

Addendum No. 2

To

Specifications

For Project No. ENG 2601722091

Description: North Entrance Road & Accessibility Improvements

Location: Brown County State Park

FOR AGENCY: Department of Natural Resources

The information contained in this Addendum shall become a part of the basic plans and specifications the same as if originally incorporated therein. The original plans and specifications shall remain in their entirety, except as modified by this Addendum. The items herein shall supersede information in the specifications and on the plans.

ITEM No. 1: Pre-qualified classifications: The Notice to Bidders shall be amended to include the classification of 1795.02 Demolition of Pavements and Roads and shall read:

...”Bids shall be taken from Prime Contractors pre-qualified by the Public Works Certification Board in the following classification(s): 1542.01 Institutional Buildings (Hospitals, Schools, Prisons), or 1611.02 Asphalt Construction of Roads & Parking Lots, or 1795.02 Demolition of Pavements and Roads.”...

All other portions of the Notice to Bidders remain unchanged by this ITEM No. 1.

ITEM No. 2: Contractor’s questions received since pre-bid meeting:

Q: one initial question is regarding the work at the parking lot at the pool. Is the intent to only mill and resurface 1.5” in the areas that do not show full depth pavement construction?

A: *Intent is to mill and resurface 1.5” the parking lot at the pool except where full depth replacement is indicated. Refer to L101 and revised C301*

Q: An electrical section is needed for Alternate 1 regarding the exterior ground lighting.

A: *Specification sections provided in this Addendum No.2, Item No. 3.*

Q: We are unable to find the specified material and finish for the handrails.

A: *Specification section provided in Addendum No.1.*

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ITEM NO. 3: The following additional Specifications Sections are hereby issued (additional specifications sections are attached and immediately follow this DAPW-118):

Table of Contents (revised)

260100 Electrical Common Requirements

260519 Low-Voltage Electrical Power Conductors and Cables

260526 Grounding and Bonding for Electrical Systems

260543 Underground Ducts and Raceways for Electrical Systems

260553 Identification for Electrical Systems

265619 LED Exterior Lighting

ITEM No. 4: The following revised plan sheets are hereby issued (revised plan sheets are attached and follow additional specification sections issued by ITEM NO. 3):

L001, L101, L102, L104, L105, L201a, L201b, L202, L205, L206, C300, C301, C303, C307

END OF ADDENDUM

State Form 21208R4

DAPW-118

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ELECTRICAL COMMON REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Submittal and Shop Drawing Requirements.
- B. Use of Engineer's Drawings and CAD files.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

- A. Section Includes:
 - 1. Electrical equipment coordination and installation.
 - 2. Common electrical installation requirements
- B. Division 26 contractor shall Provide and Install the following list for Division 27:
 - 1. Penetrations through Floors, Walls, Foundations etc.
 - 2. Sleeves in Floors, Walls, Foundations etc.
 - 3. Fire Blocking of Penetrations and Sleeves on the exterior.
 - 4. Backboxes.
 - 5. Surface Raceways.
 - 6. Conduit.
 - 7. Cabling routed in Exposed Ceiling Areas, Walls, below Grade shall be in conduit.
 - 8. Cable Trays in ER and TR's. (Refer to drawings)
 - 9. Coordinate pathways with Division 27 prior to installation.

1.4 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

1.5 COORDINATION

- A. Coordinate arrangement, mounting, and support of electrical equipment:
 - 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
 - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
 - 3. To allow right of way for piping and conduit installed at required slope.
 - 4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
- B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 Submittal and Shop Drawing Requirements.

- A. All submittals for this division shall be provided in electronic format. Hard copies shall not be submitted without prior approval from the Engineer. Files may be submitted via email, project management site, or on flash drive and will be returned as electronic PDF files that are digitally signed and locked.
- B. Acceptable file formats for electronic files includes:
 - 1. Adobe Acrobat PDF files.
- C. Files shall be reviewed by the submitting contractor and be annotated with marks indicating the specific models, options, and accessories being supplied. Submitting contractor must include a stamp or graphic indicating that they have reviewed the submittal for accuracy, completeness, and list the specification section or drawing reference for each submittal.
- D. Do not combine specification sections into a single submittal package. Each specification section must have its own submittal with the file name containing the specification section number (Ex. 230523-12 Ball valves – V1.pdf)
- E. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittal if deemed necessary.
 - 1. Allow 10 calendar days from the date of receipt of the submittal by Engineer for initial review.

2. Allow 10 calendar days from the date of receipt for each resubmittal to re-process and review.
 3. No extension to the contract time will be authorized due to failure to transmit submittals sufficiently in advance of the Work to permit processing.
- F. Submittals must contain the following items at a minimum:
1. Transmittal/cover sheet listing:
 - a. Project Name
 - b. Contractor's Name, Address, Phone, and Email address.
 - c. Equipment Supplier/Representative Name, Address, Phone, and Email address.
 - d. Date of submission.
 - e. Specification section title and number for the submittal.
 2. Each submittal must include detailed engineering data for the specific products that will be used in conjunction with the project. General catalogs are not acceptable. Supplier/contractor shall highlight or make indication as to which items specifically will be used. Include the following items at a minimum:
 - a. Model number of products.
 - b. Capacity of equipment.
 - c. Dimensional drawing of the product showing all rough-in locations, wiring connections, piping connections, and duct connections.
 - d. Show all minimum service clearances required for an installed unit.
 - e. Weight of product with any requirements for support and hanging devices.
 - f. Electrical wiring diagram showing all line voltage and control wiring within the equipment. Indicate the point of connection of all field installed wiring that is required.
 - g. Include warranty certificate listing the terms of the warranty.
- G. Engineer's Action.
1. The Engineer shall review shop drawings only for conformance with the design concept of the Project and with the information given in the Contract Documents. The Engineer's review of a separate item shall not indicate review of an assembly in which the item functions.
 2. The Engineer's review of shop drawings shall not relieve the Contractor of responsibility for any deviation from the requirements or the Contract Documents unless the Contractor has informed the Engineer in writing of such deviation at the time of submission in letter form. Notations on the submittal do not constitute informing the Engineer. The Engineer's action shall not relieve the Contractor from responsibility for errors or omissions in the shop drawings.
 3. Notations and remarks added to shop drawings by the Engineer are to ensure compliance to Drawings and Specifications and do not imply a requested or approved change to contract cost. Should the Engineer's notations and remarks result in a change to the contract cost, it is the responsibility of the Contractor to advise the Engineer accordingly prior to performance of the work in question. If

work that has been changed by the Engineer's review comments is performed without notifying the Engineer and the Owner of additional costs, any additional cost for the work shall be the sole responsibility of the Contractor.

4. Should deviations, discrepancies, or conflicts between shop drawings and the Contract Documents be discovered, either prior to or after review, the Contract Documents shall control and be followed.

H. Action Stamp.

1. The Engineer will stamp each submittal with a uniform, self-explanatory action stamp indicating the required action by the Contractor:

Commission No.	<i>Shop Drawing Review</i>
Spec. Sections:	Review No. 1
<input type="checkbox"/> REVIEWED & RELEASED	
<input type="checkbox"/> REVIEWED & RELEASED WITH CORRECTIONS	
<input type="checkbox"/> REVISE & RESUBMIT	
<input type="checkbox"/> REJECTED	
<input type="checkbox"/> NO ACTION REQUIRED	
<input type="checkbox"/> SEE TRANSMITTAL FOR NOTES	
<p>Reviewing is only for conformance with the design intent of the project and compliance with the information given in the Contract Documents. Corrections or comments made on the shop drawings during this review do not relieve Contractor from compliance with the requirements of the plans and specifications. Acceptance of a specific item shall not include acceptance of an assembly of which the item is a component. Contractor is solely responsible for: dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to techniques and procedures of construction; manufacturer's instructions, industry standards, and for coordination of the work with all trades.</p>	
Reviewed by:	Date:

2.
 - a. Final Unrestricted Release: Work may proceed, provided it complies with the contract documents, when submittal is returned with the following:
 - 1) "Reviewed and Released".
 - b. Final, but Restricted Release: Work may proceed, provided it complies with the contract documents, notations and corrections as provided, when the submittal is returned with the following:
 - 1) "Reviewed and Released with Corrections".
 - c. Revise and Resubmit: Do not proceed with work. Revise submittal in accordance with notations thereon and resubmit without delay to obtain a different action marking. Do not allow submittals with the following marking (or unmarked submittals) to be used in connection with performance of the work:
 - 1) "Revise and Resubmit".
 - 2) "Rejected".
 - d. Other Action: Where a submittal is primarily for information purposes, special processing or activity, the submittal will be returned, marked "No Action Required".

3.2 Use of Engineer's Drawing and CAD Files.

- A. The bid documents prepared by the Engineer are the property of the Engineer and shall not be copied without approval in writing from the Engineer.
- B. At the contractor's request, the Engineer will provide electronic copies of the source CAD files to the contractor for their convenience in preparation of shop drawings and submittals related to the project with the following terms and conditions.
 - 1. Electronic files are prepared using a variety of software tools that includes AutoCAD, Revit, Excel, and various calculation tools. The Engineer makes no representation as to the compatibility of these files with your hardware or software configuration.
 - 2. Data contained within these electronic files are part of our Instruments of Service and shall not be used by anyone other than the intended recipient for any other purpose than as a convenience in the preparation of shop drawings for the reference project. Any other use by you or others will be at your sole risk without liability or legal exposure to the Engineer. Recipient shall agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against the Engineer, it's officers, directors, employees, agents, or sub-consultants, that may arise out of or in connection with your use of these electronic files.
 - 3. The recipient shall, to the fullest extent permitted by law, indemnify and hold the Engineer harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from your use of these electronic files.
 - 4. These files are not construction documents. Differences may exist between the electronic files and corresponding hard-copy construction documents. The Engineer makes no representation regarding the accuracy or completeness of the files you receive. In the event a conflict arises between the signed or sealed hard copy construction documents prepared by the Engineer and the electronic files, the signed or sealed hard copy documents shall govern.
 - 5. The recipient is responsible for verifying and coordinating all field measurements, field conditions, and systems onsite with your work and other contractors for the project.
 - 6. Because electronic files can be modified, unintentionally or otherwise, the Engineer reserves the right to remove all indicia of ownership and/or involvement from each electronic file.
 - 7. A service fee of \$100 per electronic file shall be remitted to us along with a signed copy of a release prior to delivery of the electronic files. This fee is to cover processing time to prepare the files by binding reference drawings, removing proprietary information, and formatting the files as directed.
 - 8. Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by us, and we make no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall the

Engineer be held liable for any loss or profit or any consequential damages as a result of your use of the files.

9. Any party requesting use of these files must do so by submitting a written request describing what files are needed and what the intended use will be.

3.3 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to bottom of the back box for wall-mounting items.
 1. Mounting Heights:
 - a. Switches - 44" or as specified on drawings.
 - b. Receptacles or convenience outlets - 16" or as specified on drawings.
 - c. Receptacles or convenience outlets - 44" for mechanical, electrical, janitor, shop areas, Garage areas storage rooms and elevator equipment or as specified on drawings.
 - d. Exterior weather proof receptacles or convenience outlets - 24" above grade or as specified on drawings.
 - e. Enclosed Switches - 54" or as specified on drawings.
 - f. Enclosed Circuit Breakers -54" or as specified on drawings.
 - g. Motor Controllers - 54" or as specified on drawings.
 - h. Variable Frequency Drives - 54" or as specified on drawings.
 - i. Panelboards to Top - 72" or as specified on drawings.
 - j. Telephone or Data-16" or as specified on drawings.
 - k. Telephone (Pay Wall Hung) - 44" or as specified on drawings.
 - l. Lockout, panic buttons - 44" or as specified on drawings.
 - m. Fire Alarm Control Panel to Top - 72" or as specified on drawings.
 - n. Fire Alarm Annunciator Panel - 44" or as specified on drawings.
 - o. Fire Alarm Remote Test Station - 44" or as specified on drawings.
 - p. Fire Alarm Pull Station - 44" or as specified on drawings.
 - q. Fire Alarm Horn, Horn/Visual, Speaker, Speaker/Visual - 80"-84" or as specified on drawings.
 - r. Security Card Readers – 44" or as specified on drawings.
 - s. Security Intercom Unit – 44" or as specified on drawings.
 - t. Security Keypad – 44" or as specified on drawings.
 - u. Public Address Volume Control - 44" or as specified on drawings.
 - v. Public Address Call Switch – 44" or as specified on drawings.
 - w. Thermostats – 44" or as specified on drawings.
 - x. Ada Operator push stations – 44" or as specified on drawings.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to piping systems installed at a required slope.

3.4 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

END OF SECTION 26 0100

SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Copper building wire.
 - 2. Connectors and splices.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. Copper building wire.
 - 2. Connectors and splices.
- B. Product Schedule: Indicate type, use, location, and termination locations.

1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Alpha Wire Company.
 - 2. Belden Inc.
 - 3. Encore Wire Corporation.
 - 4. General Cable Technologies Corporation.
 - 5. Southwire Company.
- C. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 - 2. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- D. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.

- E. Conductor Insulation:
 - 1. Type THHN and Type THWN-2. Comply with UL 83.

2.2 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. 3M Electrical Products.
 - 2. AFC Cable Systems; a part of Atkore International.
 - 3. Hubbell Power Systems, Inc.
 - 4. Ideal Industries, Inc.
 - 5. ILSCO.
 - 6. NSi Industries LLC.
 - 7. O-Z/Gedney; a brand of Emerson Industrial Automation.
 - 8. Thomas & Betts Corporation; A Member of the ABB Group.
- C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.
- D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
 - 1. Material: Copper.
 - 2. Type: One hole with long barrels.
 - 3. Termination: Compression or Crimp.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Branch Circuits:
 - 1. Copper. Solid or stranded for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION, GENERAL

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points in accordance with Section 26 0543 "Underground Ducts and Raceways for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- F. Support cables according to Section 26 0529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material
 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 26 0553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 0544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Perform each of the following visual and electrical tests:
 - a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
 - b. Test bolted connections for high resistance using one of the following:
 - 1) A low-resistance ohmmeter.
 - 2) Calibrated torque wrench.
 - 3) Thermographic survey.
 - c. Inspect compression-applied connectors for correct cable match and indentation.
 - d. Inspect for correct identification.
 - e. Inspect cable jacket and condition.

- B. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 26 0519

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes grounding and bonding systems and equipment.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Burndy; Part of Hubbell Electrical Systems.
 2. ERICO International Corporation.
 3. Galvan Industries, Inc.; Electrical Products Division, LLC.
 4. Harger Lightning & Grounding.
 5. ILSCO.
 6. O-Z/Gedney; a brand of Emerson Industrial Automation.
 7. Robbins Lightning, Inc.
 8. SIEMENS Industry, Inc.; Energy Management Division.
 9. Thomas & Betts Corporation; A Member of the ABB Group

2.3 CONDUCTORS

- A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B3.
 - 2. Stranded Conductors: ASTM B8.
 - 3. Tinned Conductors: ASTM B33.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 5. Bonding Conductor: No. 4, stranded conductor.
 - 6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
 - 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturers for materials being joined and installation conditions.

2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. General: Except where otherwise shown or noted, all grounding conductors shall be insulated and enclosed in a raceway. Bare conductors will not be permissible except where located used for Ufer Ground (Concrete-Encased Grounding Electrode).
- B. Conductors: Install solid or stranded conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- C. Grounding Conductors: Green-colored insulation.
- D. Conductor Terminations and Connections:
 - 1. Underground Connections: Welded connectors except as otherwise indicated.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 4 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. Use exothermic welds for all below-grade connections.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 2. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- D. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.
- E. Grounding and Bonding for Conduits: Install double locknuts on all Rigid Metal Conduit (RMC) and Intermediate Metal Conduit (IMC).
- F. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.
 - 1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
 - 2. Make connections with clean, bare metal at points of contact.
 - 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 - 4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.

5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal,, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
 4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Report measured ground resistances that exceed the following values:
 1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 5 ohms.
 2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
 3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
- F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 0526

SECTION 26 05 43

UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 1. Metal conduits and fittings, including GRC.
 2. Rigid nonmetallic duct.
 3. Flexible nonmetallic duct.
 4. Duct accessories.
 5. Fiberglass handholes and boxes with polymer concrete cover.
 6. Fiberglass handholes and boxes.

1.3 DEFINITIONS

- A. Direct Buried: Duct or a duct bank that is buried in the ground, without any additional casing materials such as concrete.
- B. Duct: A single duct or multiple ducts. Duct may be either installed singly or as component of a duct bank.
- C. Duct Bank:
 1. Two or more ducts installed in parallel, with or without additional casing materials.
 2. Multiple duct banks.
- D. GRC: Galvanized rigid (steel) conduit.
- E. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. Include duct-bank materials, including spacers and miscellaneous components.
 2. Include duct, conduits, and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
 3. Include accessories for manholes, handholes, boxes, and other utility structures.
 4. Include underground-line warning tape.

5. Include warning planks.

B. Shop Drawings:

1. Factory-Fabricated Handholes and Boxes Other Than Precast Concrete:

- a. Include dimensioned plans, sections, and elevations, and fabrication and installation details.
- b. Include duct entry provisions, including locations and duct sizes.
- c. Include cover design.
- d. Include grounding details.
- e. Include dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer and testing agency responsible for testing nonconcrete handholes and boxes.
- B. Source quality-control reports.
- C. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

1.7 FIELD CONDITIONS

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions, and then only after arranging to provide temporary electrical service according to requirements indicated:
 1. Notify Engineer and Owner no fewer than (7) seven days in advance of proposed interruption of electrical service.
 2. Do not proceed with interruption of electrical service without Engineer's written permission.
- B. Ground Water: Assume ground-water level is 36 inches below ground surface unless a higher water table is noted on Drawings.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND FITTINGS

- A. GRC: Comply with ANSI C80.1 and UL 6.

- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AFC Cable Systems; a part of Atkore International.
 - 2. Allied Tube & Conduit; a part of Atkore International.
 - 3. Anamet Electrical, Inc.
 - 4. Electri-Flex Company.
 - 5. O-Z/Gedney; a brand of Emerson Industrial Automation.
 - 6. Southwire Company.
 - 7. Thomas & Betts Corporation; A Member of the ABB Group.
 - 8. Wheatland Tube Company.
- C. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

2.2 RIGID NONMETALLIC DUCT

- A. Underground Plastic Utilities Duct: Type EPC-80-PVC and Type EPC-40-PVC RNC, complying with NEMA TC 2 and UL 651, with matching fittings complying with NEMA TC 3 by same manufacturer as duct.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. ARNCO Corp.
 - 2. Beck Manufacturing.
 - 3. CANTEX INC.
 - 4. CertainTeed Corporation.
 - 5. Condux International, Inc.
 - 6. ElecSys, Inc.
 - 7. Electri-Flex Company.
 - 8. IPEX USA LLC.
 - 9. Lamson & Sessions.
 - 10. Spiraduct/AFC Cable Systems, Inc.
- C. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

2.3 DUCT ACCESSORIES

- A. Underground-Line Warning Tape: Comply with requirements for underground-line warning tape specified in Section 26 0553 "Identification for Electrical Systems."

2.4 FIBERGLASS HANDHOLES AND BOXES WITH POLYMER CONCRETE FRAME AND COVER

- A. Description: Sheet-molded, fiberglass-reinforced, polyester resin enclosure joined to polymer concrete top ring or frame.

- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armorcast Products Company.
 - 2. Carson Industries LLC.
 - 3. Quazite: Hubbell Power Systems, Inc.
- C. Standard: Comply with SCTE 77. Comply with tier requirements in "Underground Enclosure Application" Article.
- D. Color: Green.
- E. Configuration: Units shall be designed for flush burial and have open bottom unless otherwise indicated.
- F. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
- G. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
- H. Cover Legend: Molded lettering, "ELECTRIC."
- I. Direct-Buried Wiring Entrance Provisions: Knockouts equipped with insulated bushings or end-bell fittings, selected to suit box material, sized for wiring indicated, and arranged for secure, fixed installation in enclosure wall.
- J. Duct Entrance Provisions: Duct-terminating fittings shall mate with entering duct for secure, fixed installation in enclosure wall.
- K. Handholes 12 inches wide by 24 inches long and larger shall have factory-installed inserts for cable racks and pulling-in irons.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate layout and installation of duct, duct bank, manholes, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify Architect if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.
- B. Coordinate elevations of duct and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of duct and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct and duct bank will drain to manholes and handholes, and as approved by Architect.

- C. Clear and grub vegetation to be removed, and protect vegetation to remain according to Section 31 1000 "Site Clearing." Remove and stockpile topsoil for reapplication according to Section 31 1000 "Site Clearing."

3.2 UNDERGROUND ENCLOSURE APPLICATION

- A. Handholes and Boxes for 600 V and Less:
 - 1. Units Subject to Light-Duty Pedestrian Traffic Only: Fiberglass-reinforced polyester resin, structurally tested according to SCTE 77 with 3000-lbf vertical loading.
 - 2. Cover design load shall not exceed the design load of the handhole or box.

3.3 EARTHWORK

- A. Excavation and Backfill: Comply with Section 31 2000 "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.
- B. Restoration: Replace area [immediately after backfilling is completed] [or] [after construction vehicle traffic in immediate area is complete].
- C. Restore surface features at areas disturbed by excavation, and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
- D. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Section 32 9200 "Turf and Grasses" and Section 32 9300 "Plants."
- E. Cut and patch existing pavement in the path of underground duct, duct bank, and underground structures according to "Cutting and Patching" Article in Section 01 7300 "Execution."

3.4 INSTALLATION OF HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of duct, and seal joint between box and extension as recommended by manufacturer.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas and trafficways, set cover flush with finished grade. Set covers of other handholes 1 inch above finished grade.

- D. Install handholes and boxes with bottom below frost line, 36" minimum below grade.
- E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in enclosure.
- F. Field cut openings for duct according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 GROUNDING

- A. Ground underground ducts and utility structures according to Section 26 0526 "Grounding and Bonding for Electrical Systems."

3.6 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 1. Demonstrate capability and compliance with requirements on completion of installation of underground duct, duct bank, and utility structures.
 2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide a minimum 12-inch-long mandrel equal to duct size minus 1/4 inch. If obstructions are indicated, remove obstructions and retest.
 3. Test handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 26 0526 "Grounding and Bonding for Electrical Systems."
- B. Correct deficiencies and retest as specified above to demonstrate compliance.
- C. Prepare test and inspection reports.

3.7 CLEANING

- A. Clean internal surfaces of manholes, including sump.
 1. Remove foreign material.

END OF SECTION 26 0543

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Labels.
 - 2. Extruded insulating tubing.
 - 3. Tapes and stencils.
 - 4. Cable ties.

- B. Related Requirements:
 - 1. Section 26 0010 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.

- C. Identification Schedule: For each piece of electrical equipment and electrical system components to be index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

PART 2 - PRODUCTS

2.1 LABELS

- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
 - 2. Listing Criteria: UL CCN PGDQ2 for components; including UL 969.

- B. UL PGDQ2 - Self-Adhesive Wraparound Labels: Preprinted, 3 mil thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Brady Corporation.
 - b. Ideal Industries, Inc.
 - c. LEM Products Inc.
 - d. Panduit Corp.
 - e. Seton Identification Products; a Brady Corporation company.
 - 2. Self-Lamination: Clear; UV-, weather-, and chemical-resistant; self-laminating, with protective shield over legend. Size labels such that clear shield overlaps entire printed legend.
 - 3. Marker for Labels:
 - a. Permanent, waterproof, black ink marker recommended by tag manufacturer.
 - b. Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.
- C. UL PGDQ2 - Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3 mil thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Ideal Industries, Inc.
 - c. LEM Products Inc.
 - d. Panduit Corp.
 - 2. Minimum Nominal Size:
 - a. 1-1/2 by 6 inch for raceway and conductors.
 - b. 3-1/2 by 5 inch for equipment.
 - c. As required by authorities having jurisdiction.

2.2 EXTRUDED INSULATING TUBING

- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
 - 2. Listing Criteria: UL CCN YDPU2 for components; including UL 224.
- B. UL YDPU2 - Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameter and shrunk to fit firmly. Full shrink recovery occurs at maximum of 200 deg F.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Panduit Corp.

2.3 TAPES AND STENCILS

- A. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mil thick by 1 to 2 inch wide; compounded for outdoor use.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Carlton Industries, LP.
- B. Underground-Line Warning Tape:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Ideal Industries, Inc.
 - c. LEM Products Inc.
 - d. Reef Industries, Inc.
 - e. Seton Identification Products; a Brady Corporation company.
 - 2. Tape:
 - a. Recommended by manufacturer for method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - b. Printing on tape must be permanent and may not be damaged by burial operations.
 - c. Tape material and ink must be chemically inert and not be subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
 - 3. Color and Printing:
 - a. Comply with APWA Uniform Color Code using NEMA Z535.1 safety colors.
 - b. Inscriptions for Red Tapes: "CAUTION BURIED ELECTRIC LINE BELOW".
 - 4. Nonconducting Line-Warning Tape:
 - a. Pigmented polyolefin, bright colored, continuous-printed on one side with inscription of utility, compounded for direct-burial service.
 - b. Width: 3 inch.
 - c. Thickness: 4 mil.
 - d. Weight: 18.5 lb/1000 sq. ft.
 - e. Tensile in accordance with ASTM D882: 30 lbf and 2500 psi.
 - 5. Reinforced Detectable Line-Warning Tape:
 - a. Reinforced, detectable three-layer laminate, consisting of printed pigmented woven scrim, solid aluminum-foil core, and clear protective film that allows inspection of continuity of conductive core; bright-colored, continuous-printed on one side with inscription of utility, compounded for direct-burial service.
 - b. Width: 3 inch.
 - c. Overall Thickness: 8 mil.

- d. Foil Core Thickness: 0.35 mil.
- e. Weight: 34 lb/1000 sq. ft.
- f. Tensile in accordance with ASTM D882: 300 lbf and 12,500 psi.

C. Concrete Cable Route Markers :

1. Description: Concrete markers visually aid tracing the route of electrical cables. Monument markers are typically installed at grade. Protective cover markers are typically installed above the cables at grade or below grade.
2. Product Characteristics:
 - a. Material: Precast reinforced concrete.
 - b. Marker Type:
 - 1) Above-Ground Monument Post:
 - a) Nominal Dimensions (Height, Width, Depth): 30 inch, 6 inch, 3 inch.
 - 2) Above-Ground Monument Block:
 - a) Nominal Dimensions (Height, Width, Depth): 12 inch, 12 inch, 6 inch.
 - 3) In-Ground Protective Cover (Plank or Slab):
 - a) Nominal Dimensions (Length, Width, Depth): 12 inch, 12 inch, 2 inch
 - c. Legend: "**DANGER - ELECTRICITY**" For guidance, inactive British standard BS 2484, followed by U.K, Middle Eastern, and Southeast Asian manufacturers, specifies 1 inch high for covers up to 6 inch width, 1.5 inch high for wider covers. There is no equivalent U.S. standard. Local utility providers may have unique marking requirements for service feeders.
 - d. Lettering: Approximately 1/8 inch deep, not less than 1.5 inch high, symmetrically spaced; marked on both sides to allow for reversal.
3. Required Product Options:
 - a. Color: Red dye added to concrete during batching.
 - b. Attach metal medallion or sign stamped with feeder number.

D. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height must be 1 inch.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 SELECTION OF COLORS AND IDENTIFICATION MARKINGS

- A. Comply with 29 CFR 1910.144 for color identification of hazards, and the following:

1. Fire-alarm equipment must be finished, painted, or suitably marked safety red.
 2. Ceiling-mounted hangers, supports, cable trays, and raceways must be finished, painted, or suitably marked safety yellow where less than 7.7 ft above finished floor.
- B. Pipe and Conduit Labeling: Comply with ASME A13.1.
- C. Color-Coding for Phase- and Voltage-Level Identification, 1000 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.
1. Color must be factory applied.
 2. Colors for 208Y/120 V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 3. Color for Neutral (Grounded Conductor): White or gray.
 4. Color for Equipment Ground: Green.
 5. Color for Isolated Ground: Green with two or more yellow stripes.
- D. Color-Coding Raceways, Cable Trays, Junction Boxes, and Conductors for Intrinsically-Safe Circuits: Light blue. When used to identify intrinsically-safe circuits, Article 504 of NFPA 70 requires that the color light blue not be used for any other purpose.
- E. Color-Coding Instructional Signs: Self-adhesive labels, including color code for grounded and ungrounded conductors.
- F. Accessible Fittings for Raceways: Identify cover of junction and pull box of the following systems with wiring system legend and system voltage. System legends must be as follows:
1. "POWER."
- G. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.
- H. Locations of Underground Lines: Underground-line warning type IID tape for power and lighting.
- I. Conductors to Be Extended in Future: Attach write-on tags to conductors and list source.
- J. Cover Plates: Label individual cover plates with self-adhesive labels. Place label at top of cover plate. Label cover plate with the following information, in the order listed:
1. Panelboard designation.
 2. Colon or dash.
 3. Branch circuit number.
- K. Equipment Identification Labels:

1. Black letters on white field.
2. Indoor Equipment: Laminated acrylic or melamine plastic sign.
3. Outdoor Equipment: Laminated acrylic or melamine sign.

L. Cable Ties: General purpose, for attaching tags, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

3.3 SELECTION OF SIGNS AND HAZARD MARKINGS

A. Comply with 29 CFR 1910.145 for danger, caution, warning, and safety instruction signs.

B. Signs, labels, and tags required for personnel safety must comply with the following standards:

1. Safety Colors: NEMA Z535.1.
2. Facility Safety Signs: NEMA Z535.2.
3. Safety Symbols: NEMA Z535.3.
4. Product Safety Signs and Labels: NEMA Z535.4.
5. Safety Tags and Barricade Tapes for Temporary Hazards: NEMA Z535.5.

3.4 SELECTION OF IDENTIFICATION PRODUCTS FOR COMMUNICATIONS, CONTROL, AUXILIARY, AND LIFE SAFETY SYSTEMS

3.5 INSTALLATION

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

C. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

E. Verify identity of item before installing identification products.

F. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

- G. Apply identification devices to surfaces that require finish after completing finish work.
- H. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.
- I. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from floor.
- J. Vinyl Wraparound Labels:
 - 1. Secure tight to surface of raceway or cable at location with high visibility and accessibility.
 - 2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to location and substrate.
- K. Self-Adhesive Wraparound Labels: Secure tight to surface at location with high visibility and accessibility.
- L. Heat-Shrink, Preprinted Tubes: Secure tight to surface at location with high visibility and accessibility.
- M. Marker Tapes: Secure tight to surface at location with high visibility and accessibility.
- N. Self-Adhesive Vinyl Tape: Secure tight to surface at location with high visibility and accessibility.
- O. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.
- P. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's instructions.
- Q. Underground Line Warning Tape:
 - 1. During backfilling of trenches, install continuous underground-line warning tape not less than 12 inch directly above cables or raceways buried 18 inch or more below grade. Use multiple tapes where width of multiple lines installed in common trench or concrete envelope exceeds 16 inch overall.
 - 2. Install underground-line warning tape for direct-buried cables and cables in raceways.
- R. Nonmetallic Preprinted Tags:
 - 1. Place in location with high visibility and accessibility.
 - 2. Secure using plenum-rated cable ties.
- S. Laminated Acrylic or Melamine Plastic Signs: Attach signs that are not self-adhesive type with mechanical fasteners appropriate to location and substrate.

3.6 PANELBOARD DIRECTORIES

- A. Directories: Provide a completed protected typewritten panelboard directory card in each panelboard. The directory shall be approximately 5" x 8" and shall indicate load designations with the Owner's associated room numbers for each circuit. Update the panel directory card for each existing panel in which circuits are modified, added, or subtracted. Verify all existing circuits to remain and list on the updated panel directory.

END OF SECTION 26 05 53

SECTION 26 56 19
LED EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Luminaire types.
 - 2. Finishes.
 - 3. Luminaire support components.

- B. Related Requirements:
 - 1. Section 26 5613 "Lighting Poles and Standards" for poles and standards used to support exterior lighting equipment.

1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color rendering index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. Lumen: Measured output of lamp and luminaire, or both.
- F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of luminaire.
 - 1. Arrange in order of luminaire designation.
 - 2. Include data on features, accessories, and finishes.
 - 3. Include physical description and dimensions of luminaire.
 - 4. Lamps, include life, output (lumens, CCT, and CRI), and energy-efficiency data.
 - 5. Photometric data and adjustment factors based on laboratory tests, complying with IES Lighting Measurements Testing and Calculation Guides, of each luminaire type. The adjustment factors shall be for lamps and accessories identical to those indicated for the luminaire as applied in this Project.
 - a. Manufacturer's Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the NVLAP for Energy Efficient Lighting Products.
 - 6. Wiring diagrams for power, control, and signal wiring.

7. Means of attaching luminaires to supports and indication that the attachment is suitable for components involved.
- B. Shop Drawings: For nonstandard or custom luminaires.
 1. Include plans, elevations, sections, and mounting and attachment details.
 2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 3. Include diagrams for power, signal, and control wiring.
 - C. Product Schedule: For luminaires and lamps. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing laboratory providing photometric data for luminaires.
- B. Product Certificates: For each type of the following:
 1. Luminaire.
- C. Product Test Reports: For each luminaire, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Operation and Maintenance Data: For luminaires to include in operation and maintenance manuals.
 1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.

1.5 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications:
 1. Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products and complying with applicable IES testing standards.
- B. Provide luminaires from a single manufacturer for each luminaire type.
- C. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering prior to shipping.

1.7 FIELD CONDITIONS

- A. Verify existing and proposed utility structures prior to the start of work associated with luminaire installation.
- B. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.8 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including luminaire support components.
 - b. Faulty operation of luminaires and accessories.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: five year(s) from date of Substantial Completion.
- B. Special Warranty for Drivers: Manufacturer's standard form made out to Owner and signed by ballast manufacturer agreeing to repair or replace ballasts that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.
- C. UL Compliance: Comply with UL 1598 and listed for wet location.
- D. General: Provide all luminaires as shown on the Light Fixture Schedule on the drawings. Each luminaire shall be furnished complete with all necessary components including but not limited to housing, lamps, light emitting diodes (LEDs), reflectors, drivers, and wiring. Each luminaire shall be shipped complete with all components factory installed and assembled for a complete and operating unit.
- E. All Luminaires:

1. Shall bear the Underwriter's Laboratories (U.L.) label. See the individual luminaire specifications in the Light Fixture Schedule on the drawings for specific requirements such as "wet locations," etc.
2. Shall have all metal parts bonded for a common grounding connection.
3. Utilizing LED driver(s) shall be designed and constructed to minimize noise generated by the driver(s).
4. Doors shall be smooth operating, free of light leakage under operating conditions.
5. Shall be designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during re-lamping and when secured in operating position.
6. Shall have metal parts free of burrs and sharp corners and edges.
7. Shall have all ferrous metal parts, except cadmium plated hardware, rust proofed by a five-stage phosphate pre-painting hot process after fabrication.
8. Shall have all metal parts painted after fabrication.
9. Shall be manufactured to tight tolerances and have closed and tight-fitting connections with no light leaks.
10. Shall be pre-wired unless specifically noted otherwise.
11. Shall have reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
 - a. White Surfaces: 85 percent.
 - b. Specular Surfaces: 83 percent.
 - c. Diffusing Specular Surfaces: 75 percent.
 - d. Laminated Silver Metallized Film: 90 percent.
12. Shall have drivers secured to housing by means of a captive screw and nut arrangement.

F. Light Emitting Diode (LED) Luminaires shall:

1. Be furnished complete with all light emitting diodes (LEDs), electronic drivers, housing, reflectors, etc. for a complete and operating unit as specified in the Light Fixture Schedule on the drawings.
2. Be furnished complete with integral dimming driver capable of the dimming range specified for the respective luminaire as specified in the Light Fixture Schedule. The dimming driver shall be entirely compatible with dimming switches, dimming systems, etc. as specified or shown on the drawings. Proof of compatibility shall be furnished with the submittals.
3. Shall provide a continuous light output. Fixture lumen output shall be in accordance with the specifications and shall not depreciate more than 20 percent after 10,000 hours of use. The rated lumen output for LED fixtures to operate in ambient temperature of -20 deg. C to 50 deg. C.

4. Be equipped with appropriate thermal management technology to ensure that operating temperatures do not exceed the limits established by the LED chip manufacturer. Fixtures shall be provided with thermal cutoff circuitry to prevent damage to the luminaire.
 5. Have either signal based or power-based control as follows:
 - a. Signal Based Control: For LED systems with controllable attributes such as color and/or output, the communications protocol shall be in accordance with the respective luminaire specification and compatible with the system shown on the Contract Documents. For data communications driven systems, each fixture shall have the capability to set a unique address for the network through an on-board address setting device.
 - b. Power Based Control: Variable output LED fixtures that are dimmed by direct modification of the input power shall dim from 100%-10% unless specified otherwise in the Light Fixture Schedule. LED fixtures shall dim with no flicker and shall be provided with circuitry to cease light output at the low end of the dimming range prior to flicker occurring. Means of control shall be as specified on the Contract Documents by conventional dimming equipment.
 6. Have light color for color changing LED luminaires selectable through stand-alone modes on board the luminaire or through data communications.
 7. Have light color for white LED fixtures as specified in the Light Fixture Schedule for each respective luminaire. Color variation between each chip shall not exceed 100 deg. K. White LED luminaires shall utilize chip-integral or remote phosphor technology.
 8. Have all connections to fixtures reverse polarity protected and have high voltage protection.
 9. Have warranty for the complete unit as specified elsewhere in this Section.
 10. Be furnished complete with photometric reports certified by an approved DOE laboratory in accordance with IESNA LM-79.
 11. Be furnished complete with a lumen depreciation report from the manufacturer. The Lumen depreciation report shall support the LED chip manufacturer's IESNA LM-80 test data.
 12. Have the entire assembly U.L. listed.
- G. CRI of minimum 70. CCT of 4100 K .
- H. L70 LED life of 100,000 hours minimum.
- I. Nominal Operating Voltage: Refer to Drawings.
- J. Source Limitations: Obtain luminaires from single source from a single manufacturer.

- K. Source Limitations: For luminaires, obtain each color, grade, finish, type, and variety of luminaire from single source with resources to provide products of consistent quality in appearance and physical properties.

2.2 DRIVERS FOR LED MODULES

- A. Manufacturer: Subject to compliance requirements, provide products by one of the following:
 - 1. Sylvania Osram
 - 2. Philips Advance
 - 3. Universal Lighting Technologies

- B. General Requirements for Electronic Drivers:
 - 1. Comply with UL 935 and with ANSI C82.11.
 - 2. Designed for type and quantity of LED modules served.
 - 3. Drivers shall be designed for full light output unless a dimming driver is indicated.
 - 4. Sound Rating: Class A
 - 5. THD Rating: Less than 20 percent.
 - 6. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
 - 7. Power Factor: 0.90 or higher.
 - 8. Lamp-Driver combination must be factory tested to ensure proper operation.
 - 9. Module end-of-life detection and shutdown circuit.
 - 10. Automatic module starting after module replacement.

- C. Drivers for Dimmer-Controlled Luminaires.
 - 1. Dimming Range: 100 to 10 percent of rated module(s) lumens.
 - 2. Compatibility: Certified by manufacturer for use with specific dimming control system and lamp type indicated.
 - 3. Control: Coordinate wiring from ballast to control device to ensure that ballast, controller, and connecting wiring are compatible.

2.3 FINISHES

- A. Variations in Finishes: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

- B. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

- C. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Class I, Color-Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker), complying with AAMA 611.
 - a. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for luminaire electrical conduit to verify actual locations of conduit connections before luminaire installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

- A. New light fixtures **SHALL NOT** be used for temporary lighting.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Comply with NECA 1.
- B. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.
- C. Install luminaires level, plumb, and square with finished grade unless otherwise indicated.
- D. Coordinate layout and installation of luminaires with other construction.
- E. Comply with requirements in Section 26 0519 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections and wiring methods.

3.4 CORROSION PREVENTION

- A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

- B. Steel Conduits: Comply with Section 26 0533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch-thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

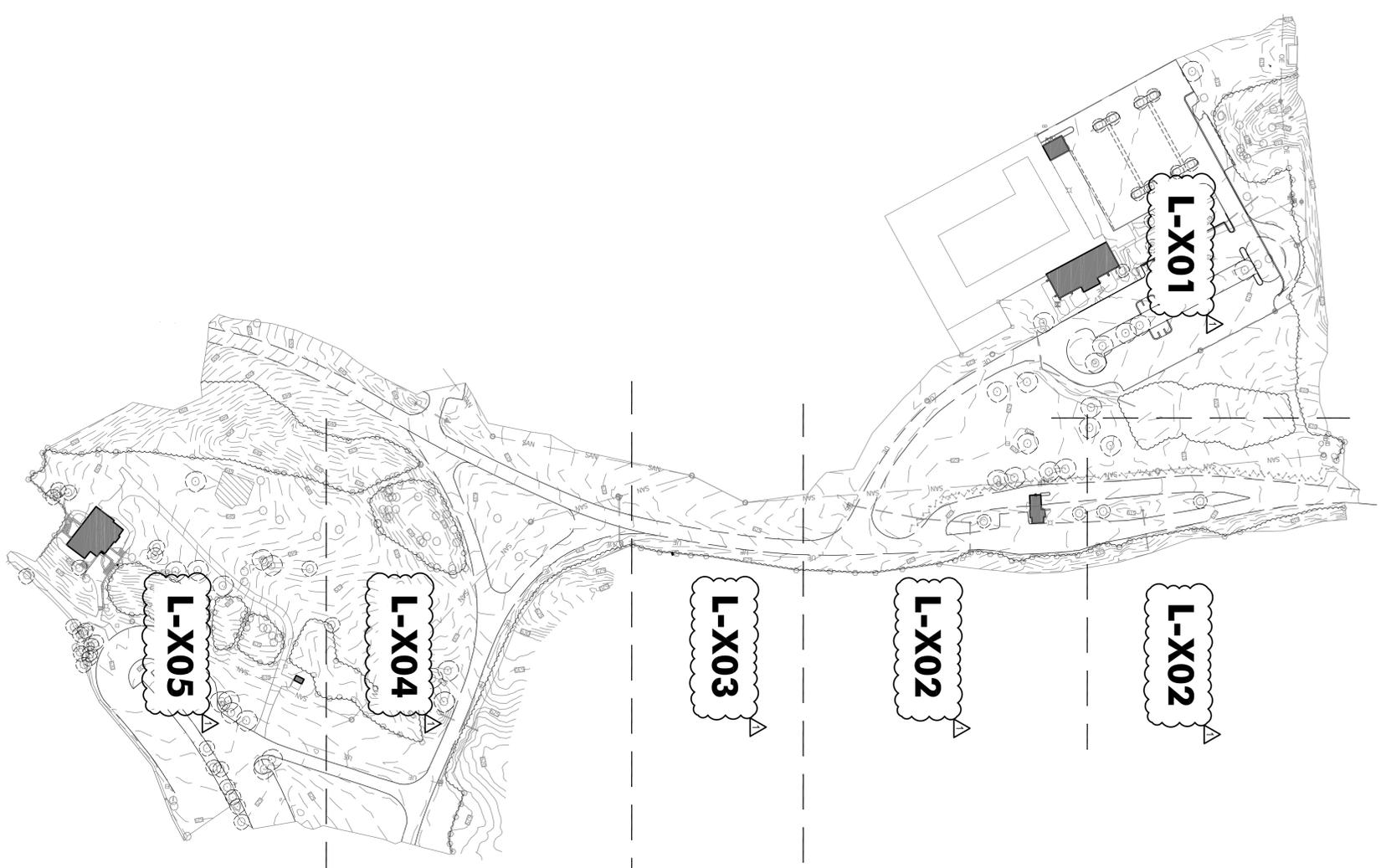
3.5 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."

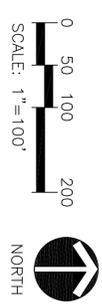
3.6 FIELD QUALITY CONTROL

- A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.
- B. Perform the following tests and inspections:
 - 1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
- C. Illumination Tests:
 - 1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
- D. Luminaire will be considered defective if it does not pass tests and inspections.

END OF SECTION 26 56 19



01 OVERALL PLAN

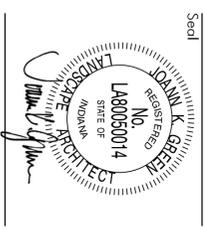


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Client
Indiana Department of Natural Resources
200 W. WASHINGTON STREET
INDIANAPOLIS, IN 46204

Project
Brown County State Park
North Entrance Road and
Accessibility Improvements

Dates
February 3, 2026

Revisions

1	Addressed No. 2 - 2/23/26
2	
3	

Project Manager
JG

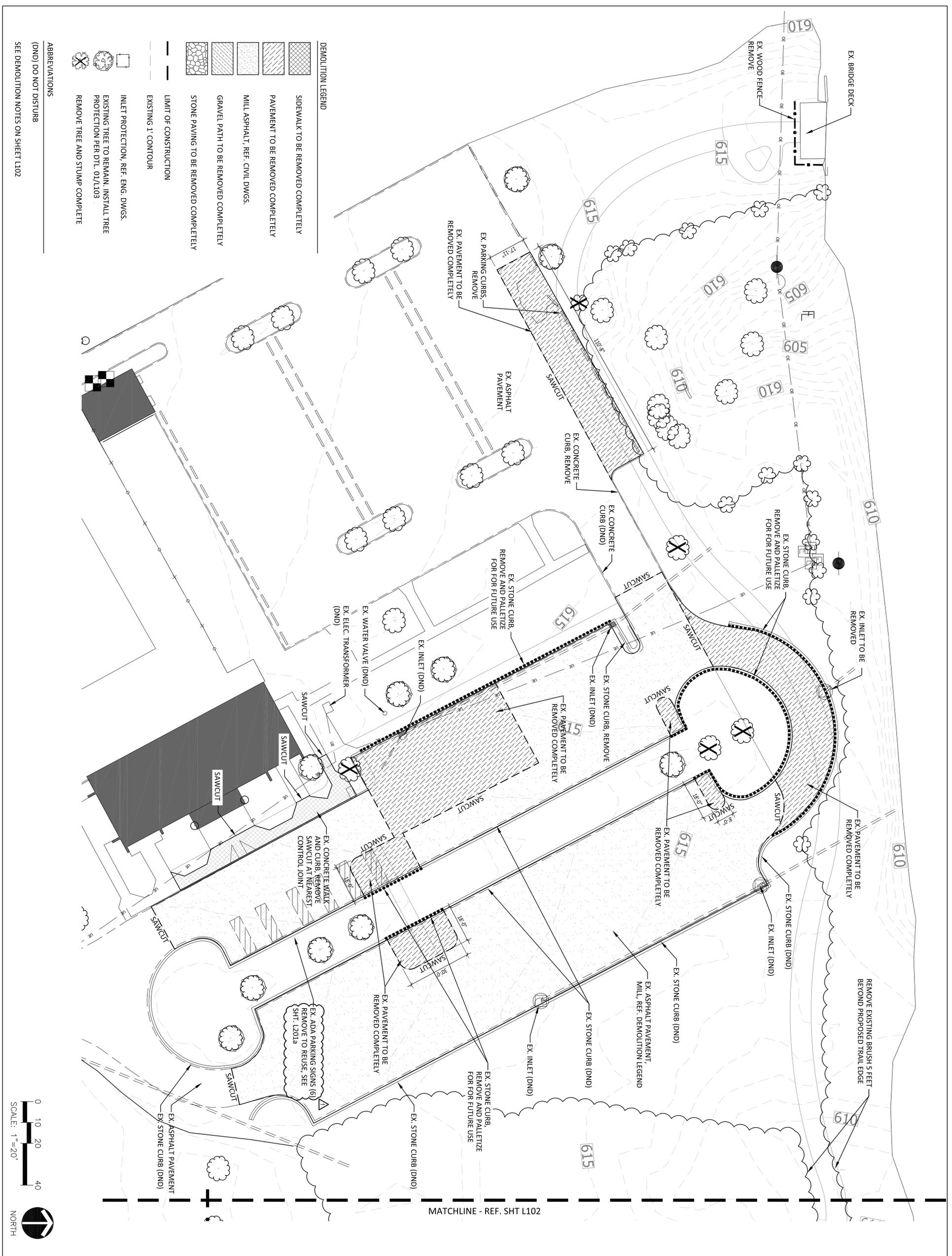
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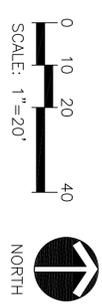
Project Number
#ENG 2601722091

Sheet Title
PATH
OVERALL PLAN

Sheet
L-001



- DEMOLITION LEGEND**
- SIDEWALK TO BE REMOVED COMPLETELY
 - PAVEMENT TO BE REMOVED COMPLETELY
 - MILL ASPHALT, REF. CIVIL DWGS.
 - GRAVEL PATH TO BE REMOVED COMPLETELY
 - STONE PAVING TO BE REMOVED COMPLETELY
 - LIMIT OF CONSTRUCTION
 - EXISTING 1' CONTOUR
 - INLET PROTECTION, REF. ENG. DWGS.
 - EXISTING TREE TO REMAIN, INSTALL TREE PROTECTION PER DTL 01/L103
 - REMOVE TREE AND STUMP COMPLETE
- ABBREVIATIONS**
- (DND) DO NOT DISTURB
- SEE DEMOLITION NOTES ON SHEET L102



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Dates
February 3, 2026

Revisions

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JG

Drawn
CM

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JG

Project Number
#ENG 2601722091

Sheet Title
DEMOLITION PLAN

Sheet
L-101

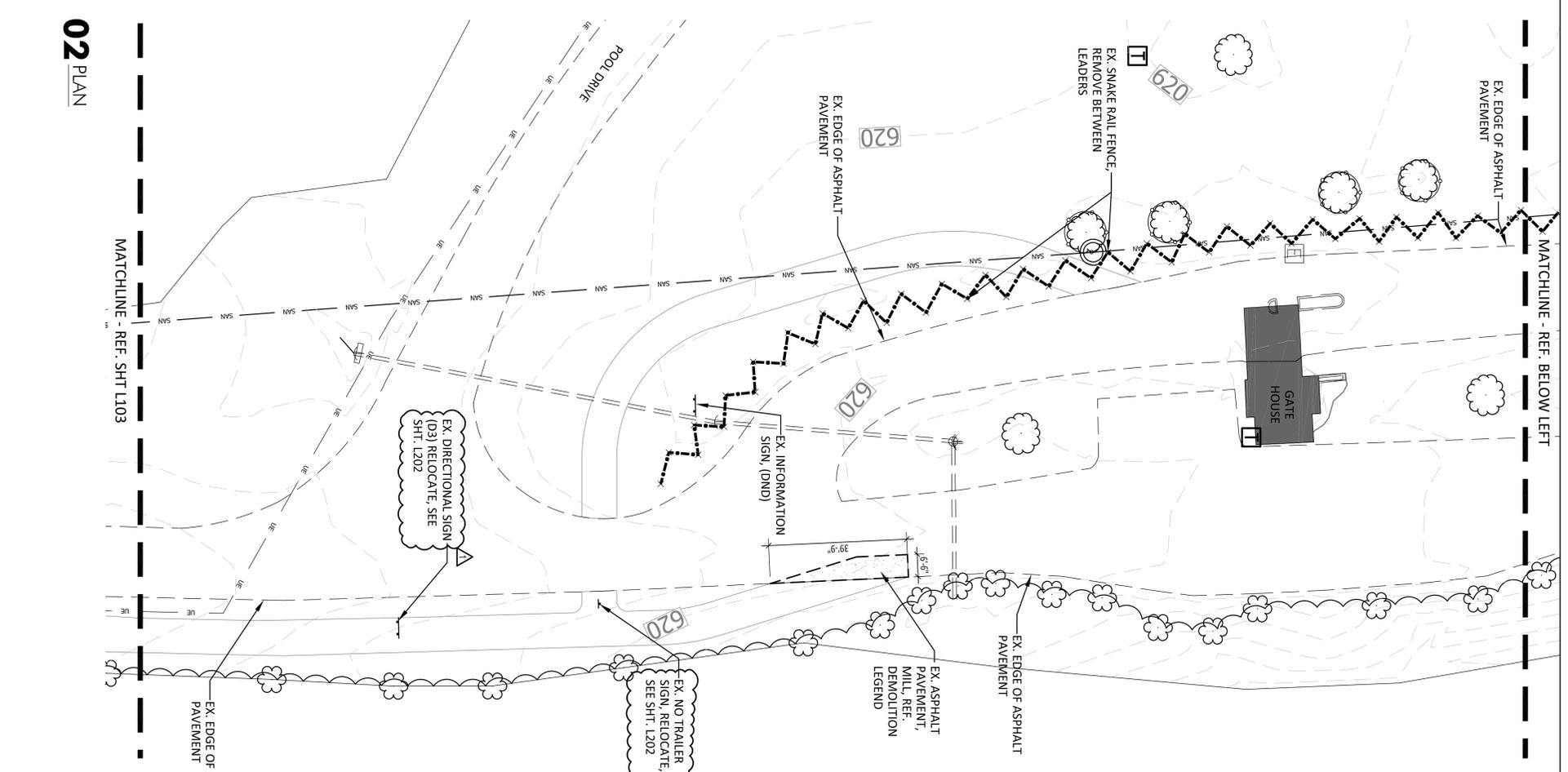
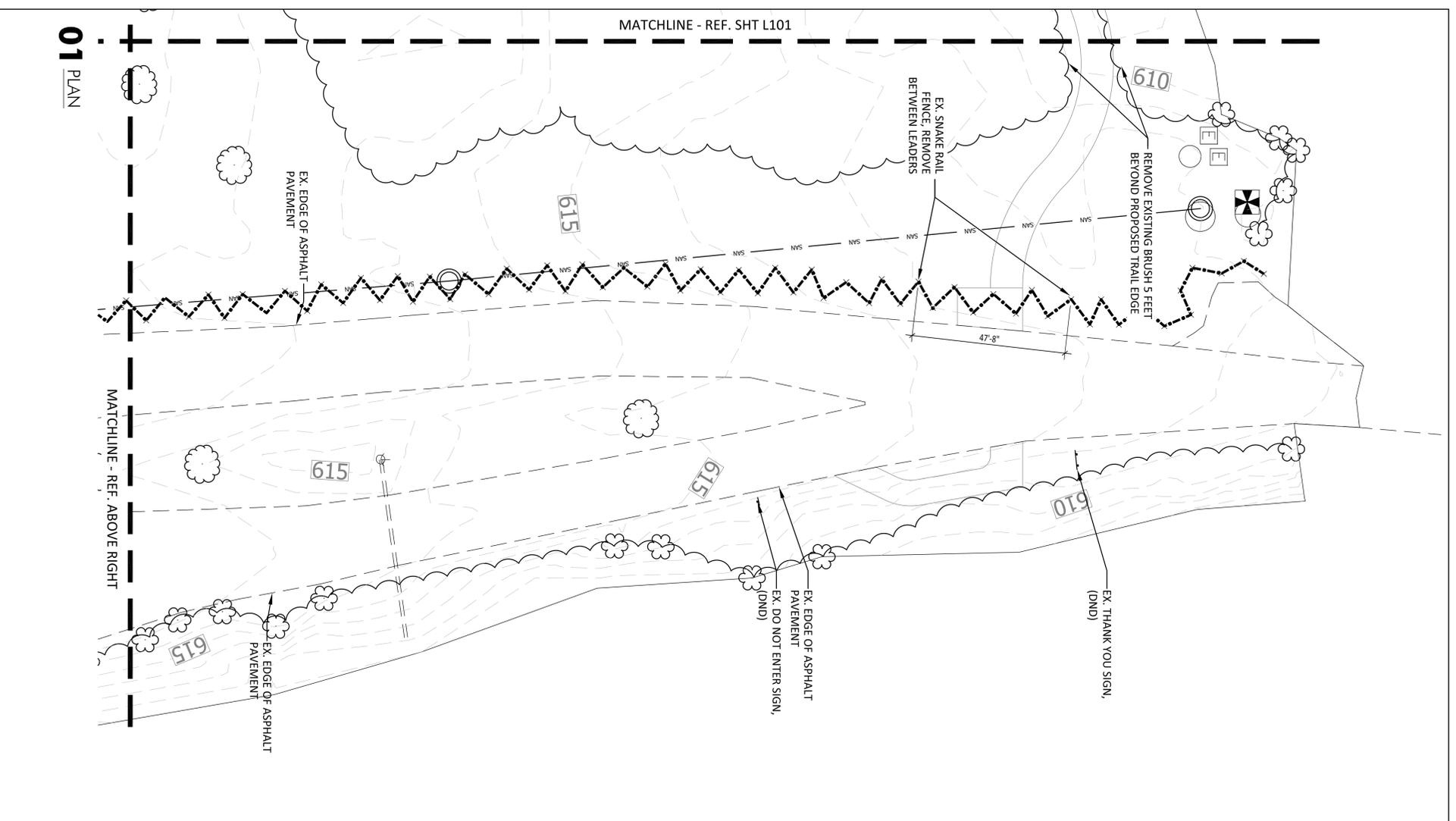
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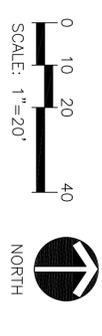
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Seal



- DEMOLITION LEGEND**
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 - PAVEMENT TO BE REMOVED COMPLETELY
 - MILL ASPHALT, REF. CIVIL DWGS.
 - GRAVEL PATH TO BE REMOVED COMPLETELY
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 - LIMIT OF CONSTRUCTION
 - EXISTING 1' CONTOUR
 - INLET PROTECTION, REF. ENG. DWGS.
 - EXISTING TREE TO REMAIN, INSTALL TREE PROTECTION PER DTL 01/L103
 - REMOVE TREE AND STUMP COMPLETE
- ABBREVIATIONS**
- (DND) DO NOT DISTURB
- DEMOLITION NOTES**
- CONTRACTOR TO INSTALL TEMPORARY TREE PROTECTION PER PLANS, DETAILS AND SPECIFICATIONS. TEMPORARY TREE PROTECTION WILL REMAIN IN PLACE THROUGHOUT DURATION OF CONSTRUCTION UNLESS OTHERWISE NOTED.
 - REFERENCE ENGINEER'S STORM WATER POLLUTION PREVENTION PLAN DRAWINGS C200.
 - THESE DRAWINGS HAVE BEEN CREATED FROM SURVEY INFORMATION PROVIDED BY FPBH, INC., NORTH VERNON, INDIANA. LANDSTORY IS NOT RESPONSIBLE FOR THE ACCURACY OF THE SURVEY.
 - IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH AND TO LOCATE ALL EXISTING SITE CONDITIONS AND UNDERGROUND UTILITIES, PIPES, AND OTHER SUBSTRUCTURES, AND TO PROTECT THEM FROM DAMAGE. THE EXPENSE OF REPAIR, BODILY INJURY OR REPLACEMENT OF SAID SUBSTRUCTURES INCLUDING DAMAGE OF THE OWNER'S PROPERTY SHALL BE BORNE BY THE CONTRACTOR. THE CONTRACTOR SHALL HAND DIG FOOTINGS, TREE WELLS, PLANTING BEDS, ETC. AS REQUIRED. CONTRACTOR IS RESPONSIBLE FOR CONTACTING UTILITY COMPANIES PRIOR TO ANY EXCAVATION.
 - LOCATION AND ELEVATION OF ALL EXISTING IMPROVEMENTS WITH AND ADJACENT TO THE AREA OF WORK SHALL BE CONFIRMED BY FIELD MEASUREMENT PRIOR TO EXCAVATION AND CONSTRUCTION OF NEW WORK. EXTREME CARE SHALL BE EXERCISED IN EXCAVATION AND WORKING NEAR EXISTING UTILITIES. REFER TO CIVIL DRAWING FOR GENERAL REFERENCE. CONTRACTOR WILL MAKE EXPLORATORY EXCAVATIONS AND LOCATE EXISTING UNDERGROUND UTILITIES, PIPES AND OTHER SUBSTRUCTURES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS, DETAILS AND SPECIFICATIONS IF REVISIONS ARE NECESSARY BECAUSE OF ACTUAL LOCATION IN THE FIELD. THE LOCATIONS OF UTILITIES, STRUCTURES AND SERVICES SHOWN IN THESE PLANS ARE APPROXIMATE ONLY, ANY DISCREPANCIES BETWEEN THESE PLANS AND ACTUAL FIELD CONDITIONS SHALL BE IMMEDIATELY REPORTED TO THE OWNER'S AUTHORIZED REPRESENTATIVE.
 - THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, LANDSCAPING, AND FEATURES TO REMAIN ON AND/OR ADJACENT TO THE PROJECT SITE DURING CONSTRUCTION. CONTRACTOR SHALL REPAIR, AT HIS OWN EXPENSE, ALL DAMAGE RESULTING FROM HIS OPERATIONS OR NEGLIGENCE.
 - EROSION CONTROL MEASURES WILL BE PROVIDED BY CONTRACTOR PER CIVIL ENGINEERING DRAWINGS AND AS REQUIRED BY AUTHORITIES HAVING JURISDICTION.
 - THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID. PERMITS FOR ANY CONSTRUCTION DEPICTED IN THESE PLANS SHALL BE OBTAINED BY THE CONTRACTOR.

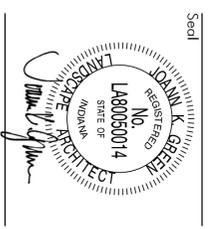


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Project: Brown County State Park
North Entrance Road and
Accessibility Improvements

Client: Indiana Department
of Natural Resources
200 W. WASHINGTON STREET
INDIANAPOLIS, IN 46204

Dates: February 3, 2026

Revisions: Addendum No. 2 - 2/23/26

Project Manager: JG

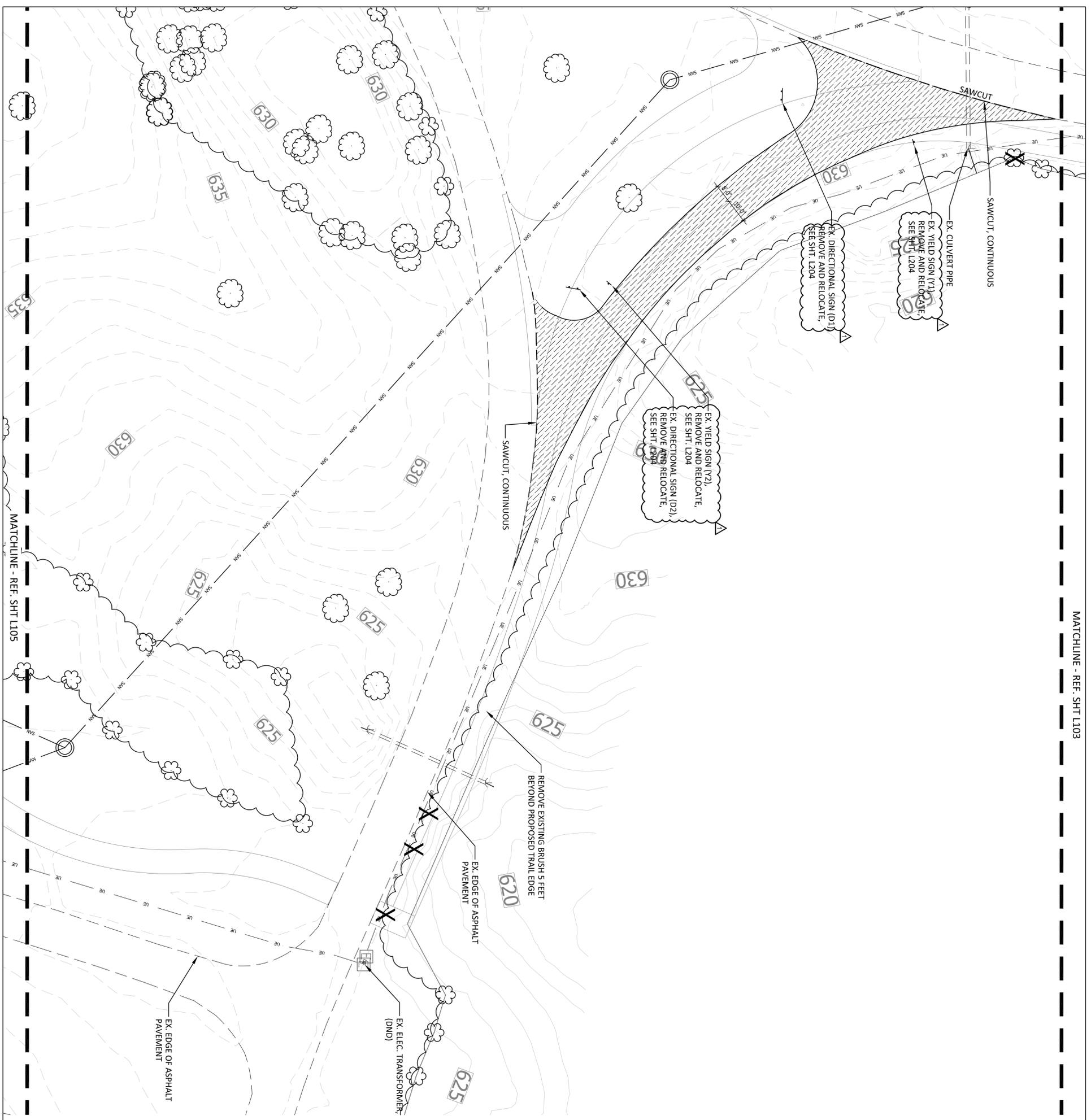
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Checked: JG

Project Number: #ENG 2601722091

Sheet Title: DEMOLITION PLAN

Sheet: **L-102**



MATCHLINE - REF. SHT L103

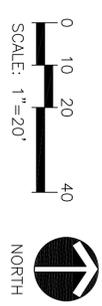
MATCHLINE - REF. SHT L105

DEMOLITION LEGEND

-  SIDEWALK TO BE REMOVED COMPLETELY
-  PAVEMENT TO BE REMOVED COMPLETELY
-  MILL ASPHALT, REF. CIVIL DWGS.
-  GRAVEL PATH TO BE REMOVED COMPLETELY
-  STONE PAVING TO BE REMOVED COMPLETELY
-  LIMIT OF CONSTRUCTION
-  EXISTING 1' CONTOUR
-  INLET PROTECTION, REF. ENG. DWGS.
-  EXISTING TREE TO REMAIN, INSTALL TREE PROTECTION PER DTL 01/L103
-  REMOVE TREE AND STUMP COMPLETE

ABBREVIATIONS

- (DND) DO NOT DISTURB
- (SEE DEMOLITION NOTES ON SHEET L102)

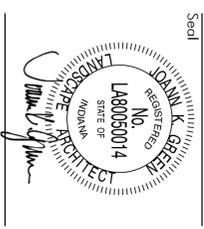


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North Entrance Road and
Accessibility Improvements

Project
Brown County State Park
North Entrance Road and
Accessibility Improvements

Project Manager
JG

Drawn
CM

Checked
JG

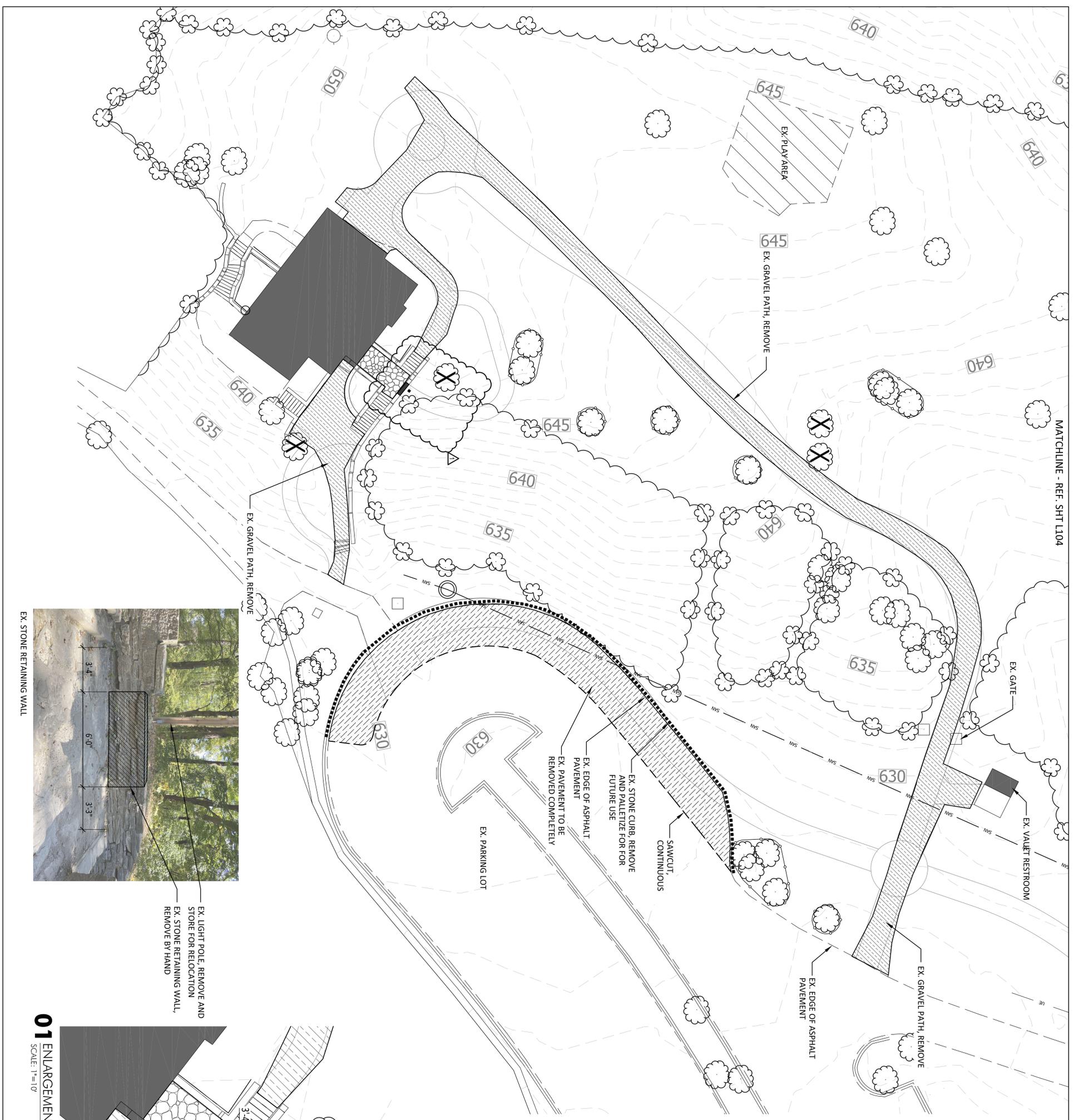
Project Number
#ENG 2601722091

Sheet Title
DEMOLITION PLAN

Sheet
L-104

Dates
February 3, 2026

Revisions
Addendum No. 2 - 2/23/26



MATCHLINE - REF. SHIT L104

EX. VAULT RESTROOM

EX. GATE

EX. GRAVEL PATH, REMOVE

EX. EDGE OF ASPHALT PAVEMENT

SAWCUT CONTINUOUS

EX. STONE CURB, REMOVE AND PALLETIZE FOR FUTURE USE

EX. EDGE OF ASPHALT PAVEMENT

EX. PARKING LOT

EX. GRAVEL PATH, REMOVE

EX. LIGHT POLE, REMOVE AND STORE FOR RELOCATION
EX. STONE RETAINING WALL, REMOVE BY HAND

EX. GRAVEL PATH, REMOVE

EX. STONE STEPS, DND

EX. STONE WALL, DND

EX. STONE STEPS, REMOVE BY HAND

EX. STONE RETAINING WALL, REMOVE BY HAND

EX. LIGHT POLE, REMOVE AND STORE FOR RELOCATION

EX. STONE RETAINING WALL, REMOVE BY HAND

EX. STONE PAVING, REMOVE

EX. STONE WALL, DND

EX. STONE STEPS, DND

EX. GRAVEL PATH, REMOVE

DEMOLITION LEGEND

- SIDEWALK TO BE REMOVED COMPLETELY
- PAVEMENT TO BE REMOVED COMPLETELY
- MILL ASPHALT, REF. CIVIL DWGS.
- GRAVEL PATH TO BE REMOVED COMPLETELY
- STONE PAVING TO BE REMOVED COMPLETELY
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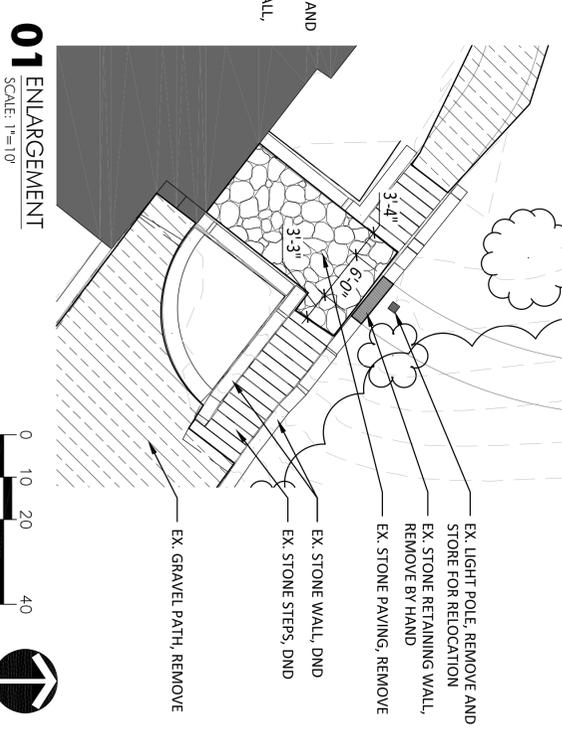
ABBREVIATIONS

(DND) DO NOT DISTURB

(SEE DEMOLITION NOTES ON SHEET L102)

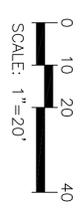


EX. STONE RETAINING WALL



01 ENLARGEMENT

SCALE: 1"=10'



SCALE: 1"=20'

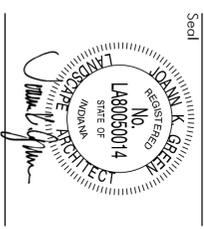


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Client
Brown County State Park
North Entrance Road and
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DNR
Indiana Department
of Natural Resources
200 W. WASHINGTON STREET
INDIANAPOLIS, IN 46204

Dates: February 3, 2026

Revisions: Addendum No. 2 - 2/23/26

Project Manager: JG

Drawn: CM

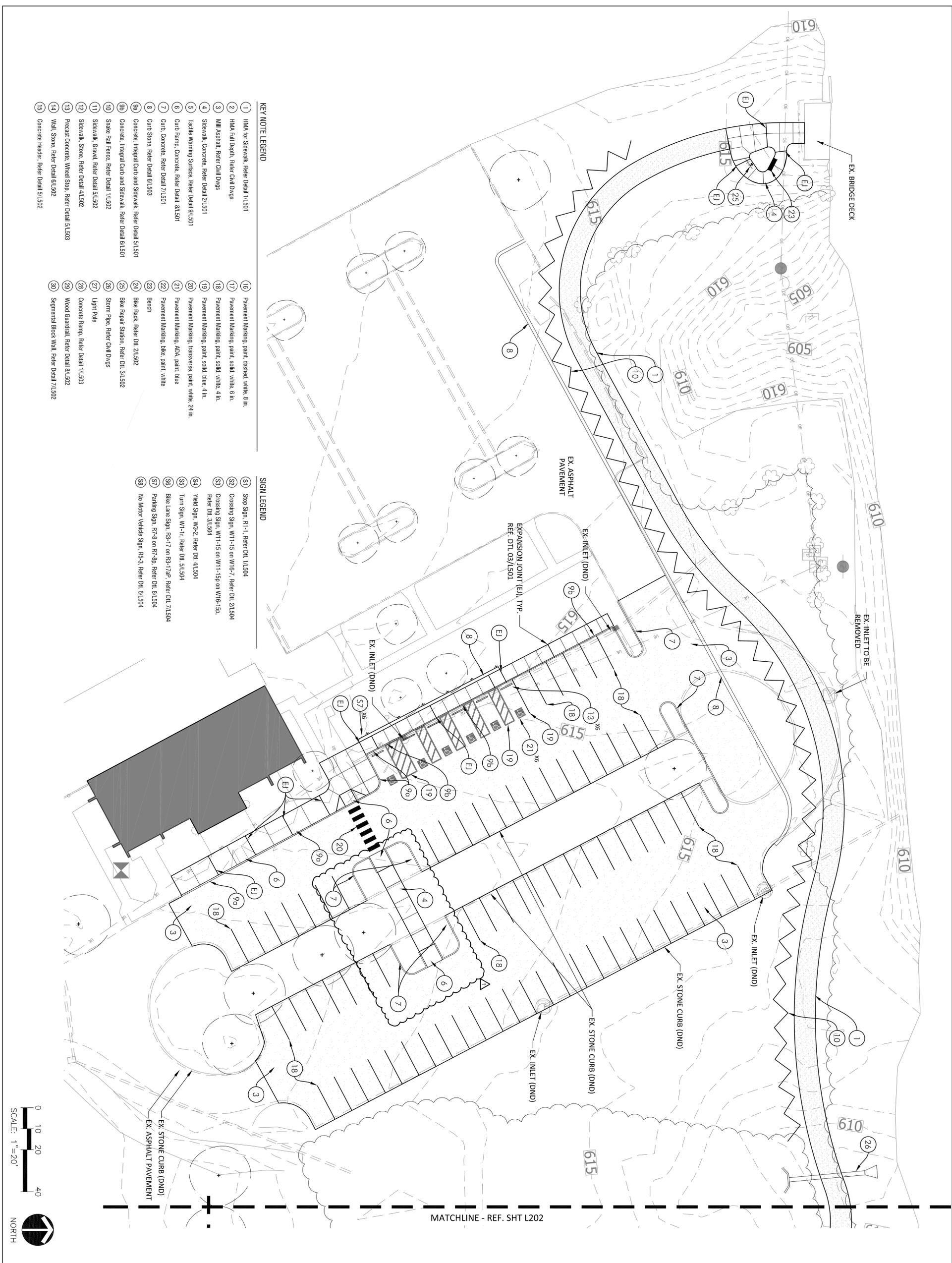
Checked: JG

Project Number: #ENG 2601722091

Sheet Title

DEMOLITION PLAN

Sheet **L-105**



KEY NOTE LEGEND

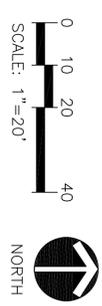
- 1 HMA for Slewak, Refer Detail 1/L501
- 2 HMA Full Depth, Refer Detail Dwg
- 3 Mill Asphalt, Refer Detail Dwg
- 4 Slewak, Concrete, Refer Detail 2/L501
- 5 Tactile Warning Surface, Refer Detail 9/L501
- 6 Curb Ramp, Concrete, Refer Detail 8/L501
- 7 Curb, Concrete, Refer Detail 7/L501
- 8 Curb Stone, Refer Detail 6/L503
- 9 Concrete, Integral Curb and Slewak, Refer Detail 5/L501
- 9a Concrete, Integral Curb and Slewak, Refer Detail 6/L501
- 10 Snake Rail Fence, Refer Detail 1/L502
- 11 Slewak, Gravel, Refer Detail 5/L502
- 12 Slewak, Stone, Refer Detail 4/L502
- 13 Precast Concrete, Wheel Stop, Refer Detail 5/L503
- 14 Wall, Stone, Refer Detail 6/L502
- 15 Concrete Header, Refer Detail 5/L502

SIGN LEGEND

- 16 Pavement Marking, paint, dashed, white, 8 in.
- 17 Pavement Marking, paint, solid, white, 6 in.
- 18 Pavement Marking, paint, solid, white, 4 in.
- 19 Pavement Marking, paint, solid, blue, 4 in.
- 20 Pavement Marking, transverse, paint, white, 24 in.
- 21 Pavement Marking, ADA, paint, blue
- 22 Pavement Marking, bike, paint, white
- 23 Bench
- 24 Bike Rack, Refer Dtl. 2/L502
- 25 Bike Repair Station, Refer Dtl. 3/L502
- 26 Storm Pipe, Refer Detail Dwg
- 27 Light Pole
- 28 Concrete Ramp, Refer Detail 1/L503
- 29 Wood Guardrail, Refer Detail 6/L502
- 30 Segmental Block Wall, Refer Detail 7/L502

- 31 Stop Sign, R1-1, Refer Dtl. 1/L504
- 32 Crossing Sign, W1-15 on W16-7, Refer Dtl. 2/L504
- 33 Crossing Sign, W1-15 on W11-15p on W16-15p, Refer Dtl. 3/L504
- 34 Yield Sign, W3-2, Refer Dtl. 4/L504
- 35 Turn Sign, W1-1, Refer Dtl. 5/L504
- 36 Bike Lane Sign, R3-17 on R3-17aP, Refer Dtl. 7/L504
- 37 Parking Sign, R7-9 on R7-9p, Refer Dtl. 8/L504
- 38 No Motor Vehicle Sign, R5-3, Refer Dtl. 6/L504

MATCHLINE - REF. SHT L202

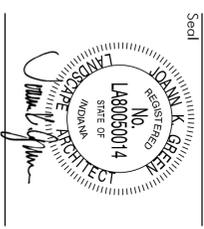


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Project
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North Entrance Road and
Accessibility Improvements

Client
DNR
Indiana Department
of Natural Resources
200 W. WASHINGTON STREET
INDIANAPOLIS, IN 46204

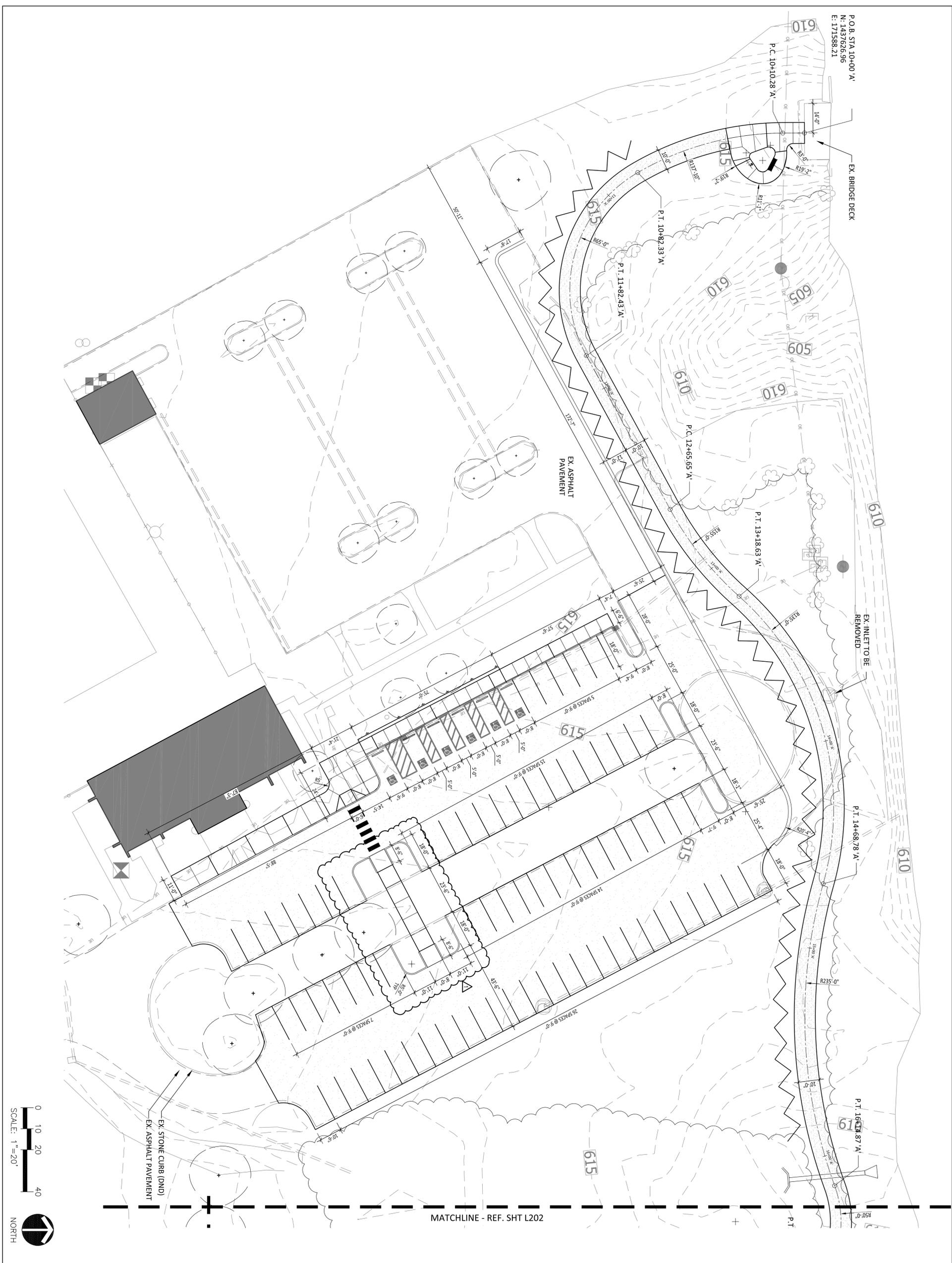
Dates
February 3, 2026

Revisions
Addendum No. 2 - 2/23/26

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Project Number
#ENG 2601722091

Sheet Title
MATERIALS PLAN

Sheet
L-201a



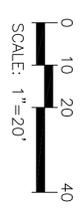
P.O.B. STA 10+00 A'
N: 1437626.96
E: 171588.21

EX. BRIDGE DECK

EX. INLET TO BE REMOVED

EX. STONE CURB (DNB)
EX. ASPHALT PAVEMENT

MATCHLINE - REF. SHT L202

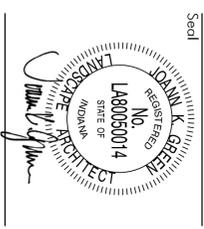


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200 W. WASHINGTON STREET
INDIANAPOLIS, IN 46204

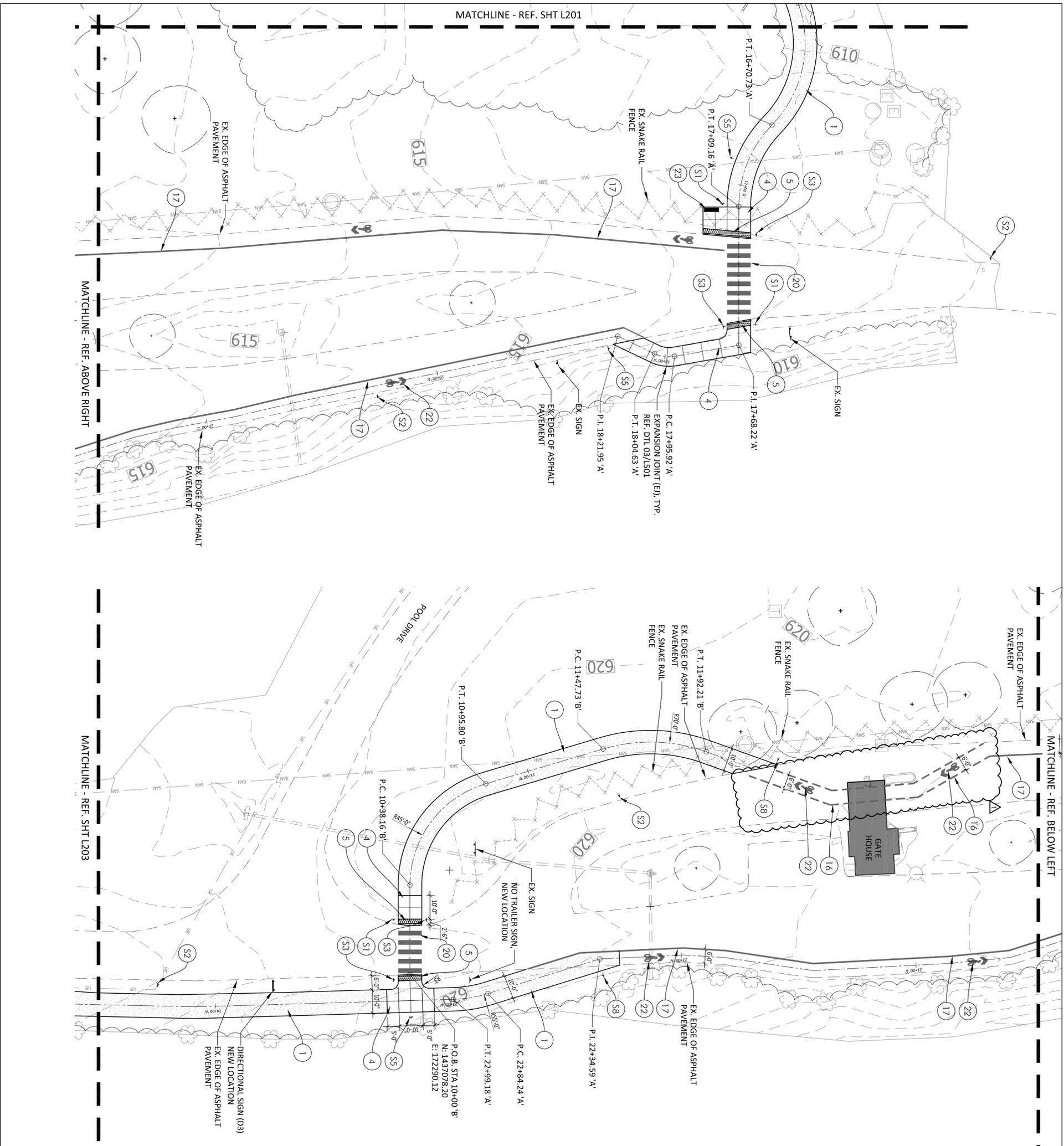
Dates
February 3, 2026

Revisions
Addendum No. 2 - 2/23/26

Project Manager
JG
Drawn
CM
Checked
JG
Project Number
#ENG 2601722091

Sheet Title
LAYOUT PLAN

Sheet
L-201b

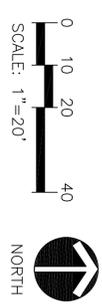


KEY NOTE LEGEND

- 1 HMA for Sidewalk, Refer Detail 1/L501
- 2 HMA Full Depth, Refer Detail Divgs
- 3 Mill Asphalt, Refer Civil Divgs
- 4 Sidewalk, Concrete, Refer Detail 2/L501
- 5 Tactile Warning Surface, Refer Detail 9/L501
- 6 Curb Ramp, Concrete, Refer Detail 8/L501
- 7 Curb, Concrete, Refer Detail 7/L501
- 8 Curb Stone, Refer Detail 6/L503
- 9 Concrete, Integral Curb and Sidewalk, Refer Detail 5/L501
- 10 Concrete, Integral Curb and Sidewalk, Refer Detail 6/L501
- 11 Snake Rail Fence, Refer Detail 1/L502
- 12 Sidewalk, Gravel, Refer Detail 5/L502
- 13 Sidewalk, Stone, Refer Detail 4/L502
- 14 Prestcast Concrete, Wheel Stop, Refer Detail 6/L503
- 15 Wall Stone, Refer Detail 6/L502
- 16 Concrete Header, Refer Detail 5/L502
- 17 Pavement Marking, paint, dashed, white, 8 in.
- 18 Pavement Marking, paint, solid, white, 6 in.
- 19 Pavement Marking, paint, solid, white, 4 in.
- 20 Pavement Marking, paint, solid, blue, 4 in.
- 21 Pavement Marking, transverse, paint, white, 24 in.
- 22 Pavement Marking, ADX, paint, blue
- 23 Pavement Marking, bike, paint, white
- 24 Bench
- 25 Bike Rack, Refer Dtl. 2/L502
- 26 Bike Repair Station, Refer Dtl. 3/L502
- 27 Storm Pipes, Refer Civil Divgs
- 28 Light Pole
- 29 Concrete Ramp, Refer Detail 1/L503
- 30 Wood Guardrail, Refer Detail 8/L502
- 31 Segmental Block Wall, Refer Detail 7/L502

SIGN LEGEND

- 32 Stop Sign, R1-1, Refer Dtl. 1/L504
- 33 Crossing Sign, W1-15 on W16-7, Refer Dtl. 2/L504
- 34 Crossing Sign, W1-15 on W1-15p on W16-15p, Refer Dtl. 3/L504
- 35 Yield Sign, W3-2, Refer Dtl. 4/L504
- 36 Turn Sign, W1-1, Refer Dtl. 5/L504
- 37 Bike Lane Sign, R3-17 on R3-17a, Refer Dtl. 7/L504
- 38 Parking Sign, R7-8 on R7-9p, Refer Dtl. 8/L504
- 39 No Motor Vehicle Sign, R5-3, Refer Dtl. 6/L504

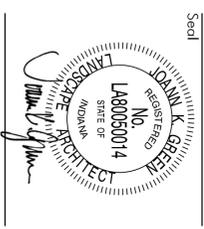


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Landscape Architecture
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317.525.2824
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Project
Brown County State Park
North Entrance Road and
Accessibility Improvements

Client
DNR
Indiana Department
of Natural Resources
200 W. WASHINGTON STREET
INDIANAPOLIS, IN 46204

Dates
February 3, 2026

Revisions
Addressed Item No. 2 - 2/23/26

Project Manager
JG

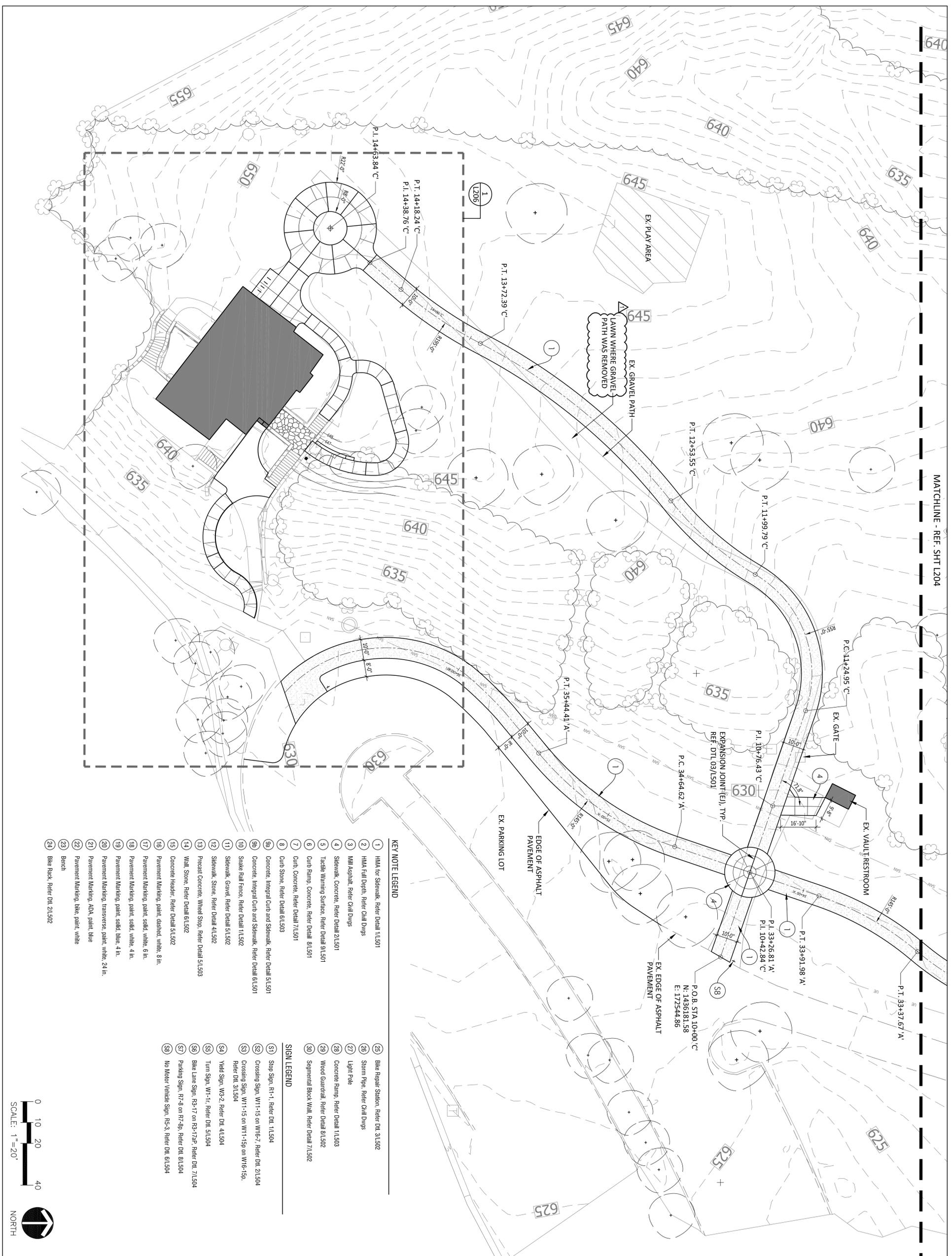
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CM

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JG

Project Number
#ENG 2601722091

Sheet Title
MATERIALS &
LAYOUT PLAN

Sheet
L-202



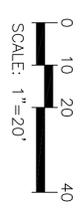
MATCHLINE - REF. SHIT L204

KEY NOTE LEGEND

- 1 HMA for Stewark. Refer Detail 1/L501
- 2 HMA Full Depth. Refer Detail Dvgs
- 3 Mill Asphalt. Refer Detail Dvgs
- 4 Stewark. Concrete. Refer Detail 2/L501
- 5 Tackle Warning Surface. Refer Detail 3/L501
- 6 Curb Ramp. Concrete. Refer Detail 8/L501
- 7 Curb. Concrete. Refer Detail 7/L501
- 8 Curb Stone. Refer Detail 6/L503
- 9 Concrete. Integral Curb and Stewark. Refer Detail 5/L501
- 9b Concrete. Integral Curb and Stewark. Refer Detail 6/L501
- 10 Snake Rail Fence. Refer Detail 1/L502
- 11 Stewark. Gravel. Refer Detail 5/L502
- 12 Stewark. Stone. Refer Detail 4/L502
- 13 Precast Concrete. Wireal Stop. Refer Detail 5/L503
- 14 Wall Stone. Refer Detail 6/L502
- 15 Concrete Header. Refer Detail 5/L502
- 16 Pavement Marking. paint, dashed, white, 8 in.
- 17 Pavement Marking. paint, solid, white, 6 in.
- 18 Pavement Marking. paint, solid, white, 4 in.
- 19 Pavement Marking. paint, solid, blue, 4 in.
- 20 Pavement Marking. transverse. paint, white, 24 in.
- 21 Pavement Marking. ADA. paint, blue
- 22 Pavement Marking. bike. paint, white
- 23 Bench
- 24 Bike Rack. Refer Dtl 2/L502

SIGN LEGEND

- 25 Stop Sign. R1-1. Refer Dtl. 1/L504
- 26 Crossing Sign. W11-15 on W16-7. Refer Dtl. 2/L504
- 27 Crossing Sign. W11-15 on W11-15p on W16-15p. Refer Dtl. 3/L504
- 28 Yield Sign. W3-2. Refer Dtl. 4/L504
- 29 Turn Sign. W1-1. Refer Dtl. 5/L504
- 30 Bike Lane Sign. R3-17 on R3-17a. Refer Dtl. 7/L504
- 31 Parking Sign. R7-8 on R7-8p. Refer Dtl. 8/L504
- 32 No Motor Vehicle Sign. R5-3. Refer Dtl. 6/L504

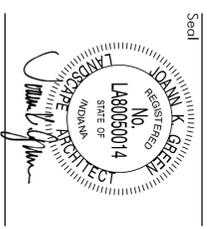


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Project
Brown County State Park
North Entrance Road and
Accessibility Improvements

Client
DNR
Indiana Department
of Natural Resources
200 W. WASHINGTON STREET
INDIANAPOLIS, IN 46204

Dates
February 3, 2026

Revisions
Addendum No. 2 - 2/23/26

Project Manager
JG

Drawn
CM

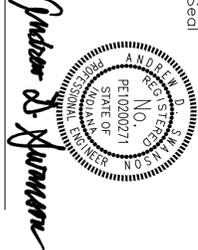
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JG

Project Number
#ENG 2601722091

Sheet Title
**MATERIALS &
LAYOUT PLAN**

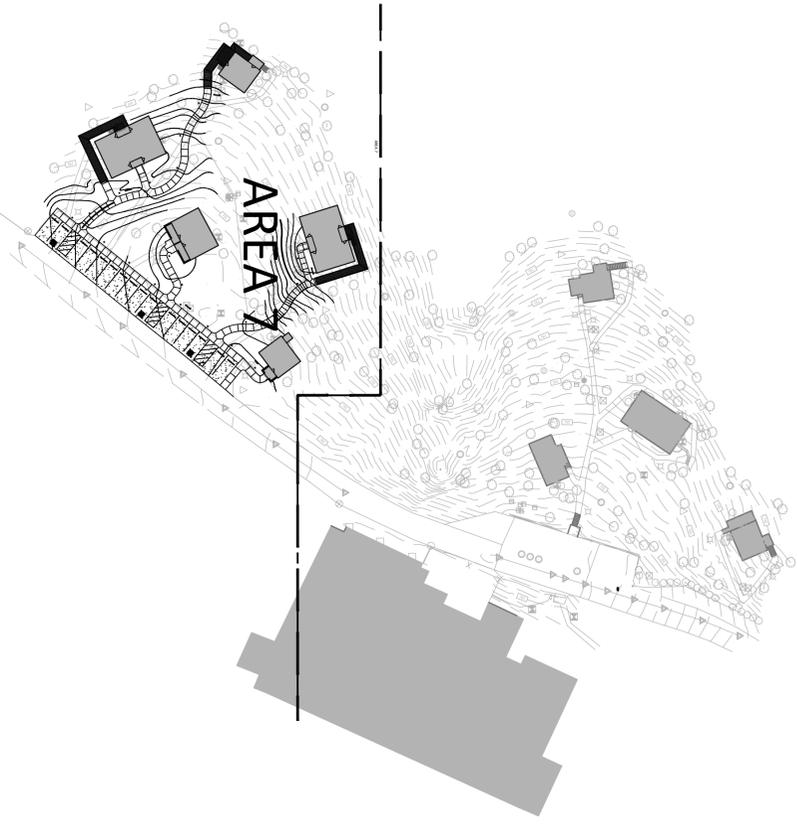
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L-205

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Andrew D. Hanson

2 BROWN COUNTY COTTAGES
SCALE: 1"=60'



Project
North Entrance
Road And
Accessibility
Improvements



Client
Indiana Department
of Natural Resources
200 W. WASHINGTON
STREET
INDIANAPOLIS, IN 46204

Dates
JANUARY 20, 2026

Revisions

△	Addendum #2 02/23/26
△	
△	

Project Manager
ADS

Drawn
ES

Checked
JRB

Project Number
ENG 2601722091

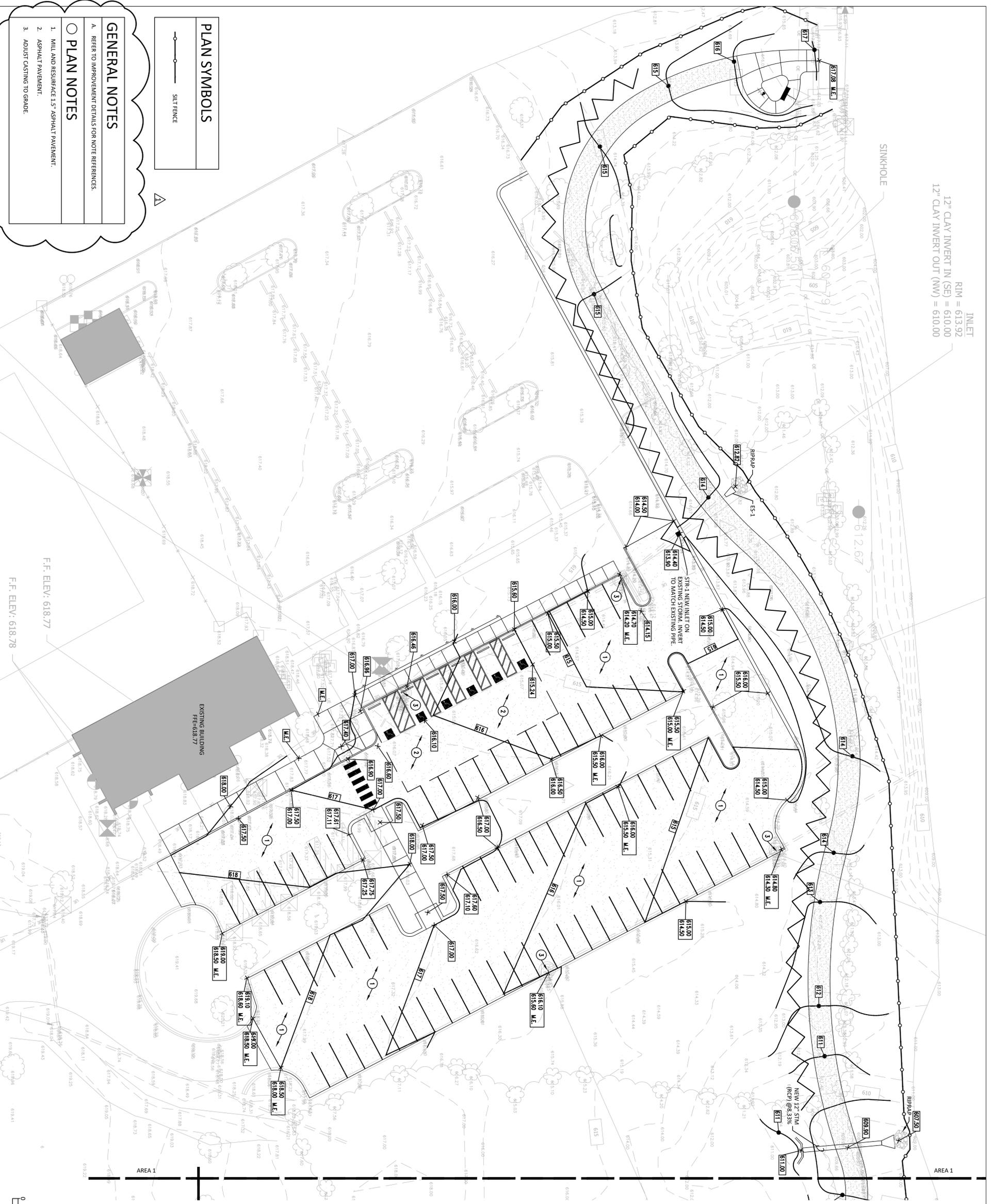
Sheet Title
OVERALL
AREA PLAN

Sheet
C300

1 ACCESSIBLE PATH
SCALE: 1"=80'



INLET
RIM = 613.92
12" CLAY INVERT IN (SE) = 610.00
12" CLAY INVERT OUT (NW) = 610.00



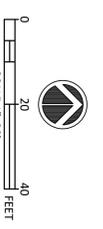
PLAN SYMBOLS

—○— SILT FENCE

- GENERAL NOTES**
- A. REFER TO IMPROVEMENT DETAILS FOR NOTE REFERENCES.
- PLAN NOTES**
1. MILL AND RESURFACE 1.5" ASPHALT PAVEMENT.
 2. ASPHALT PAVEMENT.
 3. ADJUST CASTING TO GRADE.

F.F. ELEV.: 618.77

F.F. ELEV.: 618.78

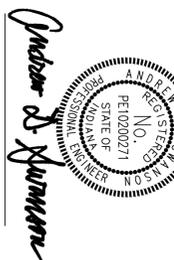


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Andrew D. Mansson



Project
North Entrance
Road And
Accessibility
Improvements



Client
Indiana Department
of Natural Resources
200 W. WASHINGTON
STREET
INDIANAPOLIS, IN 46204
Dates
JANUARY 20, 2025

Revisions

△	Addendum #2 02/23/25
△	

Project Manager
ADS

Drwn
ES

Checked
JRB

Project Number
ENG 2601722091

Sheet Title
SITE GRADING
& DRAINAGE

Area 1
Sheet
C301

