

**ADDENDUM NO. 4
IRONDALE PUBLIC LIBRARY**

BIDS RECEIVED:

TIME: 2:00pm

DATE: February 15, 2024

Irondale Library Meeting Room

CITY OF IRONDALE

THIS ADDENDUM IS DIRECTED TO ALL PRIME BIDDERS, AND ALL OTHERS TO WHOM DRAWINGS AND SPECIFICATIONS HAVE BEEN ISSUED.

THIS ADDENDUM FORMS A PART OF THE CONTRACT DOCUMENTS. THE FOLLOWING CONDITIONS TAKE PRECEDENCE OVER ANY CONFLICTING CONDITIONS IN THE DRAWINGS AND SPECIFICATIONS. THE DRAWINGS AND SPECIFICATIONS ARE HEREBY AMENDED IN THE FOLLOWING PARTICULARS.

GENERAL

DRAWINGS

1. Sheet C2.01
 - a. Delete east driveway and access drive.
 - b. Added stop bar pavement marker and stop sign to proposed west driveway access
 - c. Added concrete surface for ADA parking area
 - d. Shifted north parking bays to better align with south parking bay (based on change in site layout from deleting the east driveway and access road)
 - e. Added replacement curb & gutter at driveway entrance to west of site (to be demolished and removed as part of the project).
 - f. Added 4' high safety fence along retaining wall at back of site
2. Sheet C3.01
 - a. Show proposed connection to gas supply line on north side of Grants Mill Road
 - b. Delete light pole proposed for east driveway and access road
 - c. Adjust locations for underground electrical and telecom conduits
3. Sheet C4.01
 - a. Adjustments to access drive grading (based on change in layout from deleting the east driveway and access road)
4. Sheet C5.01
 - a. Relocated detention outfall to connect with existing stormwater system
 - b. Added HDPE storm drain line behind building

SPECIFICATIONS

1. Section 04 21 13.13 Brick Veneer Masonry
 - a. Approved as Alternate: Henry Brick- Modular, "Alabaster"
 - b. Mortar:
 - i. Basis of Design: Cemex "Antique Buff"
 - ii. Approved Alternate: Southern "Ivory Beige"
2. Section 04 72 00 Cast Stone Masonry
 - a. Approved as Alternate: Native Custom Stone- "#20 Autumn Blend" (Ledge)

3. Section 06 41 16 Plastic Laminate Faced Architectural Cabinets
 - a. Add Stevens Industries 1200 Series Particleboard core casework as approved alternate.
4. Section 12 93 13 - Bike Racks: See attached specification.
5. Section 12 93 23 – Trash and Litter: See attached specification.
6. Section 12 93 43.13 – Benches: See attached specification.
7. Section 32 84 00 – Irrigation: See attached specification.

REQUEST FOR INFORMATION/CLARIFICATIONS

1. Provide glazing schedule to match glazing types listed in 088000 spec.
Response: Exterior Glazing typically to be Type IG-1; Exterior Single Vision Glazing to be IGS1; Interior Vision glazing (not required to be safety rated) to be S-1; Interior Safety Glazing to be S-3
2. Please confirm if these “prefinished metal canopies” are to be standard Kawneer sunshades and are to connect into the curtainwall system.
Response: No canopies provided under the 107316 specification. Finish to match curtain wall.
3. Provide sizes for grab bars and vertical grab bars. No sizes listed in Specs or Drawings.
Response: Grab bar sizes are shown on sheet A10.01. Top of the page with all typical mounting heights.
4. Sanitary Napkin Disposal - are sanitary napkin disposals required in bathrooms 110 & 214.
Response: Not required in single toilets.
5. I see there are 2 colors listed on the information I was given, Coal and Gilded Grain. Which colors are going on what areas?
Response: Gilded Grain on all ceiling/soffit applications. Coal for exterior siding applications.
6. Does the soffit areas need to be vented for intake?
Response: Soffits are not vented.
7. Provide a spec for the stainless steel backsplash.
Response: Stainless steel backsplash at janitor sink to be equal to a 304 stainless steel finish, medium-duty (22ga.) sheet material. Provide panels at both walls above janitor sink, for width of sink.
8. In the Restrooms 202A and 202B, the room finish schedule has wall tile on 3 walls but A10.01 detail 1, only shows wall tile on 2 walls. Please Clarify which is correct.
Response: Wall tile should continue on the project east face of the partition beside the lavatories and on all faces of the partition separating the lavatory counter from the urinal/toilet area.
9. Sheet A4.11 calls for Meeting Room 102 to Receive ACP-1 acoustical ceiling panels. It says to see reflected ceiling plan and schedule. There are no specifications or schedules provided for ACP-1. Please advise.
Response: Sheet A4.11 is incorrect. Refer to RCP.
10. At Entry 100, the wall panel details call for fry reglet reveals to be powder coated black. There are minimum orders for this that far exceeds what is needed. Is there an alternative? Clear anodized is the other possibility.
Response: Clear Anodized is approved.
11. Please verify if CAD files can be provided to the Contractor free of charge after the project award. If not, please include associated cost that would be applied.
Response: CAD base plans are provided free of charge, we only require a waiver to be signed by the GC. CAD plans will not be provided prior to bid.
12. Confirm downspout sizes.
Response: Downspouts to be 4"x5"

13. Appliance for room 112 are listed as owner purchased and owner installed. Who purchases the appliances for room 109. Who Installs? **Response: Appliances in Room 109 will also be Owner provided/Owner installed.**
14. Room 101: 1x2 painted wood trim is showing on interior elevation 2/A11.01. The limits of this trim are not noted on the floor plans (A2.01 & A2.10). The limits of this trim is also not shown on the building sections. This trim is not shown on the finish legend an A4.11. What is the spec for this painted wood trim? Where are all locations that are required to receive this wood trim? **Response: The limits are as shown on 2/A11.01. Intent is to terminate the wallcovering as shown, rather than extend the full height of the wall. Provide paint grade wood trim.**
15. WD-1 for the west wall in entry 100: There is a detail for this wall on 1/A11.01. However the limits of this wall are not noted on the floor plans (A2.01 & A2.10). The limits of this wall are not shown on the building sections (See A7.02). Is the detail shown on 1/A11.01 the exact dimensions we will be needing for the Plyboo linear line wood wall? **Response: Yes, extents as shown on 1/A11.01**
16. Can you advise who is to provide/install the following:
- a. Cubicle Curtain Track - shown on A12.01. **GC provided and installed.**
 - b. Projector & Projector Screen - Shown on 12.10.C. **GC provided and installed.**
 - c. Automated External Defibrillator - shown on LS.1. **GC provided and installed.**
17. Vesta Steel Soffits: Please provide a detail of how they attach to the outside of the building on the exterior soffits. Please provide a detail of how they attach to the interior steel trusses. **Response: Provide 1-1/2" furring channels both interior and exterior, as req'd for adequate fastening per manufacturer recommendations. At soffits over 24" deep provide channel at center of soffit span for nailing support. Provide J-channels at ends.**
18. Please clarify operation/door hardware for Door 100, and 100A (Hardware Set 1.0). **Response: Hardware for doors 100 and 100A to be provided under specification 08 71 13 Automatic Door Operators for swinging doors.**
19. Spec Section 08 71 13 mentions automatic door opener, is this part of the storefront package or is the automatic door opener by others? **Response: It is included as part of the storefront package. It is supplied by an entrance systems installer.**
20. ACP-1. Please provide a spec for ACP-1 in Meeting Room 102. **Response: ACP-1 to be equal to Feltworks by Armstrong. 48" x 96" panels typical; Color to be determined. Edges: square; Mounted to suspended Armstrong Drywall grid or equivalent.**
21. Acoustical Wall Panels - AWP-1: On walls – At Entry 100 (Across from Circulation Desk). Spec: Momentum. Collection: Pin Drop. Pattern Crosscut. Color: Iron (1/2" Rigid decorative). Include .57" Ecoustic Edging Trim. Provide Outside Edges. – See finish legend A4.11. See also 1/A11.03. There is a detail for this wall on 1/A11.03. However the limits of this wall are not noted on the floor plans (A2.01 & A2.10). The limits of this wall are not shown on the building sections (See A7.02) or in the interior elevations. Please provide an interior elevation showing this product. **Response: Should refer to Room 201, not 100. See interior elevation 9/A11.03 for extents.**

END OF ADDENDUM NO. 4

Attachment 1: Specification Sections: 129313 Bike Racks; 129323 Trash and Litter; 129343.13 Benches; and 328400 Irrigation

Attachment 2: Cut sheet for Bollard

Attachment 3: Full size sheets: C2.01, C3.01, C4.01, and C5.01



SECTION 12 93 13 BICYCLE RACKS

PART 1 GENERAL**1.1 SECTION INCLUDES**

- A. Bicycle Rack.

1.2 REFERENCES

A. ASTM Testing Standards:

1. ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.
2. ASTM D 522 – Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
3. ASTM D 523 – Standard Test Method for Specular Gloss.
4. ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
5. ASTM D 3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
6. ASTM D 3363 – Standard Test Method for Film Hardness by Pencil Test.
7. ASTM G 155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.

B. ISO Testing Standards:

1. ISO 1520 – Paints and Varnishes – Cupping Test.
2. ISO 2815 – Paints and Varnishes – Buchholz Indentation Test.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.
- B. Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.
- C. Samples: Submit manufacturer's samples of materials, finishes, and colors.
- D. Warranty: Manufacturer's standard warranty.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged in manufacture of site furnishings since 1969.
- B. Product Support: Products are supported with complete engineering drawings and design patents.
- C. Base Worth: An installed base of products worth in excess of one hundred million dollars.
- D. Assets: Excess of twenty million dollars in assets.
- E. Production: Orders are filled within a 40-day schedule.
- F. Facility Operator: Welders and machine operators are certified.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.
- C. Handling: Protect materials and finish during handling and installation to prevent damage.

1.6 **WARRANTY**

- A. Warranty Information:
 - Products will be free from defects in material and/or workmanship for a period of three years from the date of invoice.
 - The warranty does not apply to damage resulting from accident, alteration, misuse, tampering, negligence, or abuse.
 - Landscape Forms, Inc. shall, at its option, repair, replace, or refund the purchase price of any items found defective upon inspection by an authorized Landscape Forms service representative.
 - Purchasers should be aware that normal use of these high quality products can result in superficial damage affecting the finish. Scratches, nicks, and dents are to be considered normal wear and tear, and are not the responsibility of the manufacturer.

PART 2 PRODUCTS

2.1 **MANUFACTURER**

- A. Landscape Forms, Inc., 7800 E. Michigan Ave, Kalamazoo, Michigan 49048.
Phone: (800) 521-2546. Fax (269) 381-3455. Website www.landscapeforms.com
E-mail: specify@landscapeforms.com
*OR APPROVED EQUAL

2.2 **BICYCLE RACKS**

- A. "Loop" Bicycle Rack
- B. Mounting:
 - 1. Embedded

2.3 **MATERIALS**

- A. Frame: Aluminum Casting – A356 ASTM B108 or A360 ASTM B108 & LFI 7.4.2-A1.
- B. Embedded Hardware Pack: (4) 5/16-18 UNC-2A fully threaded rods, 4" length, with Magni-coat.

2.4 **RECYCLED CONTENT**

- A. Loop Bicycle Rack:
 - Post-consumer: 97%; Pre-consumer: 2%; Recyclable: 100%

2.5 **FABRICATION**

- A. Shop assembled bicycle rack.

2.6 **FINISHES**

- A. Finish on Metal: Landscape Forms, Inc. "Pangard II".

1. Primer: Rust inhibitor.
2. Topcoat: Thermosetting TGIC polyester powder coat. UV, chip, and flake resistant.
3. Test Results: "Pangard II".
 - a. Gloss Consistency, Gardner 60 Degrees, ASTM D 523: Plus or minus 5 percent from standard.
 - b. UV Resistance, Color and Gloss, ASTM G 155, Cycle 7: Delta E less than 2 at 2.0 mils and less than 20 percent loss.
 - c. Cross-Hatch Adhesion, ASTM D 3359, Method B: 100 percent pass.
 - d. Flexibility Test, Mandrel, ASTM D 522: 3 mm at 2 mils.
 - e. Erichsen Cupping, ISO 1520: 8 mm.
 - f. Impression Hardness, Buchholz, ISO 2815: 95.
 - g. Impact Test, ASTM D 2794: 60 inch-pounds at 2.5 mils.
 - h. Pencil Hardness, ASTM D 3363: 2H minimum.
 - i. Corrosion Resistance, 1,500-Hour Test, ASTM B 117: Max undercutting 1 mm.
 - j. Humidity Resistance, 1,500-Hour Test, ASTM D 2247: Max blisters 1 mm.

Specifier Notes: Specify color of metal. Consult Landscape Forms, Inc. for selection of standard colors and availability of custom colors.

4. Color: BLUE ASH

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive racks.
- B. Notify Architect of conditions that would adversely affect installation or subsequent use.
- C. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install level.
- C. Anchor securely in place.

3.3 ADJUSTING

- A. Finish Damage: Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- B. Component Damage: Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.4 CLEANING

- A. Clean rack promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that could damage finish.

3.5 PROTECTION

- A. Protect installed racks to ensure that, except for normal weathering, racks will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 12 93 23 TRASH AND LITTER RECEPTORS

PART 1 GENERAL**1.1 SECTION INCLUDES**

- A. Litter receptacles.

1.2 REFERENCES

- A. ASTM Testing Standards:
1. ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.
 2. ASTM D 522 – Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
 3. ASTM D 523 – Standard Test Method for Specular Gloss.
 4. ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
 5. ASTM D 2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
 6. ASTM D 3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
 7. ASTM D 3363 – Standard Test Method for Film Hardness by Pencil Test.
 8. ASTM G 155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.
- B. ISO Testing Standards:
1. ISO 1520 – Paints and Varnishes – Cupping Test.
 2. ISO 2815 – Paints and Varnishes – Buchholz Indentation Test.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.
- B. Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.
- C. Samples: Submit manufacturer's samples of materials, finishes, and colors.
- D. Warranty: Manufacturer's standard warranty.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged in manufacture of site furnishings since 1969.
- B. Product Support: Products are supported with complete engineering drawings and design patents.
- C. Base Worth: An installed base of products worth in excess of one hundred million dollars.
- D. Assets: Excess of twenty million dollars in assets.
- E. Production: Orders are filled within a 40-day schedule.
- F. Facility Operator: Welders and machine operators are certified.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.
- C. Handling: Protect materials and finish during handling and installation to prevent damage.

1.6 **WARRANTY**

- A. Warranty Information:
 - Products will be free from defects in material and/or workmanship for a period of three years from the date of invoice.
 - The warranty does not apply to damage resulting from accident, alteration, misuse, tampering, negligence, or abuse.
 - Landscape Forms, Inc. shall, at its option, repair, replace, or refund the purchase price of any items found defective upon inspection by an authorized Landscape Forms service representative.
 - Purchasers should be aware that normal use of these high quality products can result in superficial damage affecting the finish. Scratches, nicks, and dents are to be considered normal wear and tear, and are not the responsibility of the manufacturer.

PART 2 PRODUCTS

2.1 **MANUFACTURER**

- A. Landscape Forms, Inc., 7800 E. Michigan Ave, Kalamazoo, Michigan 49048.
Phone: (800) 521-2546. Fax (269) 381-3455. Website www.landscapeforms.com
E-mail: specify@landscapeforms.com
*OR APPROVED EQUAL

2.2 **TRASH AND LITTER RECEPTORS**

- A. "FGP" Litter Receptacle
- B. Style:
 - 1. Side opening unit
- C. Mounting:
 - 1. Freestanding/surface mount: Non-corrosive anchoring hardware not included.

2.4 **MATERIAL**

- A. Lid and top ring: A356 or A360 cast aluminum
- B. Side panel:
 - 1. Wood for Exterior Use:
Domestically sourced thermally modified ash.
 - 2. Wood for Interior Use:
Domestically sourced thermally modified ash.
- C. Liner: Rotationally molded linear low density polyethylene. Color is black.
- D. Base: Rotationally molded linear low density polyethylene. Color is black. Base is filled with concrete for stability.

- E. Hardware: Wood slats are attached to base and top ring with carbon steel with Magni-coated hardware.
- F. Hinge: 5mm D-profile shaft with M4 hex head set screw, both are carbon steel with Magni-coat.
- G. Lid bumpers: Nylon 6/6. Color is gray.

2.5 RECYCLED CONTENT

	Post-Consumer Content	Pre-Consumer Content
Side opening litter, jarrah	0%	50%

Unit is 100% recyclable.

2.6 FABRICATION

- A. Shop assembled litter receptacles.

2.7 FINISHES

- A. Finish on metal: Landscape Forms, Inc. "Pangard II".
 - 1. Primer: Rust inhibitor.
 - 2. Topcoat: Thermosetting polyester powdercoat. UV, chip, and flake resistant.
 - 3. Test Results: "Pangard II".
 - a. Gloss, Garner 60 Degrees, ASTM D 523: Plus or minus 5.
 - b. UV Resistance, Color and Gloss, ASTM G 155, Cycle 7: Delta E less than 2 at 2.0 mils and less than 20 percent loss.
 - c. Cross-Hatch Adhesion, ASTM D 3359, Method B: 100 percent pass.
 - d. Flexibility Test, Mandrel, ASTM D 522: 3 mm at 2 mils.
 - e. Erichsen Cupping, ISO 1520: 8 mm.
 - f. Impression Hardness, Buchholz, ISO 2815: 95.
 - g. Impact Test, ASTM D 2794: 60 inches/pound at 2.5 mils.
 - h. Pencil Hardness, ASTM D 3363: 2H minimum.
 - i. Corrosion Resistance, 1,500-Hour Test, ASTM B 117: Max undercutting 1 mm.
 - j. Humidity Resistance, 1,500-Hour Test, ASTM D 2247: Max blisters 1 mm.
 - 4. Color: ASH
- B. Finish on Wood:
 - 1. Wood for Exterior Use: Unfinished.
 - 2. Wood for Interior Use: Finished with "LF-80" catalyzed lacquer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive litter receptacles.
- B. Notify Architect of conditions that would adversely affect installation or subsequent use.
- C. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. Install litter receptacles in accordance with manufacturer's instructions at locations indicated on the Drawings.

- B. Install litter receptacles level and plumb.
- C. Anchor litter receptacles securely in place, if required.

3.3 ADJUSTING

- A. Finish Damage: Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- B. Component Damage: Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.4 CLEANING

- A. Clean litter receptacles promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that could damage finish.

3.5 PROTECTION

- A. Protect installed litter receptacles to ensure that, except for normal weathering, receptacles will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 12 93 43.13 BENCHES

PART 1 GENERAL**1.1 SECTION INCLUDES**

- A. Benches

1.2 REFERENCES

A. ASTM Testing Standards:

1. ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.
2. ASTM D 522 – Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
3. ASTM D 523 – Standard Test Method for Specular Gloss.
4. ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
5. ASTM D 2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
6. ASTM D 3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
7. ASTM D 3363 – Standard Test Method for Film Hardness by Pencil Test.
8. ASTM G 155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.

B. ISO Testing Standards:

1. ISO 1520 – Paints and Varnishes – Cupping Test.
2. ISO 2815 – Paints and Varnishes – Buchholz Indentation Test.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.
- B. Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.
- C. Samples: Submit manufacturer's samples of materials, finishes, and colors.
- D. Warranty: Manufacturer's standard warranty.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged in manufacture of site furnishings since 1969.
- B. Product Support: Products are supported with complete engineering drawings and design patents.
- C. Base Worth: An installed base of products worth in excess of one hundred million dollars.
- D. Assets: Excess of twenty million dollars in assets.
- E. Production: Orders are filled within a 40-day schedule.
- F. Facility Operator: Welders and machine operators are certified.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.
- C. Handling: Protect materials and finish during handling and installation to prevent damage.

1.6 WARRANTY

- A. Warranty Information:
 - Products will be free from defects in material and/or workmanship for a period of three years from the date of invoice.
 - The warranty does not apply to damage resulting from accident, alteration, misuse, tampering, negligence, or abuse.
 - Landscape Forms, Inc. shall, at its option, repair, replace, or refund the purchase price of any items found defective upon inspection by an authorized Landscape Forms service representative.
 - Purchasers should be aware that normal use of these high quality products can result in superficial damage affecting the finish. Scratches, nicks, and dents are to be considered normal wear and tear, and are not the responsibility of the manufacturer.

PART 2 PRODUCTS**2.1 MANUFACTURER**

- A. Landscape Forms, Inc., 7800 E. Michigan Ave, Kalamazoo, Michigan 49048.
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E-mail: specify@landscapeforms.com
*OR APPROVED EQUAL

2.2 BENCHES

- A. "FGP Benches
 - 1. Style:
 - a. Backless:
 - 2. Length:
 - a. 70 inches
 - 3. Mounting:
 - a. Surface mount

2.3 MATERIALS

- A. Seat and back panels:
 - 1. Wood for Exterior Use:
 - a. Domestically sourced thermally modified ash.
 - 2. Wood for Interior Use:
 - a. Domestically sourced thermally modified ash.
- B. Frame, Legs, and Arms: end supports, seat straps: Aluminum casting.
 - 1. Anodized: AC7A or AL535 alloy

2. Powdercoated: A360 alloy
- C. Mounting: Corrosion resistant, provided by the manufacturer.
 1. Footpads: polypropylene, color is black.
 2. Surface mount bolts: Custom bolt has 5/8-11 x 3/4" length thread, with Magni-coat secured to end frame with carbon steel M6-1 hex drive set screw with Magni-coat.
 3. Embedded rods: M8 x 1.25 x 100mm threaded rods, with Magni-coat.

2.4 ACCESSORIES

- A. Anchor Bolts: Corrosion resistant, provided by the manufacturer.

2.5 RECYCLED CONTENT

	Post-Consumer Content	Pre-Consumer Content
Backless, 70in, jarrah	1%	8%

All units are 100% recyclable.

2.6 FABRICATION

- A. Assembly: Shop assembled benches.

2.7 FINISHES

- A. Finish on metal: Landscape Forms, Inc. "Pangard II".
 1. Primer: Rust inhibitor.
 2. Topcoat: Thermosetting polyester powdercoat. UV, chip, and flake resistant.
 3. Test Results: "Pangard II".
 - a. Gloss, Garner 60 Degrees, ASTM D 523: Plus or minus 5.
 - b. UV Resistance, Color and Gloss, ASTM G 155, Cycle 7: Delta E less than 2 at 2.0 mils and less than 20 percent loss.
 - c. Cross-Hatch Adhesion, ASTM D 3359, Method B: 100 percent pass.
 - d. Flexibility Test, Mandrel, ASTM D 522: 3 mm at 2 mils.
 - e. Erichsen Cupping, ISO 1520: 8 mm.
 - f. Impression Hardness, Buchholz, ISO 2815: 95.
 - g. Impact Test, ASTM D 2794: 60 inches/pound at 2.5 mils.
 - h. Pencil Hardness, ASTM D 3363: 2H minimum.
 - i. Corrosion Resistance, 1,500-Hour Test, ASTM B 117: Max undercutting 1 mm.
 - j. Humidity Resistance, 1,500-Hour Test, ASTM D 2247: Max blisters 1 mm.
- B. Finish on aluminum components:
 1. Clear anodized
 2. Powdercoat
 - a. Color: ASH
- C. Finish on Wood:
 1. Wood for Exterior Use: Unfinished.
 2. Wood for Interior Use: Finished with "LF-80" catalyzed lacquer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Site Examinations: Examine areas to receive benches.

1. Verify that substrates are stable and capable of supporting the weight of items covered under this section.
2. Verify that substrates have been adequately prepared to securely anchor those items that will be surface mounted.
3. Notify Architect of conditions that would adversely affect installation or subsequent use.
4. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. Install benches in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install benches on hard level surface.

3.3 ADJUSTING

- A. Finish Damage: Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- B. Component Damage: Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.4 CLEANING

- A. Clean benches promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that could damage finish.

3.5 PROTECTION

- A. Protect installed benches to ensure that, except for normal weathering, benches will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 328400 – IRRIGATION 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. Irrigation Systems
- B. Related Sections include the following:
 - 1. 328413.00 – Drip Line
 - 2. 328423.01 – Automatic Control
 - Valves 3. 328423.02 – Sprinklers
 - 4. 328423.03 – Quick Couplers

1.3 DEFINITIONS

- A. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.4 PERFORMANCE REQUIREMENTS

- A. Irrigation zone control shall be automatic operation with controller and automatic control valves.
- B. Location of automatic control valves: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Wiring Diagrams: For power, signal, and control wiring.
- C. Coordination Drawings: Irrigation systems, drawn to scale, on which components are shown and coordinated with each other, using input from Installers of the items involved. Also include adjustments necessary to avoid plantings and obstructions such as signs and light standards.
- D. Qualification Data: For qualified Installer.
- E. Zoning Chart: Show each irrigation zone and its control valve.
- F. Field quality-control reports.
- G. Operation and Maintenance Data: For automatic control valves to include in operation and maintenance manuals.

- H. Warranties for each component warranted by manufacturer.

1.6 QUALITY ASSURANCE

- A. **Installer Qualifications:** The automatic control valves shall be installed in accordance with the manufacturer's published instructions. The automatic control valves shall carry a warranty as advertised by Hunter Industries Incorporated for the specific series shown on the drawings. The automatic control valve(s) shall be the Pro-ASV, PGV, ICV, ICV Filter Sentry, or IBV Filter Sentry series as manufactured by Hunter Industries Incorporated, San Marcos, California. See Drawings.
- B. **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.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver automatic control valves with factory-applied identification. Provide shipping, storage, and handling to prevent damage and to prevent entrance of dirt, debris, and moisture.
- B. Store plastic valves protected from direct sunlight.
- C. Store products as recommended by Hunter Industries, Inc.

1.8 WARRANTIES

- A. **Warranties:** Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within manufacturer's specified warranty period for each component.

PART 2 - DRIP LINE

1.1 GENERAL

- A. **Description:** Hunter PLD Dripline with pressure-compensating dual-layered inline emitters. PLD for sub-surface application with dripline emitters designed to protect the emitter from root intrusion without chemicals. Emitter spacing and dripline row spacing should be indicated on construction drawings.
- B. Refer to manufacturer's recommendation regarding spacing and precipitation rate base on soil profile. (see catalog)
 - 1. PLD-04-12; 0.4 GPH emitters spaced 12" on-center
 - 2. PLD-04-18; 0.4 GPH emitters spaced 18" on-center
 - 3. PLD-04-24; 0.4 GPH emitters spaced 24" on center
 - 4. PLD-06-12; 0.6 GPH emitters spaced 12" on center
 - 5. PLD-06-18; 0.6 GPH emitters spaced 18" on center
 - 6. PLD-06-24; 0.6 GPH emitters spaced 24" on center
 - 7. PLD-1-12; 1.0 GPH emitters spaced 12" on-center
 - 8. PLD-1-18; 1.0 GPH emitters spaced 18" on-center

9. PLD-1-12; 1.0 GPH emitters spaced 24" on center
- C. Accepts Hunter PLD-LOC compression fittings and 17mm barb fittings. Operating pressure range of 15 to 50 psi. Operating emitter flow rates of 0.4, 0.6 and 1.0 GPH. Emitter spacing of 12, 18 or 24 inches. Shall be manufactured by Hunter Industries, San Marcos, CA.
- D. Drip zone Eco-Indicators are to be installed close to the end of each zone in an inconspicuous location and noted on the as-built drawing. Eco-Indicator is designed to open at 12 psi, confirming normal pressure and flow are present. Shall be manufactured by Hunter Industries, San Marcos, CA.

PART 3 - AUTOMATIC CONTROL VALVES

1.1 Plastic and brass, Automatic Control Valves:

- A. Manufacturer: Subject to compliance with requirements, provide products by the following:
1. Hunter Industries Incorporated. (or approved equal)
- B. Description: Molded-plastic body (brass for IBV series), normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid for residential and Commercial/institutional applications.
- C. PGV Valves:

The valve shall be a normally closed, electronically-actuated, diaphragm-operated, remote-control valve. The valve will be capable of operating between 20 and 150 PSI (bars; kPa) with a flow range of between 20 and 120 GPM (m^3/hr ; l/m). Pressure loss shall be 3 PSI (bars; kPa) maximum at 40 GPM (m^3/hr ; l/m).

The valve shall be available in either a globe or angle configuration in the 1-inch models with the 1-1/2- and 2-inch models having combination globe/angle body styles. All valve models will have Female National Pipe Thread (FNPT) inlets and outlets. When specified, the valve shall be configured with British Standard Pipe threads. An optional Male National Pipe Thread (MNPT) inlet and outlet model and a MNPT inlet by Poly Barb outlet model shall be available in the 1" globe style body. Both the 1-inch globe and angle valve models shall be available with an optional, non-rising stem-type, flow control mechanism. This mechanism will be operable with a slotted screwdriver or with a removable flow control handle.

The body and bonnet shall be molded of non-corrodible PVC, rated to 150 PSI (10.3 bars, 1034 kPa). The bonnet bolts shall be serviceable with a slotted screwdriver, Phillips screwdriver, or a hex wrench, and shall be held captive in the bonnet when the bonnet is removed from the valve body. The diaphragm assembly shall be of molded construction and shall have a Santoprene seating material. The valve shall be equipped with an internal filter as well as a self-cleaning metering rod, so only clean water can enter the solenoid chamber.

The valve shall be available with an optional adjustable pressure-regulating

device with a calibrated dial for setting of the outlet pressure. (The regulator shall be capable of adjusting the outlet pressure from between 20 and 100 PSI (1.4 to 7.0 bars; 138 to 689 kPa) when inlet pressure is 15 PSI (1.0 bars; 103 kPa) or greater than regulated outlet pressure.) The regulated downstream pressure shall remain constant regardless of variations in upstream pressure. The regulation shall be maintained when valve is manually operated with use of internal bleed valve.

The standard solenoid shall be a 24 VAC unit with a 350 mA inrush current and 190 mA holding current at 60 cycles and a 370 mA inrush current and 210 mA holding current at 50 cycles. When specified, the unit shall be equipped with a DC latching solenoid for use with 12-volt battery-operated controllers. The solenoid shall be an encapsulated, one-piece unit with captive plunger. It shall be equipped with manual internal bleed capability to release the upper chamber water to the downstream piping, allowing the valve to open. The valve shall have a manual bleed screw that provides an additional method for manual operation of the valve.

D. ICZ – 101 Drip Control Zone

The kit shall consist of three factory-assembled parts; the electric valve, the filter body and the regulator assembly.

The valve, filter and pressure regulator assembly will be capable of operating between 20 - 120 PSI (1.4 - 8.8 bar; 140 - 800 kPa) with a flow range of between 2 - 20 GPM / 120 - 1,200 GPH (7 - 75 l/m / 454 - 4,542 l/hr).

The valve shall be a normally closed, electronically-actuated, hydraulic, remote-control valve. The valve shall be equipped with a non-rising stem-type, manual flow control mechanism. This mechanism will be operable by hand that will regulate flow from full on to completely off.

When specified for use with reclaimed water, a reclaimed water identifier handle shall be available.

The standard solenoid shall be a 24 VAC unit with a 350 mA inrush current and 190 mA holding current at 60 cycles and a 370 mA inrush current and 210 mA holding current at 50 cycles.

When specified, the unit shall be equipped with a DC latching solenoid for use with 12-volt battery-operated controllers. The solenoid shall be an encapsulated, one-piece unit with captive plunger. It shall be equipped with manual internal bleed capability to release the upper chamber water to the downstream piping, allowing the valve to open. The valve shall have an external manual bleed screw that provides an additional method for manual operation of the valve.

The body and bonnet shall be molded of non-corrodible, glass-reinforced nylon, rated to 220 PSI (15 bars, 1500 kPa). The body of the valve shall have brass inserts, with through-holes, which will accept the bonnet bolts. The bonnet bolts shall be serviceable with a slotted screwdriver, Phillips screwdriver, or a hex wrench, and shall be held captive in the bonnet when the bonnet is removed

from the valve body. The diaphragm assembly shall be of molded construction, reinforced with nylon fabric and have a thermoplastic elastomer seating material. The valve shall be equipped with an internal filter as well as a self-cleaning metering rod, so only clean water can

enter the solenoid chamber. In addition, the valve shall be equipped with a filter cleaning system that cleans a stainless steel filter each time the valve opens and closes. All metal parts internal to the valve shall be manufactured from corrosion-resistant stainless steel. A perforated diaphragm support ring shall fit into the valve body just below the diaphragm to relieve stress on the diaphragm when the valve is closed.

The valve shall have a 1-inch Female National Pipe Thread (FNPT) inlet and outlet. All valve parts shall be serviceable after installation by unscrewing the bonnet bolts, and removing the bonnet from the valve body to access the internal components. This may be accomplished without removing the valve body from the line.

The filter shall be an in-line configuration. The filter will have a 1-inch Male National Pipe Thread (MNPT) inlet and outlet. The housing shall be molded of non-corrodible PVC, rated to 150 PSI (10.3 bars, 1034 kPa). The filter shall be equipped with a 150 mesh stainless steel filter, so only clean water can be discharged through the regulator. The filter assembly must have removable cap for easy service and cleaning.

The regulator shall be an in-line configuration. The regulator will have a 1-inch Female National Pipe Thread (FNPT) inlet and outlet. The regulator shall be molded of non-corrodible PVC, rated to 150 PSI (10.3 bars, 1034 kPa). The regulator shall be a non-adjustable pressure-regulating device that is factory calibrated for the correct outlet pressure. The regulator shall be capable of reducing the outlet pressure to 25 or 40 PSI (1.7 or 2.8 bar; 170 or 280 kPa) depending on the specified model when the inlet pressure is 15 PSI (1.0 bars; 103 kPa) or greater than the regulated outlet pressure. The regulated downstream pressure shall remain constant regardless of variations in upstream pressure.

The valve, filter and regulator assembly shall be rated for use up to 120 degrees F (49 degrees C). The valve, filter and regulator assembly shall be manufactured by Hunter Industries Incorporated, San Marcos, California.

1.2 PIPES, TUBES, AND FITTINGS

- A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.
- B. PE Pipe with Controlled ID: ASTM F 771, PE 3408 compound; SDR 11.5 and SDR 15.
 1. Insert Fittings for PE Pipe: ASTM D 2609, nylon or propylene plastic with barbed ends. Include bands or other fasteners.

- C. PE Pipe with Controlled OD: ASTM F 771, PE 3408 compound, SDR 11.
 - 1. PE Butt, Heat-Fusion Fittings: ASTM D 3261.
 - 2. PE Socket-Type Fittings: ASTM D 2683.
 - D. PE Pressure Pipe: AWWA C906, with DR of 7.3, 9, or 9.3 and PE compound number required to give pressure rating not less than [160 psig (1100 kPa)] [200 psig (1380 kPa)].
 - 1. PE Butt, Heat-Fusion Fittings: ASTM D 3261.
 - 2. PE Socket-Type Fittings: ASTM D 2683.
 - E. PVC Pipe: ASTM D 1785, PVC 1120 compound, Schedules 40 and 80.
 - 1. PVC Socket Fittings: ASTM D 2466, Schedules 40 and 80.
 - 2. PVC Threaded Fittings: ASTM D 2464, Schedule 80.
 - 3. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.
 - F. PVC Pipe, Pressure Rated: ASTM D 2241, PVC 1120 compound, SDR 21 and SDR 26.
 - 1. PVC Socket Fittings: ASTM D 2467, Schedule 80.
 - 2. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket or threaded ends.
- 1.3 PIPING JOINING MATERIALS
- A. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
 - B. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.
- 1.4 MISCELLANEOUS PIPING SPECIALTIES
- A. Water Hammer Arresters: ASSE 1010 or PDI WH 201, with bellows or piston-type pressurized cushioning chamber and in sizes complying with PDI WH 201, Sizes A to F.
 - B. Pressure Gauges: ASME B40.1. Include 4-1/2-inch- (115-mm-) diameter dial, dial range of two times system operating pressure, and bottom outlet.
 - C. Sleeves: Sleeves for pipes passing beneath paving shall conform to ASTM D2241, Schedule 40. Minimum diameter of 2 inch or 2 sizes larger than pipe scheduled to pass through them.
 - D. PVC Solvent Cement: Cement shall conform to ASTM D2564.
 - E. Swing Joint Connections: Connections between heads and laterals shall be thick wall, flexible, polyethylene pipe with fittings that have male barbs on one end and either male or female screw ends opposite. Glue fittings and female barb adapters are not allowed.
 - F. Provide watertight connectors for valve wiring connections.

- G. Valve boxes shall be provided for each valve installation shown on the plans. No irrigation valve box shall be placed in pavement areas unless otherwise shown on the Drawings.
 - 1. When used with single valve, provide Economy Turf Box with green colored snap fit cover labeled "Valve Box".
 - 2. When used with 2 or more valves, provide Jumbo Box with 20 inch x 14 inch cover opening with cover labeled "Control Valve".
- H. Manual or Automatic drain valves shall be as called out on plan or equal.
- I. Control Wire: Number 14-size minimum copper wire, U. L. approved for underground direct burial.
 - 1. Colored wire shall have same color-coding as shown on controller.
 - 2. Provide single wire from controller to each valve.
 - 3. Provide common neutral from controller to each valve.
- J. Backflow Preventers: Comply with requirements and codes of local governing authority regarding backflow prevention.
 - 1. Provide the necessary materials, insulation/drainage capabilities, and insulated fiberglass enclosure, dark green in color.
 - 2. Backflow preventers shall be type suitable for use in high hazard cross connection to potable water system as manufactured by one of the following manufacturer's: Watts Regulator Company, Febco, or Wilkins.
 - a. Reduced pressure backflow preventers shall be ASSE # 1013 and labeled accordingly.
 - b. Double check valve assembly backflow preventers shall be ASSE # 1015 and labeled accordingly.
 - c. In absence of local codes or requirements, provide double check assembly backflow preventer installed in strict accordance with manufacturer's written instructions.
- K. Meter box shall conform to requirements of local utility company.

1.5 AUTOMATIC CONTROL VALVE INSTALLATION

- A. Install automatic control valves per Hunter Industries, Incorporated written recommendations.
- B. Install control cable in same trench as irrigation piping and at least 2 inches (51 mm) below or beside piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

1.6 CONNECTIONS

- A. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.

- B. Connect wiring between controllers and automatic control valves.

1.7 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification specified in Division 22 Section "Identification for Plumbing Piping and Equipment."
- B. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches. See Division 31 Section "Earth Moving" for warning tapes.

1.8 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 - 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
 - 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Any irrigation product will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

1.9 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Verify that automatic control valves are installed and connected according to the Contract Documents.
 - 3. Verify that electrical wiring installation complies with manufacturer's submittal.

1.10 ADJUSTING

- A. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.

1.11 CLEANING

- A. Flush dirt and debris from piping before installing sprinklers and other devices.

1.12 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain automatic control valves.

PART 4 - SPRINKLER HEADS

- A. Sprinklers with a 1" and larger bottom inlet shall be installed on Hunter swing joints, minimum 3" off inside edge of curbs, drives and sidewalks. Sprinkler with a 3/4" and smaller inlet may be installed using flexible swing joints. Consistency in placement must be maintained throughout the project in all cases.
- B. Low Pop up Sprinkler Heads: Install in such manner that top is flush with finish grade. Where finish grade has not been established extend riser a minimum of twelve (12) inches above existing grade to mark location of head. After finish grade is established install heads at specified height.
- C. High Pop up Shrub Heads: Finish height to be proposed by Irrigation Contractor as a function of plants specified on landscape plans and noted on irrigation design submittal.
- D. Backfill around sprinkler head assembly in such manner as to stabilize the sprinkler head so that no lateral motion occurs during operation.
- E. Sprinkler heads on risers: Utilize a schedule 80 T.O.E. nipple. If greater than 24" height is required, provide fitting in the ground with a solvent weld 90 degree elbow with the appropriate length of pipe glued to it and coming out of the ground to the desired height. Glue male adapter to the riser to allow for the connection of the sprinkler head. Stabilize riser by fastening it to rebar as required. Height of all heads in bed areas to be proposed by Irrigation Contractor as a function of plants specified on landscape plans.
- F. Landscape Drip Line shall be located in a manner that will provide optimum concentration of water to plant material.

PART 5 - PIPES, TUBES, AND FITTINGS

- A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.
- B. PE Pipe with Controlled ID: ASTM F 771, PE 3408 compound; SDR 11.5 and SDR 15.
 - 1. Insert Fittings for PE Pipe: ASTM D 2609, nylon or propylene plastic with barbed ends. Include bands or other fasteners.
- C. PE Pipe with Controlled OD: ASTM F 771, PE 3408 compound, SDR 11.
 - 1. PE Butt, Heat-Fusion Fittings: ASTM D 3261.
 - 2. PE Socket-Type Fittings: ASTM D 2683.
- D. PE Pressure Pipe: AWWA C906, with DR of 7.3, 9, or 9.3 and PE compound number required to give pressure rating not less than [160 psig (1100 kPa)] [200

psig (1380 kPa)].

1. PE Butt, Heat-Fusion Fittings: ASTM D 3261.
2. PE Socket-Type Fittings: ASTM D 2683.

E. PVC Pipe: ASTM D 1785, PVC 1120 compound, Schedules 40 and 80.

1. PVC Socket Fittings: ASTM D 2466, Schedules 40 and 80.
2. PVC Threaded Fittings: ASTM D 2464, Schedule 80.
3. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.

F. PVC Pipe, Pressure Rated: ASTM D 2241, PVC 1120 compound, SDR 21 and SDR 26.

1. PVC Socket Fittings: ASTM D 2467, Schedule 80.
2. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket or threaded ends.

1.1 PIPING JOINING MATERIALS

- A. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
- B. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

1.2 MISCELLANEOUS PIPING SPECIALTIES

- C. Water Hammer Arresters: ASSE 1010 or PDI WH 201, with bellows or piston-type pressurized cushioning chamber and in sizes complying with PDI WH 201, Sizes A to F.
- D. Pressure Gauges: ASME B40.1. Include 4-1/2-inch- (115-mm-) diameter dial, dial range of two times system operating pressure, and bottom outlet.
- E. Sleeves: Sleeves for pipes passing beneath paving shall conform to ASTM D2241, Schedule 40. Minimum diameter of 2 inch or 2 sizes larger than pipe scheduled to pass through them.
- F. PVC Solvent Cement: Cement shall conform to ASTM D2564.
- G. Swing Joint Connections: Connections between heads and laterals shall be thick wall, flexible, polyethylene pipe with fittings that have male barbs on one end and either male or female screw ends opposite. Glue fittings and female barb adapters are not allowed.
- H. Provide watertight connectors for valve wiring connections.
- I. Valve boxes shall be provided for each valve installation shown on the plans. No irrigation valve box shall be placed in pavement areas unless otherwise shown on the Drawings.
 1. When used with single valve, provide Economy Turf Box with green

- colored snap fit cover labeled "Valve Box".
2. When used with 2 or more valves, provide Jumbo Box with 20 inch x 14 inch cover opening with cover labeled "Control Valve".
- J. Manual or Automatic drain valves shall be as called out on plan or equal.
- K. Control Wire: Number 14-size minimum copper wire, U. L. approved for underground direct burial.
1. Colored wire shall have same color-coding as shown on controller.
 2. Provide single wire from controller to each valve.
 3. Provide common neutral from controller to each valve.
- L. Backflow Preventers: Comply with requirements and codes of local governing authority re- guarding backflow prevention.
1. Provide the necessary materials, insulation/draining capabilities, and insulated fiberglass enclosure, dark green in color.
 2. Backflow preventers shall be type suitable for use in high hazard cross connection to po- table water system as manufactured by one of the following manufacturer's: Watts Regulator Company, Febco, or Wilkins.
 - a. Reduced pressure backflow preventers shall be ASSE # 1013 and labeled accordingly.
 - b. Double check valve assembly backflow preventers shall be ASSE # 1015 and labeled accordingly.
 - c. In absence of local codes or requirements, provide double check assembly backflow preventer installed in strict accordance with manufacturer's written instructions.
- G. Meter box shall conform to requirements of local utility company.

PART 6 - EXECUTION

1.1 PREPARATION

- A. Pressure/Flow Test: Perform calculations according to the Irrigation Association's 3-Step Method. Provide written calculations to the Owner including the following site information:
1. Static or residual pressure at the POC.
 2. Calculation of pressure for "worst case" sprinkler head.
 3. Calculation of GPM per zone.
- B. Prior to installation, receive approval from General Contractor to proceed with construction.
- C. Contractor shall field verify all aboveground and underground utilities prior to start of work.

1.2 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

1. Excavate trench to proper depth as shown or specified.
 2. Minimum trench width shall be 3 1/2 inches.
 3. Overexcavate trenches deeper than required in soils containing rock or other hard material that might damage pipe and backfill to proper depth with selected fine earth or sand.
 4. Backfill and hand tamp overexcavation prior to installing piping.
 5. Keep trenches free of obstructions and debris that would damage pipe.
 6. Sprinkler piping shall not be installed in same trench as heating duct, electric ducts, storm and sanitary sewer lines, water and gas mains.
- B. Install warning tape directly above pressure piping, 12 inches (300 mm) below finished grades, except 6 inches (150 mm) below subgrade under pavement and slabs.
- C. Drain Pockets: Excavate to sizes indicated. Backfill with cleaned gravel or crushed stone, graded from 3/4 to 3 inches (19 to 75 mm), to 12 inches (300 mm) below grade. Cover gravel or crushed stone with sheet of asphalt-saturated felt and backfill remainder with excavated material.
- D. Provide minimum cover over top of underground piping according to the following:
1. Irrigation Main Piping: Minimum depth of 36 inches (900 mm) below finished grade, or not less than 18 inches (450 mm) below average local frost depth, whichever is deeper.
 2. Circuit Piping: 12 inches (300 mm).
 3. Drain Piping: 12 inches (300 mm).
 4. Sleeves: 24 inches (600 mm).

1.3 AUTOMATIC CONTROLLER SYSTEM INSTALLATION

- A. Equipment Mounting: Install interior controllers on as indicated on drawings for series shown.
1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
- B. Equipment Mounting: Install exterior freestanding controllers on precast concrete bases or as indicated on drawings.
1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
- C. Install control cable in same trench as irrigation piping and at least 2 inches (51 mm) below or beside piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

1.4 AUTOMATIC CONTROLLER ACCESSORY INSTALLATION

- A. Install all accessories per Hunter Industries, Inc. written recommendations (or approved equal).

1.5 CONNECTIONS

- A. Connect wiring between controllers and automatic control valves.

1.6 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification specified in Division 22 Section "Identification for Plumbing Piping and Equipment."
- B. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.
 - 1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.
- C. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches. See Division 31 Section "Earth Moving" for warning tapes.

1.7 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 - 1. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Any irrigation product will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

1.8 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.

2. Verify that controllers are installed and connected according to the Contract Documents.
 3. Verify that electrical wiring installation complies with manufacturer's submittal.
- 1.9 ADJUSTING
 - A. Adjust settings of controllers.
- 1.10 DEMONSTRATION
 - A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain controllers, accessories and software.

END OF SECTION 328400

DESCRIPTION

The MORANO barrier bollard is available in three heights with a selection of mounting configurations. The simple top cap detail is machined from billet aluminum and press fit to the steel bollard shaft. Steel shaft is hot-dip galvanized prior to being finished in finely textured paint. Mounting variations include embedded, removable, flange mount, and collapsible models. Companion power bollard completes the product family. Standard colors; matte silver grey metallic, dark grey, graphite grey, black, dark bronze. Special RAL colors available. All hardware is stainless steel.

PROTECTED BY




Date: _____ Type: _____ Catalog Number: _____

Project Name: _____

ORDERING INFORMATION

LUMINAIRE			
MODEL	MOUNTING	FINISH	OPTION
MOR600	E Embedded	DG Dark Grey	CH* Chain Holder
MOR900	R Removable	GG Graphite Grey	*Not Available on MOR1200
MOR1200	F Flange	SG Silver Grey	
	G Collapsible	BL Black	
		DB Dark Bronze	
		CC Custom RAL Color	

ACCESSORY	
MODEL	
MOR-BB-RCP	
Cover Plate for Morano barrier bollards with Removable Mounting option	

SPECIFICATIONS

MATERIALS

Straight round bollard shaft is manufactured from cold drawn over mandrel, electric-weld, mechanical round steel tubing with nominal wall thickness of 0.126". Diameter of shaft is 3.9". Steel shaft is hot-dip galvanized prior to painting. Top element is machined from 6082 aluminum and press fit securely into the shaft. Bollard is finished in finely textured paint.

DIMENSIONS

~~MOR600= 23.6" h x 3.3" diameter~~

MOR900= 35.4" h x 3.3" diameter

~~MOR1200= 47.2" h x 3.3" diameter~~

MOUNTING

Bollard is available with four mounting options.

EMBEDDED

Bollard includes additional shaft length of 19.7" for embedment into a concrete foundation (by others).

REMOVABLE

~~Removable bollard includes hot dip galvanized steel insert for embedment into concrete to receive bollard.~~

~~Bollard is installed or removed via key-activated internal steel rod that engages with the insert.~~

FLANGE MOUNT

~~Flange model mounts to concrete foundation by others. Mounting hardware by others.~~

COLLAPSIBLE

~~Similar to removable bollard above except hinged at the base.~~

FINISH

Standard finish is finely textured matte silver grey metallic, dark grey, graphite grey, black, or dark bronze. Special RAL colors on request.

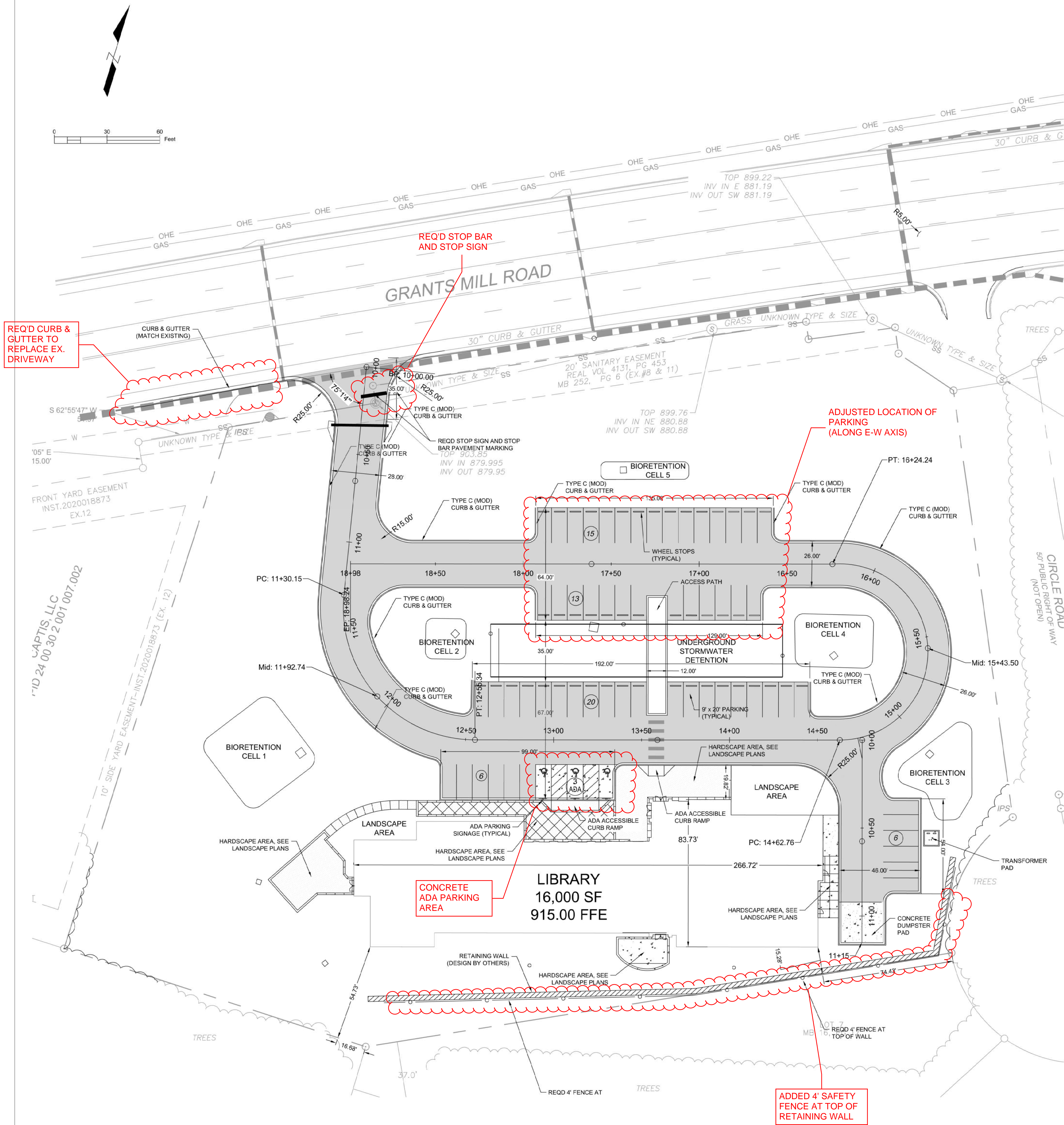
WARRANTY

Limited product warranty period is five years.

DIMENSIONS

All dimensions are shown in inches unless otherwise noted.





PARKING SUMMARY	
STANDARD SPACES	60
ADA SPACES	3
TOTAL	63

SITE NOTES

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PLANS AND SITE WORK SPECIFICATIONS AND SHALL COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES.
- REFERENCE ARCHITECTURAL PLANS FOR BUILDING DIMENSIONS, STEPS, TRANSFORMER PADS, ADDITIONAL SITEWORK, ALTERNATE INFORMATION, etc.
- TOPOGRAPHIC BOUNDARY SURVEY, PROPERTY LINES, LEGAL DESCRIPTION, EXISTING UTILITIES, SITE TOPOGRAPHY WITH SPOT ELEVATIONS, OUTSTANDING PHYSICAL FEATURES, AND EXISTING STRUCTURE LOCATIONS WAS PROVIDED BY SAIN ASSOCIATES. SARCOR, LLC. IS NOT RESPONSIBLE FOR THE ACCURACY.
- ALL DIMENSIONS AND RADII ARE TO THE FACE OF THE CURB UNLESS OTHERWISE NOTED. ALL DIMENSIONS SHOWN TO THE BUILDINGS ARE TO THE OUTSIDE FACE OF BUILDING.
- ALL HANDICAP ACCESSIBLE PARKING SIGNS AND STRIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AMERICANS WITH DISABILITY ACT (ADA).
- ALL TRAFFIC SIGNS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND ALABAMA DEPARTMENT OF TRANSPORTATION STANDARD AND SPECIAL DRAWINGS.
- ALL STRIPED AND CURBED RADII SHALL BE 5' UNLESS OTHERWISE NOTED.
- THE CONTRACTOR IS RESPONSIBLE FOR REPAIR OF ANY DAMAGE TO ANY EXISTING IMPROVEMENTS, ONSITE OR OFF SITE, SUCH AS PAVEMENT, UTILITIES, STORM DRAINAGE, etc. THE REPAIR MUST BE APPROVED BY THE ENGINEER AND BE EQUAL OR BETTER THAN EXISTING CONDITIONS.
- CONTRACTOR SHALL OBTAIN ALL PERMITS BEFORE CONSTRUCTION BEGINS.
- SITE CONTRACTOR SHALL SUPPLY AS-BUILT PLANS INDICATING ALL CHANGES AND DEVIATIONS.
- ANY DEVIATION FROM THESE PLANS MAY CAUSE THE WORK TO BE UNACCEPTABLE.
- ANY UNANTICIPATED CONDITIONS ENCOUNTERED DURING THE CONSTRUCTION PROCESS SHALL BE IDENTIFIED AND THE ENGINEER NOTIFIED IMMEDIATELY.
- CONCRETE USED FOR SIDEWALK AND CONCRETE PADS SHALL BE 3,000 PSI 28 DAY COMPRESSIVE STRENGTH. CONCRETE USED FOR CONCRETE APRONS/DRIVEWAYS SHALL BE 4,000 PSI 28 DAY COMPRESSIVE STRENGTH.
- PROJECT SIGNAGE SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
- ALL CURB AND GUTTER WITHIN THE DEVELOPMENT SHALL BE 18".
- PARKING LOT STRIPING SHALL BE INCLUDED IN THE PAVING CONTRACTOR'S SCOPE OF WORK. STRIPING WILL BE ACCORDING TO OWNER'S SPECIFICATION UNLESS NOTED OTHERWISE. ALL STRIPING IS TO HAVE TWO (2) COATS OF PAINT (MIN).
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY AND ALL OFF SITE EASEMENTS NOT DELINEATED ON THE PLANS OR KNOWN OF AT TIME OF PLAN ISSUANCE.
- THE SITE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL WORK AND APPURTENANCE TO WITHIN 5' OF THE BUILDING. THIS INCLUDES TRANSFORMER AND DUMPSTER PADS AS WELL AS UTILITY CONDUITS.

Revisions		
No.	Date	Description
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PH: 205-250-0700
FAX: 205-250-0515

SHEET TITLE: SITE PLAN	
PROJECT NUMBER: 2022-08	
DATE: 11/16/23	
DRAWN BY: JH/GP	CHECKED BY: JH

SHEET NUMBER C2.01	
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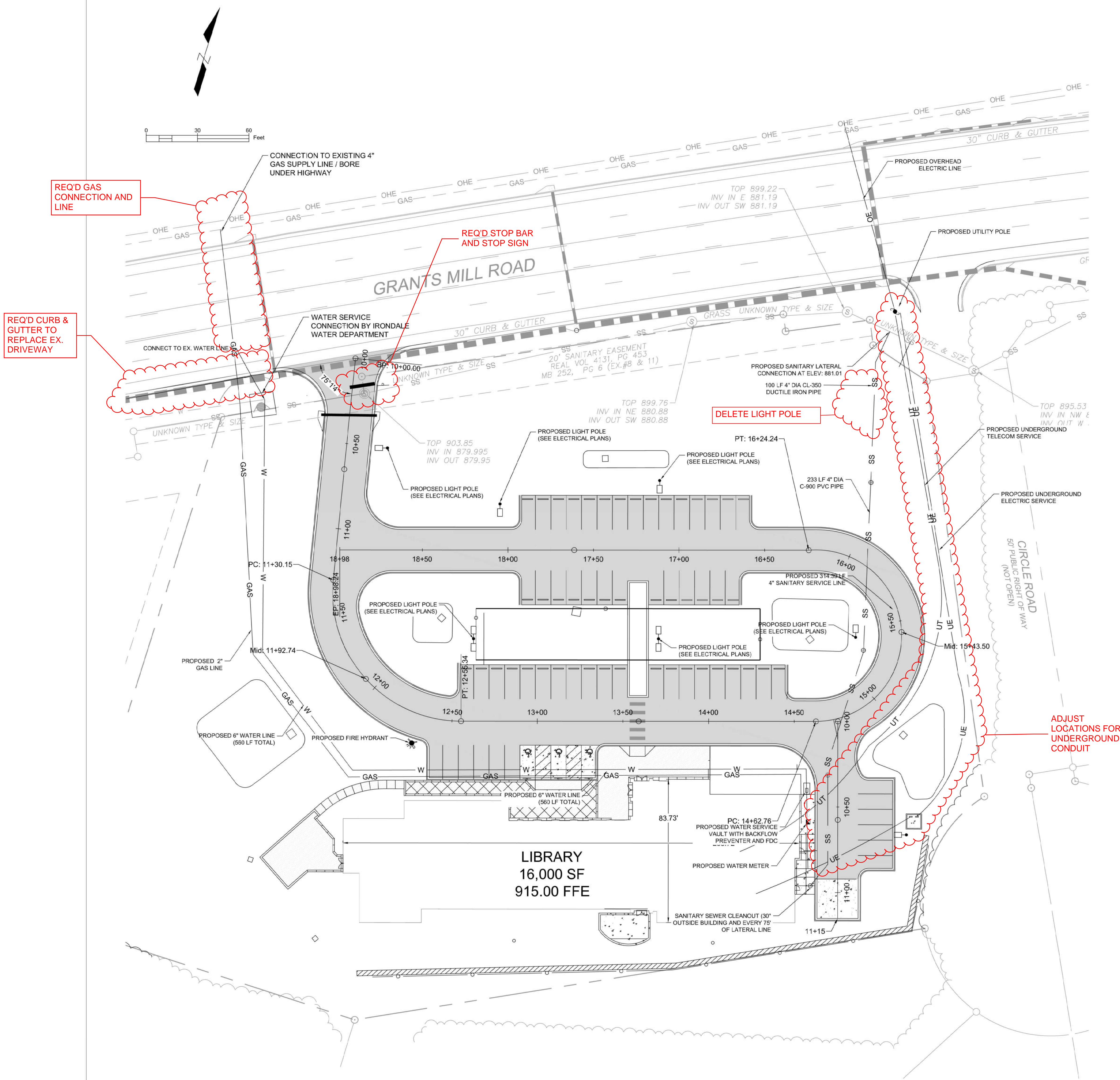
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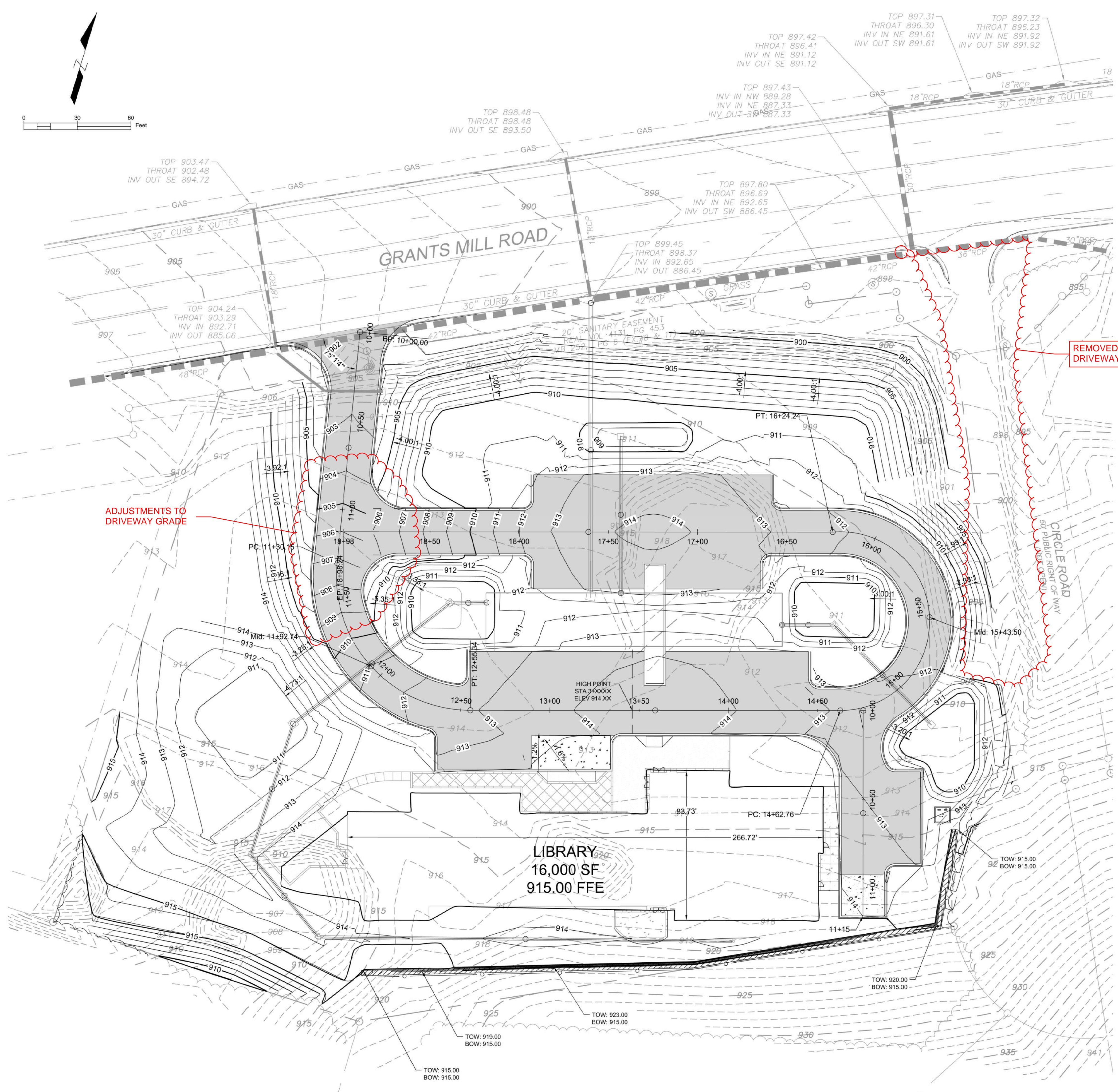
SHEET TITLE: UTILITY PLAN	
PROJECT NUMBER: 2022-08	
DATE: 11/16/23	
DRAWN BY: JH/GP	CHECKED BY: JH

SHEET NUMBER
C3.01

UTILITY NOTES

- UTILITY PROVIDERS' STANDARD SPECIFICATIONS AND DETAILS SHALL GOVERN ALL WATER AND SANITARY SEWER CONSTRUCTION.
- THE BUILDING CONTRACTOR IS RESPONSIBLE FOR COORDINATING LOCATION, SIZE AND SPECIFICATIONS OF ALL ELECTRICAL TRANSFORMER PADS WITH THE LOCAL POWER COMPANY AND PROVIDING SERVICE FROM THE TRANSFORMER TO THE BUILDING.
- CONTRACTOR SHALL COORDINATE ANY DISRUPTIONS TO EXISTING UTILITY SERVICES WITH ADJACENT PROPERTY OWNERS AND IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING UTILITIES DURING CONSTRUCTION AT NO COST TO THE OWNER.
- CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST STANDARDS AND/OR OSHA DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL PROVIDE SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION. THIS IS TO INCLUDE, BUT NOT LIMITED TO ACCESS AND EGRESS FROM ALL EXCAVATION AND TRENCHING. CONTRACTOR IS RESPONSIBLE TO COMPLY WITH PERFORMANCE CRITERIA FOR OSHA.
- SEWER SERVICE LATERALS SHALL BE COORDINATED WITH BUILDING PLANS. ANY DISCREPANCIES SHOULD BE CLARIFIED BEFORE INSTALLATION. SEWER SERVICE LATERALS ARE TO BE PERMANENTLY MARKED ON THE CURB.
- ALL WATER PIPE 4" DIAMETER AND LARGER SHALL BE C900 CLASS 150 PVC WATER PIPE WITH 150 PSI PRESSURE RATING CONFORMING TO AWWA, AND UNIBELL PLASTIC PIPE STANDARD SPECIFICATIONS. FITTINGS 4" AND LARGER SHALL BE CAST IRON OR DUCTILE IRON AND CONFORM WITH WWA STANDARD SPECIFICATIONS.
- ALL WATER PIPE 3" AND SMALLER SHALL BE TYPE K COPPER OF SDR 21 PER ANSI 16.22.
- CONTRACTOR SHALL MAINTAIN A MINIMUM OF 4" COVER OVER ALL WATER LINES.
- CONTRACTOR SHALL COORDINATE INSTALLATION OF WATER SERVICE WITH THE BIRMINGHAM WATER WORKS BOARD (BWWB). CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION, PURCHASE AND/OR FEES AND PERMITS ASSOCIATED WITH ALL APPARATUS INCLUDING: WATER METERS, BACK FLOW PREVENTERS, POST INDICATOR VALVES, AND ENCLOSURES.
- EXISTING UTILITIES ARE APPROXIMATE AND SHOULD BE VERIFIED FOR LOCATION AND NUMBERED BY THE CONTRACTOR.
- ALL ELECTRIC, TELEPHONE, AND GAS LINES, INCLUDING SERVICE LINES ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE APPROPRIATE UTILITY COMPANIES SPECIFICATIONS.
- CONTRACTOR TO COORDINATE INSTALLATION OF ALL UTILITIES BY OTHERS WITH HIS WORK.
- PRIMARY ELECTRIC SERVICE IS PROVIDED BY ALABAMA POWER. THIS INCLUDES THE TRANSFORMER AND PAD, TRENCHING, BACKFILL, AND COMPACTION. CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND FEES ASSOCIATED WITH POWER SERVICE AS WELL AS SECONDARY SERVICE.
- PRIMARY ELECTRIC LINES SHOWN ARE FOR COORDINATION ONLY. EXACT LOCATION WILL BE FIELD DETERMINED DURING CONSTRUCTION.
- ALL SANITARY MANHOLES AND PIPE ARE TO BE FLUSHED CLEAN OF DEBRIS PRIOR TO TURN OVER OF SYSTEM TO OWNER.
- ALL EASEMENTS TO BE PLATTED BY THE CONTRACTOR (UNLESS OTHERWISE NOTED).
- ANY UTILITIES NOT SHOWN THAT REQUIRE RELOCATION OR REMOVAL IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR IS TO REPORT ALL DISCREPANCIES TO THE ENGINEER IMMEDIATELY UPON DISCOVERY.





GRADING NOTES

1. ALL SPOT ELEVATIONS ARE TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF ALL DEBRIS NOT ACCEPTABLE TO THE OWNER AND ENGINEER.
3. IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, THE CONTRACTOR SHALL MAKE A TOPOGRAPHIC SURVEY AT THEIR OWN EXPENSE AND SUBMIT IT TO THE OWNER FOR REVIEW.
4. CONTRACTOR IS RESPONSIBLE FOR NOTIFYING ALL UTILITIES BEFORE CONSTRUCTION AND VERIFYING LOCATION OF ALL UTILITIES SHOWN OR NOT SHOWN.
5. CONTRACTOR SHALL PROVIDE DRAINAGE AWAY FROM THE BUILDINGS.
6. PRECAST STRUCTURES MAY BE USED AT THE CONTRACTORS OPTION.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION AND COST OF THE RELOCATION OF ALL UTILITIES ALONG THE RIGHT OF WAY AND ON THE SITE ASSOCIATED WITH THE CONSTRUCTION OF THIS PROJECT, SUCH AS, BUT NOT LIMITED TO SIGNAL POLES, SIGNAL CONTROLS, DRAINAGE STRUCTURES, TRAFFIC SIGNS, UTILITY POLES, GUY WIRES, AND ETC.
8. THE EARTHWORK FOR ALL BUILDING FOUNDATIONS AND SLABS SHALL BE IN ACCORDANCE WITH ARCHITECTURAL PLANS AND SPECIFICATIONS.
9. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURBS, ETC. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS.
10. ALL SLOPES AND DISTURBED AREAS NOT COVERED BY BUILDING OR PAVEMENT SHALL BE GRADED SMOOTH AND RECEIVE 4" OF TOPSOIL. CONTRACTOR TO PROVIDE TOPSOIL IF NOT AVAILABLE ON SITE. THE AREAS SHALL BE SEEDED, MULCHED, FERTILIZED, AND WATERED TO PROVIDE A HEARTY MOVIABLE STAND GRASS. SMALL ROCKS MUST BE REMOVED. ANY AREA DISTURBED FOR ANY REASON PRIOR TO FINAL ACCEPTANCE OF THE PROJECT SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
11. SPOIL FROM THE FOOTINGS IS THE SITE CONTRACTOR'S RESPONSIBILITY. CONTRACTOR IS TO USE THE SOIL ON SITE OR REMOVE IT FROM THE SITE.
12. EARTHWORK SHALL BE ON AN UNCLASSIFIED BASIS.
13. THIS GRADING PLAN WAS PRODUCED WITH REFERENCE TO THE JUNE 14, 2017 AND DECEMBER 20, 2022 GEOTECHNICAL REPORTS BY BECC, INC.

Revisions		
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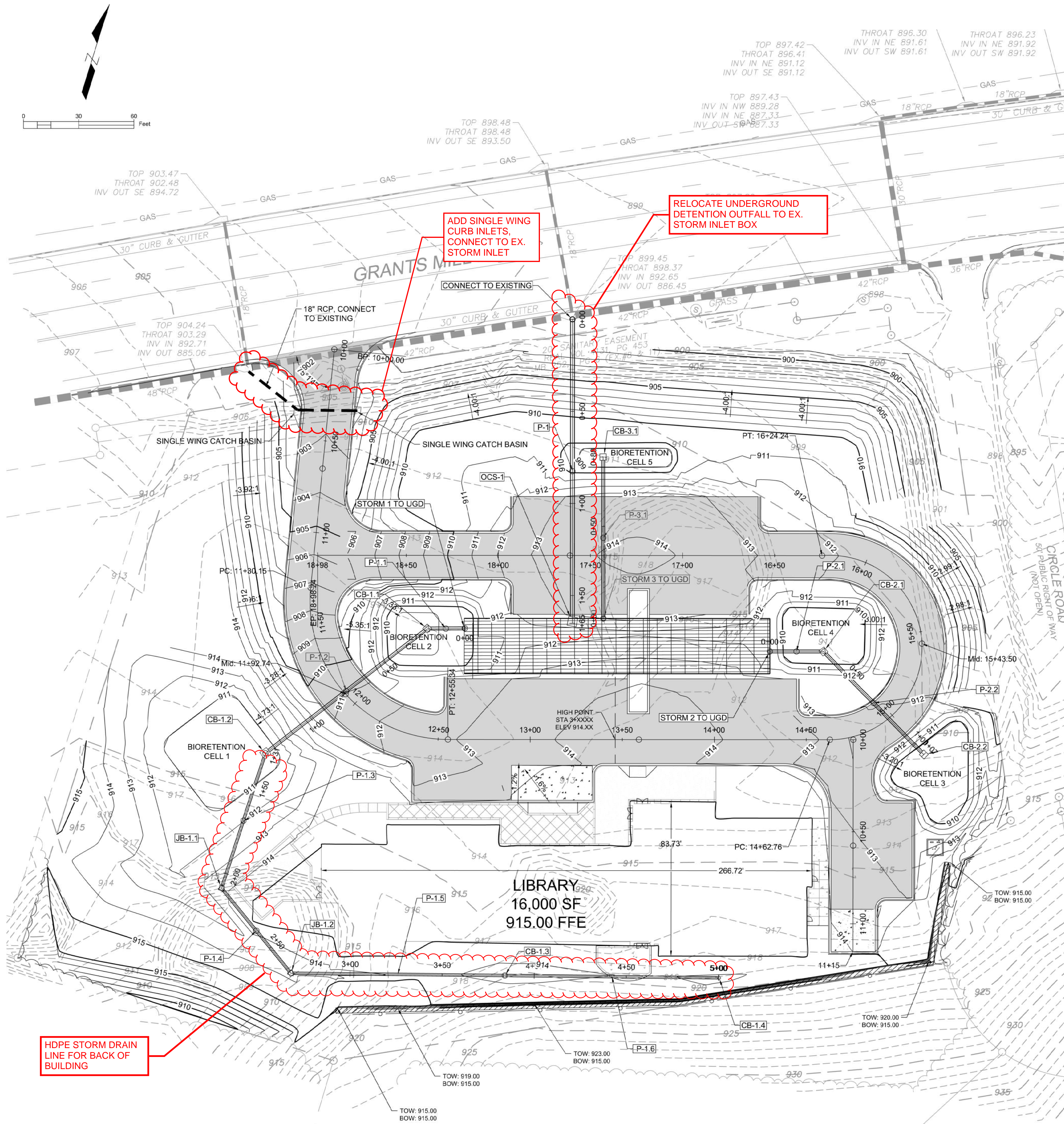
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BIRMINGHAM, ALABAMA 35222
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FAX: 205-250-0515

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C4.01





DRAINAGE NOTES

1. RCP STORM PIPE IN CITY ROW SHALL BE CLASS III PER ASTM C-76. ALL PIPE AND CONNECTIONS AT MANHOLES SHALL BE WATER TIGHT.
2. ANY FILL USED TO INCREASE THE ELEVATION OF THE FLOOR SLAB OR ANY FILL USED AS BACKFILL, SHALL BE CLEAN, GRANULAR MATERIAL. PRIOR TO THE USE OF ANY GRANULAR FILL, GRADATION ANALYSIS SHALL BE PERFORMED ON REPRESENTATIVE SAMPLES OF THE FILL MATERIAL TO DETERMINE WHETHER THE MATERIAL IS SUITABLE AS FILL. COMPACTED FILL SHALL BE PLACED IN LAYERS OF NOT MORE THAN EIGHT INCHES THICKNESS, AT MOISTURE CONTENTS WITHIN TWO PERCENT OPTIMUM, AND COMPACTED TO MINIMUM DENSITY OF 98 PERCENT OF ITS STANDARD PROCTOR (ASTM D 698) MAX DRY DENSITY.
3. CONTRACTOR IS REQUIRED TO DO OWN TESTING ON MATERIAL AND COMPACTION.
4. ALL SYSTEM MANHOLES AND PIPES ARE TO BE FLUSHED CLEAN PRIOR TO TURNING OVER TO THE OWNER.
5. ALL PIPE LENGTHS LISTED ARE BASED ON THE HORIZONTAL DISTANCE FROM CENTER OF STRUCTURE AND USED FOR DESIGN.
6. STORM PIPE WITHIN DEVELOPMENT SHALL BE CLASS III RCP FOR STORM MAINS.

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BIRMINGHAM, ALABAMA 35222
PH: 205-250-0700
FAX: 205-250-0515

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DRAINAGE PLAN	
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DRAWN BY:	CHECKED BY:
JH/GP	JH

SHEET NUMBER

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