CITY OF ROCHESTER
SPECIAL PROVISION
FOR
PROGRESS CLAUSE

The Engineer anticipates that construction can begin no earlier than **10 calendar days** after award as directed by the Engineer.

In no case shall any work be commenced prior to receipt of formal notice of award by the Department.

The Contractor shall prepare and submit a complete, detailed, signed Progress Schedule to the Engineer.

The entire project must be completed by the final completion date of **February 26, 2025**.

Unless specific pay items are provided in the contract any extra costs incurred by the Contractor due to cold-weather protection and winter grading will not be paid for separately but will be included in the payment of other pay items in the contract.

After award and prior to the start of work, the Contractor must attend a preconstruction meeting with the Engineer. The Engineer will determine the day, time and place for the preconstruction meeting. The meeting will be conducted after project award and may be rescheduled if there are delays in the award of the project.

The named subcontractor(s) for Designated and/or Specialty Items, as shown in the Proposal, should attend the preconstruction meeting if such items materially affect the work schedule.

Failure by the Contractor to meet interim completion, open to traffic, and/or final completion dates will result in the assessment of liquidated damages in accordance with subsection 108.10 of the Standard Specifications for Construction.

CITY OF ROCHESTER

NOTICE TO BIDDERS

UTILITY COORDINATION

The Contractor shall cooperate and coordinate construction activities with the owners of utilities as stated in Subsection 104.07 of the Standard Specifications for Construction. In addition, for the protection of underground utilities, the contractor shall follow the requirements in Subsection 107.12 of the Standard Specifications for Construction. Contractor delay claims, resulting from a utility, will be determined based upon Subsection 109.05E of the Standard Specifications for Construction.

PUBLIC UTILITIES

The following Public Utilities have facilities located within the Right-of-Way:

Detroit Edison Saso Trpceski 15600 Nineteen Mile Rd. Clinton Twp., MI 48038	(586) 412-3220	Electric & Street Lighting
AT & T Greg Hills 54 North Mill Street Pontiac, MI 48342	(248) 705-6529	Telephone & Fiber Optic
Consumers Energy Ernie Martyniuk 4600 Coolidge Highway Royal Oak, MI 48073	(248) 594-5089	Gas
Comcast Cable Michael Marlow 41112 Concept Dr Plymouth, MI 48170	(313) 304-9996	Cable TV
Wide Open West Scotty Fernandez 32650 N. Avis Drive Madison Heights, Michigan 48071	(586) 453-3512	Cable TV

International Transmission Company (ITC) Erika Davis 27175 Energy Way Novi, Michigan 48377	(248) 946-3688	Electric
City of Rochester Department of Public Works Alek Mizikar, DPW Director 1141 North Wilcox Rochester, Michigan 48307	(248) 651-5165	Sewer/Water
Paint Creek Trailways Commission Melissa M. Ford, Trail Manager 4393 Collins Road Rochester, Michigan 48306	(248) 651-9260	CRT

For protection of underground utilities and in conformance with Public Act 174 of 2013, the Contractor shall dial 1-800-482-7171 a minimum of three full working days, excluding Saturdays, Sundays, and holidays prior to beginning each excavation in areas where public utilities have not been previously located. Members will thus be routinely notified. This does not relieve the Contractor of the responsibility of notifying utility owners who may not be a part of the "Miss Dig" alert system.

The owners of existing service facilities that are within grading or structure limits and/or in conflict with the proposed improvements will move them to locations designated by the Engineer or will remove them entirely from the road Right-of-Way. Owners of Public Utilities will not be required by the City to move additional poles or structures in order to facilitate the operation of construction equipment unless it is determined by the Engineer that such poles or structures constitute a hazard to the public or are extraordinarily dangerous to the Contractor's operation.

The structure and utility information shown on the plans indicates approximate locations and type of facilities as disclosed by the various utility company records. No guarantee is given or implied to the completeness or accuracy thereof.

It shall be the Contractor's responsibility to locate and determine the exact depth of existing utilities and building services prior to construction. Said utility information shall be supplied to the Owner, Engineer, and/or utility companies involved.

There will be no additional compensation for delays in construction due to the failure of the Contractor to verify utility depths or properly coordinate conflicts with utility companies.

Determining the existence and location of underground and overhead utilities and their protection shall be the responsibility of the Contractor. The Contractor shall call MISS DIG. No guarantee is made by the Owner or Engineer as to the completeness and/or accuracy of utility information shown on the plans. Information is from available records and is approximate only.

CITY OF ROCHESTER

SPECIAL PROVISION
FOR
MAINTAINING TRAFFIC

AEW: CAD 1 of 5 March 2023

a. Description. This special provision consists of requirements and restrictions to maintain traffic on the Paint Creek Trail in the City of Rochester, Oakland County.

b. General. Maintain traffic throughout the project in accordance with the standard specifications, typicals, and supplemental specifications in the contract and as described on the plans for this project.

c. Construction Influence Area (CIA). The CIA includes the right-of-way of the following roadways, within the approximate limits described below:

1. On Paint Creek Trail from Woodward Avenue to approximately 0.1 miles north of Woodward Avenue.

2. In addition, the CIA includes the right-of-way of any designated detour route or alternate route, intersecting roads and ramps adjacent to the work zone for a distance of approximately 500 feet in advance of the work zone or as far as the construction or detour signing extends.

d. Traffic Restrictions. Maintain traffic in accordance with the Maintaining Traffic Typicals contained herein, except as noted below. Changes or adjustments to the Maintaining Traffic Typicals may be necessary to fit field conditions, subject to approval of the Engineer or as determined by the Engineer.

1. Utilize the following Maintaining Traffic Typicals:

   A. 101-GEN-SPACING-CHARTS

2. Do not work, deliver material, or close lanes during the holiday periods as defined in Table 1.

Table 1: 2023 Holiday Periods

Holiday	Start Date and Time	End Date and Time
Memorial Day	05/26/23 3:00pm	05/30/23 6:00am
Independence Day	06/30/23 3:00pm	07/05/23 6:00am
Labor Day	09/01/23 3:00pm	09/05/23 6:00am

3. Traffic switch operations on freeways may take place within the allowable times listed below in the traffic restriction tables and/or as otherwise approved by the Engineer. Additional lane, ramp, and/or roadway closures and shifts may be implemented during maintaining traffic stage and traffic switch operations with prior Engineer approval.

4. Traffic switch operations are exempt from lane rental assessments or liquidated damage assessments.

A. A traffic switch is defined as a change in the existing (original or staged) traffic configuration which requires multiple (more than one) lane lines and/or edge lines to be relocated in a new location and the old lines to be removed either between construction stages, or maintenance of traffic stages.

5. Maintain a minimum of one lane of traffic in each direction at all times on Woodward Avenue. (And all intersecting roads and ramps, except where detoured.)

6. Maintain a minimum of one lane of traffic in each direction at all times on all signalized side roads.

7. No more than 1 closure is allowed in each direction of travel at the same time.

8. Close any dedicated lanes (exit, ramp, turn, etc.) prior to the location under construction.

e. Traffic General.

1. For any lane open to traffic, provide a minimum lane width of 11 feet with 2 feet of shy distance on both sides unless identified otherwise on plans.

2. Do not close lanes or utilize traffic regulation sequences where work can be accomplished with a shoulder closure. Do not occupy any part of the active traffic lane with personnel or equipment when utilizing a shoulder closure. Place lane closures and traffic regulation operations only in areas as show on the plans unless otherwise directed by the Engineer.

3. Prior to shifting traffic onto shoulders or opening any lanes/shoulders and/or ramps, remove, by sweeping all accumulated debris that has collected within the shoulder and/or within the closed lane/shoulder.

4. A speed reduction will not be used.

5. Develop and submit to the Engineer an Internal Traffic Control Plan (ITCP) per subsection 104.11.B of the Standard Specifications for Construction. The requirements listed herein are the requirements for a Type A ITCP. Submit the Type A ITCP at the preconstruction meeting. The Engineer will have 7 calendar days to review the ITCP for approval or provide comments for revisions required to obtain approval. Include in the ITCP, at a minimum, the proposed ingress/egress locations for construction equipment and vehicles, traffic control devices that will be utilized to warn the motoring public of ingress/egress locations, and measures that will be taken to ensure compliance with the ITCP. Ensure that the ITCP minimizes conflicts between construction vehicles and motorists and maintains overall safety and mobility within the work zone. No work may begin prior to approval of the ITCP. Additional time required to obtain an approved ITCP will not be cause for delay or impact claims. All costs associated with obtaining an approved ITCP, providing and executing all parts of the approved ITCP including required traffic control devices, or resolving an incomplete or unacceptable ITCP will be borne by the Contractor.

6. Protect the work area at the end of each day. Close all open access points on the project to traffic with Type III barricades or other devices approved by the Engineer.

7. The Engineer will be responsible for notifying emergency services, transit agencies, law enforcement and schools prior to any lane closures, detours or major traffic shifts. In addition, the Contractor will be responsible for working with and complying with any coordination that is necessary with the Department and emergency services, transit agencies, law enforcement and schools. All costs associated with these coordination efforts will be considered included in the pay item “Minor Traf Devices”.

8. Obtain all necessary permits from local governments within areas of local jurisdiction, including noise/dust ordinance waivers when required, prior to placing construction signing on local roads.

A. The Department will reimburse permit costs in accordance with subsection 107.02.A of the Standard Specification for Construction. Adhere to all requirements made by local maintaining agencies regarding placement of traffic control devices prior to closing lanes on roadways not under MDOT jurisdiction.

9. Remove all temporary traffic control devices from MDOT right-of-way during any shut down periods unless needed for directly maintaining or channelizing traffic. No additional payment will be made for removal and/or redeployment of these devices except for in the case of an approved extension of time.

10. Cover or remove construction signing that refers to work zone speed when work at a location is planned to be inactive for a period greater than 2 days, unless otherwise specified on the plans or as directed by the Engineer.

11. Once work is initiated that includes any lane restrictions, that work must be continued daily until completed. A lack of work activity for more than 3 days will require the removal of lane closures at no expense to the Department.

f. Detours.

1. Do not detour traffic until all proposed contract work on the detour route is completed, inspected, and approved by the Engineer.

2. Signs should be on both sides of the roadway when the work is taking place on the freeway or a boulevard section.

g. Pedestrian or Non-Motorized Facilities.

1. Maintain all facilities in accordance with *The Americans with Disability Act* (ADA) requirements and the Public Rights-of Way Accessibility Guidelines (PROWAG). Provide facilities equivalent to or better than the route a person would have encountered prior to construction activities.

2. Submit an “ADA Work Plan” for sidewalk and ADA ramp construction prior to any sidewalk ramp closures or removals. The work plan must address pedestrian access and detours. Plan will allow a ramp closure up to (96) hours. The Engineer will have 7 calendar

days to review the plan for approval or provide comments for revisions required to obtain approval. Do not proceed with the work until the Engineer has approved the plan.

3. Close and detour any sidewalk ramps and crosswalk areas to pedestrian traffic that are impacted by the work.

4. Keep sidewalk areas clear of any equipment or materials at all times the sidewalks are open to pedestrian traffic.

h. Earthwork and Excavation.

1. Restore undercuts or excavations in the work areas within 3 feet of the active traffic lanes to no steeper than a 1 on 4 slope from the edge of the roadway at the end of each work day. If this condition is not met, provide a nighttime closure.

2. Delineate excavated areas located within 3 feet of traffic with channelizing devices at 20 feet spacing along the excavated area, and 100 feet before the area, or as shown on the maintaining traffic plans.

3. Use protective fencing to protect open excavations within the work zone during non-working hours.

i. Bridge Work.

1. Follow the load restriction staging on the bridge per plans and/or special provision.

2. Provide 28 days minimum for curing concrete prior to application of concrete surface coating, concrete healer sealer, or thin epoxy overlays.

3. Utilize Temporary Concrete Barrier to protect all Temporary Supports adjacent to active traffic.

j. Traffic Control Devices. Ensure all traffic control devices are in accordance with the *MMUTCD* and must meet the “acceptable” criteria as defined in the *ATSSA* publication entitled “*Quality Guidelines for Temporary Traffic Control Devices and Features*” at the time of initial deployment and after each major stage change.

1. During non-working periods, place applicable advance signs and channelizing devices at specific locations, as directed by the Engineer, at no additional cost to the Department.

2. Notify the Engineer 24 hours in advance of when traffic control devices are being delivered to the project site, to allow for initial inspection of devices to take place.

3. Remove from the project site all traffic control devices (including detour signing) no longer needed for a particular operation and equipment for construction within 14 calendar days of reopening the shoulder/lane/roadway.

4. Channelizing Devices.

A. Ensure all devices have sufficient ballast to prevent moving or tipping. If moving or tipping occurs, place additional ballast, as directed by the Engineer, at no additional cost to the Department. No more than two ballasts are allowed on each channelizing device.

B. Do not use caution tape on this project.

5. Temporary Signs.

A. Additional W20-1 (ROAD WORK AHEAD) signs are included in the quantities to be placed on all intersecting or adjacent roads where construction activities may be encountered.

C. Fabricate, install, and remove temporary sign overlays on existing signs with the pay item for Sign, Type B, Temp, Prismatic, Furn. Attach the overlay in accordance with subsection 812.03.D.2 of the Standard Specifications for Construction.

k. Measurement and Payment. Payment will be in accordance with the standard specifications unless otherwise specified. No additional payment will be made for the following activities:

1. Transporting traffic control items from site to site.

2. Providing sufficient vehicles and staff to make changes as-needed on site during work.

3. Providing sufficient vehicles and staff to remove closures from the roadway.

4. Providing additional traffic control devices required to expedite the construction for the convenience of the Contractor.

CITY OF ROCHESTER

SPECIAL PROVISION
FOR
GEOSYNTHETIC REINFORCED SOIL ABUTMENT

a. Description. The work consists of designing, furnishing and installing a Geosynthetic Reinforced Soil Abutment in accordance with the contract, the FHWA Geosynthetic Reinforced Soil- Integrated Bridge System Interim Implementation Guide, dated June, 2012 (Publication No. FHWA-HRT-11-026), the standard specifications, and as directed by the Engineer.

The following definitions apply when used herein and on the plans:

Geotextile Reinforcement. Biaxial or tri-axial geotextile reinforcement having strength and stiffness that are approximately equal in both the machine and the cross machine directions.

Geosynthetic Reinforced Soil (GRS). Alternating layers of compacted granular fill reinforced with Geotextile Reinforcement. Facing elements are connected to the reinforcement layers to form an outer GRS Wall. Facing elements must consist of segmental block units (SBUs).

GRS Abutment. A GRS retaining wall system designed to support the weight of a bridge superstructure.

GRS Abutment Face Wall. The vertical or near vertical wall parallel to the center of superstructure bearing seat and designed to support the bridge superstructure.

GRS Wing Wall. A wall attached and adjacent to the GRS abutment face wall. The GRS wing walls are built at the same time as the GRS abutment face wall and at a right or other angle to the GRS abutment face wall.

Reinforced Soil Foundation (RSF). A reinforced soil mass located below the GRS. This mass consists of alternating layers of compacted well-graded aggregate and Geotextile Reinforcement.

Retained Soil. Backfill located behind the GRS wall mass.

Segmental Block Units (SBU). Segment concrete block units used to construct the non-structural facing of the GRS abutment and wing walls.

Clear Space. The vertical distance between the top of the GRS abutment face wall and bottom of the superstructure above the wall. This distance is 3 inches or 2 percent of the GRS wall height, whichever is greater.

Beam Seat Setback. The lateral distance from the back of the GRS SBU to the front of the superstructure bearing seat area. This distance is a minimum of 8 inches or as shown on the plans.

b. Materials. The engineer shall approve the basis of acceptance for all materials not addressed by the MDOT standard specification for construction and specified herein. Provide all test data certifications by an independent testing laboratory to the Engineer prior to material use.

1. Segmental Block Units (SBU). Use SBUs from an approved segmental block wall manufacturer listed below:

Tensar Mesa Retaining Wall System
5883 Glenridge Drive, Suite 200
Atlanta, Georgia 30328
Ph. 404-250-1290

Keystone Retaining Wall System
4444 West 78th Street
Minneapolis, Minnesota 55435
Ph. 952-897-1040

Allan Block Corporation
7424 West 78th Street
Bloomington, MN 55439
Ph. 952-835-5309

Redi-Rock
05481 US 31 South
Charlevoix, MI 49720
(866) 222-8400

SBUs from these manufacturers or an equal product from another manufacturer approved by the Engineer must meet the following requirements:

A. Lot size may not exceed 10,000 units. Provide test data certifications from a qualified independent testing laboratory for compressive strength, freeze-thaw durability and absorption testing for each lot.

B. Minimum 28 day compressive strength of 5500 psi for individual SBUs and an average of 5800 psi for three SBUs per *ASTM C 140*.

C. The SBUs must have a maximum water absorption of 6 percent when tested according to *ASTM C 140*, with a 24 hour cold water soak.

D. SBUs must meet the freeze-thaw durability requirements of *ASTM C 1262* when tested using a 3 percent NaCl solution for a minimum of 90 cycles. Material loss must not exceed 1 percent for any single sample.

E. SBUs must meet the project aesthetic requirements specified for this site as indicated on the plans.

F. Utilize SBUs with dimensions of 8 inches high by 12 inches deep (minimum) by 18 inches in length (minimum). Supply cap units for the setback block that have minimum dimensions of 4 inches high by 8 inches deep by 16 inches in length.

2. Geotextile Reinforcement. The geotextile reinforcement used within the GRS must be a woven, high-density polyethylene, polypropylene or high-tenacity polyester, structural geotextile. Provide maximum vertical spacing of GRS reinforcement of 12”.

3. Reinforced Soil Foundation (RSF). The geotextile reinforcement used within the RSF must be a woven, high-density polyethylene, polypropylene or high-tenacity polyester, structural geotextile. Provide a minimum of four layers of structural geotextile separated by 8" of aggregate for the abutment. Provide MDOT 21AA aggregate or an approved equal within the wrapped geotextile reinforcement layers for the RSF volume.

The geotextile reinforcement shall be resistant to UV oxidation and degradation caused by chemical and temperature exposures normally encountered in the highway environment. The weatherometer test data certification can be for the product line material type in general and does not have to be tested directly from the batch of geotextile produced for this site.

The ASTM type, class, group, grade, and category of the primary resin used in manufacturing must be identified within the test data certification as applicable.

Provide a test data certification showing that the batch of geotextile reinforcement proposed for this site meets the physical property requirements of Table 1.

A. Table 1: Woven Geotextile Reinforcement Properties

Property	Test Method	Minimum Value
Ultimate Tensile Strength MD(a) CMD(a)	*ASTM D 4595* Strain Rate of 10% per minute	 4,800 lb/ft 4,800 lb/ft
Tensile Strength @ 2% Strain MD(a) CMD(a)	*ASTM D 4595*	 950 lb/ft 950 lb/ft
Apparent Opening Size	*ASTM D 4751*	0.425 mm
Inherent Viscosity (PET (b) only)	*ASTM D 4603*	Minimum Number Average Molecular Weight of 25000
Carboxyl End Group (PET (b) only)	*ASTM D 7409*	Maximum of Carboxyl End Group Content of 30
UV Resistance	*ASTM D 4355*	>70% breaking strength after 500 hr
a. "MD" and "CMD" represent 'machine' and 'cross-machine' directions, referring to the principle directions of the manufacturing process. b. PET - Polyester		

In addition, Certification-Verification samples will be obtained by the Engineer from on-site materials. One sample must be obtained for the first 1,200 square yards with subsequent samples every 5,000 square yards. Samples must be a minimum of 5 feet long by the full roll width, with a 6 square yard minimum.

4. GRS Granular Fill. Use MDOT 21AA aggregate as granular fill material or an approved equal within the GRS wall mass as noted on the plans. When compacted to the specified density requirements, the specified material must have a minimum angle of internal friction of 38 degrees per *AASHTO T 236* (large scale direct shear test) or *AASHTO T 296* (large scale triaxial compression test, unconsolidated undrained). Provide a test data certification from an independent testing laboratory for the angle of internal friction for the proposed aggregate source. The testing for angle of internal friction must include at least 5 tests on different samples of the proposed source material.

5. Retained Soil. If additional bridge approach embankment fill is required behind the GRS wall mass, provide Backfill, Structure, CIP extending to at least 10 feet behind the back edges of the GRS wall reinforcement materials. Backfill, Structure, CIP will be paid for separately. Coordinate with Engineer for embankment fill requirements.

6. Reinforced Soil Foundation (RSF). Provide MDOT 21AA aggregate or an approved equal within the wrapped geotextile reinforcement layers for the RSF volume.

7. Reinforced Superstructure Backfill. Provide MDOT 21AA aggregate or an approved equal within the wrapped geotextile layers for the bridge abutment backfill material situated above the GRS wall mass and below the surface aggregate section for the bridge approach.

8. Concrete. Use Portland cement concrete meeting the requirements for Grade S1 concrete according to section 701 of the Standard Specifications for Construction, except as modified herein. Use coarse aggregate originating only from geologically natural sources meeting physical requirements of MDOT Class 26A.

9. Flashings. Provide grade 304 stainless steel flashing. Provide long-life all-weather butyl sealants/adhesives for flashing overlaps.

c. Submittals. Provide an electronic pdf copy of all submittals to the Engineer at least 45 days prior to the start of RSF or GRS abutment construction. The Engineer will approve or reject the submittals within 14 calendar days after receipt of a complete submission. Additional time required due to incomplete or unacceptable submittals will not be justification for time extension or impact or delay claims. All costs associated with incomplete or unacceptable submittals will be borne by the Contractor.

1. Submit test data certifications for the proposed aggregates.

2. Submit test data certifications for geotextile reinforcement.

3. Submit test data certifications for the proposed SBUs.

4. Submit detailed GRS design & installation plan stamped and signed by a professional licensed in the state of Michigan. Within the plan, indicate construction sequence for the GRS elements including width and directional placement of geotextile reinforcement layers throughout the various RSF and GRS zones.

5. Submit a sketch illustrating crane locations, including outrigger pads, in relation to the edge of GRS walls during positioning of the truss bridge. The edge of the crane's outrigger pad mat must remain a minimum distance of 4 feet from the back of the SBUs. Crane outrigger pad sizes must result in less than a 4,000 psf bearing pressure being applied to reinforced soil areas near the GRS walls. Calculations must accompany the crane sketches indicating the resulting outrigger and load bearing system (crane, mats, beams, etc.) pressure on the underlying soil.

d. Construction. Construction procedures must adhere to the design plans, this special provision and Chapter 7 of the FHWA Geosynthetic Reinforced Soil-Integrated Bridge System Interim Implementation Guide, dated June, 2012 (Publication No. FHWA-HRT-11-026).

1. Subgrade Preparation. Excavate to the necessary elevations and dimensions shown on the plans. Provide run-off water controls to prevent excessive flow into the excavation. Provide groundwater control for the excavation. Prior to wall construction, inspect the RSF subgrade and compact, if necessary, according to subsection 205.03.I.1 of the Standard Specifications for Construction, or prepare as required in the contract. Undercut unsuitable material as directed by the Engineer. Undercutting of unsuitable material will be paid for separately as Excavation, Fdn. Unless otherwise directed by the Engineer, replace undercut soils with Backfill, Structure, CIP compacted to 95 percent of the material maximum unit weight according to section 205 of the Standard Specifications for Construction. Structure Backfill, CIP will be paid for separately.

If the base of the excavation is left open, grade the base to one end to facilitate the removal of any water intrusion with a pump. If the excavation is flooded, all water must be removed along with any unsuitable soils, as directed by the Engineer. Final subgrade must be smooth, uniform and free from irregular surface shape or protruding objects that would obstruct placement of geotextile wrapped reinforced aggregate fills for the RSF.

2. Reinforced Soil Foundation (RSF). Construct the RSF according to the plans. Place backfill in lifts measuring not more than 8 inches in thickness. Compact backfill within this zone to 98 percent of its maximum unit weight in accordance with *AASHTO T 99*. Decrease the maximum lift thickness if necessary to obtain the specified density.

The entire RSF must be completely encapsulated with Geotextile Reinforcement. The wrapped corners of the RSF must be tight and without exposed soil. Minimum shingle overlaps of 2 feet are required regardless of structure location. For GRS abutments adjacent to waterways, overlap the RSF geotextile reinforcement a minimum of 3 feet. For proper shingle flow of water over the overlaps, start with the outer layer of the overlap situated on the upstream side of the RSF. Orient overlapped sections of geotextile reinforcement to prevent water from penetrating the layers of reinforcement.

Pull the Geotextile Reinforcement taut to remove all wrinkles prior to placing and compacting the backfill. Place fill starting at the river side front face and proceeding towards the back to push out folds or wrinkles towards the free end of the reinforcement layer. The end of the overlap must be located at least 3 feet from the RSF edge.

3. Geosynthetic Reinforced Soil (GRS) Abutment. Place courses of SBUs, and GRS systematically per the contract and the approved installation procedures.

A. SBU Placement. Place each course of SBU level, even, and within plan tolerance. Adjacent blocks must be placed tightly against each other to prevent backfill from escaping between gaps. Offset subsequent courses of block by half a block width so that vertical joints are not continuous.

Check the vertical alignment of the GRS Abutment Face Wall at least every other block layer. Correct any deviations greater than 0.25 inches. In addition, check every other row of block alignment with a string line referenced off the back of the facing block from wall corner to corner. Correct deficiencies as required.

At right-angle wall corners, stagger face wall and wing wall block courses to form a tight, interlocking, stable corner. For walls with angles larger than 90 degrees, a vertical seam or joint is formed. At these locations, install rebar and concrete as indicated on the design plans.

B. GRS Wall Granular Fill. Follow the placement of each course of block closely with granular fill. Carefully place granular fill so as to avoid any damage or disturbance of the wall materials or any misalignment of the block units or soil reinforcement. Remove and replace any wall SBUs and Geotextile Reinforcement that become damaged or misaligned during granular fill placement at no cost to the Owner. Any depressions present behind the SBUs must be filled level to the top of the SBU prior to placing the Geotextile Reinforcement.

Compact the GRS Wall Granular Fill to a minimum 95 percent of its maximum unit weight per *AASHTO T 99* or to the minimum density required to achieve the minimum angle of internal friction of 38 degrees for the GRS if higher than 95 percent. For aggregate placed within the RSF, Beam Seat Zone, and Integrated Wrapped Approach Zone, compact the soil to 98 percent of its maximum unit weight per *AASHTO T 99*. Do not use sheep's foot or grid-type rollers for compaction within the reinforced soil mass.

Since the SBUs are not rigidly connected to the geotextile reinforcement, perform compaction within 3 feet of the back face of the SBU utilizing lightweight, hand operated compaction equipment (e.g., a lightweight mechanical tamper, plate, or roller). Adjust granular fill lift heights in order to achieve the compaction requirements. Check the position of the SBUs after compaction. Any elements that have been displaced should be removed and reset into their proper location and position.

Ensure uniform moisture content throughout each layer of the granular fill prior to and during compaction. Place the granular fill at a moisture content that is within two percentage points of the optimum moisture content percentage, or at a moisture content and density that is uniform and acceptable to the Engineer, throughout the entire lift.

At the end of each day's operation, slope the last layer of the granular fill away from the wall face and cover with a suitable water-resistant tarp, to rapidly direct runoff away from the wall face. Do not allow surface runoff from adjacent areas to enter the wall construction site.

C. Geotextile Reinforcement. Place geotextile reinforcement in continuous full-length strips from the wall face to the design strip lengths without use of overlap or factory seam splices in the critical load bearing dimensions. Place the strong direction (typically the machine direction) of the geosynthetic perpendicular to the GRS abutment and wing/return wall faces, unless otherwise directed by the Engineer. Extend the geotextile reinforcement so that it is situated between layers of SBU to provide a frictional connection. The geotextile reinforcement must extend to within 1 inch of the wall face. Remove all excess geotextile reinforcement extending beyond the wall face by cutting with a razor knife or other means approved by the Engineer.

Uniformly tension geotextile reinforcements to remove any slack in the connections or materials, so that geotextile reinforcements are taut, free of wrinkles, and flat. Where overlaps exist on top of the SBU, trim as necessary to prevent varying geotextile reinforcement thickness or excessive gaps between adjacent blocks.

Place granular fill starting at the wall face and moving backwards to remove and prevent the formation of wrinkles in the geotextile reinforcement. Correct any misalignment or distortion of the wall face in excess of the tolerances specified herein at no additional cost to the Owner

Driving equipment directly on the geotextile reinforcement is prohibited. Place a minimum 6 inch layer of granular fill prior to operating any vehicles or equipment over the geotextile reinforcement. Tracked vehicles are not allowed above the geotextile reinforcement.

D. Superstructure Backfill and Approach Integration. Construct reinforced superstructure backfill approach zone per the plans. Wrap the superstructure approach fill with geotextile reinforcement on three sides. Multiple sheets are allowed along the width of the approach, as long as all seams are kept perpendicular to the wall face. Wrap geotextile reinforcement on the roadway sides to prevent lateral spreading of the backfills. The superstructure backfill geotextile reinforcement must be placed so that the strong direction is parallel to the roadway.

E. The Engineer of Record is responsible for performing field density tests.

For each layer of granular fill placed behind a GRS abutment, the Engineer must perform at least three field density tests. Do not penetrate the geotextile reinforcement with field density equipment. If the granular fill is such that it cannot be tested accurately with a nuclear gauge, then a procedural specification will be developed by the Engineer at the time of construction. The procedural specification will develop a certain number of passes required based on the Contractor's compaction equipment and visual movement of the aggregate. The developed specification will address a procedure near the wall surface (within 3 feet) for smaller hand operated equipment and larger ride-on rollers further away from the wall, as necessary.

e. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay items:

Pay Items	**Pay Unit**
GRS Abutment	Square Foot
Reinforced Soil Foundation	Cubic Yard

GRS Abutment will be paid for by the square foot of total wall face area, based on material placed. Payment includes all compensation for GRS design and submittals, furnishing the SBUs including all equipment, labor, testing, and miscellaneous hardware necessary for placing the blocks; providing, placing, testing, providing submittals, and equipment, labor and miscellaneous hardware necessary for placing geotextile reinforcement; furnishing all of the aggregates, conducting angle of friction testing, providing submittals, and equipment, labor and miscellaneous hardware necessary for placing geosynthetic reinforced soil granular fill material; furnishing all materials including but not limited to concrete, stainless steel flashing, sealant, joint filler needed to complete the beam seat detailed on the plans; Payment for Segmental Block Units also includes any wasted or rejected blocks, providing submittals, and incorporation of aesthetic details (block style and color) required in the contract.

Reinforced Soil Foundation will be paid for by the cubic yard for material placed. Payment for Reinforced Soil Foundation includes Reinforced Soil Foundation design, furnishing all of the aggregate and geotextile reinforcement used in the RSF, testing, providing submittals, and all equipment, labor, and miscellaneous hardware necessary for placing and compacting the material. Payment for **Reinforced Soil Foundation** also includes equipment and labor necessary to place the RSF for the GRS Abutments.

Underdrains will be paid for separately according to the standard specifications.

CITY OF ROCHESTER

SPECIAL PROVISION
FOR
PREFABRICATED STEEL TRUSS PEDESTRIAN BRIDGE

a. Description. This work consists of designing, fabricating, delivering, and erection of the prefabricated steel truss bridge to be used for a shared path.

This special provision is for a fully engineered clear span bridge of steel construction and is regarded as minimum standards for design and construction. The work must be done in accordance with the Michigan Department of Transportation (MDOT) 2020 Standard Specifications for Construction.

1. Qualified Suppliers Experience Clause. Proposed suppliers must have at least 5 years' experience in the design and fabrication of prefabricated steel truss bridges and a minimum of 5 successful bridge projects, of similar construction, each of which has been in service at least 3 years. List the location, bridge size, Owner, and a contact for reference for each project.

Fabricators must be currently certified by the American Institute of Steel Construction (AISC) to have the personnel, organization, experience, capability, and commitment to produce fabricated structural steel for the AISC Major Steel Bridges certification and Fracture Critical Endorsement. Quality control must be in accordance with procedures outlined for AISC certification.

Pre-Approved Fabricators:

1. Contech Engineered Solutions
2. Big R Bridge
3. Anderson Bridges

2. Design Requirements. Structural design and design review of the bridge structure shall be performed by a Professional Engineer licensed in the State of Michigan and performed in accordance with recognized engineering practices and principles, current *AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges (AASHTO LRFD)* and using *LRFD Bridge Design Specifications* following MDOT *Road and Bridge Design Manual Standards*. The design shall be signed and sealed by the Designer and Checker and both shall be a Professional Engineer in the State of Michigan.

Checker. A Professional Engineer licensed in the State of Michigan who is employed by the same company as the Designer and is responsible for verifying and checking the design and working drawings developed by or under supervision of the Designer.

Designer. The individual who is a Professional Engineer licensed in the State of Michigan, is employed by the same company as the Checker and is responsible for the design and working drawings required herein.

All welding must be in accordance with section 707 of the Standard Specifications for Construction and *AASHTO/AWS D1.5 Bridge Welding Code*. Gas metal arc welding is not permitted on fracture critical members.

3. Design Criteria.

A. Uniform Live Load. All structural members of the superstructure will be designed for a uniform pedestrian live load of 90 psf in accordance with *AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges*. The pedestrian live load will be applied to those areas of the walkway so as to produce maximum stress in the member being designed.

B. Vehicle Load. AASHTO H-20 Loading in accordance with *AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges.* Additional loading is requirements of the owner due to use of the bridge.

C. Equestrian Load. All structural members of the superstructure will be designed for an equestrian live load of 1.0 kip in accordance with *AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges*. The equestrian live load will be applied to those areas of the walkway so as to produce maximum stress in the member being designed. The path load shall be applied over a square area measuring 4.0 inches on a side.

D. Wind Loads. The superstructure will be designed for a wind load of 35 psf on the full vertical surface area of the front elevation. In addition, a vertical uplift line load caused by a pressure of 0.020 ksf over the full deck width will be applied at the windward quarter point of the deck.

Wind loads are to be considered fatigue live loading. The fatigue loading used for the fatigue and fracture limit state (Fatigue I) will be as specified in section 11 of the current *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*. The natural wind gust of that specification need only be considered.

E. Dead loads will include self-weight with ipe hardwood decking.

F. Top Chord Loads. The top chord, truss verticals, and floor beams will be designed for the lateral wind loads above. In no case will the load be less than 50 plf or 200 lbs point load, whichever produces greater stresses, applied in any direction at any point along the top chord.

G. Stability. The vertical truss members and the floor beams and their connections in half through-truss spans will be proportioned to resist a lateral force of not less than 0.30 klf applied at the top panel points of each truss, considered as a permanent load for the Strength I Load Combination and factored accordingly. The top chord will be considered as a column with elastic lateral supports at the panel points.

H. Combinations of Loads. The truss will be designed for the load combinations and load factors specified in *AASHTO LRFD* Table 3.4.1-1. The load combinations to be examined are: Strength Limit States I & III, Service Limit States I & II, and Fatigue Limit State I. The load factor for Fatigue I load combination must be taken as 1.0.

I. Deflection. Deflections are to be investigated at the service limit state using load combination Service I in Table 3.4.1-1 of *AASHTO LRFD*. The deflection of the superstructure due to unfactored pedestrian live loading will not exceed 1/360 of the span length. Horizontal deflections under unfactored wind loading will not exceed 1/360 of the span length.

J. Minimum Thickness of Metal. The minimum thickness of all structural steel members will be 1/4 inch nominal and be in accordance with the AISC *Manual of Steel Constructions "Standard Mill Practice Guidelines"*.

K. Dimensional Requirements. The minimum clear distance between rails shall be fourteen feet (14'-0"). The maximum open gap in the decking shall be 1/2" and shall meet all ADA and AASHTO pedestrian bridge design requirements. Railing shall meet or exceed the dimensional requirements of the *AASHTO Guide for the Development of Bicycle Facilities.*

L. Truss Style. The new truss shall be designed and fabricated using rolled steel W-Sections, Channels, Angles, and Plates to satisfy AISC requirements in a similar geometry as what is illustrated on the plans. The connections shall be bolted connections using plate steel as gussets. The top chord shall be constructed of a rolled steel section to provide a similar geometry as illustrated in the plans. Steel tubes shall not be used for fabrication.

M. Decking. The decking material shall be IPE lumber. The decking shall been the loading requirement of the *AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges*. Maximum clear span of IPE decking shall be 2.0 feet and ends of boards shall be supported (no cantilever decking spans).

b. Materials.

1. Hardware. Hardware will meet the requirements of the MDOT 2012 Standard Specifications for Construction sections 906 and 908 and as stated herein. Provide all hardware and accessories required to properly and completely execute the carpentry for this project, including, but not limited to: screws, hangers, bolts, nuts, washers, anchors, and similar items, whether specifically mentioned herein or not. All hardware shall be galvanized steel.

2. High Strength Bolts and Anchor Bolts. High strength bolts must be ASTM F3125 Grade A325 or equal. The bolts for the truss connections shall be round, button head high strength bolts with a bolt diameter of 7/8 inch or larger. Decking and railing timber boards shall be fastened to the structure using round socket button head bolts of 1/2" diameter. All bolts shall be galvanized steel.

3. Steel. Steel will meet the requirements of the Standard Specifications for Construction sections 707, 906 and 908. All steel must be galvanized high strength, low alloy, atmospheric corrosion resistant ASTM A588 and/or ASTM A242 rolled sections and plate or galvanized high strength, low alloy ASTM A992 and/or ASTM A572 rolled sections and plate or approved equivalent. There is an environmental commitment to use recycled content in the bridge fabrication. The bridge material certifications shall include the percentage of the steel used in fabrication that is recycled content. A minimum of 10% of the steel used in fabrication shall be recycled content.

4. Deck, Longitudinal Rails and Rub Rail. Use materials in accordance with subsection 709 of the Standard Specifications for Construction. All decking, longitudinal rails and rub rails on the bridge shall be nominal 2 x 8 IPE Hardwood decking. IPE (Tabebuia species, lapacho group) shall meet or exceed the mechanical properties and other criteria listed below:

- Mechanical Properties:
  - Janka Hardness = 3,595 lb at 12% M.C.
  - Bending Strength = 22,475 psi
  - Modulus of Elasticity = 3,145,000 psi
  - Max. Crush Strength = 13,140 psi
- Friction Resistance:
  - 0.79 force in lbs for leather sole shoe.
- Fire Rating:
  - Naturally fire resistant without preservatives to meet NFPA Class A of UBC Class I
- Grade Requirements:
  - Lumber shall partially air dried to a moisture content of 18%-25%
  - Lumber shall be graded on both faces and both edges.
  - Lumber shall be straight grained and parallel cut without heart center.
  - Lumber shall be all heartwood, no sapwood allowed.
  - Lumber shall be in sound condition, free from worm holes or knots.
  - Lumber shall be S4S (surfaced four sides)
  - Lumber shall be E4E (eased 4 sides) to 1/8” diameter radius.
  - Dimensions shall be supplies plus or minus 0.04” in both width and thickness with moisture content measure at 30%.
  - Coat ends with aqueous wax log end sealer.
  - Boards shall be stacked and stickers placed to provide proper drying and reduce staining.
  - Acceptable imperfection: Natural drying checks, discoloration caused by weather, slight bow or twist that can be corrected during installation.
  - Not acceptable imperfection: Longitudinal heart cracks, Internal cracks, Firm or soft sapwood, Fungi Affects (blue to grey, brown to red, white to yellow, or incipient decay), deformation (twisting or bow) which cannot be removed using normal installation methods and tools.

5. Fabrication. The work must be done in accordance with sections 707 and 709 of the Standard Specifications for Construction, except as specifically noted, and the details shown on the plans. Furnish and install all carpentry work plumb, level and true to line and grade in a good quality workmanlike manner.

c. Construction.

1. Structural Calculations. Structural calculations for the bridge superstructure must be submitted by the bridge manufacturer and reviewed and approved by the Engineer. All calculations must be signed and sealed by a Professional Engineer licensed in the State of Michigan.

The calculations must include all design information necessary to determine the structural adequacy of the bridge to conform to AASHTO specifications using LRFD methodology. The calculations must include the following:

A. All limit state checks for axial, bending, and shear forces in the critical member of each.

B. Checks for the critical connection failure modes for each truss member type (i.e. vertical, diagonal, floor beam, etc.). Special attention must be given to all welded tube on tube connections.

C. All bolted splice connections.

D. Main truss deflection checks.

E. U-Frame stiffness checks (used to determine K factors for out-of-plane buckling of the top chord) for all half through or "pony" truss bridges.

F. Deck design.

G. Load Rating: Provide load rating for the truss and decking utilizing AASHTOWare BrR, BARS, or other approved software. The load rating engineer and checker shall be a professional engineer licensed in the State of Michigan. The submittal shall include the MDOT load rating assumptions form, MDOT load rating summary form signed by both the load rating engineer and the load rating checker, hand calculations for loading, and the exported working input file for the AASHTOWare BrR, BARS, or other approved software for the bridge file.

2. Shop plans. Submit calculations, shop plans of the prefabricated bridge, foundations layout, and installation sequence for Engineer review and approval prior to the start of fabrication of the pedestrian bridge. Engineer will have 14 days to perform each review and multiple review cycles may be necessary. Engineer approval of all shop plans is a prerequisite to bridge fabrication, installation and acceptance. The contactor installing the trusses shall verify the dimensions for the shop drawings prior to fabrication.

3. Assembly. Truss sections shall be shipped to the site in a maximum of two sections with decking fully installed. The assembly of truss sections and final installation of decking will be performed by others

4. Decking. 2 x 8 Ipe hardwood decking capable of resisting all live and dead loads is required.

5. Shop Welder and Certified Weld Inspector Qualifications. Welder qualification testing is required in accordance with subsection 707.03.C.9 of the Standard Specifications for Construction. Notify the Engineer, in writing, requesting welder qualification testing a minimum of 3 weeks prior to the start of fabrication. The Engineer will contact the Operations Field Services Division, Structural Fabrication Engineer at (517) 322-5709, to schedule the testing.

The bridge manufacturer must directly employee a CWI (Certified Welding Inspector) for quality assurance during fabrication. This person would work with the owner's independent onsite representative for compliance.

6. Bearing Devices. Bridge bearings must consist of a steel setting or slide plate placed on the abutment or grout pad. The bridge bearing plate which is welded to the bridge structure must bear on this setting plate.

One end of the bridge will be fixed by fully tightening the nuts on the anchor bolts at that end. The opposite end will have finger tight only nuts to allow movement under thermal expansion or contraction.

The bridge bearings shall be fabricated to fit the existing abutment seat, proposed abutment seat and proposed pier bent caps. The step height (from bottom of bearing to top-of-deck) must be determined by the bridge manufacturer and clearly shown on the shop drawings.

The bridges must have teflon on teflon or stainless steel on teflon slide bearings placed between the bridge bearing plate and the setting plate in lieu of grease. The top slide plate must be large enough to cover the lower teflon slide surface at both temperature extremes.

7. Anchor Rods. Unless specified otherwise, the bridge manufacturer must determine the number, size, and minimum grade of all anchor rods. The anchor rods will be designed by the prefabricated bridge manufacturer and shall be designed to resist all horizontal and vertical forces to be transferred by the superstructure to the supporting foundations and must be hot dipped galvanized.

The Contractor must provide all materials for (including anchor bolts) and construction of the bridge supporting foundations. The Contractor must install the anchor bolts in accordance with the manufacturer's anchor bolt spacing dimensions. Information as to bridge support reactions and anchor bolt locations will be furnished by the bridge manufacturer after receipt of order and after the bridge design is complete.

d. Measurement and Payment. The completed work, as described, will be measured as a lump sum and paid for at the contract price using the following pay items:

Pay Item	**Pay Unit**
70' X 14' Prefabricated Bridge, Furn	Lump Sum
70' X 14' Prefabricated Bridge, Installed	Lump Sum

70' X 14' Prefabricated Bridge, Furn includes all equipment and labor to design, fabricate, and obtain the prefabricated bridge from the supplier and deliver it to the project location complete and ready for erection. The contractor will be responsible for unloading the truss. Unloading is not paid separately and is considered included with this item.

70' X 14' Prefabricated Bridge, Installed includes all equipment, temporary structures and labor necessary for erecting, placing, repairing, and securing the prefabricated bridge onto its abutments. Abutments will be paid for separately.

CITY OF ROCHESTER

SPECIAL PROVISION
FOR
TIMBER APPROACH AND STAIRS RAIL

a. Description. This work consists of producing shop drawings, fabricating, furnishing, delivery to the site and installation of all timber members and required hardware for the Timber Approach Rail. Ensure all work is performed in accordance with section 709 of the Michigan Department of Transportation (MDOT) Standard Specifications for Construction, including any supplemental specifications, except as modified herein.

b. Materials. Provide materials in accordance with subsection 709.02 of the Standard Specifications for Construction, and as detailed on the plans and listed below:

1. Lumber. All lumber must be dressed S4S (surfaced four sides) in accordance with *ASTM D 245*. All lumber sizes are nominal.

Pressure treat all timber material with Ammoniacal Copper Quat (ACQ) or Copper Azole (CA) to the preservative retention listed in *AWPA U1 Commodity Specification F*, *Table 3.3B*, use category 4A for ground contact. Treat all glu-lam members prior to gluing.

Comply with 'Best Management Practices for the Use of Preservative-Treated Wood in Aquatic Environments in Michigan', except as modified herein. Preservative treatments and treated timber materials must comply with the following *AWPA* standards:

Commodities	
Sawn Products	U1 Commodity Specification A
Processing and Treatment Standard	
Sawn Products	T1 Section A
Preservatives	
ACQ or CA	U1 Table 1 P Standard Reference

Incorporate techniques into the treating process to minimize the amount of residual treatment on the surface of treated timber members, and to avoid excessively high retentions. To assure that treated timber members are not treated to excessively high retentions, do not exceed 150 percent of the *AWPA* specified minimums.

Subject preservative treated members to specific fixation processes. Specific fixation processes include air seasoning, kiln drying, steaming, or hot water baths. Dry preservative treated materials to a moisture content of 19 percent or less before shipping.

Inspect the preservative treatment process per *AWPA M2*. Provide all required inspections and tests at the treatment plant.

In addition to the certifications required by the MDOT 2012 Standard Specifications for Construction, submit the following certifications in accordance with section 3.01 of the *Materials Quality Assurance Procedures Manual* (*MQAPM*) and reports demonstrating compliance with preservative treatment specifications:

A. Test Data Certification that treatment and post treatment processes meet the requirements of this special provision.

B. The final inspection report per *AWPA M2, Part A, Section 6*, including a statement by the inspector that any materials or work not conforming with these specification requirements has been rejected.

C. Test Data Certification that the material moisture contents have been tested and found to comply with specification requirements.

Furnish all treatment certifications for approval of the Engineer prior to shipping. Approval of the certifications does not constitute final acceptance. All exposed edges shall be free from splinters and sharp edges.

2. Hardware. Provide all hardware and accessories required to properly and completely execute the carpentry for this project, including, but not limited to: screws, bolts, nuts, washers, straps, and similar items, whether specifically mentioned herein or not.

A. Fasteners. Regular carriage bolt and socket button head screw hot dipped galvanized *ASTM A307* steel bolts, nuts shall conform to *ASTM A563 Grade A* and shall be hot dip galvanized. Washers shall conform to *ASTM F436 Type 1* and shall be hot dip galvanized. Split ring lock washers shall conform to *ANSI B18.21.1 1999* and shall be hot dip galvanized. Nails and Wood Screws shall be hot dip galvanized.

B. Screws. Hot dipped galvanized, *ASTM A 653*, batch or post-dipped process, with a minimum coating thickness of 1.85 ounces of Zinc per square foot of surface area (G185), of type and size indicated on the contract plans.

C. Submittals. Product data conforming to the materials listed above.

c. Construction. Construct Timber Approach Rail in accordance with subsection 709.03 of the Standard Specifications for Construction, the details on the plans, and as directed herein.

Meet the recommendations of the AITC for the diameter and depth of holes in timber members, for drift pins, drive spikes, bolts, and lag bolts.

Prior to treatment, perform all drilling, cutting, and fabricating of timber members, unless otherwise noted on the plans or approved by the Engineer. Field treat any members drilled, cut or fabricated after treatment per subsection 709.03.C.5 of the Standard Specifications for Construction.

Electronically submit shop drawings for approval, prior to fabrication of all timber materials.

d. Measurement and Payment. The completed work, as described, will be measured as a lump sum and paid for at the contract unit price using the following pay item:

Pay Item	**Pay Unit**
Timber Approach Rail	Foot

Timber Approach Rail shall be paid for at the contract unit price for each foot measured to the end of the railing face and includes all equipment, labor, and materials required to complete foundations, posts, and rails, as well as all excavation, backfill, miscellaneous steel, hardware, concrete, and accessories. No compensation will be considered for delays due to the submittal and approval process, or arising from rejection of components.

CITY OF ROCHESTER

SPECIAL PROVISION
FOR
NATURAL STONE RIPRAP

a. Description.

This work consists of the construction of a riprap revetment out of natural stone per Section 813 of the *Michigan Department of Transportation (MDOT) 2020 Standard Specifications for Construction* and as shown on the plans.

b. Materials.

All materials shall be natural river cobblestone an 18 inch mean diameter with an overall thickness of 24 inches and toe and side key depth and width of 48 inches. A sample of the material and the supply location of the material to be used shall be submitted and approved by the Engineer.

Broken concrete or any other non-natural stone will not be acceptable.

Geotextile shall not be used on this project. See the Special Provision for Natural Toe Protection doe the filter Cobble, Gravel, Sand Mix to be utilized.

c. Construction.

The channel bottom on which the Natural Stone Riprap is to be placed shall be trimmed to a uniform slope as shown on the plans or as directed by the Engineer. Natural Stone Riprap shall be constructed in accordance with the requirements for Plain Riprap, under Subsection 813.03, except that the thickness of Natural Stone Riprap shall be as specified above, measured perpendicular to the slope and the liner shall be per the Special Provision for Natural Toe Protection. Individual stone shall be laid with their dimension perpendicular to the plane surface to be riprapped.

d. Measurement and Payment.

Pay Item	**Pay Unit**
Riprap, Natural Stone	Square Yard

The completed work area will be measured in place and paid for at the contract unit price. This work includes all labor, materials, equipment to furnish and place **Riprap, Natural Stone** to the limits shown on the plans.

The following items will not be measured and paid for separately and will include the furnishing of all labor, materials, and equipment as necessary to complete this work, and are included in the bid item **Riprap, Natural Stone**:

1. Provide the Engineer with a sample of the natural stone to be used along with the supply location.

2. Furnishing and placement of the natural stone riprap to the limits as shown on the Plans.

CITY OF ROCHESTER

SPECIAL PROVISION
FOR
NATURAL TOE PROTECTION

a. Description.

This work shall consist of furnishing natural stone protection at the base (toe) of the streambank or shoreline installed in accordance with Section 813 of the 2020 Michigan Department of Transportation Standard Specifications for Construction, except as herein provided. Coordinate these items with earth excavation, and with the Special Provision for Natural Toe Protection, Native Plantings, and as specified on the plans and in related sections of the specifications.

b. Materials.

1. Natural Stone

   Natural stone consists of washed field stones with sizes classes as specified on the Plans. The stone shall have a minimum bulk specific gravity of 2.5 and shall not be subject to breaking down when exposed to water or weathering. No broken concrete or limestone riprap will be allowed.

Material	Typical Size Classes
Cobble	4 to 10 inch

2. Gravel and Sand Filter Material

   A gravel filter shall be installed under and behind stone toe protection in a 6-12 inch thick layer or as indicated on the Plans. Gravel shall have a minimum Mohs hardness of 6. The mean diameter of the largest material used for the gravel filter shall not exceed 1.5 inches. The gravel and sand filter mix shall consist of the following:

Material	Size	% by Dry Weight
Coarse sand or concrete sand	19 – 79 mils	10 - 25%
Pea gravel	1/8 - 3/8 inch	35 - 50%
River run gravel (6A)	1/2 - 1 1/2 inch	10 - 35%

c. Construction

1. The Contractor shall construct a 10 linear ft sample area for each area indicated on the Plans. The sample area shall be approved by the Engineer prior to beginning work in the designated improvement area as indicated on the Project Plans.
2. Prior to stone toe construction, excavate a trench along the base of the streambank/shoreline as indicated on the Project Plans.
3. The gravel and sand filter layer specified shall be at least 6” thick and shall maintain connectivity between the upper limits of the toe stabilization and the base of the material or a collection drain.
4. Follow the general bank line provided, but provide a somewhat irregular surface relative to flow to reduce near-bank velocities. The stone toe facing should be poorly graded and well-compacted to withstand erosion forces. The stone shall not be placed on an angle greater than 1.5:1 (H:V). The upper elevation of the toe protection will correspond to 80% of the bankfull depth, the lower limits of vegetation, or as specified on the Plans.

5. The Plans calls for Live Stakes to be installed in the stone toe protection that need to be coordinated. See the Special Provision for Native Plantings for direction on Live Stakes.

d. Measurement and Payment.

The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	**Pay Unit**
Cobble, Gravel, Sand Mix	Ton

Sand, Gravel, Cobble Mix will be measured per ton of sand, gravel, cobble mix installed and will include all labor, equipment and materials required to complete the work as described.

CITY OF ROCHESTER

SPECIAL PROVISION
FOR
SLOPE RESTORATION, MODIFIED

a. Description. The work of Slope Restoration, Modified shall consist of preparation of areas to be seeded, application of weed control, placing topsoil, seeding, fertilizing, furnishing and placing paperfiber mulch on areas of flat ground and furnishing and placing high velocity mulch blankets along embankments, and watering as shown on the typical cross section in accordance with Section 816 of the Michigan Department of Transportation (MDOT) 2020 Standard Specifications for Construction, Standard Plan R-100-Series, and as directed by the Engineer.

b. Materials. All materials shall meet the requirements specified in Section 816 and 917 of the MDOT 2020 Standard Specifications for Construction, except as modified by this Special Provision below:

1. Seed. The following seed mixtures shall be utilized for this project:
    a. Areas within 2 feet of the trail edge shall be seeded with MDOT turf seed mixture THV.
    b. For areas outside 2 feet of the trail edge, see the Special Provision for **SEEDING, PAINT CREEK MIXTURE** for seed mixture and special requirements.

2. Erosion Control Blanket/Turf Mulch Blanket (both two-sided and single sided). The Erosion Control Blanket/Turf Mulch Blanket shall have biodegradable jute netting without "UV degrader additive". A product on the MDOT Qualified Product List that meets this criteria shall be utilized on this project.

3. Mulch Binders. Mulch approved for use are Paperfiber Mulch Binders as listed on the MDOT Qualified Product List.

4. Weed Control. The contractor shall utilize aquatic-approved formulations of glyphosate such as to following products:
    a. Dow AgroSciences – Rodeo Herbicide,
    b. Nufarm US - AquaNeat, and
    c. Aquacide - ShoreKlear.
    d. or an approved equivalent

c. Construction Methods. The Contractor shall restore all areas as described in Subsections 816.03 of the MDOT 2012 Standard Specifications for Construction. Materials shall be placed at rates described therein, or as directed by the Engineer.

In addition to using net anchors, mulch blankets adjacent to the path and road shall be trenched into the ground at top of slopes, as approved by the Engineer.

Topsoil thickness shall be a minimum of 3 inches. In the event that sufficient suitable topsoil as approved by the Engineer is not available from excavated material, the Contractor shall furnish additional material as part of the Slope Restoration, Modified bid item. All other items will meet or exceed the rate called for in Section 816 of the MDOT 2012 Standard

Specifications for Construction.

Weed control shall be performed in accordance with Section 816.03.J of the MDOT 2012 Standard Specifications for Construction.

Hydroseeding shall not be performed when sowing **SEEDING, PAINT CREEK MIXTURE.**

Planting grass shall not occur after September 30th.

The contractor shall be responsible for removing all silt fence upon completion of the project. Silt fences are well-known to impeded movement of amphibians and reptiles.

d. Measurement and Payment. Slope Restoration, Modified will be measured and paid for per Square Yard. Grading, Topsoil Surface, 3", Seeding (mix specified herein), Fertilizer, furnishing and placing paperfiber mulch on areas of flat ground and furnishing and placing high velocity mulch blankets along embankments, and watering shall be used and will be considered as included in the pay item Slope Restoration, Modified. No separate payment will be made for these various items of work.

The completed work for Slope Restoration, Modified will be measured per Square Yard and paid for at the contract unit price for the following contract item (pay item), which shall be payment in full for all labor, equipment, and materials required:

Pay Item	**Pay Unit**
Slope Restoration, Modified	Square Yard

Applications for payment for the work, Slope Restoration, Modified, will be made by the Engineer as follows: Upon completion of the contract item, payment shall be made for 50% of the contract item quantity. After the seed germinates and the Engineer is satisfied that the amount and area of the grass germination should reasonably provide a well-established turf, the remaining balance of 50% of the contract item quantity will be paid.

CITY OF ROCHESTER

SPECIAL PROVISION
FOR
SEEDING, PAINT CREEK MIXTURE

a. Description. This work consists of furnishing and installing a wetland seed mixture at the locations shown on the plans and in accordance with Section 816 (Turf Establishment) of the 2020 MDOT Standard Specifications for Construction, except as modified herein or otherwise directed by the Engineer. The seeding mix will be utilized to restore roadside embankment slopes adjacent to wetland areas with mature Michigan meadow vegetation (grasses & wildflowers). Seeding shall be performed by a personnel that has experienced with native seed installation.

b. Materials. The mixture proportion of the seed mixture shall be accomplished by using certified seed from local origin. Supply seed in durable bags, with a tag marked by the manufacturer and supplier of the blended mix showing the species and variety name, lot number, net weight of contents, purity, and germination.

Seed shall be from a MNPPA member nursery or native plant nursery that meets seed provenance requirements. Seed provenance (original location of wild seed harvest) shall be within 150 miles north or south of Rochester, MI and 250 miles east or west. Seed shall be Pure Live Seed (PLS), and certified weed free.

Table 1 – Seed, Paint Creek Mixture Proportions (Percent by weight)

Common Name	Latin Name	Minimum Purity (%)	Germination (%)	Percent of Mix	PLS Ounce/Acre
Big Bluestem Grass	Andropogon gerardii	90	85	9.21%	24
Fox Sedge	Carex vulpinoidea	90	85	6.14%	16
Canada Wildrye	Elymus canadensis	90	85	12.28%	32
Riverbank Wildrye	Elymus riparius	90	85	15.36%	40
Virginia Wildrye	Elymus virginicus	90	85	18.43%	48
Little Bluestem	Schizachyrium scoparius	90	85	18.43%	48
Indiangrass	Sorghastrum nutans	90	85	7.68%	20
Smooth Aster	Aster laevis	90	85	1.15%	3
Wild Bergamot	Monarda fistulosa	90	85	0.96%	2.5
Common Evening Primrose	Oenothera biennis	90	85	0.38%	1
Black-eyed Susan	Rudbeckia hirta	90	85	6.14%	16
Showy Goldenrod	Solidago speciosa	90	85	0.77%	2
Butterfly Milkweed	Asclepias tuberosa	90	85	3.07%	8
		Totals:	Grasses:	87.52%	228
			Forbs:	12.48%	32.5
			Total:	100%	260.5

c. Construction. The seed should be kept cold and dry until used. Seeding can occur within seasonal limitations, as long as the ground is unfrozen. Seed should ideally be sown in the fall to allow a cold-moist stratification period and allow the free-thaw action of the soil to promote seed-soil contact. Planting shall be performed only by experienced workmen familiar with planting procedures under the supervision of a qualified supervisor.

Seeding shall be performed by a professional that has experience with native seed installation. The professional that has experienced with native seed installation shall submit a resume for review and approval prior to performing the seeding operation. The resume shall include three other successful projects completed by the professional with references.

The Contractor shall remove from the site all existing weeds and non-native vegetation. During placing seed and initial germination, soil surface shall be loose to promote seed soil contact. Removal shall be performed only by experienced workmen familiar with the removal of non-native vegetation procedures under the supervision of a qualified supervisor.

The seed can be drill-seeded, or broadcast and raked. Contractor shall sow all seed at a depth of 1/8 inch to ensure good contact with soil. Hydroseed is not an appropriate method for installing native seed.

All upper bank areas and areas between bank stabilization treatments that have been disturbed during construction activities shall be final graded and shall have raked in seed with a layer of approved mulch. They shall drain properly and shall not drain over the bank indiscriminately. All disturbed residential areas shall be restored with grade A sod.

Washouts that occur within the onsite construction time period shall be repaired within 48 hours after occurrence, subject to approval by the Landscape Architect. All soil or live system losses shall be repaired. In linear systems, open spaces greater than two feet shall be repaired as directed in the field.

d. Measurement and Payment. No payment included with this Special Provision. The completed work, as described, will be considered included with **Slope Restoration, Modified** for payment.