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CITY OF DETROIT

PROGRESS CLAUSE

Fishbeck:DPE

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04/14/2020

The start date for this project shall be as of the date of the Start Work notice issued after the contract has been approved. Completion of the project construction including landscape planting and site furnishings must be completed to allow the public to occupy and use the project improvements. Construction of this project is expected to take 90 Calendar Days (except any landscaping maintenance guarantee work) inclusive of any rain days, and the entire project shall be completed by October 1, 2020. In no case shall any work be commenced prior to receipt of formal notice of award by the City of Detroit. Start work within ten (10) days after receiving notice of award of contract or on or before the date designated as the starting in the Detailed Progress Schedule, whichever is later. In no case, shall any work commence prior to receipt of formal notice of award by the City of Detroit.

Liquidated Damages will be assessed based on Section 108 of the 2012 Michigan Department of Transportation (MDOT) Standard Specifications for Construction.

The watering and cultivation for the First Season shall be completed on **October 20, 2021**. The watering and cultivation for the Second Season shall be completed on **October 20, 2022**. **The contract completion date will be on October 20, 2022.**

In addition to the provisions identified in the Progress Clause and contained within this contract, the low bidder(s) for the work covered by the contract proposal will be required to submit **Form 1130, Progress Schedule** for review, feedback and approval. The low bidder will also submit, for review and approval, a sequence of operation/staging plans to complete the work by the specified completion date. The construction work shall be sequenced and completed in the order shown on the plans. The approval by the Project Engineer of Form 1130, Progress Schedule will be required prior to the award of the construction contract.

A preconstruction meeting(s) will be held after the completion and approval of Form 1130, Progress Schedule and the award of the construction contract. The EDC and Project Engineer will arrange the time and place for the meeting.

The named subcontractor(s) for Specialty and/or Designated Items (if such items are designated in the proposal) which materially affect the work schedule, shall also be present at the scheduled meeting and they will be required to sign the Progress Schedule to indicate their approval of the scheduled dates of work set forth in the Progress Schedule.

The Progress Schedule shall include, as a minimum, the controlling work items for the completion of the project and the planned dates (or work day for a work day project) that these work items will be controlling operations. The dates that the specific project phases are to be opened to traffic and the public as well as the substantial completion date and the final project completion date shall also be included in the project schedule.

Failure on the part of the Contractor to carry out the provisions of the Progress Schedule, as established, may be considered sufficient cause to prevent bidding future projects until a satisfactory rate of progress is again established.

No extensions of time will be granted for labor disputes unless it can be shown that such disputes are industry wide.

No extensions of time shall be granted for delays in delivery of critical materials unless the delay can be shown to be industry wide and the delay affects the critical item of work.

No adjustment of contract time will be allowed for delays in execution of the contract caused by the Contractor. Examples of such Contractor caused delays would include, but are not limited to: (a) failure to provide proper insurance; (b) failure to provide bond; (c) failure to secure the required percentages of approved MBE/DBE/WBE subcontractors.

No extensions of time will be granted for labor disputes unless it can be shown that such disputes are industry wide.

Any extra costs including but not limited to additional labor, materials, and equipment incurred by the Contractor due to cold weather protection requirements will not be paid for separately, and are considered incidental to related items of work. The Contractor shall include all costs required to complete the construction activities per the construction milestone dates identified above and in the bidding proposal.

No extensions of time shall be granted for delays in delivery of critical materials unless the delay can be shown to be industry wide and the delay affects the critical item of work.

The Contractor shall keep all construction related noise in the project area and surrounding areas below 80dBA during the hours of 8:00pm-7:00am or as directed by the Engineer for the duration of the project.

Contractor shall coordinate work with MDOT M-5 Streetscape and Rehabilitation Project (JN 204003).

Contractor shall not park, utilize private lots, side streets and other areas not approved by the Engineer.

Contractor shall always maintain access to 15903 Planview Avenue driveway and 15910 Evergreen Road driveway.

Truck haul routes selected by the Contractor must be submitted to the City of Detroit Department of Public Works for approval prior to the start of construction and are subject to regulations of the Department.

PROGRESS MEETINGS

The Contractor and applicable subcontractors for the work covered by this proposal will be required to meet with representatives from the EDC and the City of Detroit in regularly scheduled construction progress meetings. The schedule and frequency of the meetings will be set following the award of the contract to the Contractor. The frequency of the meetings may be as often as weekly throughout the entire construction schedule.

The Contractor and applicable subcontractors shall attend when requested any additional special construction meetings to address any special or unique construction issues that arise during construction.

The Contractor is required to provide in writing a weekly look ahead to the City detailing work locations and activities.

CITY OF DETROIT
SPECIAL PROVISION
FOR
GENERAL REQUIREMENTS

SGJJR: BPC

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05-31-18

UTILITY ACCESS:

The contractor shall contact the utility providers/owners, including the Detroit Fire and Police Departments regarding their facilities prior to starting the work. All utilities outlets and control fixtures shall be maintained in an accessible condition at all times.

ADJACENT UTILITIES:

When proposed utilities cross or lay parallel to an existing or proposed utility, a vertical clearance of 12 inches and horizontal clearance of 42 inches shall be provided between the outside limits of their construction and the outside limits of the PLD/PLA or DWSD facility. PLD/PLA facilities include electrical conduits, communication conduits, and related structures. DWSD facilities include sewers, water mains, and related structures. If for any reason this clearance cannot be provided, the contractor shall notify the engineer and proceed under his direction in an approved manner.

RECLAIMING SALVAGEABLE MATERIAL:

All salvageable material within the limits of this project and belonging to either privately or municipally owned utilities, which are to be reclaimed by the utility provider/owner, will be indicated on the plans or in the proposal. The removal of such material shall be done by the utility provider/owner and at their own expense and at such time as will cause no delay to the Contractor. If after due notice the utility provider/owner does not remove the material, the Engineer shall advise the Contractor to remove the material and this material shall become the property of the Contractor. The work of removing the material is included in the construction of the project, incidental to the demolition pay items and will not be paid for separately.

HYDRANTS AND WATER:

The Contractor shall pump out at the end of each day throughout the year, regardless of the season, any fire hydrant used to obtain water.

The Contractor shall secure the required permit from the Detroit Water and Sewerage Department, and shall bear all the expense for the water used. If connections are made to hydrants, the Contractor shall also obtain permission for such connections from the Detroit Fire Department. Fire Department's standard hydrant wrench shall be used for the operation of the hydrant.

SHOP DRAWINGS:

The Contractor shall furnish submittals, shop drawings, manufacturer's literature and data, certifications, testing documentation, laboratory reports, and samples showing complete details and any other items called for on the Plans or Special Provisions. Forward submittals in sufficient time to permit proper consideration and approvals. Time submission to assure adequate lead time for procurement of contract required items. Delays attributable to untimely and rejected submittals

(including any laboratory samples to be tested) will not serve as a basis for extending contract time for completion.

The Engineer will designate the required review and approval authority(s) and will coordinate the distribution. The contractor shall be aware that multiple review agencies and/or organizations may be required prior to obtaining approval.

The Contractor shall prepare and submit to the Engineer a complete submittal list of all required documents that will be required for review and approval at the first construction meeting. The Contractor shall maintain and update the submittal list for the duration of construction and shall provide an updated submittal list at each construction progress meeting and when requested by the Engineer.

The Contractor shall submit all documentation in digital PDF format to the Engineer via email and as designated by the Engineer to obtain approvals from the City of Detroit or its Consultant(s). Shop drawings and large format drawings shall be scanned by the Contractor at their expense into a digital PDF format for distribution. Physical Samples that cannot be transmitted digitally shall be shipped and/or transported to the location(s) designated by the Engineer at the Contractor's expense. The Contractor shall provide at a minimum and when requested three duplicate physical samples. Additional copies of submittal documents shall be provided when requested by the Engineer. In addition to the digital PDF copies, the Contractor shall provide three original hardcopies of submittal documentation requiring certification, seals, signatures, etc. to the Engineer.

Submittal documentation shall be checked before submission by technically qualified employees of the Contractor for accuracy, completeness and compliance with contract requirements. These documents shall be stamped and signed by the Contractor certifying to such check. Submittal documentation shall be clearly **HIGHLIGHTED** to definitively identify the particular model numbers, sizes, products, materials, components, options, accessories, and other associated appurtenances. Documentation that is not provided in this fashion will be returned to the Contractor for correction and resubmission. The additional labor and expenses incurred by the Engineer, City of Detroit, and/or their Consultants that is required for reviews and approvals for rejected and/or submittal documentation that requires resubmission more than once will be paid for by the Contractor.

USE OF BALL TYPE PAVEMENT BREAKER FOR REMOVAL OF MISCELLANEOUS STRUCTURES:

The use of a crane and ball type pavement breaker for the removal of miscellaneous structures referred to in Section 204 of the 2012 Standard Specifications and the removal of other items called for in these Supplemental Specifications will **NOT** be permitted at any time for work under this Contract, except when specifically authorized by the Engineer.

PUMPING AND DRAINAGE:

The Contractor will be required to furnish all equipment and supplies and perform all labor necessary to keep all excavated areas dewatered during the period of the contract.

The work will include the disposal of all drainage water flowing into the excavation. The drainage of the entire project shall be disposed of in a manner that will not interfere with or delay the work of others. This work shall be performed as directed by the Engineer.

The City will permit, subject to its approval, drainage water from the excavations for the project to enter existing operating sewers without reimbursement. No claims for damages, however, will be allowed the Contractor because of the inadequacy of the City sewers to accommodate the water from the excavations.

All sewers and drainage structures shall be kept thoroughly cleaned of silt, debris and foreign matter, and shall be free from such accumulation at the time of final inspection.

The work of pumping and cleaning the structures specified will be considered included to the construction of the project and no additional payment will be made therefore.

PROPERTY AND SURVEY MONUMENTS:

Before any monuments or stakes marking the boundaries of property along or near the work are removed or disturbed, the Contractor shall notify the Engineer in sufficient time so that they can be properly located and reset.

All precautions shall be taken to avoid disturbance of permanent survey monuments of any City, County or State authority, and when any of these are disturbed or destroyed, the Contractor shall restore them to the satisfaction of such authority and shall pay all costs incurred by such authority in connection therewith.

CLEANLINESS OF THE WORK:

The Contractor shall at all times keep the street pavement and right-of-way and any public or private premises temporarily occupied by the contractor for purposes of work under this contract free from accumulations of waste material or rubbish caused by the contractor's employees, subcontractors, or other individuals involved with the work. The requirement shall apply to any streets in the vicinity of the work which are affected by the Contractor's construction or hauling operations, as well as to streets in which the work is located. If the Contractor shall fail to keep any street cleaned of debris resulting from his operations, and therefore shall create any public nuisance, he shall be notified in writing by the Engineer to clean the street and remove the nuisance immediately. If, within 24 hours after the receipt of such notice, the contractor shall fail to clean such street satisfactorily, the Engineer shall order the street cleaned by the Department of Public Works or such other agency as he shall designate and all costs of such cleaning shall be paid by the Contractor.

Materials and equipment not in current use shall not be stored on any city streets. Storage of materials on private property shall require a written agreement with the owner. The Contractor shall provide the Engineer a copy of the agreement.

COORDINATION CLAUSE

Fishbeck:DPE

1 of 1

12-27-2019

Other contracts may commence within the immediate area during the life of this Contract.

Work by the City of Detroit, utility companies, and other Contractor activities may be present at any time on the project or near the project.

The Contractor shall coordinate his operations with others performing work within, or adjacent to, the Construction Influence Area (CIA), to avoid conflicts in maintaining traffic, construction signing, and progression of construction activities.

Where applicable, the Contractor will be required to coordinate his work with the curb-side garbage pick-up within the Construction Influence Area.

Contractor shall coordinate construction activities with adjacent businesses and property owners to ensure that deliveries, loading, unloading, service, etc. can continue to operate.

The Contractor's attention is called to the requirements of cooperation with others as covered in subsection 104.08 of the 2012 Michigan Department of Transportation Standard Specifications for Construction.

No claim for extra compensation or adjustments in contract unit prices will be allowed on account of delay or failure of others to complete work units scheduled.

The contracts that may be in progress during the execution of this contract include, but are not limited to the following:

MDOT Project 204003 M-5 Streetscape and Rehabilitation Project

CITY OF DETROIT
SPECIAL PROVISION
FOR
WORKING AREA AND PROJECT CLEANUP

SG: BPC
REV: Fishbeck/KK

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05-31-18
12-27-19

All the work under this Contract shall be within the streetscape limits, easements, streets, alleys, or rights-of-way, and the space allowed for the Contractor's operations shall be within the streetscape limits as shown on the plans. Construction equipment, storage of materials, and the construction operations shall normally be restricted to such areas. Should additional working or storage space be desired, the Contractor may be permitted to utilize adjacent private property provided the contractor makes all arrangements with the owners, bears all expense in connection with its use, and in no way involves or obligates the City or State by such use.

Materials delivered on the street shall be neatly and compactly piled in such manner as to cause the least inconvenience to adjacent property owners, the general public and shall not impede traffic as defined on the maintenance of traffic plans. All materials delivered on the street or within public right-of-ways shall be promptly removed in its entirety by the end of each working day.

Working areas shall be promptly restored to their original condition as soon as the required construction work has been completed at the particular location, and shall not be used as a storage area for unneeded material or construction equipment.

The work and all property used in connection with the work shall be kept in a neat and orderly condition at all times. Waste material and refuse from the Contractor's operations may be temporarily piled behind the curb in a manner not to interfere with pedestrians. Waste materials, rubbish, and debris shall not be allowed to accumulate and shall be removed daily, or as directed by the Engineer. Construction equipment and excess materials shall be promptly removed from the site as they become no longer needed for the progress of the work.

All cost relating to maintaining a neat working area and providing the required cleanup will not be paid for separately but shall be included in the total project cost.

CITY OF DETROIT

**NOTICE TO BIDDER
FOR
UTILITY COORDINATION**

SG: BPC

1 of 1

05-31-18

The contractor shall cooperate and coordinate construction activities with the owners of utilities as stated in Section 104.08 of the 2012 Michigan Department of Transportation (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. Contractor delay claims, resulting from a utility, will be determined based upon Section 108.09 of the 2012 MDOT Standard Specifications for Construction.

For protection of underground utilities and in conformance with Public Act 53, as amended, the contractor shall call "Miss Dig" at 1-800-482-7171 a minimum of three full working days (72 hours), excluding Saturdays, Sundays and holidays, prior to beginning construction activities including each excavation in areas where public utilities have not been previously located. "Miss Dig" 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 shown on the plans represent the best information available as obtained on the survey plans. This information does not relieve the Contractor of the responsibility to be satisfied as to its accuracy, the location of existing utilities, and/or of the responsibility in case utilities have been constructed or removed since the most recent surveys.

Contractor is responsible for contacting, providing advance notice and coordinating with the utility owners/providers both public and private/franchise utilities for all required structure adjustments, relocations and work related to utilities. Contractor is responsible for scheduling adequate time for coordination and related utility work and NO claim for extra compensation or adjustments in contract unit prices and schedule will be allowed on account of delay or failure of others to complete required utility work.

Owners of utilities will not be required by the department or county to move additional poles or structures that are not within the grading or structure limits in order to facilitate the operation of construction equipment unless it is determined by the Engineer that such pole, line or structure constitutes a hazard to the public, or are extraordinarily dangerous to the Contractor's operations.

Utility coordination is incidental to the pay items for the demolition and utility pay items. It is the Contractor's responsibility to pay for all materials, labor, and equipment associated with this item.

CITY OF DETROIT
SPECIAL PROVISION
FOR
UTILITY ADJUSTMENTS, PRIVATE VS CONTRACTOR

SG: BPC

1 of 2

05-31-17

a. Description. Publicly and privately owned utilities exist throughout the project area. Contractor to perform utility adjustments to publicly owned utilities. Contractor to coordinate utility adjustments to privately owned utilities.

b. Materials. None specified.

c. Construction. Call 811 a minimum of 3 working days prior to the start of construction for location and identification of public and private utilities with the limits of the project. Identify utility lines, structures, castings and appurtenances impacted by the proposed construction.

Contractor to coordinate and perform adjustments to existing utility castings and appurtenances as indicated on the plans and identified in the field at the contract unit price for the following publicly owned utilities:

Detroit Water and Sewerage Department
6425 Huber Street
Detroit, MI 48226
313-267-1226

Great Lakes Water Authority
6425 Huber Street
Detroit, MI 48211
313-267-3698

Detroit Public Lighting Department – Electrical Distribution Systems
9449 Grinnell
Detroit, MI 48213
586-803-3516

Detroit Public Lighting Authority – Street Lighting
65 Cadillac Square
Suite 3100
Detroit, MI 48226
313-324-8291

Contractor to coordinate adjustments to existing utility castings and appurtenances as indicated on the plans and as identified in the field for the following privately owned utilities.

DTE Energy
One Energy Plaza
Detroit, MI 48226
313-235-5820

CITY OF DETROIT
SPECIAL PROVISION
FOR
UTILITY ADJUSTMENTS, PRIVATE VS CONTRACTOR

SG: BPC

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05-31-17

DTE Energy– Natural Gas Distribution System
One Energy Plaza
Detroit, MI 48226
313-235-5110

AT&T – Telephone / Communications systems
17651 Michigan Avenue
Dearborn, MI 48226
248-456-0861

Additional privately-owned utilities may exist within the project area. Contractor to confirm utility ownership and adjust and/or coordinate adjustment as necessary.

The Contractor's attention is called to the requirements of cooperation with others as covered in subsection 104.08 of the Standard Specifications for Construction.

CITY OF DETROIT
SPECIAL PROVISION
FOR
**LIMITATIONS OF OPERATIONS
AND
ANTI-NOISE CONTROL**

Fishbeck:DPE

1 of 1

05-01-19

The following paragraphs shall be added to subsection 108.02 Limitation of Operation of the 2012 Michigan Department of Transportation (MDOT) Standard Specifications for Construction.

Overtime shall be limited to the work days submitted on the progress schedule for the project. The work days used to develop the progress schedule shall be Monday through Saturday and shall not include Sundays or City Holidays. Overtime work on Sundays and City Holidays shall be limited to emergency work necessary to safeguard the health and safety of the public.

The following are the current City Holidays: New Year's Day, Martin Luther King Jr. Birthday, Good Friday, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Day after Thanksgiving, Christmas Eve, Christmas Day, New Year's Eve and New Year's Day. The Contractor shall be responsible for confirming with the City Engineering Division, any amendments to this list of calendar dates designated as holidays for City of Detroit employees.

The Engineer may require the contractor to cease construction operations during times as may be determined to be in the interest of the public at no additional compensation or cost to the City.

Contractor shall suspend or limit their operations if work interferes with the City Sponsored Public events within the project CIA (Construction Influence Area) at no additional compensation or cost to the City.

The Contractor may normally prosecute the work during the entire twenty-four (24) hours of any work day stated above, provided that he so conducts his operations as not to create a public nuisance nor disturb the peace. Operations outside normal working hours must be conducted in accordance with Local Ordinances, as outlined in Subsection 107.01 of the 2012 MDOT Standard Specifications for Construction and as directed by the Engineer.

CITY OF DETROIT

SPECIAL PROVISIONS

Fishbeck:DPE

1 of 3

REVISED 04-13-2020

Work Approvals: Acceptance by the City of Detroit of any or all utility work under this contract will be conditioned upon approval by the appropriate Department of the City of Detroit.

Utility Access: The Contractor shall contact the utility owners, including the Detroit Fire and Police Departments, regarding their facilities prior to starting the work. All utility outlets and control fixtures shall be maintained in an accessible condition at all times.

Adjacent Utilities: When proposed utilities cross or lay parallel to an existing or proposed utility, a vertical clearance of twelve (12) inches and a horizontal clearance of forty two (42) inches shall be provided between the outside limits of their construction and the outside limits of the Public Lighting Department (PLD) or Department of Water and Sewerage (DWSD) facility. PLD facilities include electrical conduits, communication conduits, and related structures. DWSD facilities include sewers, water mains, and related structures. If for any reason this clearance cannot be provided, the Contractor shall notify the project engineer and proceed under his direction in an approved manner.

Reclaiming Salvageable Material: All salvageable material within the limits of this project and belonging to either privately or municipally owned utilities, which are to be reclaimed by its owner, will be indicated on the plans or in the proposal. The removal of such material shall be done by the owner and at their own expense and at such time as will cause no delay to the Contractor. If after due notice the owner does not remove the material, the Engineer shall advise the Contractor to remove the material and this material shall become the property of the Contractor. The work of removing the material is included in the construction of the project and will not be paid for separately.

Hydrants and Water: The Contractor shall pump out at the end of each day throughout the year, regardless of the season, any fire hydrant used to obtain water.

The Contractor shall secure the required permit from the Detroit Water and Sewerage Department and shall bear all the expense for such permits and for the water used. If connections are made to hydrants, Fire Department's standard hydrant wrench shall be used for the operation of the hydrant.

Removal of Miscellaneous Structures: The use of a crane and ball type pavement breaker for the removal of miscellaneous structures referred to in Section 204 of the 2012 MDOT Standard Specifications for Construction and the removal of other items called for in these Specifications and Plans will NOT be permitted at any time for work under this Contract, except when specifically authorized by the Engineer.

Pumping and Drainage: The Contractor will be required to furnish all equipment and supplies and perform all labor necessary to keep all excavated areas dewatered during the period of this Contract.

The work will include the disposal of all drainage water flowing into the excavation. The drainage of the entire project shall be disposed of in a manner that will not interfere with or delay the work of others. This work shall be performed as directed by the Engineer.

The City will permit, subject to its approval, drainage water from the excavations for the project to enter existing operating sewers without reimbursement. No claims for damages, however, will be allowed the Contractor because of the inadequacy of the City sewers to accommodate the water from the excavations.

All sewers and drainage structures shall be kept thoroughly cleaned of silt, debris and foreign matter, and shall be free from such accumulation at the time of final inspection.

The work of pumping and draining excavations, and cleaning the structures used for disposal of same will be considered included in the construction of the project and no additional payment will be made.

Property and Survey Monuments: Before any monuments or stakes marking the boundaries of property along or near the work are removed or disturbed, the Contractor shall notify the Engineer in sufficient time so that they can be properly located and reset.

All precautions shall be taken to avoid disturbance of permanent survey monuments of any City, County or State authority, and when any of these are disturbed or destroyed, the Contractor shall restore them to the satisfaction of such authority and shall pay all costs incurred by such authority in connection therewith.

City of Detroit vertical survey monuments shall be adjusted and preserved in accordance with the Special Provision\Specification titled Vertical Survey Monuments.

Notification: The Contractor shall provide notification to residents and businesses along the length of the project of pending surface milling, curb replacement, pavement repair and resurfacing activities, and sidewalk and ADA ramp construction a minimum of 48 hours in advance of such work. The notice, at a minimum, shall advise residents of the date work activity will start, the anticipated length of time the area will be worked on, notification of temporary loss of curbside or driveway access to property, and request that street be cleared of parked vehicles.

Should construction activities cease, either due to weather or scheduling, for an anticipated time of five (5) days or more, any and all posted signage shall be removed. Once work will begin again, the Contractor shall re-notify as previously set forth.

For sidewalk repair work, the Contractor shall provide notification to residents and businesses along the length of the pending sidewalk work a minimum of 72 hours (3 day) in advance of such work. This notification shall be placed in accordance with the Specification for Sidewalk Repair Notification.

Cleanliness of the Work: The Contractor shall at all times keep the street pavement and right-of-way and any public or private premises temporarily occupied by him for purposes of work under this contract free from accumulations of waste material or rubbish caused by the Contractors employees or the work. This requirement shall apply to any streets in vicinity of the work which are affected by the Contractor's construction or hauling operations, as well as to streets in which the work is located. If the Contractor shall fail to keep any street cleaned of debris resulting from their operations, and

therefore creating a public nuisance, they shall be notified in writing by the Engineer to clean the street and remove the nuisance immediately. If, within 24 hours after the receipt of such notice, the Contractor shall have failed to clean such street satisfactorily, the Engineer shall order the street cleaned by the Department of Public Works or such other agency as he shall designate, and all costs of such cleaning shall be paid by the Contractor.

Materials and equipment not in current use shall not be stored on any city streets. Storage of materials on private property shall require a written agreement with the owner. The Contractor shall provide the Engineer a copy of the agreement.

Contractor Staking: The Contractor must complete staking in accordance with Section 824 of the 2012 MDOT Standard Specifications for Construction. The staking plan shall be approved by the Engineer.

CITY OF DETROIT
SPECIFICATION
FOR
BUSINESS CONSTRUCTION SIGNS

DET: GS

02-06-2020

- a. Description.** This work consists of the purchasing and the installation of Business Construction Signs providing all labor, equipment and materials necessary for the inclusion of these signs into the project.

Location of the installation of the signs will be provided to the Contractor from the City of Detroit at the start of the project.

Design of these signs will be provided to the Contractor by the City of Detroit at Project kickoff Meeting.

- b. Materials.** The Contractor shall provide the pre-order documentation to the Engineer for review for approval prior to purchasing. Do not order any material until approval is received from the Engineer. Provide products from a single manufacturer.

The business construction signs listed below are required for this project.

- I. 8ft x 2ft; Feather Flag; Single-Sided Full Color
- II. Feather Flag Indoor Cross-Base Stand 8ft (Full Kit)
- III. 36" x 24"; Sandwich Board (Cor. Plastic); Double-Sided Full Color
- IV. 4ft x 6ft; Premium Banner; Single-Sided Full Color

- c. Construction.** Signs shall be installed before construction begins on the project. Coordinate installations with the Engineer for onsite approvals. Work must be done in conformance with section 812 of MDOT Standard Specifications for Construction.

1. The Contractor shall not damage Business Construction Signs. If the Contractor damages a sign, at discretion of the Engineer, the Contractor shall be responsible to replace the sign with 72 hours of being identified.

2. Install all signs in accordance with the contract and the manufacturer's instructions.

- 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:

<u>Pay Item</u>	<u>Pay Unit</u>
8ft x 2ft; Feather Flag; Single-Sided Full Color	EACH

Feather Flag Indoor Cross-Base Stand 8ft (Full Kit)EACH
36" x 24"; Sandwich Board (Cor. Plastic); Double-Sided Full ColorEACH
4ft x 6ft; Premium Banner; Single-Sided Full ColorEACH

CITY OF DETROIT
SPECIAL PROVISION
FOR
**HMA AND CONCRETE PAVEMENT
SEQUENCE OF OPERATIONS AND REQUIREMENTS**

DET: GJM

1 of 1

11-30-15

Once work on a street is begun, the Contractor shall maintain a continuous operation.

The Contractor shall schedule the cold-milling operation so that entire lane width of the roadway is cold milled between road terminus limit before switching over to other lane/side. This is required to avoid having a vehicle travel over milled surface on one side and normal pavement surface other side.

The Contractor shall place a wedge, at the base of driveway approaches, a minimum of six (6) inches wide, the full width of the driveway approach, where milling is greater than 2 inches in depth, to provide a smooth transition onto and off of the milled surface and driveway approach. The cost of the wedge shall be included in the cost of the “_Cold Milling HMA Surface” pay item.

At the end of the day, the Contractor shall place a wedge, a minimum of 6 feet wide, the full length of all transverse and longitudinal joints at intersections where milling is greater than 2 inches in depth, to provide a smooth transition onto and off of the milled surface. The cost of the wedge shall be included in the cost of the “_Cold Milling HMA Surface” pay item.

All milled surfaces shall be completely resurfaced with leveling course as soon as possible, but not to exceed 48 hours from the milling unless specifically approved otherwise by the Engineer.

Top Course HMA shall be placed only after all base repairs, concrete curb repairs, and structure adjustments and repairs are completed.

All milled pavement surfaces shall be completely resurfaced with leveling and top courses before the seasonal shutdown for the winter.

It is the Contractor's responsibility to establish the finish (final) grade on all streets and to ensure proper (positive) drainage at all locations.

CITY OF DETROIT
SPECIAL PROVISION
FOR
MOBILIZATION

DET:GJM

1 of 1

01-04-2016

Description. This specification covers the preparatory work and operation, and movement of equipment, materials, and personnel to the construction site(s) in the City of Detroit. The work covered shall be as specified in the Michigan Department of Transportation 2012 Standard Specifications for Construction, Section 150, except as follows:

The word "Department" in the body of the MDOT Specification shall mean "The City of Detroit".

Measurement and Payment. In accordance with Section 150.04.

Pay Item	Pay Unit
_Mobilization, Max. 10%.....	Lump Sum

CITY OF DETROIT
SPECIAL PROVISION
FOR
REMOVING OR RELOCATING MISCELLANEOUS ITEM

Fishbeck:KK

1 of 2

12-27-2019

a. Description. This work consists of removing specific miscellaneous items not covered by other work at the locations shown on the plans.

Demolish and remove the following items:

- Abandoned Utility Pole
- Brick Planter Bed

Remove, salvage, and reinstall the following item as directed by the Engineer:

- “Minock” Park sign located in the existing brick planter bed
- Landscape rocks located on south side of Puritan Avenue

Backfill and restore all disturbed areas according to the standard specifications and as directed by the Engineer.

b. Materials. Backfill excavated areas with granular material or native soils. Restore disturbed grass areas in kind including topsoil, seed, and mulch as directed by the Engineer.

c. Construction. Complete the removal as required by State and Local regulations and as directed by the Engineer. Completely remove the items and dispose of all materials according to the Standard Specifications for Construction. Verify any electrical wiring is de-energized prior to removals. Backfill all disturbed areas.

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
_ Utility Pole, Rem	Each
_ Sign, 2-Fdn, Wood Supports, Rem, Salv, and Install, “Minock Park”	Each
_ Brick Planter Bed, Rem	Each
_ Remove, Salvage, and Install Landscape Rocks	Lump Sum

_Utility Pole, Rem item includes all labor, equipment and materials required to remove and dispose of the utility pole and associated foundation, backfill, and restoration.

_Brick Planter Bed, Rem includes all labor, equipment and materials required to remove and dispose of the brick planter bed and associated foundation, planting material, and planting material.

Placement of sidewalk or pavement for proposed work shown in the location of a miscellaneous removal item will be paid for separately.

_ Sign, 2-Fdn, Wood Supports, Removal, Salvage, and Install, "Minock Park" includes all labor, equipment, and materials to relocate a "Minock Park" sign to an area outside of the work zone approved and as directed by the Engineer, without damaging any surfaces or the sign, installing salvaged sign, restoration of the site after construction, and disposal of unsuitable materials.

_Removal, Salvage, and Install Landscape Rocks includes all labor, equipment, and materials to relocate the landscape rocks to an area outside of the work zone without damaging any surfaces, installing salvaged landscape rocks after construction is completed, restoration of the site after construction, and disposal of unsuitable materials.

CITY OF DETROIT
SPECIAL PROVISION
FOR
STREETSCAPE GRADING

Fishbeck:KK

1 of 2

01-22-2020

a Description Remove miscellaneous structures and materials and complete all earthwork required to construct the proposed cross sections within the limits shown on the plans or stated in this special provision. All lines and grades will be as shown on the plans and as directed by the Engineer. Complete this work according to the 2012 Standard Specifications for Construction and this special provision.

b Materials Furnish and place additional material conforming to the Standard Specifications for Construction as necessary to achieve the required typical cross sections. Use excavated material as embankment material, if suitable, as approved by the Engineer. Provide additional MDOT Class II fill material as required from off-site sources.

c Construction Complete this work according to applicable sections of the 2012 Standard Specifications for Construction. Streetscape Grading includes, but is not limited to, the following work:

1. Strip and stockpile topsoil for use in turf establishment, if required.
2. Excavate soil materials up to 12 inches deep.
3. Stake and develop grades and field notes from data shown on the plans.
4. Reshape to proposed grades.
5. Furnish, place and compact additional material.
6. Remove rocks or boulders less than 0.5 cubic yards in volume.
7. Remove miscellaneous structures and materials.
8. Dispose of excess and unsuitable material according to section 205.

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
_Streetscape Grading	Square Yard

Streetscape Grading will be measured in area by the Square Yard and will apply to the following areas shown on plan: concrete base, sidewalk, curbs, and concrete planters. The limits shall be field coordinated with the Engineer prior to start of work.

Pavement removal will be paid for separately.

Drainage structure adjustment items will be paid for separately.

Earthwork required for landscaping areas will be paid for separately.

Irrigation system will be paid for separately.

CITY OF DETROIT
SPECIAL PROVISION
FOR
AGGREGATE BASE, DRAINAGE COURSE

SGJJR: ESM

1 of 1

01-11-2019

a. Description. Placement of _Aggregate Base, Drainage Course shall be done in accordance with the 2012 MDOT Standard Specification for Construction, Section 302 and 902, except where noted in this Special Provision.

b. Materials.

1. _Aggregate Base, Drainage Course shall be MDOT 4AA aggregate

c. Construction. _Aggregate Base, Drainage Course shall be provided where shown on the plans and details.

1. Place aggregate in layers not more than 4 inches in loose depth and compact to a uniform thickness as indicated on plans and details as follows:

A. _Aggregate Base, Drainage Course compact to the required thickness to not less than 95 percent of maximum dry unit weight according to ASTM D4254.

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

_Aggregate Base, Drainage Course Cubic Yard

CITY OF DETROIT
SPECIFICATION
FOR
DRAINAGE STRUCTURE CLEANING AND SEWER LEAD CLEANING

DET: GJM

1 of 1

10-02-15

a. Description: The work of drainage structure cleaning consists of cleaning existing catch basins and manholes in the area of the project where directed by the Engineer. The work of sewer cleanout consists of cleaning sewer lines between catch basins and between catch basins and manholes.

b. Materials. Not applicable.

c. Construction: When necessary and as directed by the Engineer, the work shall be performed in accordance with Section 403.3.G of the 2012 MDOT Standard Specifications for Construction and as modified herein.

Cleaning shall be by high velocity hydro-cleaning (jetting). Mechanical cleaning shall only be used when authorized by the Engineer. Contractor shall take precautions to protect the sewer lines from damage.

No debris shall be accumulated on site except in totally enclosed containers approved by the Engineer. All material deposits shall be removed from site and disposed of at an approved location.

Some of the catch basins, manholes and sewers may be completely filled. The Engineer shall determine actual condition and necessity for cleaning prior to cleanout. Cleaning shall restore 90% of the pipe's carrying capacity.

d. Measurement and Payment:

Dr Structure Cleaning, Modified will consist of cleaning catch basins and manholes, and shall be paid for at the contract unit price each, and will include all equipment and labor necessary to clean each catch basin or manhole, including installation of bulkheads as necessary and hauling away and disposing of any waste and debris generated.

Dr Structure Lead, Cleaning, Modified consists of cleaning sewers between catch basins or between catch basins and manholes, and shall be paid for at the contract unit price per foot which will include payment for furnishing all equipment and labor to clean sewers lines regardless of size, temporary bulkheads, and hauling away and disposing of any waste and debris generated.

Pay Item

Pay Unit

<u>Dr Structure Cleaning, Modified</u>	Each
<u>Dr Structure Lead, Cleaning, Modified</u>	Foot

CITY OF DETROIT
SPECIAL PROVISION
FOR
**STRUCTURE COVER, ADJUSTMENT,
RECONSTRUCTING STRUCTURE, AND
WATER SHUTOFF ADJUSTMENT**

DET:AHS
Rev: Fishbeck:KK

01-19-18
04-14-20

Description: The work consists of adjusting utility structure covers in accordance with the applicable provisions of Section 403 and Section 823 of the 2012 Michigan Department of Transportation (MDOT) Standard Specifications for Construction, except as modified herein.

Utility structure cover adjustments will include all Public Lighting Department (PLD) manholes, and all Detroit Water and Sewerage Department (DWSD) gate wells, sewer manholes and catch basins whose covers are required to be raised or lowered to meet the required new pavement elevations. Water shutoff adjustments will include DWSD water shutoff boxes or stop boxes, and PLD hand holes which are required to be raised or lowered to meet the required new pavement elevations.

Before starting this work, the Contractor and the Engineer, or his representative, shall jointly inspect each structure to evaluate its interior conditions. Access to the structure will be provided by the Contractor. The Engineer, or his representative, shall determine whether the structure is to be adjusted or reconstructed. The Engineer shall also determine if any structure cleaning is necessary to remove existing debris. The Contractor shall remove all debris from the structure resulting from the Contractor's operations.

Materials: Materials used in the adjustment and reconstruction of drainage structures shall be as specified in Section 403. Drainage Structures, of the 2012 MDOT Standard Specifications for Construction.

Construction: Where called for on the plans or authorized by the Engineer, existing structure covers shall be adjusted to the proper elevation in accordance with Section 403 of the 2012 MDOT Standard Specifications for Construction, except as modified herein.

For case 1 structures, saw cut full depth and remove the adjacent concrete and/or HMA pavement, curb, curb and gutter, or sidewalk as necessary to adjust the structure and cover. Remove an area of pavement and curb at least five (5) feet by five (5) feet around the structure. The existing frame and cover shall be carefully removed and the upper portion of the existing utility structure repaired as necessary and raised or lowered as required. The frame and cover shall then be reset on the adjusted structure so constructed as to hold them firmly in place and reset on a full mortar bed so as to fit the required new pavement grade and cross section. Replace adjacent concrete and/or HMA pavement, curb, curb and gutter, or sidewalk to match

existing grades or to the required new pavement grade and cross section.

When the existing frames and covers are unacceptable for reuse as determined by the Engineer, new frames and covers shall be furnished and installed. Drainage structure frames and covers shall be as specified in the City of Detroit "Specifications for Manholes and Catch Basins", and as specified in the Plans for DWSD Watergate and PLD Manhole covers. Any reusable frame and cover damaged by the Contractor shall be replaced by the Contractor at no cost to the City. The frames and covers that are not to be used on the work shall become property of the Contractor and shall be promptly removed from the jobsite and properly disposed of.

Where the structure is in need of repair, as determined by the Engineer, in excess of the adjustment limits set forth herein, the existing structure shall be broken down and rebuilt with new materials as specified in the City of Detroit Specifications for Manholes and Catch Basins, to the required new pavement elevations.

A finished concrete collar shall be placed around any structure adjusted that is within five (5) feet of the Detroit Thermal (formerly Detroit Edison) steam lines, as directed by the Engineer. The cost of this shall be paid for separately as _Concrete Repr, Nonreinf Conc, 10 inch, Modified, and measured by the surface area of the concrete collar.

Non-ferrous handholes and covers used by PLD and other City Utilities are made of fiberglass, copolymer propylene or similar material. These structures and covers shall be adjusted by a qualified electrical contractor. The removal of concrete around the perimeter of a non-ferrous handholes shall be performed with light chipping hammers to ensure that no damage is done to the handhole, cover or any conduit or other utility that may feed the structure. Any damage to structures, conduits, cable and wiring shall be repaired by the Contractor at no cost to the City or utility.

For HMA pavement sections, immediately before placing the HMA top course or overlay, make final adjustments to drainage structure covers. Equipment will not be permitted to operate over adjusted structures for a period of twenty-four (24) hours after their completion, unless otherwise approved by the Engineer.

Measurement and Payment: The completed work as described for adjusting or reconstructing structure will be measured as units and will be paid for at the Contract Unit Price, which price will be payment in full for furnishing all materials, equipment and labor; removal and replacement of concrete or HMA pavement, curb, curb and gutter, sidewalk; excavation, backfilling, disposal of surplus material, removal of all debris and foreign material from the structure (including the sump); adjusting the structure and cover to the required new pavement grade and cross section, with the existing or new cover; and providing access to all structures for inspection, as directed by the Engineer.

Structure damage, due to the Contractors operations shall be repaired at the Contractors expense.

"_Dr Structure Cover, Adj. Case1, Modified" shall include the above described work necessary to raise or lower the existing catch basin, manhole or gate well rim elevation involving adjustment, repair or replacement of less than or equal to five (5)

layers of bricks or three (3) layers of concrete blocks, both including mortar, regardless of whether or not it is necessary to remove a cone section to accommodate the rim elevation adjustment.

“_Water Shutoff, Adj, Case _, Modified” shall include the above described work necessary to raise or lower the existing structure and cover of water DWSD water shutoff boxes or stop boxes, and PLD and PLA hand holes.

<u>Pay Item</u>	<u>Pay Unit</u>
_Dr Structure Cover, Adj, Case 1, Modified	Each
_Water Shutoff, Adj, Case 1, Modified	Each

CITY OF DETROIT
SPECIAL PROVISION
FOR
HMA APPLICATION ESTIMATE

Fishbeck:DPE

1 of 1

01-21-19

a. Description: This work shall be done in accordance with the requirements of Section 501 of the 2012 Standard Specifications for Construction and as herein specified.

b. Materials: HMA materials shall be as specified in Section 501.02.

The HMA Leveling Surface Mixture 4E3 shall have a yield of 220 pounds per square yard with an estimated thickness of 2 inches.

The HMA Top Surface Mixture 5E3 shall have a yield of 165 pounds per square yard with an estimated thickness of 1.5 inches.

The material for Hand Patching shall be HMA Mixture 5E3, having a yield of 220 to 440 pounds per square yard (or as directed by the Engineer).

Performance Grade for all HMA Mixtures: 64-22

Top Course Aggregate Wear Index: 260

HMA Prime Coat and HMA Bond Coat shall be included in the HMA pay item and shall meet the requirements specified in Section 904 of the 2012 MDOT Standard Specifications for construction.

c. Construction. Not applicable.

d. Measurement and Payment. Not applicable.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
SAMPLING ASPHALT BINDER ON LOCAL AGENCY PROJECTS

CFS:MF

1 of 1

APPR:JAR:JTL:12-19-01
FHWA:CON. APPR:06-06-11

For informational purposes, original samples of asphalt binder will be taken by the Contractor and delivered to the Engineer prior to incorporation into the mixture. The frequency of sampling will be determined by the Engineer. The cost of obtaining and delivering the samples to the Engineer will be included in the hot mix asphalt (HMA) pay items.

The Contractor must certify in writing that the materials used in the HMA mixture are from the same source as the materials used in developing the HMA mixture design and the bond coat is from an approved supplier as stated in the *Material Quality Assurance Procedures Manual*.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
RECYCLED HOT MIX ASPHALT MIXTURE ON LOCAL AGENCY PROJECTS

CFS:KPK

1 of 2

APPR:JWB:CJB:03-13-14

FHWA:APPR:03-13-14

Add the following subsection to subsection 501.02.A.2, on page 234 of the Standard Specifications for Construction.

- c. **Reclaimed Asphalt Pavement (RAP) and Binder Grade Selection.** The method for determining the binder grade in HMA mixtures incorporating RAP is divided into three categories designated Tier 1, Tier 2 and Tier 3. Each tier has a range of percentages that represent the contribution of the RAP binder toward the total binder, by weight. The tiers identified below apply to HMA mixtures with the following exception: Superpave mixture types E3, E3 High Stress, E10, E10 High Stress, E30, E30 High Stress, E50, and E50 High Stress used as leveling or top course must be limited to a maximum of 27 percent RAP binder by weight of the total binder in the mixture.

Recycled materials may be used as a substitute for a portion of the new materials required to produce HMA mixtures in accordance with contract.

- **Tier 1 (0% to 17% RAP binder by weight of the total binder in the mixture).** No binder grade adjustment is made to compensate for the stiffness of the asphalt binder in RAP.
- **Tier 2 (18% to 27% RAP binder by weight of the total binder in the mixture).** For all mixtures no binder grade change will occur in Tier 2 for all shoulder and temporary road mixtures.

The required asphalt binder grade must be at least one grade lower for the low temperature than the design binder grade required for the specified project mixture type. Lowering the high temperature of the binder one grade is optional. For example, if the design binder grade for the mixture type is PG 58-22, the required grade for the binder in the HMA mixture containing RAP would be a PG 52-28 or a PG 58-28.

For Marshall Mixes, no binder grade change will be required when Average Daily Traffic (ADT) is above 7000 or Commercial Average Daily Traffic (CADT) is above 700. No binder grade change will occur for LVSP, E03 and E1 mixtures used as leveling or top course.

The asphalt binder grade can also be selected using a blending chart for high and low temperatures. Supply the blending chart and the RAP test data used in determining the binder selection according to *AASHTO M 323*.

- **Tier 3 ($\geq$ 28% RAP binder by weight of the total binder in the mixture).** The binder

grade for the asphalt binder is selected using a blending chart for high and low temperatures per *AASHTO M 323*. Supply the blending chart and the RAP test data used in determining the binder selection.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

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

CFS:KPK

1 of 7

APPR:CJB:JWB:07-05-16

FHWA:APPR:07-05-16

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
		# 30 Sieve	±4.0	±6.0	±6.0
		# 200 Sieve	±1.0	±2.0	±2.0
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 (JMF).					
b. Deviation from JMF.					

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 JMF to the Engineer. Do not begin production and placement of the HMA until receipt of the Engineer's approval of the JMF. 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 mixtures meeting the definition of top or leveling course, field regress air void content to 3.5 percent with liquid asphalt cement unless

specified otherwise on HMA application estimate. For mixtures meeting the definition of base course, field regress air void content to 3.0 percent with liquid asphalt cement unless specified otherwise on HMA application estimate.

Ensure all persons performing Quality Control (QC) and Quality Assurance (QA) HMA field sampling are "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.

Ensure all persons performing testing are Bit Level One certified or Bit QA/QC Technician certified.

Ensure daily test samples are 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 asphalt content (AC) 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*. Ensure on non-National Highway System (NHS) routes, Contractor labs are 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, except holidays and Sundays, for projects with less than 5,000 tons (plan quantity) of HMA and within 7 calendars days, except holidays and Sundays, for projects with 5,000 tons (plan quantity) or more of HMA, after the Engineer has obtained the samples. QA test results will be provided to the Contractor after the Engineer receives the QC test results. Failure on the part of the Engineer or the laboratory to provide Quality Assurance test results within the specified time frame does not relieve the Contractor of their responsibility to provide an asphalt mix within specifications.

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. Ensure this sample is 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 of this special provision.

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 JMF or proposed alterations to the plant and/or materials to achieve the JMF to the Engineer. Effects on the Aggregate Wear Index (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 QC 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. Ensure each required roller is 8 tons minimum in weight unless otherwise approved by the Engineer.

Ensure the initial breakdown roller is capable of vibratory compaction and is a maximum of 500 feet behind the paving operations. The maximum allowable speed of each roller is 3 miles per hour (mph) or 4.5 feet per second. Ensure all compaction rollers 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 subsection 501.04 of the Standard Specifications for Construction, or the contract, except as modified below.

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

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 Contractor's 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. Ensure the independent lab is 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 base 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 base 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 base 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: _____

CITY OF DETROIT
SPECIAL PROVISION
FOR
COLD MILLING HMA SURFACE, MODIFIED

DET: UP

1 of 1

Revised: 05-08-12

a. Description. This work shall consist of removing HMA pavement or surface by use of cold-milling equipment to prepare the foundation for HMA overlays per section 501.03 of the 2012 Michigan Department of Transportation (MDOT) Standard Specifications for Construction and as specified herein.

The cost of exploration for the existing street car rails when encountered during cold milling shall be included in the work of cold milling HMA surface. Extra payment for cost of actual removal and disposal of any street car rail will be made per section 103.02

The Contractor shall schedule the cold-milling operation so that entire lane width of the roadway is cold milled between road terminus limit before switching over to other lane/side. This is required to avoid having a vehicle travel over milled surface on one side and normal pavement surface other side.

At the end of the day, the Contractor shall place a wedge, a minimum of 6 feet wide, the full length of all transverse and longitudinal joints at intersections where milling is greater than 2 inches in depth, to provide a smooth transition onto and off of the milled surface.

It is the Contractor's responsibility to establish the finish (final) grade on all streets and to ensure proper (positive) drainage at all locations. This work shall included in the work of cold milling and be done at no additional cost to project.

b. Materials. Not applicable.

c. Construction. Not applicable.

d. Measurement and Payment. The completed work as measured for **_Cold Milling HMA Surface, Modified** will be paid for at the contract unit price for the following contract pay item.

Cold milling of existing concrete patches, and establishing finish (final) grade to ensure proper drainage, the cost of exploration for an existing street car rail when encountered during cold milling and wedging for longitudinal and transverse transition when required is included in the work of "Cold Milling HMA Surface, Modified".

The price shall be payment in full for removing the HMA material to the depth specified on the typical cross section sheet, and for transportation and disposal of the material.

Pay Item

Pay Unit

_Cold Milling HMA Surface, Modified.....Square Yard

CITY OF DETROIT
SPECIAL PROVISION
FOR
CONDITIONING EXISTING PAVEMENT

DET:GJM

1 of 1

11-30-15

a. Description. This work shall be in accordance with Subsection 501.03.C of the 2012 Michigan Department of Transportation Standard Specifications for Construction including Removing HMA Patches, Joint and Crack Clean Out, Hand Patching, and Repairing Pavement Joints and Cracks, Detail 7, and, shall include the application of bond coat as required.

b. Materials. Not applicable.

c. Construction. Not applicable.

d. Measurement and Payment. Conditioning Existing Pavement, Modified will be measured and paid for by the ton of HMA material placed. The contract price per ton will be payment in full for furnishing all labor, material and equipment required to remove deteriorated or unstable HMA material, to clean the pavement surface and apply any bonding material needed, to clean and prep joints and cracks, and to furnish, place and compact the HMA Mixture 4E3 to prepare the existing pavement for the HMA leveling surface.

HMA Patch, Remove; Joint and Crack, Cleanout, Hand Patching, and Pavement Joint and Crack, Repr, Det 7 will not be paid for separately but are included in this item of work.

Full depth Pavement Joint and Crack Repair, Detail 8 is not included in the item of work.

Pay Item

Pay Unit

Conditioning Existing Pavement, ModifiedTon

MICHIGAN
DEPARTMENT OF TRANSPORTATION

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

CFS:JFS

1 of 21

APPR:TES:DBP:06-11-18

FHWA:APPR:06-14-18

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 subplot 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 and testing.
- 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/yd ³) (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:			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				
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							

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 for the project is required to be verified annually. The Engineer may allow annual mix documentation renewal if it is shown that 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 subplot 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).

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

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.

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

$$\text{ADJ} = (\text{OLPF} - 1)(\text{Price})$$

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.

CITY OF DETROIT
SPECIAL PROVISION
FOR
CONCRETE WALLS

SG: BPC

1 of 8

01-16-20

a. Description. This work consists of constructing concrete structures including concrete seat walls, transition wall and curb wall per plans and details, in accordance with Section 701 and 706 of the 2012 Michigan Department of Transportation Standard Specifications for Construction except as herein modified.

b. Materials. Concrete Pavement materials shall meet the requirements of Section 701 and 706 of the 2012 Michigan Department of Transportation Standard Specifications for Construction.

Concrete to be MDOT S1.

1. Submittals.

A. Submit shop drawings for fabrication, bending and placement of concrete reinforcement. Comply with the ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars and arrangement of concrete reinforcements. Include special reinforcement required and openings through concrete structures.

B. Submit COLOR and TEXTURE samples for Acrylic Waterproof Concrete Coating

2. Formwork

All formwork shall comply with the applicable portion of ACI 301-89.

All forms shall be free from warp and substantial enough to maintain their shape and position without springing or settlement when the concrete is placed and mechanically vibrated. Forms shall be staked, braced and/or securely tied. Construct formwork so that concrete structures are of correct size, shape, alignment, elevation and position.

All forms or liner joints shall be tightly and evenly butted. The damaged edges of reused high-density overlay plywood form liners shall be reworked as required to maintain tight joints. Severely damaged liners will be rejected.

Joints in form liners at concrete surfaces shall be taped to prevent leakage.

Horizontal joints in liners of formwork for concrete are not permitted above finish grade.

To avoid marking or staining of concrete or uneven curing effect, the forms shall be entirely removed in rapid sequence between expansion joints or other natural termination points.

Forms shall be thoroughly cleaned and wetted prior to placing concrete. Forms shall be complete for each pour, in correct alignment, shape and elevation, and shall be inspected and approved by the Engineer prior to placing concrete.

Chamfer exposed corners and edges as shown, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

Form ties: factory-fabricated, adjustable-length, removable or snapoff metal form ties, designed to prevent form deflection and to prevent spalling concrete surfaces upon removal.

Provisions for other trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.

3. Reinforcement

All reinforcement shall be Grade 60 deformed bars conforming to ASTM A615 or A617.

Comply with the specified codes and standards and Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports, and as herein specified.

Clean reinforcement of loose rust and mill scale, earth, ice and other materials which reduce or destroy bond with concrete.

Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.

Place reinforcement to at least obtain the minimum coverage for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

Construct concrete joints including associate materials (sealant, reinforcement, tie bars, and dowels) as located and shown on plans and details.

Stainless steel wall nosing is included for _Seat Wall and _Transition Wall that is bar brake bent to match angle of wall nosing, installed with a flush consistent finish as shown in plans. Stainless steel wall nosing shall be 316L stainless steel and inspected and approved by the engineer prior to applying acrylic waterproof concrete coating.

4. Joints

All expansion joint material shall be bituminous fiber type conforming to ASTM D1751. Sealant color to be submitted for Engineer review and approval.

Provide keyways at least 1 1/2 inches deep in all construction joints in walls, slabs, and between walls and footings. Accepted bulkheads designed for this purpose may be used for slabs.

Place construction joints perpendicular to the main reinforcement. Continue all reinforcement across construction joints.

Expansion joints shall be constructed as indicated on drawings. Premolded joint filler strips shall be installed so as to leave a void having a depth equal to the width of the joint plus 1/8 inch for sealing compound. Accurately position and support filler strips against displacement.

All expansion joints in walls are to be covered on the earth fill side with a waterproof fabric membrane. Fabric to extend a minimum of 6 inches either side of joint. Apply fabric or coating of approved asphalt waterproofing mastic and top coat with a full application of the same asphaltic material.

Expansion joint steel dowels, rigidly bonded half their length into one side, piercing the premolded joint filler, and wrapped with tar paper for slippage in the other side shall be installed to ensure continuous vertical alignment.

Control joints shall be as indicated on drawings.

Set and build into the work anchorage devices and other embedded items required for the project.

Curing compound shall be Type 1, clear conforming to ASTM C309.

5. Acrylic Waterproof Concrete Coating

Acrylic Waterproof Concrete Coating to be Masterprotect HB 400 by BASF. Coating to be applied to all exposed surfaces on the seat walls, transition walls and curb walls. Coating shall be provided 12" down from the top of the wall on the back side of all wall types on the planting bed side.

Custom **COLOR** and **TEXTURE** to be selected and approved by Owner. Provide physical color samples of color and textures prior to installation for Engineer and Owner review and approval.

Provide Masterprotect P150 Acrylic Primer by BASF.

c. Construction.

1. Project Conditions. Concrete placement shall be installed within the following environmental requirements:

A. Maintain an ambient temperature of between 50 degrees F and 90 degrees F during application and at least 48 hours after application for releasing agent and/or chemically stained concrete. Do not place concrete when the temperature of the surrounding air is expected to be below 40 degrees F during placing or within 24 hours thereafter. Do not allow the temperature of plastic concrete to drop below 55 degrees F.

B. When the mean daily temperature of the atmosphere is 80 degrees F and above, or during hot and dry weather, do not place concrete with a placing temperature which causes difficulty from loss of slump, flash set or cold joints 75 degrees F where possible and not more than 90 degrees F in any event. Where climatic conditions cause too rapid drying, make arrangements prior to placing concrete for installation of wind breaks,

shading, fog spraying, water sprinkling, ponding or wet covering of a light color. Take such protective measures as quickly as concrete hardening and finishing operation allow, and maintain throughout the entire curing period.

C. When the mean daily temperature of the atmosphere is 80 degrees F and above, or during hot and dry weather, do not place concrete with a placing temperature which causes difficulty from loss of slump, flash set or cold joints 75 degrees F where possible and not more than 90 degrees F in any event. Where climatic conditions cause too rapid drying, make arrangements prior to placing concrete for installation of wind breaks, shading, fog spraying, water sprinkling, ponding or wet covering of a light color. Take such protective measures as quickly as concrete hardening and finishing operation allow, and maintain throughout the entire curing period.

D. Examine work in place upon which this work is dependent. Defects which may influence satisfactory completion and performance of this work shall be corrected in accordance with the requirements of the applicable section of work prior to commencement of the work. Commencement shall be construed as work in place being acceptable for satisfying the conditions of this section.

E. Where necessary coordinate work with underground vault improvements and details.

F. The thickness of concrete will vary to accommodate site conditions and proposed finished grades as shown on plans. Provide a minimum thickness of 6".

G. Construction of the concrete structures includes, but is not limited to the following work:

- (1) Sawcut existing pavement.
- (2) Excavate soil materials (not included in sidewalk, grading and/or Pavt, Rem) as required for the proposed improvements.
- (3) Dispose of excess and unsuitable material according to section 206 of the 2012 Michigan Department of Transportation standard Specifications for Construction.
- (4) Place embankment and compacted aggregate base and reshape to proposed grades.
- (5) Match adjacent sidewalk, pavement, driveway, and approach finish grades as shown on plans.
- (6) Construct concrete pavement joints including associate materials (sealant, reinforcement, tie bars, and dowels) as located and shown on plans and details. Provide expansion joints adjacent to all fixed elements including existing building foundations.
- (7) Provide formwork as required.
- (8) Install footings and foundations.

(9) Coordinate construction with adjacent site elements including handrails, curbs, walls, buildings, and other structures.

(10) Restore area disturbed beyond concrete structure limits to its original conditions.

2. Placing Concrete in Forms.

- A. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section.
- B. If a section cannot be placed continuously, provide construction joints as herein specified.
- C. Deposit concrete as nearly as practicable to its final location to avoid segregation due to rehandling or flowing.
- D. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with the recommended practices of ACI 309 to suit the type of concrete and project conditions.
- E. Do not use vibrators to transport concrete inside of forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than the visible effectiveness of the machine.
- F. Place vibrators to rapidly penetrate the placed layer of concrete and at least 6 inches into the preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set.
- G. At each insertion limit the duration of vibration to the time necessary to consolidate the concrete and complete embedment of reinforcement, and other embedded items without causing segregation of the mix.

3. Concrete Curing.

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperature, and maintain without drying at a relatively constant temperature for a period of time necessary for hydration of cement and proper hardening.

(1) Curing Duration

The curing shall continue until the cumulative number of hours or fractions thereof during which temperature of the air in contact with the concrete is above 50 degrees F has totaled at least 168 hours.

Rapid drying at the end of the curing period shall be prevented.

4. Curing Methods

- A. Moisture curing: Execute moisture by covering surface with blankets of wetted burlap. Material shall be kept saturated and in place for at least 168 hours. Water shall be applied in form of spray to avoid damage to fresh concrete. Take precaution to prevent blankets from being displaced.
- B. Liquid membrane curing: Liquid membrane curing compound shall be applied to cover surface completely and uniformly per manufacturer's instructions and at a rate which will achieve the performance requirement specified in AASHTO Specification M148, but at a rate not less than 1 gallon per 200 square feet. Apply membrane curing compound immediately behind final finishing operation. Failure to provide complete and uniform coverage at required rate will be cause for discontinuation of this method of curing and the substitution of moisture curing. Take special care to apply curing compound immediately after forms have been removed.
- C. Curing formed surfaces: Cure formed concrete surfaces by moisture curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- D. Pavement finish shall be as noted on plans and details. Verify and coordinate concrete finishes with Engineer prior to proceeding with work
- E. Protect the work and adjacent work against damage during progress of the work.

5. Concrete Finish Prior to Acrylic Coating

- A. All concrete seat wall surfaces exposed to public view shall meet American Concrete Institute (ACI) concrete surface category (CSC) – 3 or 4. The concrete seat wall surface is a prominent feature and the finished appearance is of significant importance. All labor, materials and equipment necessary shall be provided to meet all standards and recommendations of ACI to achieve the CSC 3 or 4 surface finish.

6. Concrete Finish Surface and Repairs

- A. Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of the Engineer. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning.
- B. Repair and patch defective areas with appropriate BASF Master Builders Solutions repair materials as noted under the Acrylic Waterproof Concrete Coating. Allow appropriate cure time prior to coating. Only repair and patch concrete surface when acceptable to Engineer.
- C. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete, but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Before placing cement mortar or proprietary patching compound, thoroughly clean, dampen with

water, and brush-coat the area to be patched with neat cement grout, or proprietary bonding agent.

7. Acrylic Waterproof Concrete Coating

Prepare concrete surface and apply coating per manufacturer requirements and recommendations.

Surfaces should be clean and sound and free of all bond-inhibiting contaminants.

Concrete substrates should be fully cured.

Repair any holes, spalled and damaged concrete with appropriate Master Builders Solutions repair materials. Allow appropriate cure time prior to coating.

Remove any protruding concrete accessories and smooth out any surface irregularities.

Treat cracks greater than 1/32 inch (0.8 mm) with knife-grade or brush-grade patching compound.

Treat cracks greater than 1/4 inch (6 mm) as expansion joints and fill with sealant approved by coating manufacturer.

High-pressure power wash surface (or abrasive blast on hard, dense surfaces) to create a profile of SP 3 or better, per ICRI Guide 310.2.

Some stains may require chemical removal. Neutralize any cleaning compounds used and rinse with clean water.

Check adhesion of old coatings according to ASTM D 3359, Measuring Adhesion by Tape Test Method A.

Remove any blisters or delaminated areas and sand edges to smooth rough areas and provide transition to old paint areas.

Apply primer in accordance with manufacturer's instructions. Use primer approved by coating manufacturer.

Mix coating in accordance with manufacturer's instructions to ensure uniform color and aggregate disbursement and to minimize air entrapment. In multi-pail applications, mix contents of each new pail into partially used pail to ensure color consistency and smooth transitions from pail to pail.

Apply coating in accordance with manufacturer's instructions. Apply coating as a two-coat system. Maintain proper uniform wet-film thickness during application to ensure performance characteristics desired. Apply coating using consistent application techniques to achieve uniform color and texture.

Protect applied coating from damage during construction.

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

Pay Item	Pay Unit
_Seat Wall	Foot
_Transition Wall	Foot
_Curb Wall	Foot

_Seat Wall, _Transition Wall and _Curb Wall shall be paid for at the contract unit price for the linear foot length of the face of the seat wall. The seat wall shall include all labor, materials and equipment necessary to supply and install in the locations and dimensions shown on the plans. Payment includes all labor, materials, and equipment required to construct the seat wall including anchors, drainage aggregate, underdrains, geotextile, reinforced backfill, control joints, expansion joints, sealant, reinforcement, tie bars, stainless steel wall nosing, aggregate base materials, footings, foundations, primer, coatings and other items which may be required. Submittals, material testing, shop drawings, proof rolling, and compaction shall be incidental to the Unit Price. Removal and replacement of concrete seat walls that do not meet the surface finish requirements to the satisfaction of the Engineer shall be provided at no additional cost. If acceptable by the Engineer the surface finish may be repaired as noted in the construction section above at no additional cost. If the repaired surface is not acceptable by the Engineer the concrete seat wall shall be removed and replaced at no additional cost.

Any extra costs including but not limited to additional labor, materials, and equipment incurred by the contractor due to **cold weather protection** requirements will not be paid for separately, and are considered incidental to related items of work. The contractor shall include all costs required to complete the construction activities per the construction milestone dates identified above and in the bidding proposal.

CITY OF DETROIT
SPECIAL PROVISION
FOR
DRIVEWAY, NONREINFORCED CONCRETE, 8 INCH, MODIFIED

Fishbeck:DPE

1 of 1

05/02/2019

a. Description. This work consists of constructing a nonreinforced concrete driveway approach according to section 801 of the Standard Specification for Construction and City of Detroit Standard Plan C-4384, except as modified by the details on the plans and this special provision.

b. Materials. Provide materials in accordance with subsection 801.02 of the Standard Specifications for Construction.

c. Construction. Construct the driveway approach according to subsection 801.03 of the Standard Specifications for Construction and City of Detroit Standard Plan C-4384, except as modified by the details on the plans and this special provision

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

_Driveway, Nonreinf Conc, 8 inch, ModifiedSquare Yard

_Driveway, Nonreinf Conc, 8 inch, Modified includes all materials, labor, and equipment necessary to complete the work as described.

CITY OF DETROIT
SPECIAL PROVISION
FOR
CONCRETE CURB AND GUTTER, DETAIL C1, MODIFIED

Fishbeck:KK

1 of 1

12-27-2019

a. Description. This work consists of installing concrete curb according to section 802 of the Standard Specifications for Construction and City of Detroit Standard Plan C-4380, except as modified by the details on the plans and this special provision.

b. Materials. Provide materials in accordance with subsection 802.02 of the Standard Specifications for Construction.

c. Construction. Construct the curb according to subsection 802.03 of the Standard Specifications for Construction and City of Detroit Standard Plan C-4380, except as modified by the details on the plans and this special provision.

d. Measurement and Payment. The completed work, as described, will be measured and paid as specified in section 802 of the standard specifications at the contract unit price using the following pay item:

Pay Item	Pay Unit
_Curb and Gutter, Conc, Det C1, Modified	Foot

_ Curb and Gutter, Conc, Det C1, Modified includes all materials, labor, and equipment necessary to complete the work as described.

CITY OF DETROIT
SPECIAL PROVISION
FOR
CURB, CONC, DETAIL CD, MODIFIED

DET: MCS

03-25-2010

Description: "Curb, Conc, Detail CD, Modified" shall be constructed in accordance with details shown on the plans and the Michigan Department of Transportation Standard Specifications for Construction. No reinforcing bars are required. Joints shall be as shown in Michigan Department of Transportation Standard Plan R-30-Series and as directed by the Engineer. Lawn sprinkler systems, if encountered, shall be protected by the contractor at no extra cost.

Method of Measurement and Basis of Payment: "Curb, Conc, Detail CD, Modified" will be measured by the linear foot. The contract unit price shall be payment in full for furnishing all materials, labor and equipment necessary to construct this item.

Pay Item

Curb, Conc, Detail CD, Modified

Pay Unit

Foot

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
CURB RAMP OPENING, CONCRETE

DES:CAL

1 of 1

APPR:MB:DBP:04-10-17

APPR FHWA:04-17-17

Add the following new subsection 803.03.I, on page 543 of the Standard Specifications for Construction:

I. Curb Ramp Opening. Construct curb ramp openings in accordance with subsection 802.03 of the Standard Specifications for Construction, Standard Plan R-28 Series and as required to conform with the associated sidewalk ramp geometry (counter slope, running slope, cross slope, flares, widths, etc.).

Add the following pay item to the pay item listing in subsection 803.04, on page 544 of the Standard Specifications for Construction:

Curb Ramp Opening, ConcFoot

Delete the second paragraph of subsection 803.04.C, on page 544 of the Standard Specifications for Construction in its entirety and replace with the following:

The unit price for **Sidewalk Ramp, Conc, __ inch** includes the cost of landings, monolithic rolled curbs or side flares along the longitudinal edges of the ramp or landing, and transitions to existing sidewalk.

Add the following new subsection 803.04.G, on page 545 of the Standard Specifications for Construction:

G. Curb Ramp Opening, Conc. The Engineer will measure **Curb Ramp Opening, Conc.** in place along the joint of the curbing with the pavement including transitions to and from adjacent standard full height curb and gutter cross section.

CITY OF DETROIT
SPECIAL PROVISION
FOR
SIDEWALK, SPECIAL FINISH

SG: BPC

1 of 6

04-10-20

a. Description. The work consists of constructing concrete sidewalk, in accordance with Section 803 of the 2012 Michigan Department of Transportation Standard Specifications for Construction, Standard Plan R-29 series and this special provision.

b. Materials. Concrete Pavement materials shall meet the requirements of Section 601, 701 and 803 of the 2012 Michigan Department of Transportation Standard Specifications for Construction.

1. Concrete Grade shall be S1. All concrete finish types shall be the same concrete mix and contain the same coarse and fine aggregates.
2. Normal-Weight Aggregates: ASTM C 33, Class 4S, uniformly graded. Provide aggregates from a single source.
 - a. Coarse Aggregate:
 - i. 3/8 Pea Stone
 - ii. Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a single source, with gap-graded coarse aggregate.
 - iii. Aggregate Sizes: 3/8 to 5/8 inch nominal.
 - iv. Aggregate Source, Shape, and Color: As selected and approved by the Owner and Engineer.
 - b. Fine Aggregate: 2NS Sand, Free of materials with deleterious reactivity to alkali in cement.
3. Curing Compound. Curing compound shall be Type 1, clear, conforming to ASTM C-309.
4. Joint Sealant to be a 2-component, premium grade, polyurethane based elastomeric sealant in a non-sag consistency. Color to be submitted for Engineer review and approval. Joint sealant to be Sikaflex 2cNS, Sonneborn NP2 or equal as approved by the Engineer.
5. Submit the following documents to the Engineer for review and approval prior to proceeding with construction of sidewalks:
 - A. Concrete Mix Design
 - B. Coarse Aggregate: 5 lb. Ziplock bag of representative sample
 - C. Manufacturer's data sheets and installation instructions for chemical retarder (if applicable)
 - D. Curing method and materials
 - E. Joint Filler, Sealant and color samples

c. Construction.

1. **Installer Qualifications.** The installer shall have a minimum of 5 years experience in concrete pavement with the finishes and joint types indicated and successfully completed not less than 6 projects comparable in scale and complexity. Documented proof that the proposed installer has a 10 year proven record of performance, confirmed by at least 3 local projects that the Engineer can examine.

1. **Project Conditions.** Concrete placement shall be installed within the following environmental requirements:

A. Maintain an ambient temperature of between 50 degrees F and 90 degrees F during application and at least 48 hours after application for releasing agent and/or chemically stained concrete. Do not place concrete when the temperature of the surrounding air is expected to be below 40 degrees F during placing or within 24 hours thereafter. Do not allow the temperature of plastic concrete to drop below 55 degrees F.

B. When the mean daily temperature of the atmosphere is 80 degrees F and above, or during hot and dry weather, do not place concrete with a placing temperature which causes difficulty from loss of slump, flash set or cold joints 75 degrees F where possible and not more than 90 degrees F in any event. Where climatic conditions cause too rapid drying, make arrangements prior to placing concrete for installation of wind breaks, shading, fog spraying, water sprinkling, ponding or wet covering of a light color. Take such protective measures as quickly as concrete hardening and finishing operation allow, and maintain throughout the entire curing period.

2. Construct all sidewalks with a maximum cross slope of 2.00 % (1/4 inch per foot) sloping inclusive of all tolerances but not less than 1.00 % minimum. Slope sidewalks as shown on plans.

3. Construct concrete sidewalk to a minimum 6-inch thickness at locations indicated on the plans, with the following exceptions:

A. Construct 8-inch thick concrete pavement for driveway and alley approaches and include at a minimum the first flags of sidewalk adjacent to the driveway and alley approaches.

B. Verify the pavement thickness locations with the Engineer. Coordinate pavement thickness changes with the location of pavement joints and notify Engineer of any areas that do not align with pavement joints and the Engineer will determine the limit of this item so that unusual jointing with the adjacent sidewalk pavement does not occur.

4. Restore area disturbed beyond actual sidewalk limits to its original conditions. No separate payment will be made for such restoration but is considered part of this work item.

5. **Pavement finish** will be as indicated on plans. Verify and coordinate concrete finishes with Engineer prior to proceeding with work.

a. Do not add water to concrete surfaces during finishing operations.

- b. All concrete finishes shall be as approved by Engineer as part of the project Mock-up samples noted below. Make adjustments to the finishes as directed by the Engineer as part of the Mock-up sample review and approval process at no additional cost.
- c. Apply appropriate finish type to the concrete surface as shown on the plans. Finish types shall terminate at the arc sawcut joint line and shall not overlap adjacent finish types. Concrete finishes that overlap or extend beyond the arc joints onto the adjacent finish and/or do not match the standard of workmanship approved as part of the mock-up shall be removed and replaced at no additional cost.
- d. **Trowel Smooth Finish (Float Finish)**
 - i. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
 - ii. Begin the second floating operation when bleed-water sheen has disappeared, and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
- e. **Light Broom Finish**
 - i. Draw a soft-bristle broom across float-finished concrete surface perpendicular to adjacent arc joint shown on the plans to provide a uniform, fine-line texture. Confirm direction of broom finish with Engineer prior to proceeding with construction.
- f. **Medium(Coarse) Broom Finish**
 - i. Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch (1.6 to 3 mm) deep with a stiff-bristled broom, perpendicular to adjacent arc joint shown on the plans. Confirm direction of broom finish with Engineer prior to proceeding with construction.
- g. **Light Sandblast Finish**
 - i. Expose fine aggregate with occasional exposure of coarse aggregate; approximately 1/16 to 1/8 inch reveal.
 - ii. Sandblast (Exposed-Aggregate) Finish: Expose aggregate in paving surface by either method as follows:
 - a. Chemical Retarder
 - 1) Chemical retarder if used shall be "Grace Top-Cast Concrete Surface Retarders". Chemical retarder grade shall be selected as part of the mock-up process defined below. Contractor shall change grade as requested by the Owner and Engineer during the mock-up process at no additional cost until mock-up sample approved.
 - 2) Immediately after float finishing, spray-apply chemical surface retarder to paving according to manufacturer's written instructions.
 - 3) Cover paving surface with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
 - 4) Without dislodging aggregate, remove mortar concealing the aggregate by lightly brushing surface with a stiff, nylon-bristle broom. Do not expose more than one-third of the average

diameter of the aggregate and not more than one-half of the diameter of the smallest aggregate.

- 5) Fine-spray surface with water and brush. Repeat cycle of water flushing and brushing until cement film is removed from aggregate surfaces to depth required.

b. Sandblasting

- 1) Perform sand blasting at least 72 hours after placement of concrete. Coordinate with formwork construction, concrete placement schedule, and formwork removal to ensure that surfaces to be blast finished are blasted at the same age for uniform results.
- 2) Employ templates to prevent etching surfaces not required to be sandblasted and to prevent damage to adjacent work from sandblasting and windblown material.
- 3) Determine type of nozzle, nozzle pressure, and blasting techniques required to match the mock-up control samples.
- 4) Perform sand blasting finishing in as continuous an operation as possible, utilizing the same work crew to maintain continuity of finish on each surface or area of work.
- 5) Abrasive blast corners and edge of patterns carefully, using back-boards, to maintain uniform corner or edge line. Corners shall be free of defects caused by sandblasting.
- 6) Provide protection to prevent damage to adjacent public or private property and to prevent injury to other personnel.
- 7) Repair or replace other work damaged by finishing operations at no additional cost.
- 8) Maintain control of concrete chips, dust, and debris in each area of work. Clean up and remove such material at the completion of each day of operation. Prevent migration of airborne materials by use of tarpaulins, wind breaks, and similar containing devices.

- c. Seeding of aggregate is not permitted.

h. Medium Sandblast Finish

- i. Partially expose coarse aggregate to an approximate reveal of 3/16 to 1/4 inch reveal.
- ii. Provide medium sandblast finish by exposing aggregate in paving surface by same method selected for the light sandblast finish and as defined in section above.

6. **Project Mock-Up.** Construct mock-up samples of the sidewalk concrete. An 8 ft. x 8 ft. square minimum sample of each finish type, shall be constructed to indicate the jointing, texture and finish, and curing compound in actual construction. Make mock-up samples as required until acceptance by the Engineer. The location of the mockup shall be approved by the Engineer prior to proceeding with the mockup. The cost for construction of the mock-up samples shall be included in the unit prices for the respective concrete sidewalk pay item and no additional compensation shall be provided for additional samples. Consider the approved mock-ups as a standard of workmanship to be matched throughout the Project. The sample may NOT be constructed as part of the Project. Remove samples which fail to meet the Engineer's approval. The approved samples shall remain in place during the complete duration of construction and shall be removed and disposed of by the contractor at the

completion of the project. ***Note: Contractor to schedule and construct mock-up within appropriate time-frame to accommodate the review and approval process as well as the potential need for subsequent mock-up samples to obtain approval prior to the scheduled time to commence construction of the concrete sidewalks per the approved project schedule.***

7. Concrete pavement joints shall be constructed and located as shown on plans and as defined below.
 - a. Notify Engineer of any jointing layout discrepancies shown on the plans for supplemental directions prior to proceeding with construction.
 - b. All dimensions are back of curb, edge of pavement, center of arc or center of fixture unless otherwise noted.
 - c. There shall be ½" sealed expansion joint at all curb/sidewalk, seat wall/sidewalk, footing/sidewalk, building/sidewalk, light pole or any other fixed objects (i.e. existing pavement, walls, poles, foundations). Plans may not show every required sealed expansion joint.
 - d. Control joints and sealed expansion joints in curbs and walls to align with control joints and sealed expansion joints in the adjacent concrete pavement and sidewalk.
 - e. Control joints and sealed expansion joints at driveway and alley approaches shall align with adjacent curb returns.
 - f. Control joints and sealed expansion joints to align with adjacent pavement, curbs, walls, etc. unless otherwise noted on the plans. Align joints perpendicular to pavement edge and align with center point of arcs, as shown.
 - g. Arc control joints along edges of concrete finish types to be laid out per plans and cut to ensure uniform arc and joint depth. The arc joints shall be located such that the triangular sections of the concrete pavement/sidewalk are not less than 18" on any given side.
 - h. Contractor shall utilize a form or guide to cut uniform arc joints in the alignments, radius and tangents shown on the plan. Arc joints are to be sawcut to a true even continuous smooth radius without irregularities.
 - i. Sawcut joints cut with irregularities as identified by the Engineer shall require the removal and replacement of the concrete pavement and joints at no additional cost.
8. Finished concrete pavement shall meet or exceed the quality, finish, and workmanship exhibited in the approved mock-up or be subject to rejection and replacement at the contractor's expense.

Provide the necessary materials and take the steps required to protect subsequent pours of concrete, saw cutting joints, finish treatment and other related work from damage, damage from finish applications, staining, discoloring, contaminating and/or causing any type of blemishes. Finished concrete pavement shall meet or exceed the quality, color, finishes (all types) and workmanship exhibited in the approved mock-up or be subject to rejection and replacement at the contractor's expense.

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

Pay Item	Pay Unit
_Sidewalk, Conc, 6-inch, Special Finish, Modified	Square Foot

The completed work for **_Sidewalk, Conc, 6-inch, Special Finish, Modified** will be measured by area in square feet. The contract unit price will be payment in full for furnishing all materials, labor and equipment necessary to construct the concrete sidewalk. Sawcutting, control joints, expansion joints, sealant, reinforcement, tie bars, finishing and other items which may be required shall be considered included in the construction and will not be paid for separately. Removal of the existing curb, pavement, and sidewalk will be paid separately. Aggregate base material will be paid separately.

Any extra costs including but not limited to additional labor, materials, and equipment incurred by the contractor due to **cold weather protection** requirements will not be paid for separately and are considered incidental to related items of work. The contractor shall include all costs required to complete the construction activities per the construction milestone dates identified and in the bidding proposal.

CITY OF DETROIT
SPECIAL PROVISION
FOR
SIDEWALK, SIDEWALK RAMP, AND DETECTABLE WARNING SURFACE

DET:GJM
Rev Fishbeck:DPE

1 of 2

09-28-2015
05-03-2019

a. Description: This special provision covers construction of concrete sidewalk, sidewalk ADA ramp and installation of detectable warning surface.

The work consists of constructing concrete sidewalk, ADA ramp and/or retrofitting ramp with detectable warning surface in accordance with the applicable provisions of Section 803 of the 2012 MDOT Standard Specifications for Construction and the current MDOT Standard Plan R- 28-series.

Complete this work in conformance with the American with Disability Act (ADA) provisions as applicable.

b. Material: Materials used for the construction of concrete sidewalks, ADA ramps and detectable warning surfaces shall be as specified in Section 803.02.

The Detectable Warning Surface color shall be will be brick red, Federal Color Number 22144, unless otherwise approved by the Engineer. The color shall be homogeneous throughout the tile

c. Construction: Construct concrete sidewalk ADA ramp(s), landings flares and detectable warning surface according to MDOT Standard Plan R-28-series. The concrete sidewalk and ADA ramp thickness shall be as determined by the City of Detroit, and as shown on the MDOT Sidewalk Ramp and Detectable Warning Details, R-28-series, included in these Specifications. The Detectable Warning Surface installation shall also comply with the manufacturer's instructions.

The curb and gutter section at the bottom of the ramp (ramp opening) shall be a full depth curb with a minimum depth of 12 inches and shall be 18 inches from the back of curb to abutting pavement.

It is also the Contractor's responsibility to incorporate any changes made to the ADA accessibility requirements that may take effect prior to the start date of actual construction. If the Contractor determines that any changes significantly alter the original bid cost, the Contractor may submit a written request to the Engineer or his representative for approval and compensation. Include a cost comparison between the original bid cost and the cost of the ADA required changes in the request.

Construct all concrete sidewalks with a cross slope of 2.00% (1/4 inch per foot) sloping down towards the street, but not less than 1.00% minimum when existing conditions prevent from having a normal slope.

Construct concrete sidewalk to a minimum 6 inch thickness at all locations called for, with the following exceptions:

Construct 6-inch-thick concrete for sidewalks abutting residential driveways, and the first flags of sidewalk adjacent to commercial driveways and alley pavements. Paid

for as _Driveway, Nonreinf Conc, 8 inch, Modified.

The contractor shall stamp all concrete with a legible stamp bearing the name of the company and the year of construction. No sidewalk or ramp construction shall commence without a Contractor's stamp on site.

Restore berm areas disturbed beyond sidewalk ramp repair limits to its original conditions. No separate payment will be made for such restoration, but is considered part of the work item.

Any constructed ramps that do not met the current MDOT Sidewalk Ramp Standard Plans and the latest ADA accessibility requirements will be removed and replaced by the Contractor, as directed by the Engineer or his representative, at the Contractor's expense.

d. Measurement and Payment: The completed work as described herein for Sidewalk Ramp, ADA and Detectable Warning Surface, will be measured by square foot and foot respectively. The contract unit price will be payment in full for furnishing all materials, labor and equipment necessary to construct the ADA ramp and curb and warning surface.

Pay Item	Pay Unit
_Sidewalk, Conc, 8 inch, Modified.....	Square Foot
_Sidewalk Ramp, Conc, 6 inch, Modified	Square Foot
_Detectable Warning Surface, Modified	Foot

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
PERMANENT PAVEMENT MARKINGS

PMK:MKB

1 of 3

APPR:MWB:CRB:02-08-18

FHWA:APPR:03-01-18

Add the following to the end of the list of materials in subsection 811.02, on page 588 of the Standard Specifications for Construction:

Modified Urethane Pavement Marking Material	920
Preformed Thermoplastic Pavement Marking Material	920

Ensure preformed thermoplastic materials for surface applications have a thickness of 90 mils and preformed thermoplastic materials for recessed applications have a thickness of 125 mils.

Add the following paragraph after the first paragraph of subsection 811.03.B, on page 589 of the Standard Specifications for Construction:

If pavement marking plan sheets and/or Witness, Log are included in the project the markings will be laid out by the Contractor prior to the permanent markings being applied. Layout is considered incidental to placement of permanent pavement markings. Provide the Engineer documented notice at least 2 calendar days prior to the Contractor pavement marking crew arriving onsite to layout and place the permanent pavement markings to enable the Engineer or a representative being onsite for review of the layout prior to the marking application. Notify the Engineer if it is discovered during layout that the pavement width or geometry has been altered or is different from the planned or logged configuration. The Contractor and Engineer will discuss and document the resolution for marking layout in such areas. If pavement marking plans and/or Witness, Log are not in the project, it is the responsibility of the Engineer to provide layout for the permanent pavement markings.

Add the following rows to Table 811-1 of subsection 811.03.B, on page 591 of the Standard Specifications for Construction:

Polyurea	20	Binder (gal)	5.5	8.25	11	17	22	33	44	66
		Bead (lb)	As directed by the manufacturer							
Modified Urethane	20	Binder (gal)	5.5	8.25	11	17	22	33	44	66
		Bead (lb)	As directed by the manufacturer							

Add the following paragraph after the fifth paragraph on page 592 of subsection 811.03.B, of the Standard Specifications for Construction:

Beads are not to be placed in liquid shadow markings.

Add the following subsections after the last paragraph of subsection 811.03.D.7.c, on page 595 of the Standard Specifications for Construction:

8. **Modified Urethane.** Ensure the pavement is free of excess surface and subsurface moisture that may affect bonding. The Engineer will not decide the suitability of specific days for the application of modified urethane.

Surface preparation requirements for special, and longitudinal modified urethane pavement markings depend on surface conditions.

Prepare new HMA surfaces and HMA surfaces open to traffic for 10 days or less with no oil drips, residue, debris, or temporary or permanent markings, by cleaning the marking area with compressed air.

Prepare new PCC surfaces and PCC surfaces free of oil drips, residue, and debris, temporary, or permanent markings, by removing the curing compound from the area required for pavement markings.

Prepare existing HMA or PCC surfaces that do not have existing markings, but may have oil drip areas, debris, or both, by scarifying the marking area using non-milling grinding teeth or shot blasting. The Engineer will allow the use of water blasting to scarify the marking area on PCC surfaces.

Prepare existing HMA or PCC surfaces with existing pavement markings and that may have oil drip areas, debris, or both, by using the following methods:

- a. For existing liquid pavement markings, scarify the proposed marking area using non-milling grinding teeth or shot blast. Occasionally existing liquid pavement markings will require complete removal, which will be determined by the Engineer.
 - b. For existing cold plastic markings, completely remove the existing markings.
9. **Preformed Thermoplastic.** Ensure the pavement is free of excess surface and subsurface moisture that may affect bonding. The Engineer will not decide the suitability of specific days for the application of preformed thermoplastic.

Heat and apply the preformed thermoplastic material as recommended by the manufacturer. Feather all edges of the material with a putty knife while the preformed thermoplastic is still soft.

Modify the following row in Table 811-2 of subsection 811.03.D, on page 596 of the Standard Specifications for Construction to read as follows:

Thermoplastic	50	50	May 1	Nov. 1
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Add the following rows to Table 811-2 of subsection 811.03.D, on page 596 of the Standard Specifications for Construction:

Modified Urethane	40	40	Apr. 15	Nov. 15
Preformed Thermoplastic	35	35	Apr. 15	Nov. 15

Add the following pay items to the list of pay items in subsection 811.04, on page 598 of the Standard Specifications for Construction:

Pavt Mrkg, Modified Urethane, (symbol)	Each
Pavt Mrkg, Modified Urethane, (legend)	Each
Pavt Mrkg, Modified Urethane, ___ inch, Crosswalk	Foot
Pavt Mrkg, Modified Urethane, ___ inch, Stop Bar	Foot
Pavt Mrkg, Modified Urethane, ___ inch, Cross Hatching (color)	Foot
Pavt Mrkg, Modified Urethane, ___ inch, (color)	Foot
Pavt Mrkg, Only Cold Plastic, ___ inch, Shadow Tape, Black	Foot
Pavt Mrkg, Only Cold Plastic, ___ inch, Wet Reflective, (color)	Foot
Pavt Mrkg, Preformed Thermoplastic, (symbol)	Each
Pavt Mrkg, (binder), ___ inch, Shadow Liquid, Black	Foot

CITY OF DETROIT
SPECIAL PROVISION
FOR
RECESSING FOR PAVEMENT MARKINGS

DPW/TED: JF

1 of 1

12-09-13

a. Description. Recessing grooves shall be cut into the roadway to facilitate the protection of pavement marking material from vehicle wear and cleaning equipment such as snow plows. This work shall be performed for the installation of all transverse line markings except where markings are in-laid into fresh hot asphalt. This work shall conform to Section 811 of the Standard Specifications for Construction and the following provisions specified herein.

b. Materials. Not applicable.

c. Construction. The groove recesses shall be made on concrete and asphalt road surfaces in a single dry pass cut and the equipment used shall be self-vacuuming and leave the cut groove ready for material installation. The blade tool shall be made of stacked diamond cutting heads or engineer approved flat-tooth design hard alloy material such as tungsten-carbide. The bottom of the groove shall have a fine corduroy finish. The remaining roadway surface shall be solid and intact and not cracked or broken with potentially loose pieces subject to breaking off. If a coarse tooth pattern or cracked road surface results, then the tooling must be changed. Either a) the number of blades is to be increased and the spaces on the cutting head are to be decreased or b) the type of blade is to be changed to a superior material or cutting tool design.

Recess Width: Material width +1 inch, + / - 1/8 inch

Recess Depth: As recommended by the manufacturer, + / - 5 mils

Permanent Marking Material Application:

The recessing equipment and method used shall comply with the pavement material manufacturer's installation instructions. Recess grooves shall be clean and dry prior to placing any pavement marking material. The entire pavement marking must be placed within the recess and shall be placed in the same day as the recessing work.

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

Pay Item	Pay Unit
_Recessing for Pavt Mrkg, 12 inch.....	Foot
_Recessing for Pavt Mrkg, 18 inch.....	Foot

The item of **_Recessing for Pavt Mrkg, _ inch** includes all equipment and labor necessary to complete the work. Payment for any temporary paint lines (used as a template) is included in the item **_Recessing for Pavt Mrkg, _ inch**.

CITY OF DETROIT
SPECIAL PROVISION
FOR
MAINTAINING TRAFFIC

Fishbeck:KK

1 of 3

01-20-2020

a. Description. This work consists of all labor, materials, and equipment required to maintain traffic as specified herein, on Puritan Avenue between Evergreen Road and Plainview Avenue in the city of Detroit, Wayne County.

b. General. Traffic shall be maintained throughout the project in accordance with 2012 MDOT Standard Specifications for Construction, Section 812, Temporary Traffic Control for Construction Zone Operations, including any supplemental specifications, and as herein specified. All traffic control devices shall conform to the current edition of the 2011 Michigan Manual of Uniform Traffic Control Devices.

City of Detroit Street Maintenance Department and/or Contract Maintenance Agencies may perform maintenance work within or adjacent to the Construction Influence Area (CIA). The Maintenance Division of City of Detroit and or Contract Maintenance Agency will coordinate their operations with the Supervising Engineer to minimize the interference to the Contractor. No additional payment will be made to the Contractor for the joint use of the traffic control items.

Failure to comply with all stipulations of the following traffic specifications will be cause for complete shutdown of the project.

In the event of an emergency, the following specifications and restrictions are subject to change if traffic conditions indicate such a necessity.

Traffic specifications are to be with the work crews at all times.

c. Construction Influence Area (CIA). The CIA shall include the area within the right-of-way of the street or streets listed in the contract and/or the cross streets within the limits of the construction staging.

The Contractor shall coordinate his operations with Contractors performing work on other projects within or adjacent to the Construction Influence Area (CIA).

d. Traffic Restrictions. Maintaining traffic requirements and hourly restrictions are subject to change by the Engineer.

1. No work shall be performed or lane closures allowed during the Memorial Day, July 4th, or Labor Day holiday periods, as defined by the Engineer. The Contractor shall coordinate their work schedule around special events that take place in local communities in accordance with the Engineer. The Contractor shall be responsible to contact the Supervising Engineer to acquire specific dates and locations for these events.

2. Work shall be suspended by the Engineer at any time traffic is being unduly hampered or delayed. In general, traffic is expected to be unduly hampered from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m. weekdays. These hours may be adjusted by the Engineer.

e. Traffic General.

1. Walks, driveways, alleys and entrances to buildings shall not be blocked.
2. The paved surface shall be free of stored equipment, excavated material, etc. during specified hours.
3. Protection and temporary driveway access to residents and businesses shall be provided and maintained as directed by the Engineer.
4. The Contractor shall notify local businesses a minimum of 48 hours prior to the implementation of any lane closures, weekend closures and major traffic shifts.
5. The Contractor shall notify the Engineer, the Michigan Department of Transportation and the Detroit Police and Fire Departments patrolling the area three (3) business days prior to making any lane closures or traffic switches.
6. The Contractor must coordinate his operations with contractors performing work on other projects within or adjacent to the construction influence area.
7. The Contractor shall be required to coordinate the work with the curb-side garbage pick-up within the construction influence area.
8. Truck haul routes selected by the Contractor must be submitted to the City of Detroit Department of Public Works for approval prior to the start of construction and are subject to regulations of the Department.
9. Dirt, mud, construction materials or other debris deposited on public sidewalks or streets as the result of spilling, tracking by the wheels of trucks or construction equipment or by other actions of the Contractor, his employees or subcontractors shall be immediately removed by the Contractor. Failure to do so is a violation of City Ordinances punishable by fines and/or imprisonment.

f. Stage Construction. The traffic control required by this Special Provision for work on various streets in the contract and adjacent roadways is based on the current edition of the 2011 Michigan Manual of Uniform Traffic Control Devices.

g. Traffic Control Devices. Traffic control devices shall conform to the current edition of the 2011 Michigan Manual of Uniform Traffic Control Devices, Part VI, Construction and Maintenance; the Michigan Department of Transportation Maintaining Traffic Safety Typical Standards: M0020a, M0030a, M0040a, M0050a, M0110a, M0140a, WZD-100-A and WZD-125-E; and/or the City of Detroit, Department of Public Works Standards on Maintenance and Utility Signing as applicable.

1. General.

- A. During non-working periods, any work site with uncompleted work must have applicable advance signs and channelizing devices at specific locations, as directed by the Engineer, at no additional cost to the Department.

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

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

2. Channelizing Devices.

A. Channelizing Device, 42 inch and Barricade, Type III, High Intensity, Double Sided, Lighted necessary for traffic control and public safety shall be furnished and erected by the Contractor.

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

C. Do not use caution tape on this project.

3. Temporary Signs.

A. The Contractor shall furnish and install all signing necessary for the maintenance of traffic.

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

C. Distances between sign locations will vary depending on the lengths of the City blocks in advance of the job site. Other traffic signing and barricading requirements for this project are contained in the proposal.

D. Temporary "No Parking" signs shall be placed in all parking areas when necessary to prohibit parking during construction activities. The "No Parking" signs shall be placed in all parking areas at least 24 hours and not more than 48 hours prior to construction activities.

E. The Contractor may relocate signs and other portable barricades only after coordinating with representatives of the Traffic Engineering Division of the Department of Public Works.

h. Measurement and Payment. Payment will be in accordance with the standard specifications unless otherwise specified.

Any equipment required for nighttime operations shall be included in the cost of the work items being placed.

CITY OF DETROIT
SPECIAL PROVISION
FOR
IRRIGATION SYSTEM

SG: KWG

1 of 15

12-21-19

a. Description. This work consists of furnishing and installing an automatic irrigation system complete per plans, details and this special provision.

1. The irrigation design drawing shall be completed in strict compliance with this specification for review and approval by Owner's representative.
2. The contractor shall engage an irrigation designer to complete construction drawings and details to completely define and detail the irrigation system and all its related components. The contractor is responsible to submit the irrigation construction documents to the owner's representative for review and approval prior to proceeding with irrigation system construction activities. The contractor is responsible to provide the design modifications that are requested by the owner's representative at no additional cost. The irrigation designer shall be conversant with the design of irrigation systems including the design of drip irrigation and shall have a minimum of (10) ten years' experience in the successful design, construction, and operation of irrigation systems in the state of Michigan.
3. The irrigation system shall be constructed using drip irrigation equipment including drip tubing, emitters, bubblers, all fittings, stakes, and valves etc., of size and types as indicated in these specifications. The system shall be constructed to grades and conform to areas and locations as shown on the drawings.
4. The construction of the drip irrigation system shall include the furnishing, installing and testing of all mains, laterals, risers and fittings, emitters, drip tubing, quick coupling valves, automatic control valves, manual valves, control timers, weather sensors, flow meters, controller remotes, and other necessary specialties and the removal and/or restoration of existing improvements, excavating and backfill, connection to existing water service located in Grand River Avenue ROW and all other work in accordance with plans and specifications as required for a complete system.
5. The entire system shall conform to local standards and requirements for landscape irrigation systems.
6. Related Work Specified Elsewhere:
 1. Exterior Plantings.

b. Materials

A. General:

1. All materials to be incorporated in this system shall be new and without flaws or defect and quality and performance as specified. All material

overages at the completion of the installation are the property of the Contractor and are to be removed from the site.

2. The Contractor shall use materials as specified. Material other than specified will be permitted only after written application by the Contractor and written approval by the Owner's representative. Substitutions will only be allowed when in the best interest of the Owner.

B. Submittals

1. Provide documentation validating the irrigation designer has a minimum of (10) ten years' experience in the successful design, construction, and operation of irrigation systems in the State of Michigan. Provide certification documents confirming certification with the Irrigation Association and applicable irrigation licenses.
2. Submit specific product information including make and model number to the owner's representative on backflow devices, valves, valve boxes, two-wire cable (as applicable), two-wire decoders (as applicable), emitters, drip tubing, drip valve kits, controller, weather sensors, flow meters, wire connectors and wire, all pipe and fittings, clamps, enclosures, to be used on the project prior to purchasing materials. Submittals are subject to the owner's representative approval.
3. Upon irrigation system acceptance, submit written operating and maintenance instructions. Provide format and contents as directed by the Owner's representative. Include instruction sheets and parts lists for all operating equipment.
4. Provide a reproducible irrigation system record drawing including an electronic AutoCAD copy on a CD showing drip tubing, valves, field splices, drains and pipelines including quick coupler and automatic valves. Drawing is to be given to the Owner or the Owner's representative at the final irrigation system walkthrough. Also include zone chart in each control timer along with colored drawing indicating extent of zones.
 - 1) Legibly mark drawings to record actual construction.
 - 2) Indicate horizontal locations, with a minimum of two dimensions to permanent surface improvements.
 - 3) Identify field changes of dimension and detail and changes made by Change Order.

C. Quality Assurance

1. The Contractor shall maintain continuously a competent superintendent, satisfactory to the Owner, with authority to act for him in all matters pertaining to the work.

2. Superintendant shall hold certification as a Certified Irrigation Contractor with the Irrigation Association. Owner's Representative reserves the right to waive this certification requirement.
3. Contractor shall hold valid licensing in states where irrigation contractors must be licensed to install commercial irrigation systems.
4. The Contractor shall coordinate his work with the other trades.
5. The Contractor shall confine his operations to the area to be improved and to the areas allotted him by the Owner's representative for material and equipment storage.
6. The Contractor shall have a minimum of 10 years' experience installing irrigation systems of comparable size and complexity.
7. It shall be the Contractor's responsibility to ensure and guarantee satisfactory operation of the entire system and the workmanship and restoration of the area. The entire system shall be guaranteed to be complete and perfect in every detail for a period of one year from the date of its acceptance and he hereby agrees to repair or replace any such defects occurring within that year, free of expense to the Owner. Contractor shall winterize the system the first year.

D. Irrigation Plan Requirements

General

1. The Contractor's submitted irrigation plan(s) shall conform to all design parameters set forth in this document. Plans submitted which do not conform to all irrigation plan requirements are to be regarded as incomplete and will not be accepted.

Information Requirements

1. All plans shall be submitted at the same scale as the landscape plans, and shall contain appropriate scale designations and north arrows.
2. The irrigation Designer's name and phone number shall appear on the plans.
3. The irrigation plan shall include a run time chart which indicates the precipitation rate for that zone and the length of time each zone must operate to apply .2" of water.
4. Show proposed weekly watering schedule, conforming to water window as described elsewhere in this document.
5. Each plan shall include a key indicating all equipment to be used on the project.
6. Key shall differentiate between different sprinkler types, nozzle sizes, and arcs.

7. All zones must be identified with control timer designation, station number, gallonage, and automatic control valve size.

Design Parameters

1. The irrigation design shall be adapted to work in harmony with the landscape plan, grading plan, and other site features.
2. Drip irrigation shall be used for all planting bed areas.
3. All trees shall have three bubblers installed at each and set on a separate tree bubbler zone.
4. Protecting public safety and consideration of site aesthetics shall be incorporated into the design.
5. Conform to all codes and regulations, including State Health Codes as they apply to backflow prevention.
6. The irrigation design shall include the following system hydraulic design parameters.
 - a. A maximum pressure differential within the mainline between the water source and furthest point on the mainline shall not exceed 20% of the static pressure downstream of the backflow preventer.
 - b. Mainline pipe shall be sized to keep velocities below 5' per second. Lateral pipe shall be sized to keep velocities below 6' per second.
7. Water window to be a maximum of 8 hours, commencing at 10:00 p.m. and complete by 6:00 a.m.

E. Pipe and Fittings:

1. Pipe sizes shall conform to those shown on the drawings. No substitutions of smaller pipe sizes will be permitted, but substitutions of larger size may be approved. All pipe damaged or rejected because of defects shall be removed from the site at the time of said rejection.
2. Provide pipe continuously and permanently marked with manufacturer's name or trademark, size schedule and type of pipe working pressure at 73 degrees F. and National Sanitation Foundation (NSF) approval.
3. All mainline piping and underground piping under continuous pressure plus all pipe 3" or larger whether a lateral or mainline, shall be rigid, unplasticized polyvinyl chloride pipe extruded from virgin parent material, ASTM D-2241. Provide pipe homogeneous throughout and free from visible cracks, holes, foreign materials, blisters wrinkles and dents.

4. PVC Pipe and sleeving shall be SDR 21, Class 200 unless stated otherwise on the drawing.
5. PVC pipe four inches (4") and larger shall be ring-tite type with push on joint having integral bell end and rubber gasket.
6. PVC Pipe 3" and smaller and all sleeving shall be solvent weld type.
7. PVC pipe fittings for sizes 3" and smaller and all sleeving shall be ASTM D-2466 schedule 40 PVC molded fittings suitable for solvent weld.
8. All fittings for PVC pipe 4" and larger shall be ductile iron as manufactured by Harco.
9. All threaded PVC pipe-fittings shall be ASTM D-2467, Schedule 80 PVC.
10. Saddle and cross fittings are not permitted. Use male adapters for plastic to metal connections. Hand-tighten male adapters plus one turn with a strap wrench.
11. Areas using polyethylene lateral pipe: All pipe downstream from zone valves sized 2" and smaller, shall be flexible non-toxic polyethylene pipe. Polyethylene pipe shall be PE 3408, ASTM rated at 100 PSI minimum working pressure, and in conformance with ASTM D-2239, NSF approved or as noted on the drawing. Pipe larger than 2" size shall be PSI as specified for mainlines. PE 2306 fittings for polyethylene pipe shall be ASTM D-2609 insert type fittings. Saddle and cross fittings not permitted. All joints shall be secured with stainless steel band and screw clamps.
12. Areas using PVC lateral pipe: All pipe downstream from zone valves sized 2" and smaller, shall be schedule 40 PVC pipe.
13. Primer and solvent for use with PVC pipe to conform to ASTM D-2564. Primer to be purple in color. Solvent to be appropriate for pipe and fitting type and weather conditions.
14. All above grade pipe shall be type 'L' copper. Fittings shall be cast brass or wrought copper.
15. Systems using reclaimed water as the irrigation system watersource shall use pipe that is lavender in color or of a specific color as deemed acceptable by the local water purveyor for reclaimed water.

F. Control System:

1. The automatic controllers and valves shall be as of the same manufacturer.
2. All controllers shall be locally available and be have local trouble shooting representatives.

3. All controllers shall have a proven record of successful performance in the project area. No controller will be approved for use that has not been available in the project area for less than one year from the final approval date on the irrigation design drawings.
4. All controllers shall be accompanied by a weather or soil moisture sensor manufactured by the controller manufacturer.
5. Controllers shall be grounded per manufacturer's recommendations.
6. All controllers and sensors shall be acceptable to the local water purveyor for landscape irrigation systems.
7. Include, as applicable, phone, Ethernet, radio, or cellular card depending on potential controller/off-site monitoring communication desired.
8. Include hand-held remote, model as recommended by controller manufacturer, to allow maintenance persons to operate individual zones without direct access to the controller.

G. Control Wire, Decoders, Flow Meters, and Connections:

1. Control wire and two-wire cable shall be Type UL approved, for direct burial and shall be Size 14 or larger, as recommended by the manufacturer for the conditions of the project. Conductor to be single strand soft annealed copper.
2. 24 volt control wires to be red in color. Common wire to be white in color.
3. Two-wire cable shall be manufactured by the controller manufacturer for specific use by that controller.
4. Two-wire decoders shall be manufactured by the controller manufacturer for specific use by that controller.
5. Two-wire cable and decoders shall be grounded per manufacturer's recommendations.
6. Flow meters shall be installed at all watersources. Flow meters shall be manufactured by the controller manufacturer.
7. Low voltage wire connectors to be made using 3M DBR/Y connectors.
8. 120 volt or heavier splices made underground to be made using 3M DBR/Y connectors.

H. Drip Irrigation:

1. Sprinkler equipment shall be manufactured by Hunter (Pro-S), Rainbird (1800), or Toro (570Z) and include check valve and pressure regulating feature.

2. Provide drip irrigation for all planting beds and trees. All drip irrigation equipment including drip tubing, emitters, bubblers, all fittings, stakes and valves shall be from the same manufacturer.
 3. Provide 1" polyethylene lateral pipe installed within sleeve from drip kit valve to each planting bed.
 4. Drip tubing is to be Netafim Techline CV, or Rainbird and Hunter equivalent. All drip tubing shall be installed in the top 1" to 2" of planting mix and shall not be visible following installation. Laying drip irrigation tubing on the surface of the planting mix and covering with mulch will not be accepted.
 5. Provide .6 gph emitters spaced 12" o.c. and check valve feature in every emitter.
 6. Install drip tubing between each row of plants. Stake each row of drip tubing min. of 5'-0" o.c.
 7. Install (3) – 1.0 gpm bubblers per tree and set on a separate tree bubbler zone.
 8. Install flush valve at furthest point from drip kit.
 9. Provide quick coupler valves in the locations shown on the plans. Quick coupler shall be one-piece cast brass bodies with spring-loaded, self-closing thermoplastic locking covers and 1-inch ips inlet. Supply two brass operating keys and swivel ells to match valves installed. Hose swivels: designed to rotate 360 degrees and threaded with a male $\frac{3}{4}$ -inch hose connection.
 10. All valve boxes and covers to be black in color.
 11. Provide and coordinate electrical power connection for irrigation controller.
- I. Clamps (polyethylene lateral pipe):
1. Clamps to be stainless steel, worm gear hose clamps with stainless steel screw.
- J. Automatic Valves and Quick Coupling Valves:
1. Valves shall be manufactured by Hunter, Rainbird, or Toro.
 2. Models shall be Hunter ICV, Rainbird PEB, and Toro P-220. Size per manufacturer's recommendation for specific zone flow.
 3. Valves shall be installed inside 11" x 14' valve box.
 4. Valves shall have zone identification tag attached to the valve stem.

5. Valves installed on systems fed from a reclaimed water source shall have lavender handles.
6. Install brass ball valve upstream of all automatic valves.
7. Quick coupler valves shall be manufactured by Hunter, Rainbird, or Toro and be 1" size.
8. Quick couplers shall have one piece body with locking lid and stabilized.
9. Quick couplers shall be installed inside 10" round valve box.
10. Quick couplers installed on systems fed from reclaimed water shall have lavender lids.
11. Quick couplers shall be spaced a maximum of 50' o.c. and as requested by the owner's representative.

K. Manual Valves

1. Manual valves shall be manufactured by Nibco, Matco-Norca, or Red white.
2. Valves 2" and larger shall be gate valves, 200 #WOG, with solid wedge disc, conforming to federal specifications for its class.
3. Valves three inches (4") and larger shall be iron body bronze mounted, non-rising stem, with end connections for PVC pipe and have a two inch (2") square operating nut which turns to the left to open. Provide thrust block support.
4. Manual valves shall be installed inside 11"x14" valve box.

L. Valve Boxes:

1. Valve access boxes shall be manufactured by Carson, Pentek, NDS, or Rainbird.
2. Valve Access Boxes to be tapered enclosure of rigid plastic material comprised of fibrous components chemically inert and unaffected by moisture corrosion and temperature changes. Provide lid of same material black in color.
3. Provide lavender lid for systems fed from reclaimed water.
4. Boxes to be 10" (quick couplers and wire splices) or 11" x 14" (automatic and manual valves) and of minimum size required to permit access to the valve. Side walls to extend at least 2" below the bottom of valve body; use extension as necessary.

5. Valve access boxes shall have filter fabric liner and gravel or pea stone sump.

M. Backflow Preventer:

1. Backflow preventers shall be reduced pressure zone type as manufactured by Watts, Febco, or Wilkins-Zurn.
2. Backflow preventers shall have air-gap discharge to floor drain.

N. Water source Tap:

1. Refer to DWSD water source detail for 1" tap.
2. Installation shall conform to all applicable codes.

O. Accessories:

1. Drainage fill: 1/2" x 3/4" washed pea gravel.
2. Fill shall be clean soil free of stones larger than 2" diameter, foreign matter, organic material and debris.
3. Provide imported fill material as required to complete the work. Obtain rights and pay all costs for imported materials.
4. Suitable excavated materials removed to accommodate the irrigation system work may be used as fill material subject to the Owner's representative's review and acceptance.

c. Construction

A. DELIVERY, STORAGE AND HANDLING

1. Deliver irrigation system components in manufacturer's original undamaged and unopened containers with labels intact and legible.
2. Deliver plastic piping in bundles, packaged to provide adequate protection of pipe ends, both threaded or plain.
3. Store and handle materials to prevent damage and deterioration.
4. Provide secure, locked storage for valves, sprinkler heads and similar components that cannot be immediately replaced, to prevent installation delays.

B. PROJECT CONDITIONS

1. The bidder acknowledges that he has examined the site and specifications, and prepared appropriate irrigation plans to correspond to

the site conditions and landscape design. The submission of a proposal shall be considered evidence that examination has been made.

2. It shall be the contracting installer's responsibility to report to the Owner's authorized representative any deviations between drawings, specifications and the site. Failure to do so prior to the installing of equipment and resulting in replacing and/or relocation equipment shall be done at the Contractor's expense.
3. The exact location of all existing utilities and structures and underground utilities are not indicated on the drawings; their locations shall be determined by the Contractor, and he shall conduct his work so as to prevent interruption of service or damage to them. The Contractor shall protect existing structures and utility services and be responsible for their replacement if damaged by construction activities.
4. Minor adjustments in system layout will be permitted to clear existing fixed obstructions. Final system layout shall be acceptable to owner's representative.

C. CODES AND STANDARDS

1. The entire installation shall fully comply with all local and state laws and ordinances and with all established codes applicable thereto.
2. Any permits for the installation of construction of the work included under this contract which are required by any of the legally constituted authorities having jurisdiction, shall be obtained and paid for by the Contractor, each at the proper time. He shall also arrange for and pay all costs in connection with any inspections and examinations required by these authorities.
3. In all cases where inspection of the sprinkler system work is required and/or where portions of the work are specified to be performed under the direction and/or inspection of the Owner's authorized representative, the Contractor shall notify the Owner's authorized representative at least 24 hours in advance of the time and such inspection and/or direction is required.
4. Any necessary re-excavation or alterations to the system needed because of failure of the Contractor to have the required inspections shall be performed at the Contractor's own expense.

D. PREPARATION

1. Layout and stake the location of each pipe run and valves. Obtain Owner's representative's acceptance of layout prior to excavating, unless specifically waived by the owner's representative.

E. EXCAVATING AND BACKFILLING

1. Excavating shall be considered unclassified and shall include all materials encountered, except materials that cannot be excavated by normal mechanical means. Excavate trenches of sufficient depth and width to permit proper handling and installation of pipe and fittings. Excavate to depths required to provide 2" depth of earth fill or sand bedding for piping when rock or other unsuitable bearing material is encountered.
2. Install sleeves for irrigation piping prior to paving. Minimum depth of bury for sleeves beneath roadways and drives, 36" and 18" beneath walks. A sleeve shall be required at all locations where irrigation lines are placed below pavement, roads, walks, curbs, plaza, and any other surface features identified by the owner's representative. Provide a spare sleeve with closed ends and pull string at all sleeve locations.
3. Sleeves needing to be installed beneath existing paving shall be installed by directional bore method. Minimum depth of bury for sleeves beneath roadways and drives, 36" and 18" beneath walks.
4. Locations of all underground sleeves shall be physically marked on the closest point on the concrete curb on both ends of the sleeve. Review and obtain approval from owner's representative on an acceptable method for marking the underground sleeves prior to proceeding with work. Document and reference the as-built locations of all sleeves on the as-built documents.
5. Pipe pulling will be allowed for lateral pipe only, provided soil moisture content and other conditions are suitable to allow for full depth of bury with a minimum of stretching and scraping of the pipe. Owner's representative reserves the right to determine suitability or conditions. If the pulling method is used, the pipe "plow" shall be a vibratory type.
6. Fill to match adjacent grade elevation with approved earth fill material. Place and compact fill in layers not greater than 8" depth.
7. Provide approved fine-grained earth fill or sand to point 4" above the top of pipe, where soil conditions are rocky or otherwise objectionable.
8. Fill to within 6" of final grade with approved excavated or borrow fill materials free of lumps or rocks larger than 2" in any dimension.
9. The top 6" of backfill shall be topsoil, free of rocks, subsoil or trash. Any special soil mixture shall be replaced to the original condition it was prior to irrigation installation.
10. Except as indicated, install irrigation mains with a minimum cover of 24" based on finished grades. Install irrigation laterals with a minimum cover of 14" based on finished grades.

11. Excavate trenches and install piping and backfill during the same working day. Do not leave open trenches or partially filled trenches open overnight.

F. UNDERGROUND PIPE

1. Install plastic pipe in accordance with manufacturer's installation instructions as ASTM D- 2274. Provide for thermal expansion and contraction.
2. Saw cut plastic pipe. Use a square-in-sawing vice, to ensure a square cut. Remove burrs and shavings at cut ends prior to installation.
3. Make PVC plastic-to-plastic joints with solvent weld joints. Use only primer and solvent recommended by the pipe manufacturer. Install plastic fittings in accordance with pipe manufacturer's instructions and ASTM D-2855. Contractor shall make arrangements with pipe manufacturer for all necessary field assistance.
4. Allow joints to set at least 24 hours before pressure is applied to the system.
5. Uncoil poly-pipe and insert fitting full depth. Secure poly-pipe to insert fittings with stainless steel clamps. Double clamp pipe 1-1/2" diameter and larger.
6. Maintain pipe interiors free of dirt and debris. Close open ends of pipe by capping, taping or other acceptable method when pipe installation is not in progress.
7. All mainline and continuously pressurized pipe is to be installed using open trenches. Lateral pipe may be installed by "Plowing" if soil conditions permit, and soils do not contain gravel, rock, construction debris or other potential damaging material.
8. Install thrust blocks on the mainline pipe work in accordance with pipe manufacturer's written instructions.

G. VALVE INSTALLATION

1. All zone control valves and manual valves shall be enclosed in a minimum 11" x 14" valve box. Quick couplers shall be installed inside 10" round valve boxes. Add extensions as required to prevent soil settlement around the valve. Set box flush with finish grade and aligned with adjacent boxes and/or adjoining site-work.
2. Install filter fabric inside valve box and install valve boxes on a suitable base of gravel to provide a level foundation at proper grade and to provide drainage of the access box. Support box with block or notch box to protect pipe under box.

3. Provide all quick coupler valves with pre-fabricated three elbow swing joint, schedule 80 PVC.
4. Fittings and pre-fabricated swing joint manufacturers shall be Spears, Lasco, or Dura.

H. BACKFLOW PREVENTER

1. Backflow installation shall meet all applicable plumbing and health department codes.
2. All pipe to and from backflow preventers until the discharge pipe reaches 24" bury, shall be type 'L' hard copper.

I. WATERSOURCE TAP

1. Refer to DWSD detail for installation requirements.

J. DRAINS

1. Although it is intended that some systems will be winterized using compressed air. Contractor to install manual drain valves at low points in the system to assist in winterization and service.

K. ELECTRICAL AND CONTROLLER INSTALLATION

1. Install electrical control wire and two-wire cable in the piping trenches wherever possible. Place wire or cable in trench adjacent to or underneath mainlines but not above. Install wire with slack to allow for thermal expansion and contraction. Expansion joints in wire may be provided at 200 foot intervals by making 5-6 turns of the wire around a piece of 1/2" pipe instead of slack. Where necessary to run wire or cable in a separate trench, provide a minimum cover of 24".
2. Provide minimum 24" slack at remote control valves and at all wire splices to allow raising the valve bonnet or splice to the surface without disconnecting the wires for repair.
3. Connect each remote control valve to one station of a controller except as otherwise indicated. Where there is to be more than one valve per station, make required splice at the control timer.
4. Make splices only at valves. Locate all field splices on the as-built drawing.
5. For two-wire systems, ground cable at each valve location and every 600' or as recommended by the manufacturer.
6. Hard wire 110 volt power to controller. All connections and installations shall meet applicable electrical codes. All wire not buried to be installed in conduit.

7. Connect data line, cellular, radio, or phone line to controller and test for successful communication link.
8. Accurately label zones inside the controller. Include color sketch of approximate zone limits.

L. FLUSHING AND TESTING

1. After all new equipment is in place and connected for a given section and all necessary division work has been completed, and prior to the installation of emitters, all control valves shall be opened and a full head of water used to flush out the system.
2. The main shall be tested under normal water pressure for a period of 12 hours. If leaks occur, repair and repeat the test. Give Owner's representative 24 hours notice prior to testing.
3. Testing of the system shall be performed after completion of each section or completion of the entire installation; and any necessary repairs shall be made, at the Contractor's expense, to put the system in good working order.
4. Adjustment of the tubing and automatic equipment will be done by the Contractor upon completion of installation to provide optimum performance.

M. CLEAN UP

1. Contractor shall keep the premises free from rubbish and debris at all times and shall arrange his material storage so as not to interfere with other construction activities and as directed by the Owner's Representative. Contractor shall remove and legally dispose of all unused material, rubbish and debris, including unsuitable excavated material from the site.

N. SERVICE AND MAINTENANCE

1. The Contractor shall service the system at the request during the guarantee period and shall be paid for work performed which is not covered by the guarantee. Contractor shall winterize the system the first year as part of this contract, and will provide written instructions to the Owner for future service and maintenance.
2. Return to the site during the subsequent spring season and demonstrate to the Owner the proper procedures for the system start-up, operation and maintenance.
3. After completion, testing and acceptance of the system, the Contractor will instruct the Owner's personnel in the operation and maintenance of the system.

O. OWNER'S ACCEPTANCE

1. The completion of the contract will be accepted and Notice of Completion recorded only when the entire contract is completed to the satisfaction of the Owner's authorized representative.
2. Within ten (10) days of the Contractor's notification that the installation is complete, the Owner's Representative will inspect the installation and if a final acceptance is not given, will prepare a "Punch List" which, upon completion by the Contractor, will signify acceptance by the Owner.

P. WARRANTY

1. It shall be the Contractor's responsibility to ensure and guarantee satisfactory operation of the entire system and the workmanship and restoration of the area. The entire system shall be guaranteed to be complete and perfect in every detail for a period of one year from the date of its acceptance and he hereby agrees to repair or replace any such defects occurring within that year, free of expense to the Owner.
1. Contractor to guarantee that all trenches and other disturbed areas to be free from heaving or settling more than one-quarter (1/4"). Should it become necessary to adjust the grade, re-grade the trench and re-sod. This no-settlement clause shall extend over the entire period of guarantee of the job.
2. One month prior to the conclusion of the warranty period, the Contractor and Owner's representative shall meet at the site and adjust the zone watering times on the controller to reflect run times for established plant material.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price. **Irrigation System** shall be paid for at the contract unit price as a lump sum. Contract unit price shall consist of supplying and installing all irrigation components specified herein and shown on the plans, including connection to existing water service, all submittals, permits, excavation and properly compacted backfill, water and electrical taps/hook-ups, and other work incidental to complete installation of a fully operational system. The pay quantity will be a lump sum based on acceptance of the completed installation.

Pay Item

Pay Unit

Irrigation SystemLump Sum

CITY OF DETROIT
SPECIAL PROVISION
FOR
EXTERIOR PLANTS

SG: KWG

1 of 15

12-21-19

a. Description. This work consists of furnishing and installing all materials and completion of all work items associated with the installation and maintenance of all landscaping, trees, shrubs, ground cover, perennials, vines, plant materials, mulch, soil materials, and treatments in accordance with section 815 of the MDOT 2012 Standard Specifications for Construction, as indicated on the plans with the following exceptions and additions specified herein.

The Contractor shall be a company specializing in landscape installation and maintenance, having a minimum of 5 years' experience in projects of the scope and scale being specified.

b. Materials.

1. Plant procurement verification.

A. Within 4 weeks following execution of the contract for construction, submit vendor purchase orders or bill of lading for each plant species showing sizes, quantities and root treatment.

B. Provide digital photos of all plants materials. Photos must depict the entire size and condition of the plant and include a scale rod or other measuring device to show scale. For species where more than 20 plants are required, include a minimum of three photos that show the average plant, the best quality plant, and the worst quality plant to be provided. Label each photograph with the plant name, plant size, and name of the growing nursery.

C. The Contractor may request the Engineer to provide nursery visits for the purpose of reviewing and tagging plant materials. The Contractor shall compensate the Engineer for said services.

D. Substitutions of plant materials will not be permitted unless authorized in writing by the Engineer. If proof is submitted in writing that a plant specified is not obtainable, the Engineer may assist in identifying alternate sources or substitutions. Plants of larger size may be used if approved and if root balls meet the American Association of Nurserymen (AAN) standards for the increased size. Adjustments will be made at no additional cost. Container plants may be substituted for those designated Balled and Burlap (B&B) if approved by the Engineer.

2. Identify manufacturer and provide the applicable product data for:

A. Tree wrap

B. Fertilizer

C. Soil amendments: Provide information on composition and source of all soil amendments.

D. Mycorrhizal inoculum.

E. Pesticides and herbicides. Include product label and manufacturer's application instructions specific to the project site.

F. Antidesiccants. Include product label and manufacturer's application instructions.

G. Soil amendments. Provide information on composition and source of all soil amendments. Include test results for compost and peat.

H. Tree Root Ball Stabilizers (Staples). Provide information for anchoring tree rootballs in tree grates with tree guards.

3. Provide the following physical samples:

A. Mulch. 1 quart by volume in sealed plastic bag labeled with composition of materials by percentage of weight and source of mulch.

B. Staking and/or guying materials.

C. Topsoil. Certified test reports per topsoil special provision.

4. Certifications.

A. Phytosanitary certification. Plant material Inspection Certificates required by Federal, State or other governing authority shall be submitted to the Engineer upon delivery of each shipment.

B. Analysis and standards. Products in sealed containers shall be labeled with manufacturer's certified analysis. Bulk materials shall be tested by an approved laboratory in accordance with Association of Official Agricultural Chemists procedures, or as specified by product specifications referenced herein.

5. Schedules and Reporting

A. Maintenance Schedule. Prior to the issuance of Substantial Completion, submit a detailed typewritten approach and schedule for the maintenance of all landscape activities. Coordinate landscape maintenance with other applicable Sections (Seeding and Topsoil) and combine all maintenance activities into one plan of action. The schedule shall be comprehensive and shall be the basis for monthly payment during the maintenance period.

B. Maintenance Report Forms. Use the approved Maintenance Schedule as the framework for all maintenance activities (plant maintenance, seed bed maintenance, etc.). The Contractor shall provide detailed maintenance report forms for each site visit. The reports shall be completed by the on-site maintenance superintendent performing the work prior to leaving the site and shall be submitted monthly as back-up to each invoice. Office prepared reports will not be permitted and payment for this work will only be approved by the Engineer when proof of completed specified maintenance has been provided. Each report shall include the following:

- (1) Date of activity.
- (2) Length of time on site (start time and finish time).
- (3) Name and signature of the maintenance superintendent.
- (4) Number of personnel performing the work.
- (5) Site climatic conditions (rain, wind, temperature, etc.)
- (6) Detailed description of maintenance activities performed

C. Watering Plan. Prior to the issuance of Substantial Completion, submit a detailed typewritten approach and schedule that outlines watering requirements for maintaining the landscape as described herein. The plan shall address frequencies and durations that will be established to provide the correct watering rates for plants and lawns. Describe means, methods and frequencies for hand watering. Reliance on natural precipitation will only be allowed with provision of recorded data from a rain gauge located within a 2-mile radius of the project site. The schedule shall be comprehensive and shall be the basis for monthly payment during the maintenance period. An irrigation system is NOT being installed.

6. Delivery, Storage, and Handling of Landscape Materials.

A. Packaged Materials: Deliver packaged materials in original unopened containers showing weight, analysis and name of manufacturer. During shipment and storage on site, protect materials from breakage, moisture, heat or other damage. Store materials only in locations approved by the Engineer.

7. Plant Materials:

A. Schedule shipping to minimize on-site storage of plants. Stock shall not be shipped until the planting preparations have been completed. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. During shipment, do not bend, stack or bind plants in a manner that damages bark, breaks branches or root systems, deforms root balls or destroys natural shape. Transport plants in closed vehicles or with the entire load properly covered to protect from drying winds, heat, freezing or other exposure that may be harmful.

B. Any plants requiring sweating to break dormancy must have this procedure carried out before plants arrive onsite.

C. Labels: Prior to shipping, each plant or bundle of like variety and size shall be labeled with legible weatherproof tags indicating the correct name and size of plant.

D. Once on site, keep plants thoroughly watered and protected from sun, wind and mechanical damage; completely cover root balls with moistened topsoil or mulch. Water as often as necessary to maintain root systems in a moist, but not overly wet, condition.

E. Handle plants at all times in accordance with the best horticultural practices. Lift B&B materials from the bottom of the ball only; do not roll the plants. Plants handled otherwise will be subject to rejection. Balled and burlapped plants which have cracked or

broken balls are not acceptable and shall not be planted. Plants with mechanical damage, deformation or breakage will not be accepted and are to be replaced at the Contractor's expense.

8. Planting Season.

A. Materials shall be installed during planting seasons normally recognized in the job locality.

B. Planting season shall be from April 1 to June 15 and from October 1 until the prepared soil becomes frozen in USDA Hardiness Zone 5. Plant evergreen plants between April 1 and June 1. When unusual planting conditions exist or when container-grown material is used, the Engineer may alter these planting seasons.

C. If special circumstances warrant installation outside the normal planting season, submit a written request to the Engineer describing conditions and stating the proposed variance. Planting outside the planting season does not alter warranty obligations.

9. Plants.

A. All planting stock shall be nursery-grown, sound, healthy and vigorous, of uniform growth, typical of the species and variety, with the minimum quality conforming to American Standard for Nursery Stock, free of disease, insects, eggs, larvae, and defects such as knots, sunscald, injuries, weak crotch angles, abrasions or disfigurement. Unless noted otherwise, trees shall have straight single leaders and evergreens shall be unsheared. Branching on all plants shall be well-developed, dense, uniformly distributed and characteristic of the species.

(1) Plants indicated as specimen shall be exceptionally heavy, symmetrical, and superior in form, branching, and symmetry.

(2) Plants shall originate from same USDA Hardiness Zone as project site, or lower (colder).

(3) Height is indicated with a tolerance. The smaller dimension is the minimum acceptable; the larger dimension represents the maximum permissible except with approval of the Engineer. The average dimension of all plants must, at least, equal the average of the tolerance figures shown on the drawings.

(4) Spread shall meet the minimum dimension specified in all directions and must be considered as pivoting on the center of plant. Where tolerance is shown between two spread dimensions, the smaller dimension is the minimum acceptable. Spreads shall at least average the median of the range indicated.

(5) Caliper is the trunk diameter taken at a specified distance above root collar as described in ANSI Z60.1.

(6) Branching height is the distance above ground where balanced branching occurs or where a dimension in trunk appears to form the head of the tree.

(7) Canes on shrubs shall arise at or just below the root crown. Multi-stem and clump form trees shall have branches that arise at the root crown or just above the root crown.

(a) Plant/ball sizing shall conform with the latest edition of ANSI Z60.1, American Standard for Nursery Stock, unless otherwise designated or modified in this section or on the plant list. Plants of a larger size may be used if acceptable to Engineer and at no additional cost, with a proportionate increase in size of roots or balls.

(b) Trees shall have straight single leaders. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots will not be accepted.

(c) Root treatments on all plants shall conform to the requirements of ANSI Z60.1.

(d) Balled and burlapped ("B&B") plants shall have a firm, natural ball of earth securely wrapped with burlap, bound with cord and/or wire basket. Root flare shall be visible before planting.

(e) Containers shall be finished landscape grade material having their roots well established in the soil mass. Plants over-established in the container, as evidenced by pot-bound root ends, will not be accepted.

(f) Perennials and ornamental grasses shall have a well-established root system reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container.

(g) Stressed or damaged plants or those not conforming to the specifications shall be subject to rejection by the owner at any time during the term of the contract.

(h) All plants shall have a label securely attached bearing legible designation of plant's common and scientific name, including genus and species, and cultivar or variety, if applicable.

(i) Do not prune plants prior to delivery.

10. Topsoil. Refer to Topsoil Special Provision. Topsoil for planting will originate offsite.

11. Double Shredded Hardwood Bark Mulch. Organic mulch shall be well-composted, finely shredded processed hardwood bark, free from foreign material and fragments in excess of 2 inches in any dimension. Dyed red or colored mulch will not be accepted.

12. Staking and Anchoring Materials.

A. Triple stake deciduous trees in lawn areas and in planting beds. Use subsurface root ball stabilizing (staple) system in plant pits with tree grates and tree guards.

- B. Tree support stakes shall be 2 inch x 2 inch hardwood posts 8 feet long.
- C. Wire stays for tree stakes shall be pliable, No. 12 to 14 gauge galvanized wire.
- D. Chafing guards shall be fiber-reinforced hose of not less than 1/2 inch inside diameter, color black.
- E. Subsurface anchoring system shall carbon steel, 48-inch long staples, 3 per tree.

13. Tree Wrap. Tree wrap shall be 4-inch wide, two-ply, waterproofed crepe Kraft paper with plies cemented together with asphalt. Twine used to secure wrap shall be natural fiber two-ply jute; plastic twine is not acceptable.

14. Soil Amendments.

A. Peat shall be a product having at least 95% organic content consisting of sphagnum peat moss with a pH range of 3.0 – 4.0 and Von Post decomposition value of H1 – H3, or low-lime reed-sedge peat with a pH range of 4.0 to 5.0 and Von Post decomposition value of H4 – H6. Product shall be free of sticks, wood or other debris.

B. Compost shall be a mature/stabilized, humus-like material derived from the aerobic decomposition of yard clippings or other compostable materials. The compost shall have a dark brown or black color, be capable of supporting plant growth without ongoing addition of fertilizers or other soil amendments and shall not have an objectionable odor. The compost shall be free of plastic, glass, metal and other physical contaminants, as well as viable weed seeds and other plant parts capable of reproducing (except airborne weed species). The compost shall be visually inspected and approved by the Engineer for physical contaminants. The compost moisture content shall be such that no visible free water or dust is produced when handling it.

C. Sand shall be clean, coarse, ungraded, meeting the requirements of ASTM C33 for fine aggregates.

15. pH Adjusters:

A. Lime shall be finely ground agricultural grade dolomitic limestone containing not less than 85% calcium and magnesium carbonates.

B. Elemental sulfur shall be granular, biodegradable, horticultural grade material containing at least 90% sulfur, with a minimum of 99% passing through No. 6 sieve and a maximum of 10% passing through No. 40 sieve.

16. Mycorrhizal Inoculum. Mycorrhizal fungi in the inoculant shall be available as propagules, i.e., spores, root fragments and hyphae. The inoculant shall contain highly selected strains of low host specificity endo- and ectomycorrhizal fungi combined with other beneficial fungi (Trichoderma), humic acids, biostimulants, beneficial bacteria, soluble sea kelp, and yucca plant extracts.

17. Fertilizer

A. The fertilizer to be used to amend the soil before planting shall be granular fertilizer that conforms to applicable state and federal regulations, and contain nitrogen (of which 50% shall be organic), available phosphoric acid, and potash. Use formulation recommended by soil tests to amend site soil.

B. Fertilizer to be used during the maintenance period shall be a complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, not less than 30% of the nitrogen from a slow release source. Fifty percent of the nitrogen shall be derived from natural organic sources.

18. Pesticides and Herbicides. Pesticides and herbicides shall be registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for project conditions and application. Do not use restricted-use pesticides and herbicides unless authorized in writing by authorities having jurisdiction.

19. Antidesiccants. Water-soluble emulsion specifically manufactured for agricultural use that will provide a protective film over plant surfaces and be permeable enough to permit transpiration. Use according to manufacturer's written instructions.

20. Planting Mixture

A. Standard planting mixture for all plant beds shall be 2 parts pre-approved off site topsoil, thoroughly blended with 1 part pre-approved peat or compost.

B. Standard planting mixture for all individual trees planted in lawn areas shall be 1 part existing, well pulverized soil excavated from planting pit thoroughly blended with 1 part pre-approved topsoil and 1 part pre-approved peat or compost.

21. Geotextile, Separator

- a. Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
- b. Survivability: Class 2; AASHTO M 288.
- c. Apparent Opening Size: No. 60 (0.250-mm) sieve, maximum; ASTM D 4751.
- d. Permittivity: 0.02 per second, minimum; ASTM D 4491.
- e. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

c. Construction.

1. General.

A. Prior to beginning work, examine and verify the acceptability of the project site and notify the Engineer of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected or resolved.

B. Where planting occurs in close proximity to other site improvements, provide adequate protection to all features prior to commencing work. Promptly repair any items damaged during planting operations to their original condition.

C. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.

D. Suspend spoil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.

E. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

(1) Utilities: Have all underground utilities located by servicing agencies. In the vicinity of utilities, hand-excavate to minimize possibility of damage.

(2) On-site sources of water for planting and maintenance will NOT be available and all sources provided by the contractor must be verified and approved for use by the Engineer.

2. Pesticides and Other Chemicals. Mixing or disposal of pesticides, herbicides, and other chemicals will not be permitted on site. Notify the Engineer at least 24 hours prior to any application. Post all pesticide and herbicide applications.

3. Coordination with Other Work.

A. The Contractor shall coordinate work with other contractors or trades to determine the appropriate sequence of landscape installation with respect to other work on the site.

B. Work installed out of construction sequence which is disturbed by the completion of work by other trades shall be repaired at no additional cost.

C. Maintain grade stakes set by others until removal is mutually agreed upon by all parties concerned.

4. Preparation

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion control measures, if necessary, to prevent erosion or displacement of soils and discharge of soil-bearing water run-off or airborne dust to adjacent properties and walkways.

C. Accurately lay out plant locations according to the drawings, using clearly visible painted stakes. Prior to installation, all locations must be approved by the Engineer, who may field adjust locations at no additional cost. If layouts are not understood or if surface or subsurface obstructions are encountered that are not indicated, do not proceed with planting operations until alternative plant locations have been reviewed, selected, and approved in writing by the Engineer.

5. Vegetation Removal

A. Apply non-selective herbicide per the manufacturer's label to eradicate unwanted vegetation per manufacturer's instructions. Do not proceed with vegetation removal until the manufacturer's specified effective treatment period has expired.

B. Remove and legally dispose of all woody vegetation including roots within 24 inches of the surface.

C. Till existing herbaceous debris into soil or, if fine grading is required, strip and dispose of organic debris and root mat.

6. Excavation:

A. Remove rocks and other unclassified underground obstructions to at least 6 inches below the finished planting depth of the root ball. If underground utilities or other surface or subsurface obstructions are encountered, do not proceed with planting operations until alternate planting locations have been selected and approved by the Engineer.

B. Size and configure planting pits and beds in accordance with the planting details. If rotating augers or other mechanical diggers are used, scarify the side walls and bottom of the pit.

C. Excavate perennial and shrub beds to the depth shown on the drawings and replace with specified planting mixture, bringing the grades to a smooth and even surface which, when settled, will conform to established grades. When transitions to 4 inch deep topsoil for lawn areas, the depth transition shall occur outside the plant bed limits or landscape edging shown on the plans.

D. Remove excavated material that is not the specified planting soil from the site.

E. Where poor soil percolation is probable, test drainage by filling planting pits with 12 inches of water. Record the drainage time for each pit and if, in the opinion of the Engineer, the water does not adequately drain off within 24 hours, drill and shatter the substrate to a minimum depth of 3 feet below the bottom of the pit. Retest the drainage. If poor drainage persists, install drains as directed.

7. Fertilizing. Prior to or during planting, amend all backfill and bed mixes by incorporating fertilizer at rates specified by soil test reports.

8. Mycorrhizal Inoculum. Incorporate 3 pounds per 100 square feet into the top 8 inches of soil. For tree pits, incorporate 2 pounds per cubic yard of backfill.

9. Finish Grading

A. Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet grade.

B. Before planting, obtain Engineer's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

10. Planting

- A. Do not plant when the ground is frozen or saturated.
- B. Balled and burlapped plants: Set the plant to the grade indicated on the details and face to give the best appearance or relationship to primary views. Cut away burlap, rope, wire or other wrapping materials from the top one-third of the ball, and remove from pit. If plastic wrap or other non-degradable materials are used in lieu of burlap, completely remove them from the root ball before backfilling. Cleanly cut off broken or frayed roots. Backfill planting pit approximately two-thirds full, add water and allow planting mixture to settle. After the water has been absorbed, complete backfilling and tamp lightly to grade, and form a watering basin of the size indicated on Plans.
- C. Container-grown stock: Remove containers and make at least five vertical cuts 1 inch deep around the root ball; thoroughly loosen the roots on the outside of the ball. Plant as specified above for balled and burlapped plants, and as modified herein. All container-grown stock shall be planted so that the top of container soil is level with surrounding grade. Do not plant higher to account for mulch, as mulch should not cover plant crown.
- D. If plants die or are rejected due to non-conformity to notes and/or specifications, that plant material must be removed from the site immediately and replaced before Substantial Completion.

11. Mulching

- A. Uniformly install mulch on all trees and shrub beds to 2" depth in all planting beds and tree mulch rings, within 48 hours of planting.
- B. Keep mulch out of the crowns of shrubs and perennials, at least 3 inches from all tree trunks, and off sidewalks and roadways.

12. **_Pruning Tree**

- A. Prune trees and shrubs to remove all dead, dying, broken, weakly attached and crossed limbs. Do not prune to shape. Retain natural form of the plant type. Do not cut the primary leader back. A maximum of 20% of live wood shall be removed. Selectively thin branches within crown to reduce load and wind resistance. All pruning work shall be conducted to maintain the character and health of the tree.
- B. All pruning shall follow ISA's *Tree Pruning Guidelines* or most recent ANSI A300 Pruning Standards, and ANSI Z133.1 Safety Standards.
- C. Do NOT treat cuts with wound dressing or paints.
- D. Remove and dispose of legally off-site all removed materials, trimmings, plant limbs, and other debris.
- E. Pruning shall be conducted by a certified arborist by the International Society of Arboriculture.
- F. Pruning of new trees and shrubs shall be provided as noted above and shall be incidental to the pay items for the respective plant materials.

13. Wrapping.

A. The trunks of deciduous trees shall be wrapped immediately after planting, but not before the condition of the trunks has been inspected and approved by the Engineer. Trim the margins of any abrasions or cuts with a sharp, sterile knife prior to applying wrap.

B. Wrap trees beginning at the base and extending to the first branches in a spiral pattern with an overlap of half the width of the paper.

C. Secure the wrapping at the top, bottom and at 18 inch maximum intervals with twine.

14. Staking.

A. Install staking as shown on the details immediately after planting. Remove and dispose of stakes and guys at the end of the maintenance period.

B. For subsurface tree anchors, drive steel staples into the subsoil per manufacturer's instructions. Do not injure tree roots or damage rootball installing anchors. Anchors shall be permanently left in place.

15. Repair/Restoration.

A. Remove excess and waste material daily. When planting has been completed, clear the site of all debris, stockpiles and materials.

B. Repair any damage to existing landscape, paving or other such features as a result of work related to this contract to its original condition.

C. Protect landscape work and materials from damage due to landscape operations, operations by other Contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape work as directed.

16. Substantial Completion.

A. The Substantial Completion inspection for the landscape shall occur in phases based upon an approved phasing plan. Each area shall be 100% complete, (including all plantings, seeding, and clean-up), to be considered ready for inspection. Following the inspection, the Engineer will issue a punch list identifying all work requiring completion, replacement or correction.

B. Following this inspection complete all punch list items within two (2) weeks of its issuance except for plant replacements. All repairs and plant replacements shall occur at no additional cost.

C. After receiving a Notice of Substantial Completion maintain all plantings in a vigorous, well-kept condition until Final Acceptance.

D. The end of the maintenance period shall be Nov. 1, 2021.

E. The Contractor will not be held responsible for defects resulting from unusual phenomena or incidents beyond landscape installer's control which result from hail storms, winds over 100 miles per hour, fires or vandalism, unless Contractor has not completed specified installation in a manner that could have protected the landscaping from these phenomena.

17. Final Acceptance.

A. Approximately 2 weeks prior to the expiration of the maintenance period, the Engineer will conduct an inspection of all plantings, seeding and irrigation systems and review all previously submitted maintenance report forms to verify all completed maintenance activities. There shall be clear evidence through factual reporting by the contractor and field observations made by the Engineer that the specified maintenance has occurred. Following the inspection, the Engineer will issue a punch list identifying all work requiring completion, replacement or correction.

B. Following this inspection complete all punch list items within 1 week of its issuance except for plant replacements. All repairs and plant replacements shall occur at no additional cost.

C. Final Acceptance and the end of the maintenance period for the landscape will occur only after all punch list items have been satisfactorily completed.

18. Replacements.

A. Prior to and during the maintenance period, replace any plants that are damaged, dead, or, in the opinion of the Engineer, are unhealthy, or have lost more than 25% of their natural shape due to dead branches, excessive pruning or improper maintenance. Rejected plant materials shall be removed from the site immediately after being rejected and legally disposed off-site. Replacement plants shall be installed within 30 days following the inspection unless otherwise agreed to in writing by the Engineer.

B. Make replacements in accordance with the original specifications, plant list, and notes. Fully restore areas damaged by replacement operations to their original and specified condition.

19. Maintenance Watering and Cultivation

A. Provide all specified maintenance functions as defined herein.

B. Provide all maintenance under the supervision of a skilled employee of the landscape installer. The skilled maintenance supervisor shall be: conduct plant diagnostics to identify the presence of disease and insect problems, and be capable of directing a maintenance crew in the performance of horticultural maintenance practices identified below. Maintenance requirements identified below shall be the basis for information to be included in the Maintenance Schedule and Irrigation Plan and thoroughly documented under the required Maintenance Report Forms to verify the work has been properly performed. Failure to perform and submit factual Maintenance Report Forms could result in non-payment for said services.

C. Provide all equipment, materials, labor and services to maintain the landscape beginning immediately after each plant is installed and continuing until Final Acceptance and the end of the maintenance period. Perform all work under the direct supervision of a technician trained to recognize and treat conditions affecting the established and growth of the plants.

(1) Inspect the entire landscape at least once per week during the growing season and perform needed maintenance promptly.

(2) Water all plants to maintain optimum moisture within the root zone; reoccurring overly dry or wet conditions according to species shall be grounds for rejection of plant material. Hand watering will be required. Do not apply water with a force that displaces mulch or causes soil erosion. Supply all water at the Contractor's expense from a source approved by the Engineer.

(3) All pruning shall be performed by or under the supervision of a licensed arborist. Prune dead wood and broken limbs. Do not shear evergreens or any shrubs unless specifically required to be maintained as a sheared hedge. Maintain the natural shape of trees and shrubs. Certain tree limbs may need to be removed based on head clearance along the sidewalks and shall only be removed when directed by the Engineer.

(4) Maintain stakes and guys taut and in the specified condition. Repair tree wraps if loose, torn or untied.

(5) Maintain all plant beds and tree saucers weed free and litter free. Weeds shall not be allowed to go to seed and shall be fully removed (including root systems). Edge shrub and perennial beds and tree rings at least monthly during the growing season, keeping all tree rings to a uniform diameter. Hook mulch monthly and add mulch as needed. Collect all trash, litter and miscellaneous debris monthly and dispose off-site.

(6) Deadhead perennials as necessary during maintenance visits to extend blooming periods.

(7) Cut ornamental grass seed heads flush with the ground only in the spring as plants break dormancy.

(8) Apply treatments as necessary to keep plants and planted areas free of insects, pests, and disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and herbicides. Treatments include utilizing physical and cultural controls.

(9) All pesticides shall be applied by a licensed pesticide applicator. Apply pesticides and all other chemical products and biological control agents in accordance with the authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Engineer and others in proximity to the Work. Notify Engineer at least 24 hours before each application is performed. No mixing or disposal of chemicals is allowed onsite.

(10) Apply antidesiccant to upright conifers December through February, at least once per month. In locations subject to high wind or salt spray, install burlap

windscreens around spreading conifers and broadleaf evergreens but do not allow burlap to touch evergreen plants.

20. Fertilization.

(1) Trees and shrubs and ornamental grasses: Fertilize once in the fall after the first hard freeze (usually October) but before the ground freezes; 1 pound of 4-1-2 (N-P-K) per 1,000 square feet of ground below the tree canopy or shrub bed.

(2) Perennials: Fertilize twice, once in the early spring and again 8 weeks later with 1 pound of 5-10-5 (N-P-K) per 100 square feet.

(3) Remove dead and unacceptable plants as their condition becomes apparent.

(4) At the end of the maintenance period, but prior to Final Inspection, remove all guying, trunk wrap, watering saucers and re-mulch tree rings and beds as specified.

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

Pay Item (Botanical Name, Size, Planted Condition)	Pay Unit
☐ Ulmus 'Patriot', 4 inch, B&B	Each
☐ Allium 'Millennium', #2 cont	Each
☐ Calamagrostis x acutiflora 'Karl Foerster', #2 cont.....	Each
☐ Chasmanthium latifolium, #2 cont.....	Each
☐ Echinacea purpurea 'Magnus', #2 cont.....	Each
☐ Geranium 'Rozanne', #2 cont	Each
☐ Hemerocallis 'Bela Lugosi', #2 cont	Each
☐ Hosta 'Guacamole', #2 cont.....	Each
☐ Hosta 'Liberty', #2 cont	Each
☐ Miscanthus sinensis 'Gold Bar', #2 cont	Each
☐ Nepeta x faassenii 'Walker's Low', #2 cont.....	Each
☐ Pachysandra terminalis, flat.....	Each
☐ Perovskia atriplicifolia 'Little Spire', #1 cont	Each
☐ Rosa 'Knock-Out', 24 inch spd.....	Each
☐ Sedum kamtschaticum, #1 cont.....	Each
☐ Sedum ternatum, #1 cont	Each
☐ Spiraea japonica 'Little Princess', #3 cont.....	Each
☐ Mulch, Hardwood Bark, 2-inch Depth	Square Yard
☐ Planting Mixture, 24-inch Depth.....	Square Yard
☐ Geotextile, Separator	Square Feet
☐ Watering and Cultivating, _____ Season, Min. __, Modified	Lump Sum

_Planting Mix, 24-inch Depth, will be paid for by the square yard based on plan quantities unless modified by Change Order following acceptance of the work by the Engineer. The contracted unit price shall include; herbiciding to kill herbaceous vegetation, existing soil excavation and disposal, submittals and soil testing, supplying, mixing and installing specified materials (off-site topsoil, peat moss or compost, mycorrhizal and fertilizer), and compaction.

Planting Mixture shall also be used as tree pit backfill and shall be incidental to the pay item.

Plant Material (Botanical Name) shall be paid for at the contract unit price for Each plant installed following acceptance of the work by the Engineer. The plant pit excavation and disposal of excavated materials to install the plant is included and shall be incidental to the pay item. The contracted unit price shall include; (not paid for under **Planting Mixture, 24 Inch Depth**), plant material submittals, material supply, installation, backfill, staking, subsurface anchoring system for trees with tree grates, initial watering, mycorrhizal, trunk wrap and other necessary components specified herein and/or shown on the plans required to install the plant. The pay quantity will be determined by a field count of accepted plants installed. **Mulch, Double Shredded Hardwood Bark, 2 inch Depth**, and aggregate pea stone (MDOT 34R) below tree grates specified for the individual trees planted outside plant beds (seeded areas) shall also be incidental to the unit price.

Mulch, Hardwood Bark, 2 inch Depth, will be paid for by the square yard based on plan quantities. The contracted unit price shall include; submittals, material supply and installation.

Watering and Cultivation, _____Season, Min. _____, Modified shall be paid for at the contracted Lump Sum price for all maintenance work specified herein and as requested by the Engineer. The contracted lump sum price shall include all specified maintenance functions including but not limited to; maintenance schedule submittal, inspections, report forms, watering, cultivation, weed and litter control, fertilizing, pest controls, dead heading, dead plant removal and replacement, staking removal and remulching at the end of the maintenance period.

Geotextile, Separator shall include all labor, materials and equipment necessary to supply and install the **Geotextile, Separator** in the **Raingarden** as shown on the plans and details. The pay quantity will be determined by field measurement of the area installed in square feet.

Payment for **Watering and Cultivation, _____Season, Min. _____, Modified** shall be paid for monthly upon submission and approval of maintenance report forms that demonstrate completion of the specified activities. Work not approved shall not be paid for and subtracted from the Lump Sum price. The value of the monthly invoices shall be based on a 6 month payment plan that commences with May 1 and ends with November 1 for each season of maintenance.

CITY OF DETROIT
SPECIAL PROVISION
FOR
POROUS RESIN BONDED AGGREGATE

SG: KWG

1 of 2

02-18-2020

a. Description. This work consists of preparing and placing a permeable resin bonded aggregate material around the screen wall as detailed on the plans, in accordance with the standard specifications, this special provision, and as directed by the Engineer.

Work must be performed by experienced personnel with satisfactory record of performance on completed projects of comparable size and quality.

b. Materials. Submit shop drawings for all proposed materials. Do not order any material until shop drawing approval is received from the Engineer. Resin bonded aggregate may be a kit where the supplier provides all materials, or a site blended material. Provide additional documentation or samples if required by the Engineer. Use materials in accordance with the standard specifications and as specified herein.

1. Resin. Two-part curing, UV stable, flexible clear resin designed to bond aggregate. Color to be crystal clear that does not change the appearance or color of the aggregate.
 - A. Gravel-Lok – as manufactured/provided by Paramount Materials
 - B. Addapave TP – as manufactured/provided by Chameleon Ways
 - C. Arboresin – as manufactured/provided by Citygreen
2. Aggregate for surface.
 - A. Natural bank-run aggregate (not crushed)
 - B. Man-made materials (e.g. glass) or quartz may be utilized if produced and intended specifically for pedestrian / foot traffic use.
 - C. Provide 1 quart volume in sealed plastic bag labeled with composition of materials and color for each type and color sample for review and approval by Engineer.
 - (1) Aggregate type and color to be selected and approved by the Engineer. The aggregate shall be a natural stone blend of earth tone colors in white, tan, gold, brown, gray and blacks. Contractor to provide up to 6 aggregate samples as requested by the Engineer for review and approval at no additional cost.
 - (2) Aggregates shall be double washed, dried and bagged free of all contaminants (plastic, glass, metal or other debris)

D. Surface aggregate shall meet the following gradation requirements.

Table 1: Surface Aggregate Gradation Requirements

Sieve Analysis (MTM 109), Total Percent Passing						
U.S Sieve	3/4 inch	1/2 inch	3/8 inch	No. 4	No. 30	No. 200
% Passing	100	75-100	25-50	0-25	0-5	0-0.3

3. Drainage Course Aggregate.

A. MDOT 6AA

4. Geotextile Separator.

A. In accordance with section 910 of the Standard Specifications for Construction for non-woven geotextile separator.

c. Construction. Coordinate installation with underground utilities, sidewalk, curbing, and paving, and other work which may impact installation.

1. Installation shall occur within weather conditions as dictated by the manufacturer.

2. Only disturb enough depth of soil to allow space for the base aggregate and the resin bonded aggregate.

3. Place geotextile separator over lightly compacted soil.

4. Place drainage course aggregate. Smooth the surface but do not compact.

A. Depth of drainage course aggregate around an existing tree to be 3 to 4 inches and shall allow 3 to 4 inches of resin bonded aggregate material above.

B. Depth of drainage course aggregate around a newly planted tree to be min. of 4 inches up to 6 inches and shall allow 4 inches of resin bonded aggregate material above.

5. Blend resin and aggregate according to manufacturer recommendations and loosely place over drainage aggregate to finished grade. Trowel material evenly but do not smooth the surface which may seal the surface and prevent water drainage through the cured material.

A. Lightly broadcast clear crushed glass grit grade 300 onto the finished surface to provide increased skid resistance.

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

_Porous Resin Bonded AggregateSquare Yard

_Porous Resin Bonded Aggregate will be measured in place between edge restraints (sidewalk, back of curb, etc.) with no deductions for utility covers, and includes labor, equipment, geotextile separator fabric, crushed glass grit, aggregate drainage course, resin, and surface aggregate.

CITY OF DETROIT
SPECIAL PROVISION
FOR
PARK SIGN

SGJJR: BPC

1 of 2

01-16-20

a. Description. This work consists of providing, fabricating, and erecting signs and supports in accordance with Section 810 of the 2012 MDOT Standard Specifications for Construction except as herein modified.

b. Materials. Sign materials shall be per section 810.02 of the 2012 MDOT Standard Specifications for Construction except as herein modified and as shown on the plans.

Concrete for sign foundations to be MDOT S1. Aluminum materials to meet or exceed ASTM B209 and ASTM B221. Vinyl shall be a minimum of 0.1 mm thick, machine cut, having pressure sensitive adhesive and integral colors for exterior applications.

Signs must withstand 100 mph wind loads and meet applicable building codes, laws and regulations. The design loads shall be in accordance with the international and Michigan building codes.

Provide all necessary mounting accessories, fittings, and fastenings. All sign materials shall be designed and rated for exterior environments.

The sign plans and details are provided to form the basis of design and are provided to illustrate the aesthetic, performance and functional characteristics only. The dimensions shown are provided to quantify the form and overall scale of the sign. The dimensions provided do not indicate the precise sizes of members or assemblies. The contractor is required to provide the engineering and structural design as well as all other required components in order to provide a complete and operational sign that matches the design illustrated. Modifications to the foundation, anchorages/fasteners, structural members and other components may be necessary.

Submit complete shop drawings showing fabrication, materials, installation details, dimensions, fonts and lettering, finishes, accessories, joints, welds, anchorage, graphic symbols, colors, and other appurtenances required for a complete sign installation to the Engineer for review and approval. Shop drawings shall be approved prior to fabrication.

c. Construction. Install signs and foundations per section 810 of the 2012 MDOT Standard Specifications for Construction except as herein modified and as shown on the plans.

Coordinate and field verify sign locations and orientations with the Engineer prior to fabrication and installation. Verify field conditions and measurements before fabrication and installation. Verify utility lines in the area proposed for the sign installations. Any damage during installation of signs to utilities will be the responsibility of the contractor to repair at no additional cost.

Shop fabricate and pre-assemble signs.

All signs shall be mounted true and level with all fasteners concealed unless otherwise shown on the drawings. All exposed hardware and fasteners shall be vandal/tamper resistant. All mounting devices shall be adjusted for surface irregularity to achieve the desired position indicated on the plans.

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

Pay Item	Pay Unit
_Sign, Grand Parklet	Each

The contract price shall be payment in full for all labor, materials and equipment necessary to fabricate, supply and the installation of but not limited to, permanent signs and posts, sign supports, concrete footings, anchorages / mounting accessories, foundations, fittings, fastenings, structural supports, rigging, bases and miscellaneous hardware.

CITY OF DETROIT
SPECIAL PROVISION
FOR
SITE FURNISHINGS

SG: KWG

1 of 7

12-21-19

a. Description. The work consists of furnishing, supplying all materials, installing and the completion of all work items associated with the site furnishings as detailed on the plans, in accordance with the 2012 Standard Specifications for Construction, this special provision, and as directed by the Engineer.

1. Section Includes.

- A. ☐ Bollard, Fixed
- B. ☐ Bollard, Collapsible
- C. ☐ Tree grate, 7 ft dia
- D. ☐ Trash Receptacle
- E. ☐ Drinking Fountain
- F. ☐ Bike Rack

Work must be performed by experienced personnel with satisfactory record of performance on completed projects of comparable size and quality. Provide documentation if required by the Engineer. All site furniture work will be controlled by shop drawing review and approval.

b. Materials.

Submittals: Submit manufacturer's product data and color samples for all site furnishings included in this special provision. Submit shop drawings and additional documentation/certification as noted herein and per the plans. All submittal documentation shall be approved prior to ordering and the fabrication of products.

All hardware for all site furnishings shall be vandal/tamperproof.

The concrete foundation(s) shown on the plans for site furnishings requiring foundations and/or an embedded mounting shall be MDOT grade S1 (4000 psi).

1. Bollards shall be provided per the identified type and as noted below:

A. **☐ Bollard, Fixed** shall be as manufactured by MaxiForce.

- (1) Bollard to be Fixed Bollard, Standard Body, Standard Style 2 Head.
- (2) Color and finish to be hot-dip galvanized and powder coated **Dark Gray**.
- (3) All hardware shall be tamperproof.
- (4) Provide concrete footing with reinforcement per plans / details and per manufacturer's recommendation.
- (5) MaxiForce, www.maxiforcebollards.com, (410)-552-9939.

B. **☐ Bollard, Collapsible** shall be as manufactured by MaxiForce.

- (6) Bollard to be Collapsible Bollard, Standard Body, Padlock Operated, Standard Style 2 Head, Simple Base.
 - (7) Color and finish to be hot-dip galvanized and powder coated **to match site seat walls as approved by owner.**
 - (8) Provide concrete footing with reinforcement per plans / details and per manufacturer's recommendation.
 - (9) All hardware shall be tamperproof.
 - (10) Provide exterior rated commercial grade combination padlock with shackle seal and dial dust cover. Color to be **black**. Master Lock Pro-Series No. 1178, or approved equal.
 - (11) MaxiForce, www.maxiforcebollards.com, (410)-552-9939.
2. **_Tree Grate, 7 ft dia:** Tree Grate shall be as manufactured by Urban Accessories. The model and type shall be as follows:
- A. Urban Accessories "7 ft Round Rainbow Tree Grate". All hardware shall be tamperproof.
 - A. Provide tree grate in **CAST DUCTILE IRON** meeting **LOAD CLASS C** with **BAKED-ON-OIL** finish.
 - B. Provide tree opening size of 1'-4" diameter.
 - C. Provide matching frame and frame connection from Urban Accessories for each tree grate. Provide stand-off retro continuous frame connection that meets load CLASS C.
 - D. Tree grates shall meet ADA pedestrian requirements.
 - E. Provide tree grates of uniform quality, free from blow holes, porosity, hard spots, shrinkage defects, cracks or other injurious defects.
 - F. Finish: smooth, well cleaned by shot blasting or other approved method, without application of powder coating and/or paint.
 - G. Provide tamper/vandal resistant connections for all four tree grate sections. Provide removal tool to owner.
 - H. Provide cast-in-place concrete tree grate support as shown on plans and details.
 - I. Ironage Designs, www.urbanaccessories.com , (877) 418-3568
 - J. Root Barrier
 - 1. Provide as part of the **_Tree Grate, 7 ft dia** pay item the root barrier by Deeprout.
 - 2. Provide (3) panels per side of the tree grate (18" deep x 24" wide per panel) on all sides of the tree grate as shown on plans and details.

3. Deeproot, www.deeproot.com , (877)-487-0488
- K. Root Ball Stabilizer
 1. Provide as part of the **_Tree Grate, 7 ft dia** pay item the root ball stabilizer as shown on plans and details.
 2. Provide (3) per tree.
3. **_Trash Receptacle:** Trash Receptacle shall be as manufactured by Victor Stanley. The model and type shall be as follows:
 - A. Victor Stanley "SD-42" with rain bonnet, 36 gallon capacity. All hardware shall be tamperproof.
 - B. Color and finish to be hot dipped galvanized with **black** powder coat.
 - C. Provide high density plastic liner, drill ¾" dia drainage holes in bottom of liner.
 - D. Receptacle to be surface mounted per manufacturer's recommendations with tamperproof hardware.
 - E. Victor Stanley, www.victorstanley.com (800) 368-2573
4. **_Drinking Fountain:** Drinking fountain shall be as manufactured by Most Dependable Fountains, Inc. The model and type shall be as follows:
 - A. Most Dependable Fountains, Inc. "440 SM".
 - B. Color to be **approved by owner**.
 - C. Drinking fountain shall be ADA compliant.
 - D. Fountain to be surface mounted per manufacturer's recommendations with tamperproof hardware.
 - E. Provide stainless steel surface carrier and attached pet fountain.
 - F. Most Dependable Fountains, Inc. www.mostdependable.com, 901.867.0039
5. **_Bike Rack:** Bike Rack shall be as manufactured by Landscape Forms, Inc. The model and type shall be as follows:
 - A. Landscape Forms, Inc. 35 Collection 'Loop'.
 - B. Color and finish to be **matte black** powder coat.
 - C. Bike rack to be surface mounted per manufacturer's recommendations with tamperproof hardware.
 - D. Landscape Forms, Inc. www.landscapeforms.com, 269.337.1318

c. Construction.**1. General Installation Requirements.**

- A. Coordinate installation with underground irrigation sleeves, utility lines, concrete paving, and other work affected by the site furniture installation.
- B. Install site furniture in accordance with the plans and per manufacturer's recommendations and instructions.
- C. Prior to installation of site furnishings, contractor shall confirm all installed locations, orientations, dimensional relationships and special requirements for each particular site furnishing product in the field with the Engineer.
- D. Contractor to use care in the transport and installation of the site furnishings to avoid damaging the products and/or finish. Do not place, slide, and/or drag the site furnishings on the concrete pavement or other hard or abrasive surface. Follow manufacturer's recommendations.
- E. Scratches, marks, dents, and defects in the finishes and components shall be repaired per manufacturer recommendations. If in the opinion of the Engineer that the product exhibits defects the product shall be replaced at no additional cost.
- F. Adjustments: Should minor changes and deviations from the locations and orientations established on the plans be required by the Engineer, this shall be done by the Contractor at no additional cost.

2. _Bollard, Fixed

- A. Provide concrete footings per plans and install bollard as indicated on plans. Install bollard sleeve with adhesive tape per manufacturer's recommendations.
- B. Bottom of Bollard cover to set even and flush with surface of pavement.
- C. Provide tamper resistant hardware.

3. _Bollard, Collapsible

- A. _Bollard, Collapsible is located within the parklet and the location and orientation is critical to ensure proper restriction of vehicular traffic while maintaining a safe space for users. Field verify specific locations, orientation and relationship to other site improvements with the Engineer prior to proceeding with installation.
- B. Orient bollard to collapse away from street towards the plaza as shown in contract drawings.

- C. Provide concrete footings and reinforcement and install bollard as indicated on plans and per manufacturer's requirements.
- D. Provide adjacent concrete pavement and sealed expansion joints as shown on plans and details.
- E. Install bollard sleeve with adhesive tape per manufacturer's recommendations.
- F. Provide combination padlock and code to Engineer and Owner.

4. _Tree Grate, 7 ft dia

- A. Locate and install tree grates as shown on plans and details and per manufacturer's recommendations. Confirm locations with Engineer prior to proceeding with installation of cast-in-place concrete tree grate support and tree grate frame.
- B. Coordinate installation of tree grates with concrete surface pattern, root barrier, rootwell water system, root ball stabilizer, and other associated appurtenances.
- C. Install root barrier, rootwell water system and root ball stabilizer as shown on plans and per manufacturer's requirements.
- D. Provide cast-in-place frame and frame connection fasteners from Urban Accessories as shown on drawings and details. Install the frame with a uniform slope in one direction corresponding with the adjacent pavement slope. Do no warp or unevenly drop one or more edge of the tree grate frame. Ensure that the tree grates are set flush and even with the frame and adjacent sidewalk.
- E. Ensure tree grate sets flush with the frame and that the grates do not rock or project above the surrounding frame or pavement. Adjust tree grate per manufacturer's recommendation to ensure a flush, even, and level installation free from rocking.
- F. Install tamper resistant screw connections for all tree grate sections per manufacturer's requirements to minimize the possibility of the tree grates from being stolen. Provide removal tool to owner.

5. _Trash Receptacle

- A. Surface mount trash receptacles on concrete pavement as indicated on plans and per manufacturer's recommendation. Provide tamper resistant hardware.
- B. Orient the receptacle openings to avoid conflicts with other site elements and per Engineer's directions. Trash receptacle front (side with door), to face sidewalk.

6. _Drinking Fountain

- A. Surface mount drinking fountain on concrete pavement as indicated on plans and per manufacturer's recommendation. Provide tamper resistant hardware.

- B. Orient the fountain to avoid conflicts with other site elements and per Engineer's directions and as identified on plans.
- C. Coordinate installation of fountain with concrete surface, utility plans, water line and drain line installation and connections.

7. **_Bike Rack**

- A. Surface mount bike racks on concrete pavement as indicated on plans and per manufacturer's recommendation. Provide tamper resistant hardware.
- B. Orient the bike racks to avoid conflicts with other site elements and per Engineer's directions and as identified on plans.

d. Measurement and Payment: The concrete pad for surface mounted site furnishings will be paid for separately. The concrete foundation(s) shown on the plans for site furnishings requiring foundations and/or an embedded mounting shall be included in the pay item for the particular site furnishing product. The completed work as described includes all equipment, labor and materials necessary and shall be paid for at the contract unit price for the following pay items.

Pay Item	Pay Unit
_Bollard, Fixed	Each
_Bollard, Collapsible	Each
_Tree Grate, 7 ft dia	Each
_Trash Receptacle	Each
_Drinking Fountain	Each
_Bike Rack	Each

_Bollard, Fixed shall be paid for at the contract unit price on a per unit basis. Contract unit price shall include supplying and installing of the **_Bollard, Fixed** as specified and detailed on the plans. The pipe, concrete, bollard sleeve, reflective tape, hardware, concrete footing and other associated appurtenances which may be required shall be considered included in the pay item and will not be paid for separately. The pay quantity will be determined by field measurement of the units installed as specified.

_Bollard, Collapsible shall be paid for at the contract unit price on a per unit basis. Contract unit price shall include supplying and installing of the **_Bollard, Collapsible** as specified and detailed on the plans. The bollard, concrete, reflective tape, hardware, concrete footing and other associated appurtenances which may be required shall be considered included in the pay item and will not be paid for separately. The pay quantity will be determined by field measurement of the units installed as specified.

_Tree Grate, 7 ft dia shall be paid for at the contract unit price on a per unit basis. Contract unit price shall include supplying and installing of the tree grate as specified and detailed. The tree grate frame, hardware, anchoring/mounting components, cast-in-place concrete tree grate support, root barrier, rootwell water system, root ball stabilizer and other associated appurtenances which may be required shall be considered included in the pay item and will not be paid for separately. The pay quantity will be determined by field measurement of the units installed as specified.

_Trash Receptacle shall be paid for at the contract unit price on a per unit basis. Contract unit price shall include supplying and installing of the trash receptacle as specified and detailed on the plans. The receptacle, liner, hardware and other associated appurtenances which may be required shall be considered included in the pay item and will not be paid for separately. The pay quantity will be determined by field measurement of the units installed as specified.

_Drinking Fountain shall be paid for at the contract unit price on a per unit basis. Contract unit price shall include supplying and installing of the **_Drinking Fountain** as specified and detailed on the plans. The fountain, support, anchors, hardware and other associated appurtenances which may be required shall be considered included in the pay item and will not be paid for separately. The pay quantity will be determined by field measurement of the units installed as specified.

_Bike Rack shall be paid for at the contract unit price on a per unit basis. Contract unit price shall include supplying and installing of the **_Bike Rack** as specified and detailed on the plans. The rack, support, anchors, hardware and other associated appurtenances which may be required shall be considered included in the pay item and will not be paid for separately. The pay quantity will be determined by field measurement of the units installed as specified.

CITY OF DETROIT
SPECIAL PROVISION
FOR
WEATHERED STEEL SCREEN WALL

SG: KWG

1 of 3

03-30-20

a. Description. This work consists of providing, fabricating, and erecting screen wall and supports in accordance with Section 701, 706, and 707 of the 2012 MDOT Standard Specifications for Construction except as herein modified. An entity experienced in producing decorative formed and fabricated metal similar to that indicated for this project and with a record of successful in-service performance as well as sufficient production capacity to produce specified units are required qualifications.

b. Materials. Screen wall materials shall be as identified herein and as shown on the plans.

Concrete for screen wall foundations to be MDOT S1. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

Weathered steel to meet or exceed ASTM A588 weathering steel. Hardware to meet or exceed 316 stainless steel for exterior use and shall not be metal incompatible with materials joined. Plain steel and galvanized steel hardware shall not be used.

Screen wall must withstand 100 mph wind loads and meet applicable building codes, laws and regulations. The design loads shall be in accordance with the international and Michigan building codes.

Provide all necessary mounting accessories, fittings, and fastenings. All screen wall materials shall be designed and rated for exterior environments.

The screen wall and details are provided to form the basis of design and are provided to illustrate the aesthetic, performance and functional characteristics only. The dimensions shown are provided to quantify the form and overall scale of the screen wall. The dimensions provided do not indicate the precise sizes of members or assemblies. The contractor is required to provide the engineering and structural design as well as all other required components in order to provide a complete and operational screen wall that matches the design illustrated. Modifications to the foundation, anchorages/fasteners, structural members and other components may be necessary. The perforated weathered steel graphic will require review and approval by the Engineer.

Submit complete shop drawings showing fabrication, materials, installation details, dimensions, perforations, any fonts and lettering, finishes, accessories, joints, welds, anchorage, graphic symbols, colors, and other appurtenances required for a complete screen wall installation to the Engineer for review and approval. Shop drawings shall be approved prior to fabrication.

c. Construction. Install screen wall and foundations per the 2012 MDOT Standard Specifications for Construction except as herein modified and as shown on the plans.

Coordinate and field verify screen wall location and orientations with the Engineer prior to fabrication and installation. Verify field conditions and measurements before fabrication and installation. Verify utility lines in the area proposed for the screen wall installation. Any damage during installation of the screen wall, to existing utilities or site features and other construction improvements will be the responsibility of the contractor to repair at no additional cost.

Fabricate products from ASTM A588 sheets as specified without pitting, seam marks, roller marks, stains, unnatural discolorations, or other imperfections where exposed to view on finished units.

Fabricate concrete forms for footings for easy removal without hammering or prying against concrete surfaces. Install keyways, recesses, and the like, for easy removal. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, dust, dirt, and other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

Deposit concrete for footings continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness.

Shop fabricate and pre-assemble screen wall to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

Form metal to profiles indicated, in maximum lengths to minimize joints. Produce flat, flush surfaces without cracking or grain separation at bends.

Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1mm) unless otherwise indicated on plans. Remove sharp or rough areas on exposed surfaces.

Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded or brazed and as necessary for strength, corrosion resistance, and compatibility in fabricated items.

Weld corners and seams continuously to comply with the following: use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals; obtain fusion without undercut or overlap; remove welding flux immediately; at exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

Deliver decorative perforated panels and formed metal products wrapped in protective covering and strapped together in suitable packs or in heavy-duty cartons. Remove protective coverings before they stain or bond to finished surfaces. Store products on elevated platforms in a dry location.

Provide temporary bracing or anchors in formwork for items that are to be built into concrete or similar construction.

Provide for anchorage of type indicated, coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

Screen wall shall be mounted true and level with all fasteners concealed unless otherwise shown on the drawings. All exposed hardware and fasteners shall be vandal/tamper resistant. All mounting devices shall be adjusted for surface irregularity to achieve the desired position indicated on the plans.

Protect finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

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

Pay Item	Pay Unit
_Weathered Steel Screen Wall.....	Each

The contract price shall be payment in full for all labor, materials and equipment necessary to fabricate, supply and the installation of but not limited to, permanent screen wall, screen wall posts, supports, concrete footings, anchorages / mounting accessories, foundations, fittings, fastenings, structural supports, rigging, bases, fabrication and miscellaneous hardware.

PUBLIC LIGHTING AUTHORITY OF DETROIT

SPECIAL PROVISION
FOR
LIGHTING STANDARD COMPLETE ASSEMBLIES AND MATERIALS

MES

Page 1 of 1

31 March 2020

a. Description. Install lighting standard with 111W and 82W luminaires as called for on the plans.

b. Material. Materials for lighting standard with 111W and 82W luminaires are listed on sheets DT-01, DT-02, DT-03, DT-05, DT-08, DT-10 and DT-12 in this project. All extra PLA stock items and all salvaged material to be delivered to the PLA Yard.

PLA Yard Information:

Location: 1135 Beaufait Street, Detroit, Michigan 48207
Contact: Melanie Steele (Stateline) at 313-909-7509 and
John Vernon (PLA) at 313-324-8290
Hours: Monday – Friday 9:30 A.M. to 3:30 P.M. (Must provide 48 hours notice)

c. Measurement and Payment. The work as described will be measured and paid for using the following contract items:

Contract Item (Pay Item)	Pay Unit
_Light Std Fdn, Modified	Ea
_Light Std, Grand River Decorative, Install	Ea
_Luminaire, 150W, Install	Ea

_Light Std Fdn, Modified will be measured as a unit. The contract unit price each shall be payment in full for constructing the foundation and furnishing and installing grounding and ground rods. Pavement, sod, curb and sidewalk removal and replacement, granular material backfill and disposal of waste excavated material are also included. Hand dig entire dept of foundation if there are any underground utilities within 3 feet of the proposed foundation location.

_Light Std, Grand River Decorative, Install will be measured as a unit. The contract unit price each shall be payment in full for furnishing and installing the street light standard (with receptacle) and bracket arms on the foundation; tagging, grounding, cable bonding, fusing, and street lighting circuit connections to provide a complete and operating unit as shown on the plans.

_Luminaire, 150W, Install will be measured as a unit. The contract unit price each shall be payment in full for furnishing, installing and leveling the luminaire and LED driver; furnishing and installing the lamp cord cable and making all connections to LED driver and luminaire; and furnishing and installing light standard luminaire ID tags as indicated on the plans.

PUBLIC LIGHTING AUTHORITY OF DETROIT
SPECIAL PROVISION
FOR
STREET LIGHTING AND RECEPTACLE CABLES

MES

Page 1 of 1

31March2020

a. Description. Install street lighting and receptacle cables as called for on plans and details.

b. Material. Materials for underground street lighting and receptable cables material are listed on sheets DT-04, DT-05, DT-06, DT-07 and DT-08 in this project.

c. Measurement and Payment. The work as described will be measured and paid for using the following contract items:

Contract Item (Pay Item)	Pay Unit
_Cable, Equipment Grounding Wire, 1/C#6, Cu.....	Ft
_Cable, Sec, 600V, 2, 1/C#6, Cu.....	Ft
_Cable, Sec, 600V, 3, 1/C#1, Modified	Ft
_Wood Pole, Fit Up, Metered Sec Elec Serv	Ft
_Wood Pole, Fit Up, Sec Cable Pole.....	Ft

_Cable, Equipment Grounding Wire, 1/C#6, Cu will be measured in linear feet. The contract unit price per linear foot shall be payment in full for furnishing and installing cable in conduit, racking the cable in manholes and handholes, bonding, and tagging.

_Cable, Sec, 600V, 2, 1/C#6, Cu will be measured in linear feet. The contract unit price per linear foot shall be payment in full for furnishing and installing cable in conduit, racking the cable in manholes and handholes, bonding, and tagging.

_Cable, Sec, 600V, 3, 1/C#1, Modified will be measured in linear feet. The contract unit price per linear foot shall be payment in full for furnishing and installing cable in conduit, racking the cable in manholes and handholes, bonding, and tagging.

_Wood Pole, Fit Up, Metered Sec Elec Serv will be measured as a unit. The contract unit price each shall be payment in full for furnishing and installing or coordinating the install of the metered service and electrical service for the receptacle circuit shown on the plans.

_Wood Pole, Fit Up, Sec Cable Pole will be measured as a unit. The contract unit price each shall be payment in full for furnishing and installing or coordinating the install of the secondary riser on the DTE wood pole for the receptacle circuit shown on the plans.

PUBLIC LIGHTING AUTHORITY OF DETROIT
SPECIAL PROVISION
FOR
STREET LIGHTING UNDERGROUND STRUCTURES

MES

Page 1 of 1

31March2020

- a. Description.** Install underground structures as called for on the plans.
- b. Material.** Materials for underground structures are listed under MDOT Section 918.01 and on DT-10, DT-13 and DT-14 in this project.
- c. Measurement and Payment.** The work as described will be measured and paid for using the following contract items:

Contract Item (Pay Item)

Pay Unit

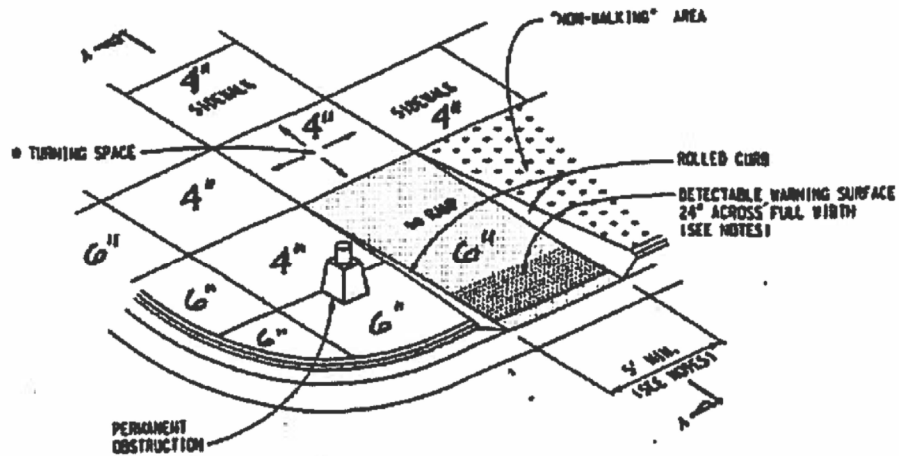
_Conduit, DB, 1, 3 inch.....	Ft
_Hh, Polymer Conc, modified.....	Ea

_Conduit, DB, 1, 3 inch of the number and diameter of ducts called for will be measured by length in linear feet in place, from the inside walls of manholes and the centers of handholes, foundations and cable poles. The contract unit price per linear foot shall be payment in full for furnishing all labor, materials and equipment and furnishing and install the conduit complete using MDOT Specification 819.02.

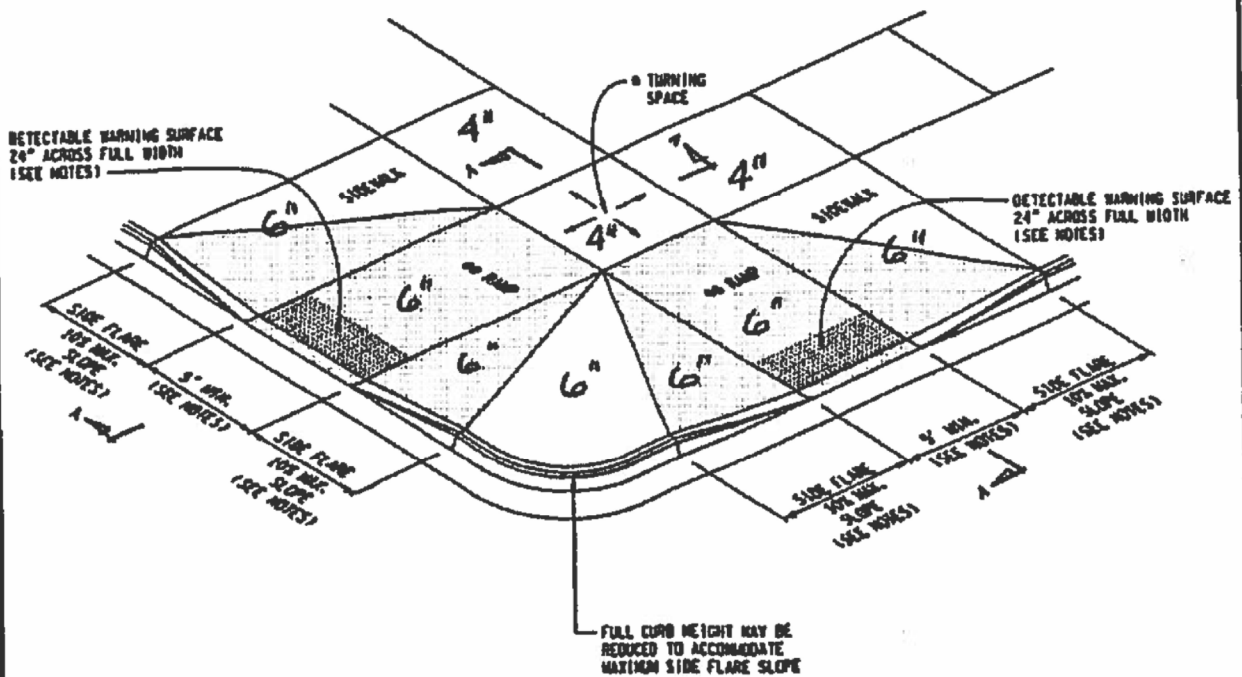
_Hh, Polymer Conc, Modified will be measured as a unit. The contract unit price each shall be payment in full for furnishing and installing the complete structure as shown on the drawings and as specified herein. Provide covers marked with a logo imprint of "LIGHTING". The polymer concrete structure must be installed level with the final grade and parallel to the curb. Tag all cables in handhole.

• MAXIMUM TURNING SPACE SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

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



SIDEWALK RAMP TYPE R
(ROLLED SIDES)



SIDEWALK RAMP TYPE F
(FLARED SIDES, TWO RAMPS SHOWN)



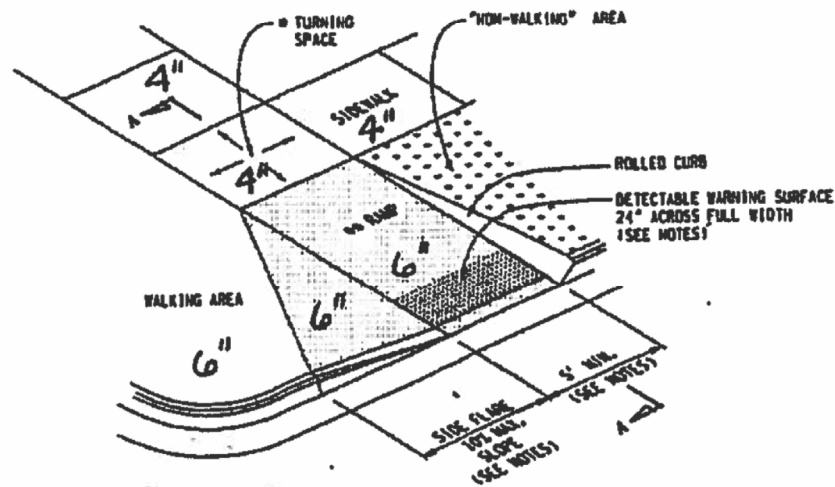
CITY OF DETROIT

DEPARTMENT OF PUBLIC WORKS, CITY ENGINEERING DIVISION
**SIDEWALK RAMP AND
 DETECTABLE WARNING DETAILS**
 R-28-1 WITH CITY OF DETROIT
 THICKNESS AMENDMENT

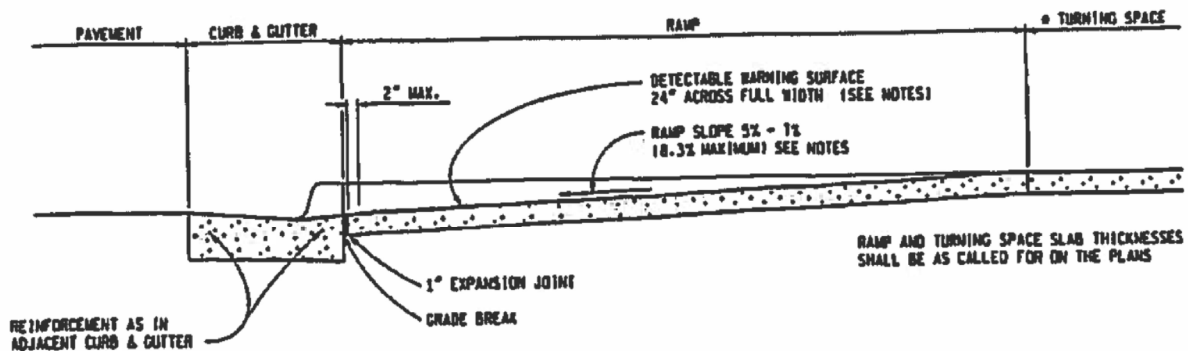
4/19/2017

SHEET 1 OF 7

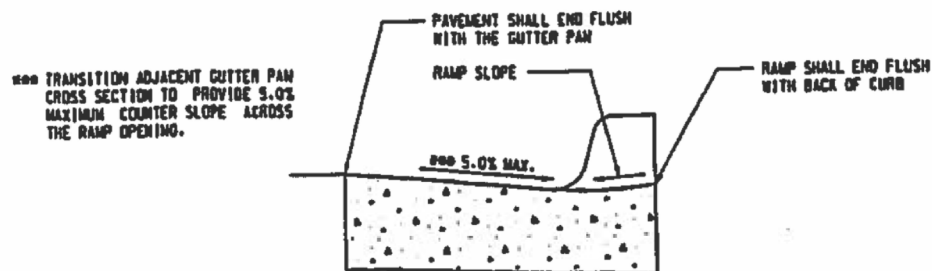
- MAXIMUM TURNING SPACE SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.
- MAXIMUM RAMP CROSS SLOPE IS 2.0%. RUNNING SLOPE 5% - 7% (0.3% MAXIMUM). SEE NOTES.



SIDEWALK RAMP TYPE RF
(ROLLED / FLARED SIDES)



SECTION A-A



SECTION THROUGH CURB CUT
(TYPICAL ALL RAMP TYPES)



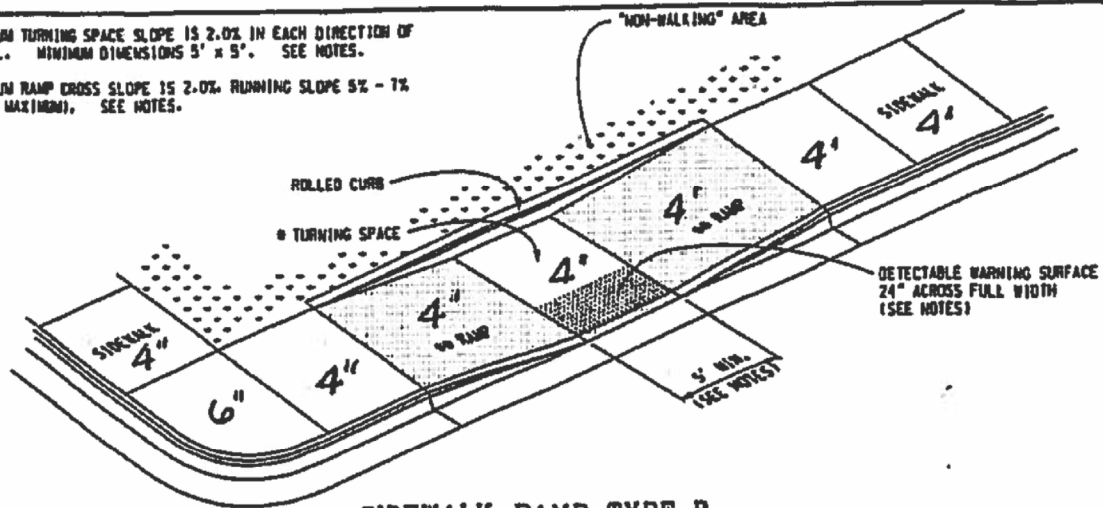
CITY OF DETROIT

DEPARTMENT OF PUBLIC WORKS, CITY ENGINEERING DIVISION
SIDEWALK RAMP AND
DETECTABLE WARNING DETAILS
R-28-1 WITH CITY OF DETROIT
THICKNESS AMENDMENT

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SHEET 2 OF 7

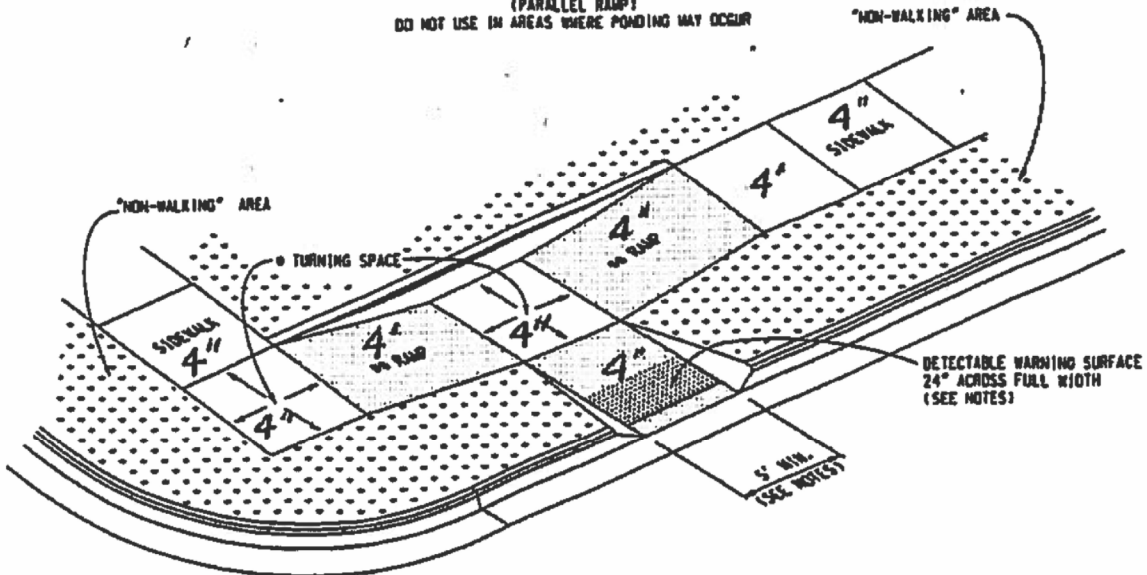
- MAXIMUM TURNING SPACE SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.
- MAXIMUM RAMP CROSS SLOPE IS 2.0%. RUNNING SLOPE 5% - 7% (0.3% MAXIMUM). SEE NOTES.



SIDEWALK RAMP TYPE P

(PARALLEL RAMP)

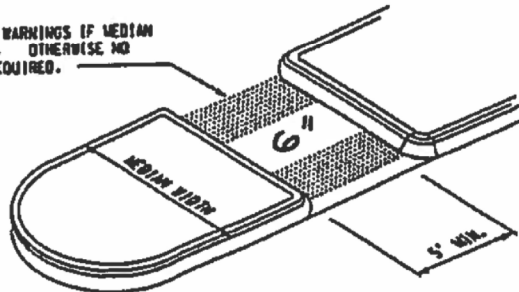
DO NOT USE IN AREAS WHERE PONDING MAY OCCUR



SIDEWALK RAMP TYPE C

(COMBINATION RAMP)

USE 24" DEEP DETECTABLE WARNINGS IF MEDIAN WIDTH IS AT LEAST 6'-0". OTHERWISE NO DETECTABLE WARNING IS REQUIRED.



SIDEWALK RAMP TYPE M



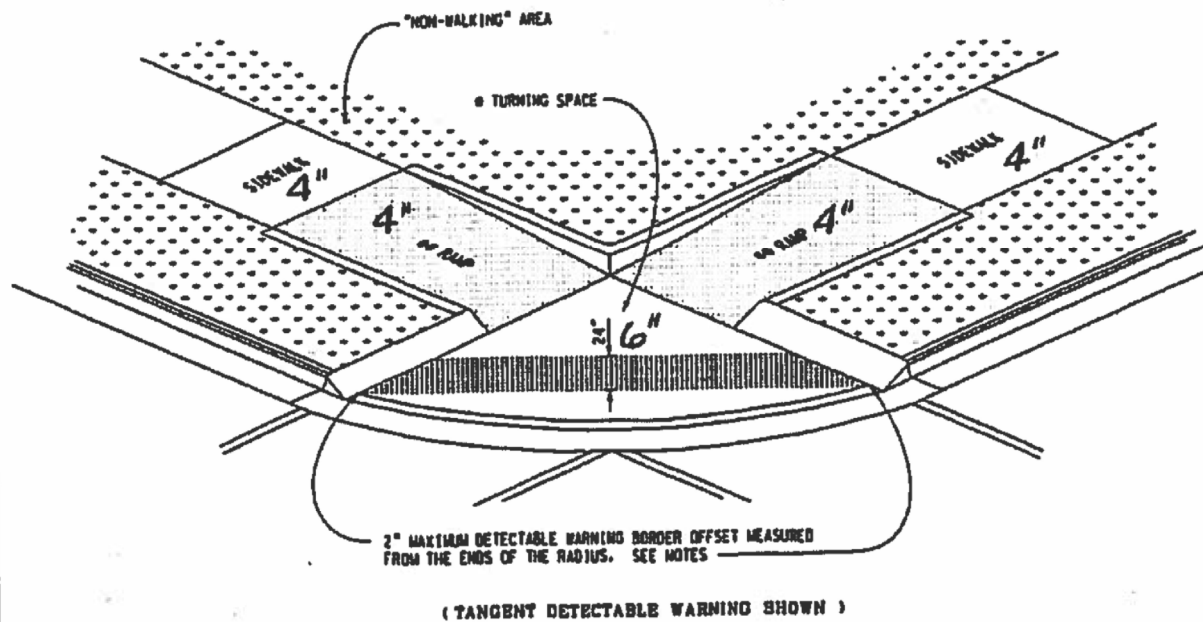
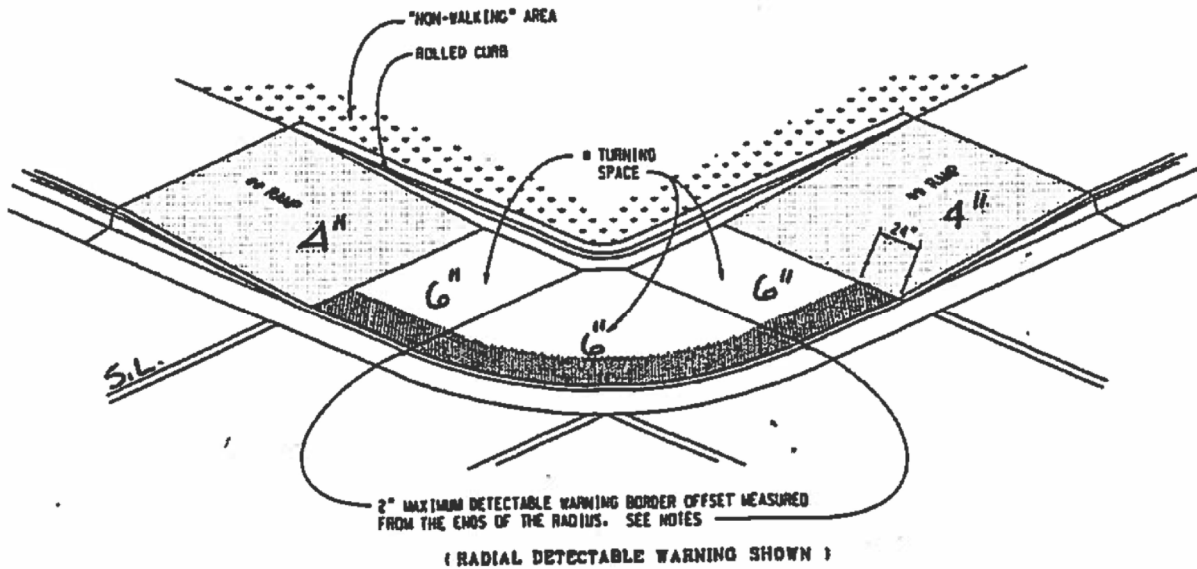
CITY OF DETROIT

DEPARTMENT OF PUBLIC WORKS, CITY ENGINEERING DIVISION
**SIDEWALK RAMP AND
 DETECTABLE WARNING DETAILS**
 R-28-1 WITH CITY OF DETROIT
 THICKNESS AMENDMENT

4/19/2017

SHEET 3 OF 7

- MAXIMUM TURNING SPACE SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. MINIMUM DIMENSIONS 5' x 9'. SEE NOTES.
- MAXIMUM RAMP CROSS SLOPE IS 2.0%. RUNNING SLOPE 5% - 7% (0.3% MAXIMUM). SEE NOTES.



SIDEWALK RAMP TYPE D (DEPRESSED CORNER)



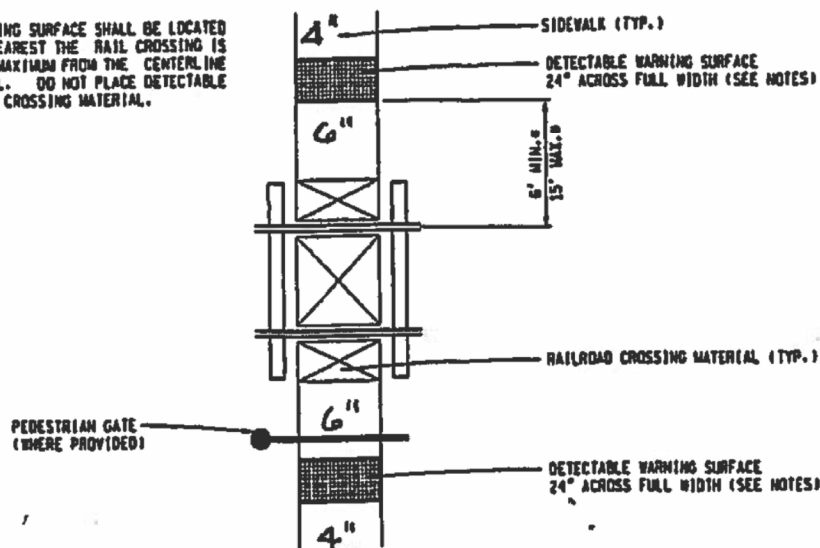
CITY OF DETROIT

DEPARTMENT OF PUBLIC WORKS, CITY ENGINEERING DIVISION
**SIDEWALK RAMP AND
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 R-28-1 WITH CITY OF DETROIT
 THICKNESS AMENDMENT

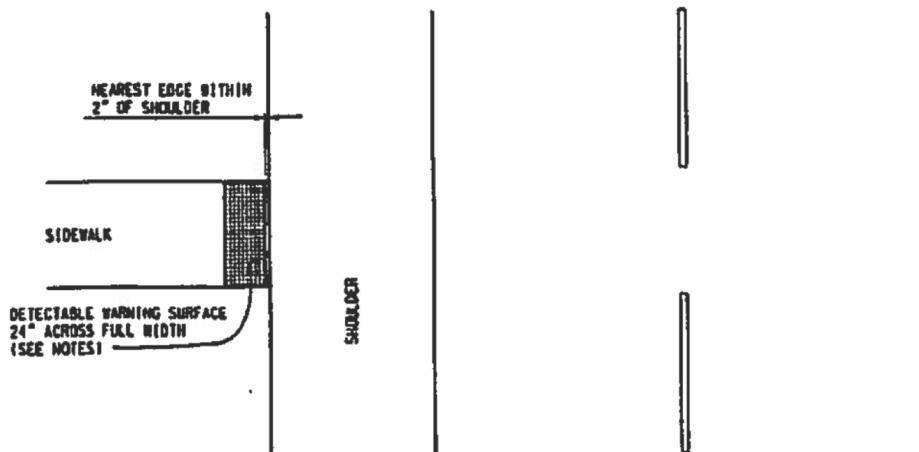
4/19/2017

SHEET 4 OF 7

THE DETECTABLE WARNING SURFACE SHALL BE LOCATED SO THAT THE EDGE NEAREST THE RAIL CROSSING IS 6' MINIMUM AND 15' MAXIMUM FROM THE CENTERLINE OF THE NEAREST RAIL. DO NOT PLACE DETECTABLE WARNING ON RAILROAD CROSSING MATERIAL.



DETECTABLE WARNING AT RAILROAD CROSSING



DETECTABLE WARNING AT FLUSH SHOULDER OR ROADWAY

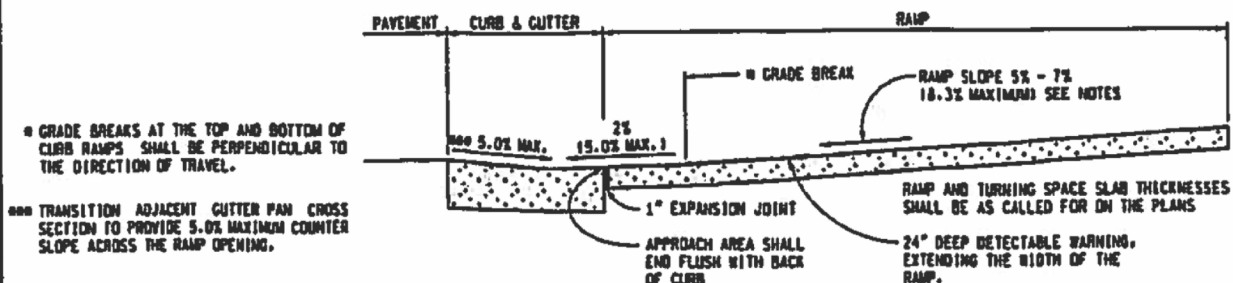
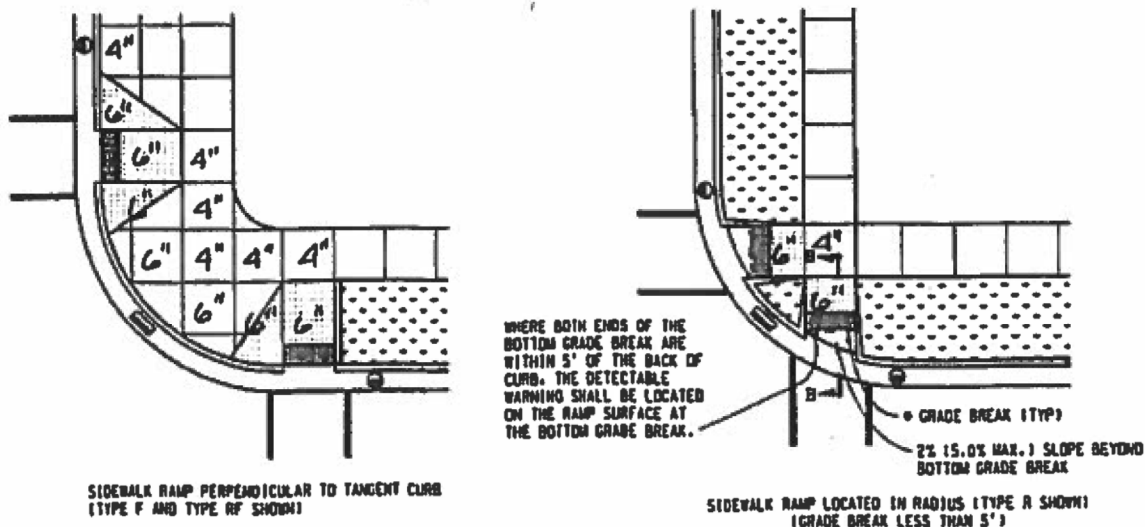
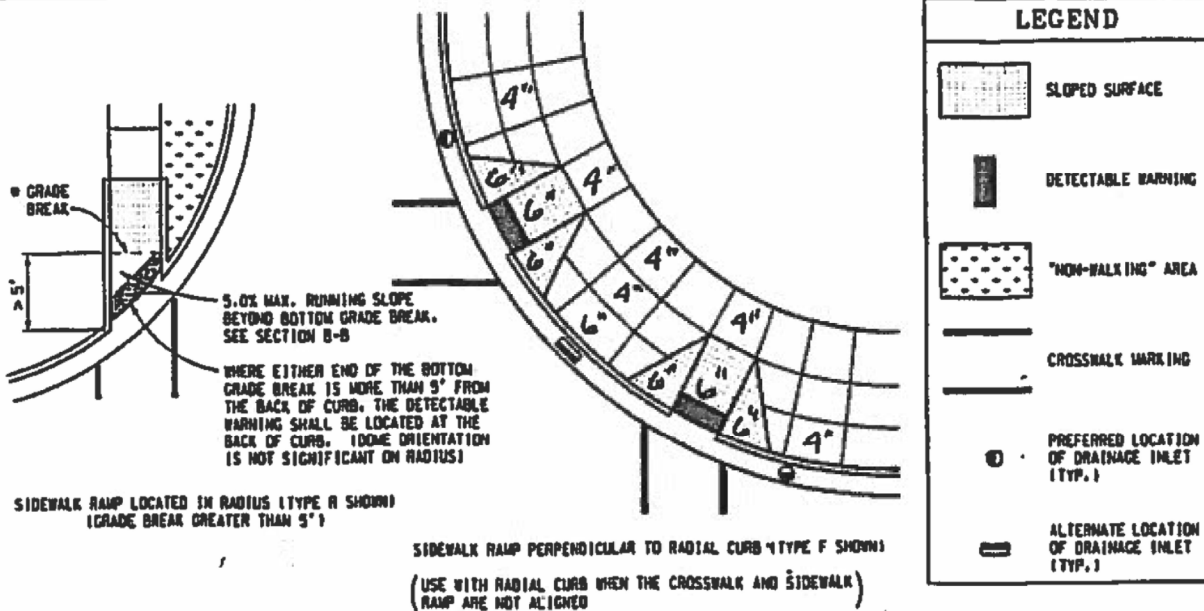


CITY OF DETROIT

DEPARTMENT OF PUBLIC WORKS, CITY ENGINEERING DIVISION
**SIDEWALK RAMP AND
 DETECTABLE WARNING DETAILS**
 R-28-1 WITH CITY OF DETROIT
 THICKNESS AMENDMENT

4/19/2017

SHEET 5 OF 7



SECTION B-B SIDEWALK RAMP ORIENTATION

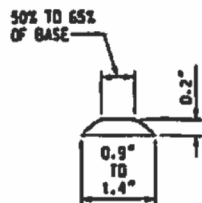


CITY OF DETROIT

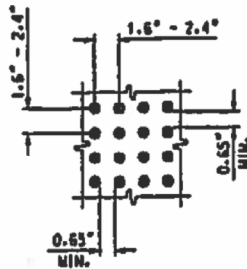
DEPARTMENT OF PUBLIC WORKS, CITY ENGINEERING DIVISION
**SIDEWALK RAMP AND
DETECTABLE WARNING DETAILS**
R-28-1 WITH CITY OF DETROIT
THICKNESS AMENDMENT

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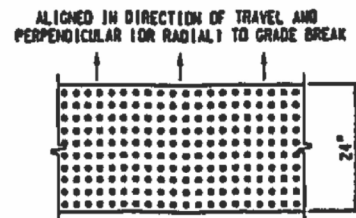
SHEET 6 OF 7



DOME SECTION



DOME SPACING



DOME ALIGNMENT

DETECTABLE WARNING DETAILS

NOTES:

DETAILS SPECIFIED ON THIS PLAN APPLY TO ALL CONSTRUCTION, RECONSTRUCTION, OR ALTERATION OF STREETS, CURBS, OR SIDEWALKS IN THE PUBLIC RIGHT OF WAY.

SIDEWALK RAMPS ARE TO BE LOCATED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

RAMPS SHALL BE PROVIDED AT ALL CORNERS OF AN INTERSECTION WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB. RAMPS SHALL ALSO BE PROVIDED AT MARKED AND/OR SIGNALIZED MID-BLOCK CROSSINGS.

SURFACE TEXTURE OF THE RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING, TRANSVERSE TO THE RUNNING SLOPE.

SIDEWALK SHALL BE RAMPED WHERE THE DRIVEWAY CURB IS EXTENDED ACROSS THE WALK.

CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP. WHERE CONDITIONS PERMIT, IT IS DESIRABLE THAT THE SLOPE OF THE RAMP BE IN ONLY ONE DIRECTION, PARALLEL TO THE DIRECTION OF TRAVEL.

RAMP WIDTH SHALL BE INCREASED, IF NECESSARY, TO ACCOMMODATE SIDEWALK SNOW REMOVAL EQUIPMENT NORMALLY USED BY THE MUNICIPALITY.

PROVIDE TURNING SPACES WHERE PEDESTRIAN TURNING MOVEMENTS ARE REQUIRED.

WHEN 5' MINIMUM WIDTHS ARE NOT FEASIBLE, RAMP WIDTH MAY BE REDUCED TO NOT LESS THAN 4' AND TURNING SPACES TO NOT LESS THAN 4' x 4'.

DETECTABLE WARNING SURFACE COVERAGE IS 24" MINIMUM IN THE DIRECTION OF RAMP/PATH TRAVEL AND THE FULL WIDTH OF THE RAMP/PATH OPENING EXCLUDING CURBED OR FLARED CURB TRANSITION AREAS. A BORDER OFFSET NOT GREATER THAN 2" MEASURED ALONG THE EDGES OF THE DETECTABLE WARNING IS ALLOWABLE. FOR RADIAL CURB THE OFFSET IS MEASURED FROM THE ENDS OF THE RADIUS.

FOR NEW ROADWAY CONSTRUCTION, THE RAMP CROSS SLOPE MAY NOT EXCEED 2.0%. FOR ALTERATIONS TO EXISTING ROADWAYS, THE CROSS SLOPE MAY BE TRANSITIONED TO MEET AN EXISTING ROADWAY GRADE. THE CROSS SLOPE TRANSITION SHALL BE APPLIED UNIFORMLY OVER THE FULL LENGTH OF THE RAMP.

THE MAXIMUM RUNNING SLOPE OF 8.3% IS RELATIVE TO A FLAT 10% REFERENCE. HOWEVER, IT SHALL NOT REQUIRE ANY RAMP OR SERIES OF RAMPS TO EXCEED 15 FEET IN LENGTH.

DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH RAMPS. THE LOCATION OF THE RAMP SHOULD TAKE PRECEDENCE OVER THE LOCATION OF THE DRAINAGE STRUCTURE. WHERE EXISTING DRAINAGE STRUCTURES ARE LOCATED IN THE RAMP PATH OF TRAVEL, USE A MANUFACTURER'S ADA COMPLIANT GRATE. OPENINGS SHALL NOT BE GREATER THAN 1/2". ELONGATED OPENINGS SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

TRANSITION THE GUTTER PAN CROSS SECTION SUCH THAT THE COUNTER SLOPE IN THE DIRECTION OF RAMP TRAVEL IS NOT GREATER THAN 5.0%. MAINTAIN THE NORMAL GUTTER PAN CROSS SECTION ACROSS DRAINAGE STRUCTURES.

THE TOP OF THE JOINT FILLER FOR ALL RAMP TYPES SHALL BE FLUSH WITH THE ADJACENT CONCRETE.

CROSSWALK AND STOP LINE MARKINGS, IF USED, SHALL BE SO LOCATED AS TO STOP TRAFFIC SHORT OF RAMP CROSSINGS. SPECIFIC DETAILS FOR MARKING APPLICATIONS ARE GIVEN IN THE "MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES".

FLARED SIDES WITH A SLOPE OF 10% MAXIMUM, MEASURED ALONG THE ROADSIDE CURB LINE, SHALL BE PROVIDED WHERE AN UNOBSTRUCTED CIRCULATION PATH LATERALLY CROSSES THE SIDEWALK RAMP. FLARED SIDES ARE NOT REQUIRED WHERE THE RAMP IS BORDERED BY LANDSCAPING, UNPAVED SURFACE OR PERMANENT FIXED OBJECTS. WHERE THEY ARE NOT REQUIRED, FLARED SIDES CAN BE CONSIDERED IN ORDER TO AVOID SHARP CURB RETURNS AT RAMP OPENINGS.

DETECTABLE WARNING PLATES MUST BE INSTALLED USING FABRICATED OR FIELD CUT UNITS CAST AND/OR ANCHORED IN THE PAVEMENT TO RESIST SHIFTING OR HEAVING.



CITY OF DETROIT

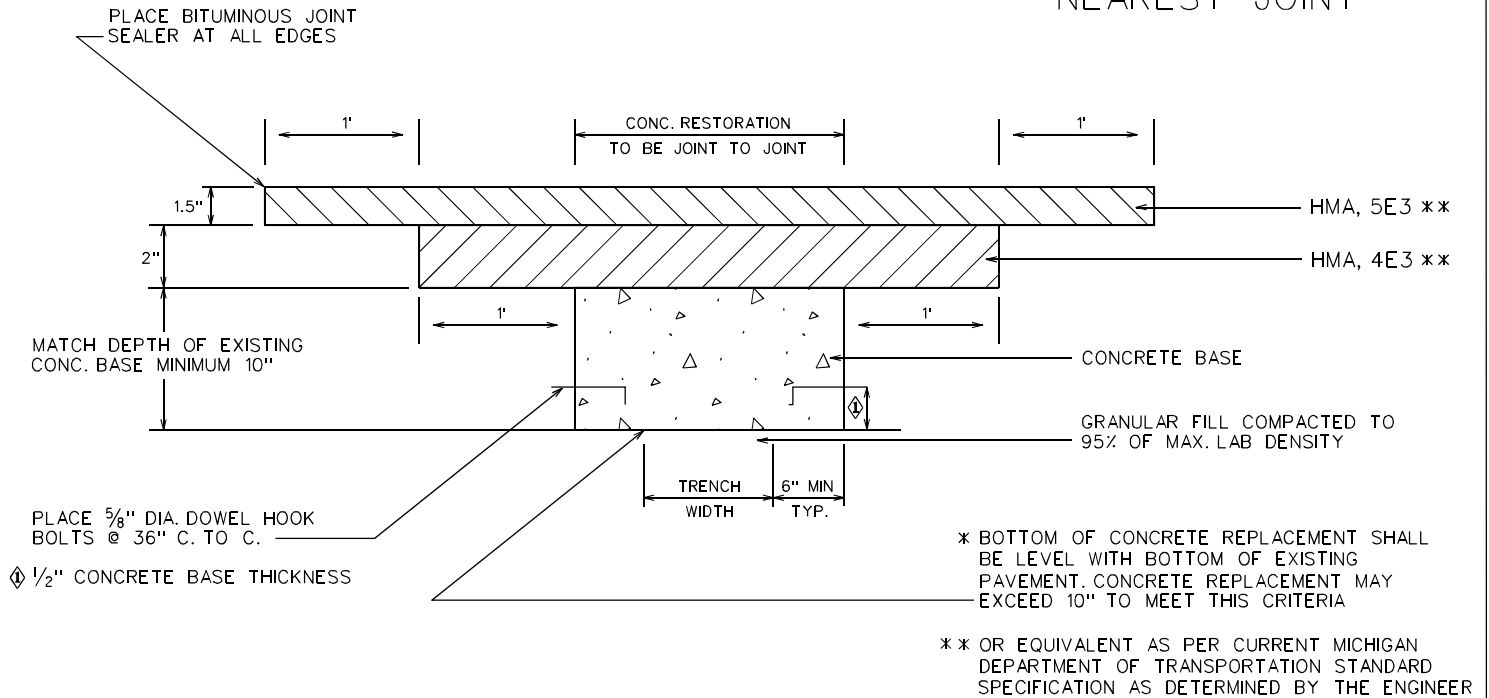
DEPARTMENT OF PUBLIC WORKS, CITY ENGINEERING DIVISION
SIDEWALK RAMP AND
DETECTABLE WARNING DETAILS
R-28-1 WITH CITY OF DETROIT
THICKNESS AMENDMENT

4/19/2017

SHEET 7 OF 7

MAJOR STREETS:

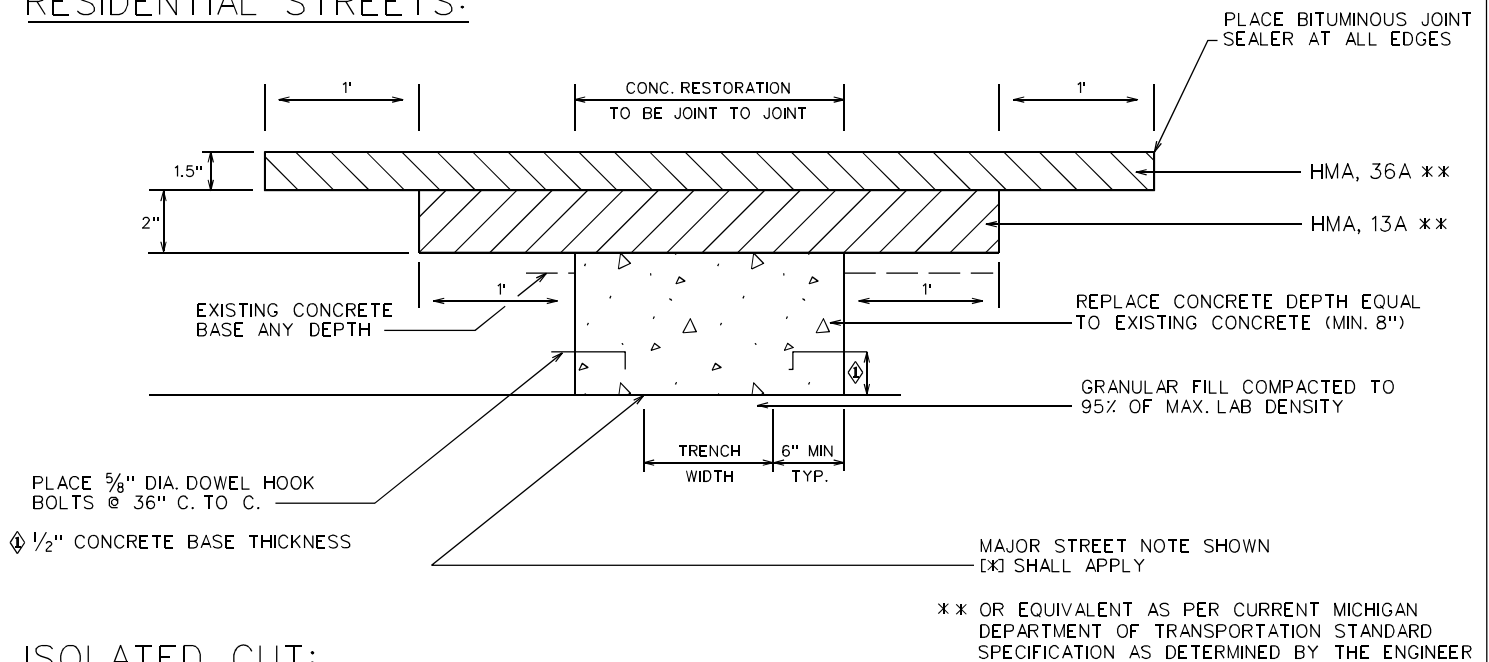
NOTE: PAVEMENT CUTS
MUST EXTEND TO
NEAREST JOINT



EXCEPTION:

TO ABOVE 3" HMA REPLACEMENT. WHEN PAVEMENT REPLACEMENT IS 100 FEET FROM EITHER SIDE OF UNDERPASS REPLACE 10" MIN CONCRETE BASE WITH TOP OF CONCRETE LEVEL WITH TOP OF EXISTING CONCRETE AND REPLACE HMA SECTION AS EXISTING

RESIDENTIAL STREETS:



ISOLATED CUT:

TRIM JOINT TO OBTAIN VERTICAL CUT

B					
A					
DESCRIPTION	DRWN	CHKD	APPD	DATE	
REVISIONS					
DRAWN BY	WLW	CHECKED	KSM		
DATE	08/29/18	APPROVED	SRB		

HMA SURFACE ON
CONCRETE BASE
UTILITY TRENCH
CONSTRUCTION
PAVEMENT RESTORATION

CITY OF DETROIT CITY ENGINEERING DIVISION SURVEY BUREAU	
JOB NO.	
DRWG. NO.	1 OF 2

CITY OF DETROIT NOTES

1. MILL (REMOVE) HMA PAVEMENT WITHIN AND BEYOND THE AREA OF TRENCH PAVEMENT REMOVAL IN ORDER TO DETERMINE LOCATION OF UNDERLYING CONCRETE BASE PAVEMENT JOINTS. MILL MINIMUM TO 1' BEYOND NEAREST CONCRETE JOINTS.
2. EXTEND UTILITY TRENCH CONCRETE PAVEMENT REMOVAL TO ALL CONCRETE PAVEMENT JOINTS AND / OR CURBS ADJACENT TO THE TRENCH AREA. REMOVAL SHALL BE "JOINT TO JOINT".
3. CONCRETE PAVEMENT CUTS SHALL BE MINIMUM 3' WIDE.
4. ALL PAVEMENT CUTS SHALL BE MINIMUM 1' WIDER THAN TRENCH WIDTH.
5. ALL REMOVALS SHALL BE SAWCUT STRAIGHT AND SQUARE (90 DEGREES).
6. CONCRETE RESTORATION PAVEMENT SHALL BE MDOT P1 MIX (3,500 PSI).
7. RESTORED CONCRETE PAVEMENT SHALL MATCH THICKNESS OF EXISTING CONCRETE PAVEMENT IN CONFORMANCE WITH MDOT STANDARDS DETAIL R-44-F.
8. RESTORED CONCRETE SHALL BE ANCHORED TO EXISTING CONCRETE PAVEMENT IN CONFORMANCE WITH MDOT STANDARD DETAIL R-44-F
9. APPLY HMA TACK COAT PER MDOT STANDARD SPECIFICATIONS SECTION 904.
10. RESTORE HMA PAVEMENT 3 1/2" TO MATCH EXISTING, IN 2 LIFTS:
1ST LIFT - 2" MDOT HMA 4E3 (13A RESIDENTIAL), COMPACTED, EXTENDED 1' BEYOND BASE CONCRETE REPAIR.
2ND LIFT - 1 1/2" MDOT HMA 5E3 (36A RESIDENTIAL), COMPACTED, EXTENDED 1' BEYOND 1ST LIFT..
11. BITUMINOUS JOINT SEALER SHALL BE PLACED AT ALL FINISHED HMA JOINTS.
12. ALL DISTURBED PAVEMENT MARKINGS AND OTHER ASSETS, INCLUDING BIKE LANE DELINEATORS, WILL HAVE TO BE REPLACED AT THE COST OF THE PERMIT HOLDER, AND SHALL CONFORM TO THE LATEST CED / TED STANDARDS.
13. FOR OTHER RELATED SPECIFICATIONS (BACKFILL COMPACTION, MATERIALS, ETC...), REFER TO DIVISION 15 OF THE STANDARD SPECIFICATIONS FOR PAVING AND RELATED CONSTRUCTION.
14. NOTIFY THE CITY OF DETROIT ENGINEERING DEPARTMENT 24 HOURS PRIOR TO STARTING CONSTRUCTION.
15. ANY OPEN EXCAVATIONS ARE TO BE STEEL PLATED. IF EXCAVATIONS ARE IN THE PAVEMENT, THE PLATES ARE TO BE SPIKED AND RAMPED WITH COLD PATCH. CONTACT THE CITY WITH LOCATION OF THE STEEL PLATE.
16. THE CITY OF DETROIT REQUIRES ALL CONCRETE WORK TO BE STAMPED WITH A CONTRACTORS IDENTIFICATION STAMP.

B						HMA SURFACE ON CONCRETE BASE UTILITY TRENCH CONSTRUCTION PAVEMENT RESTORATION	CITY OF DETROIT CITY ENGINEERING DIVISION SURVEY BUREAU
A							
DESCRIPTION		DRWN	CHKD	APPD	DATE		
REVISIONS							
DRAWN BY	WLW	CHECKED	KSM				JOB NO.
DATE	08/29/18	APPROVED	SRB			DRWG. NO. 2 OF 2	