEVATION WHERE THE MINIMUM DEPTH OF TOPSOIL CAN BE PLACED THROUGHOUT THE AREA.
3. CONTRACTOR TO FIELD VERIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION INCLUDING BUT NOT LIMITED TO: SITE LIGHTING, FIBER LINES, ETC.

SEQUENCE OF CONSTRUCTION:

START DAY	END DAY	
1	90	INSTALL CRUSHED CONCRETE ACCESS APPROACH AT SITE ROAD APPROACH.
1	90	INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES, SILT FENCES, INLET PROTECTION, ETC. AS NECESSARY.
1	120	MAINTAIN A 25' BUFFER OF VEGETATION AROUND PERIMETER OF SITE WHERE POSSIBLE.
1	15	REMOVE ALL VEGETATION, TREES AND BRUSH FROM THE PROPOSED CONSTRUCTION AREA UNLESS MARKED TO REMAIN. STRIP AND STOCKPILE TOPSOIL AS REQUIRED. ALL STOCKPILES MUST BE GRADED AND SEEDED.
5	14	REMOVE ALL PAVEMENT, CURB, UTILITIES, ETC. AS REQUIRED TO INSTALL THE PROPOSED WORK AS SHOWN ON THE TOPOGRAPHIC SURVEY AND DEMOLITION PLAN.
5	14	DISPOSE OF ALL EXCESS/UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO ON–SITE BURN OR BURY PITS ALLOWED.
14	28	ROUGH GRADE SITE. SEED AND MULCH BLANKETS MUST BE INSTALLED AS SHOWN WITHIN 5 DAYS OF FINAL GRADE. REPAIR AND/OR RE–INSTALL ANY TEMPORARY SOIL EROSION CONTROL MEASURES THAT WERE DAMAGED DURING GRADING OPERATIONS.
28	60	INSTALL SITE UTILITIES (STORM SEWER, SANITARY SEWER, WATER MAIN ETC.). INSTALL INLET PROTECTION AT ALL PROPOSED CATCH BASINS.
28	90	TEMPORARY SEEDING MUST BE PROVIDED IN AREAS NOT TO BE WORKED ON FOR 15 DAYS OR LONGER.
70	80	FINE GRADE SITE AND PREPARE FOR SITE PAVING OPERATIONS.
80	110	INSTALL ALL PAVEMENT, SIDEWALKS, CURBING AS PROPOSED. IF PERMANENT LANDSCAPING IS NOT TO BE INSTALLED SOON AFTER PAVING IS COMPLETE, ALL AREAS WITHIN 20 FEET OF BACK OF CURB MUST BE TEMPORARILY SEEDED. REPAIR INLET PROTECTION, SILT FENCE AND ANY OTHER DAMAGED SOIL EROSION CONTROL MEASURES AS NECESSARY.
90	119	FINAL GRADE, REDISTRIBUTE STOCKPILED TOPSOIL, ESTABLISH VEGETATION AND INSTALL ALL PERMANENT LANDSCAPING IN ALL DISTURBED AREAS NOT BUILT.
118	120	CLEAN PAVEMENT AND REMOVE ALL TEMPORARY SOIL EROSION CONTROL MEASURES. RE–ESTABLISH VEGETATION AS REQUIRED.
120	120	REMOVE SEDIMENTATION CONTROLS ONCE ENTIRE SITE HAS BEEN PERMANENTLY STABILIZED.

PEA GROUP
t: 844.813.2949
www.peagroup.com

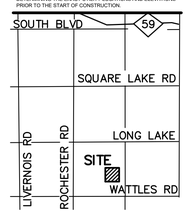
STATE OF MICHIGAN — ROBERT SCOTT KOCHIN — License No. 6201046143 — REGISTERED PROFESSIONAL ENGINEER

NORTH

0 10 20 40
SCALE: 1" = 20'

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE AND NO GUARANTEE OF ACCURACY IS EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
TSD BUILDING AND GROUNDS
1140 RANKIN
TROY, MICHIGAN 48083

PROJECT TITLE
ATHENS HIGH SCHOOL
4333 JOHN R. ROAD
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
GRADING AND SESC PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	CR
DES.	JW

DRAWING NUMBER:
C-3.4

GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. ALL CONSTRUCTION, WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT OSHA, MDOT AND MUNICIPALITY STANDARDS AND REGULATIONS.
2. THE CONTRACTOR SHALL NOTIFY THE CITY OF TROY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
3. THE CONTRACTOR MUST CONTACT THE ENGINEER SHOULD THEY ENCOUNTER ANY DESIGN ISSUES DURING CONSTRUCTION. IF THE CONTRACTOR MAKES DESIGN MODIFICATIONS WITHOUT THE WRITTEN DIRECTION OF THE DESIGN ENGINEER, THE CONTRACTOR DOES SO AT HIS OWN RISK.
4. ALL NECESSARY PERMITS, TESTING, BONDS AND INSURANCES ETC., SHALL BE PAID FOR BY THE CONTRACTOR. THE OWNER SHALL PAY FOR ALL CITY INSPECTION FEES.
5. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE 811/ONE CALL UTILITY LOCATING CENTER, THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION. IF NO NOTIFICATION IS GIVEN AND DAMAGE RESULTS, SAID DAMAGE WILL BE REPAIRED AT SOLE EXPENSE OF THE CONTRACTOR. IF EXISTING UTILITY LINES ARE ENCOUNTERED THAT CONFLICT IN LOCATION WITH NEW CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER SO THAT THE CONFLICT MAY BE RESOLVED.
6. CONTRACTOR TO VERIFY THAT THE PLANS AND SPECIFICATIONS ARE THE VERY LATEST PLANS AND SPECIFICATIONS AND FURTHERMORE, VERIFY THAT THESE PLANS AND SPECIFICATIONS HAVE BEEN APPROVED. ALL ITEMS CONSTRUCTED BY THE CONTRACTOR PRIOR TO RECEIVING FINAL APPROVAL, HAVING TO BE ADJUSTED OR RE-DONE, SHALL BE AT THE CONTRACTORS EXPENSE. SHOULD THE CONTRACTOR ENCOUNTER A CONFLICT BETWEEN THESE PLANS AND/OR SPECIFICATIONS, THEY SHALL SEEK CLARIFICATION IN WRITING FROM THE ENGINEER BEFORE COMMENCEMENT OF CONSTRUCTION. FAILURE TO DO SO SHALL BE AT SOLE EXPENSE TO THE CONTRACTOR.
7. ANY WORK WITHIN THE STREET OR HIGHWAY RIGHTS-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION AND SHALL NOT BEGIN UNTIL ALL NECESSARY PERMITS HAVE BEEN ISSUED FOR THE WORK.
8. ALL PROPERTIES OR FACILITIES IN THE SURROUNDING AREAS, PUBLIC OR PRIVATE, DESTROYED OR OTHERWISE DISTURBED DUE TO CONSTRUCTION, SHALL BE REPLACED AND/OR RESTORED TO THE ORIGINAL CONDITION BY THE CONTRACTOR.
9. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BARRICADING, SIGNAGE, LIGHTS AND TRAFFIC CONTROL DEVICES TO PROTECT THE WORK AND SAFELY MAINTAIN TRAFFIC IN ACCORDANCE WITH LOCAL REQUIREMENTS AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION). THE DESIGN ENGINEER, OWNER, CITY OF TROY AND STATE SHALL NOT BE HELD LIABLE FOR ANY CLAIMS RESULTING FROM ACCIDENTS OR DAMAGES CAUSED BY THE CONTRACTOR'S FAILURE TO COMPLY WITH TRAFFIC AND PUBLIC SAFETY REGULATIONS DURING THE CONSTRUCTION PERIOD.
10. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST THE TOP OF ALL EXISTING AND PROPOSED STRUCTURES (MANHOLES, CATCH BASINS, INLETS, GATE WELLS ETC.) WITHIN GRADED AND /OR PAVED AREAS TO FINAL GRADE SHOWN ON THE PLANS. ALL SUCH ADJUSTMENTS SHALL BE INCIDENTAL TO THE JOB AND WILL NOT BE PAID FOR SEPARATELY.
11. THE USE OF CRUSHED CONCRETE IS PROHIBITED ON THE PROJECT WITHIN 100 FEET OF ANY WATER COURSE (STREAM, RIVER, COUNTY DRAIN, ETC.) AND LAKE, REGARDLESS OF THE APPLICATION OR LOCATION OF THE WATER COURSE OR LAKE RELATIVE TO THE PROJECT LIMITS.

GENERAL BARRIER FREE NOTES:

THE FOLLOWING NOTES PROVIDE AN OUTLINE OF SOME OF THE REQUIREMENTS CONTAINED WITHIN THE "STANDARDS FOR ACCESSIBLE DESIGN – AMERICANS WITH DISABILITIES ACT 2010", AND "ACCESSIBLE AND USEABLE BUILDINGS AND FACILITIES", ICC/ANSI A117.1-2009. THE CONTRACTOR IS RESPONSIBLE FOR ALL OF THE REQUIREMENTS PRESENTED WITHIN THESE DOCUMENTS, WHICH ARE AVAILABLE IN FULL UPON REQUEST.

1. AN ACCESSIBLE ROUTE CONSISTS OF WALK SURFACES, CURB RAMPS AND RAMPS. AT LEAST ONE ACCESSIBLE ROUTE SHALL BE PROVIDED WITHIN THE SITE FROM ACCESSIBLE PARKING SPACES, ACCESSIBLE PASSENGER LOADING ZONES, PUBLIC STREETS AND SIDEWALKS, AND PUBLIC TRANSPORTATION STOPS TO THE BUILDING OR FACILITY ENTRANCE THEY SERVE.
2. THE RUNNING SLOPE OF ALL WALKING SURFACES SHALL NOT EXCEED 5% (1:20) AND THE CROSS-SLOPE SHALL NOT EXCEED 2% (1:48).
3. WALKING SURFACES MUST BE LEVEL WITH PERMITTED VERTICAL CHANGES IN LEVEL NOT TO EXCEED 1/4", OR BEVELED CHANGES IN LEVEL NOT TO EXCEED 1/2". REFER TO DETAIL DET-8 THIS SHEET. ANY CHANGE IN LEVEL GREATER THAN 1/2" MUST BE RAMPED.
4. TURNING SPACES ALONG ACCESSIBLE ROUTES MUST BE AT LEAST 5 FEET WIDE IN ALL DIRECTIONS AND NOT EXCEED 2% SLOPE (1:48) IN ANY DIRECTION.
5. ACCESSIBLE ROUTES WILL BE DESIGNED TO BE A MINIMUM OF 5 FEET WIDE. THE MINIMUM CLEAR WIDTH IS 3 FEET.
6. RAMPS ALONG ACCESSIBLE ROUTES WILL HAVE A RUNNING SLOPE GREATER THAN 5% (1:20) AND LESS THAN 8.3% (1:12).
7. THE CROSS-SLOPE OF RAMP RUNS SHALL NOT EXCEED 2% (1:48)
8. THE MINIMUM CLEAR WIDTH OF ANY RAMP IS 36 INCHES.
9. THE MAXIMUM RISE FOR ANY RAMP (NOT INCLUDING CURB RAMPS) SHALL NOT EXCEED 30 INCHES. LANDINGS ARE REQUIRED AT THE TOP AND BOTTOM OF EACH RAMP. LANDINGS SHALL HAVE A CROSS-SLOPE NOT EXCEEDING 2% (1:48), SHALL BE 5 FEET LONG AND AT LEAST AS WIDE AS THE RAMP CLEAR WIDTH. IF THERE IS A CHANGE OF DIRECTION AT A LANDING, THEN THE LANDING MUST BE AT LEAST 5 FEET WIDE AND 5 FEET LONG.
10. CURB RAMPS ALONG ACCESSIBLE ROUTES SHALL NOT RISE MORE THAN 6 INCHES, NOR BE STEEPER THAN 8.3% (1:12). APPROACHING SLOPES TO THE RAMP CANNOT EXCEED 5%, WHICH INCLUDES SIDEWALKS, PAVEMENT, GUTTERS ETC.
11. IF CURB RAMP SIDES ARE FLARED, THE FLARES SHALL NOT BE STEEPER THAN 10% (1:10).
12. LANDINGS ARE REQUIRED AT THE TOP OF ALL CURB RAMPS. THE CLEAR LENGTH OF THE LANDING SHALL BE A MINIMUM OF 36" AND WILL BE AS WIDE AS THE CURB RAMP.
13. CURB RAMPS SHALL BE LOCATED OR PROTECTED TO PREVENT THEIR OBSTRUCTION BY PARKED VEHICLES.
14. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS.
15. WHERE DETECTABLE WARNING IS REQUIRED AT CURB RAMPS, THE DETECTABLE WARNING SHALL BE 24" MINIMUM IN DEPTH AND SHALL EXTEND THE FULL WIDTH OF THE RAMP. THE DETECTABLE WARNING SHALL BE LOCATED SO THE EDGE NEAREST THE CURB IS 6 INCHES MINIMUM AND 8 INCHES MAXIMUM FROM THE CURB LINE.
16. ACCESSIBLE PARKING SPACES ON SITE SHALL BE PROVIDED AS REQUIRED IN SECTION 502 OF THE A.D.A. IF THE SITE HAS MORE THAN ONE PARKING *FACILITY*, EACH *FACILITY* IS REQUIRED TO MEET THESE REQUIREMENTS SEPARATELY. THE REQUIRED NUMBER OF SPACES SHALL BE BASED ON THE TOTAL NUMBER OF PARKING SPACES IN EACH PARKING FACILITY ON SITE.
17. FOR EVERY SIX OR FRACTION OF SIX ACCESSIBLE PARKING SPACES, ONE VAN ACCESSIBLE SPACE SHALL BE PROVIDED.
18. ACCESSIBLE PARKING SPACES SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE FROM PARKING TO A BUILDING ENTRANCE. IF THERE IS MORE THAN ONE ACCESSIBLE ENTRANCE, PARKING SHALL BE DISPERSED ALONG THE SHORTEST ACCESSIBLE ROUTE TO THE ACCESSIBLE ENTRANCES.
19. BARRIER FREE CAR PARKING SPACES SHALL BE A MINIMUM OF 8 FEET WIDE WITH AN ACCESS AISLE 5 FEET WIDE MINIMUM. VAN ACCESSIBLE PARKING SPACES SHALL BE AT LEAST 11 FEET WIDE WITH A 5' WIDE ACCESS AISLE. VAN ACCESSIBLE SPACES ARE ALSO ACCEPTABLE WITH AN 8 FOOT WIDTH AND 8 FOOT WIDE ACCESS AISLE. THE ACCESS AISLE IN ALL CASES MUST EXTEND THE FULL LENGTH OF THE PARKING SPACE.
20. SURFACE SLOPES WITHIN THE PARKING SPACES AND AISLES SHALL NOT EXCEED 2% (1:48)
21. ACCESSIBLE AREAS INCLUDING PARKING SPACES, AISLES AND PATHWAYS, REQUIRE A MINIMUM VERTICAL CLEARANCE OF 98 INCHES.
22. ACCESSIBLE PARKING SPACES ARE REQUIRED TO BE IDENTIFIED BY SIGNS. THE SIGNS SHALL INCLUDE THE INTERNATIONAL SYMBOL OF ACCESSIBILITY. VAN PARKING SPACES ARE REQUIRED TO BE DESIGNATED AS "VAN ACCESSIBLE". REFER TO DETAILS ON THIS SHEET.

S:\PROJECTS\2024\24-0963 2025 TSD SITE IMPROVEMENTS\DWG\3 CONSTRUCTION\(C-4.0)DETAILS-24-0963.dwg

GENERAL GRADING AND EARTHWORK NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING TREES AND BRUSH AND REMOVE ALL THAT ARE NECESSARY TO GRADE SITE.
2. ALL GRADES ARE TO TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
3. THE STAGING OF CONSTRUCTION ACTIVITIES SHALL OCCUR ONLY WITHIN THE SITE BOUNDARIES. ANY CONSTRUCTION ACTIVITIES OUTSIDE OF THE WORK AREA BOUNDARIES SHALL BE AT THE SOLE RESPONSIBILITY AND RISK OF THE CONTRACTOR.
4. ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES IS SHALL MEET THE REQUIREMENTS OF THE AUTHORIZED PUBLIC AGENCY OF JURISDICTION.
5. ALL EARTHWORK AND GRADING OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE PLANS AND SPECIFIACTIONS.
6. REFER TO SOIL EROSION CONTROL PLAN FOR ADDITIONAL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES AND NOTES.
7. ALL LANDSCAPING IS TO BE COMPLETED BY STALLANTIS.
8. THE CONTRACTOR SHALL NOTE EXISTING UNDERGROUND UTILITIES WITHIN AND ADJACENT TO THE SITE. BACKFILL FOR EXISTING UTILITY TRENCHES SHALL BE EXAMINED CRITICALLY. ANY TRENCHES FOUND TO HAVE SOFT, UNSTABLE OR UNSUITABLE BACKFILL MATERIAL, IN THE OPINION OF THE THIRD PARTY TESTING COMPANY, THAT ARE TO BE WITHIN THE ZONE OF INFLUENCE OF PROPOSED BUILDINGS OR PAVEMENT SHALL BE COMPLETELY EXCAVATED AND BACKFILLED WITH SUITABLE MATERIAL.
9. ON-SITE FILL CAN BE USED IF THE SPECIFIED COMPACTION REQUIREMENTS CAN BE ACHIEVED. IF ON-SITE SOIL IS USED, IT SHOULD BE CLEAN AND FREE OF FROZEN SOIL, ORGANICS, OR OTHER DELETERIOUS MATERIALS.
10. THE FINAL SUBGRADE/EXISTING AGGREGATE BASE SHOULD BE THOROUGHLY PROOFROLLED USING A FULLY LOADED TANDEM AXLE TRUCK OR FRONT END LOADER UNDER THE OBSERVATION OF A GEOTECHNICAL/PAVEMENT ENGINEER. LOOSE OR YIELDING AREAS THAT CANNOT BE MECHANICALLY STABILIZED SHOULD BE REINFORCED USING GEOGRIDS OR REMOVED AND REPLACED WITH ENGINEERED FILL OR AS DICTATED BY FIELD CONDITIONS.
11. THE REMOVAL OF EXISTING SOIL TO GET TO FINAL SUBGRADE ELEVATION SHALL NOT BE CONSIDERED SUBGRADE UNDERCUTTING. IT IS PART OF THE EARTHWORKS TO BALANCE THE SITE AND ESTABLISH THE ELEVATIONS FOR THE PLACEMENT OF THE PROPOSED PAVEMENT ELEVATIONS. THIS SHALL NOT BE PAID FOR SEPARATELY, BUT INCLUDED IN THE EARTHWORKS FOR THE PROJECT.
12. SUBGRADE UNDERCUTTING, INCLUDING BACKFILLING SHALL BE PERFORMED TO REPLACE MATERIALS SUSCEPTIBLE TO FROST HEAVING AND UNSTABLE SOIL CONDITIONS. ANY EXCAVATIONS THAT MAY BE REQUIRED BELOW THE TOPSOIL IN FILL AREAS OR BELOW SUBGRADE IN CUT AREAS WILL BE CLASSIFIED AS SUBGRADE UNDERCUTTING.
13. SUBGRADE UNDERCUTTING SHALL BE PERFORMED WHERE NECESSARY AND THE EXCAVATED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR. ANY SUBGRADE UNDERCUTTING SHALL BE BACKFILLED AS RECOMMENDED IN THE GEOTECHNICAL ENGINEERING REPORT FOR THE PROJECT.
14. ANY SUB-GRADE WATERING REQUIRED TO ACHIEVE REQUIRED DENSITY SHALL BE CONSIDERED INCIDENTAL TO THE JOB.

CONSTRUCTION MATERIAL SUBMITTALS

UNLESS REQUIRED OTHERWISE IN THE PROJECT SPECIFICATIONS, THE CONTRACTOR SHALL ONLY SUBMIT THE FOLLOWING CONSTRUCTION MATERIAL SUBMITTALS, AS APPLICABLE TO THE PLANS, FOR REVIEW BY THE ENGINEER. UNLESS APPROVED IN ADVANCE AND IN WRITING BY THE ENGINEER, ANY MATERIAL SUBMITTALS PROVIDED TO THE ENGINEER FOR REVIEW IN ADDITION TO THIS LIST SHALL BE RETURNED TO THE CONTRACTOR WITHOUT A REVIEW BEING PERFORMED.

1. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES
2. UTILITY TRENCH BACKFILL MATERIAL WITH ALL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER
3. STORM SEWER STRUCTURES
4. STORM SEWER STRUCTURE FRAME AND COVERS INCLUDING CLEAN OUTS
5. PAVEMENT AGGREGATE BASE MATERIAL WITH ALL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER
6. PAVEMENT UNDERDRAIN MATERIAL AND BACKFILL WITH ALL BACKFILL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER
7. PAVEMENT MIX DESIGNS SUBMITTED FOR REVIEW BY THE ENGINEER MUST FOLLOW THE CURRENT MDOT REVIEW CHECKLISTS AS SUMMARIZED BELOW AND ALL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER:
   - 8.1. CONCRETE MIX DESIGN REVIEW CHECKLIST (FORM 2000)
   - 8.2. SUPERPAVE MIX DESIGN CHECKLIST (FORM 1862)
   - 8.3. MARSHALL MIX DESIGN CHECKLIST (FORM 1849)
8. SITE FENCING AND GATES
9. ANY ITEMS SHOWN IN THE PLANS OR DETAIL SHEETS THAT SPECIFICALLY STATE FOR THE CONTRACTOR TO SUBMIT A SHOP DRAWING TO THE ENGINEER FOR REVIEW. THESE ITEMS INCLUDE, BUT ARE NOT LIMITED TO:

•• ANY SPECIALITY ITEMS SHOWN IN THE PLANS OR DETAIL SHEETS THAT SPECIFICALLY DO NOT STATE FOR THE CONTRACTOR SHALL SUBMIT A SHOP DRAWING TO THE ENGINEER FOR REVIEW BUT THE CONTRACTOR REQUESTS TO BE REVIEWED. THE CONTRACTOR'S REQUEST FOR REVIEW MUST BE IN WRITING AND APPROVED BY THE ENGINEER PRIOR TO SUBMITTING THE INFORMATION.

GENERAL UTILITY NOTES:

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE CITY OF TROY.
2. ALL TRENCHES UNDER OR WITHIN THREE (3) FEET OR THE FORTY-FIVE (45) DEGREE ZONE OF INFLUENCE LINE OF EXISTING AND/OR PROPOSED PAVEMENT, BUILDING PAD OR DRIVE APPROACH SHALL BE BACKFILLED WITH SAND COMPACTED TO AT LEAST NINETY-FIVE (95) PERCENT OF MAXIMUM UNIT WEIGHT (ASTM D-1557). ALL OTHER TRENCHES TO BE COMPACTED TO 90% OR BETTER.
3. WHERE EXISTING MANHOLES OR SEWER PIPE ARE TO BE TAPPED, DRILL HOLES 4" CENTER TO CENTER, AROUND PERIPHERY OF OPENING TO CREATE A PLANE OF WEAKNESS JOINT BEFORE BREAKING SECTION OUT.
4. THE LOCATIONS AND DIMENSIONS SHOWN ON THE PLANS FOR EXISTING UTILITIES ARE IN ACCORDANCE WITH AVAILABLE INFORMATION WITHOUT UNCOVERING AND MEASURING. THE DESIGN ENGINEER DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION OR THAT ALL EXISTING UNDERGROUND FACILITIES ARE SHOWN. CONTRACTOR SHALL FIELD VERIFY UTILITIES.
5. PIPE LENGTHS INDICATED ARE FROM CENTER OF STRUCTURE AND TO END OF SECTION UNLESS NOTED OTHERWISE.
6. CONTRACTOR SHALL INSPECT ALL EXISTING PUBLIC STORM SEWER, SANITARY SEWER AND WATER MAIN STRUCTURES WITHIN THE LIMITS OF CONSTRUCTION AND WITH THE GOVERNING AGENCY INSPECTOR PRIOR TO ESTABLISHING FINAL GRADE. NOTIFY THE ENGINEER, OWNER/DEVELOPER, AND GOVERNING AGENCY IF STRUCTURE IS DEEMED TO BE STRUCTURALLY UNSOUND AND/OR IN NEED OF REPAIR.

PAVING NOTES:

1. IN AREAS WHERE NEW PAVEMENTS ARE BEING CONSTRUCTED, THE TOPSOIL AND SOIL CONTAINING ORGANIC MATTER SHALL BE REMOVED PRIOR TO PAVEMENT CONSTRUCTION.
2. CONSTRUCTION TRAFFIC SHOULD BE MINIMIZED ON THE NEW PAVEMENT. IF CONSTRUCTION TRAFFIC IS ANTICIPATED ON THE PAVEMENT STRUCTURE, THE INITIAL LIFT THICKNESS COULD BE INCREASED AND PLACEMENT OF THE FINAL LIFT COULD BE DELAYED UNTIL THE MAJORITY OF THE CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. THIS ACTION WILL ALLOW REPAIR OF LOCALIZED FAILURE, IF ANY DOES OCCUR, AS WELL AS REDUCE LOAD DAMAGE ON THE PAVEMENT SYSTEM.
3. ALL EXPANSION JOINTS AND CONCRETE PAVEMENT JOINTS TO BE SEALED.
4. CONCRETE PAVEMENT JOINTING – UNLESS SHOWN OTHERWISE IN THE PLANS OR REQUIRED BY THE AUTHORITY HAVING JURISDICTION;
   - 4.1. WHERE PROPOSED CONCRETE ABUTS A STRUCTURE, PROVIDE A MINIMUM 1/2" EXPANSION JOINT. THE JOINT FILLER BOARD MUST BE AT LEAST THE FULL DEPTH OF THE CONCRETE AND HELD DOWN A 1/2" TO ALLOW FOR SEALING.
   - 4.2. WHERE PROPOSED CONCRETE ABUTS EXISTING CONCRETE OR IN BETWEEN POURS OF PROPOSED CONCRETE (CONSTRUCTION JOINT), PROVIDE 5/8" DOWELS EVERY 30" CENTER TO CENTER HALF WAY ALONG THE THICKNESS OF THE PROPOSED PAVEMENT. ALTERNATE DOWELS SIZES AND SPACING MUST BE APPROVED THE ENGINEER PRIOR TO COMMENCING WORK AND VIA THE SUBMITTAL PROCESS.
   - 4.3. WHERE PROPOSED CONCRETE ABUTS EXISTING OR PROPOSED SIDEWALK OR CURBING, PROVIDE A MINIMUM 1/2" EXPANSION JOINT.
   - 4.4. CONTROL, LONGITUDINAL AND/OR TRANSVERSE JOINTS SHALL BE PLACED TO PROVIDE PANELS WITHIN THE PAVEMENT AS SQUARE AS POSSIBLE WITH THE FOLLOWING MAXIMUM SPACING PARAMETERS:
     - 4.4.1. 6-INCH THICK CONCRETE PAVEMENT: 12' X 12'
     - 4.4.2. 8-INCH THICK CONCRETE PAVEMENT: 15' X 15'
   - 4.5. IRREGULAR-SHAPED PANELS MAY REQUIRE THE USE OF REINFORCING MESH OR FIBER MESH AS DETERMINED BY THE ENGINEER. THE USE OF MESH MUST BE APPROVED THE ENGINEER PRIOR TO COMMENCING WORK AND VIA THE SUBMITTAL PROCESS.
   - 4.6. IF A JOINT PLAN IS NOT PROVIDED IN THE PLANS, THE CONTRACTOR SHALL SUBMIT ONE TO THE ENGINEER FOR REVIEW PRIOR TO COMMENCING WORK AND VIA THE SUBMITTAL PROCESS.
5. CONCRETE CURBING JOINTING – UNLESS SHOWN OTHERWISE IN THE PLANS OR REQUIRED BY THE AUTHORITY HAVING JURISDICTION
   - 5.1. JOINTS WHEN ADJACENT TO ASPHALT PAVEMENT
     - 5.1.1. PLACE CONTRACTION JOINTS AT 10' INTERVALS
     - 5.1.2. PLACE 1/2" EXPANSION JOINT AT CATCH BASINS, EXISTING AND PROPOSED SIDEWALK OR EXISTING CURBING.
     - 5.1.3. PLACE 1" EXPANSION JOINT:
       - 5.1.3.1. AT SPRING POINTS OF INTERSECTIONS OR ONE OF THE END OF RADIUS LOCATIONS IN A CURVE
       - 5.1.3.2. AT 400' MAXIMUM INTERVALS ON STRAIGHT RUNS
       - 5.1.3.3. AT THE END OF RADIUS AT OPPOSITE ENDS IN A CURBED LANDSCAPE ISLAND
   - 5.2. JOINTS WHEN TIED TO CONCRETE PAVEMENT
     - 5.2.1. PLACE CONTRACTION JOINTS OPPOSITE ALL TRANSVERSE CONTRACTION JOINTS IN PAVEMENT
     - 5.2.2. PLACE 1/2" EXPANSION JOINT AT CATCH BASINS, EXISTING AND PROPOSED SIDEWALK OR EXISTING CURBING.
     - 5.2.3. PLACE 1" EXPANSION JOINT OPPOSITE ALL TRANSVERSE EXPANSION JOINTS IN PAVEMENT
     - 5.2.4. CURB AND GUTTER AND CONCRETE SHALL BE TIED TOGETHER SIMILAR TO A LONGITUDINAL LANE TIE JOINT (MDOT B1 JOINT)
   - 5.3. IN BETWEEN POURS OF PROPOSED CONCRETE CURBING (CONSTRUCTION JOINT):
     - 5.3.1. CARRY THE REBAR CONTINUOUSLY BETWEEN POURS
     - 5.3.2. IF THE REBAR IS NOT LONG ENOUGH TO CARRY CONTINUOUSLY, THEN TIE TWO PIECES OF REBAR PER THE LATEST MDOT SPECIFICATIONS
6. CONCRETE SIDEWALK JOINTING – UNLESS SHOWN OTHERWISE IN THE PLANS OR REQUIRED BY THE AUTHORITY HAVING JURISDICTION
   - 6.1. PLACE TRANSVERSE CONTRACTION JOINTS EQUAL TO THE WIDTH OF THE WALK WHEN WIDTH IS LESS THAN 8'
   - 6.2. PLACE TRANSVERSE AND LONGITUDINAL CONTRACTION JOINTS EQUAL TO 1/2 THE WIDTH OF THE WALK WHEN WIDTH IS EQUAL TO OR GREATER THAN 8'
   - 6.3. PLACE 1" EXPANSION JOINT WHERE ABUTTING SIDEWALK RAMP AND/OR RADIUS IN INTERSECTION
   - 6.4. PLACE TRANSVERSE 1/2" EXPANSION JOINT AT MAXIMUM OF 100' SPACING
   - 6.5. PLACE 1/2" EXPANSION JOINT WHEN ABUTTING A FIXED STRUCTURE, OTHER PAVEMENT (CONCRETE PAVEMENT AND DRIVE APPROACHES), UTILITY STRUCTURES, LIGHT POLE BASES AND COLUMNS.
   - 6.6. WHEN ALONG A CURVE, JOINTS MUST BE PERPENDICULAR TO THE CURVE WITH A MINIMUM LENGTH OF 1 FOOT BEFORE INTERSECTING ANOTHER JOINT(S) IN ANY DIRECTION. NO JOINTS ARE ALLOWED TO BE CUT AT AN ANGLE OTHER THAN 90° AT THE CURBLINE

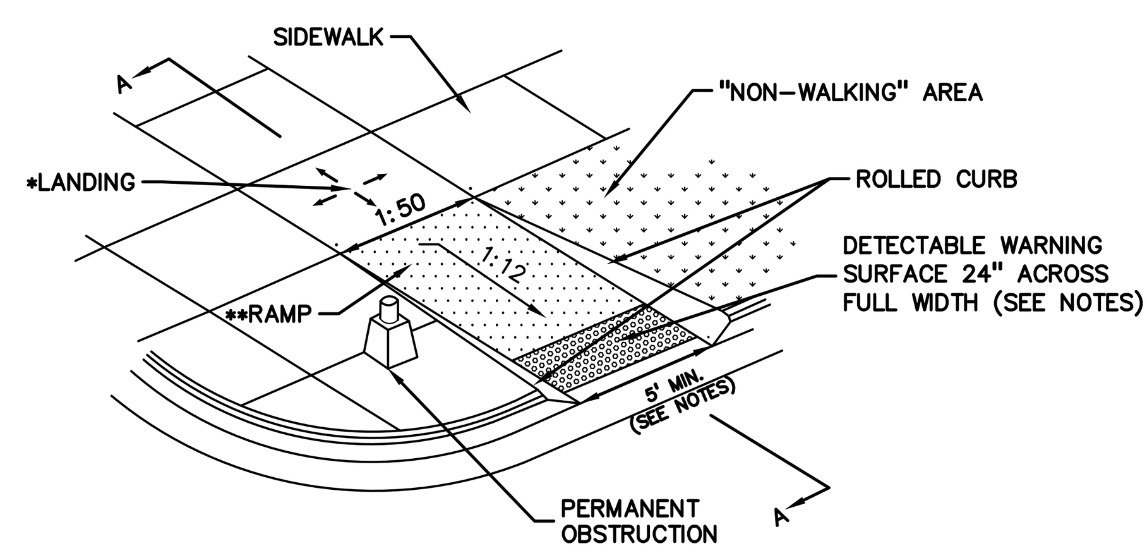
GENERAL ADA ACCESSIBILITY NOTES:

THE FOLLOWING NOTES PROVIDE AN OUTLINE OF SOME OF THE REQUIREMENTS CONTAINED WITHIN THE "STANDARDS FOR ACCESSIBLE DESIGN – AMERICANS WITH DISABILITIES ACT 2010", AND "ACCESSIBLE AND USEABLE BUILDINGS AND FACILITIES", ICC/ANSI A117.1-2009. THE CONTRACTOR IS RESPONSIBLE FOR ALL OF THE REQUIREMENTS PRESENTED WITHIN THESE DOCUMENTS, WHICH ARE AVAILABLE IN FULL UPON REQUEST.

1. AN ACCESSIBLE ROUTE CONSISTS OF WALK SURFACES, CURB RAMPS AND RAMPS. AT LEAST ONE ACCESSIBLE ROUTE SHALL BE PROVIDED WITHIN THE SITE FROM ACCESSIBLE PARKING SPACES, ACCESSIBLE PASSENGER LOADING ZONES, PUBLIC STREETS AND SIDEWALKS, AND PUBLIC TRANSPORTATION STOPS TO THE BUILDING OR FACILITY ENTRANCE THEY SERVE.
2. THE RUNNING SLOPE OF ALL WALKING SURFACES SHALL NOT EXCEED 5% (1:20) AND THE CROSS-SLOPE SHALL NOT EXCEED 2% (1:48).
3. WALKING SURFACES MUST BE LEVEL WITH PERMITTED VERTICAL CHANGES IN LEVEL NOT TO EXCEED 1/4", OR BEVELED CHANGES IN LEVEL NOT TO EXCEED 1/2". REFER TO DETAIL DET-8 THIS SHEET. ANY CHANGE IN LEVEL GREATER THAN 1/2" MUST BE RAMPED.
4. TURNING SPACES ALONG ACCESSIBLE ROUTES MUST BE AT LEAST 5 FEET WIDE IN ALL DIRECTIONS AND NOT EXCEED 2% SLOPE (1:48) IN ANY DIRECTION.
5. ACCESSIBLE ROUTES WILL BE DESIGNED TO BE A MINIMUM OF 5 FEET WIDE. THE MINIMUM CLEAR WIDTH IS 3 FEET.
6. RAMPS ALONG ACCESSIBLE ROUTES WILL HAVE A RUNNING SLOPE GREATER THAN 5% (1:20) AND LESS THAN 8.3% (1:12).
7. THE CROSS-SLOPE OF RAMP RUNS SHALL NOT EXCEED 2% (1:48)
8. THE MINIMUM CLEAR WIDTH OF ANY RAMP IS 36 INCHES.
9. THE MAXIMUM RISE FOR ANY RAMP (NOT INCLUDING CURB RAMPS) SHALL NOT EXCEED 30 INCHES. LANDINGS ARE REQUIRED AT THE TOP AND BOTTOM OF EACH RAMP. LANDINGS SHALL HAVE A CROSS-SLOPE NOT EXCEEDING 2% (1:48), SHALL BE 5 FEET LONG AND AT LEAST AS WIDE AS THE RAMP CLEAR WIDTH. IF THERE IS A CHANGE OF DIRECTION AT A LANDING, THEN THE LANDING MUST BE AT LEAST 5 FEET WIDE AND 5 FEET LONG.
10. HANDRAILS ARE REQUIRED FOR ANY RAMP (NOT INCLUDING CURB RAMPS) WITH A RISE GREATER THAN 6 INCHES. ALL HANDRAILS ARE REQUIRED TO HAVE EDGE PROTECTION UNLESS ADJOINING ANOTHER ACCESS POINT OR IF THE VERTICAL DROP-OFF AT THE EDGE OF THE RAMP DOES NOT EXCEED 1/2" IN 10 FEET. EDGE PROTECTION CAN BE PROVIDED BY MEANS OF A 4" MIN. CURB OR BARRIER.
11. CURB RAMPS ALONG ACCESSIBLE ROUTES SHALL NOT RISE MORE THAN 6 INCHES, NOR BE STEEPER THAN 8.3% (1:12). APPROACHING SLOPES TO THE RAMP CANNOT EXCEED 5%, WHICH INCLUDES SIDEWALKS, PAVEMENT, GUTTERS ETC.
12. IF CURB RAMP SIDES ARE FLARED, THE FLARES SHALL NOT BE STEEPER THAN 10% (1:10).
13. LANDINGS ARE REQUIRED AT THE TOP OF ALL CURB RAMPS. THE CLEAR LENGTH OF THE LANDING SHALL BE A MINIMUM OF 36" AND WILL BE AS WIDE AS THE CURB RAMP.
14. CURB RAMPS SHALL BE LOCATED OR PROTECTED TO PREVENT THEIR OBSTRUCTION BY PARKED VEHICLES.
15. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS.
16. WHERE DETECTABLE WARNING IS REQUIRED AT CURB RAMPS, THE DETECTABLE WARNING SHALL BE 24" MINIMUM IN DEPTH AND SHALL EXTEND THE FULL WIDTH OF THE RAMP. THE DETECTABLE WARNING SHALL BE LOCATED SO THE EDGE NEAREST THE CURB IS 6 INCHES MINIMUM AND 8 INCHES MAXIMUM FROM THE CURB LINE.
17. ACCESSIBLE PARKING SPACES ON SITE SHALL BE PROVIDED AS REQUIRED IN SECTION 502 OF THE ADA IF THE SITE HAS MORE THAN ONE PARKING *FACILITY*, EACH *FACILITY* IS REQUIRED TO MEET THESE REQUIREMENTS SEPARATELY. THE REQUIRED NUMBER OF SPACES SHALL BE BASED ON THE TOTAL NUMBER OF PARKING SPACES IN EACH PARKING FACILITY ON SITE.
18. FOR EVERY SIX OR FRACTION OF SIX ACCESSIBLE PARKING SPACES, ONE VAN ACCESSIBLE SPACE SHALL BE PROVIDED.
19. ACCESSIBLE PARKING SPACES SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE FROM PARKING TO A BUILDING ENTRANCE. IF THERE IS MORE THAN ONE ACCESSIBLE ENTRANCE, PARKING SHALL BE DISPERSED ALONG THE SHORTEST ACCESSIBLE ROUTE TO THE ACCESSIBLE ENTRANCES.
20. ADA ACCESSIBLE CAR PARKING SPACES SHALL BE A MINIMUM OF 8 FEET WIDE WITH AN ACCESS AISLE 5 FEET WIDE MINIMUM. VAN ACCESSIBLE PARKING SPACES SHALL BE AT LEAST 11 FEET WIDE WITH A 5' WIDE ACCESS AISLE. VAN ACCESSIBLE SPACES ARE ALSO ACCEPTABLE WITH AN 8 FOOT WIDTH AND 8 FOOT WIDE ACCESS AISLE. THE ACCESS AISLE IN ALL CASES MUST EXTEND THE FULL LENGTH OF THE PARKING SPACE.
21. SURFACE SLOPES WITHIN THE PARKING SPACES AND AISLES SHALL NOT EXCEED 2% (1:48)
22. ACCESSIBLE AREAS INCLUDING PARKING SPACES, AISLES AND PATHWAYS, REQUIRE A MINIMUM VERTICAL CLEARANCE OF 98 INCHES.
23. ACCESSIBLE PARKING SPACES ARE REQUIRED TO BE IDENTIFIED BY SIGNS. THE SIGNS SHALL INCLUDE THE INTERNATIONAL SYMBOL OF ACCESSIBILITY. VAN PARKING SPACES ARE REQUIRED TO BE DESIGNATED AS "VAN ACCESSIBLE". REFER TO DETAILS ON THIS SHEET.

*MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' X 5'. SEE NOTES.

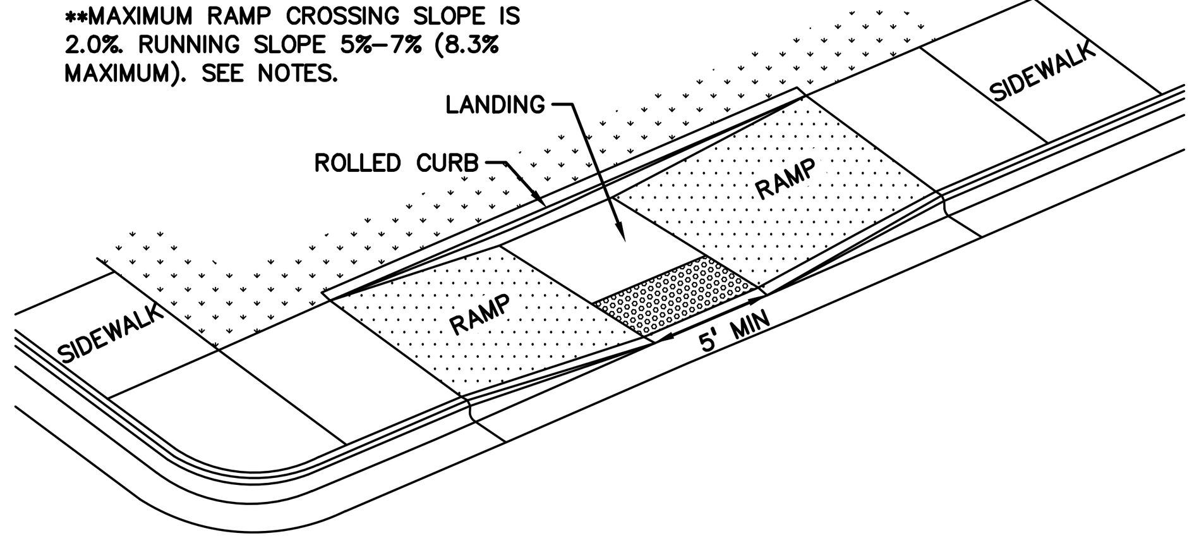
**MAXIMUM RAMP CROSSING SLOPE IS 2.0%. RUNNING SLOPE 5%-7% (8.3% MAXIMUM). SEE NOTES.



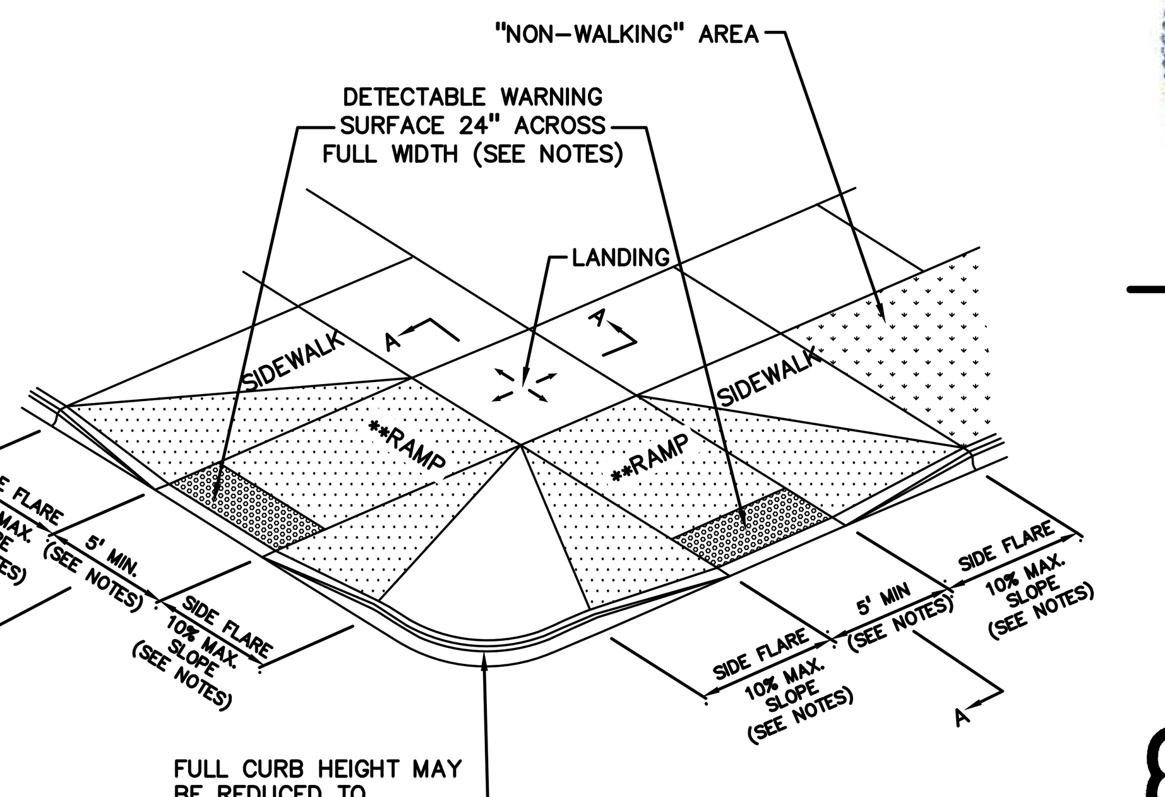
SIDEWALK RAMP TYPE R
(ROLLED SIDES)
NOT TO SCALE

*MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' X 5'. SEE NOTES.

**MAXIMUM RAMP CROSSING SLOPE IS 2.0%. RUNNING SLOPE 5%-7% (8.3% MAXIMUM). SEE NOTES.

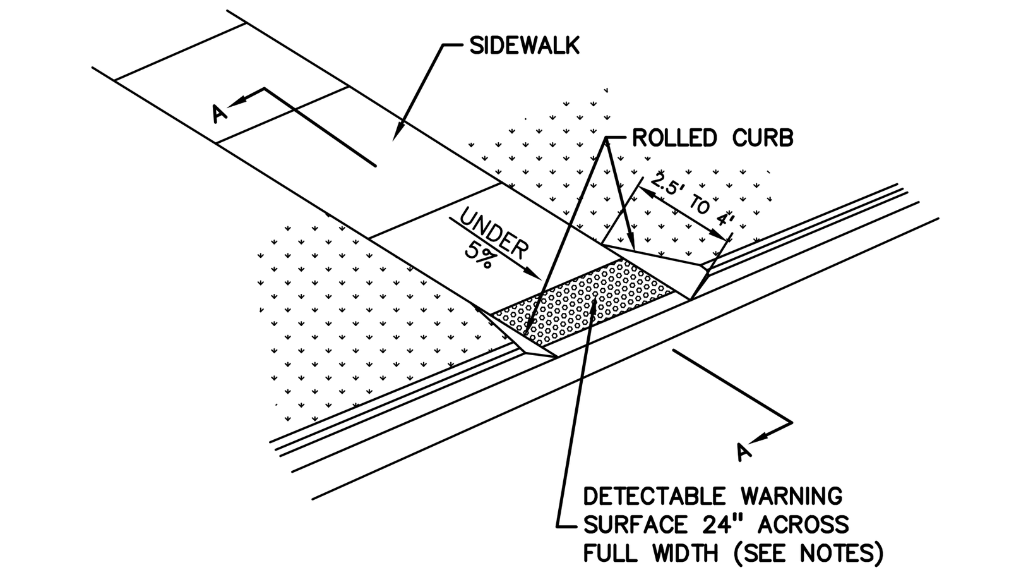


SIDEWALK RAMP TYPE P1
(PARALLEL RAMP)
DO NOT USE IN AREAS WHERE PONDING MAY OCCUR
NOT TO SCALE



SIDEWALK RAMP TYPE F
(FLARED SIDES. TWO RAMPS SHOWN)
NOT TO SCALE

MAXIMUM SIDEWALK SLOPE IS 5%

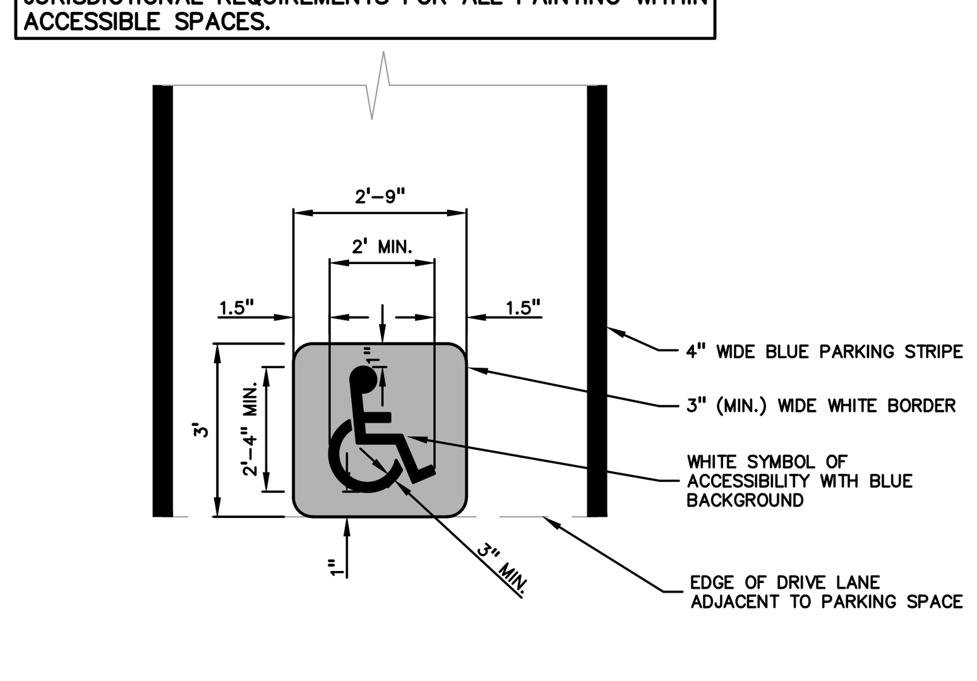


SIDEWALK RAMP TYPE X
(CURB CUT)
NOT TO SCALE

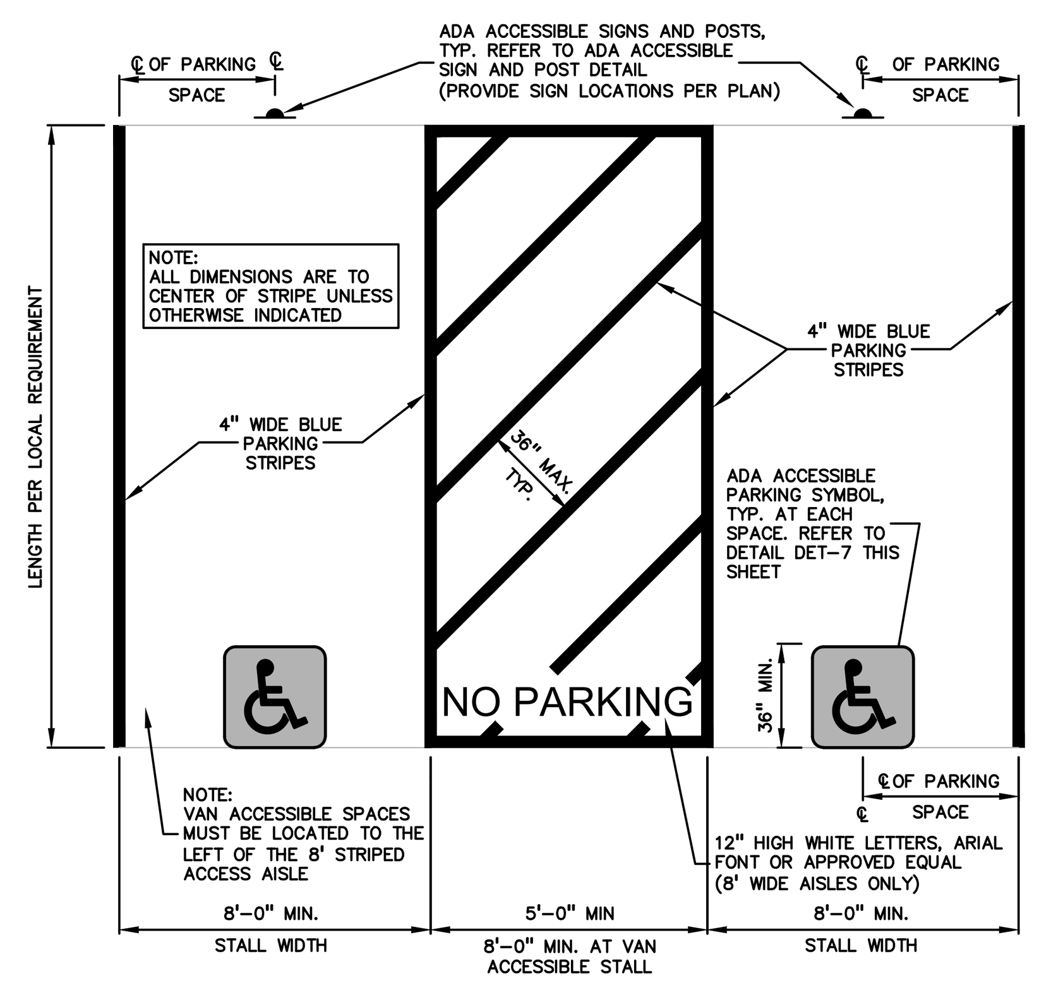
ADA ACCESSIBLE SIGN NOTES:

1. ONE SIGN IS REQUIRED AT EACH ADA ACCESSIBLE PARKING SPACE.
2. ALL SIGNS SHALL COMPLY WITH THE LATEST STANDARDS OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD).
3. WHEN TWO ADA ACCESSIBLE PARKING SPACES ARE ADJACENT AND FACING EACH OTHER, TWO SIGNS ARE REQUIRED, BUT CAN BE MOUNTED ON THE SAME POST.
4. SIGN POSTS SHALL BE 2" NOM. SQUARE 14-GAUGE GALVANIZED STEEL TUBE WITH 7/16" HOLES AT 1" CENTERS. POSTS SHALL TELESCOPE INSIDE ANCHOR POSTS A MINIMUM OF 12".
5. ANCHOR POSTS SHALL BE 2.25" NOM. SQUARE 12-GAUGE GALVANIZED STEEL POST, A MINIMUM OF 3 FEET LONG.
6. IF THESE NOTES AND DETAILS CONFLICT WITH LOCAL CODES AND ORDINANCES, THE STRICTER REQUIREMENT SHOULD BE USED.
7. ALTERNATE MATERIALS MAY BE USED IF IN COMPLIANCE WITH ADA GUIDELINES AND LOCAL REQUIREMENTS.

NOTES:
1. THE ADA ACCESSIBLE PARKING SYMBOL SHALL BE LOCATED IN THE CENTER OF THE PARKING SPACE AND ALONG THE EDGE OF THE ADJACENT DRIVE AISLE, TYP.
2. PARKING SYMBOL STRIPING SHALL HAVE A MINIMUM WIDTH OF 3"
3. CONTRACTOR SHALL ADHERE TO LOCAL/STATE JURISDICTIONAL REQUIREMENTS FOR ALL PAINTING WITHIN ACCESSIBLE SPACES.



ADA ACCESSIBLE PARKING SYMBOL DETAIL (INTERNATIONAL SYMBOL OF ACCESSIBILITY)
NOT TO SCALE

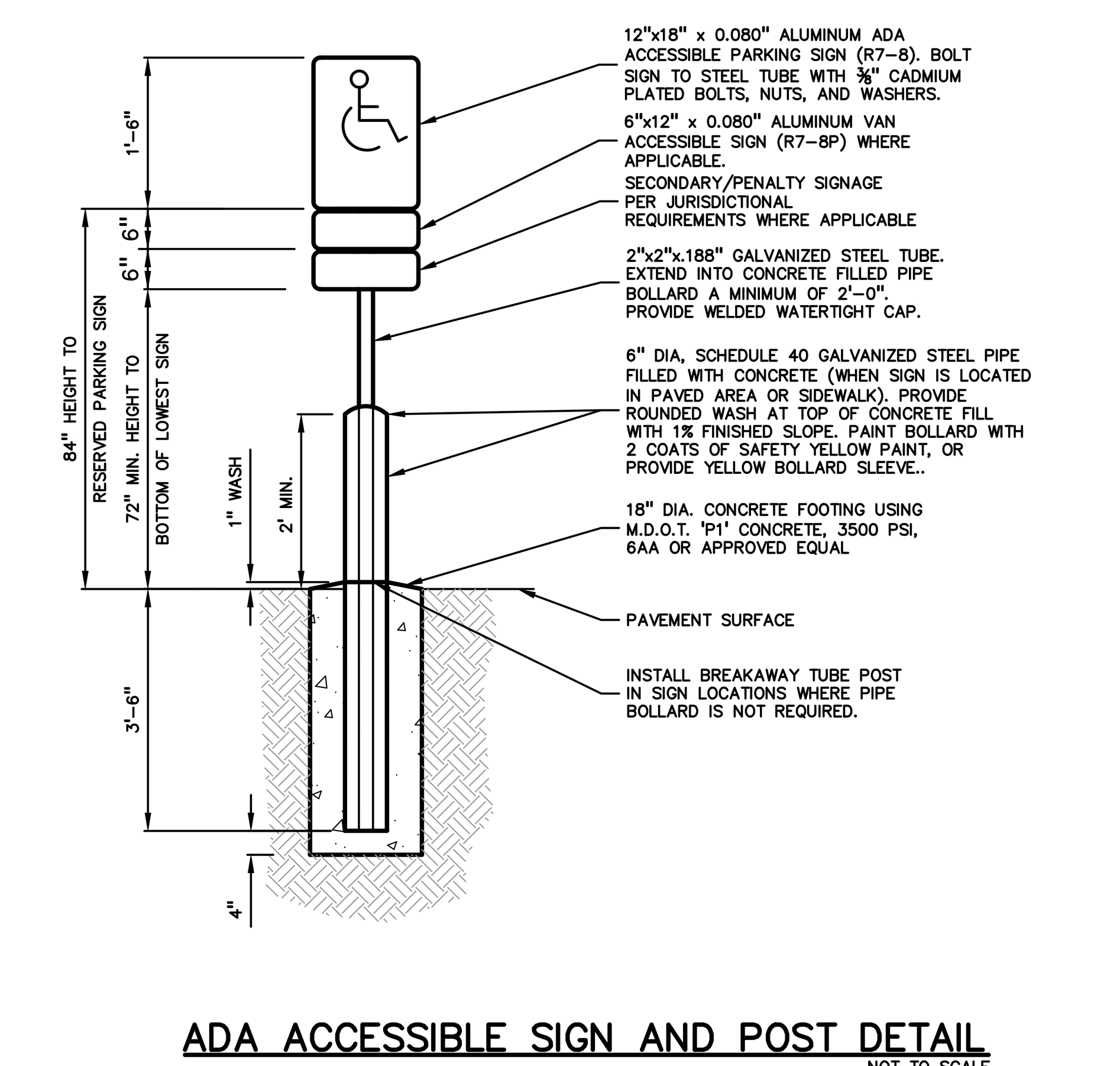


ALTERNATE ADA ACCESSIBLE PARKING STALL DETAIL
NOT TO SCALE

12" x 18" (R7-8)
GREEN BORDER AND LEGEND
WHITE SYMBOL, BLUE BACKGROUND.
REFLECTORIZED

ADA ACCESSIBLE PARKING SIGN DETAIL
NOT TO SCALE

VAN ACCESSIBLE PARKING SIGN DETAIL
NOT TO SCALE



ADA ACCESSIBLE SIGN AND POST DETAIL
NOT TO SCALE

PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN
ROBERT SCOTT KOCHON
License No. 6201046143
LICENSED PROFESSIONAL ENGINEER

CLIENT
TROY SCHOOLS
1140 RANKIN DRIVE
TROY, MI 48083

PROJECT TITLE
2025 TSD SITE IMPROVEMENTS
TROY, MICHIGAN

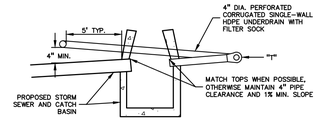
REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

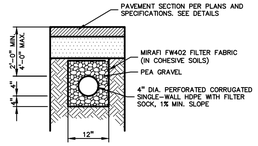
DRAWING TITLE
NOTES AND DETAILS

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

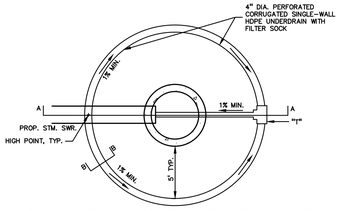
DRAWING NUMBER:
C-4.0



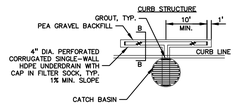
SECTION A–A



SECTION B–B

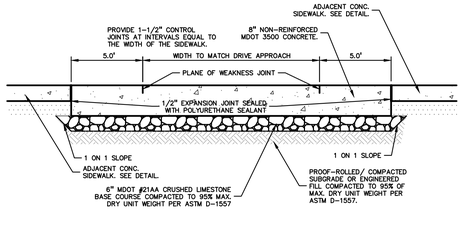


PLAN VIEW – PAVEMENT STRUCTURE

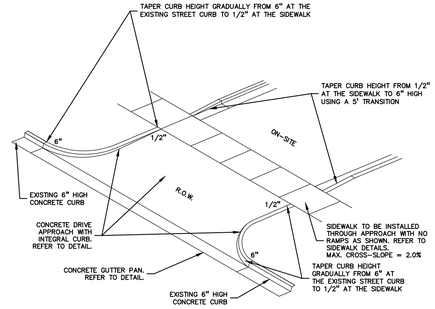


PLAN VIEW – CURB STRUCTURE

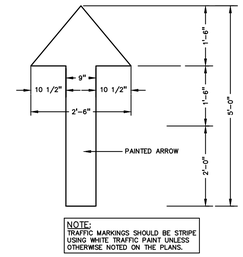
PAVEMENT INLET/CATCH BASIN UNDERDRAIN DETAIL
NOT TO SCALE



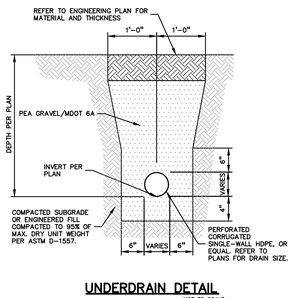
THICKENED SIDEWALK AT DRIVE APPROACH DETAIL
NOT TO SCALE



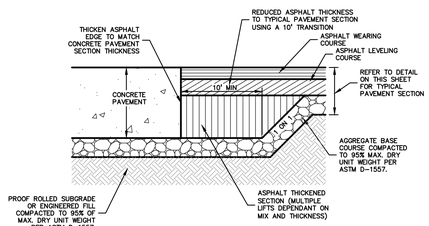
DRIVE APPROACH SCHEMATIC DETAIL
NOT TO SCALE



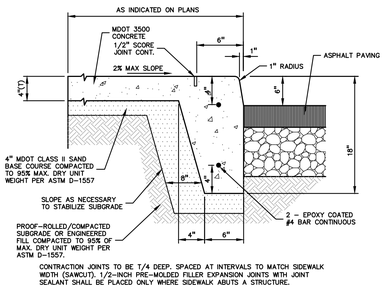
PAINTED DIRECTIONAL ARROW
NOT TO SCALE



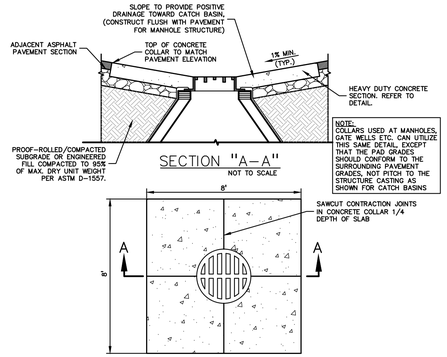
UNDERDRAIN DETAIL
NOT TO SCALE



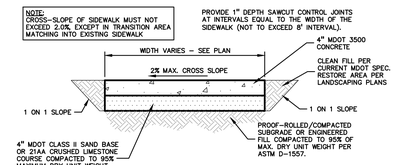
THICKENED EDGE ASPHALT DETAIL
NOT TO SCALE



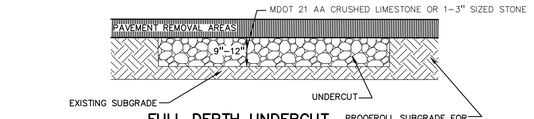
INTEGRAL CURB AND SIDEWALK
NOT TO SCALE



CONCRETE COLLAR DETAIL
NOT TO SCALE



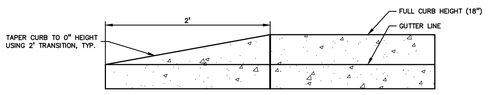
CONCRETE SIDEWALK
NOT TO SCALE



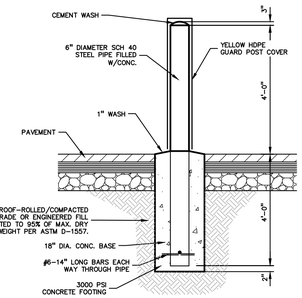
FULL DEPTH UNDERCUT
NOT TO SCALE

PROOFROLL SUBGRADE FOR EVIDENCE OF INSTABILITY

NOTE:
EXISTING SUBGRADE SHALL BE PROOFROLLED IN PROPOSED PAVEMENT OR CUT AND PATCH AREAS IF AREA IS LARGE ENOUGH TO PERFORM SUCH OPERATIONS. IF SUBGRADE IS UNSTABLE, REMOVE EXISTING MATERIAL TO MIN. DEPTH OF 9"–12" PER THE GEOTECH REPORT, AND BACKFILL WITH MDOT 21AA CRUSHED LIMESTONE COMPACTED TO MIN. 95% OF THE MAXIMUM DRY DENSITY PER ASTM D–1557 OR CRUSHED 1–3" SIZED STONE. THE WORK OF FULL DEPTH UNDERCUT CONSISTS OF REMOVAL OF THE EXISTING DETERIORATED SUBGRADE TO A DEPTH OF 9"–12" PER THE GEOTECH REPORT, AND PLACING AND COMPACTING THE REPLACEMENT MATERIALS AS SHOWN. SUBGRADE UNDERCUTTING SHALL BE PERFORMED IN ACCORDANCE WITH THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION. CONTRACTOR TO PROVIDE UNIT PRICE FOR FULL DEPTH UNDERCUT AS PART OF BASE BID.

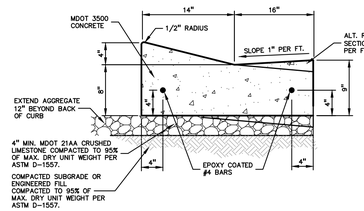


CURB END TRANSITION DETAIL
NOT TO SCALE

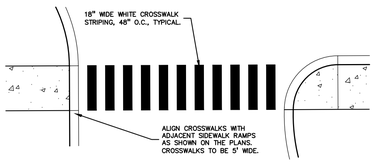


6" DIA. GUARD POST DETAIL
NOT TO SCALE

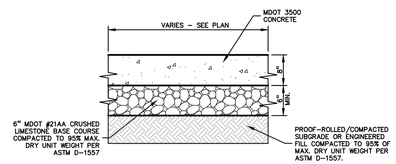
NOTE:
PROVIDE CONTROL JOINTS IN CURB AT 10' O.C. PROVIDE EXPANSION JOINT AND JOINT SEALANT AT END OF RADIUS RETURNS PER MDOT AND ACA STANDARDS. PROVIDE EXPANSION JOINTS AND JOINT SEALANT WHERE CURBS ABUT STRUCTURES.



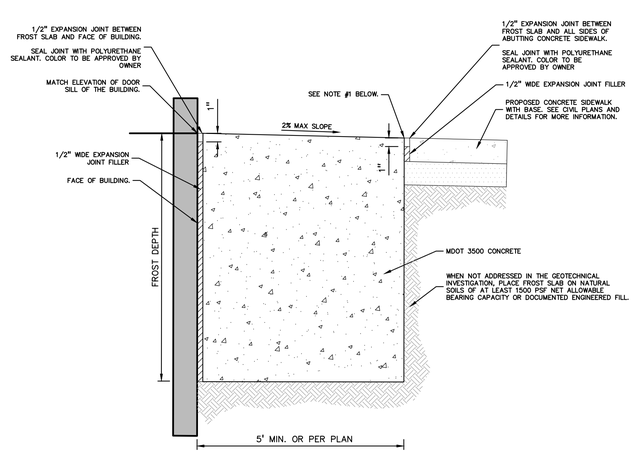
4" MOUNTABLE CURB AND GUTTER DETAIL
NOT TO SCALE



STRIPED CROSSWALK DETAIL
NOT TO SCALE



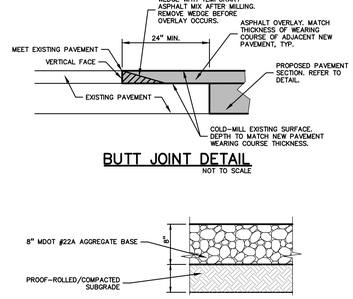
HEAVY DUTY CONCRETE DETAIL
NOT TO SCALE



NOTES:

1. WHEN FROST SLAB IS ABUTTING PAVEMENT WITH A VERTICAL FACE EXPOSED, THE EXPOSED VERTICAL FACE OF THE FROST SLAB SHALL HAVE A BROOM FINISH AND A 1" RADIUS AT THE EXPOSED CORNER SIMILAR TO THE INTEGRAL CURB AND WALK DETAIL.
2. UNLESS OTHERWISE NOTED, BIDDERS ARE TO ASSUME THAT ALL EXISTING STOOPS IN THE WORK AREA WILL BE REMOVED AND REPLACED WITH A FROST SLAB PER THIS DETAIL.
3. IF THE EXISTING STOOP IS FOUND TO BE A CONCRETE CAP ON TOP OF A FOOTING, REMOVE AND REPLACE CAP, PROTECT AND TIE NEW CAP INTO BUILDING FOOTING. PROVIDE CREDIT TO OWNER FOR CHANGE. SHOP DRAWINGS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW AND APPROVAL.

FROST SLAB AT EXTERIOR DOOR
NOT TO SCALE

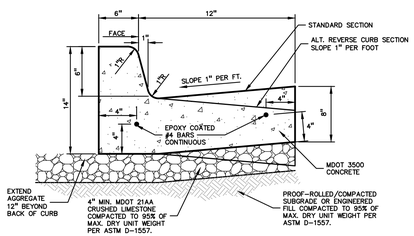


BUTT JOINT DETAIL
NOT TO SCALE

GRAVEL SHOULDER DETAIL
NOT TO SCALE

NOTE:
ALTERNATE REVERSE CURB SECTION TO BE USED ONLY WHEN DRAINING AWAY FROM CURB. SEE PLAN FOR LOCATION.

NOTE:
PROVIDE CONTROL JOINTS IN CURB AT 10' O.C. PROVIDE EXPANSION JOINT AND JOINT SEALANT AT END OF RADIUS RETURNS PER MDOT AND ACA STANDARDS. PROVIDE EXPANSION JOINTS AND JOINT SEALANT WHERE CURBS ABUT STRUCTURES.



18"x6" STANDARD CONCRETE CURB AND GUTTER
NOT TO SCALE

PEA GROUP
t: 844.813.2949
www.peagroup.com
STATE OF MICHIGAN
ROBERT SCOTT KOCHAN
License No. 6201046143
LICENSED PROFESSIONAL ENGINEER

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE AND NOT NECESSARILY COMPLETE. NO REPRESENTATION OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT
TROY SCHOOLS
1140 RANKIN DRIVE
TROY, MI 48083

PROJECT TITLE
2025 TSD SITE IMPROVEMENTS
TROY, MICHIGAN

REVISIONS

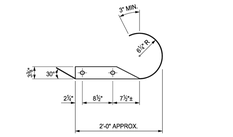
ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

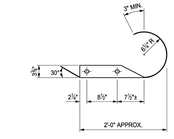
DRAWING TITLE
NOTES AND DETAILS

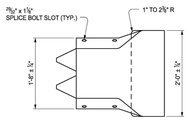
PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-4.1

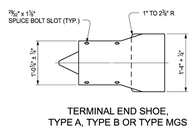
S:\PROJECTS\2024\24-0963 2025 TSD SITE IMPROVEMENTS\DWG\3_CONSTRUCTION\C-4.1DETAILS-24-0963.dwg



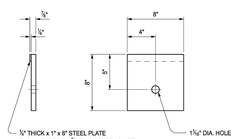




TERMINAL END SHOE, TYPE T



TERMINAL END SHOE, TYPE A, TYPE B OR TYPE MGS



BEARING PLATE

POST SLEEVE

NOTES:

ALL POSTS, OFFSET BLOCKS, BEAM ELEMENTS, AND HARDWARE (INCLUDING BOLTS, NUTS, AND WASHERS) SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION AND TO STANDARD PLAN R-60-SERIES, WHERE APPLICABLE, EXCEPT AS SPECIFIED ON THIS STANDARD.

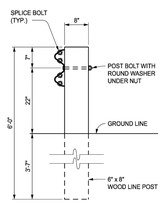
ALL 1:10 SLOPES SHALL BE GRADED TO CLASS A SLOPE TOLERANCES.

FOR DETAILS OF GUARDRAIL PLACEMENT, SEE STANDARD PLAN R-59-SERIES.

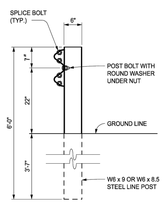
AFTER THE CABLE ASSEMBLY HAS BEEN TIGHTENED, A SECOND NUT SHALL BE INSTALLED ON EACH END OF THE CABLE SO THAT THE CABLE WILL NOT LOOSEN.

TWO HOT-DIP ZINC COATED NAILS SHALL BE DRIVEN INTO THE WOOD POST AT THE TOP OF THE BEARING PLATE TO KEEP THE BEARING PLATE FROM ROTATING.

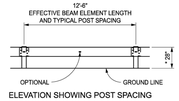
MDOT Michigan Department of Transportation	STANDARD PLAN FOR: GUARDRAIL DEPARTING TERMINAL TYPES B, T, & MGS			
DEPARTMENT DIRECTOR: BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	09/14/2023 PLAN DATE	R-66-E	SHEET 4 OF 4



WOOD POST



STEEL POST

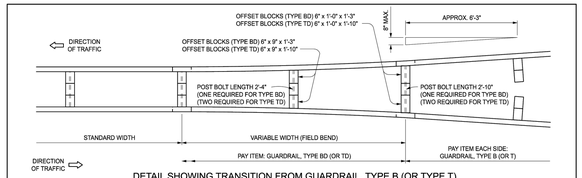


ELEVATION SHOWING POST SPACING

* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE A

APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES	MDOT Michigan Department of Transportation	STANDARD PLAN FOR: GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D			
APPROVED BY: DIRECTOR, BUREAU OF DEVELOPMENT	DEPARTMENT DIRECTOR: BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 1 OF 16



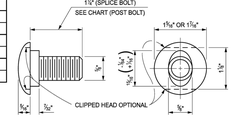
DETAIL SHOWING TRANSITION FROM GUARDRAIL, TYPE B (OR TYPE T) TO GUARDRAIL, TYPE BD (OR TYPE TD)

POST BOLTS, SPLICE BOLTS AND WASHERS AT BEAM ELEMENT SPLICE POSTS AND AT INTERMEDIATE POSTS							
GUARDRAIL TYPE	POST	OFFSET BLOCK	POST BOLTS NO. REQ'D	POST BOLTS LENGTH	SPLICE BOLTS (1½" LONG) (NO. REQ'D)	NOT NEEDED AT INTERMEDIATE POSTS	WASHERS (ROUND) (NO. REQ'D)
A	WOOD	N/A	1	9½"	8		1
	STEEL	N/A	1	2"			1
B	WOOD	WOOD	1	18"	8		1
	STEEL	WOOD	1	9½"			1
BD	WOOD	WOOD	1	* 26½"	16		———
	STEEL	WOOD	2	9½"			2
T	WOOD	WOOD	2	18"	12		2
	STEEL	WOOD	2	9½"			2
TD	WOOD	WOOD	2	* 26½"	24		———
	STEEL	WOOD	4	9½"			4

MINIMUM POST BOLT THREAD LENGTH	
BOLT LENGTH	MINIMUM THREAD LENGTH
9½"	1¾"
18"	2½"
26½"	3"

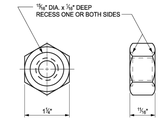
THREE BEAM TRANSITIONS REQUIRE 20 SPLICE BOLTS EACH (12 ON TYPE T END AND 8 ON TYPE B END).

* EXCEPT AS SPECIFIED ON DETAIL SHOWING TRANSITION FROM GUARDRAIL, TYPE B (OR TYPE T) TO GUARDRAIL, TYPE BD (OR TYPE TD). POST BOLTS SHALL NOT EXTEND MORE THAN ½" BEYOND NUT.

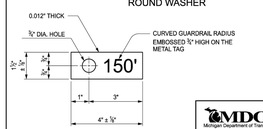


SPLICE BOLT AND POST BOLT

ROUND WASHER



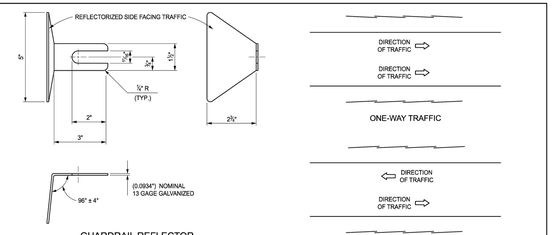
NUT



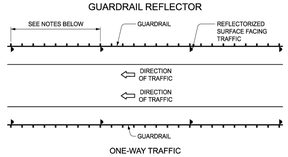
METAL TAG

FOR CURVED GUARDRAIL WITH RADIUS OF 150' OR LESS

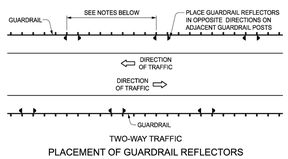
MDOT Michigan Department of Transportation	STANDARD PLAN FOR: GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D			
DEPARTMENT DIRECTOR: BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 14 OF 16



GUARDRAIL REFLECTOR



ONE-WAY TRAFFIC

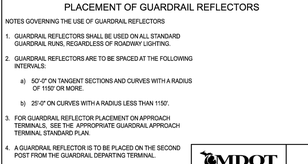


TWO-WAY TRAFFIC

PLACEMENT OF GUARDRAIL REFLECTORS

NOTES GOVERNING THE USE OF GUARDRAIL REFLECTORS

1. GUARDRAIL REFLECTORS SHALL BE USED ON ALL STANDARD GUARDRAIL RUNS, REGARDLESS OF ROADWAY LIGHTING.
2. GUARDRAIL REFLECTORS ARE TO BE SPACED AT THE FOLLOWING INTERVALS:
   a) 50'-0" ON TANGENT SECTIONS AND CURVES WITH A RADIUS OF 1150' OR MORE.
   b) 25'-0" ON CURVES WITH A RADIUS LESS THAN 1150'.
3. FOR GUARDRAIL REFLECTOR PLACEMENT ON APPROACH TERMINALS, SEE THE APPROPRIATE GUARDRAIL APPROACH TERMINAL STANDARD PLAN.
4. A GUARDRAIL REFLECTOR IS TO BE PLACED ON THE SECOND POST FROM THE GUARDRAIL DEPARTING TERMINAL.
5. ON GUARDRAIL, TYPE T AND TYPE TD GUARDRAIL REFLECTORS ARE TO BE PLACED ON THE UPPER POST BOLT.
6. GUARDRAIL REFLECTORS SHALL MATCH COLOR OF EDGE LINE.



DIRECTION OF RAIL LAP

NOTES:

DETAILS SPECIFIED ON THIS STANDARD ARE ACCORDING TO THE AASHTO-AGC-ARTBA JOINT COMMITTEE, TASK FORCE 13 PUBLICATION TITLED "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE."

BEAM ELEMENTS SHALL BE SHOP BENT TO PLAN RADIUS FOR CURVE RADII 150' OR LESS. A TAG IDENTIFYING THE CURVATURE OF THE SHOP BENT SECTION WILL BE REQUIRED FOR EACH CURVED ELEMENT.

SEE STANDARD PLAN R-63-SERIES OR R-63-SERIES FOR GUARDRAIL APPROACH TERMINALS, STANDARD PLAN R-66-SERIES FOR GUARDRAIL DEPARTING TERMINALS AND STANDARD PLAN R-67-SERIES FOR GUARDRAIL ANCHORAGE, BRIDGE.

WOOD POSTS WITH ½" BEVELS AT THE TOP MAY BE USED IN LIEU OF WOOD POSTS WITHOUT BEVELS SPECIFIED. THE LENGTH, WIDTH AND DEPTH OF THE POST SHALL BE AS SPECIFIED ON THIS STANDARD AND THE POST BOLT HOLES SHALL BE LOCATED TO ENSURE PROPER RAIL HEIGHT.

WOOD OFFSET BLOCKS WITH ½" BEVELS AT THE TOP AND BOTTOM OR A 1" BEVELED TOP MAY BE USED IN LIEU OF WOOD BLOCKS WITHOUT BEVELS SPECIFIED. THE LENGTH (FRONT AND BACK FACE), WIDTH AND DEPTH OF THE BLOCK SHALL BE AS SPECIFIED ON THIS STANDARD AND THE POST BOLT HOLES SHALL BE LOCATED TO ENSURE PROPER RAIL HEIGHT AND COMPATIBILITY WITH POST HOLES.

WHEN THE FACE OF GUARDRAIL IS PLACED FLUSH WITH FACE OF CURB, THE RAIL HEIGHT SHOULD BE MEASURED FROM THE FRONT EDGE OF THE GUTTER PAN, WHICH IS THE POINT ON THE GUTTER PAN THAT IS CLOSEST TO THE EDGE OF THE TRAVELED LANE. WHEN THE FACE OF THE GUARDRAIL PANEL IS LOCATED BEHIND THE CURB THE RAIL HEIGHT SHOULD BE MEASURED FROM THE GROUND JUST IN FRONT OF THE GUARDRAIL.

MDOT Michigan Department of Transportation	STANDARD PLAN FOR: GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D			
DEPARTMENT DIRECTOR: BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 16 OF 16

S:\PROJECTS\2024\24-0963 2025 TSD SITE IMPROVEMENTS\DWG_CONSTRUCTION\(C--4.0)DETAILS--24-0963.dwg

PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN · ROBERT SCOTT KOCHON · License No. 6201046143 · REGISTERED PROFESSIONAL ENGINEER

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE AND NOT GUARANTEED TO BE ACCURATE OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT
TROY SCHOOLS
1140 RANKIN DRIVE
TROY, MI 48083

PROJECT TITLE
2025 TSD SITE IMPROVEMENTS
TROY, MICHIGAN

REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
NOTES AND DETAILS

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-4.2

Project Information

a. Type of soil being disrupted:

Derived from: Soil Survey Soil Borings Other

b. Present the chronological sequence and expected time of year for each major phase of earth disruption.

	DATE
Site Clearing	
Soil Erosion Control	
Mass Balancing	
Underground Utilities	
Paving	
Restoration / Stabilization	

c. Indicate the measures proposed to prevent sediment from leaving the site:

Hydrologic Characteristics of Site

a. Type of "Offsite" drainage outlet(s) available for this site:

County Drain — Name of Drain:
Lake/Pond — Name of Lake/Pond:
River/Stream — Name of River/Stream:
Enclosed Drain — Name of Enclosed Drain:
Detention Basin (with outlet)
Wetland — Retention Basin (no oulet)
Overland Flow — Open Ditch

b. Distance to nearest lake, stream, pond, open drain, or wetland:

c. Does the project include any work or disruption with a flood plain (Yes or No)?

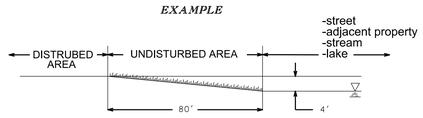
d. Does the project include work within the cross-section of a lake/stream (Yes or No)?

e. Is a MDEQ Permit required (Yes or No)? If Yes, what is the MDEQ Permit Number (if known):

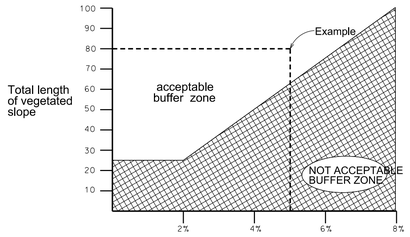
f. If MDEQ Permit is required and application has not been submitted, what is the expected date of submittal?

The graph listed below is used to determine the adequacy of an existing vegetative buffer zone for use as a sediment filter. This graph is only applicable if the vegetation is a dense well-grown stand of ground cover, at least 4" in height. An area covered with bushes and trees without a good ground cover is not acceptable.

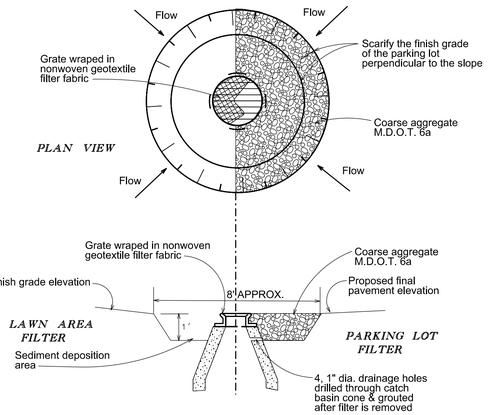
EXAMPLE



Length of Buffer Zone 80'
Drop of Buffer Zone 4'
% of Slope of Buffer Zone 4' / 80' x 100%



VEGETATIVE BUFFER ZONE



INLET SEDIMENT TRAP LAWN OR PARKING LOT

Builders and developers working in Troy are responsible for complying with the regulations for temporary Storm Drain inserts, also known as "siltsacks". The inserts are used on many construction projects to catch sediment not captured upstream by other construction-related erosion control devices and can be an important temporary environmental safeguard.

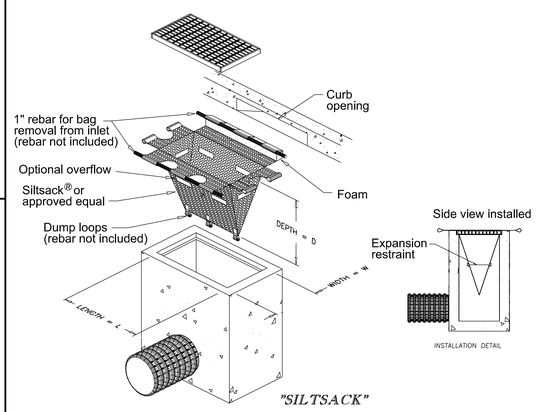
Builders must clean and/or replace the inserts when half of the trap is filled with sediment.

Builders must inspect and maintain the inserts whenever 1/2 inch of rain falls within a 24-hour period.

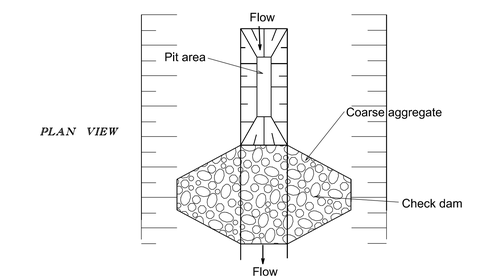
The inserts are to be removed by the builders within 30 days of site stabilization or after the temporary erosion measures are no longer needed.

If inserts are removed during times of flooding, the builder is responsible for re-installing them per regulations.

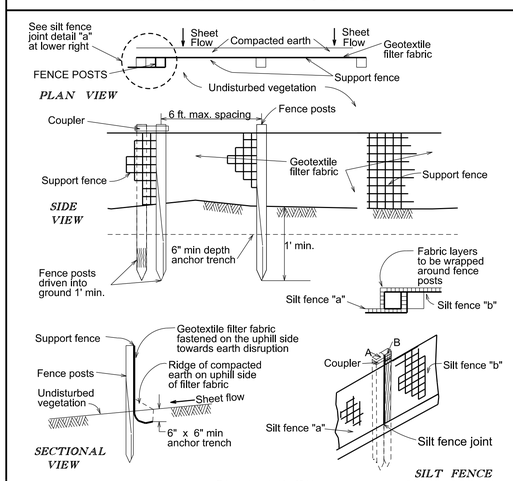
Silt sock inserts are required for all developments with curb inlets or pavement inlets. Rear yard catch basins may utilize a non-woven Geotextile fabric.



"SILTSACK"

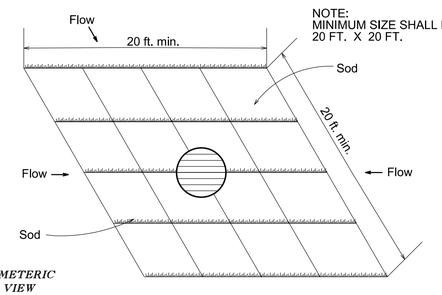


SEDIMENT TRAP WITH CHECK DAM



SILT FENCE

Definition	Sod inlet filter are pads of sod placed around a storm drain inlet or catch basin.
Purpose	Sod inlet filters are installed to slow the flow of water into an inlet or catch basin and to filter out appreciable amounts of sediment in the process.
Where applicable	Sod inlet filters should only be used to handle light concentrations of sediment. They are best used after final grading is completed and during the establishment of a vegetative cover.



SOD INLET FILTER

SOIL EROSION & SEDIMENTATION CONTROL NOTES

1. The following items are intended to be a guide to the contractor in evaluating Soil Erosion control requirements for the project. Specific Soil Erosion control devices and locations may be detailed on the plans. The contractor should also note that Soil Erosion and Sedimentation controls are included in the project unless specified otherwise on the plans or in the specifications.

2. All erosion and Sediment control work shall conform to the permit requirements and the standards and specifications of the City of Troy.

3. Daily inspections shall be made by the contractor for effectiveness of Soil Erosion and Sedimentation control measures and any necessary repairs shall be performed without delay.

4. Erosion and any sedimentation from work on this site shall be contained on the site and not allowed to collect on any off-site areas or in waterways.

5. Waterways include natural or man-made open ditches, streams, storm drains, lakes and ponds.

6. Contractor shall apply temporary soil erosion and sedimentation control measures when required or as directed. Contractor shall remove temporary measures as soon as permanent stabilization of slopes, ditches, and other earth changes has been accomplished.

7. Staging the work will be done by the contractor as indicated on the Soil Erosion plans and as required to ensure progressive stabilization of disturbed earth.

8. The contractor will establish soil erosion control measures in the early stages of construction. Sediment control measures will be applied as a perimeter defense against any transporting of silt off the site.

9. Engineer and owner certification must be included on the plans.

10. Separate sheets showing soil erosion and sedimentation control plans must be provided.

11. The following guidelines are to be implemented:

a. Check Dams:

i. Stone size must be increased with increased slope and velocity.
ii. Side slope of the dam should be 2:1 or flatter.
iii. Straw bales are not to be used for check dams.
iv. Add stones as needed to maintain design height and cross section.
v. Any accumulation of sediment shall be removed and stockpiled in a stabilized area to prevent the material from eroding back into the drainage course.

b. Vegetative Buffer Zones:

i. Vegetation must be maintained in a vigorous condition.
ii. Reshape and reseed areas where concentrated flow occurs or vegetation fails.
iii. To be used for sheet flows only.
iv. Not to be used as a roadway.

c. Silt Fence:

i. Must be installed along the contour line.
ii. Is not to be used in areas of concentrated flow.
iii. Must be trenched in at least 6 inches and backfilled.
iv. Multiple rows are to be used up a slope.
v. Accumulated sediment must be periodically removed.
vi. Where necessary, a support fence shall be used to support the geotextile filter fabric.
vii. To be removed after site is permanently stabilized.

d. Inlet Sediment Trap:

i. The sediment deposition area and nonwoven geotextile filter fabric should be cleaned of all accumulated sediment after each storm.
ii. After all contributing areas are stabilized, the filter fabric will be removed, sediment deposition area filled, and a sod inlet filter placed over the disrupted lawn area.
iii. The filter material used to backfill parking lot drainage holes will be peastone. The side excavation for the placement of this material will not be deeper than the invert of the drainage holes.

e. Inlet Filters After Paving or Grading:

i. Inlet filters will remain in place until all denuded areas contributing to them are stabilized with vegetation.
ii. Periodic inspection and maintenance will be provided to insure that filters are functioning properly.

f. Sod Inlet Filter:

i. Sod inlet filters will only be used to handle light concentrations of sediment.
ii. Recommended for use after final grading is complete and during the establishment of a vegetative cover.
iii. Catch basin inlet covers may be wrapped in a non-woven geotextile filter fabric for additional filtration
iv. Periodic inspection and maintenance must be provided to insure efficient operation.

TROY MICHIGAN

STANDARD SOIL EROSION CONTROL DETAILS
ENGINEERING DEPARTMENT
APPROVED BY: WILLIAM J. HUOTARI, CITY ENGINEER DATE: JUNE 2019

REVISIONS	DATE	REMARKS
	APRIL 2019	GENERAL UPDATES

STATE OF MICHIGAN — WILLIAM J. HUOTARI — ENGINEER NO. 43231 — REGISTERED PROFESSIONAL ENGINEER
WILLIAM J. HUOTARI, P.E. #43231

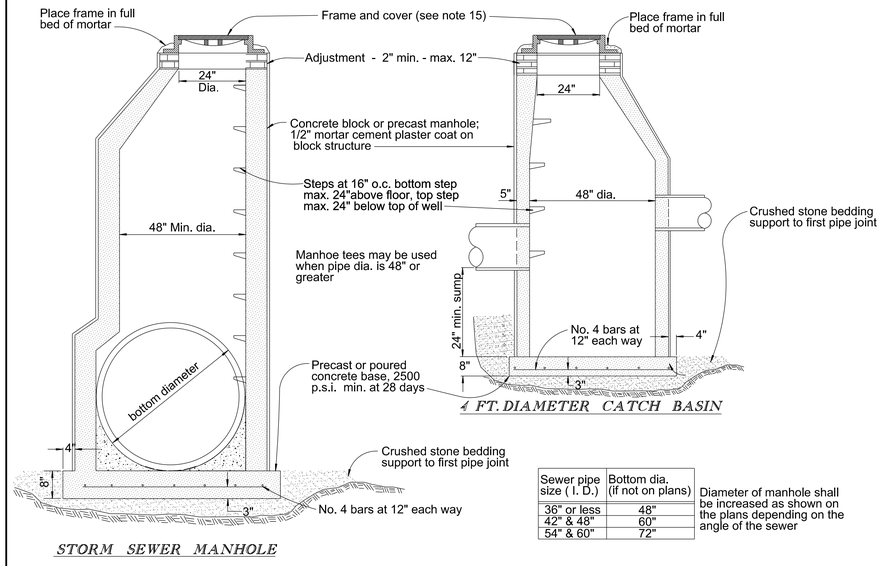
Contractor Note:
The locations of existing underground utilities are shown in an approximate way only. The contractor shall determine the exact location of all existing utilities before commencing work. The contractor to be fully responsible for any and all damages which might be occasioned by the failure to exactly locate and preserve any and all underground utilities.

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811
Know what's below. Call before you dig.
MISS DIG System, Inc. (800) 482-7171 www.missdig.net

CONTRACT NO. XX-XX
PROJECT NO. XX.XXXX.X

D

NOTIFY CITY OF TROY ENGINEERING DEPT. AT 248-524-3409 PRIOR TO STARTING ANY WORK

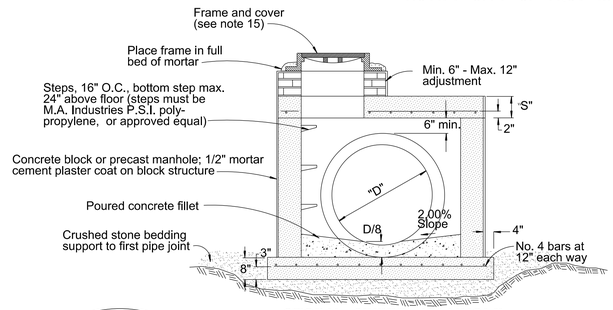


4 FT. DIAMETER CATCH BASIN

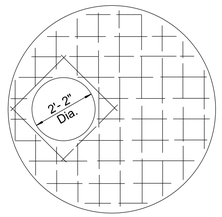
STORM SEWER MANHOLE

Sewer pipe size (I. D.)	Bottom dia. (if not on plans)
36" or less	48"
42" & 48"	60"
54" & 60"	72"

Diameter of manhole shall be increased as shown on the plans depending on the angle of the sewer



STORM SEWER MANHOLE WITH FLAT SLAB



TOP SLAB X-SECTION

Outlet "d"	M.h. I.d."	Top slab "S"	Reinforcing steel requirements
36" or less	4	9"	3/4" @ 9" ea. way
42"	5	10"	3/4" @ 9" ea. way
48"- 54"	6	11"	7/8" @ 9" ea. way
	7	12"	1" @ 9" ea. way
	8	12"	1" @ 9" ea. way

GENERAL NOTES

1. All construction shall conform to the current standards and specifications of the City of Troy. Prior to construction, the contractor shall attend a reconstruction meeting at a time and place arranged by the City Engineer, in which various utility companies and governmental agency representatives will be present. The design engineer shall submit approved plans to all utility companies and governmental agencies 10 (ten) days prior to the preconstruction meeting. Construction shall start within 3 (three) weeks of meeting. The contractor shall notify the City Engineer 72 hours prior to starting any work.

2. The entire project area of publicly funded projects, and all areas not under the ownership of any private developer for privately funded projects, shall be digitally recorded in color prior to the start of construction. The DVD shall be utilized by the City to determine construction related damage and to assure adequate restoration

3. Before start of construction, the contractor must request and have in their possession a copy of a valid permit to construct a connection to, or an extension of, the Storm Water Drainage System.

4. Prior to any excavation, the contractor shall call Miss Dig (1-800-482-7171) for the location of underground facilities and shall also notify representatives of other utilities located in the vicinity of the work. The contractor shall assume responsibility for the protection of all existing utilities, services and mains during construction. All costs for locating, removing and replacing or relocating these utilities, services and mains shall be included in the cost of constructing the sanitary sewer. All utilities, services and mains damaged during construction shall be repaired with like material. The contractor shall verify the depth and horizontal location of all existing utilities, services and mains before any work is started. The exact location of existing utilities, services and mains shall be determined by hand digging.

5. A City of Troy, Water Resources Commissioner's, Road Commission for Oakland County, and/or Michigan Department of Transportation permit is required for all construction within their Right-of-Ways. WRC must witness the new connection, contact the WRC office at 248-885-1105 - 48 hours prior to starting work. It is the contractor's responsibility to secure all permits and bonds prior to construction, or to insure that all required permits and bonds have been obtained prior to starting construction.

6. The contractor shall abide by all the requirements of the Right-of-Way owner regarding construction of storm sewer mains, maintaining traffic, barricading, boring, backfill and restoration. There will be no additional compensation due the contractor for complying with these requirements.

7. The contractor shall implement all soil erosion control measures indicated in the permit and/or shown on the plans prior to making any earth changes.

8. Prior to the start of construction, the contractor shall furnish material certificates to the City verifying that all the materials used on the project are in accordance with the specifications.

9. All construction changes must have written approval of the Project Engineer.

10. Sewer Pipe Material:

a. Reinforced concrete circular sewer pipe conforming to the current ASTM specification C-76 (Wall C) with size and class as indicated on the plans; minimum class III. All reinforced concrete sewer pipe shall be cast with reinforcing steel extending into the spigots. All joints and gaskets shall be modified tongue and groove, conforming to the requirements of ASTM (C-443). All sewer pipe 30" and larger shall have pointed joints.

b. Plastic circular sewer pipe conforming to the current ASTM specifications for PVC Corrugated with smooth interior wall (A-2000) or high-performance polypropylene (N-12 HP), when approved for use by the City Engineer. All joints and gaskets shall conform to the respective ASTM specifications.

c. The following storm sewer pipe materials may be used only with approval of the City Engineer. If soils PH & Resistivity tests demonstrate a PH of 5.0 to 9.0 and an Electrical Resistance of 2000 OHM/CM/CU or higher, then helically corrugated, full welded seam, AASHTO M-218 steel pipe, gauge as shown, manufactured according to AASHTO M-36 with 2 2/3" x ½", aluminized at 1.00 oz per sq. ft. per AASHTO M-274 may be used. Corrugated steel pipe shall have two circumstantial corrugations rolled on each end of each section. Steel coupling bands of the same material as the pipe, fitting the pipe configuration with two "O" Ring rubber gaskets shall produce a watertight joint ("Hugger Bands").

d. Underdrains, rear yard and ditches, slotted perforations of 1.90 - 2.00 square inches per foot of pipe length. A-2000, N-12 or approved equal.

e. All sump and building service connections shall be 3" Polyvinyl Chloride (PVC) sewer pipe, schedule 40 with chemically fused joints and connect to a catch basin or manhole. No blind taps. The joint between two dissimilar sizes or types of building lead pipe shall be made with a proper fitting acceptable to the City Engineer

11. All new manholes shall have approved flexible, water-tight seals where pipes pass through walls. Manholes shall be precast reinforced concrete in accordance with ASTM C478 current specifications. Precast manhole joints and gaskets shall be modified tongue and groove in accordance with ASTM C443 current specifications. Precast manhole cone sections shall be City of Troy modified eccentric cone type.

12. All precast manholes, slab bases, concrete pipe and concrete channelization shall be manufactured with Type II, IP or IIA cement.

13. Manhole steps shall normally be provided on a back wall of the manhole furthest from traffic, manhole steps shall be factory installed at 16 inches center to center spacing. Steps shall be M.A. Industries P.S.I. Polypropylene MSU #360 ALU Poly (or approved equal).

14. Existing manholes shall be tapped by coring for sewers 6" thru 15" in diameter. Manhole taps for 18" diameter sewers and larger shall have holes drilled at 4 inches center to center around the periphery of the opening to create a plane of weakness before breaking out the section. Non-shrink grout shall be used to seal the opening and a concrete collar shall be poured 12 inches around the pipe and extend 12 inches beyond the opening. If the wall of the structure being tapped is damaged, the City shall decide if it can be repaired and approve the method. If the structure cannot be repaired it will be replaced.

15. A mainline trace wire must be installed, with all service lateral trace wires properly connected to the mainline trace wire, to ensure full tracing/locating capabilities from a single connection point. Lay mainline trace wire continuously, by-passing around the outside of manholes/structures on the North or East side. Trace wire on all storm service laterals must terminate at an approved trace wire access box color coded green and located directly above the service lateral at the edge of road right of way.

16. Unless otherwise noted on the plans, structure frame and covers shall be as follows:

a. Manhole - EJ 1000 with type "C" perforated cover with CITY OF TROY STORM on cover.
b. Catch Basin in pavement - EJ 5080 with sinusoidal m2 grate, or equal, in residential areas.
c. Catch Basin in pavement - EJ 5105 with sinusoidal m2 grate, or equal, in non-residential areas.
d. Catch Basin not in pavement - EJ 1000 with type M, N, or 01 heavy duty grate, or equal.
e. Catch Basin in Landscape area or Roadside Ditch may require the use of the following:

1) EJ 1040 type "N" oval grate or type 02 beehive grate
2) EJ 1130 type "N" oval grate or type 01 beehive grate
3) EJ 2800 type "N" oval grate or type 02 beehive grate
4) EJ 6508 or EJ 6517

2" LETTERS

(2) 1" HOLES

17. The contractor shall provide a 3 year maintenance and guarantee bond to the City, dated from the time of final acceptance by the City. The bond amount shall be 35% of constructions costs.

18. Before final acceptance, As-Built drawings must be submitted to the City of Troy Engineering Department. One electronic copy (PDF) and one digital copy (DWG or DGN) is required. .

GENERAL PIPE BEDDING & TRENCH NOTES

1. The contractor shall install the pipe in accordance with the bedding detail required for the pipe depth (measured from the top of the pipe), and trench width (measured across the trench at the top of the pipe) constructed. Alternate material and methods must be approved in writing by the City Engineer

2. Crushed stone bedding shall be utilized for dewatered ground trench's, trenches greater than 30" in width or 20' in depth.

3. Bedding material shall be as follows:

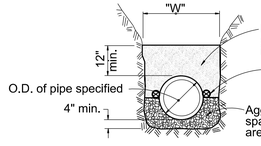
   Standard bedding - MDOT 6A, 17A or 34R
   Crushed stone bedding - MDOT 25A or 34G
   MDOT Class II or IIA granular material

4. Backfill material shall be as follows:

   Excavated material - T.D. - A
   MDOT Class II granular material - T.D. - B

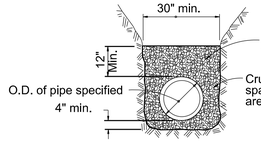
Bedding shall be defined as that material placed from four (4) inches below the pipe to a point twelve (12) inches above the pipe.

NOTE: Crushed concrete will not be allowed as bedding or backfill with underdrains or rear yard storm sewer



STANDARD BEDDING

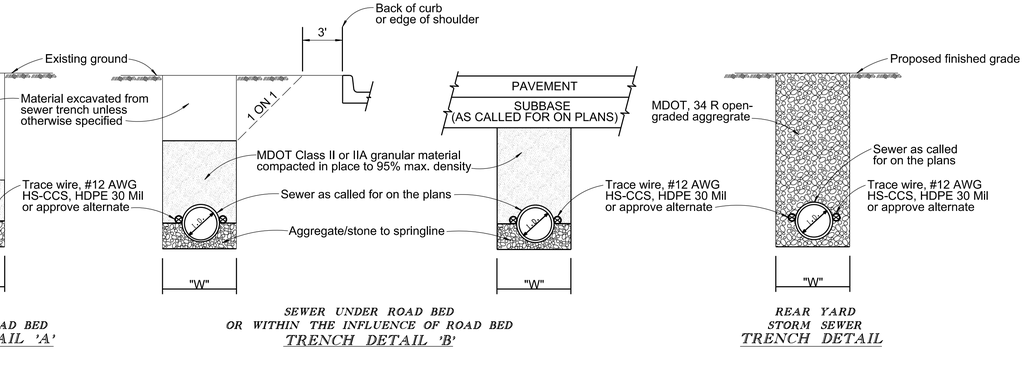
Maximum trench width = "W"
O.D. + 12" for 8" - 36" I.D.
O.D. + 24" for 42" I.D. & larger



CRUSHED STONE BEDDING

TYPICAL CONCRETE BLOCK SECTION

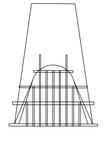
NOTE: Unless otherwise authorized by the City Engineer, each structure shall be constructed totally of either precast segments or built - up with mortar and block



SEWER NOT UNDER ROAD BED
TRENCH DETAIL 'A'

SEWER UNDER ROAD BED OR WITHIN THE INFLUENCE OF ROAD BED
TRENCH DETAIL 'B'

REAR YARD STORM SEWER
TRENCH DETAIL



Steel Grates for End Sections
See current MDOT detail
Required for 12" dia. and greater

TROY MICHIGAN

STANDARD STORM SEWER DETAILS
ENGINEERING DEPARTMENT
APPROVED BY : WILLIAM J. HUOTARI, CITY ENGINEER DATE : JUNE 2019

REVISIONS	DATE	REMARKS
	APRIL 2019	GENERAL UPDATES

STATE OF MICHIGAN · WILLIAM J. HUOTARI · ENGINEER · NO. 43231 · PROFESSIONAL ENGINEER

WILLIAM J. HUOTARI, P.E. #43231

Contractor Note:
The locations of existing underground utilities are shown on the plans in a diagrammatic way only. The contractor shall determine the exact location of all existing utilities before beginning construction work. The contractor shall be fully responsible for any and all damages which might be occasioned by the failure to exactly locate and preserve any and all underground utilities.

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811
Know what's below Call before you dig
MISS DIG System Inc. 1-800-482-7171 www.missdig.net

CONTRACT NO. XX-XX
PROJECT NO. XXXXXX

FLOODPLAIN:
(PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, REVISED DATE JANUARY 16, 2009)

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD
THE 1% ANNUAL CHANCE FLOOD (100 YEAR FLOOD), ALSO KNOWN AS THE BASE FLOOD, IS THE FLOOD THAT HAS A 1% CHANCE OF BEING EQUALED OR EXCEEDED IN ANY GIVEN YEAR. THE SPECIAL FLOOD HAZARD AREA IS THE AREA SUBJECT TO FLOODING BY THE 1% ANNUAL CHANCE FLOOD. AREAS OF SPECIAL FLOOD HAZARD INCLUDE ZONES A, AE, AH, AO, AR, A99, V AND VE. THE BASE FLOOD ELEVATION IS THE WATER-SURFACE ELEVATION OF THE 1% ANNUAL CHANCE FLOOD.

ZONE AE – BASE FLOOD ELEVATIONS DETERMINED.

OTHER FLOOD AREAS
ZONE X – AREA OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD.

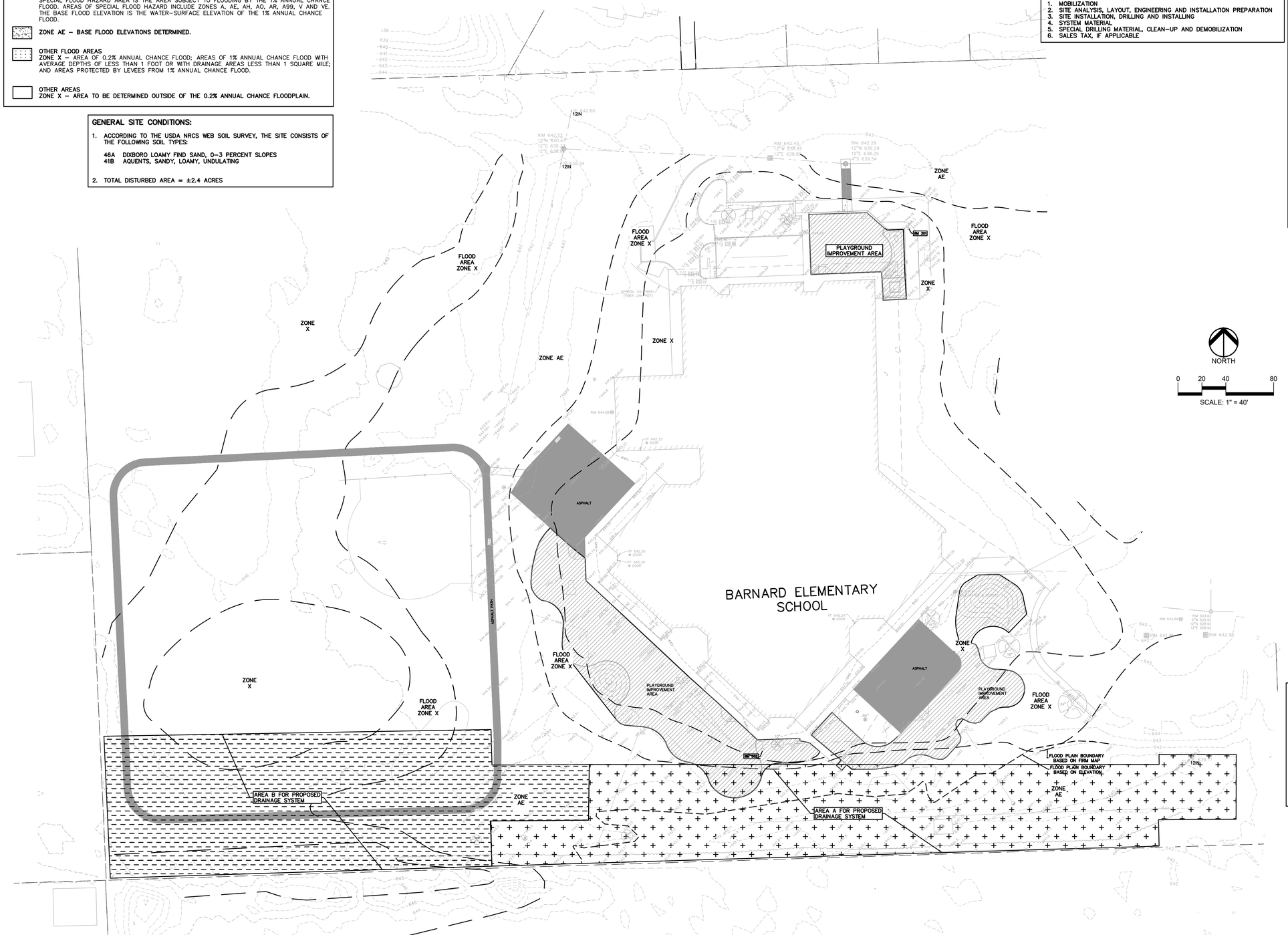
OTHER AREAS
ZONE X – AREA TO BE DETERMINED OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN.

GENERAL SITE CONDITIONS:

1. ACCORDING TO THE USDA NRCS WEB SOIL SURVEY, THE SITE CONSISTS OF THE FOLLOWING SOIL TYPES:

   46A DIXBORO LOAMY FIND SAND, 0-3 PERCENT SLOPES
   41B AQUENTS, SANDY, LOAMY, UNDULATING

2. TOTAL DISTURBED AREA = ±2.4 ACRES



PROJECT DESCRIPTION AND BASIS FOR DESIGN:

BIDDER TO PROVIDE DESIGN-BUILD SERVICES FOR A EXLTERRA GEPS® GROUNDWATER ENERGY PASSIVE SYSTEM OR EQUAL. EQUIVALENCY WILL BE SOLELY DETERMINED BY THE DISTRICT. COST SHALL BE A LUMP SUM VALUE INCLUDING THE FOLLOWING ITEMS.

1. MOBILIZATION
2. SITE ANALYSIS, LAYOUT, ENGINEERING AND INSTALLATION PREPARATION
3. SITE INSTALLATION, DRILLING AND INSTALLING
4. SYSTEM MATERIAL
5. SPECIAL DRILLING MATERIAL, CLEAN-UP AND DEMOBILIZATION
6. SALES TAX, IF APPLICABLE

UTILITY LEGEND:

- EX. OH. ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC,MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND, & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- PROPOSED WATER MAIN
- PROPOSED HYDRANT AND GATE VALVE
- PROPOSED TAPPING SLEEVE, VALVE & WELL
- PROPOSED POST INDICATOR VALVE
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY CLEANOUT & MANHOLE
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER CLEANOUT & MANHOLE
- PROPOSED CATCH BASIN, INLET & YARD DRAIN

GRADING LEGEND:

- EXISTING SPOT ELEVATION
- 622.50 — PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- 670 — EXISTING CONTOUR
- 922 — PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

T/C = TOP OF CURB	G = GUTTER GRADE
T/P = TOP OF PAVEMENT	F.G. = FINISH GRADE
T/S = TOP OF SIDEWALK	RIM = RIM ELEVATION
T/W = TOP OF WALL	B/W = BOTTOM OF WALL

REFER TO GRADING NOTES ON SHEET ########

NORTH

0 20 40 80

SCALE: 1" = 40'

BENCHMARKS:
(GPS DERIVED - NAVD88)

BM #300
SCRIBED "+" ON SOUTH SIDE OF LIGHT POLE BASE, 5' NORTH OF BACK OF CURB, ±40' WEST OF NORTHEAST CORNER OF PARKING LOT.
ELEV. - 644.27

BM #301
SCRIBED "+" ON NORTHEAST SIDE OF LIGHT POLE BASE, ±5' WEST OF BACK OF WALK, ± 80' NORTHEAST OF NORTHEAST CORNER OF BUILDING.
ELEV. - 644.97

BM #302
DIMPLE ON AN ARROW ON A HYDRANT LOCATED APPROX. 25' SOUTH OF THE BUILDING, BETWEEN THE PLAYGROUND AREAS.
ELEV. - 647.12

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP NUMBER 26125C0553G, DATED JANUARY 16, 2009.

PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN
ROBERT SCOTT KOCHON
License No. 6201046143
REGISTERED PROFESSIONAL ENGINEER

811 Know what's below. Call before you dig.

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE AND NOT GUARANTEED. THEY ARE ASSESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT
TROY SCHOOLS
1140 RANKIN DRIVE
TROY, MI 48083

PROJECT TITLE
BARNARD ELEMENTARY SCHOOL
3601 FORGE DRIVE
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

REVISIONS

ORIGINAL ISSUE DATE:
NOVEMBER 8, 2024

DRAWING TITLE
DRAINAGE IMPROVEMENT PLAN

PEA JOB NO.	2024-0963
P.M.	RR
DN.	RR
DES.	RM

DRAWING NUMBER:
C-1.0

\\peainc.local\PROJECTS\2023\23-0301 TROY SCHOOLS 2023 BOND\CIVIL\3_CONSTRUCTION PLAYGROUNDS\BARNARD\DRAINAGE ISSUE\[C-1.0] GRAD UTIL BARNARD 23-0412 rev.dwg

SOILS AND AGGREGATES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Subsoil materials.
2. Topsoil materials.
3. Coarse aggregate materials.
4. Fine aggregate materials.

B. Related Sections:

1. Section 31 22 13 - Rough Grading.
2. Section 31 23 17 - Trenching.
3. Section 31 23 23 - Fill.
4. Section 32 91 19 - Landscape Grading.
5. Section 33 41 00 - Storm Utility Drainage Piping.

1.2 REFERENCES

A. ASTM International:

1. ASTM D136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
4. ASTM D2974 - Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
5. ASTM D7928 - Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis.
6. ASTM C4972 - Test Method for PH of Soils.
7. MTM 109 - Michigan Test Method for Sieve Analysis of Fine, Dense Graded, Open Graded and Coarse Aggregates in the Field.

1.3 SUBMITTALS

A. Samples: Submit 2, 20lb samples of each type of material to be tested, to the testing agency.

B. Materials Source: Submit name of imported materials supplier(s).

C. Manufacturer's Certificate: The Contractor shall submit to the Owner, two copies of material certificates signed by the Material Producer and Contractor. Certificates shall state that each material item meets specified requirements.

D. Gradation Reports: The Contractor shall submit to the Owner, two copies of the gradations for each of the required aggregate mixtures. Mix designs shall be within allowable tolerances as specified for the particular section.

1.4 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.

B. Perform Work in accordance with local governing agency standards.

C. Testing and Inspection: The Owner will engage a testing agency to sample and test materials proposed for use in the Work.

PART 2 PRODUCTS

2.1 SUBSOIL MATERIALS

A. Subsoil Type S1:

1. Excavated and re-used material, imported borrow and select or local borrow.

2. Graded.

3. Free of lumps larger than 3 inches, rocks larger than 2 inches, organic material, and debris.

2.2 TOPSOIL MATERIALS

A. Topsoil Type S2:

1. Fertile, friable, natural topsoil of loamy character, obtained from well drained arable site.

2. Reasonably free of clay, lumps, coarse sands, plants, roots, rocks larger than 1/2 inch, subsoil, debris, large weeds, and foreign matter.

3. Acidity range pH of 5.0 to 7.5.

4. Containing minimum of 10 percent organic matter.

2.3 SOIL MATERIALS

A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.

B. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.

C. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.

D. Backfill and Fill Materials: Satisfactory soil materials as recommended by a geotechnical engineer.

2.4 AGGREGATE MATERIALS

A. Crushed Stone Fill, Type A1: Dense-graded crushed aggregate shall meet the requirements of Section 902 of the latest Michigan Department of Transportation Standard Specification for Construction and shall consist of 21AA Crushed Limestone.

B. Granular Fill, Type A2: Granular material shall consist of natural sand, stone screenings, gravel or a blend of natural sand, gravel and stone screenings. It shall be composed of rough surfaced and angular grains of quartz or other hard durable rock and meet the requirements of Section 902 of the latest Michigan Department of Transportation Standard Specification for Construction and shall consist of Class II granular material.

C. Open-Graded Drainage Course Aggregate Materials (OGDC), Type A3: for use in Temporary Construction Access Drives, Drainage Course under Pavement Aggregate Base Courses and other miscellaneous uses shall consist of crushed stone or crushed gravel free from organic matter or other deleterious substances with material sized between 1” and 3” in diameter, with less than 6% fine material (#200 sieve). Such materials are usually referred to as “1x3” or “OGDC”.

D. Crushed Aggregate Surface Course (CASC), Type A4: shall meet the requirements of Section 306 of the latest Michigan Department of Transportation Standard Specification for Construction and shall consist of 23A Crushed Aggregate.

2.5 SOURCE QUALITY CONTROL

A. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D1557.

B. Testing and Analysis of Topsoil Material: Perform in accordance with ASTM D2974 and ASTM D4972.

C. When tests indicate materials do not meet specified requirements, change material and retest.

D. Provide materials from same source throughout the Work.

PART 3 EXECUTION

3.1 EXCAVATION

A. Excavate subsoil and aggregates from areas designated. Strip topsoil to full depth of topsoil in designated areas.

B. Stockpile excavated material meeting requirements for subsoil materials, topsoil materials and aggregates.

C. Remove excess excavated subsoil and topsoil not intended for reuse, from the site.

D. Remove excavated materials not meeting requirements for subsoil materials, topsoil materials and aggregates from the site.

3.2 EXAMINATION

A. The Owner's 3rd party testing company shall verify compacted substrate is dry and ready to support paving and imposed loads.

B. The Owner's 3rd party testing company shall verify substrate has been inspected, gradients and elevations are correct.

3.3 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place fill on soft, muddy, or frozen surfaces.

3.4 AGGREGATE TRANSPORTING AND PLACEMENT

A. The aggregate shall be transported from the crushing plant to the point of use in hauling vehicles which are covered. Deliveries shall be scheduled so that spreading and compaction of all aggregate delivered that day can be completed during daylight hours, unless adequate artificial lighting is provided, or stockpile locations are provided. Hauling over freshly placed material shall not be permitted until the material has been compacted as specified.

B. Upon arrival, the aggregate shall be spread to a thickness not to exceed 6 inches by an approved grading method. It shall be struck off in a uniform layer of such depth that, when the Work is completed, it shall have the required thickness and conform to the grade and contour indicated.

C. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the aggregate may be spread, raked, leveled and compacted by using hand tools.

D. After spreading, the aggregate shall be thoroughly and uniformly compacted by approved compaction equipment. The speed of the compaction equipment shall at all times be sufficiently slow enough to avoid displacement of the aggregate. Any displacement occurring as a result of reversing direction of the compaction equipment or from any other cause shall be corrected at once. Rolling shall continue until all roller marks are eliminated, the surface is of uniform texture and true to grade and cross-section and the required field-density is obtained.

E. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.5 MINIMUM QUALITY REQUIREMENTS

A. The Owner shall hire a 3rd party testing company to test in-place aggregate surface, base course and subbase materials for compliance with the requirements for density and thickness per the latest version of ASTM and MDOT Standard Specifications for Construction.

B. Maximum dry density shall be determined per ASTM D1557 modified proctor.

C. In-place compacted minimum thickness is as shown in the cross-sectional details on the Plans. Any thickness less than shown on the plans is not acceptable.

3.6 TOLERANCES

A. Maximum Variation from Flat Surface: 1/2 inch measured with 10-foot straight edge.

B. Maximum Variation from Thickness: No less than shown on the Plans.

C. Maximum Variation from Elevation: 1/2 inch.

3.7 FIELD QUALITY CONTROL

A. The Owner shall hire a 3rd party testing company to complete all field quality control testing per the latest version of ASTM and MDOT Standard Specifications for Construction.

B. Quality Control During Aggregate Placement: Perform the following sampling and testing of aggregate mixtures for quality control during operations. Record the locations where samples are taken to correlate with subsequent testing.

C. Test uncompacted aggregate for gradation distribution per ASTM D136 or MTM 109. Test for compaction per ASTM D1557 modified proctor.

D. Perform three tests for each day’s aggregate placement, unless otherwise specified or directed.

E. Test in-place, compacted aggregate for density and thickness. Perform five tests for each day’s aggregate placement unless otherwise specified or directed.

F. Additional testing may be required if any of the previous tests indicate insufficient values. If two successive tests indicate insufficient values, contact the Owner for a course of action.

G. Aggregate materials not complying with specified requirements shall be removed and replaced with new compliant aggregate.

H. Upon completion of the construction Work and after spoils and debris have been removed, re-grade any areas disturbed by the operations.

3.8 STOCKPILING

A. Stockpile materials on site at locations designated by Owner.

B. Stockpile in sufficient quantities to meet project schedule and requirements.

C. Separate different materials with dividers or stockpile individually to prevent mixing.

D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

E. Surround stockpile with silt fence or erosion eels.

F. Stockpile unsuitable materials on impervious material and cover to prevent erosion and leaching, until disposed of.

3.9 STOCKPILE CLEANUP

A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above and below-grade site improvements.
6. Temporary erosion and sedimentation control.

1.3 DEFINITIONS

A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow.

D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings.

F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PRE-INSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

1.5 MATERIAL OWNERSHIP

A. Except for materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.6 INFORMATIONAL SUBMITTALS

A. Existing Conditions: The Contractor shall have the option to submit documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or video recordings.

2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.

B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.7 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.

3. All activities shall be appropriately scheduled and communicated to the Owner prior to commencement of construction operations.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Owner.

C. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises at location directed by the Owner.

D. Utility Locator Service: Three full working days before construction begins, call the Miss Dig system at 1-800-482-7171 or 811. Private onsite utility locations must be completed prior cutting or excavation activity.

E. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

F. Tree and Plant Protection Zones: Protect according to requirements in Section 015639 "Temporary Tree and Plant Protection."

G. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 310516 "Soils and Aggregates".

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction unless otherwise indicated to be removed.

B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed according to plan requirements.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil bearing water runoff or airborne dust to adjacent properties and walkways, according to Soil Erosion and Sedimentation Control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion and sedimentation control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. Protect trees and plants remaining on-site according to according to plan requirements.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations according to plan requirements.

3.4 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.

B. Locate, identify, and disconnect utilities indicated to be abandoned in place.

C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner not less than 3 days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Owner's written permission.

D. Excavate for and remove underground utilities indicated to be removed.

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.

2. Grind down stumps and remove roots larger than 3 inches in diameter, obstructions, and debris to a depth of 24 inches below exposed subgrade.

3. Use only hand methods or air spade for grubbing within protection zones.

4. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to required depth in a manner to prevent intermingling with underlying subsoil or other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches.

2. Do not stockpile topsoil within protection zones.

3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.

4. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

3.7 SITE IMPROVEMENTS

A. Remove existing above and below grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically. If possible, adjust line of demolition to the nearest joint.

2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

C. Burning of waste materials is not permitted on Owner’s property.

END OF SECTION

ROUGH GRADING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating subsoil.

2. Cutting, grading, filling, rough contouring, and compacting site for site structures, building pads, and pavements.

B. Related Sections:

1. Section 31 05 16 – Soils and Aggregates.

2. Section 31 10 00 - Site Clearing: Excavating topsoil.

3. Section 31 23 16 - Excavation: General area excavation

4. Section 31 23 17 - Trenching: Trenching and backfilling for utilities.

5. Section 31 23 23 - Fill: General area backfilling.

1.2 REFERENCES

A. ASTM International:

1. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

2. ASTM D6938 – Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

A. Materials Source: Submit name of imported materials suppliers.

B. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.5 QUALITY ASSURANCE

A. The services of a full-time Soils Engineer and Soils Laboratory may be retained by the Owner to observe earthwork operations, analyze soil materials and perform applicable laboratory and field tests.

B. The Contractor shall arrange and pay for any other test or required inspections necessary to meet the requirements set forth in these Construction Documents.

PART 2 PRODUCTS

2.1 MATERIALS

A. Topsoil: Type S2 as specified in Section 31 05 16.

B. Subsoil Fill: Type S1 as specified in Section 31 05 16.

C. Crushed Stone Fill: Type A1 as specified in Section 31 05 16.

D. Granular Fill: Type A2 as specified in Section 31 05 16.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify survey bench mark and intended elevations for the Work are as indicated on Drawings.

C. Locate and protect survey control and reference points. Promptly notify Engineer of discrepancies discovered.

D. Control datum for survey is that shown on Drawings.

E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

F. Promptly report to Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.

G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.

3.2 PREPARATION

A. Call Local Utility Line Information service, MISS DIG at 1-800-482-7171 or 811, not less than three working days before performing Work. Private utility location is required.

1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Identify required lines, levels, contours, and datum.

C. Notify utility company prior to removing or relocating utilities.

D. Protect utilities indicated to remain from damage.

E. Protect plant life, lawns, and other features remaining as portion of final landscaping.

F. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 SUBSOIL EXCAVATION

A. Excavate subsoil from areas to be further excavated, re-landscaped, or regraded.

B. Do not excavate wet subsoil or excavate and process wet material to obtain optimum moisture content.

C. Remove excess subsoil not intended for reuse, from site.

D. Benching Slopes: Horizontally bench existing slopes greater than 1: 4 to key placed fill material to slope to provide firm bearing.

E. Stability: Replace damaged or displaced subsoil as specified for fill.

3.4 FILLING

A. Fill areas to contours and elevations with unfrozen materials.

B. Place material in continuous layers as follows:

Compaction Method	Maximum Loose Lift Thickness
Hand-operated vibratory plate or light roller in confined areas	4 inches
Hand-operated vibratory roller weighing at least 1,000 pounds	6 inches
Vibratory roller drum roller, minimum dynamic force, 2,000 pounds	9 inches
Vibratory drum roller, minimum dynamic force, 30,000 pounds	12 inches
Sheeps-foot roller	8 inches

C. Maintain optimum moisture content of fill materials to attain required compaction density.

D. Make grade changes gradually. Blend slope into level areas.

E. Repair or replace items indicated to remain damaged by excavation or filling.

3.5 TOLERANCES

A. Top Surface of Subgrade: Plus or minus 1/10 foot from required elevation.

3.6 FIELD QUALITY CONTROL

A. The Owner shall hire a 3rd party testing company to complete all field quality control testing per the latest version of ASTM and MDOT Standard Specifications for Construction.

B. Perform laboratory material tests in accordance with ASTM D1557.

C. Perform in place compaction tests in accordance with the following:

1. Density and Moisture Tests: ASTM D-6938.

D. When tests indicate Work does not meet specified requirements, remove work, replace and retest.

E. Frequency of Tests: Provide one density test for every lift.

3.7 SCHEDULES

A. Fill in the upper 12 inches under pavement and sidewalks:

1. Compact uniformly to minimum 95 percent of maximum density per ASTM D-1557.

B. Fill below 12 inches under pavement and sidewalks:

1. Compact uniformly to minimum 92 percent of maximum density per ASTM D-1557.

C. Fill in landscape areas:

1. Compact uniformly to minimum 88 percent of maximum density per ASTM D-1557.

END OF SECTION

EXCAVATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Soil densification.
2. Excavating for paving, roads, and parking areas.
3. Excavating for slabs-on-grade.
4. Excavating for site structures.
5. Excavating for landscaping.

B. Related Sections:

1. Section 31 05 16 – Soils and Aggregates.
2. Section 31 22 13 - Rough Grading: Topsoil and subsoil removal from site surface.
3. Section 31 23 17 - Trenching: Excavating for utility trenches.
4. Section 31 23 23 - Fill.
5. Section 33 41 00 – Storm Utility Drainage Piping.

1.2 REFERENCES

A. Local utility standards when working within 24 inches of utility lines.

1.3 SUBMITTALS

A. Shop Drawings: None required.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with local governing agency standards.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PREPARATION

A. Call Local Utility Line Information service and Miss Dig at 1-800-482-7171 or 811, not less than three working days before performing Work.

1. Request underground utilities to be located and marked within and surrounding construction areas.

2. Private locating required?

B. Identify required lines, levels, contours, and datum.

C. Notify utility company prior to the removal and relocation of utilities.

D. Protect utilities indicated to remain from damage.

E. Protect plant life, lawns, and other features remaining as portion of final landscaping.

F. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs indicated to remain from excavating equipment and vehicular traffic.

3.2 EXCAVATION

A. Underpin adjacent structures which may be damaged by excavation work.

B. Excavate subsoil to accommodate slabs-on-grade, paving and site structures.

C. The removal of existing soil to get to the final subgrade elevation shall not be considered subgrade undercutting. It is part of this section for excavation to balance the site and establish the elevations for the placement of the proposed pavement elevations. Subgrade undercutting is excavation and removal below proposed top of subgrade elevation, or the elevation new work will be constructed on.

D. Slope banks with machine to angle of repose or less until shored.

E. Grade top perimeter of excavation to prevent surface water from draining into excavation.

F. Trim excavation. Remove loose matter.

G. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume. Remove larger material as specified in Section 31 23 23.

H. Notify Owner/Engineer immediately of unexpected subsurface conditions.

I. Correct over-excavated areas with crushed stone fill Type A1 specified in Section 31 05 16 or as directed by the Geotechnical Engineer.

J. Remove excess and unsuitable material from site.

K. Stockpile subsoil to be re-used on-site in area designated by Owner on site to height not exceeding 6feet and protect from erosion.

L. Repair or replace items indicated to remain damaged by excavation.

3.3 FIELD QUALITY CONTROL

A. Request inspection of excavation and controlled fill operations in accordance with applicable code and local governing agency requirements at least 48 hours ahead of scheduled work or per agency requirements.

B. Request visual inspection of bearing surfaces by inspection agency before installing subsequent work at least 48 hours ahead of scheduled work or per agency requirements.

3.4 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

TRENCHING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating trenches for utilities from 5 feet outside building to utility service.
2. Compacted fill from top of utility bedding to subgrade elevations.
3. Backfilling and compaction.

B. Related Sections:

1. Section 31 05 16 – Soils and Aggregates.
2. Section 31 22 13 - Rough Grading: Topsoil and subsoil removal from site surface.
3. Section 31 23 16 - Excavation: General building excavation.
4. Section 31 23 23 - Fill: General backfilling.
5. Section 32 91 19 - Landscape Grading: Filling of topsoil over backfilled trenches to finish grade elevation.
6. Section 33 41 00 - Storm Utility Drainage Piping

1.2 REFERENCES

A. ASTM International:

1. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
2. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, or cable.

1.4 SUBMITTALS

A. Product Data: Submit data for geotextile fabric indicating fabric and construction.

B. Materials Source: Submit name of imported fill materials suppliers.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with local governing agency standards.

1.6 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.7 COORDINATION

A. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Subsoil Fill: Type S1 as specified in Section 31 05 16.

B. Crushed Stone Fill: Type A1 as specified in Section 31 05 16.

C. Granular Fill: Type A2 as specified in Section 31 05 16.

2.2 ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, non-woven.

1. Tencate Mirafi; Model 140N Filter Fabric or approved equal.

PART 3 EXECUTION

3.1 LINES AND GRADES

A. Lay pipes to lines and grades indicated on Drawings.

1. Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.

B. Use laser-beam instrument with qualified operator to establish lines and grades.

3.2 PREPARATION

A. Call Local Utility Line Information service, Miss Dig, at 1-800-482-7171 or 811, not less than three working days before performing Work.

1. Request underground utilities to be located and marked within and surrounding construction areas.

2. Private utility location is required.

B. Identify required lines, levels, contours, and datum locations.

C. Protect plant life, lawns, and other features remaining as portion of final landscaping.

D. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs indicated to remain from excavating equipment and vehicular traffic.

E. Maintain and protect above and below grade utilities indicated to remain.

3.3 TRENCHING

A. Excavate subsoil required for utilities to utility service.

B. Remove lumped subsoil, boulders, and rock up of 1/6 cubic yard, measured by volume.

C. Perform excavation within 24 inches of existing utility service or in accordance with utility's requirements.

D. Do not advance open trench more than 200 feet ahead of installed pipe.

E. Cut trenches to width indicated on Drawings. Remove water or materials that interfere with Work.

F. Excavate bottom of trenches maximum 12 inches wider than outside diameter of pipe.

G. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material and pipe.

H. Do not interfere with 45 degree bearing splay of foundations.

I. When Project conditions permit, slope side walls of excavation starting 2 feet above top of pipe. When side walls cannot be sloped, provide a trench box or sheeting and shoring to protect excavation as specified in this section.

J. Cut out soft areas of subgrade not capable of compaction in place. Backfill with bedding material and compact to density equal to or greater than requirements for subsequent backfill material.

K. Trim excavation. Remove loose matter.

L. Correct over-excavated areas with compacted backfill as specified for authorized excavation.

M. Remove excess subsoil not intended for reuse, from site.

N. Stockpile subsoil for reuse in area designated by the Owner on site to depth not exceeding 6 feet and protect from erosion.

3.4 SHEETING AND SHORING

A. Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.

B. Support trenches more than 5 feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.

C. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.

D. Repair damage to new Work and existing improvements from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

3.5 BACKFILLING

A. Backfill trenches to contours and elevations with unfrozen fill materials.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

C. Place material in continuous layers as follows:

1. Common Fill: Maximum 4 inches compacted depth for hand compaction and 8 to 12 inches for roller compaction.

2. Granular Fill: Maximum 4 inches compacted depth for hand compaction and 8 to 12 inches for roller compaction.

D. Employ placement method that does not disturb or damage foundation perimeter drainage and utilities in trench.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Do not leave more than 50 feet of trench open at end of working day.

G. Protect open trench to prevent danger to Owner and the public.

3.6 TOLERANCES

A. Top Surface of Backfilling: Plus or minus 1 inch from required elevations.

3.7 FIELD QUALITY CONTROL

A. The Owner shall hire a 3rd party testing company to complete all field quality control testing per the latest version of ASTM and MDOT Standard Specifications for Construction.

B. Perform laboratory material tests in accordance with ASTM D1557.

C. Perform in place compaction tests in accordance with the following:

1. Density Tests: ASTM D6938.

2. Moisture Tests: ASTM D6938.

D. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

3.8 PROTECTION OF FINISHED WORK

A. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION

FILL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Backfilling site structures to subgrade elevations.
2. Fill under slabs-on-grade.
3. Fill under paving.
4. Fill for over-excavation.

B. Related Sections:

1. Section 31 05 16 – Soils and Aggregates.
2. Section 31 22 13 - Rough Grading: Site filling.
3. Section 31 23 16 - Excavation.
4. Section 31 23 17 - Trenching: Backfilling of utility trenches.
5. Section 32 91 19 - Landscape Grading.
6. Section 33 41 00 - Storm Utility Drainage Piping.

1.2 REFERENCES

A. ASTM International:

1. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
2. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: None required.

C. Materials Source: Submit name of imported fill materials suppliers.

D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with local governing agency standards.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Common Fill: Type S1 as specified in Section 31 05 16.

B. Crushed Stone Fill: Type A1 as specified in Section 31 05 16.

C. Granular Fill: Type A2 as specified in Section 31 05 16.

PART 3 EXECUTION

3.1 EXAMINATION

A. Administrative Requirements: Coordination and project conditions.

3.2 PREPARATION

A. Compact subgrade to density requirements for subsequent backfill materials. The removal of existing soil to get to the final subgrade elevation shall not be considered subgrade undercutting. It is part of excavation per Section 31 23 16 to balance the site and establish the elevations for the placement of the proposed pavement elevations.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with structural or granular fill as directed by testing agency and compact to density equal to or greater than requirements for subsequent fill material.

C. Scarify subgrade surface to a minimum depth of 8 inches.

D. Proof roll to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

3.3 BACKFILLING

A. Backfill areas to contours and elevations with unfrozen materials.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

C. Place material in continuous layers as follows:

Compaction Method	Maximum Loose Lift Thickness
Hand-operated vibratory plate or light roller in confined areas	4 inches
Hand-operated vibratory roller weighing at least 1,000 pounds	6 inches
Vibratory roller drum roller, minimum dynamic force, 2,000 pounds	9 inches
Vibratory drum roller, minimum dynamic force, 30,000 pounds	12 inches

Sheeps-foot roller	8 inches

D. Employ placement method that does not disturb or damage other new work or existing improvements.

E. Maintain optimum moisture content of backfill materials to attain required compaction density.

F. Make gradual grade changes. Blend slope into level areas.

G. Remove surplus backfill materials from site.

H. Leave fill material stockpile areas free of excess fill materials.

3.4 TOLERANCES

A. Top Surface of Backfilling Under Paved Areas: Plus or minus 1 inch from required elevations.

B. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.5 FIELD QUALITY CONTROL

A. The Owner shall hire a 3rd party testing company to test in-place aggregate surface, base course and subbase materials for compliance with the requirements for density and thickness per the latest version of ASTM and MDOT Standard Specifications for Construction.

B. Perform laboratory material tests in accordance with ASTM D1557.

C. Perform in place compaction tests in accordance with the following:

1. Density Tests: ASTM D6938.

2. Moisture Tests: ASTM D6938.

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

E. Proof roll compacted fill surfaces under slabs-on-grade and paving.

3.6 PROTECTION OF FINISHED WORK

A. Reshape and re-compact fills subjected to vehicular traffic

END OF SECTION

EROSION CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Check Dams.
2. Inlet Filters.
3. Silt Fencing.
4. Rip-Rap.

B. Related Sections:

1. Section 31 05 16 – Soils and Aggregates.
2. Section 31 10 00 - Site Clearing.
3. Section 31 23 16 - Excavation.
4. Section 31 23 23 - Fill.
5. Section 32 91 19 - Landscape Grading.
6. Section 32 92 19 - Seeding.

1.2 REFERENCES

A. Troy School District Stormwater Management – Illicit Discharge Regulatory Policy

1. A copy of this policy will be part of the bid package or is available upon request.

B. Troy School District Stormwater Management – Post -Construction Policy & Procedure

1. A copy of this policy will be part of the bid package or is available upon request.

C. ASTM International:

1. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

1.3 SUBMITTALS

A. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with local governing agency standards.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Do not place grout when air temperature is below freezing.

PART 2 PRODUCTS

2.1 ROCK MATERIALS

A. Rock: Sound, tough, durable fractured rock, free from decompressed stones or other defects impairing its durability. Broken concrete or rounded stones are not acceptable and material shall be to the sizes indicated in the plans

2.2 PLANTING MATERIALS

A. Seeding and Soil Supplements: as specified in Section 32 92 19.

B. Mulch: as specified in Section 32 92 19.

C. Erosion Control Blankets: as specified in Section 32 92 19

2.3 ACCESSORIES

A. Inlet Filter Fabric: Geotextile fabric with minimum flow rate of 100 gal/min./sft meeting local governing agency requirements.

B. Inlet Filter Bag: Silt Sack by ACF Environmental or approved equal.

C. Silt Fencing: Geotextile filter fabric with minimum flow rate of 10 gal/min./sft, Amoco ProPex 2130 or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify compacted subgrade is acceptable and ready to support devices and imposed loads.

3.2 SITE STABILIZATION

A. Incorporate erosion control devices indicated on the Drawings into the Project at the earliest practicable time.

B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.

C. Stockpile and waste pile heights shall not exceed 6 feet. Slope stockpile sides at 2H:1V or flatter.

D. Stabilize any disturbed area of affected erosion control devices on which activity has ceased and which will remain exposed for more than 5 days.

1. During non-germinating periods, apply mulch per the supplier’s recommended rates.

2. Stabilize disturbed areas which are not at finished grade and which will be disturbed within one year in accordance with Section 32 92 19 at 50 percent of permanent application rate with no topsoil.

3. Stabilize disturbed areas which are either at finished grade or will not be disturbed within one year in accordance with Section 32 92 19 permanent seeding specifications.

E. Stabilize stockpiles within 24 hours after the pile has been put in place.

3.3 FIELD QUALITY CONTROL

A. Inspect erosion control devices on a weekly basis and after each runoff event per the school district's stormwater management policies. Make necessary repairs to ensure erosion and sediment controls are in good working order.

B. Compaction Testing: In accordance with ASTM D1557.

C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.4 CLEANING

A. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment structure or device, remove and dispose of sediment.

B. Do not damage structure or device during cleaning operations. Repair or replace any damages structures or devices.

C. Do not permit sediment to erode into construction or site areas or natural waterways.

D. Clean channels when depth of sediment reaches approximately one-half channel depth.

END OF SECTION

ASPHALT PAVING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Asphalt materials.
2. Aggregate materials.
3. Aggregate subbase.
4. Asphalt paving base course, binder course, and wearing course.
5. Asphalt paving overlay for existing paving.

B. Related Sections:

1. Section 31 22 13 - Rough Grading: Preparation of site for paving [and base].
2. Section 31 23 23 - Fill: Compacted subbase for paving.
3. Section 31 05 16 – Soils and Aggregates: Product requirements for aggregate for placement by this section.
4. Section 32 13 13 – Concrete Paving
5. Section 32 17 23 - Pavement Markings: Painted pavement markings, lines, and legends.
6. Section 33 05 13 - Manholes and Structures

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M140 - Standard Specification for Emulsified Asphalt.
2. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

B. Asphalt Institute:

1. AI MS-19 - Basic Asphalt Emulsion Manual.

C. ASTM International:

1. ASTM D977 - Standard Specification for Emulsified Asphalt.
2. ASTM D979 - Standard Practice for Sampling Bituminous Paving Mixtures.

3. ASTM D1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples.

4. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

5. ASTM D1559 – Test Method for Resistance of Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.

6. ASTM D2172 - Standard Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.

7. ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.

8. ASTM D2950 - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.

9. ASTM D3381 - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.

10. ASTM D3549 - Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.

11. ASTM D3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal.

12. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

1.3 SUBMITTALS

A. Product Data:

1. Submit product information for asphalt and aggregate materials per plans.

2. Submit mix design with laboratory test results supporting design per plans.

3. All testing and material data must be dated within the previous two months of the date of the submittal.

B. Manufacturer's Certificate: Certify that materials specified in this section meet or exceed the specified requirements.

C. The paving contractor shall execute the Guarantee for Bituminous Pavement form located at the end of this section per the requirements set forth on the form.

1.4 QUALITY ASSURANCE

A. Mixing Plant: Certified by State of Michigan.

B. Obtain materials from same source throughout.

C. Perform Work in accordance with Michigan Department of Transportation (MDOT) standards.

1.5 QUALIFICATIONS

A. Installer: Company specializing in performing work of this section with minimum of five (5) years documented experience.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Apply bituminous tack coats only when temperature has not been below 35 degrees F for 12 hours immediately prior to application. Construct asphalt surface course only when atmospheric temperature is above 40 degrees F and base is dry. Asphalt binder and base courses may be laid when the atmospheric temperature is above 35 degrees F and rising.

PART 2 PRODUCTS

2.1 ASPHALT MATERIALS

A. Asphalt Cement: Shall comply with the requirements of ASTM D3381 for viscosity graded asphalt cement AC-10 (85-100 penetration grade) and meet the requirements of Section 501 of the Michigan Department of Transportation Standard Specifications for Construction (latest edition) for PG64-28.

B. Tack Coat: Shall be emulsified asphalt meeting the requirements of ASTM D977, AASHTO M140 and the Asphalt Institute for type SS-1h.

C. Reclaimed Asphalt Pavement (RAP): Processed material obtained by milling or full depth removal of existing asphalt paving.

2.2 AGGREGATE MATERIALS

A. Coarse Aggregate: Shall consist of crushed stone, crushed gravel, a mixture of uncrushed gravel with either crushed stone or crushed gravel, or other inert material having similar characteristics. It shall be composed of clean, tough, durable fragments free from an excess of flat or elongated pieces and shall be free of organic matter and deleterious substances and meet the requirements of Section 902 of the Michigan Department of Transportation Standard Specifications for Construction (latest edition).

B. Fine Aggregate: Shall be well graded from coarse to fine and consist of natural sand, stone screenings or a blend of natural sand and stone screenings. It shall be composed of rough surfaced and angular grains of quartz or other hard durable rock and meet the requirements of Section 902 of the Michigan Department of Transportation Standard Specifications for Construction (latest edition).

C. Mineral Filler: Shall be limestone dust, dolomite dust, slag or hydrated lime meeting the requirements of Section 902 of the Michigan Department of Transportation Standard Specifications for Construction (latest edition).

2.3 MIXES

A. Use dry material to avoid foaming. Mix uniformly.

B. Asphalt Paving Mixtures: Designed in accordance with Section 501 the Michigan Department of Transportation Standard Specifications for Construction (latest edition).

1. Asphalt Cement: PG 64-28 per plans

2. Leveling Course: MDOT 4EML or 4EMH per plans

3. Wearing Course: MDOT 5EML or 4EMH per plans

2.4 SOURCE QUALITY CONTROL

A. Submit proposed mix design of each class of mix for review prior to beginning of Work.

B. Test samples in accordance with ASTM D979, D2172 or D6307and D6925.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify utilities indicated under paving are installed with excavations and trenches backfilled and compacted.

C. Verify compacted subgrade, aggregate base course and subbase is dry and ready to support paving and imposed loads.

D. Verify gradients and elevations of base are correct.

E. Verify existing concrete curb lines and elevations are correct.

F. Verify all manhole, catch basin and inlet grates and frames (and any other type of casting within the area to be paved) are installed in correct position and at correct elevation.

3.2 BASE COURSE

A. Aggregate Base Course to be installed per Section 31 05 16.

3.3 EXISTING WORK

A. Saw cut existing paving as indicated on the Drawings.

B. Clean existing paving to remove foreign material, excess joint sealant and crack filler from paving surface.

C. Repair surface defects in existing paving to provide uniform surface to receive new paving.

D. Protect new and existing works adjacent to the paving area to prevent damage.

3.4 BOND COAT

A. Apply bond coat to contact surfaces of previously constructed surfaces abutting or projecting into the area to be paved with new asphalt.

1. New Asphalt Surfaces: 0.02-0.05 gal/sq yd residual rate.

2. Existing Asphalt Surfaces: 0.004-0.07 gal/sq yd residual rate.

3. Milled Asphalt Surfaces: 0.04 – 0.08 gal/sq yd residual rate.

4. Portland Cement Concrete Surfaces: 0.03 – 0.05 gal/sq yd residual rate.

B. Apply bond coat to contact surfaces of curbs, gutters and sidewalks etc. as required. Protect surfaces from overspray Bond coat shall be applied uniformly without streaks and/or bare spots.

C. Coat surfaces of manholes, catch basin and any other casting frames with oil to prevent bond with asphalt paving. Do not tack coat these surfaces.

3.5 SINGLE COURSE ASPHALT PAVING

A. Install Work in accordance with Section 502 of the Michigan Department of Transportation Standard Specifications for Construction (latest edition).

B. Place asphalt within 24 hours of applying bond coat.

C. Place asphalt wearing course to the thickness as indicated on Drawings.

D. Compact paving by rolling to specified density (Ninety-two (92) to Ninety-seven (97) percent of the recorded laboratory specimen density per ASTM D2041). Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.

E. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.6 DOUBLE COURSE ASPHALT PAVING

A. Place asphalt binder course within 24 hours of applying bond coat to existing vertical surfaces abutting proposed pavement.

B. Place binder course to the thickness as indicated on Drawings.

C. Clean and dry binder surface and apply bond coat before placing wearing course.

D. Place wearing course to the thickness as indicated on Drawings.

E. Compact each course by rolling to specified density (Ninety-two (92) to Ninety-seven (97) percent of the recorded laboratory specimen density per ASTM D2041) . Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.

F. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.7 ASPHALT PAVING OVERLAY

A. Apply tack coat to existing paving milled surface at rate recommended of 0.04 – 0.08 gal/sq yd residue rate.

B. Place wearing course to the thickness as indicated on Drawings.

C. Compact overlay by rolling to specified density (Ninety-two (92) to Ninety-seven (97) percent of the recorded laboratory specimen density per ASTM D2041) . Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.

D. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.8 CONSTRUCTION TOLERANCES

A. Flatness: Maximum variation of 1/4 inch as measured with 10-foot straight edge.

B. Scheduled Compacted Thickness: No less than specified on the Drawings.

C. Variation from Indicated Elevation: Within 1/4 inch.

3.9 FIELD QUALITY CONTROL

A. The Owner shall hire a 3rd party testing company to test compliance with the requirements for density and thickness per the latest version of ASTM and MDOT Standard Specifications for Construction.

B. Record the locations where samples are taken to correlate with subsequent testing.

C. Sample asphalt paving in accordance with ASTM D979.

D. Asphalt Paving Mix Temperature: Measure and record temperature at time of placement.

E. Asphalt Paving Thickness: Owner's 3rd party testing company will verify loose thickness during placement.

F. Asphalt Paving Density: ASTM D2950 nuclear method; perform minimum of three tests and one test per 5,000 sft for each day of paving unless otherwise directed or specified by the Owner. In-place Density shall be 92 – 97% of ASTM D2041 maximum density shall be based on either the value in the JMF or the daily testing value by the plant, if available.

G. Additional testing may be required if any of the previous tests indicate insufficient values. If two successive tests indicate insufficient values, contact the Owner for a course of action.

H. Asphalt concrete materials not complying with specified requirements shall be repaired or removed and replaced with new paving.

3.10 PROTECTION OF FINISHED WORK

A. Immediately after placement, protect paving from mechanical injury for at least 6 hours or until surface temperature is less than 140 degrees F.

END OF SECTION

DATE:

CONTRACTOR:

STREET ADDRESS:

CITY, STATE, ZIP:

AGENT:

GUARANTEE FOR BITUMINOUS PAVEMENT

We hereby guarantee that the Asphalt Pavement which we have installed at for _____has been done in strict accordance with the Drawings and Specifications. We will repair or replace, or agree to have repaired or replaced, all Work which may prove to be defective in workmanship or materials. We will repair or replace, or agree to have repaired or replaced, any adjacent Work which required repair or replacement because of our defective Work. We guarantee the Work for two years from the date of acceptance by the Owner

Failure to comply with the above paragraph within 10 days after receipt of written notice from the Owner, or failure to Work with diligence authorizes the Owner to proceed with repair of the defective Work. We shall pay the costs and charges for the repairs along with interest at the maximum rate permitted by law upon demand. If we fail to fulfill the preceding obligation, and if the Owner brings an action to enforce this guarantee, we agree to pay the Owner's reasonable attorney fees incurred.

CONTRACTOR'S SIGNATURE

(a) The Paving Contractor shall execute the Guarantee Form as shown above.

(b) All Manufacturer's Warranties for materials shall be filled out, dated, signed and submitted to Owner.

CONCRETE PAVING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete paving for:

a. Concrete sidewalks
b. Concrete curbs and gutters
c. Concrete parking areas and roads

B. Related Sections:

1. Section 32 17 23 - Pavement markings
2. Section 31 22 13 - Rough Grading
3. Section 31 23 23 - Fill
4. Section 32 05 16 – Soils and Aggregates
5. Section 32 12 16 - Asphalt Paving
6. Section 32 91 19 - Landscape Grading
7. Section 33 05 13 - Manholes and Structures

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M213 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

B. American Concrete Institute:

1. ACI 304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
2. ACI 305R - Hot Weather Concreting.
3. ACI 306R - Cold Weather Concreting.
4. ACI 315 - Manual of Standard Practice for Detailing Reinforced Concrete Structures.

C. ASTM International:

1. ASTM A184 - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.

2. ASTM A185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.

3. ASTM A497 - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.

4. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

5. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.

6. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

7. ASTM C94 - Standard Specification for Ready-Mixed Concrete.

8. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.

9. ASTM C150 - Standard Specification for Portland Cement.

10. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.

11. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

12. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.

13. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

14. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.

15. ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete.

16. ASTM C994 – Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).

17. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.

18. ASTM D994 – Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).

1.3 SUBMITTALS

A. Submittal of Ready-Mixed Concrete Information

1. Statement of Purchase for Ready-Mixed Concrete: Prior to actual delivery of concrete, submit, to the Owner, the Statement of Purchase, giving the dry weights of cement and saturated surface dry weights of fine and coarse aggregates and quantities, type and name of admixtures (if any) and of water per cu. yd., that will be used in the manufacture of the concrete. The Contractor shall also furnish evidence satisfactory to the Owner that the materials to be used and proportions selected will produce concrete of the quality specified. Whatever strengths are obtained, the quality of cement used

shall not be less than the minimum specified. The information must follow the current MDOT Review Checklist (Form 2000).

2. Reports: Submit four copies of reports, to the Engineer/Owner, for ready-mix concrete slump, air content, unit weight, yield and strength tests as specified in Section 15 and 17 of ASTM C94.

3. Ready-Mixed Concrete Delivery Tickets: Submit one copy of each delivery ticket to the Owner and Contractor in accordance with Section 16 of ASTM C94.

4. Submit manufacturers complete technical data sheet for colored admixtures and curing compounds for any colored concrete pavement and sidewalk areas. Include color charts for initial selection of color by Owner.

B. The paving contractor shall execute the Guarantee for Concrete Pavement, Guarantee for Concrete Curb, and Guarantee for Concrete Sidewalk forms located at the end of this section per the requirements set forth on the forms.

C. Design Data:

1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:

a. Hot and cold weather concrete work.

2. Identify mix ingredients and proportions, including admixtures.

3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.

1.4 QUALITY ASSURANCE

A. Testing and Inspection Service: The Owner will engage a testing agency to sample and test concrete materials proposed for use in the Work, perform tests and calculations for concrete mixtures and perform testing during paving operations.

B. Submit to the Owner, materials certificates signed by Material Producer and Contractor per the plans. Certificates shall state that each material item meets specified requirements.

C. Submit to the Owner, job-mix formulas for each required cement-aggregate mixture per the plans. Mix designs shall be within allowable tolerances as specified for the particular application. The job-mix formula must follow the current MDOT Review Checklist (Form 2000).

D. All testing/material data must be dated within the previous two months of the date of the submittal.

E. Obtain cementitious materials from same source throughout.

F. Perform Work in accordance with local governing agency standards.

1.5 QUALIFICATIONS

A. Manufacturer: All ready-mixed concrete suppliers must be Michigan Department of Transportation certified and approved by the Engineer/Owner. Concrete shall be manufactured and delivered to the job Site by a ready-mixed concrete manufacturer thoroughly experienced in ready-mixed concrete. If requested by the Owner, submit a written description of proposed ready-mixed concrete Manufacturer, giving qualifications of Personnel, location of batching plant, list of Projects similar in scope to specified Work, and other information as may be requested by the Owner.

B. Installer: All concrete installers must be approved by the Owner. If requested by the Owner, submit a written description of proposed ready-mixed concrete Installer, giving qualifications of Personnel, list of Projects similar in scope to specified Work, and other information as may be requested by the Owner.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Construct concrete surface course only when ground temperature is above 35-degrees F and base is dry. Base course must be laid when temperature is above 35-degrees F and rising.

1.7 TRAFFIC CONTROL

A. Maintain vehicle and pedestrian traffic during paving and repair operations in such a manner as to not disrupt normal business activities of adjacent enterprises.

B. Protect newly placed concrete from traffic.

PART 2 PRODUCTS

2.1 FORM MATERIALS

A. Wood, steel or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required.

B. When forms are used and the pavement radius is less than 200 feet, the curved alignment shall be provided for by either standard steel forms equipped with flexible liners or by flexible forms. The forms shall be of the full depth of the section. Curb and gutter forms shall be so constructed as to permit the inside of the form to be securely fastened to the outside forms.

2.2 JOINT MATERIALS

A. Asphalt Expansion Joint Filler: Per Section 914 of the Michigan Department of Transportation Specification (latest edition).

B. Hot Poured Joint Sealer: Per Section 914 of the Michigan Department of Transportation Specification (latest edition).

C. Cold Applied Joint Sealer: Per Section 914 of the Michigan Department of Transportation Specification (latest edition).

D. Expansion papers shall be of the pre-molded non-extruding, asphalt impregnated type, not less than ½-inch thick. The length shall be equal to the width of the slab and the depth equal to the thickness of the slab plus 1-inch.

2.3 REINFORCING

A. Deformed Reinforcing Bars: Steel: ASTM A615, 60 ksi yield grade, deformed billet-steel bars, epoxy coated finish.

B. Deformed Bar Mats: ASTM A184; fabricated from ASTM A615; 60 ksi yield strength, steel bars, epoxy coated finish.

C. Welded Deformed Wire Fabric: ASTM A497; in flat sheets; epoxy coated finish.

D. Welded Plain Wire Fabric: ASTM A185; in flat sheets; epoxy coated finish.

E. Dowels: ASTM A615; 60ksi yield strength, plain steel bars; cut to length indicated on Drawings, square ends with burrs removed; epoxy coated finish.

F. Tie Wire: Black, Minimum 16-gauge annealed steel type, epoxy coated.

G. Epoxy Coating Patching Material: Type as recommended by coating manufacturer.

H. Supports for Reinforcements: Bar supports conforming to “Bar Support Specifications” contained in the ACI “Manual of Standard Practice”. Provide chairs, spacers and other devices suitable for proper spacing, supporting and fastening reinforcing bars.

I. Shop fabricated reinforcing bars to conform to the shapes and dimensions shown on the reviewed Shop Drawings and in accordance with ACI “Manual of Standard Practice”.

2.4 CONCRETE MATERIALS

A. Cement: All cement used in pavement construction shall be Portland Cement per Section 901 of the Michigan Department of Transportation Specification (latest edition) or as approved by the Engineer/Owner.

B. Fine and Coarse Aggregates:

1. The fine aggregate shall meet all requirements of Section 902 of the Michigan Department of Transportation Specification (latest editions) for 2NS-Natural Sand

2. The coarse aggregate shall meet all requirements of Section 902 of the Michigan Department of Transportation Specification (latest edition) for No. 6A Coarse Aggregate.

C. Air Entrainment: Air-entraining admixture shall be in accordance with ASTM C260.

D. Chemical Admixture: ASTM C494.

E. Concrete must be ready-mixed concrete.

2.5 ACCESSORIES

A. Curing Compound: The curing compound ASTM C309, Type II, Class B, or approved equal. It shall not allow a moisture loss of more than 0.055 gr./sq. cm. when applied at 200 sft./gallon.

2.6 CONCRETE MIX

A. Production of Ready-Mixed Concrete:

1. Ready-mixed concrete shall be batched, mixed and transported in accordance with ASTM C94, and comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete," except as otherwise specified herein.

2. Ready-mixed concrete shall be mixed and delivered to the point of discharge at the job by means of a ready-mix concrete truck.

3. No water from the truck water system or elsewhere shall be added after the initial introduction of the mixing water for the batch. Under no circumstances shall the approved maximum water content be exceeded nor shall the slump exceed the maximum specified.

4. Discharge of the concrete shall be completed within 1-1/2 hours or before the drum has revolved 300 revolutions, whichever comes first, after the introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates.

5. In hot weather (air temperature 80-degrees F. and above) or under conditions contributing to quick stiffening of the concrete, the time shall be reduced to one hour.

6. Concrete delivered in cold weather (air temperature 45-degrees F. and lower) shall have a temperature not less than 60-degrees F. at the point of discharge at job, and in compliance with ACI 306 R "Cold Weather Concreting". Concrete placing will not be permitted when the air temperature is 35-degrees F. or lower.

7. Concrete delivered under hot weather conditions contributing to quick stiffening of concrete, or in air temperature of 80-degrees F. and over, shall have a temperature between 60- and 80-degrees F. at the point of discharge at job, and in accordance with ACI 305 R "Hot Weather Concreting."

B. Provide concrete to the following criteria:

1. Per Table 1004-1: Concrete Mixtures of the Michigan Department of Transportation Specification (latest edition).

C. Use calcium chloride only when approved by the Engineer in writing.

2.7 CLEANING OF THE MIXER OR TRUCK

A. In no case shall the mixer or truck be flushed out onto the street pavement, in a catch basin or sewer manhole, or in any public right-of-way. The contractor will be responsible for clean-up of all washout areas at no additional expense to the Owner.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify utilities indicated under paving are installed with excavations and trenches backfilled and compacted.

C. Verify compacted subgrade is dry and ready to support paving and imposed loads.

1. Proof roll subbase with a (25-ton minimum weight) rubber-tired roller, loaded front-end loader or loaded dump truck in a minimum of two perpendicular passes to identify soft spots.

2. Remove soft subbase and replace with compacted fill as specified in Section 31 23 23.

D. Verify gradients and elevations of base are correct.

E. Verify all manhole, catch basin and inlet grates and frames (and any other type of casting within the area to be paved) are installed in correct position and at correct elevation.

3.2 BASE COURSE

A. Aggregate Base Course shall be installed per Section 32 05 16.

3.3 PREPARATION

A. Moisten substrate to minimize absorption of water from fresh concrete.

B. Coat surfaces of manholes, catch basins and inlets (and any other type of casting within the area to be paved) with oil to prevent bond with concrete paving.

3.4 LINE AND GRADE

A. The contractor will hire a Registered Land Surveyor to establish the line and grade from the Construction Plans.

3.5 PROPERTY MARKERS

A. All property stakes, irons, monuments, etc. shall be protected and shall not be moved without the written permission of the Property Owner.

3.6 FORMING

A. Compact and cut-to-grade subgrade under forms so that forms when set will be uniformly supported for the entire length. Securely stake and brace or tie forms to prevent leakage of mortar. Bracing with piles of earth will not be permitted.

B. Coat surfaces of forms to be in contact with concrete with light clear paraffin oil or parting compound which will not stain the concrete.

C. Before start of concrete placing, formwork shall be complete and approved by the Geotechnical Engineer.

D. Hardened concrete, debris and foreign material shall be removed from interior of forms.

3.7 REINFORCING

A. Provide reinforcement for concrete pavement as shown on the Drawings. Reinforcement shall be kept clean and free from objectionable rust. Bends or kinks in reinforcing bars shall be corrected before placing. All reinforcement shall be accurately located in forms and securely held in place, before and during concrete placing, by supports adequate to prevent displacement during the course of construction.

3.8 PLACING CONCRETE

A. Concrete shall be handled from the point of delivery and to concrete conveying equipment, and to the location of final deposit by methods which will prevent segregation and loss of concrete mix materials and in a manner, which will assure that the required quality of concrete is maintained.

B. Equipment for Conveying Concrete:

1. Runways for wheeled concrete conveying equipment shall be provided for the ready-mix concrete delivery point to the locations of final deposit.

2. The interior surfaces of concrete conveying equipment shall be maintained free of hardened concrete, debris, water, snow, ice and other deleterious materials.

C. When the temperature of the surrounding air is expected to be below 40-degrees F. during concrete placing or within 24-hours thereafter, the temperature of the plastic concrete, as placed, shall be no lower than 60-degrees F. The temperature of the concrete as placed shall not be so high as to cause difficulty from loss of slump, flash set of cold joints, and should not exceed 90-degrees F. When the temperature of the concrete exceeds 80-degrees F., precautionary measures approved by the Engineer shall be put into effect. When the temperature of steel forms is greater than 120-degrees F., the steel surfaces shall be sprayed with water just prior to placing the concrete.

D. Concrete shall be deposited continuously. Concrete which has partly hardened or has been contaminated by foreign materials shall not be placed; such concrete shall be removed from the Site and disposed of in a location approved by the Owner or Governing Agency.

E. Pavement may be constructed either by use of forms or by a mechanical paver, provided the required finish, and cross-section, as shown on Drawings, are obtained. Concrete shall be placed to provide one course monolithic structure without the use of mortar topping or sand-cement drier. Concrete shall be spaded or vibrated sufficiently to ensure satisfactory consolidation.

F. The concrete surface shall be struck off to a plane surface with a straightedge. After the surface has been floated to an even surface, the contraction joint shall be cut and all slab edges rounded with a 1/2-inch radius edging tool that will finish to a width of 2-inches. After the concrete has slightly set, a broom shall be brushed lightly across the surface at right angles to forms so as to impart the required finish per Section 3.13.

3.9 JOINTS FOR CONCRETE PAVEMENT

A. Per Section 902 of the Michigan Department of Transportation Specification (latest edition) and as listed in the Plans.

B. Provide contraction joints in concrete pavement at the end of each day's pour, unless the pour ends at an expansion joint; in line with all contraction joints and end-of-pour joints of abutting concrete placements, maximum intervals listed in the Plans..

C. Form contraction joints by sawing a 1/4" wide cut perpendicular to the surface and at right angles to the edge of pavement, to a depth of at least 1/4 the slab thickness with a minimum depth of 3 inches.

D. Longitudinal joints shall be placed parallel to edge of pavement and located at 1/3 points or as listed in the Plans. Depth and width are specified in paragraph 3.9B above.

E. Provide expansion joints in concrete pavement at tangent points or radius returns at intersections as listed in the Plans.

F. Provide expansion joints between concrete pavement and adjacent rigid structures not specified herein before.

G. Fill expansion joints with expansion joint filler strips, 1-inch thick unless otherwise shown on the Drawings. The strap shall extend the full depth of the concrete complying with AASHTO M-213, Type III.

H. Where the expansion joint will not be sealed, install joint filler strips with top flush with concrete finish elevation.

I. All contraction joints in concrete pavement sections shall be sealed with either hot-poured joint sealer or cold-applied joint sealer as listed in the Plans

J. Prior to applying joint sealer, remove wood strips. Clean joint groove of foreign matter and loose particles, and dry surface.

K. Slightly underfill joint groove with joint sealer to prevent extrusion of the sealer. Remove excess joint sealer material as soon after sealing as possible.

L. Subsequent to joint sealing, protect sealed areas from contact with injurious substances or damage from construction traffic or operations until project completion.

3.10 JOINTS FOR CONCRETE SIDEWALK

A. Contraction joints shall be placed at right angles to the edge of the sidewalk and perpendicular to the surface and at a depth of at least 1/4 the slab thickness with a minimum depth of 1-1/4 inches.

B. Where along a curve, joints must be perpendicular to the curve with a minimum length of 1 foot before intersecting another joint(s) in any direction. No joints are allowed to be cut at an angle other than 90° at the curb line.

C. Contraction joints shall be spaced as listed in n the Plans.

D. The concrete surface shall be struck off to a plane surface with a straightedge. After the surface has been floated to an even surface, the contraction joint shall be cut and all slab edges rounded with a ½-inch radius edging tool that will finish to a width of 2-inches.

E. After the concrete has set, a broom shall be brushed lightly across the surface at right angles to forms so as to impart the required finish per Section 3.13.

F. Expansion joints shall be placed at the following locations:

1. At the back of the curb and front edge of the sidewalks adjacent to each driveway.

2. At any place where a sidewalk abuts a building or fixed structure.

3. At any other locations listed in the Plans.

3.11 JOINTS FOR CONCRETE CURB AND GUTTER

A. Provide contraction joints in concrete curb and gutter at the end of each day's pour, unless the pour ends at an expansion joint, in line with all contraction joints and end-of-pour joints of the abutting concrete placements, at 40-foot maximum intervals and elsewhere as listed in the Plans.

B. Form contraction joints by steel templates ¼-inch in thickness, shaped to conform to the required cross-section of the curb. Leave templates in place until the concrete has set sufficiently to hold its shape.

C. Provide expansion joints in concrete curb and gutter at tangent points of curb returns, at intersections and in straight runs at uniform intervals not exceeding 400-feet on centers.

D. Provide expansion joints with expansion joint filler strips, 1-inch thick, unless otherwise shown on the Drawings. The strips shall extend the full depth of the concrete complying with AASHTO M-213, Type III.

E. After the concrete has set, a broom shall be brushed lightly across the surface at right angles to forms so as to impart the required finish per Section 3.13.

F. Install joint filler strips at the proper depth below the finished concrete construction with a slightly tapered, dressed-and-oiled wood strip temporarily secured to the top of the filler strip to form a groove not less than ¼-inch in depth.

G. All contraction joints in concrete curb sections shall be sealed with either hot-poured joint sealer or cold-applied joint sealer.

H. Prior to applying joint sealer, remove wood strips. Clean joint groove of foreign matter and loose particles and dry surface.

I. Slightly underfill joint groove with joint sealer to prevent extrusion of the sealer. Remove excess joint sealer materials as soon after sealing as possible.

J. Subsequent to joint sealing, protect sealed areas from contact with injurious substances or damage from construction traffic or operations until project completion.

K. Joints in curbing should align with joints in adjacent concrete paved sidewalk or site concrete.

3.12 FINISHING

A. Paving: Light broom.

B. Sidewalk Paving: Light broom, radius to1 inch radius, and trowel joint edges.

C. Curbs and Gutters: Light broom.

D. Direction of Texturing: Transverse to paving direction.

E. Place curing compound on exposed concrete surfaces immediately after finishing.

3.13 CURING AND WEATHER PROTECTION

A. Freshly placed concrete shall be protected as required to maintain the temperature of the concrete at not less than 50-degrees F nor more than 80-degrees F and in a moist condition continuously for a period of time necessary for the concrete to cure per Section 3.14B and 3.14C. Changes in temperature of the concrete during curing shall be as uniform as possible and shall not exceed 5-degrees F in any one hour, or 50-degrees F in any 24 hour period.

B. Cold Weather Protection: When the temperature of the atmosphere is 40-degrees F and below, the concrete shall be protected by heating, insulation covering, housing or combination thereof as required to maintain the temperature of the concrete at or above 50-degrees F and in a moist condition continuously for the concrete curing period. Cold weather protection shall meet the requirements of ACI 306R “Cold Weather Concreting”.

C. Hot Weather Protection: When the temperature of the atmosphere is 90-degrees F and above, or during other climatic conditions which will cause too rapid drying of the concrete, the concrete shall be protected by windbreaks, shading, fog spraying light-colored moisture-retaining covering, or a combination thereof as required to maintain the temperature of the concrete below 80-degrees F and in a moist condition continuously for the concrete curing period. Hot weather protection shall meet the requirements of ACI 305R “Hot Weather Concreting”.

3.14 IDENTIFICATIONS

A. Prior to the application of the curing compound, the Contractor shall clearly and neatly mark the pavement with the Contractor’s name and year of construction. This identification shall be stamped in the concrete at both ends of a length of pavement construction, at intersection locations of the pavement constructed, at both ends of a length of curb constructed and once in the middle, at both ends of a length of sidewalk constructed and at one spot in a driveway approach.

3.15 REMOVAL OF FORMS AND CLEAN UP

A. All forms, rails and stakes shall be removed within 24-hours after placing the pavement, sidewalk or curbs.

B. After completion of concrete curing in an area, remove all weather protection materials and rubbish and debris resulting from the specified Work, sweep concrete curbs clean and seal joints as specified in Sections 3.9 through 3.11.

3.16 ERECTION TOLERANCES

A. Maximum Variation of Surface Flatness: 1/8 inch in 10 ft.

B. Variation from Indicated Elevation: Maximum 1/4 inch.

C. Maximum Variation from True Position: 1/4 inch.

D. Scheduled Thickness: No less than specified on the Drawings.

3.17 FIELD QUALITY CONTROL

A. The Owner shall hire a 3rd party testing company to test in-place materials for compliance with the latest version of ASTM and MDOT Standard Specifications for Construction.

B. Perform field inspection and testing in accordance with ASTM C94 and local governing agency standards.

C. Inspect reinforcing placement for size, spacing, location, support.

D. Quality Control During Paving Operations:

1. Sampling Procedures: ASTM C172.

2. Cylinder Molding and Curing Procedures: ASTM C31, cylinder specimens.

3. Sample concrete and make three cylinders for each day of paving unless otherwise specified by the Owner. Record the locations where the samples are taken to correlate with subsequent testing.

4. Test one cured concrete cylinder from each sample set per ASTM C39 at 7-day and 28-day periods and report the type of failure and compressive strength at failure. Note the third cylinder is to be stored for future use.

5. Test slump in-field per ASTM C143 for each sample.

6. Test mix for air-entrainment per ASTM C231 for each sample.

E. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

F. Additional testing may be required if any of the previous tests indicate insufficient values. If two successive tests indicate insufficient values, contact the Owner for a course of action.

G. Concrete materials not complying with the specified requirements shall be repaired or removed and replaced with new paving.

3.18 PROTECTION

A. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury. Refer to section 3.14 for additional detail.

B. Do not permit vehicular traffic over paving for a minimum of 14 days after finishing.

END OF SECTION

PAVEMENT MARKINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Traffic lines and markings
2. Legends
3. Paint

B. Related Sections:

1. Section 32 12 16 - Asphalt Paving
2. Section 32 13 13 - Concrete Paving

1.2 PERFORMANCE REQUIREMENTS

A. Paint Adhesion: Adhere to road surface forming smooth continuous film one minute after application.

B. Paint Drying: Tack free by touch so as not to require coning or other traffic control devices to prevent transfer by vehicle tires within two minutes after application.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit paint formulation for each type of paint.

C. Manufacturer's Installation Instructions: Submit instructions for application temperatures, eradication requirements, application rate, line thickness, and any other data on proper installation.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with local governing agency standards.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Invert containers several days prior to use when paint has been stored more than 2 months. Minimize exposure to air when transferring paint. Seal drums and tanks when not in use.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint product manufacturer

C. Do not apply exterior coatings during rain or snow when relative humidity is outside humidity ranges, or moisture content of surfaces exceed those required by paint product manufacturer.

D. Do not apply paint when temperatures are expected to fall below 40 degrees F for 24 hours after application.

E. Volatile Organic Content (VOC). Do not exceed State or Environmental Protection Agency maximum VOC on traffic paint.

PART 2 PRODUCTS

2.1 PAINTED PAVEMENT MARKINGS

A. Furnish materials in accordance with local governing agency standards.

B. Color:

1. Traffic lane striping shall be white or yellow reflectorized as shown on the Plans.

2. Traffic marking, curb faces and light pole bases shall be yellow reflectorized as shown on the Plans.

3. Parking lot striping shall be yellow unless otherwise noted.

4. Handicap stall striping meeting current ADA guidelines shall be blue unless noted otherwise.

2.2 EQUIPMENT

A. Continuous Longitudinal Line Application Machine: Use application equipment with following capabilities.

1. Dual nozzle paint gun to simultaneously apply parallel lines of indicated width in solid or broken patterns or various combinations of those patterns.

2. Pressurized bead-gun to automatically dispense glass beads onto painted surface, at required application rate.

3. Measuring device to automatically and continuously measure length of each line placed, to nearest foot.

4. Device to heat paint as necessary for fast dry applications.

B. Machine Calibration:

1. Paint Line Measuring Device: Calibrate automatic line length gauges to maintain tolerance of plus or minus 25 feet per mile.

2. Cycle Length/Paint Line Length Timer: Calibrate cycle length to maintain tolerance of plus or minus 6 inches per 40 feet; calibrate paint line length to maintain tolerance to plus or minus 3 inches per 10 feet.

3. Paint Guns: Calibrate to simultaneously apply paint binder at uniform rates as specified with an allowable tolerance of plus or minus 1 mil.

C. Other Equipment:

1. For application of crosswalks, intersections, stop lines, legends and other miscellaneous items by walk behind stripers, hand spray or stencil trucks, apply with equipment meeting requirements of this section. Do not use hand brushes or rollers.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Do not apply paint to pavement surfaces until it has cured for 28 days, unless approved by Owner.

3.2 PREPARATION

A. Maintenance and Protection of Traffic:

1. Prevent interference with marking operations and to prevent traffic on newly applied markings before markings dry.

2. Maintain access to existing businesses, and other properties requiring access.

B. Surface Preparation.

1. Clean and dry paved surface prior to painting.

2. Blow or sweep surface free of dirt, debris, oil, grease or gasoline or other material that would adversely affect paint bonding with pavement.

3. Pavement surface shall be protected during any paint transfer operations to contain spillage and splatter.

3.3 APPLICATION

A. Agitate paint for 1-15 minutes prior to application to ensure even distribution of paint pigment.

B. Dispense paint per manufacturer’s recommendations to a wet-film thickness of 15 mils, except dispense edge markings to wet-film thickness of 12 mils.

C. Apply markings to indicated dimensions at indicated locations.

D. Prevent splattering and over spray when applying markings.

E. Unless material is track free at end of paint application, use traffic cones to protect markings from traffic until track free. When vehicle crosses a marking and tracks it or when splattering or over spray occurs, eradicate affected marking and resultant tracking and apply new markings.

F. Collect and legally dispose of residues from painting operations.

G. Install Work in accordance with local governing agency standards.

3.4 APPLICATION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation from Wet Film Thickness: 1 mil.

C. Maximum Variation from Wet Paint Line Width: Plus or minus 1/8 inch.

D. Maintain cycle length for skip lines at tolerance of plus or minus 6 inches per 40 feet and line length of plus or minus 3 inches per 10 feet.

E. Maximum Variation from Specified Application Temperature: Plus or minus 5 degrees F

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspect for incorrect location, line length, insufficient thickness, line width, coverage, retention, uncured or discolored material, and insufficient bonding.

C. Repair lines and markings, which after application and curing do not meet following criteria:

1. Incorrect Location: Remove and replace incorrectly placed patterns.

2. Insufficient Thickness, Line Width, Paint Coverage, Glass Bead Coverage or Retention: Prepare defective material by acceptably grinding or blast cleaning to remove substantial amount of beads and to roughen marking surface. Remove loose particles and debris. Apply new markings on cleaned surface in accordance with this Section.

3. Uncured or Discolored Material, Insufficient Bonding: Remove defective markings in accordance with this Section and clean pavement surface one foot beyond affected area. Apply new markings on cleaned surface in accordance with this Section.

D. When eradication of existing paint lines is necessary, eradicate by shot blast or water blast method. Do not gouge or groove pavement more than 1/16 inch during removal. Limit area of removal to area of marking plus 1 inch on all sides. Prevent damage to transverse and longitudinal joint sealers, and repair any damage according to requirements in Section 32 13 13 or Section 32 12 16.

E. Maintain daily log showing work completed, results of above inspections or tests, pavement and air temperatures, relative humidity, presence of any moisture on pavement, and any material or equipment problems. Make legible entries in log in ink, sign and submit to owner by end of each work day. Enter environmental data into log prior to starting work each day and at two additional times during day.

3.6 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Protect painted pavement markings from vehicular and pedestrian traffic until paint is dry and track free. Follow manufacturer's recommendations or use minimum of 30 minutes. Consider barrier cones as satisfactory protection for materials requiring more than 2 minutes dry time.

END OF SECTION

SOIL PREPARATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preparation of subsoil.
2. Soil testing.
3. Placing topsoil.

B. Related Sections:

4. Section 31 22 13 - Rough Grading: Rough grading of site.
5. Section 31 23 17 - Trenching: Rough grading over cut.
6. Section 32 91 19 - Landscape Grading: Preparation of subsoil and placement of topsoil in preparation for the Work of this section.
7. Section 32 92 19 - Seeding

1.2 REFERENCES

A. ASTM International:

1. ASTM D2607 – Classification of Peats, Mosses, Humus, and Related Products

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with local governing agency standards regarding materials, methods of work, and disposal of excess and waste materials.

PART 2 PRODUCTS

2.1 MATERIALS

A. Topsoil: As specified in Section 310516 Type S2. Frozen or muddy topsoil is not acceptable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify prepared soil base is ready to receive the Work of this section.

C. Locate and identify existing underground and overhead services and utilities within contract limit work areas. (Call private utility locating service and Miss Dig: 1-800-482-7171 or 811).

D. Provide adequate means to protect utilities and services designated to remain.

E. Repair utilities damaged during site work operations at Subcontractor's expense.

F. When uncharted or incorrectly charted underground piping or other utilities and services are encountered during site work operations, notify the applicable utility company and Engineer immediately to obtain procedure directions. Cooperate with applicable utility company in maintaining active services in operation.

G. Locate, protect and maintain bench marks, monuments, control points and project engineering reference points. Re-establish disturbed or destroyed items at Subcontractor's expense.

H. Perform landscape work operations and the removal of debris and materials to ensure minimum interference with streets, walks, and other adjacent facilities.

I. Protect existing trees scheduled to remain against injury or damage including cutting, breaking or skinning of roots, trunks or branches, smothering by stockpiled construction materials, excavated materials or vehicular traffic within branch spread.

3.2 DISPOSAL OF WASTE MATERIALS

A. Stockpile, haul from site and legally dispose of waste materials and debris. Accumulation is not permitted.

B. Maintain disposal routes, clear, clean and free of debris.

C. On site burning of combustible cleared materials is not permitted.

D. Upon completion of landscape preparation work, clean areas within contract limits, remove tools and equipment. Site to be clear, clean, and free of materials and debris and suitable for site work operations

E. Materials, items and equipment not scheduled for reinstallation or salvaged for the General Contractor are the property of the Landscape Contractor. Remove cleared materials from the site as the work progresses. Storage and sale of Landscape contractors salvage items on site is not permitted.

END OF SECTION

LANDSCAPE GRADING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Final grade topsoil for finish landscaping.

B. Related Sections:

2. Section 31 22 13 - Rough Grading: Site contouring.

3. Section 31 23 17 - Trenching: Backfilling trenches.

4. Section 31 23 23 - Fill: Backfilling at building areas.

5. Section 32 05 16 - Soils and Aggregates.

6. Section 32 92 19 - Seeding.

1.2 SUBMITTALS

A. Materials Source: Submit name of imported materials source.

B. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.3 QUALITY ASSURANCE

A. Furnish each topsoil material from single source throughout the Work.

B. Perform Work in accordance with local governing agency standards.

PART 2 PRODUCTS

2.1 MATERIAL

A. Topsoil: Fill Type S2 as specified in Section 32 05 16.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify substrate base has been contoured and compacted.

3.2 PREPARATION

A. Protect landscaping and other features remaining as final Work.

B. Protect existing structures, fences, sidewalks, utilities, paving, and curbs.

3.3 SUBSTRATE PREPARATION

A. Eliminate uneven areas and low spots.

B. Remove debris, roots, branches, stones, in excess of 1 inch in size. Remove contaminated subsoil.

C. Scarify surface to depth of 4 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.4 PLACING TOPSOIL

A. Prior to placing topsoil Contractor must call for an inspection by the Owner/Engineer to verify that the grading is within tolerance for installing the proper depth of topsoil.

B. Place topsoil in areas where seeding is required to compacted depth of 3 inches. Place topsoil during dry weather.

C. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.

D. Remove roots, weeds, rocks, and foreign material while spreading.

E. Lightly compact placed topsoil.

F. Remove surplus subsoil and topsoil from site.

3.5 TOLERANCES

A. Top of Topsoil: Plus or minus 1/2 inch.

3.6 PROTECTION OF INSTALLED WORK

A. Prohibit construction traffic over topsoil.

END OF SECTION

SEEDING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Seeding.
2. Hydroseeding.
3. Mulching.

B. Related Sections:

1. Section 31 22 13 - Rough Grading: Rough grading of site.
2. Section 31 23 17 - Trenching: Rough grading over cut.
3. Section 32 05 16 - Soils and Aggregates.
4. Section 32 91 13 - Soil Preparation
5. Section 32 91 19 - Landscape Grading: Preparation of subsoil and placement of topsoil in preparation for the Work of this section.

1.2 DEFINITIONS

A. Weeds: Vegetative species other than specified species to be established in given area.

1.3 SUBMITTALS

A. Product Data: Submit data for seed mix, fertilizer, mulch, and other accessories.

B. Submit seed vendor’s certification for required grass seed mixture, indicating percentage by weight, and percentage of purity, germination, and weed seed for each grass species.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Include maintenance instructions, cutting method and maximum grass height and types, application frequency, and recommended coverage of fertilizer.

1.5 QUALITY ASSURANCE

A. Provide seed mixture in original unopened containers showing percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight, date of packaging, and location of packaging. Store in manner to prevent wetting and deterioration.

B. Perform Work in accordance with local governing agency standards.

1.6 QUALIFICATIONS

A. Seed Supplier: Company specializing in manufacturing Products specified in this section with minimum three years' experience.

B. Installer: Company specializing in performing work of this section with minimum 3 years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

1.8 FIELD CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: April 1 and June 1.

2. Fall Planting: August 15 and October 15.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 PRODUCTS

2.1 SEED MIXTURE

A. Lawn seeded areas: Fresh, clean and new crop seed mixture. Mixed by approved methods.

B. Seed mixture composed of the following varieties, mixed to the specified proportions by weight and tested to minimum percentages of purity and germination.

C. Detention Basin Embankment Seed Mixture as indicated below:

SEED TYPE	**OUNCES/ACRE**
Permanent Grasses/Sedges/Rushes:	
River Bulrush	1.00
Crested Oval Sedge	0.50
Bottlebrush Sedge	3.00
Brown Fox Sedge	2.00
Virginia Wild Rye	24.00
Fowl Manna Grass	1.00
Common Rush	1.00
Rice Cut Grass	1.00
Switch Grass	2.00
Great Bulrush	3.00
Dark Green Rush	2.00
Wool Grass	1.00

Temporary Cover:	
Common Oat	512.00
Forbs/Shrubs	
Common Water Plantain	2.50
Swamp Milkweed	2.00
Bidens Species	2.00
Common Boneset	1.00
Sneezeweed	2.00
Blue Flag	4.00
Common Water Horehound	0.50
Monkey Flower	1.00
Ditch Stonecrop	0.50
Pinkweed Species	2.00
Sweet Black-Eyed Susan	1.00
Brown-Eyed Susan	1.50
Common Arrowhead	1.00
Wild Senna	2.00
Panicled Aster	0.50
New England Aster	0.50
Purple Meadow Rue	2.00

No noxious weed seeds permitted

Basis of design is Cardno Stormwater Mix. Install per manufacturer's recommended application rates.

D. Irrigated Seed Mixture for grass areas proportioned by volume as indicated below:

SEED TYPE	PROPORTION	PURITY	GERMINATION
Penn Lawn Fescue	30%	95%	80%
Kentucky Bluegrass	50%	90%	75%
Annual Ryegrass	20%	95%	80%

No noxious weed seeds permitted.
(Fertilizer for irrigated lawn 12-12-12)

E. Non-irrigated Seed Mixture for grass areas proportioned by volume as indicated below:

SEED TYPE	PROPORTION	PURITY	GERMINATION
Penn Lawn Fescue	60%	90%	85%
Kentucky 28# common Bluegrass	20%	90%	90%
Pennfine Perennial Rye	20%	90%	90%

No noxious weed seeds permitted.
(Fertilizer for non-irrigated lawn 10-10-10)

2.2 EROSION CONTROL BLANKETS

A. The use of erosion control blankets will not be allowed on sloped earth/embankments flatter than 6H:1V.

B. For sloped earth/embankments between 3H:1V and 6H:1V the following erosion control blankets shall be used.

1. AEC Curlex Netfree

2. Engineer and owner approved equal

C. If the specified erosion control blanket will not work properly due to site conditions, as agreed to by the Owner and Engineer, and/or greater than a 3V:1H sloped earth/embankment, then the following erosion control blankets shall be used.

1. AEC Premier Straw FibreNet SN MSMC s75bn

2. AEC Premier Straw FibreNet DN MSMC s150bn

3. Engineer and owner approved equal

D. If erosion control blankets with netting are approved for use, then the Contractor must remove the blankets once there is 80% uniform growth established for the entire area. If the Contractor refuses to remove the netting 14 days after initial notification, then the Owner will remove the netting at Contractor's expense in the form of a deduct change order/credit to the contract. Final payment will not be issued to the Contractor until the netting has been removed to the satisfaction of the Owner.

2.3 ACCESSORIES

A. Water: Free of substance harmful to seed growth. Hoses or other methods to transpiration furnished by Sub Contractor.

2.4 SOURCE QUALITY CONTROL

A. Testing is not required when recent tests and certificates are available for imported topsoil. Submit these test results to testing laboratory. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify prepared soil base is ready to receive the Work of this section.

C. Work notification: Notify Owner or General Contractor's representative at least seven (7) working days prior to start of seeding operation.

D. Protect existing utilities, paving, and other facilities from damage caused by seeding operations.

E. Perform seeding work only after planting and other work affecting ground surface has been completed.

F. Provide hose and lawn watering equipment as required.

3.2 SURFACE PREPARATION

A. After lawn areas have been prepared, take no heavy objects over them except lawn rollers.

B. After preparation of lawn areas and with topsoil in semi-dry condition, roll lawn planting areas in two directions at approximately right angles with water ballast roller weighing 100 to 300 lbs according to soil type.

C. Rake or scarify and cut or fill irregularities that develop as required until area is true and uniform, free from lumps, depressions, and irregularities.

D. Restore prepared areas to specified condition if eroded, settled or otherwise disturbed after fine grading and prior to seeding.

3.3 HYDROSEEDING

A. Hydro-seeding: The application of grass seed and a wood cellulose fiber mulch tinted green shall be accomplished in one operation by use of an approved spraying machine.

B. Mix seed, fertilizer, and wood cellulose fiber in required amount of water to produce homogenous slurry. Add wood cellulose fiber after seed, water, and fertilizer have been thoroughly mixed and apply at the rate of 200 pounds per acre dry weight.

C. For hydro-seeding, wood cellulose fiber shall be used. Silva-Fiber Mulch by Weyerhaeuer Company, Tacoma WA (800-443-9179) or approved equal.

D. Hydraulically spray material on ground to form a uniform cover impregnated with grass seed.

E. Immediately following application of slurry mix, make separate application of wood cellulose mulch at the rate of 1,000 pounds, dry weight, per acre.

F. Apply cover so that rainfall or applied water will percolate to underlying soil.

3.4 ESTABLISH LAWN

A. Establish dense lawn of permanent grasses, free from lumps and depressions. Any area failing to show uniform germination to be reseeded; continue until dense lawn established. This includes watering the seeded areas to establish growth.

B. Damage to seeded area resulting from erosion to be repaired by Contractor.

C. In event Contractor does not establish dense lawn during first germination period, return to project to re-fertilize and reseed to establish dense lawn.

D. Should the seeded lawn become largely weeds after germination, Contractor is responsible to kill the weeds and reseed the proposed lawn areas to produce a dense turf, as specified.

E. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches. If irrigation system is present, coordinate with irrigation contractor to maintain and adjust water requirements during maintenance/warranty period.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.

2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

3.5 CLEANING

A. Perform cleaning during installation of the work and upon completion of the work to the approval of the Owner. Remove from site all excess materials, debris, and equipment. Repair damage resulting from seeding operations.

END OF SECTION

MANHOLES AND STRUCTURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Monolithic concrete manhole section with masonry transition to cover frame, covers, anchorage, and accessories.

2. Modular precast concrete manhole section with tongue-and-groove joints [with masonry transition to cover frame,] covers, anchorage, and accessories.

3. Monolithic FRP manhole section with transition to cover frame, covers, anchorage, and accessories.

4. Masonry manhole section with masonry transition to cover frame, covers, anchorage, and accessories.

5. Outlet Control Structures for detention areas.

6. Bedding and cover materials.

B. Related Sections:

1. Section 31 05 16 - Aggregates for Earthwork: Aggregate for backfill in trenches.

2. Section 31 23 16 - Excavation: Excavating for manholes.

3. Section 31 23 23 - Fill: Backfilling after manhole installation.

1.2 REFERENCES

A. American Concrete Institute:

1. ACI 318 - Building Code Requirements for Structural Concrete.

2. ACI 530/530.1 - Building Code Requirements for Masonry Structures and Specifications for Masonry Structures.

B. ASTM International:

1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.

2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

3. ASTM C55 - Standard Specification for Concrete Brick.

4. ASTM C62 - Standard Specification for Building Brick (Solid Masonry Units Made from Clay or Shale).

5. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.

6. ASTM C497 - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile.

7. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.

8. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

9. ASTM D3753 - Standard Specification for Glass-Fiber-Reinforced Polyester Manholes and Wet wells.

10. ASTM A760/A760M-15 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains

1.3 DESIGN REQUIREMENTS

A. Equivalent strength: Based on structural design of reinforced concrete as outlined in ACI 318.

B. Design of Lifting Devices for Precast Components: In accordance with ASTM C913.

C. Design of Joints for Precast Components: In accordance with ASTM C913; maximum leakage of 0.025 gallons per hour per foot of joint at 3 feet of head.

1.4 SUBMITTALS

A. Shop Drawings: Indicate manhole locations, elevations, piping with sizes and elevations of penetrations.

B. Product Data: Submit manhole cover and frame construction, features, configuration, dimensions.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with local governing agency standards.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum of three years experience.

1.7 DELIVERY, STORAGE AND HANDLING

A. Comply with precast concrete manufacturer’s instructions for unloading, storing and moving precast manholes.

B. Store precast concrete manholes to prevent damage to Owner’s property or other public or private property. Repair property damaged from materials storage.

C. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers shown on Drawings to indicate its intended use.

PART 2 PRODUCTS

2.1 MANHOLES

A. Manhole Sections: Reinforced precast concrete in accordance with ASTM C478 with gaskets in accordance with ASTM C923.

B. Mortar and Grout: Mortar for finishing and sealing shall be Class “C”. Honeycombing less than 2 inches deep shall be repaired using Class “D” mortar.

C. Brick Transition Reinforcement: Formed steel 8 gage wire with galvanized finish.

2.2 OUTLET CONTROL STRUCTURES

A. Structure shall be material and size as indicated on Drawings.

B. Casting shall be material and size as indicated on Drawings.

C. Base shall be material and size as indicated on Drawings.

D. Bedding and backfill shall be material and sizes as indicated on Drawings.

2.3 FRAMES AND COVERS

A. Manufacturers:

1. EJ or approved equal.

B. Product Description: ASTM A48, Class 30B Heavy-Duty Cast-iron construction, machined flat bearing surface, removable lid, closed or open as indicated on Drawings; sealing gasket; cover molded with identifying name and logo as required by local governing agency.

2.4 COMPONENTS

A. Manhole Steps: M.A. Industries P.S.I. Polypropylene or approved equal.

B. Base Pad: Cast-in-place concrete 3,000 psi at 28 days, leveled top surface.

2.5 CONFIGURATION

A. Manhole Section Construction: Concentric with eccentric cone top section.

B. Shape: Cylindrical.

C. Clear Inside Dimensions: 48-inch diameter or as indicated on Drawings.

D. Design Depth: As indicated on Drawings.

E. Clear Lid Opening: 24-inch minimum diameter or as indicated on Drawings.

F. Pipe Entry: Provide openings as indicated on Drawings.

G. Steps: 16 inches on center vertically, set into manhole wall. As indicated on Drawings.

2.6 BEDDING AND COVER MATERIALS

A. Bedding: Fill Type A1 as specified in Section 31 05 16 and as indicated on Drawings.

B. Cover: Fill Type A2, as specified in Section 31 05 16 and as indicated on Drawings.

2.7 FINISHING - STEEL

A. Galvanizing: ASTM A123, hot dip galvanized after fabrication.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify items provided by other sections of Work are properly sized and located.

C. Verify built-in items are in proper location, and ready for roughing into Work.

D. Verify correct size of manhole excavation.

3.2 PREPARATION

A. Coordinate placement of inlet and outlet pipe required by other sections.

B. Do not install structures where site conditions induce loads exceeding structural capacity of structures.

C. Inspect precast concrete structures immediately prior to placement in excavation to verify structures are internally clean and free from damage. Remove and replace damaged units.

3.3 INSTALLATION

A. Excavation and Backfill:

1. Excavate for manholes in accordance with Section 31 23 16 in location and to depth shown. Provide clearance around sidewalls of structure for construction operations.

2. When groundwater is encountered, prevent accumulation of water in excavations. Place manholes in dry trench.

3. Where possibility exists of watertight structure becoming buoyant in flooded excavation, anchor structure to avoid flotation.

B. Place base pad, trowel top surface level.

C. Place manhole sections plumb and level, trim to correct elevations, anchor to base pad.

D. Backfill excavations for manholes in accordance with Section 31 23 16 and 31 23 23.

E. Form and place manhole cylinder plumb and level, to correct dimensions and elevations.

F. Cut and fit for pipe.

G. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour to form continuous drainage channel as indicated on Drawings.

H. Set cover frames and covers level without tipping, to correct elevations.

I. Coordinate with other sections of Work to provide correct size, shape, and location.

3.4 PRECAST CONCRETE MANHOLE INSTALLATION

A. Lift precast components at lifting points designated by manufacturer.

B. When lowering manholes into excavations and joining pipe to units, take precautions to ensure interior of pipeline and structure remains clean.

C. Set precast structures bearing firmly and fully on crushed stone bedding, compacted in accordance with provisions of Section 31 23 16, Section 31 23 23 or on other support system shown on Drawings.

D. Assemble multi-section structures by lowering each section into excavation. Lower, set level, and firmly position base section before placing additional sections.

E. Remove foreign materials from joint surfaces and verify sealing materials are placed properly. Maintain alignment between sections by using guide devices affixed to lower section.

F. Joint sealing materials may be installed on site or at manufacturer’s plant.

G. Verify manholes installed satisfy required alignment and grade.

H. Remove knockouts or cut structure to receive piping without creating openings larger than required to receive pipe. Fill annular space with mortar.

I. Cut pipe to finish flush with interior of structure.

J. Shape inverts through manhole as shown on Drawings.

3.5 CAST-IN-PLACE CONCRETE MANHOLE INSTALLATION

A. Prepare crushed stone bedding or other support system shown on Drawings, to receive base slab as specified for precast structures.

B. Erect and brace forms against movement.

C. Install reinforcing steel as indicated on Drawings.

D. Place and cure concrete.

3.6 FRAME AND COVER INSTALLATION

A. Set frames using mortar and masonry. Install radially laid concrete brick with 1/4-inch-thick vertical joints at inside perimeter. Lay concrete brick in full bed of mortar and completely fill joints. Where more than one course of concrete brick is required, stagger vertical joints.

B. Set frame and cover 2 inches above finished grade for manholes with covers located within unpaved areas to allow area to be graded away from cover beginning 1 inch below top surface of frame.

3.7 FIELD QUALITY CONTROL

A. Test concrete manhole and structure sections in accordance with ASTM C497.

B. Vertical Adjustment of Existing Manholes:

1. Where required, adjust top elevation of existing manholes to finished grades shown on Drawings.

2. Reset existing frames, grates and covers, carefully removed, cleaned of mortar fragments, to required elevation in accordance with requirements specified for installation of castings.

3. Remove concrete without damaging existing vertical reinforcing bars when removal of existing concrete wall is required. Clean vertical bars of concrete and bend into new concrete top slab or splice to required vertical reinforcement, as indicated Drawings.

4. Clean and apply sand-cement bonding compound on existing concrete surfaces to receive cast-in-place concrete.

END OF SECTION

STORM UTILITY DRAINAGE PIPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Storm drainage piping.
2. Accessories.
3. Catch basins.
4. Bedding and cover materials.

B. Related Sections:

1. Section 31 05 16 – Soils and Aggregates: Aggregate for backfill in trenches.
2. Section 31 23 16 - Excavation: Product and execution requirements for excavation and backfill required by this section.
3. Section 31 23 17 - Trenching: Execution requirements for trenching required by this section.
4. Section 31 23 23 - Fill: Requirements for backfill to be placed by this section.
5. Section 33 05 13 - Manholes and Structures.
6. Section 33 46 00 - Subdrainage: Termination of catch basin subdrain system for connection to Work of this Section.

1.2 REFERENCES

A. ASTM International:

1. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
2. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
4. ASTM D1785 Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe
5. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

6. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.

7. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

8. ASTM D3212 Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

9. ASTM D3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

10. ASTM A760/A760M-15 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains

1.3 SUBMITTALS

A. Product Data: Submit data indicating pipe and pipe accessories.

B. Manufacturer's Installation Instructions: Submit special procedures required to install Products specified.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents:

1. Accurately record actual as-built locations of pipe runs, connections, catch basins, cleanouts, and invert elevations.

2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with local governing agency standards.

1.6 COORDINATION

A. Coordinate the Work with termination of storm sewer connection outside building, trenching, and connection to private or municipal sewer utility service.

PART 2 PRODUCTS

2.1 STORM DRAINAGE PIPING

A. Reinforced Concrete Pipe: ASTM C76, Class IV unless indicated otherwise on Drawings.

1. Fittings: Reinforced concrete.

2. Joints: ASTM C443, rubber compression gasket.

B. Corrugated Metal Pipe: A760/A760M-15 material, fittings and joints as indicated on Drawings.

C. Plastic Pipe: ASTM D1785, SCH 26, Poly (Vinyl Chloride) (PVC) material; bell and spigot style rubber ring sealed gasket joint.

1. Fittings: PVC.

2. Joints: ASTM D3212, elastomeric gaskets.

2.2 CATCH BASINS

A. Catch Basin Lid and Frame Manufacturers:

1. EJ or approved equal.

B. Catch Basin Lid and Frame:

1. Construction: Cast iron or ductile iron construction as indicated on Drawings.

C. Shaft Construction and Cone Top Section: Reinforced precast concrete pipe sections, lipped male/female joints, nominal shaft diameter as indicated on Drawings, conforming to City of Troy Standard Details and Specifications.

D. Base Pad: Pre-cast or cast-in-place concrete of type specified on Drawings.

2.3 CLEANOUTS

A. Cleanout Lid and Frame Manufacturers:

1. EJ or approved equal.

2.4 BEDDING AND COVER MATERIALS

A. Bedding: Fill Type A1 as specified in Section 31 05 16.

B. Cover: Fill Type A2, as specified in Section 31 05 16.

C. Soil Backfill from Above Pipe to Finish Grade: Soil Type A2, as specified in Section 31 05 16.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify trench cut and excavation is ready to receive work and excavations, dimensions, and elevations are as indicated on drawings.

3.2 PREPARATION

A. Hand trim excavations to required elevations. Correct over excavation with fine aggregate.

B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

C. Contractor shall hire a Registered Land Surveyor to establish lines and grades for storm sewer installation.

3.3 BEDDING

A. Excavate pipe trench in accordance with Section 31 23 17 for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Place bedding material at trench bottom, level materials in continuous layers not exceeding 6 inches compacted depth, each layer. Place compacted bedding material to elevation of paving subgrade as indicated on Drawings.

C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with ASTM D2321, ASTM C12 or manufacturer's published instructions, and state or local requirements. Seal joints watertight. Pipe shall be +/- 0.10' of the elevation shown on Drawings.

B. Install pipe on minimum 6-inch bedding, ½" to 1 ½" crushed angular graded stone compacted to 95% maximum dry unit weight per ASTM D1557.

C. Lay pipe to slope gradients indicated on Drawings.

D. Install aggregate at sides and over top of pipe. Provide top cover to minimum compacted thickness equal to paving subgrade elevation indicated on Drawings.

E. Refer to Section 31 23 23 for backfilling and compacting requirements. Do not displace or damage pipe when compacting.

F. Refer to Section 33 05 13 for manhole requirements.

G. Connect to private or municipal storm sewer system, manholes, catch basins, and inlets as indicated on Drawings.

H. Install site storm drainage system piping to 5 feet of building. Coordinate with other trades/contractors to ensure depth and location are adequate for connection.

I. Install Work in accordance with local government standards.

3.5 INSTALLATION - CATCH BASINS

A. Form bottom of excavation clean and smooth to elevation indicated on Drawings.

B. Form and place cast-in-place concrete base pad, with provision for storm sewer to be placed at required elevations.

C. Level top surface of base pad; sleeve concrete shaft sections to receive storm sewer pipe sections.

D. Establish elevations and pipe inverts for inlets and outlets as indicated on Drawings.

E. Mount grate and frame level, in grout, secured to top section to elevation indicated.

F. Connect to catch basin subdrainage system piping. Refer to Section 33 46 00.

G. Install Work in accordance with local government standards.

3.6 FIELD QUALITY CONTROL

A. The Owner shall hire a 3rd party testing company to test in-place materials for compliance with the requirements for density and thickness per the latest version of ASTM and MDOT Standard Specifications for Construction.

B. Request inspection prior to and immediately after placing aggregate cover over pipe.

C. Compaction Testing: In accordance with ASTM D1557.

D. When tests indicate work does not meet specified requirements, remove work, replace and retest.

E. Frequency of Compaction Tests: One test for each 50 lineal feet of trench.

F. Infiltration Test: Test in accordance with applicable local Public Works Department Standard Specifications and requirements.

G. Deflection Test: Test in accordance with applicable local Public Works Department Standard Specifications and requirements.

H. Pressure Test: Test in accordance with applicable local Public Works Department Standard Specifications and requirements.

3.7 PROTECTION OF FINISHED WORK

A. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

1. Take care not to damage or displace installed pipe and joints during construction of pipe supports, backfilling, testing, and other operations.

2. Repair or replace pipe that is damaged or displaced from construction operations.

END OF SECTION

SUBDRAINAGE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Catch basin finger drain system.
2. Pavement underdrain system

B. Related Sections:

1. Section 31 05 16 – Soils and Aggregates.
2. Section 31 23 23 – Fill.
3. Section 33 41 00 - Storm Utility Drainage Piping: Connection to catch basin.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M252 – Standard Specification for Corrugated Polyethylene Drainage Pipe.

1.3 SUBMITTALS

A. Shop Drawings: Indicate dimensions, layout of piping, high and low points of pipe inverts.

B. Product Data: Submit data on pipe drainage products and pipe accessories.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with local governing agency standards.

PART 2 PRODUCTS

2.1 PIPE MATERIALS

A. Furnish materials in accordance with local governing agency standards.

B. HDPE corrugated polyethylene pipe: AASHTO M-252 Type CP; perforated, flexible type, with required fittings per Plans.

2.2 AGGREGATE AND BEDDING

A. Filter Aggregate and Bedding Materials: Drainage aggregate as specified in Section 31 05 16.

2.3 ACCESSORIES

A. Pipe Coupling: Pre-fabricated coupling with soil tight gasketed joint.

B. Filter Fabric: Water pervious type, polyester; with filter pipe sock, or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify excavated base is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION

A. Hand trim excavations to required elevations.

B. Remove large stones or other hard matter which could damage drainage piping or impede consistent backfilling or compaction.

3.3 INSTALLATION

A. Place drainage pipe on aggregate pipe bedding.

B. Lay pipe to slope gradients noted on Drawings; with maximum variation from indicated slope of 1/8 inch in 10 feet.

C. Place pipe with perforations facing down.

D. Install pipe couplings as needed.

E. Install Drainage aggregate at sides, over joint covers and top of pipe.

F. Place filter fabric over leveled top surface of aggregate cover prior to subsequent backfilling operations.

G. Place trench backfill aggregate in maximum 6-inch lifts, consolidating each lift.

H. Refer to Section 31 23 23 for compaction requirements. Do not displace or damage pipe when compacting.

3.4 FIELD QUALITY CONTROL

A. The Owner shall hire a 3rd party testing company to test in-place materials for compliance with the requirements for density and thickness per the latest version of ASTM and MDOT Standard Specifications for Construction.

B. Request inspection prior to and immediately after placing aggregate cover over pipe.

C. When inspections indicate work does not meet specified requirements, remove work, replace and retest.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Protect pipe and aggregate cover from damage or displacement until backfilling operation begins.

END OF SECTION

CHIP SEAL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Chip Seal.

1.2 SUBMITTALS

A. Product Data: The contractor shall submit mix design reports (shop drawings) for the chip seal material that includes the gradation and physical characteristics of the coarse aggregate, providing all the information contained within Table 2 of the MDOT 'Special Provision for Pavement Performance Warranty for Double Chip Seals' publication (provided and attached), FHWA approved 2-23-09, as well as the emulsified asphalt properties as contained in Table 1 of the same document. Submit a minimum of 7 working days prior to start of field operations to allow for sufficient time to review, unless otherwise directed by the Owner.

B. Manufacturer's Certificate: Certify that materials specified in this section meet or exceed the requirement liste in Section 505.03. F and G of the Michigan Department of Transportation Standard Specifications for Construction (current edition).

PART 2 PRODUCTS

2.1 MATERIALS

A. All material shall comply with the requirements of Section 505.02 of the Michigan Department of Transportation Standard Specifications for Construction (current edition).

2.2 EQUIPMENT

A. All equipment shall comply with the requirements of Section 505.03.A of the Michigan Department of Transportation Standard Specifications for Construction (current edition).

B. No fuel oil is allowed to clean the paving machine.

2.3 CHIP SEAL MATERIALS

A. Coarse Aggregate
   1. MDOT Coarse Aggregate CS-T is required for all chip seal courses per Table 2 of the attached 'Special Provision for Pavement Performance Warranty for Double Chip Seals' MDOT publication, FHWA approved 2-23-09. All physical property and gradation requirements shall meet Table 2 standards.
   2. Coarse aggregate used in the chip seal mixture shall be washed prior to batching, free from surface dust.
   3. The use of blast furnace slag is prohibited. Only natural aggregate is allowed.
   4.
   5. Coarse aggregate shall have a maximum moisture content of 4% at the time of placement.

B. Asphalt Emulsions
   1. Emulsified asphalt shall be cationic and conform to Table 1of the MDOT 'Special Provision for Pavement Performance Warranty for Double Chip Seals' publication (provided and attached), FHWA approved 2-23-09, in lieu of Table 904-6 within the 2020 MDOT SSFC.

2. If anionic emulsified asphalt is approved by the owner, the material shall meet MDOT designation HFRS-2M per Table 904-5 within the 2020 MDOT SSFC.
3. Other emulsions which will enhance chip seal performance may be substituted following approval by the engineer and the owner.

C. Regular Seal
1. A fog seal in accordance with MDOT 'Special Provision for Pavement Performance Warranty for Double Chip Seals' publication shall be applied with 7 days to final chip course placement for Chip Seal applications.
2. The Regular Seal shall be omitted for projects considered a Cape Seal, where a slurry surface or micro-surfacing course will be applied after the chip seal.

2.5 CHIP SEAL MIXES

A. Application rates and mix proportioning shall be used per section 505.03 of the 2020 MDOT SSFC, as follows:
1. Asphalt Emulsion : apply within the range per section 5.0.3.E.1.b for Double Chip Seal.
2. Coarse Aggregate: apply within the range .per section 5.0.3.E.1.b for Double Chip Seal..

PART 3 EXECUTION

3.1 PLACING CHIP SEAL

A. All work shall be installed in accordance with Section 505: Chip Seals; Section 902: Aggregates; and Section 904: Asphaltic Materials of the Michigan Department of Transportation Standard Specifications for Construction (current edition) and MDOT 'Special Provision for Pavement Performance Warranty for Double Chip Seals' publication, FHWA approved 2-23-09.

B. Protection
1. Provide barricades, flagmen, warning signs and warning lights as required allowing for the movement of traffic. If fire lanes are affected by these operations, secure alternate route for fire trucks.
2. Provide protection for vehicle and pedestrian traffic through and adjacent to these operations.

C. Sequence, Scheduling
1. Do not install any materials when ground is frozen or covered with snow, ice or water; it is raining; or when rain is threatening.
2. Provide owner with a sequence of construction plans, including target completion schedule. Inform Owner immediately if plan modifications are needed.

D. Weather Limitations

1. Place the chip seal when the pavement and atmospheric temperatures are at or above 55 deg F; do not place chip seal when the existing pavement temperature is 130 deg F or above.

2. Do not place chip seal if there is threatening weather or temperatures are forecasted to be below 40 deg F within 24 hours from the time of work completion.

3. Chip seals shall not be placed in foggy or rainy weather.

4. Chip seals shall not be placed in area exhibiting moisture presence or within 48 hours of a rainfall event.

E. Minimum of two rollers required.

F. All surfaces inside the work area, that is not to be sealed, such as castings and concrete pavement, are to be covered with tarpaper and secured with tape or loose stone.

G. All areas chip sealed on one day shall be rolled continuously the following day, for a minimum of one hour, with one roller.

H. No overlapping is allowed in tapered areas. Chip seal surfaces are to be uniform in depth.

3.2 FIELD QUALITY CONTROL

A. Producer and Installer Qualifications
   1. Producer and installer of chip seal surface treatments shall have completed projects of similar size and specified material types, with successful in-service results.

B. Warranty Requirements
   1. The Contractor shall warranty his work against defective materials or workmanship as described within the attached MDOT ‘Special Provision for Pavement Performance Warranty for Double Chip Seal’, MDOT designation 03SP508(C), FHWA approved 2-23-09.
   2. The length of warranty will be per the contract documents with the District.

END OF SECTION