

SECTION 02513

BITUMINOUS CONCRETE PLATFORM

PART 1: GENERAL

- 1.01 DESCRIPTION OF WORK: This Work shall consist of constructing a bituminous concrete platform at the location shown in the plans or as directed by the Engineer. This work shall include all excavation and backfill; preparation of subgrade; furnishing and preparing subbase granular material, Type B; furnishing, installing and removal of formwork; re-grading; furnishing and installing of reinforcement; furnishing and placing concrete, Class SI, and protective coat; furnishing joint sealants; constructing expansion and contraction joints; furnishing and constructing bituminous concrete binder and surface course, Class I; furnishing and installing timber platform edge restraint; furnishing and installing detectable warning tiles; furnishing and installing PVC schedule 40 conduits; trench backfill; bedding; handholes; electrical identification; and all labor, tools, and equipment necessary to complete the work as specified, including clean-up and restoration of the location.
- 1.02 REFERENCES: Except as modified herein, the Work shall conform to the applicable portions of the following Sections/Articles:
- A. IDOT Standard Specifications: Sections 201, 202, 204, 205, 208, 301, 311, 406, 420, 424, 507, 508, 550, 801, 810, 813, 814, 868, 1003, 1004, 1006, 1007, 1020, 1022, 1024, 1030, 1050, 1051, and 1085.
 - B. NEMA TC-3
 - C. NEMA 4X
 - D. ASTM E84 - Standard method of test for surface burning characteristics of flooring, floor severing and miscellaneous materials.
 - E. ASTM E662 - Specific optical density of smoke generated by solid materials.
 - F. BOEING BSS 7239 - Toxic gas generation.
 - G. ASTM E648 - Critical radiant flux of floor covering systems using a radiant heat energy source.
 - H. ASTM C373 - Water absorption of tile.
 - I. ASTM C501 - Abrasive wear index.

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- J. ASTM C241 - Abrasion resistance of tile.
- K. ASTM C1028.89 - Determining the static coefficient of friction of ceramic tile and other like surfaces by the horizontal dynamometric pull method.
- L. ASTM D695 - Compressive strength of tile.
- M. ASTM D785 - Rockwell hardness of tile.
- N. ASTM D638 - Tensile strength.
- O. ASTM D1037 - Failing ball impact resistance of tile.
- P. ASTM D2299 - Chemical stain resistance of tile.
- Q. ASTM D1037 - Accelerated aging and freeze thaw test of tile and adhesive system.
- R. ASTM C666 - Comparison of sheer strengths of tile adhesive system after exposure of fifty complete cycles of freeze thaw exposure.
- S. ASTM D905 - Comparison of sheer strengths of tile adhesive system after exposure of fifty complete cycles of freeze thaw exposure.
- T. ASTM B117 - Salt and spray performance of tile.

1.03 STANDARDS

- A. Standard Bituminous Concrete Platform Drawing.
- B. IDOT Highway Standard 2368, latest edition.

1.04 SPECIAL REQUIREMENTS:

- A. Conduct site clearing operations to ensure minimum interference with railway, roads, streets, walks and/or adjacent facilities. Do not close traveled ways without written permission from authorities having jurisdiction.
- B. Provide protection to prevent damage to existing structures, track, roadway, sidewalk and/or other improvements on or adjacent to the job site. Restore any damaged improvement to its original condition as acceptable to parties having jurisdiction, with no additional compensation due the Contractor.

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1.05 SUBMITTALS:

- A. The Contractor shall submit manufacturer's catalogues and/or Shop Drawings for Metra's approval for the following items:
 - 1. Handhole.
 - 2. Reinforcement Bars.
 - 3. Preformed Expansion Joint Filler.
 - 4. Protective Coat.

- B. Cast-in-Place Concrete: The Contractor shall submit the following:
 - 1. The proposed concrete mix design(s) for review and approval by the Engineer. All mix designs shall be IDOT mix designs approved for the ready-mix supplier.
 - 2. Manufacturer's Data: Furnish copies of the manufacturer's specifications for the admixtures, bonding agent, patching and surfacing compound, non-slip material, form oil, joint fillers and vapor barrier, including methods of application and installation.

- C. The Contractor shall submit to the Engineer a certificate from the supplier indicating the grade of steel being furnished to the job.

- D. Preformed Expansion Joint Filler: The Contractor shall submit the following:
 - 1. Manufacturer's Literature: Material descriptions and installation instructions for each type of compound and filler to be used.
 - 2. Guarantees: Guarantee period shall be five years and shall include protection against:
 - a. Loss of adhesion or cohesion.
 - b. Loss of elasticity.
 - d. Staining or bleeding.
 - e. Running or sagging.
 - f. Shrinkage or opening of joints.
 - g. Loss of color stability.

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- E. Detectable Warning Tiles:
1. Product Data: Submit manufacturer's literature describing products, installation procedures and routine maintenance practices.
 2. Samples: Submit full-size samples of each type, color and pattern of detectable warning tiles required.
 3. Shop Drawings: Shop Drawings are required for products specified showing fabrication details; composite structure; plans of panel placement including joints at straight and curved platform areas; and material to be used as well as outlining installation materials and procedure.
 4. Material Test Reports: Submit test reports from qualified independent testing laboratory indicating that materials proposed for use are in compliance with requirements and meet the properties indicated.
- F. Platform Edge Restraint: The Contractor shall submit to the Engineer certificates from the supplier indicating that the materials meet the specified requirements for the following materials:
1. Timber and preservative treatment.
 2. Metal hardware.
- G. Bituminous Materials: The proposed mix design shall be submitted for review and approval by the Engineer. All mix designs shall be IDOT mix designs approved for the supplier.

1.06 QUALITY ASSURANCE:

- A. Concrete Formwork: The Work shall be performed in accordance with the applicable portions of Article 420.06 of the IDOT Standard Specifications and the following requirements.
1. Qualifications of Workmen: Provide at least one person who shall be present at all times during execution of this portion of the Work and who shall be thoroughly familiar with the type of materials installed, the referenced standards and the requirements of this Work, who shall direct all Work performed under this section.
 2. Codes and Standards: Unless otherwise shown or specified, design, construct, erect, maintain and remove forms and related structures for cast-in-place concrete work in compliance with American Concrete

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Institute Standards ACI 347, "Recommended Practice for Concrete Formwork" and AREA, Chapter 8.

3. Allowable Tolerances: Except as specified in this section herein, construct formwork to provide completed cast-in-place concrete surfaces complying with the tolerances specified in ACI 347. Before concrete placement, check the lines and levels of erected formwork. Make corrections and adjustments to ensure proper size and location of concrete members and stability of forming systems. During concrete placement, check formwork and related supports to ensure that forms are not displaced and that completed work will be within specified tolerances.
4. The Contractor shall submit to the Engineer his proposed installation. The Contractor shall make modifications, if required, to his procedure to the satisfaction of the Engineer, but it is understood that the Engineer's approval shall not relieve the Contractor from his sole responsibility for obtaining satisfactory results.

B. Cast-in-Place Concrete:

1. All work included in this section shall be performed in accordance with applicable portions of Sections 420, 503, 508, 1020, 1021, 1022, 1023, 1051, and 1058 of the IDOT Standard Specifications.
2. Correction of Defective Work: All concrete work which does not conform to the requirements of the Contract Documents, including strength, tolerances, and finishing, shall be corrected as directed by the Engineer at the Contractor's expense. The Contractor shall be responsible for the cost of corrections to any other work affected by or resulting from corrections to the concrete work.

C. Detectable Warning Tiles:

1. Provide detectable warning tiles and accessories as produced by a single manufacturer, including recommended primers and sealants. Manufacturer must have a minimum of two years experience in the manufacture and installation of detectable warning tiles which are certified by the U.S. Department of Transportation as meeting the Americans with Disabilities Act (ADA) requirements.
2. Performance Testing:
 - a. Flame spread and smoke developed of tile not to exceed the following specified values:

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ASTM E84 requirement < 25 flame spread
requirement < 275 smoke developed

- b. The smoke density of tile not to exceed the following specified values:

ASTM E662 requirement < 100 DS 1.5 minutes
< 300 DS 4.0 minutes

- c. Toxic Gas Generation of tile not to exceed the following specified values:

Boeing BSS 7239 requirement products of combustion are to be less than specified maximum for CO, HCN, HCl, HF, HBR, SO₂ and NO₂

- d. Critical radiant flux of tile not to be less than the following specified value:

ASTM E648 requirement > 0.50 w/CM²

- e. Water absorption of tile:

ASTM 373 requirement not to exceed 3.0%

- f. Abrasive wear index:

ASTM C501 requirement > 350

- g. Abrasion resistance of tile:

ASTM C241 requirement > HA 95

- h. Slip resistance of tile:

ASTM C1028.89 requirement > 0.80

- i. Compressive strength of tile:

ASTM D 695 requirement > 8000 PSI

- j. Rockwell Hardness of tile:

ASTM D 785 requirement > 70 Rockwell "E"

- k. Tensile strength of tile:

ASTM D 638 requirement > 6000 PSI

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- l. Fall ball impact resistance of tile:

ASTM D 1037 requirement shall withstand a 2-inch steel ball dropped from a height of 50 inches without damage.

- m. Chemical stain resistance of tile:

ASTM D 2299 requirement shall withstand without discoloration or staining - bleach solution, turpentine, iron oxide, soap solution hydraulic oil, motor oil, diesel fuel, carbon black, calcium chloride, ethylene glycol and salt.

3. Detectable warning tile adhered to concrete shall meet or exceed the following test criteria:

- a. Accelerated aging and freeze thaw test of tile and adhesive system: ASTM D 1037 requirement shall show no evidence of cracking, delamination, checking, blistering, loosening of tiles or other defects.

- b. Comparison of sheer strengths of tile adhesive system after exposure to fifty complete cycles of freeze thaw exposure: ASTM C666 and ASTM D905 requirements shall not show any failure in adhesive bond or deterioration in sheer strengths.

- c. Salt and spray performance of the tile adhesive system: ASTM B117 requirement shall not show any deterioration or other defects after 100 hours of exposure.

4. Installers qualifications:

Engage installer who is certified in writing by tactile flooring manufacturer as qualified for installation.

1.07 TRANSPORTATION AND HANDLING

- A. Detectable warning tiles shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy wrappings and each tile type shall be identified by a cast-in-part number.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct and products are undamaged.

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- D. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement or damage.

1.08 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports above ground.
- C. Provide off-site storage and protection when site does not permit on-site storage or protection.
- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- F. Arrange storage of products. to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

1.09 JOB CONDITIONS: Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.

1.10 TESTING SERVICE: Detectable warning tiles are to be subjected to all tests specified under performance testing and must meet or exceed the requirements of this specification as verified by an independent testing agency accredited by the United States National Institute of Standards and Technology (NIST).

1.11 GUARANTEE: Detectable warning tiles are to be guaranteed in writing for a period of ten years from date of installation. The guarantee includes defective work, breakage, deformation and loosening of tiles.

PART 2: PRODUCTS

2.01 BORROW: Borrow material shall be provided by the Contractor, as required, from a borrow site approved by Metra. It shall meet the requirements of Section 204 of the Standard Specifications.

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- 2.02 GRANULAR SUBBASE: Granular subbase material shall meet the requirements of Article 1004.04 of IDOT Standard Specifications, Type B, gradation CA 6.
- 2.03 TRENCH AND BACKFILL:
- A. Bedding material and trench backfill shall meet the requirements of Article 1003.04 of IDOT Standard Specifications, Gradation FA 2.
 - B. Underground cable marking tape shall meet the requirements of Article 1085.23 of IDOT Standard Specifications.
- 2.04 PVC CONDUITS AND TUBING FITTINGS: PVC conduits and tubing fittings shall meet the requirements of Article 1085.15 of IDOT Standard Specifications.
- 2.05 HANDHOLE: Handhole materials shall meet the requirements of Article 1085.59 of IDOT Standard Specifications.
- 2.06 FORMWORK:
- A. Form Materials: Form concrete surfaces with plywood, lumber, metal, or other acceptable material. Provide lumber that is dressed on at least two edges and one side for tight fit. Forms shall provide a 3/4" chamfer on all concrete edges.
 - B. Form Coating: Provide commercial formulation, form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatment of concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compound.
- 2.07 CONCRETE MATERIALS: Concrete materials shall meet the requirements of Section 1020 of IDOT Standard Specifications. The concrete shall be Class SI and meet the following requirements:
- A. Portland Cement: ASTM C150, domestic brand, Type I, normal Portland Cement; Type III for high-early strength Portland cement as per the requirements of Section 1001 of IDOT Standard Specifications. The same brand of Portland Cement shall be used for exposed concrete throughout the job unless a change is approved by the Engineer. Air entraining cement is not acceptable.
 - B. High-early strength concrete may be used subject to Engineer's approval. All provisions of the specifications shall apply except that the 7 day compressive strength equal the 28 day strength required for normal concrete.
 - C. Admixtures: Admixtures shall meet the requirements of Article 1020.05 and Section 1021 of IDOT Standard Specifications.

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- D. Water-Reducing Admixture: As per the requirements of Article 1021.03 of IDOT Standard Specifications.
- E. Air-Entraining Admixture: Use air-entraining admixtures in all concrete, as per the requirements of Article 1021.02 of IDOT Standard Specifications. Add air entraining admixture at the manufacturer's prescribed rate to result in concrete at the point of placement having an air content of not less than 5% nor more than 8% of the volume of the concrete.
- F. Fly Ash: Shall not be used.
- G. Calcium Chloride: Shall not be used.
- H. Bonding Agent: Epoxy type: "Resiweld Concrete Bonding R7650 Adhesives" (H.B. Fuller Co.), "PR-930" (Products Research Co.), "Epoweld 812" (Coast Pro-Seal & Manufacturing Co.), "Sta-Crete T1": (Sta-Crete Inc.). Use Bonding Agent where patching is allowed for certain concrete, subject to the Engineer's approval. Apply in accordance with the manufacturer's printed instructions.
- I. Patching and Surfacing Compound: Epoxy Type: "PR-940 Patching and Surfacing Compound" (Products Research Co.) "Chemcrete" (Protex-A-Cote, Inc.), "Resiweld 7640 Series" with sand aggregate (H.B. Fuller Co.), "Sta-Crete 12" with sand aggregate (Sika Chemical Corp.). Use where patching compound is allowed for certain concrete work, subject to the Engineer's approval. Apply in accordance with the manufacturer's printed instructions. Patching and surfacing compound for use on "exposed" concrete surfaces shall be equal in color and texture to the basic concrete structure, as approved by the Engineer.
- J. Grout: Shall meet the requirements of Section 1024 of IDOT Standard Specifications.
- K. Concrete Curing Materials: Burlap curing blankets, waterproof paper blankets, white polyethylene sheeting, and burlap-polyethylene blanket shall meet the requirements of Section 1022 of IDOT Standard Specifications.
- L. Curing and Finishing Materials:
 - 1. Liquid Membrane-Forming Compounds for Curing Concrete: Fed. Spec. TT-C-800A, Type I Styrene Acrylate or Type II Chlorinated Rubber; non-pigmented; "Kure-N-Seal" (Sonneborn Div. of Contech Inc.), "Dekote T130" (W.R. Grace & Co.) or "CR-26" (W.R. Meadows, Inc.)
 - 2. Curing compounds shall be guaranteed not to affect the bond, adhesion or effectiveness of damp-proofing, or surface treatments.

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M. Ready Mix Concrete:

1. All ready-mixed concrete shall comply with Article 1020.11 of IDOT Standard Specifications
2. The ready-mixed concrete producer shall submit duplicate delivery tickets, one for the Contractor and one for the Engineer, with each load of concrete delivered to the site.
3. Delivery tickets shall provide the following information:
 - a. Date
 - b. Name of ready-mix concrete plant
 - c. Contractor
 - d. Job Location
 - e. Type of cement (Standard or H.E.S.)
 - f. Cement content in bags per cubic yard of concrete
 - g. Truck number
 - h. Time dispatched, and time unloaded
 - i. Amount of concrete in load in cubic yards
 - j. Admixtures in concrete, if any

N. Cast-In-Place Provisions: Sleeves and anchor bolts which are cast in concrete shall be AASHTO M-183 (A-36) steel and shall be galvanized in accordance with Article 1006.08 of IDOT Standard Specifications.

2.08 REINFORCEMENT BARS:

- A. Reinforcement bars shall be epoxy coated, deformed bars, Grade 60 conforming to Article 1006.10 (b) of IDOT Standard Specifications.
- B. Dowel bars shall be epoxy coated, smooth bars, Grade 70 through 80, conforming to Article 1006.11 (b) of IDOT Standard Specifications.
- C. Welded wire fabric shall be 6" x 6" (W2.9 x W2.9) conforming to Article 1006.10 of IDOT Standard Specifications.
- D. Tie wire shall be black annealed wire, 16 gauge or heavier if necessary for providing cage rigidity. Where the tie wire is in contact with epoxy-coated bars, the tie wire shall be epoxy coated.
- E. Reinforcement bars support shall meet the requirements of Article 420.10 of IDOT Standard Specifications.

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2.09 CONCRETE JOINT SEALER: Shall meet the requirements of Section 588 of IDOT Standard Specifications, except as modified herein:

- A. Polyurethane Sealant Type H: ASTM C920, Grade P, Class 25, Use NT, M, A, O; multi-component, chemical curing, non-staining, non-bleeding, capable of continuous water immersion, non-sagging, self-leveling, gun grade type. Use primer recommended by the sealant manufacturer. Primer and sealant shall not cause visible stain on top surface of the substrate to which they are applied. All sealants shall match in color. The following products are acceptable:
 - 1. Horizontal surfaces: Sonneborn "Sonolastic SL1" or equal.
 - 2. Vertical surfaces: Sonneborn "Sonolastic NP1" or equal.
- B. Primers, Solvents, Cleaners: Non-staining materials recommended by sealant manufacturer for conditions of application; primer as necessary as required for the particular joint materials and sealant to be used and solvents which will clean substrate and remove sealant without deleterious effect.
- C. Backer Rods and Strips ASTM D1056 Round: Closed-cell, expanded polyethylene foam, "Ethafoam" (The Dow Chemical Co.), "Expand-O-Foam (Williams Products), or approved equal. Furnish continuous lengths over-sized, larger than 30% to 50% joint width, and depth as indicated on Plans or as directed.
- D. Bond Breaker: Polyethylene tape film or other approved material compatible with sealant. Bond breaker is required where sealant would otherwise bond to back surface of joint recess.

2.10 PROTECTIVE COAT: Shall meet the requirements of Section 1023 of IDOT Standard Specifications.

2.11 DETECTABLE WARNING TILES:

- A. Detectable warning tiles shall consist of raised truncated domes with the following dimensions and tolerances:

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| Length and Width | Multiples of 12 inches \pm 0.6% max. |
| Thickness | 0.4375" \pm 0% adhesive applied 0.100" \pm 5% max., direct embedment, mechanically fastened along with adhesive and mechanically fastened only. |

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| Dome Height | 0.200" ± 5% max. |
| Dome Diameter - Base | 1.234" ± 8% max. |
| Dome Diameter - Top | 0.851" ± 3% max. |
| Center-to-Center of Domes | 2.63" ± 11% max. |
| Warpage of edges | ± 0.5% max. |

- B. Tile Composition: Polymer composite resin or equal.
- C. Color: Color will be safety yellow and shall be integral throughout the matrix.
- D. Approved Manufacturer: Armor Tile or approved equal.

2.12 BITUMINOUS CONCRETE MATERIALS:

- A. The platform bituminous concrete binder course shall be type (Mixture IL-90.0, N50) and the platform bituminous concrete surface course shall be the type (Mixture "C", N50) and shall meet all of the requirements of Section 406 of the IDOT Standard Specifications with one exception. This one exception is to install the platform bituminous binder course at a depth of 1-1/2 inches.
- B. The prime coat over the aggregate base shall be prepared according to Article 403.11 of IDOT Standard Specifications.
- C. Edge Restraint: Adequate edge restraint shall be provided along the perimeter of all paving in the form of a treated timber edge strip as shown on the Drawings. The face of the edge restraint shall be vertical down to the sub-base. All edge restraints shall be constructed to dimensions and levels specified, and shall be supported on a compacted sub-base not less than 6" thick.
 - 1. Timber members shall meet the applicable requirements of Section 1007 of the IDOT Standard Specifications. Timber shall conform to the requirements of Article 1007.03 for Douglas fir (coast region) [*not Southern Pine*] and shall be treated with creosote in accordance with Article 1007.12.
 - 2. All hardware, metal fastenings, and other miscellaneous metal appurtenances shall conform to the requirements of ASTM A307, and Articles 507.07 and 100617 of the IDOT Standard Specifications.

PART 3: EXECUTION

- 3.01 SITE CLEARING: Remove all trees, shrubs, grass and other vegetation interfering with proposed construction. Removal includes digging out stumps and roots.

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3.02 EARTHWORK:

- A. Before any material is placed for construction of embankments, topsoil within the limits of clearing and grubbing shall be excavated and stockpiled on site for subsequent placement on finished embankment. Placement of embankment may proceed upon acceptance of a proof-rolling test. The equipment used for the proof-rolling shall be approved by the Engineer.
- B. Embankment shall be compacted in accordance with the requirements of Article 205.06 of the Standard Specifications. Vertical tolerance shall be ± 1 inch.
- C. All material shall be disposed of in accordance with Article 202.03 of the IDOT Standard Specifications at the Contractor's expense. Metra shall be informed of the disposal site and shall be given a copy of necessary permit(s). If the disposal site is on private property, Metra shall be given a copy of written permission from the property owner allowing the disposal.
- D. The Contractor shall support, maintain, and protect all utility lines to remain in service.
- E. When necessary, due to weather conditions, the Contractor shall remove snow and ice from the work area to the satisfaction of the Engineer.
- F. Prior to placement of granular sub-base material, the Contractor will coordinate for Metra's engineer to inspect earthwork performed.
- G. Prior to excavating greater than the estimated amounts (within $\pm 10\%$), the Contractor shall notify Metra's engineer, in writing. Failure to do so will result in additional excavation being paid for by the Contractor, with no additional compensation due.
- H. Geotechnical fabric is to be placed and secured on top of railroad ties, while work on the site is in progress, to prevent contamination of the ballast. It shall be removed at completion of construction, with no additional compensation due.
- I. The Contractor shall control dust on the site by spraying water or by other means satisfactory to the Engineer.

3.03 GRANULAR SUBBASE: The granular subbase shall be constructed as per Article 311 of the IDOT Standard Specifications.

3.04 TRENCH AND BACKFILL: Trench and backfill shall be constructed as per Section 868 of IDOT Standard Specifications.

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- A. Trenches shall be excavated in the locations and to the widths and depths shown on the Plans.
- B. Backfilling shall be done in accordance with Article 550.07 of the Standard Specifications, except as modified in this section. Methods 2 and 3 shall not be permitted.
- C. Trenches shall not be backfilled until tests and inspections have been made. Care shall be used in back-filling and compacting to avoid damage or displacement of conduit runs.
- D. All trenches and excavations shall be backfilled as soon as possible after tests and inspections have been satisfactorily completed. Backfill materials and compaction procedures shall be approved by the Engineer. In backfilling, any compressible or destructible rubbish and refuse shall be removed from the excavated space before backfilling is started, except that sheeting and bracing shall be left in place or removed as the Work progresses as specified or directed by the Engineer.
- E. Where multiple cables for lines are installed in a common trench or concrete envelope and do not exceed an overall width of 16 inches, install a single line marker.
- F. If the Contractor and/or Engineer find that the materials encountered at the elevations specified are unstable and not suitable or in case it is found desirable or necessary to go an additional depth, the excavation shall be carried to such additional depth as directed by the Engineer.
- G. Each lift of Trench Backfill shall be within $\pm 2\%$ of optimum moisture content before the succeeding lift is placed. Backfilling and compaction shall be done in a manner to avoid damaging top or side pressures on the conduit runs. Each lift of Trench Backfill shall be a maximum of 12" before compaction. Compaction shall be to 95% of the Standard Proctor Density.
- H. Any depression which may develop in backfilled areas from settlement within one year after the Work is fully completed and accepted shall be the responsibility of the Contractor. The Contractor shall provide as needed, at his own expense, additional backfill material, platform repairs or replacement, and shall perform the necessary reconditioning and restoration work to bring such depressed areas to proper grade as approved by the Engineer.
- I. All material and backfilling operations shall be subjected to testing by the Engineer with the assistance of the Contractor.

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3.05 PVC PIPES AND TUBING FITTINGS: PVC pipes and tubing fittings shall be installed as specified in Section 810 of IDOT Standard Specifications. The work shall also meet the requirements of Section 801 and the following:

- A. Prevent foreign matter from entering PVC pipes by using temporary closure protection.
- B. Make bends and offsets so the inside diameter is not effectively reduced. Unless otherwise indicated, keep the legs of a bend in the same plane and the straight legs of offsets parallel.
- C. All PVC pipes are to contain fish tape for future pulls. The stub end of the pipe shall extend five feet beyond the ends of the platform, unless otherwise noted. Use No. 14 AWG zinc-coated steel or monofilament plastic line having not less than 200-lb. tensile strength. Leave not less than 12 inches of slack at each end of the pull wire.
- D. Conceal all PVC pipes unless otherwise indicated. Install pipes at proper elevations.
- E. Upon completion of installation of PVC pipes, inspect interiors of pipes, clear all blockages and remove burrs, dirt and construction debris.

3.06 HANDHOLE: The handhole construction shall meet the requirements of Section 814 of the IDOT Standard Specifications. The handhole shall be installed at midpoint and flush with top of platform at an offset from the centerline of track as shown on the Drawings.

3.07 CONCRETE FORMWORK:

- A. Design Of Work:
 - 1. The design and engineering of the formwork, as well as its construction, shall be the responsibility of the Contractor and shall conform to "Recommended Practice for Concrete Formwork", ACI 347.
 - 2. Forms shall conform to shape, lines and dimensions shown on the Drawings. They shall be designed to safely resist the pressure and weight of the concrete, and shall be properly tied and braced or shored so as to maintain position and shape.
 - 3. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.

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4. Temporary Openings: Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement and for placement of concrete. Brace temporary closures and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms in as inconspicuous locations as possible, consistent with project requirements.

B. Construction Formwork:

1. General: Construct all required forms to be substantial, sufficiently tight to prevent leakage of mortar, and able to withstand internal pressure when filled with wet concrete.
2. Layout:
 - a. Form all required cast-in-place concrete to the shapes, sizes, lines and dimensions indicated on the Drawings.
 - b. Exercise particular care in the layout of forms to avoid necessity for cutting of concrete after forms have been removed.
 - c. Make proper provision for all openings, offsets, recesses, anchorage, blocking and other features of the Work as shown or required.
 - d. Carefully examine the Drawings and Specifications and consult with other trades as required, relative to provision for openings, anchor bolts and other items in the forms.
3. Tolerances: Construct all forms straight, true, plumb and square within a tolerance horizontally of 1/8 inch and a tolerance vertically of 1/8 inch.
4. Wetting: Keep forms sufficiently wetted to prevent joints opening up before concrete is placed.

C. Work Prior To Concrete Placement:

1. Form Coatings: Coat form contact surfaces with form-coating compound before reinforcement is placed. Do not allow excess form-coating material to accumulate in the forms or to come into contact with surfaces which will be bonded to fresh concrete. Apply in compliance with manufacturer's instructions. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust stained steel formwork is not acceptable.

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2. **Cleaning and Tightening:** Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is to be placed. Retighten forms immediately after placement as required to eliminate mortar leaks.
 3. **Edge Forms and Screed Strips:** Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in the finished slab surface. Provide and secure units to support types of screeds required.
 4. **Once forms are set and at least 24 hours prior to the placement of concrete, the Contractor shall notify Metra's Engineer that the formwork is ready for final inspection.**
- D. **Removal of Formwork:** Side forms not supporting vertical loads may be removed after cumulative curing at not less than 50° F for 24 hours after placing concrete, providing the concrete is sufficiently hard not to be damaged by form removal operations and providing that curing and protection operations are maintained.
- E. **Reuse Forms:** Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form-coating compound material to concrete contact surfaces as specified for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets. Do not use "patched" forms for exposed concrete surfaces.

3.08 CONCRETE PLACEMENT:

- A. **Pre-placement Inspection:** Before placing concrete, inspect and complete the formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other trades to permit the installation of their Work; cooperate with other trades in setting such work as required. Thoroughly wet wood forms immediately before placing concrete, as required where form coatings are not used. Coordinate the installation of joint materials with placement of forms and reinforcing steel.
- B. **General Requirements:** Comply with Section 424 and applicable portions of Section 420 of IDOT Standard Specifications.
- C. **Temperature Control for Placement:** Comply with Article 1020.14 of IDOT Standard Specifications.

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- D. Concrete Curing and Protection: Concrete curing shall meet the requirements of Article 1020.13 of IDOT Standard Specifications.
- E. Concrete Joints: Expansion joints, construction joints, and control joints shall be as shown on the Drawings, and as specified. Additional construction joints shall be subject to approval by the Engineer.
- F. Concrete Finishing:
 - 1. Horizontal concrete surfaces shall be finished as per Article 424.06 of IDOT Standard Specifications.
 - 2. Vertical concrete surfaces shall be finished smooth and even, and given a light brush finish while the concrete is still workable. The edges shall be rounded with approved finishing tools having the radii shown on the plans.

3.09 REINFORCEMENT BARS:

- A. The placement of reinforcement shall meet the requirements of Articles 420.09 and 420.10 of IDOT Standard Specifications.
- B. The reinforcement bars shall be securely tied to prevent displacement during the concreting operation.
- C. All reinforcing bars shall be placed with a tolerance of 1/2" to provide for adequate protective concrete cover, unless stated specifically on the Plans.
- D. Coordinate with Metra's Engineer at least 24 hours prior to placement of concrete to arrange for inspection of steel reinforcement.

3.10 CONCRETE JOINT SEALER: Joint Sealers shall meet the requirements of Section 1058 of the IDOT Standard Specifications, except as herein modified:

- A. Before commencing installation, the Engineer shall examine substrate surfaces to determine that they are free of conditions which might be detrimental to proper and timely completion of the Work.
- B. Verify that joint backing and release tapes are compatible with sealant.
- C. Clean substrate and remove protective coatings which might fail in adhesion or interfere with bond of compound so that surfaces are free of deleterious substances which might impair the Work. Elastomeric sealants shall not be applied to joint surfaces previously treated with paint, lacquer, sealer, curing

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compound, water repellent or other coatings unless such coatings have been entirely removed.

- D. Prime substrate in accordance with the instructions of the sealant manufacturer.
- E. Install bond breakers in locations and of type recommended by the sealant manufacturer to surface where such bond might impair the performance of the sealant.
- F. Before applying materials, joints shall be clean. Remove dust and other loose debris with a stiff brush or compressed air. Wire brush to remove rust or corrosion from metals. If concrete joints were "wet" sawed, remove laitance from sides of joint by approved means. Eliminate traces of oil, grease, or lacquers with a solvent wash, using toluene, xylene, or methylethyl ketone (MEK) applied with a clean brush and wiped dry with frequently changed clean rags.
- G. Mix and install all materials in accordance with the manufacturer's printed instructions. Unless otherwise directed conform with the following:
 - 1. Compounds shall not be installed below a temperature of 40° F. unless the manufacturer specifically permits application of his materials at a lower temperature. If job conditions require the installation of compounds below 40° F. (or below the minimum installation temperature recommended by the manufacturer), consult the manufacturer's representative and establish the minimum provisions required to ensure satisfactory work.
 - 2. Confine compounds to joint areas shown. Use masking tape to prevent staining of adjoining surfaces or spillage and migration of compound out of the joints. Remove excess compound and clean adjoining surfaces as may be required to eliminate any indication of soiling or migration.
 - 3. Use power driven equipment wherever possible to install compounds so as to ensure uniformity of application and the highest quality of workmanship.
 - 4. Apply primer only to sides of working joints and not to back surfaces. Use masking tape along the joint edge before application of primer on areas where the highest standards of appearance are required. Remove masking tape immediately after the joint has been tooled and before the material skins over.
 - 5. Application of materials shall be done by skilled mechanics with at least five years satisfactory experience in the caulking and sealing field.

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6. When placing material against a rigid bondable material in working joints, lay strips of bond breaker over back face of the rigid material to prevent material from bonding. Apply bond breaker only after application of primer.
7. Material shall be forced into joint mechanically with sufficient pressure to expel all air and provide a solid filling against sides of the joint and bond breaker or back-up material. Tool joints in accordance with the manufacturer's printed instructions. Do not use water or soap for lubricant. Material shall finish flush with adjacent surfaces unless otherwise specified.
8. Clean adjoining surfaces of smears, compound, or other soiling due to these operations, as work progresses. Restore, refinish or replace any adjacent surfaces or materials which are marred or damaged to the satisfaction of the Engineer.

3.11 PROTECTIVE COAT: Shall be applied as per Article 420.21 of IDOT Standard Specifications and the following requirements:

- A. Inspection: Before commencing work, the surface shall be examined to determine that it is clean, dry and free of grease, oil or other surface contaminants which might be detrimental to proper and timely completion of work.
- B. Clean adjoining surfaces of smears, compound, or other soiling due to these operations, as work progresses. Restore, refinish or replace any adjacent surfaces or materials which are marred or damaged to the satisfaction of the Engineer.

3.12 DETECTABLE WARNING TILES:

- A. See attached Section 06610 for Full Depth Tactile specifications and Section 09310 for Surface Applied Tactile specifications.

3.13 BITUMINOUS CONCRETE PLATFORM:

- A. Granular Subbase Installation:
 1. The granular subbase shall be constructed as per Section 311 of IDOT Standard Specifications, and as specified herein.
 2. The subbase shall be trimmed to specified grade and cross-section with an allowable local tolerance of 1/8".

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3. The finished base course shall be inspected and approved before the placement of the bituminous binder and surface courses.

B. Edge Restraint:

1. All timber shall be pre-bored for fastenings where possible to facilitate installation. Any pre-bored holes not used shall be plugged with a fine grained hardwood and sealed and treated with creosote preservative according to Article 1007.12 of the IDOT Standard Specifications.
2. Edge restraint shall be installed in accordance with Section 507 of the IDOT Standard Specifications.

C. Bituminous Concrete Binder and Surface Courses:

1. The bituminous concrete binder and surface course shall be constructed as per the requirements of the applicable portions of Section 406 and Section 1030 of IDOT Standard Specifications. Contractor shall furnish and install Bituminous Concrete Binder and Surface Courses for the platform.
2. The prime coat shall be furnished and installed by the Contractor as specified in Article 403.09 of IDOT Standard Specifications.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT: No separate measurement shall be made for BITUMINOUS CONCRETE PLATFORM.

4.02 PAYMENT: Payment shall be included in the Contract lump sum price as shown in the Schedule of Prices.

END OF SECTION

BITUMINOUS CONCRETE PLATFORM