Northville Township Police Station Renovation Project

ADDENDUM NO. 2
August 9, 2016

THIS IS AN ADDENDUM
TO PROSPECTIVE BIDDERS AND OTHERS CONCERNED:

This addendum supplements the ***Request for Proposal -Northville Township Police Station Renovation Project Invitation to Bid*** (the "RFP") document. All provisions, which are not so amended or supplemented, remain in full force and effect.

This Addendum includes the following:

1. The geotechnical report prepared by GeoTran (GeoTran Project Number 16-05003G-10) is attached as part of this addendum.
2. Inspection Days:
   A. The cost of Inspection Days and Engineer Days will no longer be the Contractor's cost to include in Base Bid #1. Inspection Days will now be contracted directly between Northville Township and Spicer Group.
   B. The Contractor must still coordinate the inspection days with the Engineer, and include a minimum of twenty (20) Inspection Days in the Schedule of Values, and Additional Inspection Days as forecasted.
3. Irrigation Piping:
   A. The new 1" irrigation pipe shall be 1" HDPE, PE 3408/3608, continuous roll or butt-fused.
   B. Contractor shall provide a minimum 200 feet of piping.
   C. The new pipe shall run underground, under the new HMA surface, from the existing irrigation box located approximately 30'-0" to the northeast of the existing Gas Tank Filling Station, to the new Yard Hydrant located at the southwest corner of the existing Dumpster Fence. See Sheet C4.
   D. The piping shall no longer be Type L Copper.
   E. The piping shall no longer be required to run indoors.
   F. The new piping will be connected downstream from the existing irrigation backflow device. A new backflow device is not required.
   G. The Contractor must terminate the new 1" irrigation piping shall be terminated and extra pipe coiled at the existing irrigation box.
   H. Northville Township Facilities Technician, Alex Hester will connect the new piping when the irrigation system is purged.
   I. The Yard Hydrant as noted on plans will be eliminated and should not be included in bid.
   J. Instead of a yard hydrant terminate piping in underground utility box. The utility box should be installed off the southwest corner of the existing dumpster enclosure. Provide 12" of free pipe length (in 24" long enclosure) for future irrigation valve attachment by Northville TWP. Utility Box shall be Pencell Plastics model DT1324-

18 HD, light duty, 12-3/8" x 21-7/8" clear opening, L =27-7/8", W =18-3/8", H=15-1/4"; HDPE, Top Stamped "Irrigation".

4. Add Alternate #5: Sign Package:
   A. The Contractor shall include the sign package pricing in the Add Alternate #5 Sign Package Bid. The Contractor is responsible for the installation of all signs, and coordination with Graphic Visions. See Section 01 60 00 Product Requirements.
   B. All custom sign work must be postponed until Phase 2 design begins. Replacement work for these signs shall not take place as part of this bid. Graphic Visions has been instructed to remove the custom signage. The Contractor must not include time for custom sign coordination and installation.
   C. Custom Signs: Do not remove the Six Mile Main Entrance Sign, or the two signs located to the southeast and southwest of the garage. See "Police Entrance" sign and "Police Main Entrance Sign" photos attached as part of this addendum.
   D. All other sign work must remain in Bid, and the Contractor shall coordinate all new and existing sign work with Graphic Visions, Sue Dillon, 248-347-3355.
   E. Graphic Visions will have pricing available for the metal sign replacements and banners.
   F. The existing concrete planters and surrounding rocks located in front of the Six Mile main entrance sign must be removed as part of Add Alternate #5.
5. Surveillance Camera Conduit.
   A. Sheet C4 incorrectly lists the new surveillance camera conduit as 1' in diameter. This conduit should be 1" in diameter.
   B. Add two (2) electrical ground boxes to join the sections of the conduit.
   C. The conduit shall run from the corner of the garage as shown, across the driveway, to the first light pole where the existing surveillance camera is installed. The first electrical box should be installed next to the lighting pole, with open-ended conduit sections terminated in box.
   D. Two (2) electrical ground boxes: Pencell Plastics model PE-9HD, 9" dia., 10" deep. Field core for conduits.
   E. The second conduit box should be installed at the end of the conduit piping where the future pole is noted on Sheet C4.
   F. The electrical conduit shall be continuous, flexible, 1" HDPE, ASTM F2160, electrical solid wall piping.
   G. The surveillance contractor shall provide all secondary wiring and conduit from ground box to camera(s).
   H. The Contractor or subcontracted Electrical Contractor should plan to remove and reinstall and reconnect the single surveillance camera and associated wiring from the light pole that is to be removed.
6. In area 13P use 4'x6' riprap.
7. Lighting:
   A. There are a total of 22 single light heads, and 4 dual light heads (8 luminaires), for a total of thirty (30) luminaries.
   B. There are a total of 26 existing lighting bases. The existing bolt pattern is noted in the specifications, but the Electrical Contractor is responsible for field verifying all existing bolt patterns for single luminaire and double luminaire mountings.

C. A single head luminaire symbol, LT-01, located northernmost center on Sheet C6 is not shown, but is tagged. This pole and lighting head is included in the totals listed above.
D. The Electrical Contractor must provide new wiring conduit at the light pole connections only, where the existing conduit is damaged. The existing electrical wiring and new luminaire wiring shall be joined at the integral lighting pole hand-hole wiring box.
E. The Electrical Contractor must include time in Bid to field verify the existing site lighting circuits and existing wiring schematics. There are no existing drawings available. In general this is a remove/replace lighting replacement project. The Contractor may be required to reassign existing conductors to new circuits, and existing lighting panels.
F. The Electrical Contractor is responsible for installation, wiring, and programming of the new lighting control panel, and should provide a complete installation. See Electrical and Lighting Specifications.

8. Carport Electrical Sub-Panel:
   A. A new electrical sub-panel will be install in the 2003 Building Electrical Room, and new conduit must be installed from the electrical room to a new wall mounted pull box, where it can branch out and run underground to the new carports. See Electrical Sketch Addendum #2 attached for a rough sketch of the area described above.
   B. The Electrical Contractor must include an exterior wall mounted pull box to join above ground wall conduits and underground conduits.
   C. The number of wall-mounted conduits shall be determined by the Electrical Contractor. Underground conduits should follow Sheet C6, or they can be installed as best determined by the Electrical Contractor.
   D. The nominal length of wall-mounted conduit from subpanel to wall mounted pull box is 150 feet.
9. Add Alternate #7: Garage Floor Replacement:
   A. Do not remove the step-up portion, noted as "raised area" on plans, of the garage floor. Both existing step-up areas can remain in place. The area of the step-up portion is approximately 125 square feet.
   B. The existing step-up portion must be repainted. All necessary stripping and/or preparation of the existing surface must take place.
   C. The total garage floor area that is required to be replaced is approximately 2,575 square feet.
   D. All areas must be field verified by the Contractor.
10. 32 01 16 Flexible Paving Rehabilitation: Refer to the attached 32 01 16 Flexible Paving Rehabilitation for pulverization, base crush and shape specifications.
11. 32 17 23 Pavement Marking: Refer to attached 32 17 23 Pavement Marking for additional specifications.
12. 32 12 16 Asphalt Paving: Refer to tack coat and adjusting ring data added to 32 12 16 Asphalt Paving specification.

Attachments:

1. Northville TWP Police Department Geotechnical Report.pdf
2. Pencell Plastics model DT1324 ground box.pdf
3. Pencell Plastics model
4. Police Entrance Sign.pdf
5. Police Main Entrance Sign.pdf
6. Police Headquarters (Six Mile Sign).pdf
7. Electrical Sketch Addendum #2.pdf
8. 32 01 16 Flexible Paving Rehabilitation.pdf
9. 32 17 23 Pavement Marking.pdf
10. 32 12 16 Asphalt Paving.pdf

Prospective bidders shall attach this addendum to their proposal and shall sign the Addendum and submit same with bid. Failure to include signed Addendum with bid proposal shall be cause for rejection of bid. Bidders shall affix the signed Addendum to the inside cover of the submitted Contract Documents.

_____

(Bidder)

By:_____

Date:_____

Title:_____

1-800-257-9448 | Rocky Mount, NC

Industry Category

Electrical Utility
Contractor & Industrial
CATV
Communications
Water

PenCell Plastics

546 English Road
Rocky Mount, NC 27804
Map

Main: 800-257-9448
252-467-2210
Fax: 252-467-2212

Email: info@pencell.com

Product Quicklinks

Vaults By Size
Pedestals by Size
Accessories/Customization
Product Catalog PDF

Sales Representatives

Rep Locator Map

General

Contact Info
Terms & Conditions

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PE-9HD

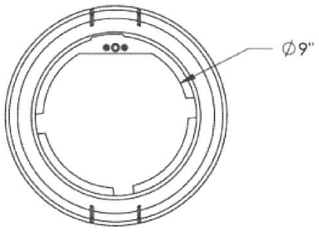
EMAIL PRINT

This unit is molded of high density polyethylene. Flange around base prevents frost heaving or tilting. Units can be nested for a minimum amount of warehouse storage space. Units offered in green.

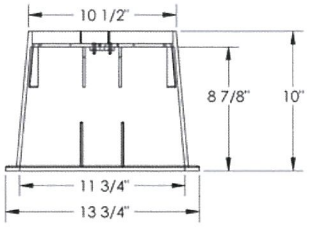
When ordering please specify:

(2)- 2 1/2x2 1/4 per box
(Allen type)-
(B) - Button Head Bolt
(H)- Hex Head Bolt
(K) - Knockouts
(X)- 3/6-16 Penta Head Bolt

Example: **PE-9HDHK** - Enclosure with H.D. polyethylene lid with hex head bolt and knockouts



Click For Photo



PE-9HD

PO Box 8317
546 English Road
Rocky Mount, NC 27804

TEL: 800-257-9448
LOCAL: 252-467-2210
FAX: 252-467-2212

EMAIL: info@pencell.com
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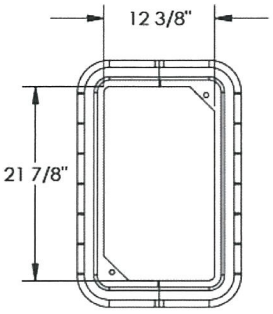
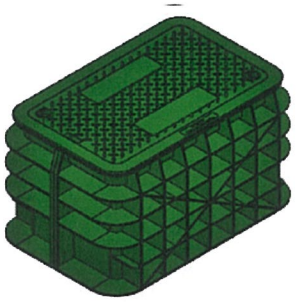
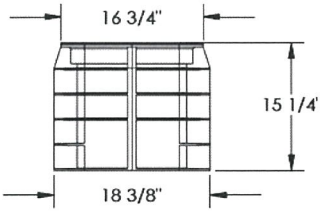
JFTP::login: Unable to login

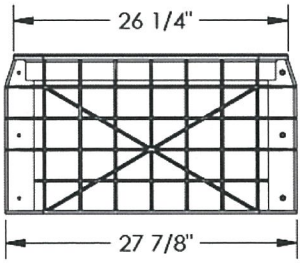
DT-1324HD

EMAIL PRINT









DT-1324HD

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FAX: 252-467-2212

EMAIL: info@pencell.com
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NORTHVILLE
TOWNSHIP
MICHIGAN
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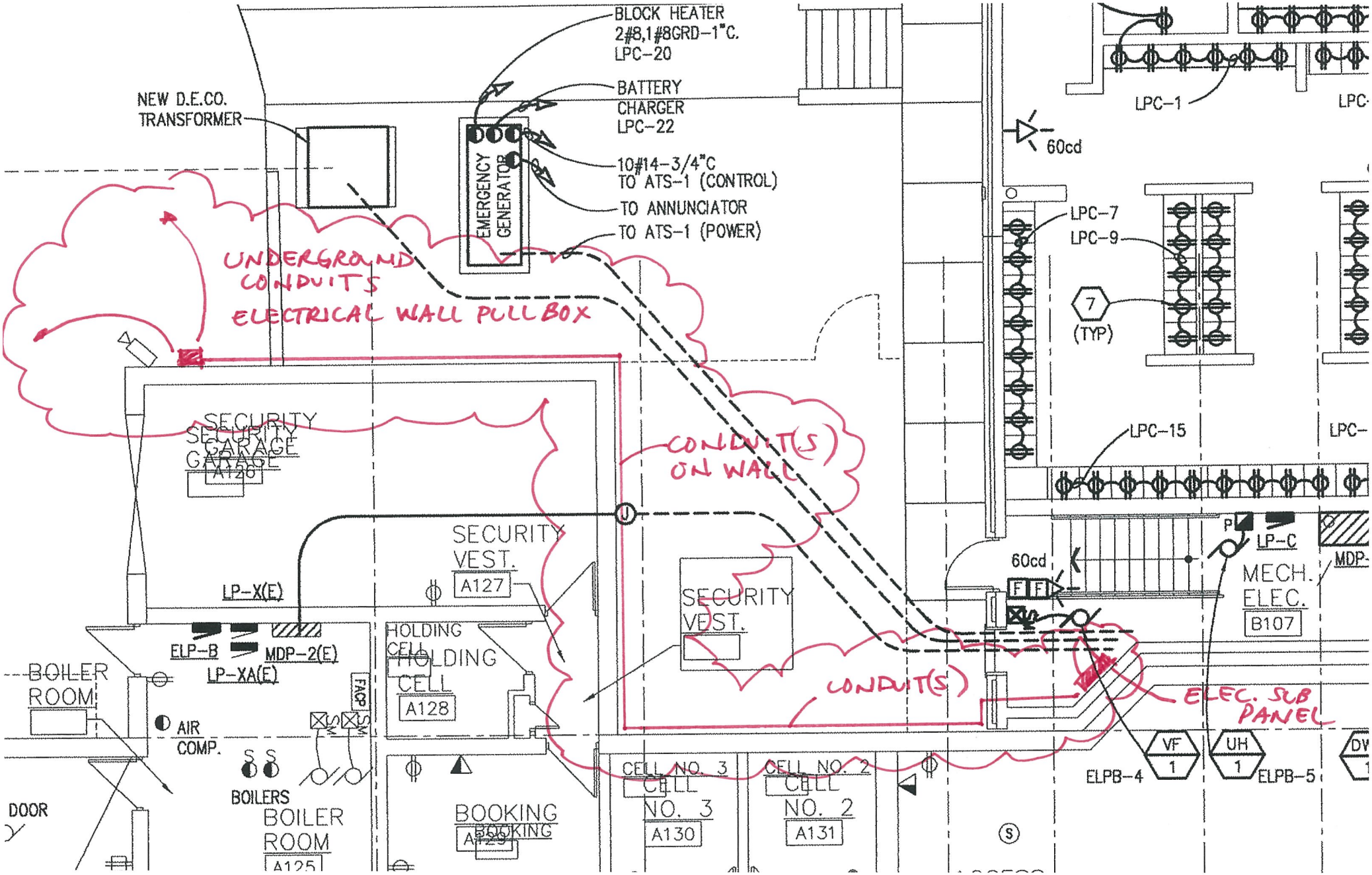
POLICE ENTRANCE
DO NOT REMOVE

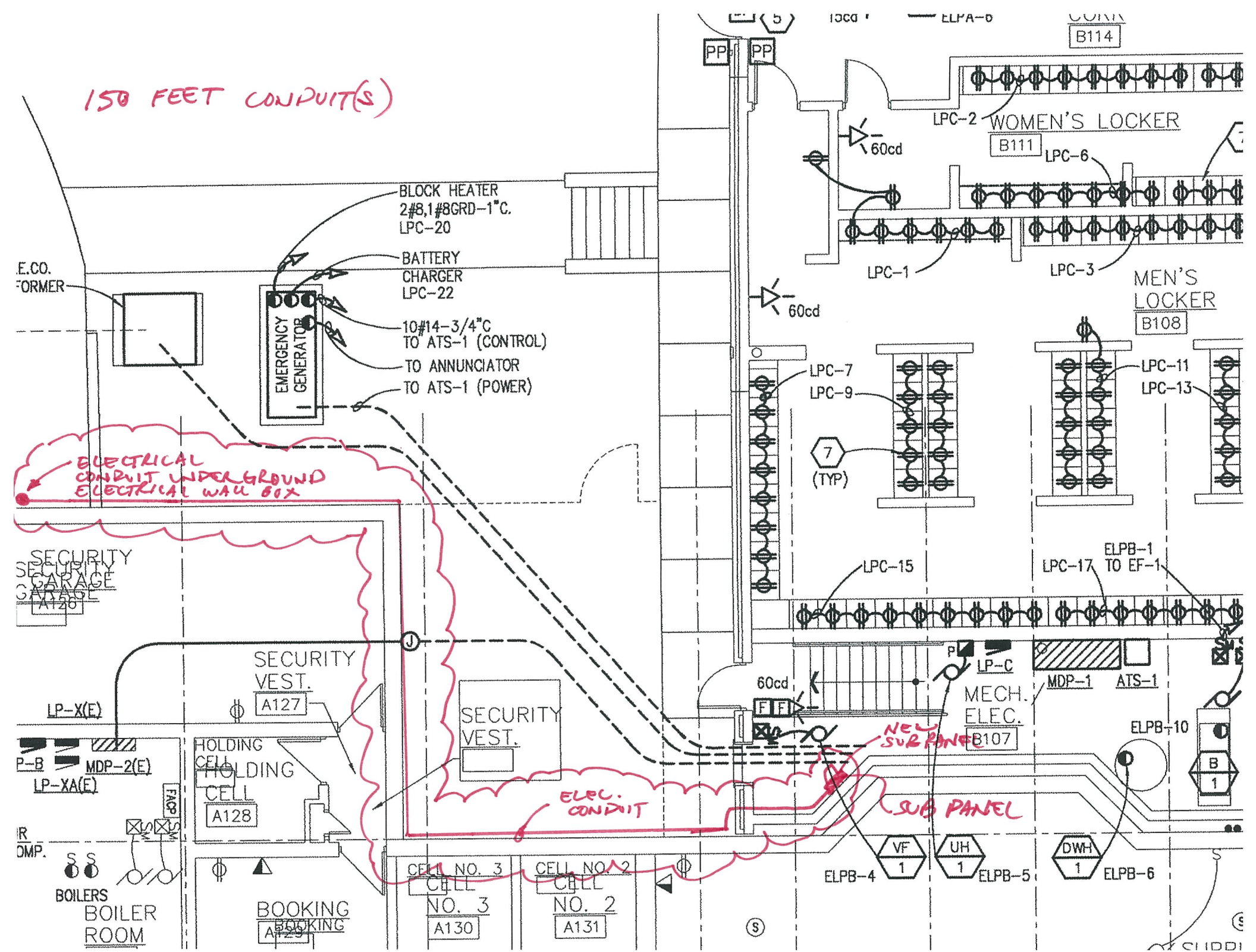

DO NOT REMOVE
POLICE
MAIN ENTRANCE


POLICE HEADQUARTERS
41600
DO NOT REMOVE
REMOVE PLANTER
REMOVE

- 150' OF CONDUIT ON WALL



ELECTRICAL SKETCH ADDENDUM 2
NO SCALE


150 FEET CONDUIT(S)
BLOCK HEATER
2#8,1#8GRD-1"C.
LPC-20
BATTERY
CHARGER
LPC-22
10#14-3/4"C
TO ATS-1 (CONTROL)
TO ANNUNCIATOR
TO ATS-1 (POWER)
EMERGENCY GENERATOR
E.CO.
FORMER
ELECTRICAL
CONDUIT UNDERGROUND
ELECTRICAL WALL BOX
SECURITY
GARAGE
A126
SECURITY
VEST.
A127
SECURITY
VEST.
LP-X(E)
P-B
MDP-2(E)
LP-XA(E)
HOLDING
CELL
HOLDING
CELL
A128
FACP
SM
SM
R
OMP.
S S
BOILERS
BOILER
ROOM
BOOKING
BOOKING
A129
CELL NO. 3
CELL
NO. 3
A130
CELL NO. 2
CELL
NO. 2
A131
ELEC.
CONDUIT
NEW
SUB PANEL
SUB PANEL
PP
PP
B114
WOMEN'S LOCKER
B111
LPC-2
60cd
LPC-6
LPC-1
LPC-3
60cd
MEN'S
LOCKER
B108
LPC-7
LPC-9
7
(TYP)
LPC-11
LPC-13
LPC-15
LPC-17
ELPB-1
TO EF-1
P
LP-C
60cd
F F
MECH.
ELEC.
B107
MDP-1
ATS-1
ELPB-10
B
1
VF
1
ELPB-4
UH
1
ELPB-5
DWH
1
ELPB-6

SECTION 32 01 16
FLEXIBLE PAVING REHABILITATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Heating, milling, remixing, placing, and compacting existing asphaltic concrete for full depth reclamation of existing HMA surfaces.

B. Related Sections
   1. Section 321216 - Asphalt Paving.
   2. Section 321713 - Pavement Markings

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Pavement Surface Scarifying, Mixing, and Recycling.
   1. Basis of Measurement: By square yard. Provide unit price on Schedule of Values. Provide total cost as part of Lump Sum Base Bid #1.
   2. Basis of Payment: Includes surface cleaning, pre-heating, milling, mixing, compacting and rolling; and protection to adjacent surfaces.

B. Recycling agent, cementitious, asphaltic binders.
   1. None required.

1.3 REFERENCES

A. Asphalt Institute:
   1. AI MS-19 - Basic Asphalt Emulsion Manual.
   2. AI MS-20 - Asphalt Hot-Mix Recycling.

B. MDOT
   1. Section 305 HMA Base Crushing and Shaping.
   2. Section 501 Plant Produced Hot Mix Asphalt.

C. Asphalt Recycling and Reclaiming Association:
   1. ARRA ARS 5-HR - Hot-Mix Recycling.

D. ASTM International:
   1. ASTM C1371-2004a - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
   2. ASTM C1549-2004 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
   3. ASTM E408-1971(1996)e1 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
   4. ASTM E903-1996 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.

5. ASTM E1918-1997 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
6. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

1.4 Quality Assurance

A. Perform Work in accordance with State of Michigan Department of Transportation standard.

B. Maintain one copy of each document on site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Recycled Material: Existing in-place asphaltic concrete

B. Provided Material: MDOT Dense-graded aggregate 21AA

2.2 EQUIPMENT

A. GENERAL: - Shall meet the requirements as specified under Subsection 305 & 502, of the MDOT 2012 Standard Specifications For Construction and as follows:

B. ROLLERS: - Adequately sized, self-propelled rubber tired and vibratory steel compactors meeting the requirements as specified under Section 502.03 of the MDOT 2012 Standard Specifications for Construction shall be used.

C. PULVERIZATION EQUIPMENT: - Pulverization shall be done in place. Pulverization equipment shall be a bi-directional rotary reduction machine capable of operating in either an upcut or downcut mode to insure reducing the existing asphalt to the specified size and gradation. The forward speed and depth of cut shall be automatically as well as manually controllable to produce a consistent gradation. Both front and rear material control gates shall be hydraulically adjustable from the operator's platform in increments of 1/8 inch in order to control the amount of material being processed to insure proper sizing.

D. STABILIZING EQUIPMENT: - The stabilizing plant shall be a single-pass, multi-drum, self-propelled machine combining a cutting rotor, a blending rotor and two mixing rotors in the mixing chamber. The mixing chamber shall have a positive depth control to insure a uniform depth of stabilized material and must be capable of loosening the base materials to the depth called for without disturbing the subbase. The stabilizing plant shall add the asphalt in predetermined and accurately metered quantities, while maintaining a constant and fixed rate of forward motion, thoroughly blend the asphalt with the road materials, and spread the mixture uniformly on the roadway. The spray bar shall have nozzles spaced at increments not to exceed six (6) inches and shall operate in such a manner that all asphalt will be uniformly applied throughout the mixing chamber at the time of injection. The asphalt additive system shall consist of a positive displacement pump and shall display the temperature, pressure, and flow rate to

accurately check the rate of application of the asphalt at any time. Note - Various width machines may be required depending on width of road to be processed.

2.3 SCHEDULING

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify site conditions and see Drawings for sub-base removal depths.

3.2 PREPARATION

A. Mechanically sweep pavement surfaces immediately prior to commencement of Work. Clean pavement surfaces of loose foreign materials. Verify surfaces are dry.

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

C. Use a water sprinkling system to suppress dust generated from pavement crushing operations.

D. Prior to crushing and shaping the existing HMA surface, the contractor shall verify the trenching operation according to the cross section identified in each parking area and drive area on plans, and as staked by the Engineer.

3.3 CONSTRUCTION

A. CRUSHING AND SHAPING:
   1. The existing parking and driveway areas shall be pulverized in accordance with Section 305 of the MDOT 2003 Standard Specifications for Construction. The Contractor must note that the depth of the existing HMA and subbase as referenced on Drawings, and documented in the GeoTran Geotechnical Exploration Report dated June 23, 2016.
   2. Uniformly crush existing aggregate pavement and subbase to depths listed on Drawings.
   3. Ensure 95% of the crushed material has a maximum particle size of 1-1/2 inches, and the remaining 5 percent contains no particles larger than 4 inches.
   4. Uniformly spread and compact the crushed material to the dimensions shown on Drawings.
   5. Remove and relocate salvaged crushed materials as noted on plans. Refer to Drawings for base adjustment recommendations.
   6. Where needed add dense graded aggregate, MDOT 21AA, to attain the grade or cross section listed on the Drawings.

B. BASE STABILIZATION and ASPHALT BINDER MATERIAL
   1. Not required.

C. COMPACTING AND SHAPING

1. Compact the crushed material to at least 98 percent of the maximum unit weight, at no greater than optimum moisture content, in accordance with the Michigan Modified T 180 Test in the *Density Testing and Inspection Manual.*
2. Repair base destabilized by the over watering or non-uniform water application, damaged by Contractor operations, or from maintaining traffic, at no additional cost to the Owner.

D. EXCESS CRUSHED MATERIAL:
1. Contractor must remove and dispose of excess crushed material.

E. WEATHER LIMITATIONS:
1. Do not crush HMA pavement if anticipated precipitation may destabilize the prepared base.
2. Crush and shape HMA base in accordance with the seasonal limitations specified in MDOT Section 501.

3.4 FIELD QUALITY CONTROL

A. Request visual inspection of utility bearing surfaces by Engineer before bedding, install, and backfilling utility.

B. INSPECTIONS
1. The Engineer will inspect crushing and shaping work and base acceptance on all the following criteria:
   A. Crushed material meets particle size requirements.
   B. After shaping, the surface down not vary by more than ½ inch, when tested with a 10-foot straightedge.
   C. Immediately before paving, undulations or variations are corrected to meet the criteria.
   D. Required density is maintained until the HMA surface material application.

END OF SECTION

SECTION 32 12 16
ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Asphalt materials.
   2. Asphalt paving base course, binder course, and wearing course.
   3. Asphalt paving overlay for existing paving.

B. Related Requirement:
   1. Section 31 22 13 - Rough Grading: Preparation of site for paving and base.
   2. Section 31 23 17 – Trenching.
   3. Section 32 01 16 – Flexible Paving Rehabilitation
   4. Section 32 11 23 - Aggregate Base Courses: Compacted subbase for paving.

1.2 PRICE AND PAYMENT PROCEDURES

A. Section 01 20 00 - Price and Payment Procedures Contract Sum/Price

B. HMA,13A: See plans for required depths
   1. Basis of Measurement: Included in the unit price bid per ton.
   2. Basis of Payment: Includes all associated labor, material, equipment, mix design, supplying to site, preparing base, testing, tack coating surfaces, hand patching, placing, compacting and rolling, etc. for a complete installation.

C. Adjust Structures to Grade:
   1. Basis of Measurement: Included in the unit price bid per each structure as stated in the Proposal.
   2. Basis of Payment: Includes all associated labor, materials, and equipment necessary to adjust the drainage structures, manholes, valve boxes etc.to grade of the proposed pavement surface and/or sidewalk for a complete installation. Includes adjustment of castings to final grade when sidewalk and/or curb and gutter is placed.

1.3 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:
   1. AASHTO M17 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
   2. AASHTO M29 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
   3. AASHTO M140 - Standard Specification for Emulsified Asphalt.
   4. AASHTO M208 - Standard Specification for Cationic Emulsified Asphalt.
   5. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
   6. AASHTO M320 - Standard Specification for Performance-Graded Asphalt Binder.

7. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
8. AASHTO MP1a - Standard Specification for Performance-Graded Asphalt Binder.

B. Asphalt Institute:
1. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot- Mix Types.
2. AI MS-19 - Basic Asphalt Emulsion Manual.
3. AI SP-2 - Superpave Mix Design.

C. ASTM International:
1. ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
2. ASTM C1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
3. ASTM D242 - Standard Specification for Mineral Filler For Bituminous Paving Mixtures.
4. ASTM D692 - Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.
5. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.
6. ASTM D977 - Standard Specification for Emulsified Asphalt.
7. ASTM D1073 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
8. ASTM D1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
9. ASTM D2027 - Standard Specification for Cutback Asphalt (Medium-Curing Type).
10. ASTM D2397 - Standard Specification for Cationic Emulsified Asphalt.
11. ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
12. ASTM D2950 - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
13. ASTM D3381 - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
14. ASTM D3515 - Standard Specification for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
15. ASTM D3549 - Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
16. ASTM D3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal.
17. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
18. ASTM E408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
19. ASTM E903 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
20. ASTM E1918 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
21. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.
22. MDOT 2012 Standard Specifications for Construction.

1.4 SUBMITTALS

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

B. Product Data:
   1. Submit product information for asphalt and aggregate materials.
   2. Submit mix design with laboratory test results supporting design.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements for MDOT Standard Construction Specifications.

1.5 QUALITY ASSURANCE

A. Mixing Plant: Conform to State of Michigan Department of Transportation Standard.

B. Obtain materials from same source throughout.

C. Perform Work in accordance with State of Michigan Department of Transportation standard.

D. Maintain one copy of each document on site.

1.6 REGULATORY REQUIREMENTS

A. Conform to applicable local codes for paving work.

1.7 QUALIFICATIONS

A. Installer: Company specializing in performing work of this section with minimum 3 years documented experience.

1.8 AMBIENT CONDITIONS

A. Section 01 50 00 - Temporary Facilities and Controls: Ambient conditions control facilities for product storage and installation.

B. Do not place asphalt mixture when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.

C. Place asphalt mixture when temperature is not more than 15 degrees F less than initial mixing temperature.

PART 2 PRODUCTS

2.1 MATERIALS

A. Asphalt Cement: In accordance with MDOT standards.

B. Aggregate for Leveling Course Mix: In accordance with MDOT standards.

C. Aggregate for Wearing Course Mix: In accordance with MDOT standards.

D. Fine Aggregate: In accordance with MDOT standards.

E. Mineral Filler: In accordance with MDOT standards.

F. Adjusting Rings: In accordance with MDOT standards.

2.2 ACCESSORIES

A. Primer: Homogeneous, medium curing, liquid asphalt in accordance with MDOT standards.

B. Tack Coat: Homogeneous, medium curing, liquid asphalt in accordance with MDOT standards.

2.3 ASPHALT PAVING MIX

A. Use dry material to avoid foaming. Mix uniformly.

B. Base Course: provide mix in accordance with MDOT uniformity tolerances for bituminous mixtures.

C. Leveling Course: provide mix in accordance with MDOT uniformity tolerances for bituminous mixtures.

D. Wearing Course: provide mix in accordance with MDOT uniformity tolerances for bituminous mixtures.

2.4 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Submit proposed mix design of each class of mix for review prior to beginning of Work.

C. Submit MDOT approved job mix formula (JMF) of each mix for review 14 days prior to commencement of work.

D. Test samples in accordance with AI MS-2 and MDOT standards.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify utilities indicated under paving are installed with excavations and trenches backfilled and compacted.

C. Verify compacted subgrade and subbase is dry and ready to support paving and imposed loads.

1. Proof roll subbase with 7 ton in minimum two perpendicular passes to identify soft spots.
2. Remove soft subbase and replace with compacted fill as specified in Section 31 11 23.

D. Verify gradients and elevations of base are correct.

E. Verify gutter drainage grilles and frames manhole frames and valve boxes are installed in correct position and elevation.

3.2 PREPARATION

A. Prepare subbase in accordance with State of Michigan Department of Transportation standards.

3.3 DEMOLITION

A. Saw cut and notch existing paving, saw cutting shall be paid for as part of pavement removal.

B. Clean existing paving to remove foreign material, excess joint sealant and crack filler from paving surface.

C. Repair surface defects in existing paving to provide uniform surface to receive new paving.

3.4 INSTALLATION

A. Subbase:
1. Aggregate Subbase: Install as specified in Section 32 11 23.

B. Primer:
1. Apply primer in accordance with AI MS-2. State of Michigan Department of Transportation standards.
2. Use clean sand to blot excess primer.

C. Tack Coat:
1. Apply bond coat on existing, abutting asphalt and concrete surfaces according to manufacturer's instructions and MDOT standards.
2. Apply bond coat on new aggregate base and pulverized asphalt base.
3. Apply bond coat to contact surfaces of curbs, gutters, building walls and sidewalks. Prevent overspray from reaching adjacent surfaces.
4. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt pavement. Do not bond coat these surfaces.
5. Use clean sand to blot excess primer.

D. Single Course Asphalt Paving:
1. Install Work in accordance with State of Michigan Department of Transportation standards.
2. Place asphalt within 24 hours of applying primer or tack coat.
3. Place asphalt wearing course to compacted thickness as indicated on the drawings and stated in the proposal.
4. Compact paving by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.

5. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

E. Double Course Asphalt Paving:
   1. Place asphalt binder course within 24 hours of applying primer or tack coat.
   2. Place binder course to compacted thickness indicated on drawings and as stated in the proposal.
   3. Place wearing course within 24 hours of placing and compacting binder course. When binder course is placed more than 24 hours before placing wearing course, clean surface and apply tack coat before placing wearing course.
   4. Place wearing course to compacted thickness indicated on drawings and as stated in the proposal.
   5. Install gutter drainage grilles and frames, manhole frames, valve and monument boxes in correct position and elevation.
   6. Compact each course by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
   7. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

F. Asphalt Paving Overlay
   1. Apply asphalt cement tack coat to existing paving surface at rate recommended by geotextile fabric manufacturer.
   2. Install geotextile fabric in accordance with manufacturer's instructions to permit asphalt saturation of fabric. Lap fabric edge and end joints 4 inches.
   3. Place wearing course to compacted thickness indicated on drawings and as stated in the proposal.
   4. Compact overlay by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
   5. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

G. Hand Patching
   1. Install uniform thickness surface slurry over existing paving in accordance with ASTM Install work according to current MDOT standards.
   2. Place to compacted thickness as specified on plans.
   3. Compact in maximum lifts by use of a machine vibrator or approved roller according to current MDOT standards.

H. Curbs
   1. Install extruded asphalt curbs of profile as indicated on Drawings.

3.5 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

C. Scheduled Compacted Thickness: Within 1/4 inch.

D. Variation from Indicated Elevation: Within 1/4 inch.

3.6 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Requirements for inspecting, testing.

B. Take samples and perform tests in accordance with State of Michigan Department of Transportation Standards.

C. Asphalt Paving Mix Temperature: Measure temperature at time of placement.

D. Asphalt Paving Thickness: ASTM D3549; test one core sample from every 1000 square yards compacted paving.

E. Asphalt Paving Density: ASTM D2950 nuclear method; density testing shall be performed at the discretion of the Engineer.

3.7 PROTECTION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Immediately after placement, protect paving from mechanical injury for 3 days.

END OF SECTION

SECTION 32 17 23
PAVEMENT MARKINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Traffic lines and markings.
   2. Legends.
   3. Paint.
   4. Glass beads.

B. Related Requirements:
   1. Section 32 12 16 - Asphalt Paving.
   2. Section 32 13 13 - Concrete Paving.

1.2 PRICE AND PAYMENT PROCEDURES

A. Section 01 20 00 - Price and Payment Procedures Contract Sum/Price

B. Signing and Pavement Marking:
   1. Basis of Measurement: By the lump sum.
   2. Basis of Payment: Includes furnishing, installing, inspecting and maintaining pavement markings, first and second applications as required, and permanent signing in accordance with MDOT Standard Specifications and Michigan Manual of Uniform Traffic Control Devices.

1.3 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:
   1. AASHTO M247 - Standard Specification for Glass Beads Used in Traffic Paint.

B. ASTM International:
   1. ASTM D34 - Standard Guide for Chemical Analysis of White Pigments.
   2. ASTM D126 - Standard Test Methods for Analysis of Yellow, Orange, and Green Pigments Containing Lead Chromate and Chromium Oxide Green.
   3. ASTM D562 - Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer.
   4. ASTM D711 - Standard Test Method for No-Pick-Up Time of Traffic Paint.
   5. ASTM D713 - Standard Practice for Conducting Road Service Tests on Fluid Traffic Marking Materials.
   6. ASTM D969 - Standard Test Method for Laboratory Determination of Degree of Bleeding of Traffic Paint.
   7. ASTM D1301 - Standard Test Methods for Chemical Analysis of White Lead Pigments.
   8. ASTM D1394 - Standard Test Methods for Chemical Analysis of White Titanium Pigments.
   9. ASTM D1475 - Standard test Method for Density of Liquid Coatings, Inks, and Related Products.

10. ASTM D1640 - Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature.
11. ASTM D2202 - Standard Test Method for Slump of Sealants.
12. ASTM D2371 - Standard Test Method for Pigment Content of Solvent-Reducible Paints.
13. ASTM D2621 - Standard Test Method for Infrared Identification of Vehicle Solids From Solvent-Reducible Paints.
14. ASTM D2743 - Standard Practices for Uniformity of Traffic Paint Vehicle Solids by Spectroscopy and Gas Chromatography.

C. MDOT Standard Specifications for Construction

D. Michigan Manual of Uniform Traffic Control Devices.

1.4 SUBMITTALS

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

B. Product Data: Submit paint formulation for each type of paint.

C. Samples:
1. Submit eight sample plates of each color of material. Prepare four plates without glass beads and four with glass beads for each different batch of material. After approval, Owner will retain these plates for field comparisons of applied paint.
2. Submit two gallons and four one quart paint samples accompanied by properly executed test reports.
3. Submit samples of glass bead in compliance with AASHTO M247.

D. Manufacturer's Certificate: Certify meet or exceed MDOT Standard Specifications for Construction.

E. Test and Evaluation Reports: Submit source and acceptance test results in accordance with AASHTO M247.

F. Manufacturer's Instructions: Submit instructions for application temperatures, eradication requirements, application rate, line thickness, type of glass beads, bead embedment and bead application rate, and any other data on proper installation.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with MDOT Standard Specifications for Construction.

B. Maintain one copy of each document on site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Invert containers several days prior to use when paint has been stored more than 2 months. Minimize exposure to air when transferring paint. Seal drums and tanks when not in use.

C. Glass Beads. Store glass beads in cool, dry place. Protect from contamination by foreign substances.

1.7 AMBIENT CONDITIONS

A. Section 01 50 00 - Temporary Facilities and Controls: Ambient conditions control facilities for product storage and installation.

B. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint product manufacturer.

C. Do not apply exterior coatings during rain or snow when relative humidity is outside humidity ranges, or moisture content of surfaces exceed those required by paint product manufacturer.

D. Do not apply paint when temperatures are expected to fall below 50 degrees F for 24 hours after application.

E. Volatile Organic Content (VOC). Do not exceed State or Environmental Protection Agency maximum VOC on traffic paint.

1.8 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for warranties.

B. Furnish year manufacturer's warranty for traffic paints in accordance with MDOT Standard Specifications for Construction.

PART 2 PRODUCTS

2.1 PAVEMENT MARKINGS

A. Manufacturers: From the MDOT Material Source Guide Qualified Product list.

B. Furnish materials in accordance with MDOT Standard Specifications for Construction.

C. Symbols and Crosswalks: In accordance with MDOT Standard Specifications for Construction for Overlay Cold Plastic.

D. Lane lines: In accordance with MDOT Standard Specifications for Construction for Waterborne.

E. Glass Beads: In accordance with MDOT Standard Specifications for Construction.

2.2 PERMANENT SIGNING

1. Permanent signs and sign posts shall conform to MDOT Standards, Michigan Manual of Uniform Traffic Control Devices and MDOT Standard Highway Sign Manual.

2.3 EQUIPMENT

A. Continuous Longitudinal Line Application Machine: Use application equipment with following capabilities.
   1. Dual nozzle paint gun to simultaneously apply parallel lines of indicated width in solid or broken patterns or various combinations of those patterns.
   2. Pressurized bead-gun to automatically dispense glass beads onto painted surface, at required application rate.
   3. Measuring device to automatically and continuously measure length of each line placed, to nearest foot.
   4. Device to heat paint to the required temperature for fast dry applications.

B. Machine Calibration:
   1. Paint Line Measuring Device: Calibrate automatic line length gauges to maintain tolerance of plus or minus 25 feet per mile.
   2. Cycle Length/Paint Line Length Timer: Calibrate cycle length to maintain tolerance of plus or minus 6inches per 40 feet; calibrate paint line length to maintain tolerance to plus or minus 3 inches per 10 feet.
   3. Paint Guns: Calibrate to simultaneously apply paint binder at uniform rates as specified with an allowable tolerance of plus or minus 1 mil.
   4. Bead Guns: Calibrate to dispense glass beads simultaneously at specified rate. Check guns by dispensing glass beads into gallon container for predetermined fixed period of time. Verify weight of glass beads.

C. Other Equipment:
   1. For application of crosswalks, intersections, stop lines, legends and other miscellaneous items by walk behind stripers, hand spray or stencil trucks, apply with equipment meeting requirements of this section. Do not use hand brushes or rollers. Optionally apply glass beads by hand.

2.4 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Test and analyze traffic paints in accordance with MDOT Standard Specifications for Construction.

C. Make paints and glass beads available for inspection at manufacturer's factory prior to packaging for shipment. Notify Engineer at least seven days before inspection is allowed.

D. Allow witnessing of factory inspections and test at manufacturer's test facility. Notify Engineer at least seven days before inspections and tests are scheduled.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Do not apply paint to concrete surfaces until concrete has cured for 28 days.

3.2 PREPARATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Maintenance and Protection of Traffic:
   1. Provide short term traffic control in accordance with Section 01 50 00 - Temporary Facilities and Controls.
   2. Prevent interference with marking operations and to prevent traffic on newly applied markings before markings dry.
   3. Maintain travel lanes between 7:00 AM to 9:00 AM, and between 4:00 PM and 6:00 PM.
   4. Maintain access to existing businesses, and other properties requiring access.

C. Surface Preparation.
   1. Clean and dry paved surface prior to painting.
   2. Blow or sweep surface free of dirt, debris, oil, grease or gasoline.
   3. Spot location of final pavement markings as specified and as indicated on Drawings by applying pavement spots 25 feet on center.
   4. Notify Architect/Engineer after placing pavement spots and minimum 3 days prior to applying traffic lines.

3.3 DEMOLITION

A. Remove existing markings in an acceptable manner. Do not remove existing pavement markings by painting over with blank paint. Remove by methods that will cause least damage to pavement structure or pavement surface. Satisfactorily repair any pavement or surface damage caused by removal methods.

B. Clean and repair existing remaining lines and legends.

3.4 APPLICATION

A. Install Work in accordance with MDOT Standard Speficiations for Construction.

3.5 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation from Wet Film Thickness: 1 mil.