Non-Motorized Pathway and HMA Overlay Bray Road

From Ormes Road to Van Cleve Road

Letting Date – February 3rd, 2022; 8:45 am.

Contractor: _____

Address: _____

_____

Sign & Print:_____

Date: _____

Phone & Fax_____

Email: _____

- Non Motorized Vehicle Pathway Construction and HMA Overlay Bray Road from Ormes Rd to Van Cleve Rd, Tuscola Township
  LSUM Price $_____

Project Completion Date: September 1, 2022

Signed Insurance and Agreement shall be enclosed.

Bid Submittal

Bids are to be submitted on the Road Commission forms in a plainly marked and sealed envelope. No electronic or faxed bids will be accepted. Plans and specifications are available online at www.tuscolaroad.org. Please contact Brent Dankert, Tuscola County Highway Engineer at 989-233-7472 or highwayengineer@tuscolaroad.org with any questions. Any addenda must be noted and initialed.

If you are interested in bidding and have downloaded plans from the website please email highwayengineer@tuscolaroad.org to be added to the plan holders list to receive any addendums.

The Contractor has examined the proposal, permits, plans, and the location of the work described here in and is fully informed as to the nature of the work and the conditions relating to its performance.

General:

Construction activity of clearing of the right of way, earth excavation, embankment, drainage improvements, pathway construction, HMA Paving, concrete curb and gutter, guardrail, signing, pavement markings and all other necessary work items shall remain in the road right of way. The quantities on the plan sheets are estimated quantities and differing quantities will need to be discussed with the engineer before work begins.

The Contractor hereby proposes to furnish all necessary labor, equipment and materials to complete the work called out and shown on the plan sheets, for the lump sum price listed, herein described in strict accordance with the requirements of the Michigan Department of Transportation 2012 Standard Specifications for Construction, and/or such other special provisions and supplemental specifications as may be listed or attached to this proposal.

Construction:

Work Schedule:

The Contractor may not begin work on the project until the EGLE Permit is obtained by the Tuscola County Road Commission. It is anticipated the permit will be received by May 15th, 2022. Completion is scheduled for September 1st, 2022, unless arranged with Engineer. Liquidated damages may be assessed at a rate of $100.00 per day, starting September 1st, 2022. Contractor MUST coordinate during construction with the Tuscola County Road Commission Bank Stabilization Project.

Utility Coordination:

The Contractor is responsible for coordinating all utility relocations as needed. Attached is a list of the contact information for the utilities on site. **Note: Miss Dig must be contacted 72 hours prior to start of work.**

Staking and Material Testing:

The Tuscola County Road Commission will provide construction staking, and material testing on the project. The contractor shall provide 48 hours advance notice prior to scheduling of the work.

Crushed Concrete Near Water

The use of crushed concrete is prohibited on this project within 500 feet of any water course (stream, river, county drain, etc.) and lake, regardless of the application or location of the water course relative to the project limits.

Items of Work bolded and italicized have an attached special provision

MDOT 2012 SSFC = Michigan Department of Transportation 2012 Standard Specification for Construction

Clearing Right of Way:

All trees, stumps, brush, and rock shall be removed is limited to the 66-foot right of way unless otherwise indicated on the plans. It is anticipated the clearing item to include but is not limited to the 1 Ea Tree Rem 19 inch to 36 inch and 1 Ea Tree Rem 6 inch to 18 inch as detailed in the plans. Property owners have first choice of claiming wood. Any materials not claimed shall be disposed of at approved locations. The Road Commission shall be given a copy of agreement signed by the property owner accepting the material. Burning will not be allowed within the road- right-of-way.

Culv, Rem, XX inch:

Material and work shall meet requirements of Section 203 of the MDOT 2012 SSFC for Construction. The unit price includes all cost to completely remove the culvert, dispose of offsite; provide, place and compact necessary backfill of material for a complete removal.

XXXX, Rem:

Includes Curb and Gutter, Guardrail, Masonry and Conc Structure, Pavement, and Sidewalk Material removal. Materials and work shall meet requirements of Section 204 of the MDOT 2012 SSFC. The unit price includes all cost to completely remove the indicated item, dispose of offsite; provide, place and compact necessary backfill material for a complete removal.

Non Haz Contaminated Material Handling and Disposal, LM:

Shall be completed per Section 205 of the MDOT 2012 SSFC. Includes all cost associated to removal, excavation, disposal, storage, trucking and testing of material deemed Non Haz Contaminated by the Engineer. If such materials are encountered all work shall stop immediately and the Engineer shall be notified. Work shall resume once a plan of action has been agreed to between the contractor and the Tuscola County Road Commission. The Plan of Action shall include defined limits, proposed solution, and proposed cost.

Subgrade Undercutting, Type II:

Material and work shall meet the requirements of Section 205 of the MDOT 2012 SSFC and as modified here. Subgrade Undercutting includes the excavation, disposal of the unsuitable material, backfill, and compaction of suitable material as indicated by the Engineer. If such materials are encountered all work shall stop immediately and the Engineer shall be notified. Work shall resume once a plan of action has been agreed to between the contractor and the Tuscola County Road Commission. The Plan of Action shall include defined limits, proposed solution, and proposed cost.

Subbase, CIP:

Material shall meet requirements of Section 902 of the MDOT 2012 SSFC. Subbase, CIP shall be installed in accordance with Section 301 the MDOT 2012 SSFC Subbase shall be placed under the Aggregate Base Material to establish the proposed cross section in widening areas. Paid for using plan quantity. Material tickets shall be provided by the contractor with invoice.

Aggregate Base, XX inch:

Material shall meet requirements of Section 902 of the MDOT 2012 SSFC and as modified here. All work shall be completed in accordance with Section 307 of the MDOT 2021 SSFC. Pay item includes all transportation, hauling, delivery, grading, compaction, materials, labor, and equipment for a complete installation. Material tickets shall be provided by the contractor with invoice.

Trenching, Modified:

Material and work shall meet requirements of Section 307 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, excavation, hauling, embankment, delivery, installation, grading, compaction, materials, labor and equipment for a complete installation.

Shoulder, Cl II, XX inch:

Material shall meet requirements of Section 902 of the MDOT 2012 SSFC and as modified here. All work shall be completed in accordance with Section 307 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, excavation, hauling, embankment, delivery, grading, compaction, materials, labor and equipment for a complete installation.

Approach Cl XX, XX inch, Modified:

Material shall meet requirements of Section 902 of the MDOT 2012 SSFC and as modified here. Approach Cl II is modified and shall be 100% crushed limestone. All work shall be completed in accordance with Section 307 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, hauling, delivery, installation, grading, compaction, materials, labor, and equipment for a complete installation.

Geotextile, Separator:

Material and work shall meet requirements of Section 308 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, hauling, delivery, materials, labor and equipment for a complete installation. If such materials are necessary, all work shall stop immediately and the Engineer shall be notified. Work shall resume once a plan of action has been agreed to between the contractor and the Tuscola County Road Commission. The Plan of Action shall include defined limits, proposed solution, and proposed cost.

Culv, Cl X XX inch:
Material and work shall meet requirements of Section 401 of the MDOT 2012 SSFC and as modified here. All corrugated metal pipe cross culverts underneath the roadway shall be poly coated. Pay item includes all compaction, materials, labor and equipment for a complete installation.

Culv End Sect, XX inch:

Material shall meet requirements of Section 909 of the MDOT 2012 SSFC and as modified here. All work shall be completed in accordance with Section 401 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, hauling, delivery, materials, labor, and equipmemt for a complete installation.

Culv, Slp End Sect, 1 on 4, XX inch, Longit:

Material shall meet requirements of Section 909 of the MDOT 2012 SSFC and as modified here. All work shall be completed in accordance with Section 401 of MDOT 2012 SSFC and as modified here. Pay item includes all transportation, hauling, delivery, materials, labor and equipment for a complete installation.

Sewer, Cl IV, XX inch, Tr Det B:

Material shall meet requirements of Section 909 of the MDOT 2012 SSFC and as modified here. All work shall be completed in accordance with Section 402 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, hauling, delivery, and installation per the manufacturer's guidelines.

Sewer Tap, 24 inch:

All work shall be completed in accordance with Section 402 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, hauling, delivery, materials, labor and equipment for a complete installation.

Sump Pump Lead and Drain Tile Connection:

Material and work shall meet requirements of the MDOT 2012 SSFC and as modified here. Pay item includes all materials, labor, and equipment necessary to reconnect the sump pump leads and drain tiles for a complete installation.

Dr Structure Cover, Adj, Case XX:

Material and work shall be completed in accordance with Section 403 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, hauling, delivery, materials, labor and equipment for a complete installation.

Dr Structure Cover, Type XX:

Material and work shall be completed in accordance with Section 403 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, hauling, delivery, materials, labor and equipment for a complete installation.

Dr Structure, Adj, Add Depth:

Material and work shall be completed in accordance with Section 403 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, hauling, delivery, materials, labor and equipment for a complete installation.

Dr Structure, Tap XX Inch:

Material and work shall be completed in accordance with Section 403 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, hauling, delivery, materials, labor, and equipment for a complete installation.

Dr Structure, XX inch dia Modified:

Material and work shall be completed in accordance with Section 403 of the MDOT 2012 SSFC and as modified here. Pay item includes all transportation, hauling, delivery, materials, equipment, and labor for a complete installation.

Underdrain, XXXX, XX inch:

Includes Underdrain, Subbase, XX inch, Underdrain, Subgrade, XX inch, Underdrain Outlet, XX inch, Underdrain Outlet Ending, XX inch. Material and work shall be completed in accordance with Section 404 of the MDOT 2012 SSFC and as modified here. Pay item includes all materials, equipment, and labor for a complete installation.

HMA Surface, Rem:

All work shall be completed in accordance with the plan sheets and Section 501 of the MDOT 2012 SSFC and as modified here.

HMA:

Includes all Hand Patching, HMA Approach and HMA, LVSP. The HMA shall be placed in accordance with the plan sheets, and Section 501 of the MDOT 2012 SSFC and as modified here. Pay item includes pavement cleaning, tack coat, bag joint removal, sweeping, transportation, hauling, delivering, compaction, materials, equipment and labor for a complete installation.

Butt Joints

Includes all working associated to constructing a butt joint as indicated by the engineer. Cost to include milling, cleaning, temporary ramp, traffic control, mobilization and all other costs associated to milling a clean, vertical joint to begin and end HMA overlay construction.

Curb and Gutter

Includes Curb and Gutter, Bridge Approach, Curb and Gutter, Conc, Det XX, Spillway, Conc, Spillway, Conc, Curb Ramp Opening, Conc. Material shall meet requirements of Section 901, Section 902, Section 903, and Section 905 of the MDOT 2012 SSSFC. All work shall be completed in accordance with Section 802 and Section 803 of the MDOT 2012 SSFC and as modified here. Pay item includes all materials, equipment, and labor for a complete installation.

Concrete Sidewalk

Includes Sidewalk Ramp, Conc,XX inch and Sidewalk, Conc, XX inch. Material shall meet requirements of Section 901, Section 902, Section 903, and Section 905 of the MDOT 2012 SSFC. All work shall be completed in accordance with the plan sheets, and Section 803 of the MDOT SSFC . Pay item includes all materials, equipment, and labor for a complete installation.

Guardrail

Includes Post, Mailbox, Guardrail, Type XX, Guardrail, Curved, Type XX, Guardrail Anch, Bridge, Det XX and Guardrail Approach Terminal, Type XX. All materials shall meet the requirements Section 908, and Section 912 of the MDOT SSFC. All work shall be completed in accordance with the plans sheets, and Section 807 of the MDOT 2012 SSFC and as modified here. Pay item includes all materials, equipment, and labor for a complete installation.

Permanent and Existing Signs:

All permanent sign installation, salvage, removal shall be coordinate with and completed by the Tuscola County Road Commission.

Pavement Markings

All permanent pavement marking items shall be completed by the Tuscola County Road Commission.

Rip Rap, Plain:

Material shall meet requirements of Section 916 of MDOT 2012 SSFC. All work shall be completed in accordance with Section 813 of the MDOT 2012 SSFC. Quantity of plain riprap is estimated as noted on the plans. Pay item includes all materials, equipment, and labor for a complete installation.

Soil Erosion and Sedimentation Control:

The contractor is responsible for all temporary and permanent control measures such as silt fence, check dams, sediment traps, riprap, temporary slope restoration and dust control to prevent loss of soils from the road right-of-way or into the county drains. These items will not be paid for separately but shall be included in the work item Soil Erosion and Sedimentation Control.

Slope Restoration:

All materials shall meet the requirements and all work performed in accordance with the attached special provision “Slope Restoration, Non-Freeway” and as modified here. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING/REPAIRING THE SITE UNTIL PERMANENT VEGETATION IS ESTABLISHED. A Retainer of up to 10% of the project cost will be held until the project has permanent vegetation.

Traffic Control:

Traffic will be maintained according to the Tuscola County Road Commission Special Provision for Maintaining Traffic (enclosed) with the 2011 Michigan Manual on Uniform Traffic Control Devices or as directed by the Engineer. The project will be open to local traffic during the

duration of the project. All work shall be completed in accordance with Section 812 and all materials shall meet the requirements of Section 922 of the MDOT 2012 SSFC and as modified here. All work shall be performed underneath a single lane closure. Pay item includes all work, materials and equipment necessary to maintain the traffic which includes but is not limited to Barricade, Type III, High Intensity, Double Sided, Lighted, Furn/Oper, Pedestrian Type II Barrrice, Temp, Lighted Arrow, Type C, Furn/Oper, Plastic Drum, Fluorescent, Furn/Oper, Minor Traf Devices, Plastic Drum, Fluorescent, Furn/Oper, Sign Cover, Sign, Type XX, temp, Prismatic, Furn/Oper, and Traf Regulator Control.

Documents Attached:

- Bid Tab
- Agreement
- Utility Coordination
- Special Provision – Acceptance of Hot Mix Asphalt Mixture on Local Agency Projects
- Special Provision – Trenching Modified
- Special Provision – Sump Pump Lead and Drain Tile Connection
- Special Provision – Drainage Structure Cover, Type DG
- Special Provision – Drainage Structure Modified
- Special Provision – Pavement Marking Waterborne Bike Symbol & Arrow
- Special Provision – Temporary Pedestrian Type II Barricade
- Special Provision – Slope Restoration, Non-Freeway
- Special Provision – Quality Control and Acceptance of Portland Cement Concrete for LAP Projects
- Tuscola County Road Commission Maintaining Traffic
- Title IV and VI Compliance
- Tuscola County Road Commission Bank Stabilization Project Plans
- Plan Sheets

Payment and Paperwork:

Liability:

The Contractor shall at all times exercise extreme care and shall assume all liability for any damages resulting from their operation and shall hold the Tuscola County Road Commission harmless from any such claims or damages.

The successful bidder must also furnish certificates for policies giving satisfactory evidence of insurance coverage to the minimum extent of $500,000.00 property damage and $1,000,000.00 personal liability to insure adequate payment for any damage caused by his operations.

The Contractor shall, prior to the start of work, file with the Tuscola County Road

Commission a certificate that he carries worker's compensation insurance.

The contractor shall, prior to the start of work, file with the Tuscola County Road Commission a General Right of Way Permit.

Payment:

These projects are quoted on a "NOT TO EXCEED" total basis for all work necessary to complete each project. Payment shall be made by the Tuscola County Road Commission upon receipt of site specific invoice. Invoice shall be accompanied by all necessary material tickets. The lump sum amount bid shall be payment in full for all labor, materials, and equipment needed to accomplish the work.

NON-COMPLIANCE WITH PROJECT SPECIFICATION PROVISIONS:

Any variation from the specifications of the project herein without written approval from the Tuscola County Road Commission and/or its authorized representative may result in, at the discretion of the Road Commission, the voiding and/or canceling of the acceptance of any bid and/or contract, resulting from this project.

The Board reserves the right to accept or reject any or all proposals and to re-advertise or to accept the proposal that, in their opinion, is in the best interest of Tuscola County.

TCRC Bray Road Non Motorized Vehicle Path and HMA Overlay
Ormes Road to Van Cleve Road
Tuscola County, MI

Item No	Quantity	Unit	Description	Unit Price	Amount
1	1	LSUM	Mobilization (Max. $15,000)		
2	1	LSUM	Clearing		
3	1	LSUM	Traffic Control		
4	1	LSUM	Soil Erosion and Sedimentation Control		
5	4	Ea	Culvert, Rem		
6	133	Ft	Curb and Gutter, Rem		
7	170	Ft	Guardrail, Rem		
8	1	Cyd	Masonry and Conc Structure, Rem		
9	74	Syd	Pavt, Rem		
10	14	Syd	Sidewalk, Rem		
11	1.6	Sta	Ditch Cleanout		
12	484	Cyd	Subbase, CIP		
13	55	Syd	Aggregate Base, 4 inch		
14	1165	Syd	Aggregate Base, 6 inch		
15	50	Ton	Maintenance Gravel		
16	89	Syd	Approach, Cl I, 8 inch		
17	131	Syd	Approach, Cl II, 6 inch		
18	137	Syd	Shoulder, Cl II, 4 inch		
19	15	Sta	Trenching, Modified		
20	3	Ea	Culv End Sect, 12 inch		
21	1	Ea	Culv End Sect, Conc, 36 inch		
22	72	Ft	Culv, Cl F, 12 inch		
23	1	Ea	Culv, Slp End Sect, 1 on 6, 30 inch, Longit		
24	24	Ft	Sewer, Cl IV, 12 inch, Tr Det B		
25	605	Ft	Sewer, Cl IV, 30 inch, Tr Det B		
26	76	Ft	Sewer, Cl IV, 36 inch, Tr Det B		
27	100	Ft	Sump Pump Lead and Drain Tile Connection		

TCRC Bray Road Non Motorized Vehicle Path and HMA Overlay
Ormes Road to Van Cleve Road
Tuscola County, MI

Item No	Quantity	Unit	Description	Unit Price	Amount
28	1	Ea	Dr Structure Cover, Adj, Case 1		
29	1	Ea	Dr Structure Cover, Adj, Case 2		
30	1	Ea	Dr Structure Cover, Type K		
31	1	Ea	Dr Structure, Adj, Add Depth		
32	1	Ea	Dr Structure, Tap, 6 inch		
33	3	Ea	Dr Structure Cover, Type DG		
34	1	Ea	Dr Structure, 36 inch dia, Modified		
35	2	Ea	Dr Structure, 60 inch dia, Modified		
36	1	Ea	Dr Structure, 72 inch dia, Modified		
37	1372	Ea	Underdrain, Subbase, 6 inch		
38	100	Ft	Underdrain, Subgrade, 6 inch		
39	24	Ft	Underdrain Outlet, 6 inch		
40	3	Ea	Underdrain, Outlet Ending, 6 inch		
41	292	Syd	HMA Surface, Rem		
42	18	Ton	Hand Patching		
43	32	Ton	HMA Approach		
44	230	Ton	HMA, LVSP		
45	67.5	Ft	Curb and Gutter, Bridge Approach		
46	87	Ft	Curb and Gutter, Conc, Det F4		
47	1	Ea	Shoulder Gutter, Conc, Det 3		
48	39	Ft	Spillway, Conc		
49	14	Ft	Detectable Warning Surface		
50	15	Ft	Curb Ramp Opening, Conc		
51	186	Sft	Sidewalk Ramp, Conc, 6 inch		
52	313	Ft	Guardrail, Type MGS-8		
53	63	Ft	Guardrail, Curved, Type MGS-8		
54	2	Ea	Guardrail Approach Terminal, Type 2M		

TCRC Bray Road Non Motorized Vehicle Path and HMA Overlay
Ormes Road to Van Cleve Road
Tuscola County, MI

Item No	Quantity	Unit	Description	Unit Price	Amount
55	2	Ea	Guardrail Departing Terminal, Type MGS		
56	24	Ea	Guardrail Reflector		
57	1	Ea	Post, Mailbox		
58	3	Ea	Guardrail Anch, Bridge, Det M1		
59	63	Syd	Riprap, Plain		
60	2300	Syd	Slope Restoration, Modified		
				Total	

Roadway Quantities

Item No	Quantity	Unit	Description	Unit Price	Amount
1	4	Ea	Butt Joint		
2	400	Ton	HMA, LVSP		
3	100	Ton	23A Shoulder Gravel		
				Total	
			TOTAL PROJECT COST		

AGREEMENT

TUSCOLA COUNTY ROAD COMMISSION – 1733 S. MERTZ ROAD, CARO, MI 48723

This agreement made this _____day of_____, 20_____
by and between the Board of Tuscola County Road Commissioners and _____
_____.

1. _____hereby agrees to undertake the following work in the status of an independent contractor performing the following job:
   _____
   _____
   _____.

2. Said contractor, _____, shall at all times exercise extreme care and shall assume any and all liability for property damage or bodily injury resulting from the above operation by this employees, agents, assigns, sub-contractors and anyone else acting under his control or direction; and will indemnify, hold harmless and defend the Tuscola County Road Commission, its Commissioners or employees from any and all claims for property damage or bodily injury arising out of this Agreement.

3. Said contractor, _____, while engaged in said job shall maintain and furnish certificates of insurance, naming the Tuscola County Road Commission and Commissioners as an additional insured under the policy, with policy limits of $500,000/$1,000,000 for property damage and bodily injury, and shall furnish the Tuscola County Road Commission copies of said certificates of insurance prior to commencing any work on said project.
   Additionally, said contractor, _____, shall furnish prior to start of said job with the Board of Tuscola County Road Commissioners, a policy of insurance certifying he carries and has in effect worker's compensation insurance on all those required to be covered under Michigan law.

4. The address of the Board of Tuscola County Road Commissioners is I 733 S, Mertz Rd., Caro, MI 48723.

Witnessed:

_____ _____
Board of Tuscola County Road Commissioners

_____ _____
Contractor

Contractor bid will not be accepted unless the enclosed Agreement is Signed and Returned with you bid.

TUSCOLA COUNTY ROAD COMMISSION

NOTICE TO BIDDERS FOR
UTILITY COORDINATION

The contractor shall cooperate and coordinate activities with the owners of utilities as stated in Section 104 of the 2012 MDOT Standard Specifications for Construction. In addition, for the protection of underground utilities, the contractor shall follow the requirements in Section 107.12 of the 2012 MDOT Standard Specifications for Construction. **Utility coordination will not be paid for separately and will be included in other items of work.**

PUBLIC UTILITIES

Refer to the project Plans for the contact information for public utilities that are located within the Construction Influence Area (CIA).

For the protection of underground utilities and in conformance with Public Act 174 of 2013, the Contractor shall contract the Miss Dig system, Inc. by phone at 811 or (800) 482-7171 or via the web at either elocate.missdig.org for single address or rte.missdig.org, a minimum of 3 business days prior to excavation, excluding weekends and holidays.

The Plans identify the utilities that are required to be relocated or abandoned by others. Contact information for all utilities reflected on these plans is below:

CHARTER COMMUNICATIONS
Attn: Mark Kelly
1480 S Valley Center Drive
Bay City, MI 48706
Phone: 989-233-9404
Email: mark.kelly@charter.com

CONSUMERS ENERGY
Attn: Joe Rodea
2400 Weiss Street
Saginaw, MI 48602
Phone: 989-791-5869
Email: joseph.rodea1@cmsengery.com

DTE
Attn: Sara Kipp
4100 Doerr Road
Cass City, MI 48726
Phone: 989-872-6108
Email: sara.force@dteenergy.com

WOLVERVINE TELEPHONE
Attn: William Bouman
P.O. Box 292 4712 E. Main Street
Millington, MI 48746
Phone: 989-971-5101
Email:
William.bouman@tdstellecom.com

Owners of public utilities will not be required to move poles or structures not already identified in the Plans to be relocated, in order to facilitate the operation of construction equipment, unless it is determined by the Project Engineer that such poles or structures constitute a hazard to the public or are extraordinarily dangerous to the Contractor's operations. **If the Contractor determines that additional relocations will be required in order to facilitate the operation of construction equipment for completion of this project, the Contractor shall notify the Engineer and the Public Utility in writing, no later than 10 calendar days after award.**

The Contractor shall coordinate with Public Utility companies to relocate any facilities required to accommodate the proposed scope of work, at no additional cost to the Owner.

Underground electrical, cable, phone, and gas services may exist throughout the project limits. **The Contractor shall be prepared to work with these utility companies to coordinate necessary relocations if additional conflicts arise.** The private utility owner is responsible for costs, equipment, and labor to relocate their utilities as shown on the plans, or as deemed necessary by the Engineer.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
ACCEPTANCE OF HOT MIX ASPHALT MIXTURE ON LOCAL AGENCY PROJECTS

CFS:KPK 1 of 7 APPR:JWB:CJB:02-05-15
FHWA:APPR:02-04-15

a. Description. This special provision provides sampling and testing requirements for local agency projects using the roller method and the nuclear density gauge testing. Provide the hot mix asphalt (HMA) mixture in accordance with the requirements of the standard specifications, except where modified herein.

b. Materials. Provide aggregates, mineral filler (if required), and asphalt binder to produce a mixture proportioned within the master gradation limits shown in the contract, and meeting the uniformity tolerance limits in Table 1.

Table 1: Uniformity Tolerance Limits for HMA Mixtures

Parameter			Top and Leveling Course		Base Course	
Number	Description		Range 1 (a)	Range 2	Range 1 (a)	Range 2
1	% Binder Content		-0.30 to +0.40	±0.50	-0.30 to +0.40	±0.50
2	% Passing	# 8 and Larger Sieves	±5.0	±8.0	±7.0	±9.0
		# 30 Sieve	±4.0	±6.0	±6.0	±9.0
		# 200 Sieve	±1.0	±2.0	±2.0	±3.0
3	Crushed Particle Content (b)		Below 10%	Below 15%	Below 10%	Below 15%

a. This range allows for normal mixture and testing variations. The mixture must be proportioned to test as closely as possible to the Job-Mix-Formula.
b. Deviation from Job-Mix-Formula.

Parameter number 2 as shown in Table 1 is aggregate gradation. Each sieve will be evaluated on one of the three gradation tolerance categories. If more than one sieve is exceeding range 1 or range 2 tolerances, only the one with the largest exceedance will be counted as the gradation parameter.

The master gradation should be maintained throughout production; however, price adjustments will be based on Table 1. Aggregates which are to be used in plant-mixed HMA mixtures must not contain topsoil, clay, or loam.

c. Construction. Submit a Mix Design and a Job-Mix-Formula to the Engineer. Do not begin production and placement of the HMA until receipt of the Engineer's approval of the Job-

Mix-Formula. Maintain the binder content, aggregate gradation, and the crushed particle content of the HMA mixture within the Range 1 uniformity tolerance limits in Table 1. For all mixtures, field regress air void content to 3.5 percent with liquid asphalt cement unless specified otherwise on HMA application estimate.

All persons performing QC and QA HMA field sampling must be "Local Agency HMA Sampling Qualified" samplers. At the Pre-Production or Pre-Construction meeting, the Engineer will determine the method of sampling to be used. Ensure all sampling is done in accordance with MTM 313 (Sampling HMA Paving Mixtures) or MTM 324 (Sampling HMA Paving Mixtures Behind the Paver). Samples are to be taken from separate hauling loads.

For production/mainline type paving, obtain a minimum of two samples, each being 20,000 grams, each day of production, for each mix type. The Engineer will sample and maintain possession of the sample. Sampling from the paver hopper is prohibited. Each sample will be divided into two 10,000 gram parts with one part being for initial testing and the other part being held for possible dispute resolution testing. Obtain a minimum of three samples for each mix type regardless of the number of days of production.

Obtain samples that are representative of the day's paving. Sample collection is to be spaced throughout the planned tonnage. One sample will be obtained in the first half of the tonnage and the second sample will be obtained in the second half of the tonnage. If planned paving is reduced or suspended, when paving resumes, the remaining sampling must be representative of the original intended sampling timing.

All persons performing testing must be Bit Level One certified or Bit Quality Assurance/Quality Control (QA/QC) Technician certified.

Daily test samples must be obtained, except, if the first test results show that the HMA mixture is in specification, the Engineer has the option of not testing additional samples from that day.

At the Pre-Production or Pre-Construction meeting, the Engineer and Contractor will collectively determine the test method for measuring AC content using MTM 319 (Determination of Asphalt Content from Asphalt Paving Mixtures by the Ignition Method) or MTM 325 (Quantitative Extraction of Bitumen from HMA Paving Mixtures). Back calculation will not be allowed for determining asphalt content.

Ensure all labs performing local agency acceptance testing are qualified labs per the *HMA Production Manual* and participate in the MDOT round robin process, or they must be AASHTO Materials Reference Laboratory (AMRL) accredited for AASHTO T 30 or T 27, and AASHTO T 164 or T 308. On non-NHS routes, Contractor labs must be made available, and may be used, but they must be qualified labs as previously stated. Contractor labs may not be used on NHS routes. Material acceptance testing will be completed by the Engineer within 14 calendar days for projects with less than 5,000 tons (plan quantity) of HMA and within 7 calendars days for projects with 5,000 tons (plan quantity) or more of HMA, after the Engineer has obtained the samples. Quality Assurance test results will be provided to the Contractor after the Engineer receives the Quality Control test results.

The correlation procedure for ignition oven will be established as follows. Asphalt binder content based on ignition method from MTM 319. Gradation (ASTM D 5444) and Crushed particle content (MTM 117) based on aggregate from MTM 319. The incineration temperature will be established at the Pre-Production Meeting. The Contractor will provide a laboratory

mixture sample to the acceptance laboratory to establish the correction factor for each mix. This sample must be provided to the Engineer a minimum of 14 calendar days prior to production.

For production/mainline type paving, the mixture may be accepted by visual inspection up to a quantity of 500 tons per mixture type, per project (not per day). For non-production type paving defined as driveways, approaches, and patching, visual inspection may be allowed regardless of the tonnage.

The mixture will be considered out-of-specification, as determined by the acceptance tests, if for any one mixture, two consecutive tests per parameter, (for Parameter 2, two consecutive aggregate gradations on one sieve) are outside Range 1 or Range 2 tolerance limits. If a parameter is outside of Range 1 tolerance limits and the second consecutive test shows that the parameter is outside of Range 2, then it will be considered to be a Range 1 out-of-specification. Consecutive refers to the production order and not necessarily the testing order. Out-of-Specification mixtures are subject to a price adjustment per the Measurement and Payment section.

Contractor operations will be suspended when the mixture is determined to be out-of-specification, but contract time will continue to run. The Engineer may issue a Notice of Non-Compliance with Contract Requirements (Form 1165), if the Contractor has not suspended operations and taken corrective action. Submit a revised Job-Mix-Formula or proposed alterations to the plant and/or materials to achieve the Job-Mix-Formula to the Engineer. Effects on the AWI and mix design properties will be taken into consideration. Production and placement cannot resume until receipt of the Engineer's approval to proceed.

Pavement in-place density will be measured using one of two approved methods. The method used for measuring in-place density will be agreed upon at a pre-production or pre-construction meeting.

Pavement in-place density tests will be completed by the Engineer during paving operations and prior to traffic staging changes. Pavement in-place density acceptance testing will be completed by the Engineer prior to paving of subsequent lifts and being open to traffic.

Option 1 – Direct Density Method

Use of a nuclear density gauge requires measuring the pavement density using the Gmm from the JMF for the density control target. The required in-place density of the HMA mixture must be 92.0 to 98.0 percent of the density control target. Nuclear density testing and frequency will be in accordance with the *MDOT Density Testing and Inspection Manual*.

Option 2 – Roller Method

The Engineer may use the Roller Method with a nuclear or non-nuclear density gauge to document achieving optimal density as discussed below.

Use of the density gauge requires establishing a rolling pattern that will achieve the required in-place density. The Engineer will measure pavement density with a density gauge using the Gmm from the JMF for the density control target.

Use of the Roller Method requires developing and establishing density frequency curves, and

meeting the requirements of Table 2. A density frequency curve is defined as the measurement and documentation of each pass of the finished roller until the in-place density results indicate a decrease in value. The previous recording will be deemed the optimal density. The Contractor is responsible for establishing and documenting an initial or Quality Control rolling pattern that achieves the optimal in-place density. When the density frequency curve is used, the Engineer will run and document the density frequency curve for each half day of production to determine the number of passes to achieve the maximum density. Table 5, located at the end of this special provision, can be used as an aid in developing the density frequency curve. The Engineer will perform density tests using an approved nuclear or non-nuclear gauge per the manufacturer's recommended procedures.

Table 2: Minimum Number of Rollers Recommended Based on Placement Rate

Average Laydown Rate, Square Yards per Hour	Number of Rollers Required (a)	
	Compaction	Finish
Less than 600	1	1 (b)
601 - 1200	1	1
1201 - 2400	2	1
2401 - 3600	3	1
3601 and More	4	1

a. Number of rollers may increase based on density frequency curve.
b. The compaction roller may be used as the finish roller also.

After placement, roll the HMA mixture as soon after placement as the roller is able to bear without undue displacement or cracking. Start rolling longitudinally at the sides of the lanes and proceed toward the center of the pavement, overlapping on successive trips by at least half the width of the drum. Each required roller must be 8 tons minimum in weight unless otherwise approved by the Engineer.

The initial breakdown roller must be capable of vibratory compaction and must be a maximum of 500 feet behind the paving operations. The maximum allowable speed of each roller is 3 mph or 4.5 feet/second. All compaction rollers must complete a minimum of two complete rolling cycles prior to the mat temperature cooling to 180 degrees Fahrenheit (F). Continue finish rolling until all roller marks are eliminated and no further compaction is possible. The Engineer will verify and document that the roller pattern has been adhered to. The Engineer can stop production when the roller pattern is not adhered to.

d. Measurement and Payment. The completed work, as described, will be measured and paid for using applicable pay items as described in section 501.04 of the Standard Specifications for Construction, or other contract documents, except as modified below.

If acceptance tests, as described in section c. of this special provision, show that a Table 1 mixture parameter exceeds the Range 1, but not the Range 2, tolerance limits, that mixture parameter will be subject to a 10 percent penalty. The 10 percent penalty will be assessed based on the acceptance tests only unless the Contractor requests that the 10,000 gram sample part retained for possible dispute resolution testing be tested. The Contractor has 4 calendar days from receipt of the acceptance test results to notify the Engineer, in writing, that dispute resolution testing is requested. The Contractors QC test results for the corresponding

QA test results must result in an overall payment greater than QA test results otherwise the QA tests will not be allowed to be disputed. The Engineer has 4 calendar days to send the dispute resolution sample to the lab once dispute resolution testing is requested. The dispute resolution sample will be sent to an independent lab selected by the Local Agency, and the resultant dispute test results will be used to determine the penalty per parameter, if any. The independent lab must be a MDOT QA/QC qualified lab or an AMRL HMA qualified lab. The independent lab must not have conflicts of interest with the Contractor or Local Agency. If the dispute testing results show that the mixture parameter is out-of-specification, the Contractor will pay for the cost of the dispute resolution testing and the contract unit price for the material will be adjusted, based on all test result parameters from the dispute tests, as shown in Table 3 and Table 4. If the dispute test results do not confirm the mixture parameter is out-of-specification, then the Local Agency will pay for the cost of the dispute resolution testing and no price adjustment is required.

If acceptance tests, as described in section c. of this special provision, show that a Table 1 mixture parameter exceeds the Range 2 tolerance limits, the 10,000 gram sample part retained for possible dispute resolution testing will be sent, within 4 calendar days, to the MDOT Central Laboratory for further testing. The MDOT Central Laboratory's test results will be used to determine the penalty per mixture parameter, if any. If the MDOT Central Laboratory's results do not confirm the mixture parameter is out-of-specification, then no price adjustment is required. If the MDOT Central Laboratory's results show that the mixture is out-of-specification and the Engineer approves leaving the out-of-specification mixture in place, the contract unit price for the material will be adjusted, based on all parameters, as shown in Table 3 and Table 4.

In the case that the Contractor disputes the results of the test of the second sample obtained for a particular day of production, the test turn-around time frames given would apply to the second test and there would be no time frame on the first test.

The laboratory (MDOT Central Laboratory or independent lab) will complete all Dispute Resolution testing and return test results to the Engineer, who will provide them to the contractor, within 13 calendar days upon receiving the Dispute Resolution samples.

In all cases, when penalties are assessed, the penalty applies to each parameter, up to two parameters, that is out of specification.

Table 3: Penalty Per Parameter

Mixture Parameter out-of-Specification per Acceptance Tests	Mixture Parameter out-of-Specification per Dispute Resolution Test Lab	Price Adjustment per Parameter
NO	N/A	None
YES	NO	None
	YES	Outside Range 1 but not Range 2: decrease by 10%
		Outside Range 2: decrease by 25%

The quantity of material receiving a price adjustment is defined as the material produced from the time the first out-of-specification sample was taken until the time the sample leading to the first in-specification test was taken.

Each parameter of Table 1 is evaluated with the total price adjustment applied to the contract unit price based on a sum of the two parameter penalties resulting in the highest total price adjustment as per Table 4. For example, if three parameters are out-of-specification, with two parameters outside Range 1 of Table 1 tolerance limits, but within Range 2 of Table 1 limits and one parameter outside of Range 2 of Table 1 tolerance limits and the Engineer approves leaving the mixture in place, the total price adjustment for that quantity of material is 35 percent.

Table 4: Calculating Total Price Adjustment

Cost Adjustment as a Sum of the Two Highest Parameter Penalties		
Number of Parameters Out-of-Specification	Range(s) Outside of Tolerance Limits of Table 1 per Parameter	Total Price Adjustment
One	Range 1	10%
	Range 2	25%
Two	Range 1 & Range 1	20%
	Range 1 & Range 2	35%
	Range 2 & Range 2	50%
Three	Range 1, Range 1 & Range 1	20%
	Range 1, Range 1 & Range 2	35%
	Range 1, Range 2 & Range 2	50%
	Range 2, Range 2 & Range 2	50%

Table 5: Density Frequency Curve Development

Tested by: _____ Date/Time: _____

Route/Location:		Air Temp:
Control Section/Job Number:		Weather:
Mix Type:	Tonnage:	Gauge:
Producer:	Depth:	Gmm:

Roller #1 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Roller #2 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Roller #3 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Summary: _____

_____

_____

_____

_____

TUSCOLA COUNTY ROAD COMMISSION

SPECIAL PROVISION
FOR
TRENCHING, MODIFIED

a. Description. Trenching, Modified shall be in accordance with section 307 of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction, except as outlined in this Special Provision. The work of Trenching, Modified shall consist of stripping, salvaging and stockpiling topsoil, all excavation, all embankment, the utilization of all suitable material in constructing the adjacent fills and the furnishing, hauling, and placing of borrow and grading to achieve the typical cross sections shown on the plans and for the proposed intersections, driveway approaches, and approach replacements as shown on the plans.

The Contractor shall locate, protect, and preserve all drainage structures, water shutoffs, gate valves, air relief valves, and blow off valves located within limits of the proposed Trenching, Modified. This work shall also be included with payment for Trenching, Modified.

b. Materials. All materials shall be in accordance with sections 307.02 and 902 of the MDOT 2012 Standard Specifications for Construction.

c. Construction Methods. Trenching, Modified shall include all necessary stripping, salvaging and stockpiling topsoil, excavation, moving, hauling, embankment, shaping and compacting the earth to develop the proposed cross section shown on the plans. Where undercuts below bottom of base for the purpose of removing additional objectionable material is ordered by the Engineer, the item of Subgrade Undercutting, Type II will apply.

The roadbed shall be finished to grade with a blade grader or equivalent equipment. All intersections, approaches, entrances, and driveways shall be graded as shown or as directed by the Engineer.

The disposal of surplus and unsuitable material shall be in accordance with section 205.03P of the MDOT 2012 Standard Specification for Construction. Disposal of surplus and unsuitable material will not be paid for separately, but shall be considered included with payment for Trenching, Modified.

d. Measurement and Payment. The completed work, **Trenching, Modified** including all materials, labor, and equipment, as measured, will be paid for at the Contract Unit Price for the following item Pay Item.

Pay Item	**Pay Unit**
Trenching, Modified	Station

Trenching, Modified will be measured in place by the 100' station as measured along each side of the road where work is to be performed which shall be payment in full for all work specified herein.

Quantities **for information only** for earthwork include the following:

Embankment, CIP .....___ Cyd
Excavation, Earth .....___ Cyd

Trenching, Modified will only apply from station 10+36 to station 26+91 (one side).

TUSCOLA COUNTY ROAD COMMISSION

SPECIAL PROVISION
FOR
SUMP PUMP LEAD AND DRAIN TILE CONNECTION

CON:SGI 402 1 of 1 02-12-20

a. Description. This work shall consist of constructing free flowing outlets for all sump pump leads and drain tiles encountered during construction, and connection to the proposed storm sewer or storm drainage structures.

b. Materials. The Contractor shall extend each sump pump lead and drain tile with piping of a diameter equal to that of the existing tile or as directed by the Engineer. The piping shall be made of polyvinyl chloride plastic and shall meet the requirements as specified in ASTM D 1785, Schedule 40, ASTM D 2665, or ASTM D 3034 Type SDR 23.5.

c. Construction. The sump pump leads or drain tile extension shall extend from the existing sump pump lead or drain tile to the proposed storm sewer, storm drainage structure, or proposed drain bank.

The sump pump leads or drain tile shall be connected to the existing or proposed storm sewer, culvert, or drainage structure in accordance with the Sewer, Tap, _ inch or Dr Structure, Tap _ inch per Section 402 or 403 of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction.

For any sump connection into a sewer or culvert; only approved watertight joint systems pursuant to MDOT 2012 Standard Specifications for Construction will be allowed. Mortar joints, pursuant to Section 402 of the MDOT 2012 Standard Specifications for Construction will ONLY be allowed when tapping into a CONCRETE mainline sewer or culvert. All other NON-CONCRETE sewer or culverts shall be tapped using manufactured fitting(s) meeting the approved watertight joint specification, defined in Section 909.03 of the MDOT 2012 Standard Specifications for Construction.

The Contractor shall connect the existing sump pump leads and drain tiles to the new pipe by the use of standard adapter fittings or by using methods approved by the Engineer that will provide a satisfactory leak proof installation.

c. Measurement and Payment. The completed work as measured for **Sump Pump Lead and Drain Tile Connection** will be paid for at contract unit prices for the following pay item:

Pay Item	**Pay Unit**
Sump Pump Lead and Drain Tile Connection	Foot

Sump Pump Lead and Drain Tile Connection will be measured and paid for at the contract unit price per linear foot, which price shall be payment in full for all labor, material, and equipment needed to accomplish this work. Taps to sewer, culverts, or drainage structures will not be paid for separately but will be included in payment for **Sump Pump Lead and Drain Tile Connection**.

TUSCOLA COUNTY ROAD COMMISSION

SPECIAL PROVISION
FOR
DRAINAGE STRUCTURE COVER, TYPE DG

CON:SGI 403 1 of 1 01-08-13

a. Description. The Contractor shall furnish and install new covers, including frames and grates, on new or existing drainage structures as described herein, and as shown in the plans. Work shall in accordance with Section 403 & 908 of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction, or as modified herein.

b. Materials. The materials shall be in accordance with Sections 403 and 908 of the Michigan Department of Transportation 2012 Standard Specifications for Construction.

The type of frames and grates for Drainage Grate to be furnished and installed on this project in grass areas shall be E.J.I.W. #1046 frame with type N oval grate, Neenah #R-4370 frame with type C oval grate, or equal, and shall properly fit the openings for the proposed drainage structures. The type of frames and grates for Drainage Grate to be furnished and installed on this project in paved areas shall be E.J.I.W #1020 frame with M1 grate, Neenah #R-2502 frame with Type C grate, or equal and shall properly fit the openings for the proposed drainage structures.

The grates shall be stamped with “Dump No Waste Drains to Waterways” lettering.

c. Construction

Castings shall be placed on a full bed of mortar.

d. Measurement and Payment. The completed work as measured for **Dr Structure Cover, Type DG** will be paid for at the contract unit price for the following pay item:

Pay Item	**Pay Unit**
Dr Structure Cover, Type DG	Each

The work of **Dr Structure Cover, Type DG** will be measured by the unit each and will be paid for at the contract unit price per each, which price shall be payment in full for all labor, material, and equipment necessary to accomplish this work.

TUSCOLA COUNTY ROAD COMMISSION

SPECIAL PROVISION
FOR
DRAINAGE STRUCTURE, MODIFIED

CON:SGI 403 1 of 1 02-12-20

a. Description. The Contractor shall construct **Dr Structure, __ inch dia, Modified** of the size and at the locations as shown on the plans or as directed by the Engineer. Work shall in accordance with Section 403 & 913 of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction, or as modified herein.

b. Materials. Drainage Structures shall be precast reinforced concrete units manufactured to American Society for Testing Materials (ASTM) C-478 specifications and Section 913 of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction, with either a cast in place bottom or precast concrete base as detailed on the plans.

Masonry structures will not be allowed to be used on this project, unless approved by the Engineer for special circumstances, or where specifically called for on the Plans.

Thirty-six inch diameter drainage structures (catch basins or inlets) will be allowed to be used on this project, where called for on the plans or where directed by the Engineer.

c. Construction. None Specified.

d. Measurement and Payment. The completed work as measured for **Dr Structure, __ inch dia, Modified** will be paid for at the contract unit price for the following pay item:

Pay Item	**Pay Unit**
Dr Structure, __ inch dia, Modified	Each

The work of **Dr Structure, __ inch dia, Modified** includes the concrete footing, and up to 8' of drainage structure depth. **Dr Structure, __ inch dia, Modified** will be measured by the unit each and will be paid for at the contract unit price per each, which price shall be payment in full for all labor, material, and equipment necessary to accomplish this work.

If during construction, due to utility conflicts or plan revisions, modifications are required to the piping connection holes or additional taps are required to precast concrete sections, this work will be paid for separately, in the Pay Item for the **Dr Structure, Tap, __ inch**.

TUSCOLA COUNTY ROAD COMMISSION

SPECIAL PROVISION
FOR
SLOPE RESTORATION, MODIFIED

CON:SGI 816 1 of 3 01-04-22

a. Description. This work consists of preparing all lawns and slopes on non-freeway projects designated for slope restoration on the plans or as directed by the Engineer and applying topsoil, fertilizer, hydroseed, hydromulch, or mulch blanket, high velocity mulch blanket and permanent turf reinforcement mat to those areas. Turf establishment must be in accordance with section 816 of the Standard Specifications for Construction and Standard Plan R-100 Series, except as modified herein or otherwise directed by the Engineer.

b. Materials. The materials and application rates specified in sections 816 and 917 of the Standard Specifications for Construction apply unless modified by this special provision or otherwise directed by the Engineer. The following materials must be used on this project:

1. Seeding mixture as called for on the plans.

2. Hydromulch must be 100 percent wood fiber with a premium tackifier (preblended high viscosity organic polysaccharide).

3. Fertilizer, Chemical Nutrient, Class A.

4. Topsoil Surface, Furnished or Salvaged, 4 inch. Remove any stones greater than 1 inch in diameter or other debris from all topsoil.

5. Mulch Blanket and High Velocity Mulch Blanket.

6. Permanent Turf Reinforcement Mat (TRM) must be 100 percent synthetic and consist of 100 percent ultraviolet (UV) stabilized polyolefin fibers sewn between two layers of black UV stabilized polypropylene netting with polyolefin thread. The TRM must meet the following "minimum average roll value" requirements:

Property	Test Method	Requirement
Mass/Unit Area	ASTM D 6566	10 oz/syd
Ultraviolet Stability @ 1000 hrs	ASTM D 4355	80 percent
Tensile Strength (MD)	ASTM D 6818	165 lbs/ft

Acceptance. Supply a Test Data Certification for the permanent TRM from one of the following manufacturers:

Recyclex - American Excelsior Co., Arlington, TX (800) 777-7645
P300 - North American Green, Poseyville, IN (800) 772-2040
Landlok 450 - Propex, Inc., Chattanooga, TN (800) 621-1273
PP5-10 - Western Excelsior, Mancos, CO (800) 833-8573

c. Construction. Construction methods must be in accordance with subsection 816.03 of the

Standard Specifications for Construction. Begin this work as soon as possible after final grading of the areas designated for slope restoration but no later than the maximum time frames stated in subsection 208.03 of the Standard Specifications for Construction. It may be necessary, as directed by the Engineer, to place materials by hand.

Shape, compact and assure all areas to be seeded are weed free prior to placing topsoil. Place topsoil to the minimum depth indicated above, to meet proposed finished grade. If the area being restored requires more than the minimum depth of topsoil to meet finished grade, this additional depth must be filled using topsoil or, at the Contractor's option, embankment. Furnishing and placing this additional material is included in this item of work.

Topsoil must be weed and weed seed free and friable prior to placing seed. Remove any stones greater than 1 inch in diameter or other debris. Apply seed mixture and fertilizer to prepared soil surface. Incorporate seed into top 1/2 inch of topsoil.

No hay will be allowed for use with slope restoration on this project.

Apply mulch at a rate of 2 tons per acre. Place Mulch Anchoring over the mulch at a rate specified in subsection 816.03.F of the Standard Specifications for Construction. Mulch Blanket and High Velocity Mulch Blanket must be placed in accordance with subsection 816.03.H of the Standard Specifications for Construction and as shown on Standard Plan R-100 Series.

Do not apply fertilizer to frozen soil or soil saturated with water. Any fertilizer released onto a hard surface, such as a sidewalk or driveway must be cleaned up promptly. Maintain at least a 15-foot application buffer from surface water (lake, river, stream). If a spreader guard, deflector shield, or drop spreader is used, then maintain at least a 3-foot buffer. If a continuous natural vegetative buffer separates the turf and surface water, then maintain at least a 10-foot buffer from the water.

Turf or lawn areas that soil tests, performed within the past three years by the Michigan State University Extension Service or other qualified or recognized authority in the area of soil analysis, confirm are below phosphorus levels established by the Michigan State University Extension Service. The lawn fertilizer application shall not contain an amount of phosphorus exceeding the amount and rate of application recommended in the soil test evaluation.

Areas constructed with the TRM must be installed on prepared (seeded) grades as shown on the plans in strict accordance with the manufacturer's published installation guidelines. The top edge of the TRM must be anchored in a minimum 6 inch deep trench. Operation of equipment on the slope will not be allowed after placement of the TRM. No credit for splices, overlaps, tucks or wasted material will be made.

If an area washes out after this work has been properly completed and approved by the Engineer, make the required corrections to prevent future washouts and replace the topsoil, fertilizer, seed and mulch. This replacement will be paid for as additional work using the applicable contract items.

If an area washes out for reasons attributable to the Contractor's activity or failure to take proper precautions, replacement will be at the Contractor's expense.

The Engineer will inspect the seeded turf to ensure the end product is well established, weed free, in a vigorous growing condition, and contains the species called for in the seeding mixture.

If the seeded turf is not well established, the Contractor is responsible to re-seed until the turf is well

established and approved by the Engineer at his own cost.

If weeds are determined by the Engineer to cover more than 10 percent of the total area of slope restoration, the Contractor must provide weed control in accordance with subsection 816.03.J of the Standard Specifications for Construction. Weed control will be at the Contractor's expense with no additional charges to the project.

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**
Slope Restoration, Modified	Square Yard

1. Place **Slope Restoration, Modified** in all areas and will be measured by area in square yards in place. **Slope Restoration, Modified** includes all labor, equipment and materials required to install Topsoil Surface, Furnished or Salvaged; Fertilizer, Chemical Nutrient, Class A; hydroseed mixture; hydromulch mixture; mulch blanket; high velocity mulch blanket; and turf reinforcement mat; which will not be paid for separately but is included in the contract unit price for **Slope Restoration, Modified**. Mulch Blanket must be used in areas that have a 1 on 3 slope and in any ditch with a grade less than 1.5 percent, or as directed by the Engineer. High Velocity Mulch Blanket must be used in areas that have a 1 on 2 slope, any ditch with a grade of 1.5 percent to 3 percent, or as directed by the Engineer. Turf Reinforcement Mat must be used in areas that have a slope steeper than 1 on 2, any ditch with a grade steeper than 3 percent, or as directed by the Engineer. Use Hydroseed and Hydromulch in all other areas.

Note: Areas where unsatisfactory grass growth is evident as determined by the Engineer prior to or during the Final Project Inspection, must be re-worked, re-seeded, re-fertilized, and re-mulched to the satisfaction of the Engineer, at the Contractor's expense. The end product shall be well established, weed free, in a growing and vigorous condition, and must contain the species called for in the seeding mixture.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
QUALITY CONTROL AND ACCEPTANCE OF PORTLAND CEMENT CONCRETE (FOR LOCAL AGENCY PROJECTS ONLY)

a. Description. The Contractor must administer quality control (QC) and the Department will administer quality assurance (QA) procedures that will be used for acceptance of and payment for all Portland cement concrete (PCC) for the project. Except as explicitly modified by this special provision, all materials, test methods, and PCC mixture requirements of the standard specifications and the contract apply.

Do not place concrete until the Engineer's daily startup testing verifies that the fresh concrete properties have been met, in accordance with subsection d.2 of this special provision.

Provide the Engineer a minimum 24 hours notification prior to each concrete placement.

1. Terminology.

Air Content of Fresh Concrete. The recorded total air content of fresh concrete sampled and tested according to this special provision.

Air Content Test Results. The recorded air content of fresh concrete corresponding to the strength test specimens that were molded for acceptance.

Alkali-Silica Reactivity (ASR). A chemical reaction which occurs over time within concrete between high alkaline cement paste and reactive forms of silica found in some aggregates. In the presence of moisture, an expansive ASR gel is formed which can exert pressure within the concrete, causing random cracking and premature deterioration of the concrete. See subsection c.5.A of this special provision.

Base Price. Price established by the Department to be used in calculating incentives or adjustments to pay items and shown in the contract.

Concrete Mix Design. The process, by which the concrete mixture performance characteristics are defined, based on selected materials, performance requirements, environmental exposure considerations, placement methods, and other factors that control the plastic and hardened properties of the concrete in efforts to produce an economical and durable product.

Job Mix Formula (JMF). The actual batch quantities (mixture proportions) of each constituent included in the concrete mixture, based on adjustments to the target weights attained from the mix design process, necessary to optimize the concrete mixture properties.

Pay Factor (PF). The factor that is determined according to subsections d.3 of this special provision, used to calculate the price adjustment for a discrete quantity of concrete relative

to its respective level of quality. Pay factor will not exceed 1.00. Therefore, there will never be a positive pay adjustment.

Price Adjustment (ADJ). The price adjustment applied to the quantity of concrete represented by the respective quality index analysis described in subsections d.3 of this special provision.

Production Lot. A discrete cubic yard quantity of concrete containing the same JMF and used for the same application, as described in subsection d.2 of this special provision.

Quality Assurance (QA). Activities administered by the Engineer dealing with acceptance of the product, including, but not limited to, materials selection, sampling, testing, construction inspection, and review of Contractor QC documentation. All concrete QA sampling and testing will be administered by the Department. Department administered QA is described in section d of this special provision.

Quality Control (QC). All activities administered by the Contractor to monitor, assess, and adjust production and placement processes to ensure the final product will meet the specified levels of quality, including, but not limited to, training, materials selection, sampling, testing, project oversight and documentation. Contractor administered QC is described in section c of this special provision.

QC Action Limits. A range of values established by the Contractor in the QC plan that, if exceeded, requires that corrective action be taken by the Contractor to restore the continuity and uniformity of the mixture and methods in conformance with specification requirements. The QC action limits must not exceed the QC suspension limits.

QC Plan. The project-specific plan developed by the Contractor describing, in detail, all aspects of production and construction for the project to ensure consistent control of quality to meet specification requirements.

QC Plan Administrator. An employee of, or consultant engaged by the Contractor, responsible for developing and overseeing all aspects of QC for the project. This includes, but is not limited to preparing the QC plan, managing the Contractor QC personnel, communicating routinely with the production personnel to ensure quality, initiating corrective action and suspending operations when the process is found to be producing non-conforming materials, and preparing and submitting all necessary QC documentation to the Engineer within the specified time period.

QC Suspension Limits. A range of values defined in Table 1 that, if exceeded on a single QC test, requires that the Contractor suspend operations and determine, correct, and document the deficiencies before resuming production. The QC suspension limit must not exceed specification requirement thresholds.

Sample. A representative quantity of concrete taken during production which is used to measure the quality characteristics for the concrete.

Sampling Rate. The number of times the fresh concrete is sampled, as described in subsection d.2 of this special provision.

Small Incidental Quantity. A single day's placement of less than 20 cubic yards of concrete used for non-structural or non-pavement related applications, including, but not limited to:

curb and gutter, sidewalks and sidewalk ramps (excluding driveways and driveway ramps), installing sign or fence posts, guard rail or cable rail foundations (excluding end anchorage foundations), or other contract items where the small quantity of concrete is not paid for separately, as approved by the Engineer. Requirements for small incidental quantity consideration are described in subsections c.5.G, d.2.B and d.3 of this special provision. The corresponding weekly QA test results must meet specification limits defined in Table 3.

Specification Limits. The threshold values placed on a quality characteristic used to evaluate the quality of the material.

Strength Sample Test Result. The average of the two companion 28-day compressive strength test specimens taken from the same sample of concrete is considered a strength sample test result.

Strength Test Specimen. A strength test specimen is an individual 6-inch by 12-inch strength test cylinder or 4-inch by 8-inch strength test cylinder molded and cured according to *AASHTO T23/ASTM C 31* and tested according to *AASHTO T22/ASTM C 39*. All respective QC or QA strength test specimens must be the same nominal size. Strength test specimen cylinder size of 4-inch by 8-inch is permitted only if the nominal maximum coarse aggregate particle size, as specified for the coarse aggregate in the concrete mixture, is 1-inch, or less.

Sublot. A portion of a production lot, represented by a complete set of QA tests, as described in subsection d.2.A of this special provision. The Engineer and the Contractor may agree to reduce the typical sublot size based on project staging or other project conditions.

Supplementary Cementitious Materials (SCM). A mineral admixture (slag cement, fly ash) used to replace a portion of the Portland cement, either individually or as a blended cement, in the concrete mixture. SCM requirements are described in subsection c.5 of this special provision.

b. Materials. Mixture requirements must be in accordance with the contract.

c. Contractor Administered Quality Control (QC).

1. Contractor Quality Control Plan (QC plan). Prepare, implement, and maintain a QC plan specific to the project for concrete that will provide quality oversight for production, testing, and control of construction processes. The QC plan must be in conformance with the contract and must identify all procedures used to control production and placement including when to initiate corrective action necessary to maintain the quality and uniformity of the work.

Develop concrete mix designs and JMFs, as specified, and conduct QC sampling, testing, and inspection during all phases of the concrete work at the minimum frequency, or at an increased frequency sufficient to ensure that the work conforms to specification requirements.

Project-specific items required in the QC plan include (where applicable), but are not limited to the following:

A. Organization chart.

B. QC Plan Administrator and contact information.

C. The name(s) and credentials of the QC staff.

D. Methods for interaction between production and QC personnel to engage timely corrective action, including suspension of work.

E. Coordination of activities.

F. Documentation, procedures, and submittals.

G. Project and plant specifics.

H. Concrete production facilities inspections and certifications.

I. Current testing equipment calibration documentation including calibration factor.

J. Testing and initial field curing facilities for QC and QA strength test specimens (AASHTO T23/ASTM C 31).

K. Stockpile management plan.

L. Corrective action plan.

M. Mixing time and transportation, including time from batching to completion of delivery and batch placement rate (batches per hour), along with the manufacturer's documentation relative to the batching equipment's capabilities in terms of maximum mixing capacity and minimum mixing time (*ASTM C 94*).

N. Placement and consolidation methods including monitoring of vibration, depth checks, and verification of pavement dowel bar alignment.

O. Process for monitoring stability of air content of fresh concrete during concrete production and placement.

P. Hot and cold weather protection considerations and methods.

Q. Control charts with action and suspension limits.

R. Verification for non-deleterious alkali-silica reactivity (see subsection c.5.A of this special provision).

S. Mix design and JMFs.

T. Proposed production lot size and location for use of each JMF on the project.

U. The frequency of sampling, testing, and yield verification.

V. Handling, protection, initial curing, and transporting of strength test specimens (*AASHTO T23/ASTM C31*).

W. Methods to monitor construction equipment loading and open-to-traffic strengths.

X. Finishing and curing procedure.

Y. Ride quality control.

Z. List of QC records to be submitted to the Engineer in accordance with subsection c.2 of this special provision.

Submit the QC plan, for the appropriate items of work, to the Engineer for review a minimum of 10 working days before the start of related work. The Engineer will notify the Contractor of any objections relative to the content of the QC plan within 5 working days of receipt of the QC plan. Do not begin concrete placement before acceptance of the QC plan by the Engineer. If the approved QC plan fails to provide acceptable work, or acceptable control of the work, the Engineer may require the Contractor to revise the QC plan. Revisions to the QC plan must be approved by the Engineer prior to resuming work.

2. QC Records. Maintain complete records of all QC tests and inspections. Document what action was taken to correct deficiencies. Include sufficient information to allow the test results to be correlated with the items of work represented.

Furnish one copy of all QC records, including test reports for the fresh concrete placement, to the Engineer within 24 hours after the date covered by the record in a format acceptable to the Engineer. The Engineer will withhold acceptance of the concrete for failure to provide properly documented and timely QC records and reports.

If the Engineer is performing QA sampling and testing at the same time the Contractor is performing QC sampling and testing, all associated QC records must include the appropriate production lot identification number that correlates with the Department's QA production lot identification number.

3. Personnel Requirements. The QC Plan Administrator must have full authority and responsibility to take all actions necessary for the successful implementation of the QC plan, including but not limited to, the following:

A. Monitoring and utilizing QC tests, control charts, and other QC practices to ensure that delivered materials and proportioning meets specification requirements.

B. Monitoring materials shipped to the project, prior to their use, to ensure their continued compatibility toward producing consistent quality.

C. Periodically inspecting all equipment utilized in transporting, proportioning, mixing, placing, consolidating, finishing, and curing to ensure proper operation.

D. Monitoring materials stockpile management, concrete batching, mixing, transporting, placement, consolidation, finishing, and curing to ensure conformance with specification requirements.

E. Maintaining and submitting all QC records and reports.

F. Directing the necessary corrective action to ensure continual conformance within

the QC action limits.

G. Suspending production for the project when suspension limits are exceeded.

H. Conducting or monitoring adjustments to the JMF.

Individuals performing QC tests must demonstrate that they are proficient and capable of sampling and testing concrete or aggregate, where applicable, in accordance with the associated test procedures and Department requirements prior to commencement of related work. Any adjustments to the JMF must be made by a certified concrete technician (Michigan Concrete Association (MCA) Michigan Level II).

4. QC Laboratory Requirements. Laboratories, including field laboratories and all associated testing equipment that prepare concrete mixes or perform QC testing, must demonstrate to the Engineer that they are equipped, staffed, calibrated, and managed so as to be capable of batching, and testing PCC in accordance with the applicable test methods and procedures. Mix designs and their accompanying JMFs must include a statement, signed by a certified concrete technician (MCA Michigan Level II), that all applicable standard test methods have been followed in verifying the mix design and JMF.

5. Mix Design and Documentation. Design concrete mixtures meeting the requirements specified in Table 1. Provide the grade of concrete for the section number reference application specified in Table 1, or as specified in the contract. Request variance in writing when proposing a mix design that exhibits temperature, slump or air content other than those specified. Include the proposed mix design, JMF, and associated trial batch verification test data. Do not use a grade of concrete with a lower specification limit (LSL) 28-day compressive strength greater than what is designated for the application.

Blended cement meeting the requirements of *ASTM C 595 Type IL* is permitted.

Ensure supplementary cementitious materials are from an MDOT Approved Manufacturer. Slag cement must meet the requirements of subsection 901.06 of the Standard Specifications for Construction. Fly ash must meet the requirements of subsection 901.07 of the Standard Specifications for Construction.

Secure prior approval from the Engineer to use concrete intended for early opening to traffic to facilitate driveway gaps or other features necessary for required local access.

Unless otherwise specified in the contract, set accelerating admixtures are prohibited.

Optimized aggregate gradation is required for high performance concrete and concrete mixtures that are placed using a pump. Concrete mixtures for tremie and drilled shaft applications do not require optimized aggregate gradation. The physical requirements for coarse and intermediate aggregates specified in subsection 902.03.C of the Standard Specifications for Construction apply to high performance concrete pavement mixtures. The physical requirements for aggregates used in concrete mixtures for all other applications will be according to the contract.

Unless otherwise specified in the contract, provide either concrete Grade P1 or Grade D for bridge approach slab applications.

Unless otherwise specified in the contract, do not exceed 40 percent replacement of the Portland cement in the concrete mixture with a supplementary cementitious material. Do not exceed 40 percent total replacement of the Portland cement if more than one supplementary cementitious material is used in the concrete mixture.

Use the combined weight of all cementitious materials to determine compliance with the maximum water-cementitious ratio and cementitious material content requirements specified in Table 1.

For night casting, where applicable, a water-reducing admixture may be used in lieu of a water-reducing and retarding admixture, provided the concrete can be placed and finished in the sequence specified on the plans prior to initial set, is not subjected to residual vibration, or is not within the areas influenced by dead load deflections as a result of adjacent concrete placement operations. When the maximum air temperature is not forecast to exceed 60 degrees F for the day, the Contractor may use a water-reducing admixture or a water-reducing retarding admixture.

Table 1: Minimum Mix Design Requirements for Concrete

Mix Design Parameter	Grade of Concrete						
	P1M (a,b,e)	P1 (a,b)	D,DM (a,b,e)	T	S1 (a)	S2,S2M (a,b,e)	S3/P2 (a)
Lower Specification Limit (LSL) (28-day compressive, psi)	3500	3500	4500	3500	4000	3500	3000
Rejection Limit for an Individual Strength Sample Test Result	3000	3000	4000	3000	3500	3000	2500
Maximum Water/Cementitious Ratio (lb/lb) (c)	0.45						
Cementitious Material Content (lb/yd3) (d)	470-564	517-611	517-658	517-611	517-611	517-611	489-517
Air Content (percent) (f)	5.5-8.5						
Slump (inch) (max.)	(g)						
Section Number Reference (h)	602, 603	602, 603, 801, 802, 803, 810	706, 711, 712	706, 718	705	401, 706, 712, 713, 718, 801, 802, 803, 810, 819	402, 403, 602, 803, 804, 806, 808, 810, 813, 814

a. If the local average minimum temperature in the next 10 consecutive days is forecast to be below 40 degrees F, submit a revised QC plan for the Engineer's approval, addressing in detail changes in materials, concrete batching and mixing processes, construction methods, curing, and protection of the in situ concrete to ensure that the necessary quality characteristics of the hardened concrete product will not be compromised as a result of the cold weather. The revised QC plan must be approved by the Engineer prior to cold weather concrete placement. Do not remove supplementary cementitious material from the concrete mixture.

b. Use aggregates from only geologically natural sources for pavement, shoulder, miscellaneous pavement (including ramps), concrete pavement overlay, bridge approach slab, structural concrete, drilled shaft, bridge railing, and bridge sidewalk applications.

c. Use admixtures as listed in the Qualified Products Lists to reduce mixing water. Ensure concrete in concrete diaphragms contains a water-reducing admixture, or a water-reducing retarding admixture.

d. Type III cement is not permitted.

e. For grades of concrete requiring optimized gradation, aggregates must meet the physical requirements specified in subsection 902.03.C of the Standard Specifications for Construction.

f. For action, suspension, and specification limits, see Tables 2 and 3, where applicable.

g. The maximum slump for Grades P1, P1M, and P2 concrete is 3 inches or as documented on the approved JMF. All other grades of concrete will be according to Table 701-1 of the Standard Specifications for Construction.

h. Section Number Reference:

401 Pipe Culverts
403 Drainage Structures
603 Concrete Pavement Restoration
706 Structural Concrete Construction
712 Bridge Rehabilitation-Concrete
718 Drilled Shafts
802 Concrete Curb, Gutter and Dividers
804 Concrete Barriers and Glare Screens
808 Fencing
813 Slope Protection
819 Electrical and Lighting
402 Storm Sewers
602 Concrete Pavement Construction
705 Foundation Piling
711 Bridge Railings
713 Bridge Rehabilitation-Steel
801 Concrete Driveways
803 Concrete Sidewalk, Sidewalk Ramps, and Steps
806 Shared Use Paths
810 Permanent Traffic Signs and Supports
814 Paved Ditches

A. Alkali-Silica Reactivity. Provide documentation to the Engineer that the concrete mixture does not present the potential for deleterious expansion caused by alkali-silica reactivity (ASR). Provide current ASR test results (valid for 2 years from completion of testing), for the fine aggregate that is proposed to be used in the concrete, from an independent testing laboratory proficient in ASR testing. The independent testing laboratory must certify in writing, including a signed statement that all testing was conducted in accordance with the designated standard test procedures, described herein. Test results must conform to the specified criterion for one of the following standard test methods. ASR testing is not required for concrete pavement repairs and temporary concrete pavements. Use the Rounding Method described in *ASTM E 29* when determining significant digits for reporting expansion test results.

(1) Method 1. *ASTM C 1293*. Concrete Prism Test. If the expansion of concrete prisms is not greater than 0.040 percent (rounded to the nearest 0.001 percent) after 1 year, the fine aggregate is considered non-deleterious to ASR and may be used in the JMF.

(2) Method 2. *ASTM C 1567*. Mortar Bar Test. If no previous test data are available for the fine aggregate that shows it is resistant to ASR using Method 1, above, replace 25 to 40 percent of the Portland cement in the concrete mixture with a supplementary cementitious material. A blended cement meeting the requirements of *ASTM C 595* containing the above Portland cement and supplementary cementitious material proportions may also be used.

Demonstrate the ability of the supplementary cementitious material to control the deleterious expansion caused by ASR by molding and testing mortar bars according to the standard test method described in *ASTM C 1567* using the mix proportions and constituent sources for both the aggregates and the cementitious materials that will be used for the project. Make at least three test specimens for each cementitious materials-aggregate combination. If the average of three mortar bars for a given cementitious materials-aggregate combination produces an expansion less than 0.10 percent (rounded to the nearest 0.01 percent) at 14 days of immersion, the JMF associated with that combination will be considered non-deleterious to ASR. If the average expansion is 0.10 percent (rounded to the nearest 0.01 percent) or greater, the JMF associated with that combination will be considered not sufficient to control the deleterious expansion caused by ASR and the JMF will be rejected.

(3) Method 3. *ASTM C 1260*. Mortar Bar Test. If the expansion of the mortar bars is less than 0.10 percent (rounded to the nearest 0.01 percent) at 14 days of immersion, the fine aggregate is considered non-deleterious to ASR and may be used in the concrete without the need for ASR mitigation.

The Engineer will not approve the use of the JMF if the expansion exceeds the respective threshold limits for the respective ASTM test method used.

B. Contractor Provided Mixes. Provide mix design and accompanying JMFs using the methods of verification included in this special provision. Include sufficient information on constituent materials and admixtures along with trial batch verified physical properties of the fresh concrete, mix proportions per cubic yard for all constituents and compressive strength test results necessary to allow the Engineer to

fully evaluate the expected performance of the concrete mixture.

(1) Mix Documentation. Prepare mix designs for each grade of concrete required on the project. Submit JMF for each mix design, including all required documentation, to the Engineer for review 10 working days before the anticipated date of placement. The Engineer will notify the Contractor of any objections within 5 working days of receipt of the mix documentation. Number or otherwise identify each JMF and reference all accompanying documentation to this identification. Reference each JMF to the appropriate method of verification. Mix design and JMF submittals that do not include all required documentation will be considered incomplete and the Engineer will return them without review.

Mix documentation is valid for 2 years provided the material characteristics have not deviated beyond the requirements specified in the contract.

All mix designs and accompanying JMFs must be traceable to a laboratory meeting the requirements of this special provision.

Submit mix design and JMF on the MDOT Job Mix Formula (JMF) Concrete Field Communication form (MDOT Form Number 1976); include accompanying documentation. List the source of materials, bulk density (unit weight) of coarse aggregate (rodding procedure or shoveling procedure), absorption of aggregates, relative density (specific gravity) of aggregates, aggregate correction factors, batch weights, and project specific or historical laboratory test data. Include the recorded air content of fresh concrete using the same admixture and cementitious material sources to be used in the production of the concrete for the project. A JMF will be approved only if all of the minimum mix design requirements specified in the contract have been met.

(2) Job Mix Formula (JMF). Select proportions for concrete mixtures according to *ACI Standard 211.1*. The volume (oven-dry-rodded) of coarse aggregate per unit volume of concrete must be 65 percent, minimum.

Four methods of verification of proposed JMF are acceptable.

(a) Method 1. Trial Batches. Verification of JMF is based on trial batches with the same materials and proportions proposed for use on the project. Prepare at least one trial batch for each mix design in sufficient time before starting concrete placement to allow for review according to subsection c.5.B.(1) of this special provision. Provide the results of temperature, slump, density (unit weight), air content of fresh concrete, 28-day compressive strength, and age of concrete at the time of strength testing, for a minimum of three independent samples. All samples may be taken from a single trial batch for a mix design provided the trial batch is at least four cubic yards in volume. For JMF trial batch verification purposes only, 7-day compressive strength test results which report at least 70 percent of the specified 28-day lower specification limit (LSL) will be sufficient documentation in lieu of 28-day compressive strengths. The average of at least two strength test specimens represents one compressive strength sample test result for each independent sample. Provide the necessary ASR documentation as described in subsection c.5.A of this special provision.

(b) Method 2. Same Mix. Verification of JMF is based on the concrete producer's experience with the same mix design, JMF, and the same materials. Provide the results of temperature, slump, density (unit weight), air content of fresh concrete, 28-day compressive strength, and age of concrete at the time of strength testing, for a minimum of three independent samples. The average of at least two strength test specimens represents one compressive strength sample test result for each independent sample. Do not substitute material types or sources, including admixtures or cementitious materials, nor change mix proportions in the JMF. Provide the necessary ASR documentation as described in subsection c.5.A of this special provision.

(c) Method 3. Similar Mix. Verification of JMF is based on requirements described in Method 2, in subsection c.5.B.(2).(b) of this special provision. Substitution of coarse aggregate source is permitted if the new source is of the same geologic type as the original aggregate, and conforms to the specification requirements for the application. Substitution of fine aggregate is permitted only if the new source has been tested for ASR. Provide the necessary ASR documentation as described in subsection c.5.A of this special provision.

Provide the supporting laboratory trial batch documentation and accompanying calculations showing how the mix proportions in the JMF were adjusted, based on the documented differences in relative density (specific gravity), bulk density (unit weight) and absorption of the substituted aggregate sources, to produce a theoretical yield of 100 percent and the required fresh concrete properties.

(d) Method 4. Annual Verification. At the Engineer's option, verification may be accepted annually for a concrete producer rather than on a project basis provided the sources and proportions of the constituent materials, including cementitious materials and source and types admixtures, do not change. If the project is the continuation of work in progress during the previous construction season and written certification is submitted to the Engineer that materials from the same source and with the same mixture properties are to be used, the Engineer may waive the requirement for annual renewal verification of the JMF for the project. Provide the necessary ASR documentation as described in subsection c.5.A of this special provision.

C. Department Provided Mixes. Unless otherwise specified in the contract or approved by the Engineer, the Engineer will provide the concrete JMF for the following types of concrete regardless of the total quantity for the project.

(1) Structural concrete patching mixtures, mortar and grout.

(2) Bridge deck overlay concrete mixtures.

(3) Project-specific concrete mixtures and grades not defined in Table 1.

Provide all other mix designs and accompanying JMF's according to subsection c.5.B of this special provision.

The ASR documentation for the fine aggregate described in subsection c.5.A of this special provision must accompany the Contractor's request for the concrete JMF.

D. Changes in Materials and Proportions. Any changing from one approved JMF to another for the same grade of concrete must have prior approval by the Engineer.

Prior to batching, verify that the proposed JMF changes will not affect the properties of the fresh concrete (slump, temperature, air content, density (unit weight), workability), nor result in deleterious mortar bar expansion as a result of ASR, as described in subsection c.5.A of this special provision.

Record all changes to JMF in the QC records along with the rationale for the change.

E. QC Sampling and Testing. Conduct startup sampling and testing for temperature, slump, density (unit weight), and air content on the first load. Do not place concrete until testing verifies that the fresh concrete properties have not exceeded the QC action and suspension limit thresholds specified in Table 2 and the testing correlation requirements of subsection d.1.B of this special provision have been met. Continue testing subsequent loads as described in the QC plan, for each grade of concrete delivered to the work site each day. The QC sampling and testing must be random and independent from the Agencies QA sampling and testing.

Provide the curing facilities in accordance with subsection d.2.C of this special provision prior to start of concrete production.

Perform QC sampling and testing for air content of fresh concrete that is either slipformed or pumped, as described in the QC plan. Sample and test a representative haul unit of concrete immediately after its discharge but before the slipform paver or pump hopper, where applicable. Sample and test the concrete representing the same haul unit, again, after the slipform paver or after discharge from the pump (without interruption or alteration of the pumping operation), where applicable. If the difference in measured air content between the two test locations for the same concrete is greater than 1.5 percent air by volume of concrete, suspend operations and administer corrective action. Resume concrete placement only after taking the necessary corrective action to reduce the loss in air content of fresh concrete between the two test locations, as approved by the Engineer. Document the corrective action to be taken in the QC records and make the necessary changes to the QC plan, where applicable.

Concrete exceeding the maximum specification limits for slump or temperature must be rejected regardless of the total mixing time at the time of arrival to the project.

The Engineer may require the Contractor to administer additional QC sampling and testing if the Engineer determines the Contractor’s current QC sampling and testing methodology is shown to be insufficient to ensure continual control of the quality of the concrete.

Take the appropriate corrective action, as described in the QC plan, when QC testing shows the QC action limits for any quality characteristic are exceeded. Suspend production if any of the QC suspension limits are exceeded or if the corrective action is not sufficient to restore the quality to acceptable levels.

Resume production only after making all necessary adjustments to bring the mixture into conformance with all applicable specifications and receiving approval to resume work

from the Engineer. Document these adjustments in the QC records.

Table 2: QC Action and Suspension Limits

Quality Characteristic	Action Limits	Suspension Limits
Air Content (percent)	See Note Below	< 5.0 or > 9.0
Air Content Loss (percent)	As Defined in the Contractor QC plan	Greater than 1.5
Conc. Temp. (Deg. F)		< 45 or > 90 at time of placement
Slump (max.) (inch)		See Table 1, footnote (g)
Density (unit weight)		N/A
Note: Action limits must be defined in the Contractor QC plan and cannot be < 5.5 or > 8.5. Suspend work if air content is < 5.0 or > 9.0 percent after pump or paver, regardless of the air content loss.		

F. Work Progress Test Specimens. Determine the strength of concrete for opening to construction traffic or regular traffic, for removing shoring and forms, or for similar purposes in accordance with subsections 104.11, 601.03.H and 701.03.D of the Standard Specifications for Construction, and as approved by the Engineer. Cure work progress test specimens in the same manner as the in-situ concrete. Allow the Engineer to witness testing of work progress test specimens.

The maturity method may be used to determine the in-place, opening-to-traffic flexural strength, provided the necessary preliminary flexural strength versus time-temperature factor correlation, using the same materials and JMF, is established according to Department procedures and approved by the Engineer before placing the concrete.

G. Reduced QC for Small Incidental Quantities. If approved by the Engineer, reduced levels of on-site QC testing for concrete may be considered for small incidental quantities defined in subsection a.1 of this special provision.

Unless approved by the Engineer, multiple small incidental quantities, including ones that are consecutively placed throughout the project on the same day, are not eligible for reduced QC consideration if the total plan quantity of concrete for the item exceeds 100 cubic yards in volume. Include details for reduced QC testing and oversight in the approved QC plan, and in accordance with following:

(1) The small incidental quantity of concrete will be limited to a single day's concrete placement of a maximum 20 cubic yards in volume.

(2) The small incidental quantity of concrete is not an integral part of a structural load bearing element.

(3) The Engineer received written certification from the Contractor that the concrete supplier has a current QC plan in place and available for review upon request by the Engineer.

(4) The concrete supplier employs a certified concrete technician (MCA Michigan Level II) available at the plant or on call during concrete placement to validate and authorize modifications to the concrete JMF, as necessary.

(5) Prior to the first concreting operation, concrete representing the JMF for the small incidental quantity has been sampled and tested by a certified concrete technician (MCA Michigan Level I or II) to verify that, historically, the JMF produced a

concrete mixture meeting the minimum requirements for density (unit weight), slump, air content, and strength. Annual verification may be acceptable provided there are no changes to the material types or sources, including the cementitious materials and admixtures.

(6) The Engineer verified that the temperature, slump, and air content conform to specification requirements at the start of the day's concreting operation associated with the small incidental quantity.

(7) The Engineer is notified and provided sufficient opportunity to witness concrete placement.

d. Department Administered Quality Assurance (Acceptance).

1. Department Quality Assurance Plan (QA plan). The Engineer will be responsible for administering the quality-based acceptance and will institute any actions necessary toward its successful implementation.

Acceptance of concrete pavement repair mixtures and concrete mixtures not included in Table 1 will be in accordance with the contract.

The Engineer will develop and follow a QA plan. The Engineer will provide the QA plan to the QC Plan Administrator a minimum of 5 working days prior to the pre-production meeting. The QA plan will be reviewed at the pre-production meeting and any proposed changes will be documented.

The nominal QA strength test specimen size, defined in subsection a.1 of this special provision will be noted in the QA plan.

A. Personnel Requirements. The personnel responsible for field inspection and for obtaining QA samples will possess the required qualifications to collect QA samples. Sampling will be performed by a certified concrete technician (MCA Michigan Level I or II) or (MCAT) certified aggregate technician, where applicable.

B. Testing Correlation. Prior to initial concrete placement, the testing personnel for both the Engineer's QA and Contractor's QC will use the equipment they have assigned to the project to conduct side by side correlation testing of the same concrete used on the project to verify correlation of both the Department's and the Contractor's test results for temperature and air content of fresh concrete. Additional side by side correlation testing will be conducted whenever there is a change in QC or QA equipment and/or testing personnel for the project, or as directed by the Engineer. The temperature measuring devices used for QC and QA must correlate with each other within 2 degrees F. If the air content results of the side by side tests conducted by the QC and QA testers and equipment differ by more than 0.8 percent air by volume of concrete, a referee air content test of fresh concrete must be conducted by a third party, designated by the Engineer but independent of the project, prior to commencement or continuation of concrete placement in efforts to resolve issues associated with non-correlation.

C. Laboratory Facilities. The testing laboratory with responsibility for acceptance testing on this project is the Department testing laboratory, or a qualified facility under the authority of the Engineer.

2. QA Sampling and Testing. The Engineer will verify the Contractor's daily startup sampling and testing of temperature, slump, and air content of fresh concrete on the first load; conduct QA sampling and testing; monitor Contractor adherence to the QC plan; and inspect field placed materials in such a manner as to ensure that all concrete for the project is represented. The testing correlation requirements of subsection d.1.B of this special provision must be met prior to concrete placement.

The following *ASTM* test methods will apply. The Department's established procedures for sampling and testing are acceptable alternatives.

C 31 Practice for Making and Curing Concrete Test Specimens in the Field

C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens

C 78 Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)

C 138 Test Method for Density (Unit Weight), Yield and Air Content (Gravimetric) of Concrete

C 143 Test Method for Slump of Hydraulic-Cement Concrete

C 172 Practice for Sampling Freshly Mixed Concrete

C 173 Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

C 231 Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

C 293 Test Method for Flexural Strength of Concrete (Using Simple Beam with Center-Point Loading)

A. Lot Size and Make Up. A production lot will not include more than one grade of concrete, concrete of the same grade having different specified slump or air content, or concrete of the same grade having different mix designs, or JMFs. Lot size and makeup will be determined by the Engineer, based on site conditions. A production lot may consist of a single day's production, individual concrete structural elements (eg. footing, column, pier cap, deck, bridge approach slab), or any combination thereof, provided they are of the same JMF. Each production lot will be divided into sublots of approximately equal size, as determined by the Engineer. The minimum number of sublots will be one per production lot, with the maximum number of sublots based on the anticipated total quantity of concrete to be placed and site conditions. A minimum of one sublot will be required for each day of production.

B. Sampling. QA sampling and testing will be conducted by the Engineer during concrete placement. Where practical, the random number method (as described in the "Random Sampling for Quality Control/Quality Assurance Projects" section of the Materials Quality Assurance Procedures Manual) will be used to determine the sampling locations. The sampling rate will be determined by the Engineer, based on the anticipated total quantity of concrete to be placed and site conditions, with a minimum of one sampling for each day of production.

At the option of the Engineer, small incidental quantities as defined in subsection a.1 of this special provision may be accepted (visually inspected and noted on the Inspector's Daily Report) without daily 28-day compressive strength QA test specimens provided there is a current acceptable strength test history of the JMF for the project prior to placement of the small incidental quantity. One set of compressive strength QA test specimens will then be molded for each small incidental quantity JMF at least once per week during production, thereafter, as determined by the Engineer (note the test results or identification number for the corresponding weekly QA compressive strength test result on the Inspector's Daily Report for each small incidental quantity). Quality control testing and daily QA testing for temperature, slump, and air content of fresh concrete are still required. Reduced QC for small incidental quantities, as described in subsection c.5.G of this special provision, may be considered.

The QA sampling rate and sample location will be based on cubic yard quantities.

Samples for acceptance will be taken at the point of discharge from the haul unit, at approximately the middle one-third of the load. Mix adjustments to the concrete contained within the haul unit selected for QA sampling and testing (beyond normal QC) will not be permitted prior to QA sampling and testing. QA sampling will be random and without prior notification.

The Engineer will perform QA sampling and testing for air content loss of fresh concrete that is either slipformed or pumped, (1) at least once during each day of production, (2) whenever the concrete pump is relocated, where applicable, or (3) whenever there is a significant change in the boom configuration or operation of the concrete pump, or there is a significant change in the characteristics of the paving operation during concrete placement. Concrete will be sampled from a representative haul unit immediately after its discharge but before the slipform paver or pump hopper, where applicable. The concrete representing the same haul unit will then be sampled and tested after the slipform paver or after discharge from the pump (without interruption or alteration of the pumping operation), where applicable. If the difference in measured air content between the two test locations for the same concrete is greater than 1.5 percent air by volume of concrete, the Engineer will issue a Notice of Non-Compliance with Contract Requirements (Form 1165), as described in subsection d.2.D of this special provision. The Contractor may resume concrete placement only after the necessary corrective action is taken to reduce the loss in air content of fresh concrete between the two test locations, as approved by the Engineer. Document the corrective action that was taken by the Contractor.

C. Testing. The location(s) within the project limits for QA testing of the fresh concrete and placement of curing facilities for initial curing of the 28-day compressive strength QA test cylinders will be determined by the Engineer in conformance with the following criteria:

(1) The elapsed time between obtaining the first and the final portion of the composite sample must not exceed 15 minutes.

(2) Testing for slump, temperature, and air content of fresh concrete must begin within 5 minutes after obtaining the final portion of the composite sample.

(3) Molding of the 28-day compressive strength QA test cylinders must begin within 15 minutes after obtaining the final portion of the composite sample.

(4) The concrete sample must be protected from the sun, wind, and other sources of rapid evaporation, and from contamination.

Two QA concrete strength test specimens per sample will be molded for 28-day compressive strength QA testing.

The Contractor will provide curing facilities equipped to ensure the proper environment for the Agencies QA concrete strength test specimens during initial cure. Each initial cure facility must provide ventilation or insulation, where applicable, to ensure the ambient temperature surrounding the specimens is maintained according to *AASHTO T23/ASTM C 31*. Failure by the Contractor to maintain the proper curing environment during initial cure will not be basis for rejection of samples or claims against the Department. Each initial curing facility must be capable of being locked, using an Department provided padlock. The Contractor will ensure that all initial curing facilities are accounted for at all time, and protected against theft and damage. The Contractor will place and secure each initial cure facility throughout the project limits in such a manner so as to minimize excessive transport of the test specimens prior to initial cure, as follows:

(5) Immediately after finishing molded specimens, the Engineer will move the QA concrete strength test specimens to the closest initial cure facility provided by the Contractor.

(6) Immediately after all QA concrete strength test specimens are placed into the cure facility and the proper initial curing conditions have been established, the Engineer will secure the facility using the Department provided padlock. Access to the QA concrete strength test specimens, thereafter, must be coordinated with the Engineer and will only be permitted in the presence of the Engineer.

(7) The Engineer will transport the QA concrete strength test specimens within 48 hours after molding, but not prior to 8 hours after final set of the concrete, from the initial curing facility to the Department's designated testing laboratory for final curing and strength testing. The specimens will be protected with a suitable cushioning material to prevent damage from jarring during transport. The total transportation time must not exceed 4 hours prior to commencement of final curing.

D. QA Stop Production Criteria. The Engineer will issue a Notice of Non-Compliance with Contract Requirements (Form 1165) and concrete production must stop when one or more of the following are observed.

(1) The QA testing shows that one or more of the suspension limits for quality characteristics defined in Table 2 are in non-compliance.

(2) The QC plan is not being followed.

(3) Segregation, excessive slumping of unsupported slipformed edges, or other notable changes in the fresh concrete properties is observed that may prevent proper placement, consolidation and finishing, or compromise the performance or long-term durability of the finished product.

(4) The required curing system is not being applied in a timely manner, as specified by the contract.

(5) If the measured air content loss between the two testing locations for the same concrete is greater than 1.5 percent air by volume of concrete as described in subsections c.5.E and d.2.B of this special provision.

(6) If the air content of fresh concrete is less than 5.0 or greater than 9.0 percent after pump or paver, regardless of the recorded QC or QA air content loss through the pump or paver.

The Engineer will issue a Notice to Resume Work (Form 1165) only after all necessary adjustments are made to restore conformance with all applicable specifications, and the appropriate documentation is made in the QC records.

E. QA Records. The Engineer will maintain a complete record of all QA tests and inspections. The records will contain, as a minimum, signed originals of all QA test results and raw data, random numbers used (where applicable) and resulting calculations. The QA test results will not be provided to the Contractor until the corresponding QC test results are received by the Engineer.

3. Quality Index Analysis. The Engineer's QA test results will be used to determine the pay factor (PF) and price adjustment (ADJ). The Contractor's QC test results will not be used for pay factor and price adjustment analysis. The Engineer will complete pay factor and price adjustment analysis within 7 working days after completion of all 28-day compressive strength testing for the representative production lot or quantity of concrete. The quality index parameter specification limits are defined in Table 3. Unless otherwise specified in the contract, concrete not conforming to the requirements specified in Table 3 is rejectable and subject to further evaluation. All values of PF and OLPF in these formulae are decimal, not percent. All values of PF and OLPF are rounded to two decimal places.

Price adjustment for 28-day compressive strength deficiencies will be based on test results for the corresponding weekly QA test specimens and the pay factor (PFs) calculated according to the formula defined in subsection d.3.A. The price adjustment (ADJ) = (PFs – 1)(Price).

Table 3: Quality Index Parameter Specification Limits

Quality Characteristic	Specification Limits
Air Content of Fresh Concrete (percent)	5.5 – 8.5
Rejection Limit (percent)	<5.0 or >9.0
Conc. Temp. (deg. F)	45 - 90 at time of placement
Slump (max.) (inch)	See Table 1, footnote (g)
28-day Compressive Strength (psi)	For LSL see Table 1
Rejection Limit - 28-day Compressive Strength	See Table 1

A. Pay Factor for 28-Day Compressive Strength (PFs).

$$PFs = \frac{\text{Tested Strength}}{\text{LSL}}$$

Where:

PFs = Pay Factor for 28-day compressive strength (not to exceed 1.00)

Tested Strength = QA 28-day compressive strength sample test result

LSL = Lower specification limit (see Table 1)

If the tested strength does not meet the rejection limit specified in Table 1, the Engineer will require additional evaluation as described in subsection d.4 of this special provision.

B. Pay Factor for Air Content of Fresh Concrete (PFac). The pay factor for air content of fresh concrete (PFac) will be according to Table 4.

Table 4: Air Content of Fresh Concrete Pay Factor (PFac)

Air Content of Fresh Concrete (percent)	Pay Factor (PFac)
5.5 – 8.5	1.00
5.0 – 5.4	0.50
Below 5.0	Rejection
8.6 – 9.0	0.75
Above 9.0	Rejection

If the air content of fresh concrete is below 5.0 or above 9.0 percent, the Engineer will elect to do one of the following.

(1) Require removal and replacement of the entire quantity of concrete represented by the test with new testing conducted on the replacement concrete and repeat the evaluation procedure.

(2) Allow submittal of a corrective action plan for the Engineer's approval. If the Engineer does not approve the plan for corrective action, subsection d.3.B.(1) of this special provision will be applied. All costs associated with plan submittal and corrective action under this subsection will be borne by the Contractor.

C. Overall Lot Pay Factor (OLPF). The following formulae are used to calculate the OLPF and ADJ. The OLPF will not exceed 1.00.

$$OLPF = (0.60 \times PFs) + (0.40 \times PFac)$$

$$ADJ = (OLPF - 1)(Price)$$

ADJ = Price adjustment per pay unit to be applied to the quantity represented by the QA test

Price = Base price established for the pay item

4. Evaluation of Rejectable Concrete. The Engineer will require additional evaluation to decide what further action may be warranted, as described below. Acceptance for air content of fresh concrete will be based on QA test results reported at the time of concrete placement.

If the Engineer determines that non-destructive testing (NDT) is appropriate, this work will be

done by the Contractor in the presence of the Engineer within 45 calendar days from concrete placement. All costs associated with this work will be borne by the Contractor. A complete set of non-destructive tests must be conducted (in accordance with the respective standard test method) at a minimum three randomly selected locations. If NDT is used to estimate the in-situ strength, a calibrated relationship between the project JMF under evaluation and the NDT apparatus must have been established prior to NDT testing according to its respective standard test method.

If the 28-day compressive strength QA test results show that the rejection limit (as specified in Table 1) has not been achieved, the quantity of concrete under evaluation will be rejected and the Engineer will require additional evaluation to decide what further action may be warranted.

Propose an evaluation plan and submit it to the Engineer for approval before proceeding. The results from NDT will be used only to decide what further action is required. This determination will be made by the Engineer, as follows:

A. For non-structural concrete. If no test result from non-destructive testing falls below the lower specification (LSL) 28-day compressive strength, the represented quantity of concrete under evaluation will remain in place and a pay factor for 28-day compressive strength (PFs) of 1.00 will be applied for overall lot pay factor (OLPF) and price adjustment (ADJ) determinations according to subsection d.3 of this special provision.

B. For structural concrete (including overhead sign foundations). If no test result from non-destructive testing falls below the lower specification limit 28-day compressive strength, the represented quantity of concrete under evaluation will remain in place and a pay factor for 28-day compressive strength (PFs) of 0.85 will be applied for overall lot pay factor (OLPF) and price adjustment (ADJ) determinations according to subsection d.3 of this special provision.

C. If one or more of the non-destructive test results fall below the lower specification limit (LSL) 28-day compressive strength, the Engineer may elect to do one of the following:

(1) Require removal and replacement of the entire rejected quantity of concrete, including new initial tests for pay factor (PF) determination and price adjustment conducted according to subsection d.3 of this special provision.

(2) Allow the Contractor to submit a plan for corrective action, for the Engineer's approval, to address the disposition of the rejected concrete. If the Engineer does not approve the plan for corrective action, subsection d.4.C.(1) of this special provision will be applied. All costs associated with plan submittal and corrective action under this subsection will be borne by the Contractor.

(3) Allow the in-situ quantity of concrete under evaluation to remain in place and a pay factor (PFs) of 0.50 will be applied for overall lot pay factor (OLPF) and price adjustment (ADJ) determinations according to subsection d.3 of this special provision.

e. Measurement and Payment. If a price adjustment is made for reasons included in this special provision, that adjustment will be made using the base price established for the specific item. If a contract unit price requires adjustment for other reasons not described in this special provision, the adjustments will be made using the unit price and the adjustments will be

cumulative.

Separate payment will not be made for providing, implementing, and maintaining an effective QC program. All costs associated with this work will be included in the applicable unit prices for the concrete items. Failure by the Contractor to maintain the proper curing environment during initial cure will not be basis for claim against the Department.

All costs associated with providing, locating, relocating, maintaining, and securing the adequate number of portable initial curing facilities for both the QC and QA strength test specimens will be included in the applicable unit prices for the concrete items. No additional payment will be permitted. The Contractor is responsible for damage, theft, subsequent replacement, and removal after completion of the work for each curing facility used on the project.

SPECIAL PROVISION FOR
MAINTAINING TRAFFIC

TUSCOLA COUNTY ROAD COMMISSION – 1733 S. MERTZ ROAD, CARO, MI 48723

GENERAL

Traffic shall be maintained in accordance with Sections 812 and 922 of the 2020 Michigan Department of Transportation (MDOT) Standard Specifications for Construction, including any Supplemental Specifications, and as herein specified.

CONSTRUCTION INFLUENCE AREA

The construction influence area (CIA) shall consist of the width of the project right-of-way from 3,500 feet before the project P.O.B. to 3,500 feet beyond the project P.O.E. and 500 feet in all directions along all crossroads.

TRAFFIC CONTROL DEVICES

All traffic control devices and their usage shall conform to the Michigan Manual on Uniform Traffic Control Devices (MMUTCD), 2011 edition as amended, and as herein specified.

Sign covers shall be placed over existing regulatory, warning and construction signs that are not applicable during construction.

Signing for a lane closure shall be according to attached MDOT Maintaining Traffic Typical Figure M0150a. The use of the speed limit signs, R 2-1, will be as needed.

Sheeting shall conform to section 922.02B of the 2020 Standard Specifications for Construction. Engineer grade reflective sheeting must meet the requirements for ASTM D 4956 Type I engineer grade sheeting.

TRAFFIC RESTRICTIONS

Work shall be conducted during daylight hours only. No work shall be conducted on Sundays unless approved by the Engineer.

The maximum distance between the traffic regulators shall be no more than 2 miles in length. All sequences of more than 2 miles in length will require written permission from the Engineer before proceeding.

PAYMENT

Payment for Maintaining Traffic shall be included in other Bid unit prices. There will be no separate payment for Maintaining Traffic.

Approved by Board 1/27/05 rev.1/17/07 rev.12/22/11 rev. 117/13

TUSCOLA COUNTY ROAD COMMISSION
TITLE IV COMPLIANCE
APPENDIX A

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

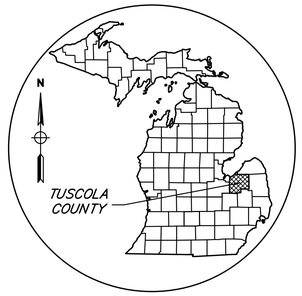
1. Compliance with Regulations: The contractor shall comply with the Regulations relative to non-discrimination in Federally-assisted programs of the Department of Transportation, Title 49, code of Federal Regulations, Part 21 as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.
2. Non-discrimination: The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment.
3. The contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulation, including employment practices when the contractor covers a program set forth in Appendix B of the Regulations.
4. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to non-discrimination on the grounds of race, color, or national origin.
5. Information and Reports: The contractor shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities us may be determined by the Tuscola County Road Commission to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of a contractor is in the exclusive possession of another who fails or refuses this information, the contractor shall so certify to the State high· way department, or the Federal Highway Administration as appropriate, and shall set forth what efforts it has made to obtain the information.
6. Sanctions for Non-compliance: In the event of the contractor's non-compliance with the non-discrimination provisions of this contract, the Tuscola County Road Commission Shall Impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:
    a) Withholding of payments to the contractor under the contract until the contractor complies, and/or
    b) Cancellation, termination, or suspension of the contract, in whole or in part.
7. Incorporation of Provisions: The contractor shall Include the provisions of paragraphs (l) through (6) in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Regulations, or directives Issues pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the Tuscola County Road Commission may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that, in the event u contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the Tuscola County Road Commission to enter into such litigation to protect the interests of the County, and, in addition, the contractor may request the State highway department to enter into such litigation to protect the interests of the State and/or the United States to enter into such litigation to protect the interests of the United States.

"The TUSCOLA COUNTY ROAD COMMISSION, in accordance with Title VI of the Civil Rights Act of 1964, 78-252, 42 U.S.C. 2000d-222d-4, the Civil Rights Act of 1987, P.L. 100-259, and Title 49, Code of Federal Regulations, Department of Transportation, subtitle A, Office of the Secretary, Part 21, Non- discrimination in federally assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, Disadvantaged Business Enterprise firms will be afforded full oppo1iunity to submit bids in response to this invitation and will not be discriminated against on the grounds of Race, Color, Sex, Age, National Origin, or Handicap in consideration for an award. For additional compliance information, please see Appendix A."

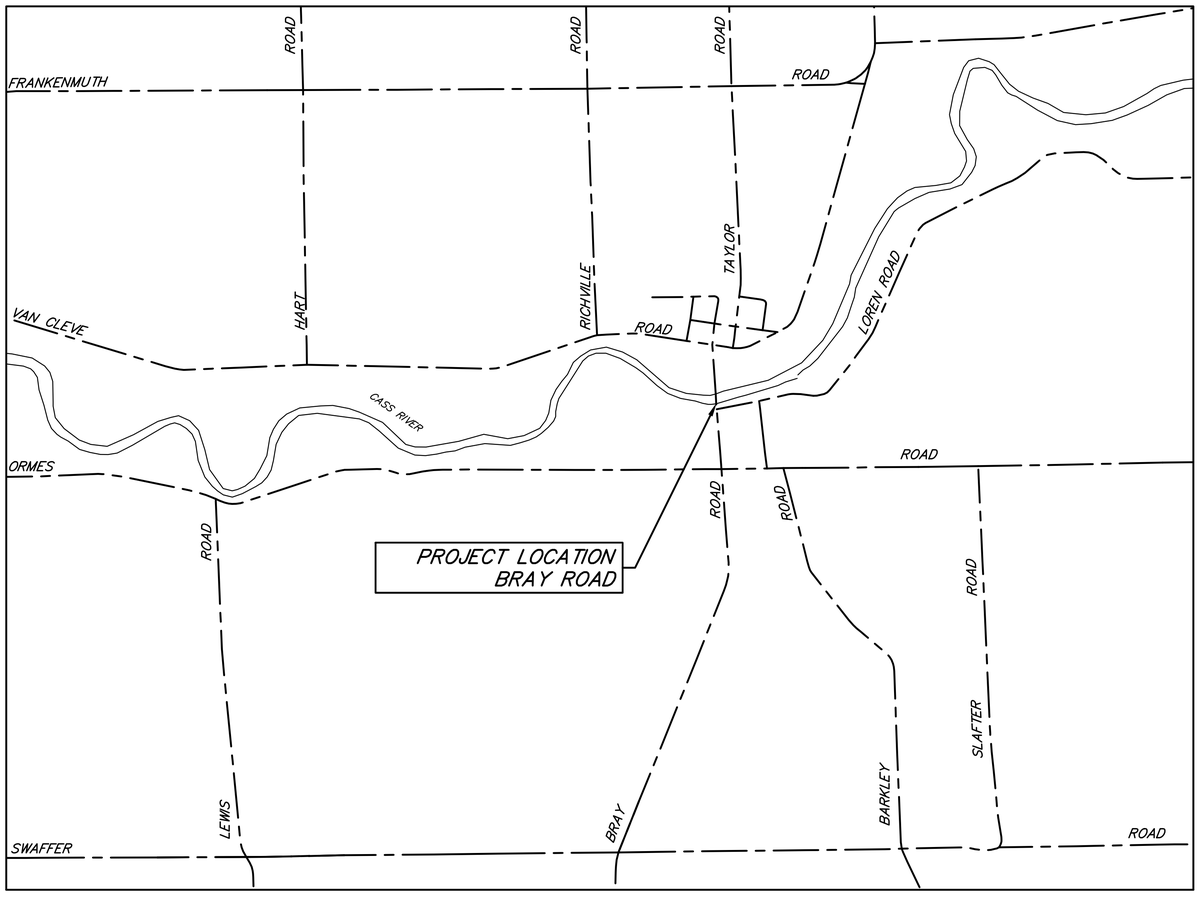
BRAY ROAD STORM OUTLET

TUSCOLA COUNTY ROAD COMMISSION

PLAN INDEX		
FILE NO.	DESCRIPTION	NO.
DR-4024-01	COVER SHEET	1
DR-4024-02	CONTACTS, GENERAL NOTES, LINE TYPES LEGEND, AND SESC MEASURE LEGEND	2
DR-4024-03	PLAN AND PROFILE - BRAY ROAD STA 0+00 TO STA 3+00	3
DR-4024-04	STANDARD DETAILS	4



AREA MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

SECTION 28, T11N-R07E,
TUSCOLA TOWNSHIP,
TUSCOLA COUNTY, MICHIGAN

BY	MARK	REVISIONS	DATE

THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREON IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.

BRAY ROAD STORM OUTLET
TUSCOLA COUNTY, MICHIGAN

COVER SHEET

SAGINAW OFFICE
230 S. Washington Ave.
Saginaw, MI 48607
Tel. 989-754-4717
Fax. 989-754-4440
www.SpicerGroup.com

DE. BY: POC/NDC CH. BY: NDC DR. BY: POC APP. BY: RBH		PROJECT NO. 128551SG2020
STDS.	SHEET 01 OF 04	DR 01
DATE JUNE, 2021 SCALE AS SHOWN	FILE NO. DR-4024-01	

GENERAL NOTES

NO WORK SHALL BE PERFORMED BEFORE 7:00 AM OR AFTER 7:00 PM MONDAY THROUGH SATURDAY. NO WORK SHALL HAPPEN ON SUNDAYS OR HOLIDAYS. UNLESS AUTHORIZED BY THE OWNER.

CONTRACTOR SHALL NOTIFY ENGINEER 72 HOURS PRIOR TO START OF CONSTRUCTION, CONSTRUCTION STAKING AND INSPECTION.

CONTRACTOR SHALL MAINTAIN ACCESS FOR MAIL DELIVERY AND GARBAGE PICKUP AT ALL PARCELS. IF THESE SERVICES CANNOT BE PERFORMED CONTRACTOR IS RESPONSIBLE FOR TAKING THE NECESSARY MEASURES TO CARRY THEM OUT.

CONTRACTOR TO PROVIDE DUST CONTROL AND SWEEP ROADS DAILY.

ALL EXCAVATED MATERIAL NOT TO BE REUSED OR DISPOSED OF ON SITE SHALL BE REMOVED FROM SITE. THE CONTRACTOR IS RESPONSIBLE FOR DISPOSING MATERIALS ACCORDING TO LOCAL AND STATE REQUIREMENTS.

ALL WORK SHALL BE WITHIN DRAIN RIGHT-OF-WAY. WORK OUTSIDE RIGHT-OF-WAY MUST BE AGREED UPON BY LANDOWNER AND ENGINEER WITH A SIGNED LANDOWNER AGREEMENT PRIOR TO WORK ON THAT PROPERTY.

RESTORE ALL LAWN AREAS WITH 4" OF TOPSOIL, SEED, AND MULCH.

CONTRACTOR TO RESTORE INCIDENTAL DAMAGES ON THE PROJECT AS DIRECTED BY OWNER AND ENGINEER AT CONTRACTORS EXPENSE.

ALL DRAIN SIDE SLOPES SHALL BE 2H:1V OR FLATTER, UNLESS SPECIFIED OTHERWISE.

THE WORDS "RIGHT SIDE" OR "LEFT SIDE" IMPLY A REFERENCE TO THE DRAIN FACING UPSTREAM.

REMOVE EXISTING FENCES, LANDSCAPING, AND OTHER STRUCTURES IN DRAIN RIGHT-OF-WAY AS NEEDED FOR CONSTRUCTION. REINSTALLATION OF FENCES MUST BE COORDINATED WITH THE LAND OWNER AT THE LAND OWNER'S EXPENSE, UNLESS STATED OTHERWISE IN THE PLANS. COST TO BE INCLUDED IN SITE CLEARING.

CONTRACTOR SHALL COORDINATE REMOVAL OF TREES WITHIN THE LIMITS OF CONSTRUCTION WITH THE PROPERTY OWNER AND ENGINEER.

TOPSOIL SHALL BE STRIPPED AND STOCKPILED FOR USE AS TOPSOIL SURFACE AS DIRECTED BY THE ENGINEER.

ALL SPRINKLER SYSTEMS DAMAGED SHALL BE REPAIRED BY CONTRACTOR. COST TO BE INCLUDED IN OTHER WORK ITEMS OF THE PROJECT.

UNDERGROUND UTILITIES/MISS DIG

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 174, 2013, THE CONTRACTOR SHALL DIAL 1-800-482-7171 OR 811 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 EXISTING UTILITIES ON THESE DRAWINGS HAVE BEEN SHOWN ACCORDING TO THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL FIELD LOCATE ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION AND SHALL NOTIFY THE ENGINEER AS TO WHERE POSSIBLE CONFLICT EXISTS.

ALL CONSTRUCTION UNDER EXISTING UTILITIES, INCLUDING HOUSE SERVICES, SHALL BE COMPLETELY BACKFILLED WITH SAND, IN 12" LAYERS, AND COMPACTED TO NOT LESS THAN 95% OF THE MAXIMUM UNIT WEIGHT.

ANY UTILITIES ENCOUNTERED DURING CONSTRUCTION SHALL BE SUPPORTED, PER THE SPECIFICATIONS OF THE INDIVIDUAL UTILITY COMPANY CLAIMING OWNERSHIP OF THE UTILITY.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES

APPROPRIATE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EARTH-DISTURBING ACTIVITIES. PLACE TURF ESTABLISHMENT ITEMS AS SOON AS POSSIBLE ON POTENTIAL ERODABLE SLOPES AS DIRECTED BY THE ENGINEER. CRITICAL DITCH GRADES SHALL BE PROTECTED WITH EITHER SOD OR SEED/MULCH OR MULCH BLANKET AS DIRECTED BY THE ENGINEER.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT SOIL EROSION AND SEDIMENTATION CONTROL MEASURES ARE IN PLACE AND MAINTAINED UNTIL THE CONTRACT HAS BEEN COMPLETED AND ACCEPTED. MEASURES SHALL ONLY BE PAID FOR ONCE.

ALL CATCHBASINS AND SEDIMENTATION TRAP/BASIN SHALL BE CLEANED OUT UPON COMPLETION OF THE PROJECT.

CONTRACTOR SHALL CONFORM TO SOIL EROSION AND SEDIMENTATION CONTROL ACT, PART 91 OF ACT 451 OF 1994.

SOIL EROSION SEDIMENT CONTROL

GROUNDWATER SEEPAGE AND STORMWATER RUNOFF IS ANTICIPATED TO BE A FACTOR DURING CONSTRUCTION. WATER CONTROL AND DEWATERING METHODS MAY BE NECESSARY. ALL WATER CONTROL AND DEWATERING REQUIRED IS THE CONTRACTOR'S RESPONSIBILITY AND COST SHALL BE INCLUDED IN THE PAY ITEM BEING INSTALLED. THE METHODS SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.

ALL DEWATERING REQUIRED FOR CONSTRUCTION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR UTILITY BEING INSTALLED.

ALL RIPRAP MATERIAL SHALL BE APPROVED BY THE ENGINEER UNLESS OTHERWISE DIRECTED. SUBMIT SAMPLES TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. OWNER AND ENGINEER RESERVES THE RIGHT TO REJECT ANY AND ALL RIPRAP.

CONTRACTORS SHALL FINISH GRADE, SEED, FERTILIZE, AND MULCH DAILY ON ALL DISTURBED AREAS AS DESCRIBED IN THE SPECIFICATIONS.

HAND SEED, FERTILIZE, AND MULCH DITCH BANKS AND SPOILS DAILY.

ALL DISTURBED WETLAND AREA SHALL BE SEEDED WITH NATIVE WETLAND SEED AS SPECIFIED BY ENGINEER.

PROPERTY OWNERS

PROPERTY OWNERS' NAMES AND PARCEL LINES, WHERE SHOWN, ARE FOR INFORMATION ONLY, AND THEIR ACCURACY IS NOT GUARANTEED.

PROPERTY CORNER MONUMENT VISIBILITY OBSERVED ON SITE SHALL BE PROTECTED. DAMAGED PROPERTY CORNER WILL BE RESET AT CONTRACTORS EXPENSE.

ADJUSTING MONUMENT BOXES

ALL GOVERNMENT CORNERS ON THIS PROJECT SHALL BE PRESERVED, WHETHER SHOWN OR NOT. IT MAY BE NECESSARY TO PLACE OR ADJUST MONUMENT BOXES, AS REQUIRED.

TRAFFIC

PERMITS

PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED BY THE APPROPRIATE AGENCIES. THIS INCLUDES A GENERAL RIGHT-OF-WAY PERMIT WITH THE TUSCOLA COUNTY ROAD COMMISSION.

CONSTRUCTION PROCEDURES SHALL CONFORM TO THE REQUIREMENTS OF THE APPROPRIATE AGENCIES.

GENERAL NOTES

ROADS, DRIVEWAYS AND SIDEWALKS

COORDINATE DRIVEWAY CLOSURES WITH LANDOWNERS A MINIMUM OF ONE DAY IN ADVANCE.

ALL JOINTS AT INTERSECTION APPROACHES AND DRIVEWAYS SHALL BE SAW-CUT WITH BUTT-JOINTS. COST TO BE INCLUDED IN UNIT PRICE BID THAT INCLUDES ROAD AND DRIVEWAY REPAIRS.

FOR OPEN CUT PAVEMENT REMOVAL CONTRACTOR SHALL SAW CUT THE EXISTING PAVEMENT FULL DEPTH PRIOR TO REMOVAL.

ALL DRIVING SURFACES ARE TO BE RESTORED TO IN KIND DEPTH AND MATERIAL UNLESS OTHERWISE SPECIFIED ON THE PLANS. COST TO BE INCLUDED IN THE BID PRICE FOR WORK PERTAINING TO EACH CROSSING.

PROTECT ALL BITUMINOUS ROADS NOT SPECIFIED TO BE REMOVED DURING CONSTRUCTION. REPAIR ANY UNAUTHORIZED DAMAGE AT CONTRACTORS EXPENSE.

BROKEN CONCRETE AND DEBRIS SHALL BE CONSIDERED WASTE AND SHALL BE DISPOSED OF BY THE CONTRACTOR OFF SITE. COST SHALL BE INCLUDED IN THE OTHER PAY ITEMS OF THE PROJECT.

MATCH EXISTING TYPE FOR CONCRETE CURB AND GUTTER RESTORATION.

CONTRACTOR SHALL REMOVE ALL STREET AND TRAFFIC SIGNAGE AS NECESSARY FOR CONSTRUCTION. ALL COSTS TO BE INCLUDED IN THE LUMP SUM PRICE BID FOR SITE CLEARING. REPLACE SIGNAGE AS CONSTRUCTION ALLOWS. COST TO BE INCLUDED IN THE UNIT PRICE FOR CLEANUP AND RESTORATION.

CONTRACTOR SHALL COORDINATE LOCATION OF ANY ACCESS ROADS WITH THE LANDOWNER AND THE ENGINEER. ANY ACCESS ROAD SHALL BE REPAIRED TO THE LANDOWNERS AND OWNERS APPROVAL.

ALL WORK WITHIN THE ROAD RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND GENERAL SPECIFICATIONS OF THE COUNTY ROAD COMMISSION, CITY, VILLAGE, AND MDOT.

UTILITIES

ELECTRIC, GAS AND TELEPHONE UTILITIES LOCATED IN THE ROAD AND DRAIN RIGHT-OF-WAYS REQUIRING RELOCATION WILL BE RELOCATED BY OTHERS.

WHEN RELOCATING UTILITIES AS REQUIRED FOR CONSTRUCTION OF DRAIN IMPROVEMENTS A MINIMUM CLEARANCE OF 36" BELOW THE BOTTOM OF PROPOSED DRAIN CROSSING MUST BE ACHIEVED UNLESS OTHERWISE SPECIFIED.

ALL WATER VALVE BOXES SHALL BE ADJUSTED TO FINISHED GRADE. COST SHALL BE INCLUDED IN THE PAY ITEM BEING INSTALLED.

ANY UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

ALL MANHOLE RIMS IN ROADWAYS AND DRIVES SHALL BE ADJUSTED PRIOR TO FINAL PAVING TO BE FLUSH WITH FINISHED GRADE.

GRADING AROUND MANHOLES/CATCHBASINS, FLARED END SECTIONS, AND OTHER INLETS DETERMINED BY THE ENGINEER SHALL BE SMOOTH AND SHAPED TO PROVIDE POSITIVE DRAINAGE INTO THE INLETS.

ALL CORRUGATED METAL PIPE SHALL BE TYPE II ALUMINIZED UNLESS OTHERWISE NOTED.

DEMOLISH EXISTING STRUCTURE(S) AND DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS. COST TO BE INCLUDED WITH THE ITEM BEING INSTALLED AS DIRECTED BY OWNER/ENGINEER.

CONTRACTOR SHALL CONNECT ANY AND ALL FIELD TILE OUTLETS AND OTHER STORM LEADS TO PROPOSED STORM SEWER WITH PREMANUFACTURED TEES, WYES, GASKETS, SEALS, COUPLERS, BOOTS, ETC. COST TO BE INCLUDED IN UNIT BID PRICE FOR STORM SEWER INSTALLATION.

LINE TYPE LEGEND

- EXISTING ROAD CENTERLINE
- EXISTING WATER MAIN
- EXISTING SANITARY SEWER OR FORCEMAIN
- EXISTING STORM SEWER
- EXISTING TELEPHONE
- EXISTING GAS MAIN
- EXISTING ELECTRIC
- EXISTING FIBER OPTIC
- EXISTING CABLE/TV
- PROPOSED UTILITY
- EXISTING CURB & GUTTER
- PROPOSED CURB & GUTTER
- FENCE LINE
- OVERHEAD UTILITY
- RAILROAD TRACKS
- STATION LINE
- LIMITS OF RIGHT OF WAY
- EASEMENT
- SILT FENCE
- REVERSE PAN CURB & GUTTER
- TREE LINE
- EXISTING CONTOURS
- PROPOSED CONTOURS

ABBREVIATIONS

BC = BACK OF CURB
BM = BENCH MARK
CB = CATCH BASIN
C/C = CENTER TO CENTER
CJ = CONSTRUCTION JOINT
CL = CENTERLINE
CMP = CORRUGATED METAL PIPE
CONC = CONCRETE
CORR = CORRUGATED
CSP = CORRUGATED STEEL PIPE
DI = DUCTILE IRON PIPE
EF = EACH FACE
ELEC = ELECTRIC
EL OR ELEV = ELEVATION
EOM = EDGE OF METAL
EOP = EDGE OF PAVEMENT
EQ/SP = EQUALLY SPACED
ESMT = EASEMENT
EW = EACH WAY
EX OR EXIST = EXISTING
FF = FINISH FLOOR
FG = FINISH GROUND
FL = FLOW LINE
FS = FINISH SURFACE
FT = FEET
GALV = GALVANIZED
G = GUTTER
GA = GAUGE
HDG = HOT DIP GALVANIZED
HDPE = HIGH DENSITY POLYETHYLENE
HMA = HOT MIX ASPHALT
HOR = HORIZONTAL
HP = HIGH POINT
HYD = HYDRANT
INV = INVERT
LP = LOW POINT
OC = ON CENTER
OH = OVERHEAD
MH = MANHOLE
MIN = MINIMUM
MON = MONUMENT
NFL = NOT FIELD LOCATED
NTS = NOT TO SCALE
PROP = PROPOSED
PVC = POLYVINYL CHLORIDE
RCP = REINFORCED CONCRETE PIPE
ROW = RIGHT OF WAY
SAN = SANITARY
SB = SOIL BORING
SS = STAINLESS STEEL
STA = STATION
STM = STORM
SWR = SEWER
T/B = TOP AND BOTTOM
TC = TOP OF CURB
TOB = TOP OF BANK
TOS = TOE OF SLOPE
TELE = TELEPHONE
TRW = TOP OF RETAINING WALL
TW = TOP OF WALK
UNO = UNLESS NOTED OTHERWISE
WM = WATER MAIN
WS = WATER SURFACE ELEVATION

MICHIGAN ASSOCIATION OF COUNTY DRAIN COMMISSIONERS SOIL EROSION AND SEDIMENTATION CONTROL KEYING SYSTEM

KEY	SESC MEASURE	SYMBOL	WHERE USED
1	SEEDING		When bare soil is exposed, temporarily or permanently, to erosive force from wind and or water on flat areas, mid slopes, grassed waterways and spillways, diversion ditches and dikes, barrow and stockpile areas, and spoil piles.
2	MULCH		On flat areas, slopes, grassed waterways and spillways, diversion ditches and dikes, barrow and stockpile areas, and spoil piles when areas are subject to raindrop impact, and erosive force from wind or water.
7	STORM DRAIN INLET PROTECTION		Around the entrance to a catch basin or an inlet that will capture runoff from an earth change activity.
15	RIPRAP		Riprap and toe of slope protection is used in areas where velocities are causing drain bank erosion and are too high to stabilize using other methods
19	Armored Spillway		When concentrated flow must be conveyed down a drain bank or slope or discharge into another drain. Where slope failure or channel scour is observed or is likely to occur, or when runoff must be redirected around work in the drain.
23	Outfall Stabilization		In the stream or drain bank usually above the ordinary high water mark where an enclosed drain or tile discharges to an open drain.
26	DUST CONTROL		As a temporary measure on exposed and unstabilized areas that must be protected from wind or water erosion.

DETAILED DRAWINGS AND SPECIFICATIONS ARE LOCATED IN THE MICHIGAN ASSOCIATION OF COUNTY DRAIN COMMISSIONERS SOIL EROSION AND SEDIMENTATION CONTROL AUTHORIZED PUBLIC AGENCY PROCEDURES MANUAL

SYMBOLOGY FOR INSERTION INTO CONSTRUCTION DRAWINGS:

P = PERMANENT MEASURE

T = TEMPORARY MEASURE

CONTACTS

BRENT J. DANKERT P.E. — OWNER
TUSCOLA COUNTY ROAD COMMISSION
1733 MERTZ ROAD
CARO, MI 48723
(989) 751-3873

NICHOLAS D. CZERWINSKI P.E. — ENGINEER
SPICER GROUP, INC.
230 S. WASHINGTON AVENUE
SAGINAW, MI 48605
(989) 929-0256

SARAH KIPP — ELECTRIC
DTE ENERGY
1 ENERGY PLAZA 518 SB
DETROIT, MI 48226
(313) 399-3754

JOE RODEA — GAS
CONSUMERS ENERGY
2400 WEISS ST
SAGINW, MI 48602
(989) 791-5869

WILLIAM BOUMAN — TELEPHONE
WOLVERINE TELEPHONE (TDS TELECOM)
P.O. BOX 292
4712 EAST MAIN STREET
MILLINGTON, MI 48746
(989) 721-5101

PATRICK DELISI — TELEPHONE
CHARTER COMMUNICATIONS
1392 TRADE CENTRE DR
TRAVERSE CITY, MI 49696
(810) 247-3899

SYMBOL LEGEND
EXISTING SYMBOLS

- MANHOLE
- CATCH BASIN
- CURB CATCH BASIN
- FIRE HYDRANT
- GAS VALVE
- WATER VALVE
- TELEPHONE PEDESTAL
- POWER POLE
- TELEPHONE POLE
- POWER AND TELEPHONE POLE
- LIGHT POLE
- GUY ANCHOR AND POLE
- MAIL BOX
- WATER METER
- TELEPHONE MANHOLE
- ELECTRIC MANHOLE
- M.W. — MONITORING WELL
- HAND HOLE
- TRANSFORMER
- ELECTRICAL PEDESTAL
- BARRIER FREE PARKING
- SPRINKLER
- RAILROAD SIGNAL
- ANTENNA
- SATELLITE DISH
- AC — AIR CONDITIONING UNIT
- SB# — SOIL BORING
- BENCH MARK
- FOUND SURVEY CORNER
- SET 1/2" IRON ROD
- 1/4 SECTION CORNER
- BREAK IN LINE
- EXISTING SIGN-1 POST
- EXISTING SIGN-2 POST
- STUMP
- WETLANDS
- PINE
- BUSH
- TREE

PROPOSED SYMBOLS

- MANHOLE
- CATCHBASIN
- FIRE HYDRANT
- WATER VALVE
- BARRIER FREE PARKING
- LIGHT POLES
- DRAINAGE FLOW
- 600.00 LABEL — SPOT ELEVATION LABELS
  - G = GUTTER
  - TW = WALK
  - TC = TOP OF CURB
  - FS = FINISH SURFACE

WATERSHED LINE TYPE LEGEND

- EXISTING PROJECT DRAIN
- EXISTING DRAINS (OTHER)
- EXISTING DRAINAGE DISTRICT LINE
- PROPOSED DRAINAGE DISTRICT LINE
- PROPOSED SUB-DRAINAGE DISTRICT LINE

PROJECT DATUM	
HORIZONTAL:	STATE PLANE SOUTH MI '83 2113
VERTICAL:	NORTH AMERICAN VERTICAL DATUM '88

BY	MARK	REVISIONS	DATE

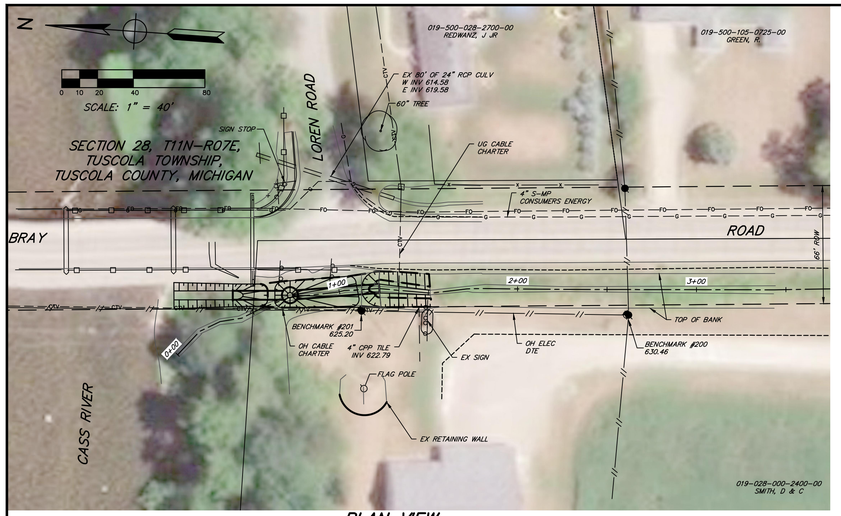
THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREON IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.

BRAY ROAD STORM OUTLET
TUSCOLA COUNTY, MICHIGAN

CONTACTS, GENERAL NOTES, LINE TYPES, LEGEND AND SESC MEASURE LEGEND

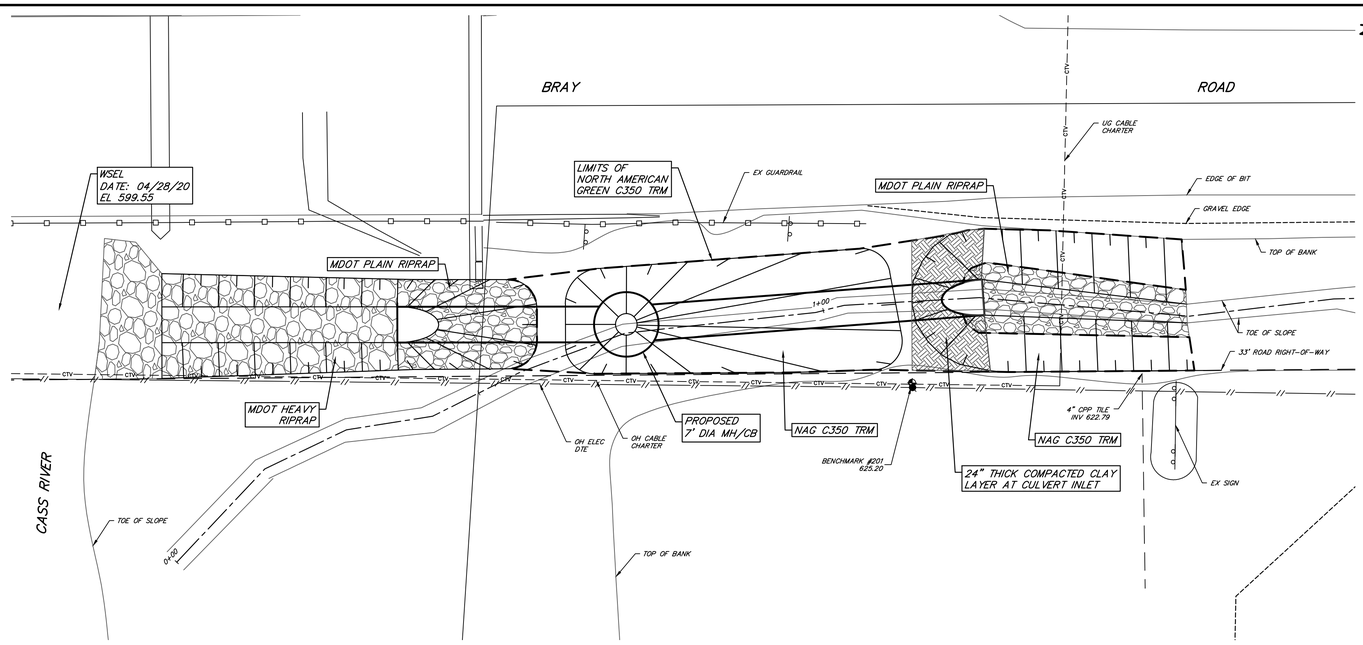
SAGINAW OFFICE
230 S. Washington Ave.
Saginaw, MI 48607
Tel. 989-754-4717
Fax. 989-754-4440
www.SpicerGroup.com

DE. BY: POC/NDC CH. BY: NDC DR. BY: POC APP. BY: RBH		PROJECT NO. 128551SG2020
STDS.	SHEET 02 OF 04	DR 02
DATE JUNE, 2021 SCALE AS SHOWN	FILE NO. DR-4024-02	



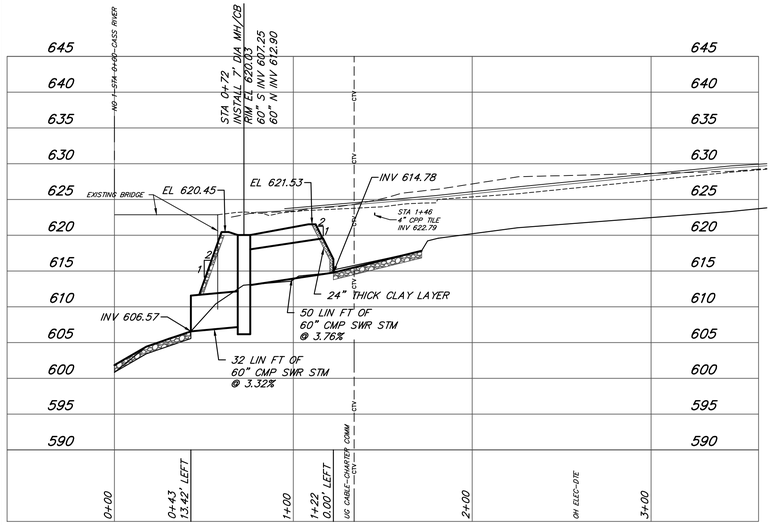
PLAN VIEW

SCALE: 1"=40'



DETAIL VIEW

SCALE: 1"=10'



PROFILE VIEW

SCALE: H:1"=40' V:1"=10'

QUANTITIES THIS SHEET

ITEM	UNIT	QTY.
7' DIA MH/CB (INCLUDES EJ 1045 FRAME W/ N OVAL GRATE	EACH	1
60" CMP (3"X1" CORR., 12GA) BEVEL INLET END 2 HOR. TO 1 VERT	LIN FT	82
NAG C350 TRM	SQ YDS	160
MDOT PLAIN RIPRAP	SQ YDS	70
MDOT HEAVY RIPRAP	SQ YDS	90
ALT BID ITEM : 60" DIA 1:6 MDOT SAFETY END SECTION	EACH	1

CONSTRUCTION NOTES

1. ALTERNATE BID ITEM INCLUDES 60" DIA 6:1 MDOT SAFETY END SECTION AS SHOWN ON MDOT DETAIL R-95-G IN LIEU OF THE BEVEL ON THE CULVERT INLET. PROPOSED CULVERT TO BE INSTALLED SO THAT MDOT SAFETY END SECTION ALIGNS WITH EXISTING DITCH CENTERLINE
2. CONTRACTOR TO SUPPORT EXISTING ROAD EMBANKMENT AND ANY UTILITIES WITH SHORING AS NECESSARY.
3. CONTRACTOR TO PROVIDE 24" THICK LAYER OF CLAY COMPACTED TO 95% OF MAXIMUM DRY DENSITY AT INLET END OF CULVERT TO PREVENT SEEPAGE THRU SAND BACKFILL.

BENCHMARKS

BM 200 – SET GEAR SPIKE IN 1ST POWER POLE NORTH OF "BEAVERS" ENTRANCE.
EL 630.46

BM 201 – FOUND LARGE SPIKE IN EAST FACE OF 2ND POWER POLE NORTH OF "BEAVERS" ENTRANCE.
EL 625.19

BM 202 – SET CHISELED SQUARE ON NORTHWEST CORNER OF NORTHWEST WING WALL ON NORTH SIDE OF BRIDGE.
EL 619.66

BY	MARK	REVISIONS	DATE

BRAY ROAD STORM OUTLET
TUSCOLA COUNTY, MICHIGAN

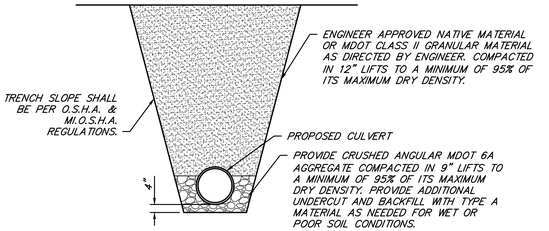
PLAN AND PROFILE BRAY ROAD OUTLET STA 0+00 TO STA 3+00

SAGINAW OFFICE
230 S. Washington Ave.
Saginaw, MI 48607
Tel. 989-754-4717
Fax. 989-754-4440
www.SpicerGroup.com

DE. BY: POC/NDC CH. BY: NDC
DR. BY: POC APP. BY: RBH
PROJECT NO. 128551SG2020

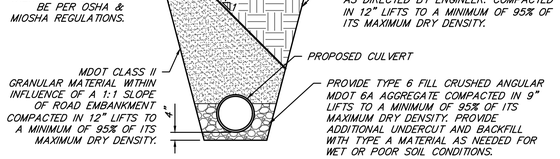
STDS.
SHEET 03 OF 04
DR 03

DATE JUNE, 2021
SCALE H:1"=40' V:1"=10'
FILE NO. DR-4024-03



TYPICAL NATIVE DRIVE CROSSING DETAIL

NOT TO SCALE



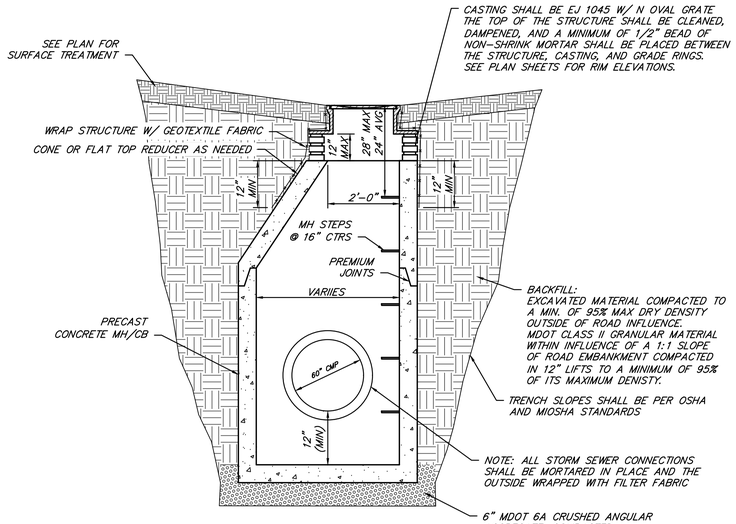
ADJACENT TO ROAD TRENCH DETAIL

NOT TO SCALE

TRENCH WIDTH CHART

PIPE SIZE	MINIMUM	MAXIMUM
8" & 10"	24"	30"
12" & 15"	30"	36"
18"	34"	40"
21"	38"	42"
24"	42"	46"
27"	45"	49"
30"	49"	53"
36"	56"	60"
LARGER THAN 36"	I.D. +20"	I.D. +24"

NOTE: CONTRACTOR SHALL USE APPROPRIATE MEASURES, APPROVED BY THE ENGINEER, TO PROVIDE A SEALED CONNECTION.



84" DIA MH/CB DETAIL

NOT TO SCALE

BY	MARK	REVISIONS	DATE

BRAY ROAD STORM OUTLET
TUSCOLA COUNTY, MICHIGAN

STANDARD DETAILS

SAGINAW OFFICE
230 S. Washington Ave.
Saginaw, MI 48607
Tel. 989-754-4717
Fax. 989-754-4440
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STDS.	SHEET 04 OF 04	DR 04
DATE JUNE, 2021 SCALE AS SHOWN	FILE NO. DR-4024-04	