WER ARCHITECTS 901 West Third Street Little Rock, Arkansas 72201 / 501.374.5300

ADDENDUM 2

ADDENDUM NO. 2

TO: PROJECT MANUAL AND DRAWINGS

FOR: CENTRAL HOUSE AND GARDEN
606 East Central, Bentonville, AR

October 19, 2026

This addendum forms a part of the Contract Documents and modifies or interprets the Project Manual and Drawings, as noted below. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject bidder to disqualification.

BID DATE: ~~November 3, 2026~~ **OCTOBER 29, 2026**

A. GENERAL:
1. Refer to Procore for Pre-Bid RFI questions and answers. These questions and answers become part of the Contract Documents.
2. See attached **Dirtworks Addendum #02 Narrative**

B. PROJECT MANUAL:

Refer to **Dirtworks Addendum #02 Narrative** for index of specifications sections

B. DRAWINGS:

LANDSCAPE
Refer to **Dirtworks Addendum #02 Narrative** for sheet listing

D. ATTACHMENTS:

1. Drawings (48 sheets)
2. Specifications (161 pages)
3. Dirtworks Addendum Narrative (3 pages)

END OF ADDENDUM NO. 2 (212 pages total)

Dirtworks

ADDENDUM 02

Project Name: 606 Central House & Garden
Bentonville, AR
DWLA Project Number: 31483
Date: 10/19/26

L-000 Cover Sheet

- Date and title
- Geometry changes on site plan
- Added one planting plan sheet, which changed numbering for the others

L-100 Site Plan

- Site geometry adjustments

L-110-115 Tree Protection Series

- All sheets: ROW line added
- All sheets: Tree protection adjusted or removed outside ROW line

L-120-125 Demolition and Removal Series

- All sheets: ROW line added
- All sheets: “Brick Salvage” removed from legend
- L-122 and L-124: “Remove brick pavers typ” changed to “Remove hardscape typ”

L-200-207 Materials Plan Series

- All sheets: Site geometry adjustments
- All sheets: Legend adjusted as shown, concrete swale crossing removed and wooden stepper trail added; numbering updated accordingly across all materials plans
- L-200, L-201:Wooden stepper trail moved from furnishings plan to this series
- L-201: Note on boulder, stump and mulch path layout clarified to LA laying out, not Natural State
- L-201: Fence geometry adjustment
- L-203: Handrail locations added
- L-203: Note about ground hydrant added for clarification, under boardwalk
- L-204: Service drive changed / dumpster area relocated
- L-204: Handrail location added
- L-206: Handrail location added
- L-206: Note about equipment pad added
- L-207: Tree pit added
- L-207: Handrail location added

- L-207: Pavement outside entry extended to replace former stair
- L-207: Vent grates added per architecture

L-210-220 Furnishing Plan Series

- All sheets: Site geometry adjustments
- L-210-214: Outdoor learning bench added to legend, wooden stepper trail and play sculpture removed from legend; numbering adjusted accordingly
- L-210, L-211, L-213, L-216, L-220: Wood stepper path moved to materials series
- L-211: Fence adjustment in NW corner, neon sign location shifted accordingly
- L-212: Bench relocated
- L-213: Note added to clarify Natural State scope
- L-216: Outdoor learning bench added to legend
- L-217: Fenceline adjustment
- L-218: Pot quantity reduced
- L-218: Legend renumbered
- L-219: Pot quantity reduced
- L-219: Legend renumbered
- L-220: Outdoor learning bench added to schedule; other entries renumbered accordingly
- L-220: Park bench quantity reduced by 1
- L-220: Decorative round pot and urn planter quantity reduced

L-230-236 Lighting Plan Series

- All sheets: Site geometry adjustments, and corresponding light fixture location adjustments
- All sheets: Bollard light quantity reduced

L-300-306 Layout Plan Series

- All sheets: Site geometry adjustments, minor updates to dimensions accordingly

L-400-411 Grading Plan Series

- All sheets: Site geometry adjustments, minor updates to grading locations accordingly
- All sheets: The abbreviations “BSL/TSL - Bottom/Top of Slab” added to legend
- L-404: Minor adjustments to spot grades at slab and entry
- L-408: Additional spot grades added to wall for clarity
- L-410: Elevations at Henry St. property line slightly adjusted to align with civil

L-500-505 Soils Plan Series

- All sheets: Site geometry adjustments, minor updates to soil area locations accordingly
- All sheets: Key approximate dimensions added per contractor request, let us know if you need any other specific areas
- L-500, L-501: One area changed from Type B to Type C

L-600-610.x Planting Series (primary)

- All sheets: Site geometry adjustments, updates to planted areas accordingly

- All sheets: Specific plant species were added, removed, and relocated according to geometry adjustments and client direction. The individual plant location changes are far too detailed to show plant-by-plant in a legible way with revision clouds, but we have clouded the legend itself with specific quantity and species changes, and we are also providing a separate schedule comparison sheet for quick reference.
- All sheets: “Under planting at boardwalk (add alt)” removed from legends

L-611-658 Planting Enlargements

- All sheets: To help with identifying plants on these enlargements, we have provided a legend for the symbols on that sheet, and called out the full name for one of each appearing on that sheet. These are obviously very complex planting plans by their nature, and if needed we are happy to discuss additional communication measures to help with identification during installation.

L-660-665 Irrigation Series

- All sheets: Site geometry adjustments, minor updates to irrigation areas accordingly

L-700-717 Site Details

- 3/L-701: Tooled edge removed from joints
- 1/L-702: Stone and weed barrier fabric added under boardwalk. Fence removed underneath boardwalk.
- 2-7/L-702: Expansion joint limited to concrete subgrade slab only
- 8/L-703: Stone and weed barrier fabric added under boardwalk. Fence removed underneath boardwalk.
- 3/L-706: Added footings and stone landings to stone stairs, adjusted base accordingly
- 1/L-707: Removed decorative baluster from railing
- 3/L-707: Trellis size increased to accommodate table and benches
- 4/L-707: Removed decorative baluster from railing
- 5/L-707: Refined historic wall reconstruction detail to accommodate onsite material and provide for new core material
- L-707: Concrete swale crossing removed (civil is now covering this item)
- 1/L-712: Fence below boardwalk removed; gravel and weed barrier added
- 2/L-713: Pineapple finial label clarified (removed specific manufacturer)
- 5/L-715: Paver signage moved to this sheet (previously on L-716). Note all signage remains subject to change, depending on PCF signage consultant work.
- 2/L-716: Wooden stump trail added
- 4/L-716: Tree cookie paving refined, with more detail added / Natural State reference removed

SECTION 04 21 00 - CLAY UNIT MASONRY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Clay masonry units and accessories including:
   1. Facing brick.
      a. Glazed brick.

B. Steel reinforcement

C. Anchors and ties.

D. Flashing.

E. Expansion joints.

F. Weepholes.

G. Mortar.

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 32 32 19 – Garden Wall.

1.3 RELATED SECTIONS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 05 12 13 - Architecturally-Exposed Structural Steel Framing.

C. Section 06 10 63 – Exterior Rough Carpentry.

1.4 REFERENCES

A. ASTM International (ASTM):
   1. ASTM A36 - Standard Specification for Carbon Structural Steel.
   2. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
   3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
   4. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
   5. ASTM A775 - Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
   6. ASTM A996 - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.

7. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction.
8. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
9. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale).
10. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
11. ASTM C652 - Standard Specification for Hollow Brick (Hollow Masonry Units Made from Clay or Shale).
12. ASTM C1088 - Standard Specification for Thin Veneer Brick Units Made from Clay or Shale.
13. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Clay Brick: Manufacturer's letter of certification, including:
1. Test reports.
2. Cleaning recommendations.

C. Other Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

D. Samples: Furnish not less than five individual brick as samples, showing extreme variations in color and texture.

E. Sample Panel: Mock-up or sample panels shall be used to review brick and mortar color and serve as the standard of workmanship for the Project.
1. Approximately 4 feet (1.2 m) long by 3 feet (1 m) high, showing the proposed color range, texture, bond, mortar, and workmanship. Use all the brick shipped for the sample in assembling the sample panel.
2. When required, provide a separate sample panel for each type of brick or mortar.
3. Do not start work until the Architect/Engineer has accepted the sample panel.
4. Use panel as a standard of comparison for all masonry work built of the same material.
5. Do not destroy or move the panel until work is completed and accepted by Architect.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5 years manufacturing similar products.

B. Installer Qualifications: Minimum 2 years installing similar products.

C. Brick Tests: Sample and test shall be in accordance with ASTM C67.

D. Test Reports:

1. An independent laboratory shall complete testing and reports.
2. Test reports for each type of building and facing brick shall be submitted to the Architect/Engineer for review.
3. Test reports shall indicate:
    a. Compressive strength.
    b. 24-hour cold water absorption.
    c. 5-hour boil absorption.
    d. Saturation coefficient.
    e. Initial rate of absorption.
    f. Efflorescence.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store brick off the ground to prevent contamination by mud, dust, or other materials likely to cause staining or other defects.

C. Cover all materials with a non-staining waterproof membrane material when necessary to protect from elements.

D. Store different types of materials separately.

1.8 ALLOWANCES

A. Allowance includes the purchase of brick, taxes, delivery, and any special handling charges.

B. Special shaped brick units shall have a separate allowance.

1.9 PROJECT CONDITIONS

A. Protection of Work:
    1. Wall Covering:
        a. During construction, cover the top of the wall with a durable non-staining waterproof membrane at the end of each day or shutdown.
        b. Cover partially completed walls when work is not in progress.
        c. Extend cover minimum of 24 inches (610 mm) down both sides.
        d. Hold the cover securely in place.
    2. Load Applications:
        a. Do not apply uniform floor or roof loading for at least 12 hours after building masonry columns or walls.
        b. Do not apply concentrated loads for at least three days after building masonry columns or walls.
    3. Stain Prevention:
        a. Prevent grout or mortar from staining the face of the masonry.
        b. Remove grout or mortar immediately in contact with the face of such masonry.
        c. Protect all sills, ledges, and projections from droppings of mortar.
        d. Protect the base of the wall from rain-splashed mud and mortar splatter.
        e. Scaffold boards shall be turned on edge when work is not in progress.

B. Cold Weather Protection:

1. Preparation:
    a. When ice or snow has formed on the masonry bed, remove by carefully applying heat not to exceed 120 degrees F (49 degrees C) until the surface is dry to the touch.
    b. Remove all masonry deemed frozen or damaged.
2. Products:
    a. When brick suction exceeds BIA reference standard, sprinkle with heated water:
        1) When units are above 32 degrees F (0 degrees C), heat water above 70 degrees F (21 degrees C).
        2) When units are below 32 degrees F (0 degrees C), heat water above 130 degrees F (54 degrees C).
    b. Use dry masonry units.
    c. Do not use wet or frozen units.
3. Construction Requirements While Work is Progressing:
    a. Air temperature 40 degrees F (4 degrees C) to 32 degrees F (0 degrees C):
        1) Heat sand or mixing water to produce mortar temperatures between 40 degrees F (4 degrees C) to 32 degrees F (0 degrees C).
    b. Air temperature 32 degrees F (0 degrees C) to 25 degrees F (-4 degrees C):
        1) Heat sand and mixing water to produce temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C).
        2) Maintain the temperature of mortar on boards above freezing.
    c. Air temperatures 25 degrees F (-4 degrees C) to 20 degrees F (-7 degrees C).
        1) Heat sand and mixing water to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F. (49 degrees C).
        2) Maintain the temperature of mortar on boards above freezing.
        3) Use salamanders or other heat sources on both sides of walls under construction.
        4) Use windbreaks when the wind is more than 15 mph (24 kms/h).
    d. Air temperature 20 degrees F (-7 degrees C) and below:
        1) Heat sand and mixing water to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C.).
        2) Provide enclosures and auxiliary heat to maintain air temperature above 32 degrees F (0 degrees C).
        3) Minimum temperature of units when laid: 20 degrees F (-7 degrees C).
4. Protection Requirements for Completed Masonry and Masonry Not Being Worked On:
    a. Mean daily air temperature 40 degrees F (4 degrees C) to 32 degrees F (0 degrees C):
        1) Protect masonry from rain or snow for 24 hours by covering it with a weather-resistive membrane.
    b. Mean daily air temperature 32 degrees F (0 degrees C) to 25 degrees F (-4 degrees C):
        1) Completely cover masonry with weather-resistive membrane for

24 hrs.

c. Mean daily temperature 25 degrees F (-4 degrees C) to 20 degrees F (-7 degrees C):
   1) Completely cover masonry with insulating blankets or equal protection for 24 hours.

d. Mean daily air temperature 20 degrees F (-7 degrees C) and below:
   1) Maintain masonry temperature above 32 degrees F (0 degrees C) for 24 hours by:
      a) Method: Enclosure and supplementary heat
      b) Method: Electric heating blankets
      c) Method: Infrared lamps
      d) Method: Other approved methods

C. Hot Weather Protection:
   1. Construction Requirements While Work is Progressing:
      a. When the temperature exceeds 100 degrees F or 90 degrees F with 8 mph wind (above 38 degrees C or 32 degrees C with 13 kms/h wind).
         1) Maintain the temperature of mortar and grout between 70 degrees F and 120 degrees F (21 degrees C and 49 degrees C).
            a) Limit spread of mortar bed to 4 feet (1.2 m). Place units within 1 minute of spreading mortar.
      b. Partially or recently completed walls may be fog sprayed and/or covered with opaque plastic or canvas or both to control moisture evaporation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Gavin Historical Brick, 2050 Glendale Road, Iowa City, IA. info@historicalbricks.com

B. Approved equal.

2.2 CLAY MASONRY UNITS

A. Antique Iowa Brick, by Gavin Historical Brick.

B. Approved equal.

C. All brick supplied shall be pre-blended by the manufacturer.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars:
   1. Billet Steel Deformed Bars: ASTM A 615.
   2. Rail Steel Deformed Bars: ASTM A 616 or A996.
   3. Axle Steel Deformed Bars: ASTM A 617 or A996.
   4. Epoxy Coated Billet Steel: ASTM A 615 and ASTM A 775.

2.4 ANCHORS AND TIES

A. Corrugated Ties: ASTM A 1008, 20 Gage, Galvanized: ASTM A 153, Class B-2.

B. Truss Joint Reinforcement: ASTM A 82 (ASTM A 666), Galvanized: ASTM A 153, Class B-2.

C. Ladder Joint Reinforcement: ASTM A 82 (ASTM A 666), Galvanized: ASTM A 153, Class B-2.

D. Wire Wall Ties: ASTM A 82, Wire, Galvanized: ASTM A 153, Class B-2.

E. Dovetail Anchors: ASTM A 1008, Galvanized: ASTM A 153, Class B-2.

F. Anchors:
   1. Plate Bent Bar Anchors: ASTM A 36, Galvanized: ASTM A 153, Class B-2.
   2. Plate Header Bar Anchors: ASTM A 36, Galvanized: ASTM A 153, Class B-2.

2.5 FLASHING

A. Copper: ASTM B 370, 7 oz.

2.6 EXPANSION JOINTS

A. Premolded Foam: ASTM D 1056, Type 2, Class A, Grade 1.

B. Backer Rod: Extruded, Closed Cell Polyethylene.

2.7 ACCESSORIES

A. Weepholes:
   1. Rope Wicks: Cotton Sash Cord, 12 inches long with end laid in a cavity.
   2. Plastic Tubes: 1/4 inch (6 mm) minimum inside diameter by 4 inches (102 mm) long.
   3. Aluminum Weep/Vents.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify the Architect of inadequate preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to before installation.

B. Cleaning Reinforcement: Remove mud, loose rust, ice, and other coatings from reinforcement that would interfere with the bond.

C. Prepare surfaces using the methods recommended by the manufacturer to achieve the best result for the substrate under the project conditions.

3.3 BONDING

A. Lay masonry in bond pattern as indicated on drawings or general notes. Reference BIA Technical Note 30 for additional requirements.

3.4 LAYING MASONRY

A. Lay masonry with full head and bed joints.

B. Lay all brick plumb and true to lines.

C. Where fresh mortar joins partially set mortar, remove loose brick and mortar, and lightly wet exposed surface of set masonry.

D. Toothing shall be subject to approval by the Architect/Engineer.

E. When adjustment is necessary to be made after mortar begins to harden, remove hardened mortar, and replace it with fresh mortar.

3.5 TOOLING AND POINTING

A. Joint Profile: Tool mortar joints to a concave appearance.

B. Tool exposed joints when "thumb-print" hard.

C. Flush cut all joints not tooled.

D. When pointing, rake mortar joints to a depth of not less than 1/2 inch (12 mm). Fill solidly with pointing mortar. Tool joints.

3.6 FLASHING

A. Clean from masonry surface any projections that might puncture flashing.

B. Place through-wall flashing on a bed of mortar. Cover flashing with mortar.

C. Lap flashing a minimum of 6 inches (152 mm).

D. Leave flashing project from the face of the wall approximately 1/4 inch (6 mm) to form a drip. Flashing shall be cut back to the face of the wall after inspection if the drip is deemed objectionable by the Architect.

3.7 WEEPHOLES

A. Provide weepholes in head joints of the first brick course immediately above flashing by placing weeps no more than 24 inches (610 mm) on the center horizontally.

B. Keep the cavity free from mortar droppings.

3.8 EXPANSION JOINTS

A. Keep clean from all mortar and debris. Locate as shown on drawings. Install neoprene pre-molded foam pad, backer rod, and sealant. Prime surfaces if necessary.

3.9 CLEANING

A. Cut out all defective mortar joints and holes in exposed masonry and provide new mortar.

B. Clean pre-selected sample wall area. Do not proceed with cleaning until approved by Architect.

C. Clean brick as outlined in BIA Technical Note 20.

D. All cleaning practices and products used shall follow the cleaning products manufacturer's printed instructions.

E. For waxed thin brick, clean with 130 degrees F water using clean water and a low-pressure washer.

END OF SECTION 04 21 00

SECTION 06 10 63 EXTERIOR ROUGH CARPENTRY

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.

B. Examine all Drawings and Specifications for dimensions, locations, attachment conditions, finishes, and related work affecting exterior rough carpentry.

1.2 SUMMARY

A. Section Includes:
   1. Exterior wood pergola / play structure framing and associated rough carpentry.
   2. Wood trellis framing and supports indicated on Drawings.
   3. Coordination and attachment of associated decorative trellis components, including metal arches and cast-stone column components where specifically indicated.
   4. Blocking, backing, anchors, fasteners, and miscellaneous carpentry required for a complete installation.
   5. Work specified in other Sections that interfaces with exterior rough carpentry, including concrete foundations, metal fabrication, and site finishes.

1.3 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete foundations and reinforced concrete where required for column cores or foundations.

B. Section 05 50 00 - Metal Fabrications: Miscellaneous metal supports, plates, and attachments where indicated.

C. Section 13 34 00 - Exterior Trellis: Use only where a separate trellis specification is provided; coordinate to avoid duplication.

D. Division 32 Sections: Site furnishings, planting, paving, and landscape construction adjacent to exterior carpentry.

1.4 DEFINITIONS

A. Boards: Lumber of less than 2 inches nominal (38 mm actual) in thickness and 2 inches nominal (38 mm actual) or greater in width.

B. Dimensional Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.

C. Timber: Lumber of 5 inches nominal (114 mm actual) or greater in least dimension.

D. FSC-Certified Wood Products: Wood products certified in accordance with Forest Stewardship Council chain-of-custody requirements.

E. Exposed Work: Wood or associated components visible in the completed installation.

F. Salvaged Timber: Lumber of varying sizes salvaged from existing onsite felled trees.

1.5 REFERENCE STANDARDS

A. Comply with the latest adopted editions of applicable standards, except where more stringent requirements are indicated in the Contract Documents.
   1. DOC PS 20 - American Softwood Lumber Standard.
   2. ASTM F1667 - Driven and Other Fasteners for Use in Wood.
   3. ASTM F593 - Stainless Steel Bolts, Hex Cap Screws, and Studs.
   4. ASTM F594 - Stainless Steel Nuts.
   5. ASTM E488/E488M - Strength of Anchors in Concrete and Masonry Elements.
   6. ICC-ES AC70 - Acceptance Criteria for Fasteners Power-Driven into Concrete, Steel and Masonry Elements.
   7. AF&PA WCD1 - National Design Specification for Wood Construction.
   8. Applicable lumber grading rules of agencies accredited by the American Lumber Standard Committee (ALSC).
   9. FSC standards applicable to products designated FSC-certified.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of manufactured product, fastener, anchor, preservative, coating, and accessory.

B. Shop Drawings: Show field-measured dimensions of the complete composition; member sizes; joinery; hardware; fasteners; anchorage; connections; foundations; and interfaces with adjacent construction.
   1. Include plans, elevations, sections, enlarged details, connection details, attachment methods, and locations of field joints.
   2. Show proposed locations of concealed blocking, backing, anchors, and reinforcement required to support the work.

C. Samples: Submit representative samples of each exposed wood species, finish, cast-stone color, and powder-coated metal finish.
   1. Color and Finish Samples: Submit actual manufacturer samples for approval before fabrication.

1.7 INFORMATIONAL SUBMITTALS

A. Material Certificates: For lumber, fasteners, anchors, preservative-treated wood if used, coatings, and proprietary products.

B. FSC Certification: For all wood products designated FSC-certified, provide documentation establishing chain of custody and identification of each certified product.
   1. Provide vendor invoices identifying FSC-certified products and the vendor's chain-of-custody number. Wood products without acceptable documentation may be rejected.

C. Certificates of Inspection: Issued by the applicable lumber grading agency for exposed wood not identified by a grade stamp.

D. Evaluation Reports: ICC-ES reports for proprietary anchors and preservative-treated wood products where applicable.

E. Installer's qualifications and relevant project experience.

F. Manufacturer's installation instructions for proprietary components.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: Experienced installer regularly engaged in installation of exterior wood structures and capable of producing work of the specified quality.

B. Fabricator Qualifications: Experienced in fabrication of exterior wood and metal trellis assemblies of similar size and complexity.

C. Wood Grading: Comply with applicable rules of an ALSC-accredited grading agency.

D. FSC Compliance: All wood products designated FSC-certified shall be certified according to applicable Forest Stewardship Council requirements.

E. Mockup: Where requested by Landscape Architect, construct a representative mockup of exposed wood joinery, finish, hardware, and adjacent connections. Approved mockup establishes the standard for the completed Work.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened packaging with labels intact and legible.

B. Protect materials from weather, moisture, soil, physical damage, and contamination during delivery and storage.

C. Store lumber under cover and off damp or wet surfaces. Stack lumber flat with spacers between bundles to provide continuous air circulation.

D. Do not allow wood to contact standing water, mud, concrete washout, or other contaminants.

E. Handle finished and exposed components to prevent dents, scratches, staining, or damage to coatings.

1.10 FIELD CONDITIONS

A. Field verify dimensions and existing conditions before fabrication and installation.

B. Notify Landscape Architect of discrepancies between Drawings, field conditions, and fabricated components before proceeding.

C. Do not install exterior wood components when site conditions will result in trapped moisture, excessive movement, or damage to finished surfaces.

D. Coordinate installation with concrete foundations, paving, planting, utilities, drainage, and adjacent site improvements.

PART 2 - PRODUCTS

2.1 LUMBER, GENERAL

A. Comply with DOC PS 20 and applicable grading rules of lumber grading agencies accredited by ALSC.

B. Factory mark each item with the grade stamp of the applicable grading agency. For exposed work where grade stamps would be objectionable, omit grade stamps and provide certificates of grade compliance.

C. Provide actual dimensions required by DOC PS 20 for nominal sizes indicated. Where actual dimensions are indicated, provide minimum dressed dimensions.

D. Provide dressed lumber, S4S, unless otherwise indicated.

E. Select lumber free of defects that impair structural performance, durability, appearance, or fastening.

F. Maximum Moisture Content at time of fabrication and installation:
   1. Boards: 19 percent.
   2. Dimension Lumber: 19 percent.
   3. Timber: 19 percent.

G. FSC-Certified Wood: Provide FSC-certified lumber where identified in the Drawings or this Section.

2.2 EXTERIOR WOOD PERGOLA / WOODEN PLAY

A. Provide hand-selected exterior wood suitable for prolonged exposure to weather and outdoor use.

B. Species:
   1. Salvaged Timber, if materials are appropriate for intended use.
   2. If quantity of Salvaged Timber is insufficient:
      a. Black Locust

b. Approved equal.

C. Use one wood species consistently for all exposed wood elements unless otherwise indicated.

D. Select exposed surfaces and edges for freedom from decay, honeycomb, knot holes, shake, splits, torn grain, excessive wane, and other characteristics that impair finish appearance or performance.

E. Sizes and dimensions: As indicated on Drawings and as appropriate to construct intent of items.

F. Fabricate members accurately to required overall dimensions with clean cuts. ***~~Provide concealed joinery where indicated.~~ Concealed joinery is not necessary. All hardware connections must be safe for public access; do not allow exposed, protruding, or sharp edges.***

G. Provide exterior-rated finish or coating where indicated on Drawings. Apply in accordance with manufacturer's written instructions.

~~H. Provide compatible sealants at joints and penetrations where required to prevent water intrusion, as specified in Division 07.~~

2.3 TRELLIS COLUMNS

A. Canopy Material: Aluminum, powder coated, RAL 6021 Black Green.

B. Size: As indicated on Drawings.

C. Welds: Grind and dress exposed welds smooth. Prepare surfaces and apply powder coating in accordance with coating manufacturer's requirements.

D. Columns: Haddonstone Tuscan Pilaster M7 Short Shaft Full Column, or approved equal.
1. Capital: M750M.
2. Shaft: M750R, M750S, or M750U, as indicated on Drawings.
3. Base: M750F.
4. Pedestal: M750H.
5. Quantity: 4.

E. Provide all proprietary connectors, dowels, anchors, reinforcing, and accessories required for a complete installation.

2.4 METAL ARCHES

A. Material: Aluminum, powder coated, RAL 6021 Black Green.

B. Size and configuration: As indicated on Drawings.

C. Fabricate true to line and radius, with clean transitions and uniform appearance.

D. Welds: Grind and dress exposed welds smooth before coating.

E. Provide concealed reinforcement and attachment plates as required for the indicated geometry and loading.

F. Provide corrosion-resistant isolation between dissimilar metals and between metal and masonry or treated wood where required.

2.5 FASTENERS

A. General: Provide fasteners of size and type indicated and suitable for exterior exposure. Select fasteners to resist corrosion and galvanic action under project environmental conditions.

B. Stainless steel fasteners shall be used unless otherwise indicated.

C. Provide fasteners in sufficient length to penetrate not less than 1-1/2 inches (38 mm) into wood substrate unless greater penetration is required by design or manufacturer's instructions.

D. Nails: ASTM F1667.

E. Power-Driven Fasteners: ICC-ES AC70.

F. Wood Screws and Lag Screws: ASME B18.2.1, ASME B18.6.1, or ICC-ES AC233.

G. Stainless-Steel Bolts: ASTM F593, Alloy Group 1 or 2; ASTM F738M, Grade A1 or A4; with ASTM F594, Alloy Group 1 or 2; ASTM F836M, Grade A1 or A4 nuts and washers as indicated.

H. Washers: Provide flat washers under bolt heads and nuts where bearing surfaces or Drawings require.

I. Do not use incompatible fasteners, coatings, or metals that could cause galvanic corrosion or staining of adjacent materials.

2.6 POST INSTALLED ANCHORS

A. Provide stainless-steel, torque-controlled expansion anchors or approved equivalent compatible with substrate and loading.

B. Anchors shall have published capacities appropriate for the substrate and loads imposed and shall be installed in accordance with manufacturer's written instructions.

C. Where required by the Contract Documents, anchors shall sustain without failure a load equal to 6 times the imposed load in unit masonry and 4 times the imposed load in concrete, based on testing in accordance with ASTM E488/E488M.

D. Use stainless-steel bolts and nuts complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2; ASTM F738M and ASTM F836M, Grade A1 or A4.

2.7 ACCESSORIES

A. Provide shims, blocking, spacers, plates, brackets, connectors, sealants, and miscellaneous materials required for complete installation.

B. Provide preservative treatment only where required by Drawings, code, or conditions of use. Do not field-treat exposed Black Locust unless specifically approved.

C. Use nonstaining, exterior-grade materials compatible with adjacent wood, metal, masonry, and stone.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that substrates, foundations, embedded items, and adjacent construction are ready to receive exterior rough carpentry.

B. Verify dimensions, elevations, and locations before beginning fabrication or installation.

C. Do not proceed until unsatisfactory conditions have been corrected.

D. Commencement of installation constitutes acceptance of conditions, except for concealed conditions specifically identified to the Landscape Architect.

3.2 PREPARATION

A. Mark out all locations of exterior trellises, pergolas, columns, and arches prior to construction. Locations shall be approved by Landscape Architect before permanent installation.

B. Protect adjacent paving, planting, walls, building finishes, and existing site improvements from damage during installation.

C. Clean substrates of dirt, loose material, laitance, oil, and other substances that could interfere with anchorage or installation.

3.3 INSTALLATION OF WOOD PERGOLA / ROUGH CARPENTRY

A. Set work to required levels and lines, with members plumb, true to line, accurately cut, and fitted. Scribe and cope as needed for accurate fit.

B. Framing Standard: Comply with AF&PA WCD1 unless otherwise indicated.

C. Install metal framing anchors and connectors in accordance with approved Shop Drawings.

D. Do not splice structural members between supports unless specifically indicated or approved.

E. Provide blocking, backing, and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

F. Sort and select lumber so that natural characteristics do not interfere with installation, fastening, appearance, or performance.

G. Do not use lumber with defects that impair structural function or result in excessive joints, splitting, or unacceptable appearance.

H. Secure exterior rough carpentry to substrate with anchoring and fastening methods indicated on Drawings and approved Shop Drawings.

I. Install fasteners straight and true without splitting wood. Pre-drill near ends and edges where required to prevent splitting.

J. Do not countersink exposed fastener heads unless indicated. Where countersinking is indicated, plug or finish openings as specified.

K. Maintain required clearances from wood end grain, edges, and joints to prevent splitting and loss of connection capacity.

L. Provide positive drainage at horizontal surfaces and joints. Do not create pockets that retain water against wood.

M. Keep wood members clear of soil and standing water and maintain separation from adjacent paving and planting media as indicated.

3.4 INSTALLATION OF TRELLIS COLUMNS

A. Haddonstone columns (or approved equal) are nonstructural decorative cladding with a hollow central core unless otherwise indicated.

B. Erect each column on a suitable foundation designed for the applicable loads and site conditions.

C. Coordinate foundation dimensions, reinforcing, anchor locations, and structural cores with Drawings and Division 03 work.

D. Fill hollow cores with reinforced concrete where indicated. Do not allow concrete or grout to bear directly on decorative stonework where differential movement could cause cracking.

E. Bedding and Jointing: Use manufacturer's recommended bedding and jointing materials and installation procedures. Where mortar is specified, provide approximately 1/4-inch (6 mm) joints unless otherwise indicated.

F. Tool joints slightly recessed from the face of the stonework or rake to form a clean, consistent joint.

G. Point exposed joints with manufacturer's color-matched material or approved equivalent compatible with the stone.

H. Provide a compressible filler or other soft joint between capital stonework and the structure above where required to ensure structural loads are carried by the structural core and not decorative stonework.

I. Line hollow cores with an isolating medium where required by the manufacturer's instructions to accommodate differential movement between stone and concrete.

J. Install isolating material continuously against the inner core surface, with sufficient overlap at vertical and horizontal joints.

K. Concrete infill shall be workable enough to fill the core without excessive vibration that could damage decorative components. Use aggregate size compatible with the manufacturer's requirements and core dimensions.

L. Place concrete in accordance with the concrete specification and allow each section to reach initial set before placing subsequent sections where required by the manufacturer's instructions.

M. Where a structural steel member is sleeved by the column, maintain required isolation between steel and decorative stone and provide grout only where indicated or approved.

3.5 INSTALLATION OF METAL ARCHES AND ASSOCIATED TRELLIS COMPONENTS

A. Install metal arches plumb, level, true to line and radius, and securely anchored to supporting construction.

B. Coordinate concealed anchors, plates, and reinforcing with column and foundation construction before installation.

C. Do not field cut, drill, weld, or modify powder-coated components without written approval and a manufacturer-approved repair procedure.

D. Repair damaged coatings in accordance with coating manufacturer's written instructions and to match adjacent finish.

E. Isolate dissimilar materials where required to prevent galvanic corrosion, staining, or premature deterioration.

3.6 ADJUSTING AND CLEANING

A. Adjust installed work to provide uniform lines, reveals, joints, and alignment.

B. Remove dirt, dust, fingerprints, mortar, concrete, adhesive, and other construction residue from exposed surfaces without damaging finishes.

C. Replace wood members or components that are cracked, split, excessively stained, warped, damaged, or otherwise unacceptable.

D. Replace damaged metal or cast-stone components that cannot be satisfactorily repaired without visible evidence of repair.

3.7 FIELD QUALITY CONTROL

A. Inspect connections, anchors, fasteners, and exposed wood for compliance with approved Shop Drawings and manufacturer's instructions.

B. Verify that postinstalled anchors are installed at required locations, embedment depths, spacing, and torque.

C. Correct work that does not comply with the Contract Documents at no additional cost to Owner.

3.8 PROTECTION

A. Protect completed exterior rough carpentry from damage caused by subsequent construction, weather, equipment, landscaping operations, and public access.

B. Maintain temporary protection until adjacent work is complete and the Landscape Architect authorizes removal.

C. Do not use completed pergolas, trellises, columns, or arches as supports for scaffolding, temporary construction loads, signage, or material storage.

3.9 CLOSEOUT

A. Provide manufacturer's maintenance and care instructions for exposed wood, powder-coated metal, and cast-stone components.

B. Submit record information identifying approved products, finishes, and replacement components.

C. Clean completed work and leave it ready for final inspection.

END OF SECTION 06 10 63

SECTION 26 56 19 - LED EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior lighting fixtures, with LED modules, components and drivers
2. Poles and mounting arms

B. Related Requirements:

1. Section 260923 "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.
2. Section 015639: “Temporary Tree and Plant Protection” for tree protection measures, definitions, and excavation procedures.
3. Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections and wiring methods.
4. Section 260533.13 "Conduits for Electrical Systems" for conduit requirements.
5. Section 033000 "Cast-in-Place Concrete" for concrete bases and footings.

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 STRUCTURAL ANALYSIS CRITERIA FOR POLE SELECTION

A. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied as stated in AASHTO LTS-4-M.

B. Live Load: Single load of 500 lbf (2224 N), distributed as stated in AASHTO LTS-4-M.

C. Ice Load: Load of 3 lbf/sq. ft. (145 Pa), applied as stated in AASHTO LTS-4-M Ice Load Map.

D. Wind Load: Pressure of wind on pole and luminaire and banners and banner arms, calculated and applied as stated in AASHTO LTS-4-M.

1. Basic wind speed for calculating wind load for poles 50 feet (15 m) high or less is 100 mph (45 m/s).

    a. Wind Importance Factor: 1.0.
    b. Minimum Design Life: 25 years.
    c. Velocity Conversion Factors: 1.0.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of luminaire, pole, and support component, arranged in order of lighting unit designation. Submit manufacturer's data on features, accessories, and finishes as well as the following:

1. Include physical description of the luminaire including materials, dimensions, effective protected area, and verification of indicated parameters. Submit dimensioned drawings of lighting fixtures.
2. Details of luminaire attachments and accessories.
3. Luminaire materials
4. Lamps module manufacturer data including 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.
    b. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.

6. Materials, dimensions, and finishes of poles; details of handholes and wire entries, mast or bracket arms and connection to poles, wind load and deflection, corrosion resistance, and finishes.
7. Means of attaching luminaires to supports (both new and existing), and indication that attachment is suitable for components involved.
8. 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. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Anchor-bolt templates keyed to specific poles and certified by manufacturer.
3. Wiring diagrams for power, control, and signal wiring.
4. Photoelectric relays
5. Include plans, elevations, sections, and mounting and attachment details.
6. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Luminaires.
2. Structural members to which luminaires will be attached.
3. Underground utilities and structures.
4. Existing underground utilities and structures.
5. Above-grade utilities and structures.
6. Existing above-grade utilities and structures.
7. Building features.
8. Vertical and horizontal information.
9. Existing trees to remain with their critical and structural root zones shown.

B. Qualification Data: For testing laboratory providing photometric data for luminaires.

C. Product Certificates: For each type of the following:

1. Luminaire.
2. Photoelectric relay.

D. Product Test Reports: For each luminaire, for tests performed by manufacturer and witnessed by a qualified testing agency.

E. Source quality-control reports.

F. Sample warranty.

1.6 PHOTOMETRIC REQUIREMENTS

A. Walkways, Pathways, and Seating areas: Refer to drawings.

B. Parking Lots, Vehicular Circulation, and Exterior Compactor / Maintenance Areas require 2.0 Footcandles maintained minimum.

C. All Means of Egress / Entrances Require minimum 4.0 Footcandles maintained minimum for 10 Feet along path.

D. Uniformity to meet or exceed and Average to Minimum of 4:1.

E. Grass areas to have a minimum of .01 Footcandles, Uniformity is not considered for this area.

F. CRI shall be 70+

G. Light Loss factor to include lumen depreciation at 100,000 hours.

H. Visual or AGI are acceptable calculation software.

I. Buildings/ large obstructions are to be considered and included when photometric calculations are performed.

J. Each area listed above is to have a separate calculation zone for review purposes.

K. Photometric reports and ies files for each fixture type to be included in an electronic submittal form. Edited photometric files are not acceptable.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires and photoelectric relays to include in operation and maintenance manuals.

1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.
2. Provide a list of all photoelectric relay types used on Project; use manufacturers' codes.
3. Provide a collection of manufacturer recommended maintenance practices for each lighting fixture type.

1.8 QUALITY ASSURANCE

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 IEEE C2, "National Electrical Safety Code."

C. Comply with NFPA 70

1.9 DELIVERY, STORAGE, AND HANDLING

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

1.10 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.

1.11 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Refer to the Lighting Fixture Schedule on the Lighting Drawings.

B. Subject to compliance with requirements, provide the Basis-of-Design product and manufacturer, or an equivalent product from an approved equal manufacturer, for each lighting fixture type. The Basis-of-Design product and manufacturer for each lighting fixture type, as well as approved equal manufacturers for each lighting fixture type, are provided on the Lighting Fixture Schedule of the Lighting Drawings.

2.2 GENERAL REQUIREMENTS FOR LUMINAIRES

A. Wall Light

1. Manufacturer: LUXR, Modux One Step Light, Solid Eyelid.
2. Model: M1-SLE-IA-C-27-ACAN
3. Description: Machined copper wall and step light; copper, copper, canister.
4. Lamp: Pin mounted 1W 3VF Cree XPG-3, 1 watt
5. CCT: 2700K
6. Quantity: See drawings
7. The specified products establish the minimum requirements that substitutions must meet to be considered acceptable.

B. Path Light

1. Manufacturer: Hunza, Twig Lite.
2. Model: TG/L/S/COP/2
3. Description: Solid copper path light; direct burial installation; copper, copper, 1/2 in. NPS universal thread.
4. Lamp: 3W LED module, 3W / 5VA
5. CCT: 2700K
6. Beamspread: 100° flood
7. Quantity: See drawings
8. The specified products establish the minimum requirements that substitutions must meet to be considered acceptable.

C. Pedestrian Lamp

1. Manufacturer: Lumenpulse, Lampost.
2. Fixture: ALG7200-VOLT-SSL-LXX-27K-CRI80-5-DIM
3. Pole: PLM-4-AL-R-10-X-Q8-CC-QT8-AB
4. Arm: ARM-P-P4-CS12-S1E-4-R-X-BRK-CC
5. Material and Finish: Aluminum, black, pole.
6. CCT: 2700K
7. Quantity: See drawings
8. The specified products establish the minimum requirements that substitutions must meet to be considered acceptable.

D. Uplight

1. Manufacturer: QTL, Voya.

2. Model: QTL-VOYA-EM-2.5-COB-12VAC-SW-ST-95-27-30D-COB-B-P-09-WPH-NA-NA-NA
3. Order Code: DIR110144, brass, (BLP) bronze living patina, (2GS) ground stake with 2 in. cap.
4. Lamp: 2W LED module, 2.5W / 2.5VA
5. CCT: 2700K
6. Beamspread: 15° narrow
7. Quantity: 2
8. The specified products establish the minimum requirements that substitutions must meet to be considered acceptable.

E. Bollard

1. Manufacturer: Radia, Pathway.
2. Model: LBRAP-AC, 9W custom LED light engine
3. Dimming Protocol: 0-10V / forward and reverse phase
4. Voltage: 120/277V
5. CCT: 3000K, International Dark-Sky approved
6. Cove Interior Color Options: Body exterior powder coat match
7. Body Material: Cast aluminum
8. Body Finish: Powder coat, custom RAL 6021
9. Mounting: Surface mount
10. Quantity: 32
11. The specified products establish the minimum requirements that substitutions must meet to be considered acceptable.

F. Pendant Light

1. Manufacturer: Auroralight Inc, Agave.
2. Model: HPD100137 AGAVE / HPD1001372703-NAT
3. Finish: Natural brass
4. CCT: 2700K
5. Beamspread: 90°
6. Quantity: 17
7. The specified products establish the minimum requirements that substitutions must meet to be considered acceptable.

G. LED Tape Light, Waterproof

1. Manufacturer: QTL, LED Tape Light, Waterproof.
2. Product Number: QTL-RGBW-HE24.4.0-WET-RGBW-XX-BW-XX-BK-CL2-288/WIDE-BZ-SST-DF-N1-98
3. Quantity: 150 LF +/-
4. Add Alternate for Boardwalk: 695 LF +/-
5. The specified products establish the minimum requirements that substitutions must meet to be considered acceptable.

H. Anchor bolts and hardware: Per manufacturer's recommendations. Footing per manufacturer's requirements and local code.

I. The specified products establish the minimum requirements that substitutions must meet to be considered acceptable.

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. Examine walls, roofs, and canopy ceilings and overhang ceilings for suitable conditions where luminaires will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

A. If approved by Landscape Architect, use selected permanent luminaires for temporary lighting. When construction is substantially complete, clean luminaires used for temporary lighting and install new lamps.

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 lamps in each luminaire.

D. Fasten luminaire to structural support.

E. Supports:

1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position after cleaning and relamping.
3. Support luminaires without causing deflection of finished surface.
4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.
5. Alignment: Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole.
6. Clearances: Maintain the following minimum horizontal distances of poles from surface and underground features unless otherwise indicated on Drawings:

    a. Fire Hydrants and Storm Drainage Piping: 60 inches (1520 mm).
    b. Water, Gas, Electric, Communication, and Sewer Lines: 10 feet (3 m) .
    c. Trees: 15 feet (5 m) from tree trunk (or as indicated).

F. Foundation-Mounted Poles: Mount pole with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.

1. Use anchor bolts and nuts selected to resist seismic forces defined for the application and

approved by manufacturer.
2. Grout void between pole base and foundation. Use nonshrink or expanding concrete grout firmly packed to fill space.
3. Install base covers unless otherwise indicated.
4. Use a short piece of 1/2-inch- (13-mm-) diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.
5. Cure concrete a minimum of 72 hours before performing work on pole.

G. Poles and Pole Foundations Set in Concrete Paved Areas:

1. Install poles with minimum of 6- inch- (150-mm-) wide, unpaved gap between the pole or pole foundation and the edge of adjacent concrete slab. Fill unpaved ring with pea gravel to a level 1 inch (25 mm) below top of concrete slab.

H. Raise and set poles using web fabric slings (not chain or cable)

I. Wall-Mounted Luminaire Support:

1. Wall packing mounting to be per manufacturer's standard installation methods and in coordination with architect or structural engineer..
2. Mount wall mount plate over standard single gang junction box supplied by installer. Outside face of box shall be flush or slightly recessed with wall.
3. Apply silicone bead to back of bracket plate as needed to ensure plate seals to junction box and wall.
4. Installer must provide strain relief to line-in wires where they connect to light fixture wires.

J. Path Light Installation:

1. Prepare footing per local codes and manufacturer's recommendations. Minimum footing depth: 36 inches or frostline, whichever is deeper. Minimum footing diameter: 12 inches.
2. Maximum conduit size: 3/4 inch. Preferred conduit size: 1/2 inch.
3. Install anchor template in position over conduit. Mark four anchor hole locations and drill per anchor manufacturer's recommendations.
4. Install base plate flat on concrete with anchors per manufacturer's recommendations.
5. Set unit body over base plate and attach per manufacturer's instructions.
6. Make wiring connections per NEC and local building codes.
7. Do not connect or disconnect LED cartridge or driver while energized.
8. Protect powdercoated finish during assembly. Do not place or slide powdercoated parts on concrete or other hard or textured surfaces.

K. Wiring Method: Install cables in raceways. Conceal raceways and cables.

L. Install luminaires level, plumb, and square with finished grade unless otherwise indicated.

M. Coordinate layout and installation of luminaires with other construction.

N. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

O. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" and Section 260533.13 "Conduits for Electrical Systems" 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 260533.13 "Conduits 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 GROUNDING

A. Ground metal poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

1. Install grounding electrode for each pole unless otherwise indicated.
2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

B. Ground nonmetallic poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

1. Install grounding electrode for each pole.
2. Install grounding conductor and conductor protector.
3. Ground metallic components of pole accessories and foundations.

3.6 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.7 FIELD QUALITY CONTROL

A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Photoelectric Control Operation: Verify operation of photoelectric controls.

C. Illumination Tests:

1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IES testing guide(s):

a. IES LM-5.
b. IES LM-50.
c. IES LM-52.
d. IES LM-64.
e. IES LM-72.

2. 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.

E. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.8 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain luminaires and photocell relays.

3.9 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.

1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
3. Adjust the aim of luminaires in the presence of Landscape Architect.

END OF SECTION 26 56 19

SECTION 32 13 13 - CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes concrete paving, including the following:

1. Roadways.
2. Curbs and gutters.
3. Walks.

B. Related Requirements:

1. Section 03 30 00 "Cast-in-Place Concrete" for general building applications of concrete.
2. Section 03 35 23 “Exposed Aggregate Concrete Finishing” for exposed aggregate concrete applications.
3. Section 32 13 73 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.
4. Section 03 20 00 "Concrete Reinforcing" for reinforcing materials.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to concrete paving, including but not limited to, the following:

a. Concrete mixture design.
b. Quality control of concrete materials and concrete paving construction practices.

2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.

d. Concrete paving Subcontractor.
e. Manufacturer's representative of stamped concrete paving system used for stamped detectable warnings.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For each type of product, ingredient, or admixture requiring color selection.

C. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete manufacturer.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Admixtures.
4. Curing compounds.
5. Applied finish materials.
6. Bonding agent or epoxy adhesive.
7. Joint fillers.

C. Material Test Reports: For each of the following:

D. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

B. Testing Agency Qualifications: Qualified according to ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests must be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified independent testing agency to perform preconstruction testing on concrete paving mixtures.

1.8 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

C. Hot-Weather Concrete Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless otherwise indicated.

2.2 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth

exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

A. This section establishes standards for a range of reinforcement types. Refer to the Drawings for materials used in this project.

B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

C. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, fabricated from galvanized-steel wire into flat sheets.

D. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

E. Epoxy-Coated Welded-Wire Reinforcement: ASTM A884/A884M, Class A, plain steel.

F. Reinforcing Bars: ASTM A615/A615M, Grade 60; deformed.

G. Galvanized Reinforcing Bars: ASTM A767/A767M, Class II zinc coated, hot-dip galvanized after fabrication and bending; with ASTM A615/A615M, Grade 60 deformed bars.

H. Epoxy-Coated Reinforcing Bars: ASTM A775/A775M or ASTM A934/A934M; with ASTM A615/A615M, Grade 60 deformed bars.

I. Steel Bar Mats: ASTM A184/A184M; with ASTM A615/A615M, Grade 60 deformed bars; assembled with clips.

J. Plain-Steel Wire: ASTM A1064/A1064M, galvanized.

K. Deformed-Steel Wire: ASTM A1064/A1064M.

L. Epoxy-Coated-Steel Wire: ASTM A884/A884M, Class A; coated, plain.

M. Joint Dowel Bars: ASTM A615/A615M, Grade 60 plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A767/A767M, Class I coating. Cut bars true to length with ends square and free of burrs.

N. Epoxy-Coated, Joint Dowel Bars: ASTM A775/A775M; with ASTM A615/A615M, Grade 60 plain-steel bars.

O. Tie Bars: ASTM A615/A615M, Grade 60; deformed.

P. Hook Bolts: ASTM A307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

Q. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

R. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

S. Zinc Repair Material: ASTM A780/A780M.

2.4 CONCRETE MATERIALS

A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C150/C150M, gray portland cement Type I.
2. Fly Ash: ASTM C618, Class C, or, Class F.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
4. Blended Hydraulic Cement: ASTM C595/C595M, Type IL, Portland-limestone cement.

B. Normal-Weight Aggregates: ASTM C33/C33M, Class 4S, uniformly graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 1 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Air-Entraining Admixture: ASTM C260/C260M.

D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM

C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

E. Water: Potable and complying with ASTM C94/C94M.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry, or, cotton mats.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

2.6 RELATED MATERIALS

A. Joint Fillers: ASTM D8139, semirigid, closed-cell polypropylene foam in preformed strips.

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

C. Bonding Agent: ASTM C1059/C1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Rock Salt: Sodium chloride crystals, kiln dried, coarse gradation with 100 percent passing 3/8-inch sieve and 85 percent retained on a No. 8 sieve.

2.7 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.

B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content, 1-inch Nominal Maximum Aggregate Size: 4-1/2 percent plus or minus 1-1/2 percent.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

F. Concrete Mixtures: Normal-weight concrete.

1. Compressive Strength (28 Days): 4000 psi.
2. Slump Limit: 5 inches, plus or minus 1 inch.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For concrete batches of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For concrete batches larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 312000 "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 INSTALLATION OF STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Zinc-Coated Reinforcement: Use galvanized-steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.

F. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D3963/D3963M.

G. Install fabricated bar mats in lengths as long as practicable. Handle units to keep

them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Butt Joints: Use epoxy-bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 20 feet unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows, to match jointing of existing

adjacent concrete paving:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

    a. Tolerance: Ensure that sawed joints are within 3 inches either way from centers of dowels.

2. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 3/8-inch radius. Repeat tooling of edges after applying surface finishes.[**Eliminate edging-tool marks on concrete surfaces.**]

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

K. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

3.7 FLOAT FINISHING: SERVICE DRIVE ONLY

A. General: Do not add water to concrete surfaces during finishing operations.

B. For exposed aggregate concrete applications, refer to Section 03 35 23.

C. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

D. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-feet- long; unleveled straightedge not to exceed 1/2 inch.
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch.
6. Vertical Alignment of Dowels: 1/4 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
8. Joint Spacing: 3 inches.
9. Contraction Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C172/C172M will be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 5000 sq. ft. or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C231/C231M, pressure method; one test for each

composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C31/C31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C39/C39M; test one specimen at seven days and two specimens at 28 days.

    a. A compressive-strength test to be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results to be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests to contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency will make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.11 REPAIR AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine

magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 13

SECTION 32 14 00 - UNIT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Limestone Pavers
2. Brick Pavers
3. Granite Pavers
4. Stone Slab Paving
5. Curbs and Edge Restraints
6. ***Joint Sand***

B. Related Requirements:

1. Section 32 13 13 "Concrete Paving" for concrete base under unit pavers, and for cast-in-place concrete curbs and gutters serving as edge restraints for unit pavers.
2. Section 03 35 23 “Exposed Aggregate Concrete Finishing” for exposed aggregate concrete applications.
3. ***Section 32 15 40 “Gravel and Wood Paving” for those applications.***

1.2 ACTION SUBMITTALS

A. Product Data:

1. For materials other than water and aggregates.

B. Sieve Analyses: For aggregate setting-bed materials, according to ASTM C136.

C. Samples for Initial Selection: For each type of unit paver indicated.

1. Two pavers.
2. Joint materials involving color selection.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Adhesion and Compatibility Test Reports: From latex-additive manufacturer for mortar and grout containing latex additives.

C. Material Certificates: For unit pavers. Include statements of material properties indicating compliance with requirements, including compliance with standards. Provide for each type and size of unit.

1.4 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store pavers on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store liquids in tightly closed containers protected from freezing.

1.6 FIELD CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

~~***B. Weather Limitations for Bituminous Setting Bed:***~~

~~***1. Install bituminous setting bed only when ambient temperature is above 40 deg F and when base is dry.***~~
~~***2. Apply asphalt adhesive only when ambient temperature is above 50 deg F and when temperature has not been below 35 deg F for 12 hours immediately before application. Do not apply when setting bed is wet or contains excess moisture.***~~

C. Weather Limitations for Mortar and Grout:

1. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
2. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6. Provide artificial shade and windbreaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F and higher.

a. When ambient temperature exceeds 100 deg F, or when wind velocity exceeds 8 mph and ambient temperature exceeds 90 deg F,

set pavers within 1 minute of spreading setting-bed mortar.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each type of unit paver, joint material, and setting material from single source with resources to provide materials and products of consistent quality in appearance and physical properties.

2.2 PRODUCTS

A. UNIT PAVERS

1. Face Size and Shape:

    a. As indicated.

2. Color: As selected by Architect from manufacturer's full range.

B. LIMESTONE PAVERS (PA-8)

1. Size: 24”x24”x2 ¼”
2. Color: Prairie Shell
3. Vendor: US Stone, 2561 Q Ave, Herington, KS 67449, or approved equal.
4. Finish: Honed

C. LIMESTONE PAVERS (PB-8)

1. Size: 24”x24”x2 ¼”
2. Color: Cottonwood
3. Vendor: US Stone, 2561 Q Ave, Herington, KS 67449, or approved equal.
4. Finish: Honed

D. LIMESTONE PAVERS (PC-8)

1. Size: 36”x12”x2 ¼”
2. Color: Cottonwood
3. Vendor: US Stone, 2561 Q Ave, Herington, KS 67449, or approved equal.
4. Finish: Honed

E. LIMESTONE PAVERS (PD-8)

1. Size: 36”x18”x2 ¼”
2. Color: Cottonwood
3. Vendor: US Stone, 2561 Q Ave, Herington, KS 67449, or approved equal.
4. Finish: Honed

F. BRICK PAVERS (P-5)

1. Size: 2-1/4” x 4”x 8”
2. Color: Burgundy
3. Vendor: Endicott Clay Products, endicott@endicott.com, or approved equal.
4. Finish: Wire cut

G. GRANITE UNIT PAVERS PEDESTRIAN (P6)

1. Size: 4”x4”x2”
2. Color: Moonlit Rose
3. Vendor: Williams Stone, 1158 Lee Westfield Rd, East Otis MA, or approved equal.
4. Finish: Hammered

H. GRANITE UNIT PAVERS VEHICULAR (P7)

1. Size: 4”x4”x3”
2. Color: Moonlit Rose
3. Vendor: Williams Stone, 1158 Lee Westfield Rd, East Otis MA, or approved equal.
4. Finish: Hammered

I. RECLAIMED STONE PAVING

1. Size: natural, refer to drawings. Minimum 2’-0” x 3’-0”
2. Thickness: 3 inches – variable due to natural material
3. Color: natural beige
4. Finish: Natural cleft
5. Source: Native Arkansas river/ field slabs

~~***2.3 MORTAR SETTING-BED MATERIALS***~~

~~***A. Portland Cement: ASTM C150/C150M, Type I or Type II.***~~

~~***B. Sand: ASTM C144.***~~

~~***C. Latex Additive: Manufacturer's standard water emulsion, serving as replacement for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed portland cement and aggregate mortar bed, and not containing a retarder.***~~

~~***D. Water: Potable.***~~

~~***E. Reinforcing Wire Fabric: Galvanized, welded wire fabric, 2 by 2 inches by 0.062 inch in diameter; comply with ASTM A1064/A1064M except for minimum wire size.***~~

2.4 GROUT MATERIALS

A. Sand-Portland Cement Grout: ANSI A108.10, made of white or gray cement and

white or colored aggregate as required to produce color indicated.

B. Grout Colors: As selected by Architect from manufacturer's full range.

C. Water: Potable.

2.5 MORTAR AND GROUT MIXES

A. General: Comply with referenced standards and with manufacturers' written instructions for mix proportions, mixing equipment, mixer speeds, mixing containers, mixing times, and other procedures needed to produce setting-bed and joint materials of uniform quality and with optimal performance characteristics. Discard mortars and grout if they have reached their initial set before being used.

B. Mortar-Bed Bond Coat: Mix neat cement and latex additive to a creamy consistency.

C. Latex-Modified, Portland Cement Setting-Bed Mortar: Proportion and mix portland cement, sand, and latex additive for setting bed to comply with written instructions of latex-additive manufacturer and as necessary to produce stiff mixture with a moist surface when bed is ready to receive pavers.

D. Latex-Modified, Portland Cement Bond Coat: Proportion and mix portland cement, aggregate, and liquid latex for bond coat to comply with written instructions of liquid-latex manufacturer.

E. Job-Mixed Portland Cement Grout: Proportion and mix job-mixed portland cement and aggregate grout to match setting-bed mortar except omit hydrated lime and use enough water to produce a pourable mixture.

1. Pigmented Grout: Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment-to-cement ratio of 1 to 10, by weight.

2.6 JOINT SAND

A. Polymeric Joint Sand: Dry mix, contains polymeric binding agent, activated with water.

1. Products:

a. Techniseal RG+.
b. Unicare HP Polymeric Max Sand.
c. Approved equal.

2. Color: To be selected by Landscape Architect.
3. Compression Strength: Proven resistance to compression of 550 PSI after drying for 7 days under controlled conditions of 73 degrees F (23 degrees C) at 50 percent humidity.

4. ***Test Sand Sample Shape: Cylinder; 2 inch (50 mm) dia. x 4 inch (100 mm) high.***
5. ***Gradation Requirements per ASTM C144. Percent Passing Sieve Size:***

    a. ***No. 4 (4.75 mm): 100 percent.***
    b. ***No. 8 (2.36 mm): 95 to 100 percent.***
    c. ***No. 16 (1.18 mm): 70 to 100 percent.***
    d. ***No. 30 (0.600 mm): 40 to 75 percent.***
    e. ***No. 50 (0.300 mm): 20 to 40 percent.***
    f. ***No. 100 (0.150 mm): 10 to 25 percent.***
    g. ***No. 200 (0.075 mm): 0 to 10 percent.***

2.7 SETTING BED SAND

A. Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.

B. Do not use limestone screenings, stone dust, or sand for the Joint Sand material that does not conform to conform to the grading requirements of ASTM C33.

C. Do not use mason sand or sand conforming to ASTM C144.

D. Utilize sands that are as hard as practically available where concrete pavers are subject to vehicular traffic.

E. Gradation Requirements per ASTM C33. Percent Passing Sieve Size:

1. 3/8 inch (9.5 mm): 100 percent.
2. No. 4 (4.75 mm): 95 to 100 percent.
3. No. 8 (2.36 mm): 85 to 100 percent.
4. No. 16 (1.18 mm): 50 to 85 percent.
5. No. 30 (0.600 mm): 25 to 60 percent.
6. No. 50 (0.300 mm): 10 to 30 percent.
7. No. 100 (0.150 mm): 2 to 10 percent.
8. No. 200 (0.075 mm): 0 to 1 percent.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces indicated to receive unit paving, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Where unit paving is to be installed over waterproofing, examine waterproofing installation, with waterproofing Installer present, for protection from paving operations, including areas where waterproofing system is turned up or flashed against vertical surfaces.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove substances from concrete substrates that could impair mortar bond, including curing and sealing compounds, form oil, and laitance.

B. Sweep concrete substrates to remove dirt, dust, debris, and loose particles.

3.3 INSTALLATION, GENERAL

A. Do not use unit pavers with chips, cracks, voids, discolorations, or other defects that might be visible or cause staining in finished work.

B. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

C. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

D. Joint Pattern: As indicated.

E. Vibrate or set pavers to leveling course to conform with tolerances and provide stable surface.

F. Tolerances:

1. Do not exceed 1/32-inch unit-to-unit offset from flush (lippage) or 1/8 inch in 10 feet from level, or indicated slope, for finished surface of paving.
2. Do not exceed 1/4 inch in 10 feet from level, or indicated slope, for finished surface of paving.

~~*3.4 MORTAR SETTING-BED APPLICATIONS*~~

~~*A. Saturate concrete subbase with clean water several hours before placing setting bed. Remove surface water about one hour before placing setting bed.*~~

~~*B. Apply mortar-bed bond coat over surface of concrete subbase about 15 minutes before placing mortar bed. Do not exceed 1/16-inch thickness for bond coat. Limit area of bond coat to avoid its drying out before placing setting bed.*~~

~~*C. Apply mortar bed over bond coat; spread and screed mortar bed to uniform thickness at subgrade elevations required for accurate setting of pavers to finished grades indicated.*~~

~~***D. Mix and place only that amount of mortar bed that can be covered with pavers before initial set. Before placing pavers, cut back, bevel edge, and remove and discard setting-bed material that has reached initial set.***~~

~~***E. Place pavers before initial set of cement occurs. Immediately before placing pavers on mortar bed, apply uniform 1/16-inch- thick bond coat to mortar bed or to back of each paver with a flat trowel.***~~

~~***F. Tamp or beat pavers with a wooden block or rubber mallet to obtain full contact with setting bed and to bring finished surfaces within indicated tolerances. Set each paver in a single operation before initial set of mortar; do not return to areas already set or disturb pavers for purposes of realigning finished surfaces or adjusting joints.***~~

~~***G. Spaced Joint Widths: Provide 3/8-inch nominal joint width with variations not exceeding plus or minus 1/8 inch.***~~

~~***H. Grouted Joints: Grout paver joints complying with ANSI A108.10.***~~

~~***I. Grout joints as soon as possible after initial set of setting bed.***~~

~~***1. Force grout into joints, taking care not to smear grout on adjoining surfaces.***~~
~~***2. Clean pavers as grouting progresses by dry brushing or rubbing with dry burlap to remove smears before tooling joints.***~~
~~***3. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.***~~
~~***4. If tooling squeezes grout from joints, remove excess grout and smears by dry brushing or rubbing with dry burlap and tool joints again to produce a uniform appearance.***~~

J. ~~***Cure grout by maintaining in a damp condition for seven days unless otherwise recommended by grout or liquid-latex manufacturer.***~~

3.5 REPAIRING, ~~***POINTING,***~~ AND CLEANING

A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

~~***B. Pointing: During tooling of joints, enlarge voids or holes and completely fill with grout. Point joints at sealant joints to provide a neat, uniform appearance, properly prepared for sealant application.***~~

C. Cleaning: Remove excess ***material*** ~~***grout***~~ from exposed paver surfaces; wash and scrub clean.

1. Remove temporary protective coating as recommended by coating manufacturer and as acceptable to paver and grout manufacturers.

~~***2. Do not allow protective coating to enter floor drains. Trap, collect, and remove coating material.***~~

END OF SECTION 32 14 00

SECTION 32 15 40 – GRAVEL AND WOOD PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Contract 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. This Section includes requirements for demolition, earthwork, grading, furnishing, and placement of crushed stone paving and wood paving or “tree cookies.”
   1. Furnish and place crushed stone paving, bonded with fine aggregate, constructed on a prepared underlying base course in accordance with these specifications and in conformity with the dimensions and the lines and grades shown on the Contract Drawings. The locations where crushed stone paving will be used are shown on the Contract Drawings.

1.3 REFERENCES

A. ASTM C117 – Test Method for Materials Finer than No. 200 (75-um) Sieve in Mineral Aggregates by Washing.

B. ASTM C136 – Method for Sieve Analysis of Fine and Coarse Aggregates.

C. ASTM D4318 – Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.4 QUALITY CONTROL

A. Installer Qualifications: Experience on projects of a similar scope and scale successfully completed within the past five (5) years.

1.5 SUBMITTALS

A. Provide a one (1) quart sample of crushed stone material for approval.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways, and pavements, or on existing turf areas, plant materials or within critical root zones.

2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

C. Rejection of material.
1. Evidence of inadequate protection or improper handling or storage shall be cause for rejection.
2. Any product or material exhibiting signs of damage due to nonconformity to specifications or due to delivery, storage or handling shall be rejected by the Project Manager. Contractor shall be responsible for hauling off-site and disposing of according to general conditions and codes of the governing jurisdiction.

1.7 PROJECT CONDITIONS

A. Environmental requirements: Work shall occur only when weather and soil conditions permit in accordance with locally accepted practice.

B. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with proposed crushed stone paving areas by field measurements before proceeding with work.

C. Interruption/Damage of Existing Services or Utilities: Do not interrupt or damage services or utilities. The Contractor is responsible for repair to services and utilities if interrupted or damaged.

D. Existing Conditions:
1. Utilities: Determine location of existing and proposed underground utilities. Perform work in a manner to avoid damage. Hand excavation as required.
2. Excavation: Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

E. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained.

1.8 MAINTENANCE SERVICE

A. General: Maintain Work in accordance with Division 01.
1. Maintenance Period: Begin maintenance immediately after the Work is completed. If Landscape Management and Maintenance is not part of the Contract Documents, maintain the Work until Substantial Completion is granted.

1.9 WARRANTY

A. See Division 01 Section “Warranty”.

PART 2 - PRODUCTS

2.1 CRUSHED STONE PAVING

A. Type: Crushed granite stone or gravel. Shall be unused material free of shale, lay, friable materials, organics, and debris.
   1. Size Range: 3/8 inch maximum

Sieve Size	Percent Passing
2 inch	100
3/8 inch	100
No. 4	85
No. 8	63
No. 16	50
No. 30	39
No. 50	29
No. 100	18

   2. Color: Uniform grey or as approved by the Project Manager.

2.2 WOOD PAVEMENT

A. Type: Reclaimed Timber as defined in 06 10 63, Exterior Rough Carpentry.

B. Sizes within range as shown on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas where the Work of this Section will be performed for compliance with requirements and conditions affecting installation and performance.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within the work area.
   2. Verify that final grades are completed in accordance with the drawings.

B. Proceed with installation only after unsatisfactory conditions have been corrected and approved by Project Manager.

3.2 FIELD QUALITY CONTROL

A. Mockup: Provide field constructed sample installation for Wood Pavement.
   1. Mock-up to be ten-foot (10') x ten-foot (10') and located as directed by the Project Manager.

2. The Contractor shall make necessary adjustments as directed by the Project Manager.
3. The Contractor shall obtain approval from the Project Manager before proceeding with the Work.
4. The Contractor shall retain and protect the mockup during construction as a standard for judging completed crushed stone paving and surface stabilization, if specified, work. Do not remove or destroy the mock-up until approved by the Project Manager.
5. Accepted and properly maintained sample installations may remain in the completed work if approved in writing by the Project Manager.
6. All work shall match the accepted field mockup.

3.3 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, turf areas, existing landscape areas, and trees from damage.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of

C. Install edging of type and in locations shown on drawings. Obtain acceptance of layout by Project Manager before excavating or installing. Make minor adjustments as required.

3.4 PLACEMENT OF CRUSHED STONE PAVING

A. Cut earthwork to width of trail/area to receive crusher fines paving to approximate depth section as specified on the Contract Drawings. Remove, haul, and dispose of excess material off site, or use on-site with approval of Project Manager.

B. Complete excavation required in sub-grade before fine grading and final compaction of sub-grade is performed. Extend sub-grade compaction one foot (1') beyond proposed edge of crushed stone paving or as indicated on drawings.
1. Where earth moving is required the sub-grade shall be compacted to ninety five percent (95%) standard proctor within two percent (2%) of the optimum moisture.
2. Keep areas being graded or compacted shaped and drained during construction. Ruts greater than or equal to 1 inch deep in sub-grade shall be graded out and reshaped as required, and re-compacted before crushed stone paving placement.
3. If the trail is part of a cross slope it should drain in the direction of the slope no greater than two percent (2%). Ensure that no low spots exist so that ponding does not occur.

C. Prior to placement of Crushed Stone Paving material, the sub-grade shall be proof rolled. Where soft spots are detected, scarify subgrade beneath Crushed Stone Paving trail to a minimum of six-inch (6") depth. Moisture treat and compact to a minimum ninety five percent (95%) proctor density as determined by ASTM D698 or AASHTO T-99. Take moisture density tests every two hundred fifty (250) lineal feet of trail or proof roll. Treat and compact sub-grade, leaving it 5-inches below final grade

for placement of Crushed Stone Paving. Compact material and retest by proof rolling to achieve approval of Project Manager.

D. Install crushed stone paving only after excavation and construction work which might injure it have been completed, and after edging has been completely installed on the compacted sub-grade. Install crushed stone paving, over compacted base course in areas indicated on plan.

E. Spread crushed stone evenly to fifty percent (50%) of specified depth. Avoid segregation of aggregate and contamination with lower courses or sub-grade.

F. Compact to ninety-five percent (95%) of maximum density as determined by ASTM D1557.
   1. Maintain surface course moisture content within plus/minus three percent (± 3%) of optimum. Add water to quarry fines paving as required to achieve optimum moisture content and a uniform, compacted surface conforming to the finish grades indicated.
   2. Compact areas inaccessible to rolling by mechanical tamping.

G. Protect crushed stone paving from soil or other contaminates during and following installation.

H. Spread and compact additional crushed stone paving to achieve the required minimum compacted thickness per compaction requirements in this section.

3.5 WOOD PAVING INSTALLATION

A. Cut earthwork to width of trail/area to receive full profile approximate depth section as specified on the Contract Drawings. Remove, haul, and dispose of excess material off site, or use on-site with approval of Project Manager.

B. Install wood paving only after excavation and construction work which might injure it have been completed. Install timber paving over compacted base course in areas indicated on Drawings.

C. Ensure positive drainage on completed surface of 2%.

D. Set wood paver materials and gravel to prevent any trip hazards, maximum displacement of ½”.

3.6 MAINTENANCE AND REPAIRS:

A. Areas that do not compact, become eroded, or are degraded in visual quality and/or performance as determined by the Project Manager are to be removed and/or repaired. The Contractor shall obtain approval of repair methods from the Project Manager prior to completing repairs.

3.7 EDGE TREATMENT AND BACKFILLING

A. Refer to Division 32 Section “Soil Preparation”.

3.8 CLEANUP AND PROTECTION

A. All areas shall be clean at the end of each workday.

B. The Contractor shall maintain protection during installation, curing, and maintenance periods.
   1. Erect temporary fencing or barricades and warning signs as required protecting newly installed Crushed Stone Paving areas from traffic, other trades, and trespassers. Maintain fencing and barricades throughout initial maintenance period and remove with approval of the Project Manager.

C. Project completion: All debris, soil, trash, excavated, and stripped material resulting from Crushed Stone Paving operations used for completing the Work in this Section shall be disposed of off-site.

D. Maintain protection during installation and maintenance periods. See Division 1. Treat, repair or replace damaged work as required.

END OF SECTION 32 15 40

SECTION 32 31 19 DECORATIVE METAL FENCES AND GATES

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. Decorative metal fences.
   2. Swing gates.
   3. Expanded mesh fences.
   4. Fence and gate assemblies at boardwalks, including special connections to boardwalk structure.
   5. Posts, frames, infill, hardware, anchors, finishes, and accessories required for complete installations.

B. Related Requirements:
   1. Section 033053 "Miscellaneous Cast-in-Place Concrete" for concrete.
   2. Section 32 34 13 for boardwalk structure and manufacturer-supplied fence and gate connection brackets.
   3. Division 26 Sections for electrical work, if any.

C. Coordinate dimensions, locations, grades, and interfaces with Drawings and adjacent construction before fabrication.

1.3 REFERENCES

American Architectural Manufacturers Association (AAMA):
1. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates.

B. ASTM International (ASTM):
   1. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   2. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
   3. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes.
   4. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

5. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated by the Hot-Dip Process.
6. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
7. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
8. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
9. ASTM C1107/C1107M - Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

C. American Welding Society (AWS):
1. AWS D1.1/D1.1M - Structural Welding Code - Steel.
2. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel, where applicable.

D. Builders Hardware Manufacturers Association (BHMA):
1. BHMA A156.1 - Butts and Hinges.

E. National Ornamental & Miscellaneous Metals Association (NOMMA):
NOMMA Guidelines for ornamental and miscellaneous metals workmanship and weld finishing.

F. Society for Protective Coatings (SSPC):
1. SSPC-SP 6/NACE No. 3 - Commercial Blast Cleaning.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Landscape Architect, Contractor, fence and gate installer, fabricator, boardwalk manufacturer or representative where applicable, and trades involved in adjacent work.
1. Review approved Shop Drawings, dimensions, grades, post locations, foundations, finishes, gate operation, hardware, boardwalk connections, and protection of adjacent construction.
2. Review field verification requirements before fabrication.
3. Review procedures for repair of damaged coatings and field welds or cuts.
4. Review mockup requirements and acceptance criteria.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Manufacturer's data sheets on each product to be used.
2. Preparation instructions and recommendations.
3. Storage and handling requirements and recommendations.
4. Typical installation methods.
5. Finish system data, including primer, topcoat, powder-coat system, or other specified coating.

B. Shop Drawings: For fencing and gates.

1. Plans, elevations, sections, details, dimensions, post spacing, gate locations, opening dimensions, infill spacing, and attachment details.
2. Identify materials, member sizes, wall thicknesses, welds, fasteners, anchors, hardware, coatings, and finishes.
3. Show transitions, corners, changes in grade, terminations, returns, and interfaces with paving, walls, structures, and planting.
4. Show gate swing, clear opening, latch locations, cane bolts, hinges, keepers, strikes, and padlock provisions.
5. Show connection of gate and fence to boardwalk structure via bracket supplied by boardwalk manufacturer. Coordinate with Section 32 34 13.
6. Submit coordinated Shop Drawings to Landscape Architect for review prior to fabrication.

C. Samples: For all fence and gate materials and for each color specified.
1. Provide Samples 12 inches in length for linear materials.
2. Provide finish samples large enough to demonstrate color, texture, sheen, and coating uniformity.

D. Hardware Schedule: Identify manufacturer, type, material, finish, quantity, and location of each gate hardware item.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and installer.

B. Welding qualifications and procedures when requested.

C. Field quality-control reports.

D. Manufacturer's installation instructions.

E. Finish manufacturer's written requirements for field touch-up and repair.

F. Delivery documentation identifying coating system and batch or lot information when requested.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: According to manufacturer's recommendations.

B. Record documentation identifying final gate hardware, finish systems, and special maintenance requirements.

C. Warranty documentation.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this Section with a minimum five years documented experience.

B. Installer Qualifications: Company specializing in performing Work of this Section with minimum two years documented experience with projects of similar scope and complexity.

C. Fabricator Qualifications: Experienced in ornamental and miscellaneous metal fabrication of comparable scale and complexity.

D. Welding: Perform welding by qualified welders using procedures appropriate for the materials being joined.

E. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

F. Mockups: Construct a mock-up with actual materials in sufficient time for Landscape Architect's review and to not delay construction progress. Locate mock-up as acceptable to Landscape Architect and provide temporary foundations and support.

1. Include 10-foot length of fence complying with requirements.
2. Include representative post, rail, picket, connection, finish, and termination conditions.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
4. Intent of mock-up is to demonstrate quality of workmanship, alignment, fabrication, finish, and visual appearance.
5. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
6. Retain mock-up during construction as a standard for comparison with completed work.
7. Do not alter or remove mock-up until work is completed or removal is authorized.

1.9 DELIVERY, STORAGE AND HANDLING

A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.

B. Protect finished surfaces from scratches, abrasion, staining, distortion, corrosion, and other damage.

C. Store components off the ground on padded supports, separated to permit air circulation and prevent contact with incompatible materials.

D. Do not use chains, cables, or handling devices that can damage exposed finished surfaces.

E. Replace components that are bent, twisted, cracked, gouged, corroded, or otherwise damaged beyond acceptable field repair.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's recommended limits.

B. Verify field dimensions and existing grades before fabrication. Do not fabricate from scaled Drawings alone.

C. Coordinate work with underground utilities, irrigation, drainage, foundations, paving, planting, boardwalks, and adjacent structures.

D. Do not install fence or gate components until substrates and supporting construction are sufficiently complete to receive the Work.

1.11 WARRANTY

A. Manufacturer's standard limited warranty unless indicated otherwise.

B. Correct defective Work, including coating failure, corrosion attributable to defective materials or workmanship, failed welds, and defective gate hardware, within the warranty period at no additional cost to Owner.

PART 2 - PRODUCTS

2.1 DECORATIVE METAL FENCES

A. Decorative Steel Fences: Fences made from wrought iron tubes, bars, and shapes, as shown on Drawings.

B. Fencing and Gates:
1. Size: As indicated on Drawings.
2. Material: Wrought Iron.
3. Color: Black.
4. Style: Heritage Ornamental Fence, Product ID H2L-48.
5. Columns: Decorative, refer to Drawings.
6. Vendor: Tuscumbia IronWorks, or approved equal. info@tuscumbiaironworks.com.

C. Fasteners: Wrought iron carriage bolts and nuts unless otherwise indicated.

D. Fabrication: Assemble fences into sections by welding pickets to rails.
1. Fabricate sections with clips welded to rails for field fastening to posts.
2. Drill posts and clips for fasteners before finishing to maximum extent possible.
3. Fabricate accurately to required dimensions and free from warp, twist, bow, or other distortion.
4. Make exposed joints neat and inconspicuous.

E. Finish exposed welds to comply with NOMMA Guideline 1, Finish #4 - good-quality, uniform undressed weld with minimal splatter.

F. Finish for Wrought Iron Items: DTM Acrylic Enamel: Black or approved equal.

G. Field touch-up and repair materials shall be compatible with the original finish system and supplied or approved by the finish manufacturer.

2.2 SWING GATES

A. Gate Configuration: Single ***or double*** leaf ***as indicated on Drawings ~~unless indicated otherwise~~***.

B. Gate Frame Height: As indicated on Drawings.

C. Gate Opening Width: As indicated on Drawings.

D. Wrought Iron Frames and Bracing: Fabricate members from square stainless steel according to dimensions on Drawings. Coordinate material and finish compatibility before fabrication.

E. Frame Corner Construction: Welded.

F. Additional Rails: Provide as indicated, complying with requirements for fence rails.

G. Infill: Comply with requirements for adjacent fence.

H. Picket Size, Configuration, and Spacing: Comply with requirements for adjacent fence.

I. Hardware: Latches permitting operation from both sides of gate, hinges, and keepers for each gate leaf. Provide cane bolts as shown on Drawings. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.

J. Hinges: BHMA A156.1, Grade 1, suitable for exterior use.
1. Function: 39 - Full surface, triple weight, antifriction bearing.
2. Material: Stainless steel.

K. Cane Bolts: Provide as shown on Drawings. Fabricated from 3/4-inch diameter, round steel bars, hot-dip galvanized after fabrication. Finish to match gates. Provide galvanized-steel pipe strikes to receive cane bolts in both open and closed positions.

L. Finish exposed welds to comply with NOMMA Guideline 1, Finish #4 - good-quality, uniform undressed weld with minimal splatter.

M. Galvanizing: For items other than hardware that are indicated to be galvanized, hot-dip galvanize to comply with ASTM A123/A123M. For hardware items, hot-dip galvanize to comply with ASTM A153/A153M.

N. Finish: DTM Acrylic Enamel: Black or approved equal.

O. Gate frames shall be rigid and sufficiently reinforced to maintain alignment and smooth operation under normal use.

2.3 EXPANDED MESH FENCES

A. Product: ***~~Jacob~~ Jakob*** Webnet with sleeves or approved equal.

B. Vendor: Jakob Rope Systems, 119 H St, Lake Worth, FL, 33460.

C. Color: Silver, woven stainless steel.

D. Fasteners: Provided by vendor.

E. Posts and Frame: 2 in by 2 in square steel tube, powder coated dark bronze, 61/68001.

F. Install mesh taut, uniform, and free from kinks, wrinkles, visible deformation, or irregular tension.

2.4 FENCE AT BOARDWALK

A. Frame: 3-inch by 3-inch square steel tube, welded, hot-dip galvanized.

B. Upper Infill: Stainless steel wire rope cables, 3/16-inch diameter, 3 inches o.c. maximum. Height: 3'-0".

C. Lower Infill (Skirt): Stainless steel cable mesh, 3/16-inch diameter, galvanized, height varies to match grade, 2'-6" maximum.

D. Base: Secure base of mesh to grade with galvanized ground anchors at 6'-0" o.c.

E. Finish: Powder coated, dark bronze, 61/68001.

F. Connection: Fence to connect to boardwalk structure via bracket supplied by boardwalk manufacturer (Section 32 34 13).

G. Coordinate connection locations, fastener types, tolerances, and structural requirements with boardwalk manufacturer before fabrication.

H. Do not field-drill or weld to the boardwalk structure unless specifically approved by the boardwalk manufacturer and Landscape Architect.

2.5 GATE AT BOARDWALK

A. Configuration: Double gate, ***size according to Drawings. ~~6'-3 1/2" per leaf~~***.

B. Frame: 4-inch by 4-inch square steel tube, welded, hot-dip galvanized.

C. Infill: Stainless steel wire rope cables, 3/16-inch diameter, 3 inches o.c. maximum. Height: 6'-0".

D. Hinges: (3) heavy-duty, 304 stainless steel, by McMaster-Carr or approved equal.

E. Hardware: Latch with cane bolt and strike plate, by McMaster-Carr or approved equal.

F. Finish: Powder coated, dark bronze, 61/68001.

G. Connection: Gate to connect to boardwalk structure via bracket supplied by boardwalk manufacturer (Section 32 34 13).

H. Gate leaves shall be fabricated square and rigid, with clearances coordinated for full swing and latch engagement.

I. Coordinate gate swing with adjacent boardwalk, railings, planting, grades, and accessible circulation.

2.6 STEEL AND IRON

A. All elements: Stainless Steel Type 316 or approved equal, where stainless steel is indicated.

B. Dissimilar metals: Provide compatible materials, isolators, coatings, or other measures necessary to prevent galvanic corrosion at interfaces.

2.7 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For aluminum, provide type and alloy as recommended by producer of metal to be welded and as required for strength and compatibility in fabricated items.

B. Concrete: Normal-weight, air-entrained, ready-mix concrete complying with requirements in Section 033000 "Cast-in-Place Concrete" with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch maximum aggregate size or dry, packaged, normal-weight concrete mix complying with ASTM C387/C387M mixed with potable water according to manufacturer's written instructions.

C. Nonshrink Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M and specifically recommended by manufacturer for exterior applications.

D. Anchors and Fasteners: Corrosion-resistant and compatible with materials being joined. Provide stainless steel where exposed or where indicated.

E. Isolation Materials: Nonconductive washers, sleeves, gaskets, or coatings where required to separate dissimilar metals.

2.8 STEEL FINISHES

A. Surface Preparation: Clean surfaces according SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning." After cleaning, apply a conversion coating compatible with the organic coating to be applied over it.

B. Blackened Steel: Alloy based. Additional information TBD.

C. Powder Coating: Where indicated, provide a complete powder-coat system suitable for exterior exposure, including pretreatment, primer where required, and topcoat. Color and gloss shall match approved samples.

D. Finish coatings shall be continuous, uniform, and free of runs, sags, pinholes, holidays, blisters, peeling, overspray, and visible substrate defects.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.

B. Verify dimensions, grades, post locations, gate openings, structural supports, and connection points before fabrication.

C. Do not begin installation before final grading is completed unless otherwise permitted by Landscape Architect. If substrate preparation is the responsibility of another installer, notify Landscape Architect in writing of unsatisfactory preparation before proceeding.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Consult with local jurisdictional authorities regarding specific utility locations. Arrange for a local underground utility locating service to identify and locate potential below-grade utility hazards such as electric, gas, water, sewer, telecommunications and similar infrastructure prior to commencing clearing, digging, excavating or fence installation.

B. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 20 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

1. Construction layout and field engineering are specified in Section 017300 "Execution."

C. Verify final fence and gate elevations against adjacent grades and construction. Obtain Landscape Architect's approval before making adjustments that materially alter the Drawings.

D. Protect existing paving, planting, structures, boardwalk components, and other adjacent work during excavation and installation.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction. Install fences by setting posts as indicated and fastening rails to posts.

B. Posts: Locate and space according to Manufacturer drawings. Set posts in suitable concrete footers designed and constructed for structural integrity in specific application. Consult Marine engineer drawings.

1. Setting of posts by other methods is permissible only as determined by Landscape Architect or engineer.

C. Post Excavation: Drill or hand-excavate holes for posts in firm, undisturbed soil. Excavate holes to a diameter of not less than 4 times post size and a depth of not less than 24 inches plus 3 inches for each foot or fraction of a foot that fence height exceeds 4 feet, unless greater dimensions are indicated by structural requirements or Drawings.

D. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
2. Concrete Fill: Place concrete around posts and sleeves and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
   a. Concealed Concrete: Top 2 inches below grade to allow covering with surface material. Slope top surface of concrete to drain water away from post.
3. Posts Set in Concrete: Extend post to within 6 inches of specified excavation depth, but not closer than 3 inches to bottom of concrete.
4. Space posts uniformly at dimensions shown on Drawings.

E. Install fence panels level, plumb, true to line, and with consistent spacing and alignment. Match approved mockup.

F. Make field connections tight and secure. Do not force components into alignment in a manner that induces visible distortion.

G. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

H. Install boardwalk fence and gate connections using brackets and methods approved by boardwalk manufacturer. Do not compromise waterproofing, structural members, or protective coatings.

I. Maintain required clearances and avoid contact with adjacent paving, walls, planting, drainage structures, and other construction except where specifically detailed.

3.3 FIELD MODIFICATIONS AND FINISH REPAIR

A. Fence installation may require limited cutting or drilling to accommodate slight variations in field measurements and normal construction tolerances. Contractor shall take reasonable precautions to make sure exposed metal surfaces are properly sealed from environment, as described below.

1. Failure to properly clean, prime and finish paint exposed surfaces as described in the following steps will void the Manufacturer's Warranty.
2. Carefully inspect fence and metal components during installation.
3. Remove metal shavings from drilling or cutting of posts or metal fence components.
4. Where drilling or cutting was deemed necessary, clean metal surfaces and apply two (2) coats of zinc-rich metal primer to thoroughly cover each cut edge or hole drilled during installation processes. Allow each coat to dry thoroughly.
5. Apply two (2) thin coats of Manufacturer-supplied custom touch-up paint to such locations. Allow each coat to dry thoroughly.
6. Inspect work and verify each drilled or cut metal surface was properly treated, as described above.

B. Repair damaged galvanized coatings in accordance with ASTM A780/A780M and coating manufacturer's written instructions.

C. Repair damaged powder-coated or painted finishes using materials and methods approved by finish manufacturer. Blend repairs to produce uniform appearance.

D. Do not field-weld finished components unless specifically approved. Protect adjacent finished surfaces from welding heat, sparks, and splatter.

3.4 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Lubricate hardware and other moving parts.

C. Adjust gate clearances and stops so that leaves do not strike adjacent construction and remain securely latched.

D. Verify cane bolts engage fully in strikes in both open and closed positions where applicable.

3.5 FIELD QUALITY CONTROL

A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

1. Inspect installation, post spacing, location dimensions, alignment, gate operation, connections, and finishes.
2. Verify concrete footings are adequately consolidated and that posts remain plumb and aligned after concrete has cured.

3. Verify all exposed cuts, drilled holes, field welds, and coating repairs have been properly treated.
4. Document preparatory, initial and follow-up inspection in Contractor's Test and Inspection Reports.
5. Contractor Test and Inspection Reports shall be available to Landscape Architect and Manufacturer upon request.

B. Remove and replace components that cannot be corrected to meet requirements.

C. Correct deviations from approved Shop Drawings and mockup at no additional cost to Owner.

3.7 DEMONSTRATION

A. Train Owner's personnel to adjust, operate, and maintain gates.

B. Demonstrate operation of all latches, cane bolts, hinges, keepers, and other moving hardware.

C. Provide manufacturer's recommended maintenance procedures and compatible touch-up materials.

3.8 CLEANING AND PROTECTION

A. Clean products in accordance with the manufacturers recommendations.

B. Remove dirt, dust, construction debris, labels, protective films, metal shavings, weld residue, and other contaminants from completed work.

C. Do not use cleaning agents or tools that damage coatings, galvanizing, stainless steel, or adjacent materials.

D. Touch-up, repair or replace damaged products before Substantial Completion.

E. Protect completed fence and gate work from damage by subsequent construction operations until Substantial Completion.

F. At Substantial Completion, inspect all fence and gate components and leave the Work clean, fully operable, and free of visible defects.

END OF SECTION 32 31 19

SECTION 32 32 19 GARDEN WALL

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. *Supply and installation of structural garden wall, with brick units and limestone cap.*
   2. *Supply and installation of reconstructed fieldstone wall, with new fieldstone core and salvaged outer wall material.*

B. Work of this Section includes all labor, materials, equipment and services necessary to complete the work as shown on the drawings and/or specified herein, including but not necessarily limited to the following:
   1. *Concrete block walls.*
   2. *Joint sealant walls.*
   3. *Metal joint reinforcing, anchors, ties, closures and related accessories for masonry.*
   4. *Control and expansion joints in masonry, filled with joint fillers.*
   5. *Chases, recesses, pockets and openings in masonry as required for installation of work by others.*
   6. *Building in of items furnished by others into masonry, including access doors, door frames, anchors, sleeves and inserts, and other similar items to be embedded in masonry.*
   7. *Grouting in of metal items built into masonry work.*
   8. *Protection, pointing and cleaning of masonry.*
   9. *Coordination of masonry work with fountain work, utilities, drainage, planting and adjacent site construction.*

C. Related Sections May include:
   1. *Unit Masonry 04 20 00.*
   2. *Clay Unit Masonry 04 21 00.*
   3. *Cast in Place Concrete 03 30 00.*

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate work of this Section with other related work, including structural work, fountain work, paving, site furnishings, utilities, drainage, planting, waterproofing and work embedded in or adjacent to masonry.

B. Schedule: Prepare a schedule for the work of this Section including a detailed activity list, start and finish dates, milestones and date of substantial completion. Provide Landscape Architect with a copy of proposed schedule and obtain Landscape Architect’s acceptance of schedule.

C. Pre-Installation Meeting: Convene a pre-installation site meeting at least 7 days prior to commencing work at site. Require attendance of parties directly affecting work of this Section, including Landscape Architect and, if appointed, testing agency. Review work activities and schedule. Tour site and inspect and discuss site physical conditions. Review required inspections, mockup requirements, material deliveries, protection, weather limitations and coordination with adjacent work.

1.4 SUBMITTALS

A. Provide Landscape Architect with submittals specified in this clause at least 30 days prior to scheduled commencement of work at site.

B. Shop Drawings: Submit shop drawings for the following:
1. *Anchoring details.*
2. *Control and expansion joint locations and details.*
3. *Layout and dimensions.*
4. *Wall sections, coursing, bond patterns, returns, corners, openings and transitions.*
5. *Locations of reinforcing, grouting, embedded items, sleeves, anchors and ties.*
6. *Limestone cap profiles, joints, corners, radial conditions and transitions.*
7. *Coordination details at fountain work and other adjacent construction.*

C. Submit Samples for the following:
1. *Joint reinforcing, each type, width and proposed location (labeled).*
2. *Anchors, wedges and ties, each type, width and proposed location (labeled).*
3. *Joint filler, each type.*
4. *Limestone cap showing the front ledge profiles – 4 inches by 4 inches by 3 inches.*
5. ***Sample brick** as described in 04 21 00 Clay Unit Masonry.*

D. Submit technical and installation information for the following:
1. *Mortar materials, each material and mortar type.*
2. *Certification of mortar mix.*
3. *Flashing material, descriptive literature.*
4. *Concrete block, joint reinforcing, anchors, ties and joint filler; submit manufacturer's technical and descriptive literature.*
5. *Block manufacturer certifications of compliance with ASTM C 90, ASTM C 331 and UL 618 prior to any job site delivery. Field sampling of concrete block may be tested by an Independent Testing Laboratory.*
6. *Source materials for fieldstone core wall. Samples not necessary.*

E. Construction Procedures: Submit the following:
1. *Procedures and materials for cleaning masonry work, including certification that cleaner will not adversely affect stone, gaskets, sealants, adjacent materials or finishes.*
2. *Procedures for protection of completed masonry during construction.*
3. *Procedures for cold-weather and hot-weather masonry construction.*

F. Product Data: Submit manufacturer’s product data for each type of product to be used. For soils and aggregates provide testing agency laboratory analysis.

G. Qualification Data: Submit proof of qualifications of installer and installer’s site supervisor.

H. Mockup: Submit proposed mockup materials, mortar, brick, limestone cap, joint profiles and cleaning procedures prior to construction of the required mockup.

1.5 MOCK UP

A. Provide a 8'-0" x 8'-0" mock up wall section showing the brick archway and limestone cap. Upon satisfactory completion of the mock up and approval by the Landscape Architect, the mock up may remain in place for final construction.

B. ***Provide a minimum 4'-0" long section of reconstructed stone wall, retaining version*.**

C. Mockup shall demonstrate representative brick ***or stone*** coursing, mortar joints, control or expansion joint conditions, limestone cap profile, corners, archway, finish quality and cleaning.

D. Do not proceed with exposed final masonry construction until mockup has been reviewed and approved by Landscape Architect.

E. Approved mockup shall establish the standard for workmanship, appearance, joint tooling, color, texture, alignment and cleaning of the completed Work.

F. ***If mockup is found acceptable, may remain as part of finished Work*.**

1.6 QUALITY ASSURANCE

A. Conform to the following non-cumulative tolerances. Any masonry work not meeting these standards shall be re-built as directed by the Landscape Architect:
   1. *Variation from Plumb: in lines and surfaces of walls 1/8" in 10 feet.*
   2. *Variation from level or grades dictated in drawings: 1/4" in 20 feet.*
   3. *Variation of the linear building lines from established position in plan: 1/2" in 40 feet.*
   4. *Variation in cross sectional dimensions and thickness of walls: +/- 1/8".*
   5. *Variation in dimensions of masonry openings: Horizontal and Vertical +/- 1/16".*

B. Work of this Section shall conform to the requirements of the following, unless otherwise superseded by prevailing Building Code:
   1. *2008 ACI 530/ASCE 5/TMS 402 Building Code Requirements for Masonry Structures. 2008 ACI 530-1/ASCE 6/TMS 602 Specifications for Masonry Structures.*

C. Install masonry by an experienced masonry contractor regularly engaged in work of similar type, material and scale.

D. Provide a competent site supervisor familiar with masonry construction, mortar mixing, reinforcement, anchorage, jointing, cleaning and protection.

E. Field Quality Control: Where testing is required by the Contract Documents or directed by Landscape Architect, provide access for Independent Testing Laboratory to sample and test materials and completed work.

1.7 PRODUCT HANDLING

A. General: Deliver, store, handle and protect all materials from damage, moisture, dirt and intrusion of foreign matter. Store all masonry units and mortar materials on raised platforms and under ventilated and waterproof cover. Store packaged materials in manufacturer's unopened containers, marked with manufacturer's name and product brand name. Immediately reseal containers after partial use. Remove and replace damaged materials.

B. Masonry Units: Pack, deliver and store to prevent breakage, cracking, chipping, spalling or other damage. Store, protect and ventilate units at project site.

Aggregate: Store with provisions for good drainage.

C. Reinforcement and Anchors: Store and protect so that when placed, joint reinforcement and anchors will be free of soil, dirt, ice, loose rust, scale, or other coatings which would destroy or reduce bond with mortar, and will not be disfigured or bent out of shape.

D. Limestone: Protect from staining, chipping, cracking, scratching, weathering and contact with materials that could discolor or damage finished surfaces.

1.8 JOB CONDITIONS

A. In cold weather, when the outside temperature is below forty (40) degrees F., conform to the requirements of 'Cold Weather Masonry Construction and Protection Recommendations' publication by Brick Industry Association (BIA). No anti-freeze admixtures are permitted.
   1. In addition, conform to the following*:*
      a. Masonry materials must be warmed as required.
      b. Brickwork must be protected a minimum of 24 hours after installation so as to maintain enough heat for hydration of the cement in the mortar.

B. B. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg. F. and above.
   1. Masonry materials must be cool.
   2. Mortar must be used within 2 hours of initial mixing*.*

C. C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
   1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
   2. Protect sills, ledges, and projections from mortar droppings.
   3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
   4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry*.*

D. Do not construct masonry when conditions are unsuitable for proper bond, curing, alignment or protection. Protect completed work from weather and construction activities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Standard Concrete Block.
1. Portland cement, ASTM C 150, Type 1, low alkali (less than 65) one source.

~~***B.***~~ Brick: ***As described in 04 21 00 Clay Unit Masonry.*** ~~***Provide units without cores or frogs and with exposed surfaces finished for ends of walls and fascia.***~~
~~***1. Face Brick.***~~
~~***2. Vendor: Gavin Historical Bricks, 2050 Glendale Rd. Iowa City Iowa, USA, info@historicalbricks.com.***~~
~~***3. Color: Antique Iowa Brick, or approved equal.***~~

C. Limestone Cap: Provide limestone cap as per dimensions to drawings with eased edges and profiles matching the drawings.
1. Color: Prairie Shell.
2. Vendor: US Stone, 2561 Q Ave, Herington, KS 67449.
3. Provide pieces of sufficient length and size to minimize joints and provide continuous appearance at straight and curved conditions.

D. Aggregates, ASTM C 331, lightweight expanded shale, clay or slate aggregates, manufactured by the rotary kiln process equal to 'Solite,' 'Norlite,' or 'Haydite.'
1. Block scheduled to receive painted finish shall contain normal weight aggregate meeting ASTM C-33 in addition to light weight aggregate in order to receive a smooth, uniform finish.

E. Concrete Masonry Units: Load bearing lightweight aggregate concrete masonry units conforming to the requirements of ASTM C 90.
1. Block behind veneer block and block for rated walls shall be 75% solid units.
2. All other block may be hollow units.

F. Sizes and Shapes: Nominal face size by thickness as indicated on drawings, with stretcher units, jamb units, header units, square corner units (at ends and corners of exposed or painted work), sash units (at control joints within masonry wall), lintel units and other special shapes and sizes required to complete the work.

G. The producer of the concrete masonry units shall furnish certification from an independent testing laboratory confirming that all 8" or larger masonry units meet all of the UL 618 requirements for two (2) hours or better (as required), referencing full scale fire test reports (ASTM E 119). All 4" and 6" units shall conform to 'National Bureau of Standards' and 'National Research Council' full scale fire tests.

H. Finish: For exposed or painted block surfaces, in addition to ASTM requirements, block shall have uniformly dense, flat, fine grain texture, with no cracks, chips, spalls, or other defects which would impair appearance. For concealed CMU, surfaces shall be free from deleterious materials that would stain plaster or corrode metal.

I. Curing: All concrete block shall be steam cured, and air dried for not less than thirty (30) days before delivery.

J. Density of concrete block shall not exceed one hundred and five (105) lbs. per cubic foot.

K. Shrinkage: Shrinkage of concrete blocks shall not exceed 0.065% when tested in accordance with ASTM C 426-99.

L. Water Content:
   1. *At the time of delivery to the job site, concrete masonry units shall have a value, in weight of contained water, of not more than thirty (30) percent of the fully saturated content for the unit tested.*
   2. *Ship all units from the factory, and store at the job site, with all necessary protection to prevent increase of water content from rain and other source.*

M. ***Fieldstone: Suitable materials of varying sizes, generally flat, conforming to overall dimensions of wall as indicated on Drawings***.

2.2 JOINT SEALANTS

A. Provide one (1) part non-sag sealant equal to No. 790 or 795 made by Dow Corning, 'Silpruf SCS 2000' or 'LM SCS 2700' made by G.E. or 'Spectrem 1' or 'Spectrem 3' made by Tremco or 'Sonolastic 150' by Sonneborn conforming to the minimum standards of ASTM C 920, Type S, Grade NS, Class 50.

B. Back-Up Materials: Provide back-up materials and preformed joint fillers, non-staining, non-absorbent, compatible with sealant and primer, and of a resilient nature, equal to 'HBR' made by Nomaco Inc. or approved equal, twenty-five (25) percent wider than joint width. Materials impregnated with oil, bitumen or similar materials shall not be used.

C. Sealant color shall be selected to closely match adjacent masonry unless otherwise indicated by Landscape Architect.

2.3 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type 1, standard color, one source.

B. Hydrated Lime: ASTM C 207, Type S, as manufactured by Corsons, or approved equal.

C. Aggregate: Clean, washed, buff colored sand, graded per ASTM C 144.

D. Aggregate for Grout: ASTM C 404.

E. Water: Clean, fresh and suitable for drinking.

F. Exterior masonry: Provide integral waterproofing additive in mortar.

G. Vertical Soil Inspection Pipe: 150 mm diameter rigid 100% high density polyethylene.

2.4 MORTAR MIX

A. Exterior Masonry Construction: Provide Portland cement/lime mortar conforming to ASTM C 270, Type M.

B. Mixing:

1. General: Add cement just before mixing and mix dry. Use sufficient amount of water as necessary to produce workable mix. Mix in small batches to make plastic mass***.***

2. Mixing: Machine mix all mortars in approved type mixer with device to accurately and uniformly control water. Add hydrated lime dry. Mix dry materials not less than two (2) minutes. Add water, then mix not less than three (3) minutes, not to exceed five (5) minutes. Mix only amount of mortar that can be used before initial set. Do not use mortar which has reached its initial set or two (2) hours after initial mixing, whichever comes earlier. Mortar may not be re-tempered. Clean mixer for each batch, whenever mortar type is changed, and at end of each day's work.
3. Acceleration or other admixtures not permitted.
4. Mortar shall have a flow after suction of not less than seventy-five (75) percent of that immediately after mixing as determined by ASTM C 91*.*

C. C. Admixtures:

1. No air-entraining admixtures or cementitious materials containing air-entraining admixtures shall be used in the mortar.
2. No antifreeze compounds or other substances shall be used in the mortar to lower the freezing point.
3. Calcium chloride or admixtures containing calcium chloride shall not be used in mortar*.*

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine substrates, foundations, adjacent construction, embedded items and conditions affecting installation. Notify Landscape Architect of conditions that would prevent proper execution.

B. Concrete Block: Do not wet concrete block.

C. Carefully coordinate with all other trades to ensure proper and adequate interface of the work of other trades with the work in this Section.

D. Verify locations of utilities, sleeves, piping, fountain work, drainage, reinforcement, anchors and other embedded items before beginning masonry construction.

E. Do not begin masonry construction until foundations and supporting construction are sufficiently complete and cured to support the Work.

3.2 INSTALLATION

A. GENERAL: Build walls to the full thickness shown. Build single wythe walls to the actual thickness of the masonry units, using units of nominal thickness shown.

B. Build chases and recesses as shown or required for the work of other trades.

C. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.

D. Leave openings to account for the fountain work.

E. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to properly locate openings, movement type joints, returns and off-sets. Avoid the use of less than half size units at corners, jambs and wherever possible.

F. Lay up walls plumb and true with courses level, accurately spaced and coordinated with other work.

Provide templates made of steel studs for plumbing of two story masonry openings.

G. For brick facing installation standards, refer to 04 21 00 Clay Unit Masonry.

H. Pattern Bond: Lay exposed masonry patterns as noted on drawings and to match Architecture. Lay concealed concrete block with all units in a wythe bonded by lapping not less than two (2) inches. Bond and interlock each course of each wythe at corners. Do not use units of less than four (4) inches horizontal face dimensions at corners or jambs.

I. Mortar, ties and reinforcement must not extend into or bridge any expansion joints.

J. Precast Concrete Cap: Install caps and cut end joints to accommodate radial curves.

K. Limestone Cap: Install caps to lines and grades shown, with uniform joints, consistent profiles and continuous alignment. Protect finished faces from mortar staining and damage.

L. Construct archway and other special masonry features in accordance with approved shop drawings and mockup. Maintain consistent coursing and joint dimensions through transitions.

3.3 MORTAR BEDDING AND JOINTING

A. Lay concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on exterior walls and in all courses of piers, columns and pilasters, where solid CMU is used and where adjacent to cells or cavities to be reinforced or filled with concrete or grout.
   1. To ensure alignment of veneer block and block coursing, adjust block back-up by cutting block to insure alignment of coursing or use adjustable anchorage.
   2. Lay masonry walls with 3/8" joints unless otherwise shown on drawings.
   3. Tool joints flush.
   4. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners at jambs to fit stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

B. Stopping and Resuming Work: Rake back 1/2 block length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.

C. Built-In Work:
   1. As the work progresses, build in items specified under this and other Sections of these specifications. Fill in solidly with masonry around built-in items.

2. Mortar in metal items embedded or built into masonry work solidly with mortar as the masonry units are laid up.
3. Grout under lintels, bearing plates, and steel bearing on masonry with solid bed grout.
4. Fill vertical cells of masonry units solid with grout which have anchoring, reinforcing rods, supporting or hanging devices embedded in the cell including stone anchors and window or curtain wall anchors.
5. Fill vertical cells of masonry units solid with mortar on each side to sixteen (16) inches beyond.
6. Unless otherwise noted, fill vertical cells of masonry units solid with grout which are below structural elements, to eight (8) inches beyond bearing and from foundation to bearing.
7. Place wire mesh in horizontal joint below masonry unit cells to be filled with mortar, to prevent mortar from dropping into unfilled cells below.
8. Masonry indicated as being reinforced shall have all voids filled solid with grout. Grout shall be consolidated in place by vibration or other methods which insure complete filling of cells. When the least clear dimension of the grouted cell is less than two (2) inches, the maximum height of grout pour shall not exceed twelve (12) inches.
9. When the least clear dimension is two (2) inches or more, maximum height of grout pour shall not exceed forty-eight (48) inches. When grouting is stopped for one (1) hour or longer, the grout pour shall be stopped 1-1/2" below the top of a masonry unit. Vertical bar reinforcing shall be accurately placed and held in position while being grouted, and shall be in place before grouting starts. All such reinforcing shall have a minimum clear cover of 5/8". Lap all bars a minimum of forty (40) bar diameters and provide steel spacer ties (not to exceed 192 bar diameter) to secure and position all vertical steel and prevent displacement during grouting. Provide continuous horizontal reinforcement embedded in mortar joints every second course.

D. Cutting and Patching:
1. All exposed masonry which requires cutting or fitting shall be cut accurately to size with motorized carborundum or diamond saw, producing cut edges.
2. Do not saw cut any masonry openings in face brick construction without Architect's approval and after a procedure has been reviewed and approved.
3. Holes made in exposed masonry units for attachment of handrail brackets and similar items shall be neatly drilled to proper size.
4. All masonry which requires patching in exposed work, if approved by Landscape Architect, shall be patched neatly with mortar to match appearance of masonry as closely as possible and to the Landscape Architect's satisfaction. Rake back joints and use pointing mortar to match as required.

E. Ties and Anchors for Masonry Construction:
1. Provide ties and anchors as shown or specified, but not less than one metal tie, spaced not to exceed sixteen (16) inches o.c. horizontally and/or vertically. Provide additional ties within 1'-0" of all openings and adjacent to expansion joints and spaced not more than 16" apart around perimeter of openings.

F. Control and Expansion Joints:
1. Provide expansion, control and isolation joints in masonry as shown in approved shop drawings. Build in related items as the masonry work progresses.
2. CMU Control Joint Spacing: If location of control joints is not shown, place vertical joints spaced not to exceed 40'-0" o.c. In addition, locate joints at points of natural weakness in the masonry work, including the following:
   a. At structural column or joint between bay.

b. Above control joints in the supporting structure.
c. Below major openings at top of arch downward. Place at one side of arch for openings less than 6'-0" wide and at both sides for openings over 6'-0" wide.
d. At reduction of wall thickness.
e. Where masonry abuts supporting structure.

3. If additional joints are required, indicate same on approved shop drawings.
4. Keep mortar, ties, reinforcement and grout out of movement joints unless specifically indicated otherwise.

3.4 SEALANT INSTALLATION

A. Install back-up materials and sealants in clean, dry joints in accordance with manufacturer's written recommendations.

B. Do not bridge expansion, control or isolation joints with mortar or other rigid materials.

C. Tool sealant to provide a neat, uniform profile, fully bonded to joint substrates and free of voids, wrinkles, bubbles or surface defects.

D. Protect adjacent masonry and finished surfaces from sealant staining and residue.

3.5 CLEANING

A. Upon completion of work on site, clean areas within contract limits. Remove tools, equipment, debris, rubbish and excess materials. Leave site in broom clean condition.

B. The Contractor shall take adequate precautions for the protection of all surfaces against mortar spatter, and shall immediately remove any such spatter should it inadvertently occur, leaving no stain or discoloration.

C. Excess mortar shall be wiped off the masonry surfaces as the work progresses.

D. Wood coverings shall be placed over all such masonry surfaces as are likely to be damaged during the progress of the entire project.

E. Protective measures shall be performed in a manner satisfactory to the Landscape Architect.

F. Damaged masonry units shall be replaced to satisfaction of the Landscape Architect.

G. Exterior masonry walls shall be draped with waterproof covering until copings are in place, to prevent water penetration in cavity.

H. Cleaning of Masonry: Upon completion, all exposed masonry shall be thoroughly cleaned following recommendations of the NCMA Technical Notes. Before applying any cleaning agent to the entire wall, it shall be applied to a sample wall area of approximately 4' x 4' in a location approved by the Landscape Architect. No further cleaning work may proceed until the sample area has been approved by the Landscape Architect, after which time the same cleaning materials and method shall be used on the remaining wall area.

I. If stiff brushes and water do not suffice, the surface shall be thoroughly saturated with clear water and then scrubbed with a solution of an approved detergent masonry cleaner, equal to 'Vana Trol' made by ProSoCo Inc. or equal made by Diedrich or approved equal, mixed and applied as per manufacturer's directions, followed immediately by a thorough rinsing with clear water. All adjacent non-masonry surfaces shall be thoroughly protected during cleaning.

J. Do not use cleaning agents, acids, abrasives or methods that damage brick, limestone, mortar, sealants, metal components, adjacent paving, planting or other completed work.

3.6 FINAL INSPECTION AND PROTECTION

A. Inspect completed masonry for alignment, plumb, level, joint consistency, finish quality, cracks, chips, spalls, staining, open joints, damaged units and incomplete work.

B. Correct deficiencies identified by Landscape Architect. Replace damaged or unacceptable masonry units rather than attempting cosmetic repair where repair would be visible or would not restore the required appearance.

C. Maintain protective coverings until adjacent construction is sufficiently complete to prevent damage to completed masonry.

D. Leave completed walls clean, dry, protected and ready for acceptance.

END OF SECTION 32 32 19

SECTION 32 34 13 – FABRICATED BOARDWALK AND BRIDGES

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Precast concrete boardwalk system, consisting of precast concrete tread (deck) units and precast concrete beams.
2. Toe kick, integral or attached.
3. Coordination requirements with foundation systems.
4. Fence and gate connection bracket, supplied by boardwalk manufacturer for attachment of fence and gate specified under separate section.
5. ***Prefabricated bridge system.***
6. Coordination review of bridge decking, truss, and handrail.

B. Related Requirements:

1. ***Section 03 30 00 Cast-In-Place Concrete.***
2. Section 32 31 19 Decorative Metal Fences and Gates.

1.2 REFERENCES

A. ASTM C1611 – Standard Test Method for Slump Flow of Self-Consolidating Concrete.

B. ASTM A615/A615M – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

C. ACI 318 – Building Code Requirements for Structural Concrete.

D. AASHTO LRFD Bridge Design Specifications, current edition.

E. ADA Standards for Accessible Design, current edition.

1.3 SUBMITTALS

A. PRODUCT DATA:

1. Manufacturer’s printed data for the precast boardwalk system, including standard tread and bearer dimensions, unit thickness, connection hardware, and finish/color options.
2. Manufacturer’s printed data for the bridge truss and handrail system.

B. SHOP DRAWINGS:

1. Shop drawings to be submitted to Landscape Architect for coordination and review prior to fabrication.
2. Submit shop drawings for each boardwalk segment showing:

    a. Overall boardwalk layout (plan and profile)
    b. Individual tread layout and dimensions
    c. Toe kick connection detail
    d. Toe kick ~~***play***~~ layout, showing full run of toe kick along the boardwalk and indicating all locations where toe kick breaks or is interrupted (e.g., at access points, bridge transitions, intersection paths, or other planned gaps)
    e. Fence and gate connection bracket detail — connection point(s) supplied by boardwalk manufacturer for attachment of fence and gate (specified under Section 32 31 19) to boardwalk structure.

C. SAMPLES:

1. Submit two 12" x 12" (minimum) physical samples of the precast tread unit for approval prior to fabrication.
2. Submit two 12" x 12" (minimum) physical samples of standard finish/color options, as applicable to the manufacturer selected, for Landscape Architect approval prior to fabrication.

D. ENGINEERING SUBMITTALS

1. Manufacturer to provide the following, sealed by a Professional Engineer licensed in the state of the project (manufacturer's engineer of record for the boardwalk system), submitted by Contractor prior to fabrication:

    a. Reinforcement layout, including bar, mesh, and/or fiber reinforcement type, size, spacing, and placement within precast tread and beam units, as applicable to manufacturer's standard design. Provide these documents sealed by Professional Engineer licensed in the state of the project (manufacturer's engineer of record for the boardwalk system).
    b. Structural design calculations demonstrating that the precast boardwalk system meets or exceeds the design loading criteria specified in Section 1.5, including concentrated (point) load capacity. Provide these documents sealed by Professional Engineer licensed in the state of the project (manufacturer's engineer of record for the boardwalk system).
    c. ***Based on project structural Drawings, provide*** pile design calculations and layout, demonstrating pile type, spacing, and embedment adequate for point loads furnished by boardwalk manufacturer (Section 2.3) and project geotechnical report. Foundation supplier to provide, sealed by Professional Engineer licensed in the state of the project (foundation supplier's engineer of record).

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Boardwalk ***and bridge*** systems shall be manufactured by a firm regularly engaged in the fabrication of precast concrete boardwalk/pedestrian ***and metal bridge*** structures, with a minimum of five (5) comparable installed projects.

B. Installer Qualifications: Installation shall be performed by the manufacturer's authorized installer or by a Contractor trained and approved by the manufacturer.

C. Mockups:

1. Boardwalk Mockup: Build mockup of boardwalk assembly, minimum 12 linear feet, including precast tread and beam units, foundation connection, toe kick, and fence, to verify material, color, finish, and assembly selections and to set quality standard for fabrication and installation.
2. Approved mockups establish the standard by which the completed work will be judged.
3. Do not proceed with fabrication or installation of remaining boardwalk work beyond the mockup until mockup has been reviewed and approved by Landscape Architect.
4. Subject to compliance with requirements, approved mockup may remain as part of the completed Work if undisturbed at time of substantial completion.

1.5 PERFORMANCE REQUIREMENTS

A. Design Loading: Precast tread and beam units and ***bridge deck system*** to meet or exceed manufacturer's standard published design loading, including uniform pedestrian live load and concentrated (point) load capacity, and comply with governing building code minimums, whichever is greater.

1. Manufacturer to be responsible for providing engineering drawings and design calculations demonstrating compliance with this section, sealed by a Professional Engineer licensed in the state of the project per Section 1.3.D.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle precast concrete tread and beam units in strict accordance with manufacturer's written instructions.

B. Store units off the ground on dunnage, at locations and in a manner per manufacturer's written instructions, protected from damage.

C. Handle units using lifting points, methods, and equipment specified by manufacturer. Do not lift, move, or place units by methods not approved by manufacturer.

1.7 WARRANTY

A. Contractor to submit warranty terms and documentation from each manufacturer and foundation supplier listed in Section 2.1 ***and any other proposed manufacturers***, prior to selection, for Landscape Architect and Owner review as part of manufacturer/supplier selection.

B. Selected manufacturer to provide minimum ten (10) year standard warranty against material defects for the precast concrete boardwalk system, including finish/color defects such as fading, chalking, or delamination beyond manufacturer's published tolerances.

C. Selected foundation supplier to provide minimum ten (10) year standard warranty against material and installation defects for the pile foundation system.

D. Warranty terms shall be a factor in Landscape Architect and Owner's review and approval of manufacturer and foundation supplier selection, per Section 2.1.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. PermaTrak

1. Contact: Jonathan Dove / Email: jdove@permatrak.com / Phone: 956-229-1848
2. Color: “Savannah Brown” (subject to sample approve per section 1.3.C.)
3. Finish: “Permaplank” (subject to sample approve per section 1.3.C.)
4. Website: www.permatrak.com

B. TerraTread

1. Contact: Bryan Martin / Email: bmartin@terratread.com / Phone: 419-351-5412
2. Color: Not selected. Contractor to submit full range of available standard finish/color samples for Landscape Architect review and selection, per Section 1.3.C.
3. Finish: Not selected. Contractor to submit full range of available standard finish/color samples for Landscape Architect review and selection, per Section 1.3.C.

C. York Bridge Concepts

1. Contact: Brian Kennedy / Email: bkennedy@ybc.com / Phone: 813-956-1763
2. Website: www.ybc.com
3. System: Composite decking on timber stringers, subject to Owner approval.

D. Foundation Suppliers: Boardwalk beams to bear on a pile foundation system furnished by one of the following or approve equal:

1. Helical Concepts, Inc.

a. Contact: Josh Lindberg / Email: josh@helicalpier.com / Phone: 214 803-0207
b. Website: www.helicalpier.com

2. Sinacola, LLC

a. Contact: Anthony Sinacola / Email: asinacola62@gmail.com / Phone: 419-705-4913

E. BRIDGE TRUSS & STRUCTURE

1. Contech Engineered Solutions LLC

a. Contact: Aaron Clauson / Email: Aaron.Clauson@ContechES.com / Phone: 501-626-1385 / Website: www.ContechES.com

2. Approved equal.

2.2 MATERIALS

A. Precast Concrete Tread Units: Manufacturer's standard precast concrete tread (deck) unit, reinforced per manufacturer's engineered design for the specified span and loading. Joint spacing between treads to comply with ADA standards for openings in walking surfaces, and to be coordinated to match bridge decking joint spacing per Section 2.2.F, subject to Landscape Architect approval.

B. Precast Concrete Beams: Manufacturer's standard precast concrete beam, supporting tread units and connecting to foundation pile via threaded bar connection with 1/8" rubber leveling pad, reinforced per manufacturer's engineered design.

C. Reinforcement: Per manufacturer's standard design, conforming to ASTM A615/A615M or manufacturer's proprietary reinforcement system.

D. Finish: Manufacturer's standard integral color finish; color as selected (Savannah Brown or approved equal).

E. Connection Hardware: Per manufacturer’s specifications.

F. Bridge Decking: Concrete decking at bridge to be the same precast concrete tread system specified in Section 2.1 and 2.2.A, by the same manufacturer selected for the boardwalk. If not feasible, bridge decking to match boardwalk decking in material, color, texture, width, and joint spacing, subject to Landscape Architect approval.

2.3 FOUNDATION SYSTEM

A. Pile Type Determination: Pile type (helical or drilled/grouted micropile) to be determined by the foundation supplier selected per Section 2.1, based on:

1. Point load and reaction data provided by the boardwalk manufacturer (Section 2.3.B) for the selected boardwalk system.
2. Project geotechnical report.
3. Foundation supplier to submit recommended pile type, layout, and design calculations, sealed by foundation supplier's professional engineer.

B. Coordination: Boardwalk manufacturer to furnish point load and reaction data to the selected foundation supplier, who will coordinate final pile layout, spacing, and embedment based on geotechnical report and structural engineer review.

2.4 TOE KICK

A. Provide continuous toe kick along one side of boardwalk (side without fence)

B. Provide joint filler material at toe kick joints per manufacturer's specifications.

C. Confirm with selected manufacturer whether toe kick is available as a standard or optional integral component prior to bid; note in shop drawings which method (manufacturer-provided or contractor-built) is being used.

2.5 FENCE AND GATE AT BOARDWALK

A. Fence/gate at Boardwalk is specified under Section 32 31 19 – Decorative Metal Fences and Gates.

B. Boardwalk manufacturer to supply connection bracket for attachment of fence/gate to boardwalk structure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify foundation system (helical piles or micropiles) is installed, cured/set, and within tolerance per manufacturer's requirements prior to placing beam and tread units.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Verify boardwalk layout and elevations against Drawings and field conditions

prior to fabrication of precast units.

B. Coordinate pile locations with foundation supplier's approved layout.

3.3 INSTALLATION

A. Install precast boardwalk tread and beam units in accordance with approved shop drawings and manufacturer's written installation instructions.

B. Coordinate beam-to-pile connection with foundation installer.

C. Install toe kick continuously along designated side.

D. Install fence and gate connection brackets per Sections 2.5; coordinate fence and gate installation with Section 32 31 19.

E. Do not proceed with installation of boardwalk beyond mockup extent until mockup is reviewed and approved by Landscape Architect, per Section 1.4.C.

3.4 TOLERANCES

A. Install tread and beam units level and true to line, per manufacturer's published tolerances.

3.5 FIELD QUAILTY CONTROL

A. Landscape Architect to review installed boardwalk ***and bridge*** for conformance with approved samples, mockup, and shop drawings prior to acceptance.

3.6 PROTECTION

A. Protect installed units from construction traffic and damage until substantial completion.

END OF SECTION 32 34 13

SECTION 32 84 00 - PLANTING IRRIGATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipes, tubes, and fittings.
2. Encasement for piping.
3. Manual valves.
4. Pressure-reducing valves.
5. Automatic control valves.
6. Automatic drain valves.
7. Transition fittings.
8. Dielectric fittings.
9. Miscellaneous piping specialties.
10. Sprinklers.
11. Quick couplers.
12. Drip irrigation specialties.
13. Controllers.
14. Boxes for automatic control valves.
15. Ground hydrants.

B. Related Requirements:

1. Section 220500 "Common Work Results for Plumbing" for water metering requirements.

1.2 DEFINITIONS

A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.

B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.

C. ET Controllers: EvapoTranspiration Controllers. Irrigation controllers, which use some method of weather-based adjustment of irrigation. These adjusting methods include use of historical monthly averages of ET, broadcasting of ET measurements, or use of on-site sensors to track ET.

D. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

E. 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.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Pipes, tubes, and fittings.
2. Encasement for piping.
3. Manual valves.
4. Pressure-reducing valves.
5. Automatic control valves.
6. Automatic drain valves.
7. Transition fittings.
8. Dielectric fittings.
9. Miscellaneous piping specialties.
10. Sprinklers.
11. Quick couplers.
12. Controllers.
13. Boxes for automatic control valves.
14. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
15. Ground hydrants.

B. Wiring Diagrams: For power, signal, and control wiring.

C. Delegated Design Submittals: For irrigation systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Irrigation systems, drawn to scale, on which components are indicated 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.

B. Zoning Chart: Indicate each irrigation zone and its control valve.

C. Controller Timing Schedule: Indicate timing settings for each automatic controller zone.

D. Field Quality-Control Submittals:

1. Field quality-control reports.

E. Qualification Statements: For Installer.

F. Delegated design engineer qualifications.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For sprinklers, controllers, and, automatic control valves to include in operation and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of maintenance material items.

1.7 QUALITY ASSURANCE

A. Qualifications:

1. Installers: Entity that employs a Certified Irrigation Designer - Landscape qualified by the Irrigation Association.

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.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and entrance of dirt, debris, and moisture.

B. Store plastic piping protected from direct sunlight. Support piping to prevent sagging and bending.

1.9 FIELD CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of water service.
2. Do not proceed with interruption of water service without Owner's written permission.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Irrigation Zone Control: Automatic operation with controller and automatic control valves.

B. Delegated Design: Design 100 percent coverage irrigation system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:

1. Irrigation Main Piping: 200 psig.
2. Circuit Piping: 150 psig.

D. NOTE: Client has expressed a strong preference for spray fixtures only, no drip lines. If irrigation professional believes drip lines are required in any area, coordinate with landscape architect before proceeding with irrigation design.

E. NOTE: Client intends to complete watering of entire site within one cycle, outside hours when the park is open (dawn to dusk). Irrigation design should provide for these conditions, with individual zones set up accordingly.

F. Coordinate with project engineers for necessary feed line sizes and pressure prior to irrigation design.

2.2 PIPES, TUBES, AND FITTINGS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

B. Galvanized-Steel Pipe: ASTM A53/A53M, Standard Weight, Type E, Grade B.

1. Galvanized-Steel Pipe Nipples: ASTM A733, made of ASTM A53/A53M or ASTM A106/A106M, Standard Weight, seamless-steel pipe with threaded ends.
2. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
3. Malleable-Iron Unions: ASME B16.39, Class 150, hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface, and female threaded ends.
4. Cast-Iron Flanges: ASME B16.1, Class 125.

C. Ductile-Iron Pipe with Mechanical Joints: AWWA C151, with mechanical-joint bell and spigot ends.

1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

    a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

D. Ductile-Iron Pipe with Push-on Joint: AWWA C151, with push-on-joint bell and spigot ends.

1. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

    a. Gaskets: AWWA C111 rubber.

E. Soft Copper Tube: ASTM B88, Type L, water tube, annealed temper.

1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper solder-joint fittings. Furnish wrought-copper fittings if indicated.
2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end.
3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.

F. Hard Copper Tube: ASTM B88, Type L,, and, ASTM B88, Type M, water tube, drawn temper.

1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper solder-joint fittings. Furnish wrought-copper fittings if indicated.
2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end.
3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.

G. PE Pipe with Controlled ID: ASTM D2239, PE 3408 compound; SIDR 11.5, and, SIDR 15.

1. Insert Fittings for PE Pipe: ASTM D2609, nylon or propylene plastic with barbed ends. Include bands or other fasteners.

H. PE Pipe with Controlled OD: ASTM D3035, PE 3408 compound, SIDR 11.

1. PE Butt, Heat-Fusion Fittings: ASTM D3261.
2. PE Socket-Type Fittings: ASTM D2683.

I. PE Pressure Pipe: AWWA C906, with DR of 7.3, 9, or 9.3 and PE compound number required to give pressure rating of not less than 200 psig.

1. PE Butt, Heat-Fusion Fittings: ASTM D3261.
2. PE Socket-Type Fittings: ASTM D2683.

J. PVC Pipe: ASTM D1785, PVC 1120 compound, Schedules 40 and 80.

1. PVC Socket Fittings: ASTM D2466, Schedules 40 and 80.
2. PVC Threaded Fittings: ASTM D2464, Schedule 80.
3. PVC Socket Unions: Construction similar to that of MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.

K. PVC Pipe, Pressure Rated: ASTM D2241, PVC 1120 compound, SDR 21, and, SDR 26.

1. PVC Socket Fittings: ASTM D2467, Schedule 80.
2. PVC Socket Unions: Construction similar to that of MSS SP-107, except both headpiece and tailpiece shall be PVC with socket or threaded ends.

2.3 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick unless

otherwise indicated; full-face or ring type unless otherwise indicated.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

C. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

D. Solder Filler Metals: ASTM B32, lead-free alloys. Include water-flushable flux in accordance with ASTM B813.

E. Solvent Cements for Joining PVC Piping: ASTM D2564. Include primer in accordance with ASTM F656.

F. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.4 ENCASEMENT FOR PIPING

A. Standard: ASTM A674 or AWWA C105.

B. Form: Sheet or tube.

C. Material: LLDPE film of 0.008-inch minimum thickness or high-density, cross-laminated PE film of 0.004-inch minimum thickness.

D. Color: Black.

2.5 MANUAL VALVES

A. Curb-Valve Casing:

1. Standard: Similar to AWWA M44 for cast-iron valve casings.
2. Top Section: Telescoping, of length required for depth of burial of curb valve.
3. Barrel: Approximately 3-inch diameter.
4. Plug: With lettering "WATER."
5. Bottom Section: With base of size to fit over valve.
6. Base Support: Concrete collar.

B. Shutoff Rods for Curb-Valve Casings: Furnish two steel, tee-handle shutoff rod(s) with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve for Project.

C. Iron Gate Valve Casings:

1. Standard: AWWA M44 for cast-iron valve casings.
2. Top Section: Adjustable extension of length required for depth of burial of valve.
3. Barrel: Approximately 5-inch diameter.
4. Plug: With lettering "WATER."
5. Bottom Section: With base of size to fit over valve.

6. Base Support: Concrete collar.

D. Operating Wrenches for Iron Gate Valve Casings: Furnish two steel, tee-handle operating wrench(es) with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut for Project.

2.6 AUTOMATIC DRAIN VALVES

A. Description: Spring-loaded-ball type of corrosion-resistant construction and designed to open for drainage if line pressure drops below 2-1/2 to 3 psig.

2.7 TRANSITION FITTINGS

A. General Requirements: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

2.8 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials or ferrous material body with separating nonconductive insulating material suitable for system fluid, pressure, and temperature.

2.9 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 Gages: ASME B40.1. Include 4-1/2-inch- diameter dial, dial range of two times system operating pressure, and bottom outlet.

2.10 SPRINKLERS

A. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.

2.11 BOXES FOR AUTOMATIC CONTROL VALVES

A. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4 inch minimum to 3 inches maximum.

2.12 GROUND HYDRANTS

A. Encased, non-freeze ground hydrant, for flush with grade or finished floor installation.

B. Galvanized steel casing, all bronze interior parts, bronze seat and replaceable seat washer, and non-turning operating rod with free-floating compression closure valve.

C. Cast iron box with scoriated hinged cover and operating key lock.

D. 1/4" NPT drain port in valve housing.

E. Product: Zurn Z1370, by Zurn Industries, Erie, PA, or approved equal.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

B. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches 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, to 12 inches 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 below finished grade, or not less than 18 inches below average local frost depth, whichever is deeper.
2. Circuit Piping: 12 inches.
3. Drain Piping: 12 inches.
4. Sleeves: 24 inches.

3.2 PREPARATION

A. Set stakes to identify locations of proposed irrigation system. Obtain Architect's approval before excavation.

3.3 INSTALLATION OF PIPING

A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.

B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.

C. Install piping free of sags and bends.

D. Install groups of pipes parallel to each other, spaced to permit valve servicing.

E. Install fittings for changes in direction and branch connections.

F. Install unions adjacent to valves and to final connections to other components with NPS 2 or smaller pipe connection.

G. Install flanges adjacent to valves and to final connections to other components with NPS 2-1/2 or larger pipe connection.

H. Install expansion loops in control-valve boxes for plastic piping.

I. Lay piping on solid subbase, uniformly sloped without humps or depressions.

J. Install ductile-iron piping in accordance with AWWA C600.

K. Install PVC piping in dry weather when temperature is above 40 deg F. Allow joints to cure at least 24 hours at temperatures above 40 deg F before testing.

L. Install water regulators with shutoff valve and strainer on inlet and pressure gage on outlet. Install shutoff valve on outlet. Install aboveground or in control-valve boxes.

M. Water Hammer Arresters: Install between connection to building main and circuit valves aboveground or in control-valve boxes.

N. Install piping in sleeves under parking lots, roadways, and sidewalks.

O. Install sleeves made of Schedule 80, PVC pipe and socket fittings, and solvent-cemented joints.

P. Install transition fittings for plastic-to-metal pipe connections according to the following:

1. Underground Piping:

    a. NPS 1-1/2 and Smaller: Plastic-to-metal transition fittings.
    b. NPS 2 and Larger: AWWA transition couplings.

2. Aboveground Piping:

    a. NPS 2 and Smaller: Plastic-to-metal transition unions.
    b. NPS 2 and Larger: Use dielectric flange kits with one plastic flange.

Q. Install dielectric fittings for dissimilar-metal pipe connections according to the following:

1. Underground Piping:

    a. NPS 2 and Smaller: Dielectric coupling or dielectric nipple.
    b. NPS 2-1/2 and Larger: Prohibited except in control-valve box.

2. Aboveground Piping:

    a. NPS 2 and Smaller: Dielectric union.
    b. NPS 2-1/2 to NPS 4: Dielectric flange.
    c. NPS 5 and Larger: Dielectric flange kit.

3. Piping in Control-Valve Boxes:

    a. NPS 2 and Smaller: Dielectric union.
    b. NPS 2-1/2 to NPS 4: Dielectric flange.
    c. NPS 5 and Larger: Dielectric flange kit.

3.4 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads in accordance with ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

    1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
    2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Flanged Joints: Select rubber gasket material of size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

E. Ductile-Iron Piping Gasketed Joints: Comply with AWWA C600 and AWWA M41.

F. Copper-Tubing Brazed Joints: Construct joints in accordance with CDA's "Copper Tube Handbook," using copper-phosphorus brazing filler metal.

G. Copper-Tubing Soldered Joints: Apply ASTM B813 water-flushable flux to tube end unless otherwise indicated. Construct joints in accordance with ASTM B828 or CDA's "Copper Tube Handbook," using lead-free solder alloy (0.20 percent maximum lead content) complying with ASTM B32.

H. PE Piping Fastener Joints: Join with insert fittings and bands or fasteners in accordance with piping manufacturer's written instructions.

I. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join in accordance with ASTM D2657.

    1. Plain-End PE Pipe and Fittings: Use butt fusion.
    2. Plain-End PE Pipe and Socket Fittings: Use socket fusion.

J. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings in accordance with the following:

    1. Comply with ASTM F402 for safe-handling practice of cleaners, primers, and solvent cements.
    2. PVC Pressure Piping: Join schedule number, ASTM D1785, PVC pipe and PVC

socket fittings in accordance with ASTM D2672. Join other-than-schedule-number PVC pipe and socket fittings in accordance with ASTM D2855.

3. PVC Nonpressure Piping: Join in accordance with ASTM D2855.

3.5 INSTALLATION OF VALVES

A. Underground Curb Valves: Install in curb-valve casings with tops flush with grade.

B. Underground Iron Gate Valves, Resilient Seat: Comply with AWWA C600 and AWWA M44. Install in valve casing with top flush with grade.

1. Install valves and PVC pipe with restrained, gasketed joints.

C. Aboveground Valves: Install as components of connected piping system.

D. Pressure-Reducing Valves: Install in boxes for automatic control valves or aboveground between shutoff valves. Install full-size valved bypass.

E. Throttling Valves: Install in underground piping in boxes for automatic control valves.

F. Drain Valves: Install in underground piping in boxes for automatic control valves.

3.6 INSTALLATION OF AUTOMATIC IRRIGATION CONTROL SYSTEM

A. Equipment Mounting, Interior: Install controllers on interior wall.

1. NOTE: Client preference is for all controllers to be installed inside the maintenance building. Confirm viability of location as part of delegated design process.

2. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
3. Install anchor bolts to elevations required for proper attachment to supported equipment.

B. Equipment Mounting, Exterior (if required): Install exterior freestanding controllers on precast concrete bases.

1. As noted above, exterior controls are not preferred.
2. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
3. 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 below or beside piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

3.7 CONNECTIONS

A. Comply with requirements for piping specified in Section 331415 "Site Water Distribution Piping" for water supply from exterior water service piping, water meters, protective enclosures, and backflow preventers. Drawings indicate general arrangement of piping, fittings, and specialties.

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

C. Connect wiring between controllers and automatic control valves.

3.8 IDENTIFICATION

A. Identify system components. Comply with requirements for identification specified in Section 220553 "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 Section 312000 "Earth Moving" for warning tapes.

3.9 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 with Test Assistance: 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.
4. Irrigation system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.10 STARTUP SERVICE

A. Perform startup service.

1. Complete installation and startup checks in accordance with manufacturer's written instructions.
2. Verify that controllers are installed and connected in accordance with the Contract Documents.
3. Verify that electrical wiring installation complies with manufacturer's submittal.

3.11 ADJUSTING

A. Adjust settings of controllers.

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

C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with, or not more than 1/2 inch above, finish grade.

3.12 CLEANING

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

3.13 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain automatic control valves, and controllers.

3.14 PIPING SCHEDULE

A. Install components having pressure rating equal to or greater than system operating pressure.

B. Piping in control-valve boxes and aboveground may be joined with flanges or unions instead of joints indicated.

C. Aboveground Irrigation Main Piping:

1. NPS 4 and Smaller:

a. Galvanized-steel pipe and galvanized-steel pipe nipples; galvanized, gray-iron threaded fittings; and threaded joints.
b. Type M hard copper tube, wrought- or cast-copper fittings, and brazed joints.

c. Schedule 80, PVC pipe; socket-type PVC fittings; and solvent-cemented joints.
d. Schedule 80, PVC pipe; Schedule 80, threaded PVC fittings; and threaded joints.

2. NPS 5 and Larger:

a. Galvanized-steel pipe and galvanized-steel pipe nipples; galvanized, gray-iron threaded fittings; and threaded joints.
b. Schedule 80, PVC pipe and socket fittings; and solvent-cemented joints.
c. Schedule 80, PVC pipe; Schedule 80, threaded PVC fittings; and threaded joints.

D. Underground Irrigation Main Piping:

1. NPS 4 and Smaller:

a. NPS 3 and NPS 4 ductile-iron, mechanical-joint pipe; ductile-iron, mechanical-joint fittings, glands, bolts, and nuts; and gasketed joints.
b. NPS 3 and NPS 4 ductile-iron, push-on-joint pipe; ductile-iron, push-on-joint fittings and gaskets; and gasketed joints.
c. Type L soft copper tube, wrought-copper fittings, and brazed joints.
d. NPS 4 PE pressure pipe; PE butt, heat-fusion or socket-type fittings; and heat-fusion joints.
e. Schedule 80, PVC pipe and socket fittings, and solvent-cemented joints.
f. Schedule 80, PVC pipe; Schedule 80, threaded PVC fittings; and threaded joints.
g. SDR 21, PVC, pressure-rated pipe; Schedule 80, PVC socket fittings; and solvent-cemented joints.

2. NPS 5 and Larger:

a. NPS 6 and larger ductile-iron, mechanical-joint pipe; ductile-iron, mechanical-joint fittings, glands, bolts, and nuts; and gasketed joints.
b. NPS 6 and larger ductile-iron, push-on-joint pipe; ductile-iron, push-on-joint fittings and gaskets; and gasketed joints.
c. PE pressure pipe; PE butt, heat-fusion fittings; and heat-fusion joints.
d. Schedule 80, PVC pipe and socket fittings; and solvent-cemented joints.
e. SDR 21, PVC, pressure-rated pipe; Schedule 80, PVC socket fittings; and solvent-cemented joints.

E. Circuit Piping:

1. NPS 2 and Smaller:

a. SIDR 9, PE, controlled ID pipe; insert fittings for PE pipe; and fastener joints.
b. DR 11, PE, controlled OD pipe; PE butt, heat-fusion, or PE socket-type fittings; and heat-fusion joints.
c. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.
d. SDR 26, PVC, pressure-rated pipe; Schedule 40, PVC socket fittings; and

solvent-cemented joints.

2. NPS 2-1/2 to NPS 4:

    a. SIDR 9, PE, controlled ID pipe; insert fittings for PE pipe; and banded or fastener joints.
    b. DR 11, PE, controlled OD pipe; PE socket or butt-fusion fittings; and heat-fusion joints. NPS 3 pipe and fittings if NPS 2-1/2 pipe and fittings are not available.
    c. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.
    d. SDR 26, PVC, pressure-rated pipe; Schedule 40, PVC socket fittings; and solvent-cemented joints.

F. Underground Branches and Offsets at Sprinklers and Devices: Schedule 80, PVC pipe; threaded PVC fittings; and threaded joints.

1. Option: Plastic swing-joint assemblies, with offsets for flexible joints, manufactured for this application.

G. Risers to Aboveground Sprinklers and Specialties:

1. Type M hard copper tube, wrought-copper fittings, and brazed joints.
2. Schedule 80, PVC pipe and socket fittings; and solvent-cemented joints.

H. Drain piping shall be one of the following:

1. SIDR 9, 11.5, or 15; PE, controlled ID pipe; insert fittings for PE pipe; and banded or fastener joints.
2. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.
3. SDR 21, 26, or 32.5; PVC, pressure-rated pipe; Schedule 40, PVC socket fittings; and solvent-cemented joints.

3.15 VALVE SCHEDULE

A. Underground, Shutoff-Duty Valves: Use the following:

1. NPS 2 and Smaller: Curb valve, curb-valve casing, and shutoff rod.
2. NPS 3 and Larger: Iron gate valve, resilient seated; iron gate valve casing; and operating wrench(es).

B. Aboveground, Shutoff-Duty Valves:

1. NPS 2 and Smaller:

    a. Brass or bronze ball valve.
    b. Bronze gate valve.

2. NPS 2-1/2 and Larger:

    a. Iron gate valve, NRS.

C. Throttling-Duty Valves:

1. NPS 2 and Smaller:

a. Brass or bronze ball valve.

2. NPS 2-1/2 and NPS 3:
3. Iron ball valve.

D. Drain Valves:

1. NPS 1/2 and NPS 3/4:

a. Brass or bronze ball valve.
b. Bronze gate valve.

2. NPS 1 to NPS 2:

a. Bronze gate valve.

3.16 GROUND HYDRANT INSTALLATION

A. Provide water service to ground hydrants via irrigation lines. Ensure sufficient pressure to operate all ground hydrants.

END OF SECTION 32 84 00

SECTION 32 91 15 - SOIL PREPARATION (PERFORMANCE SPECIFICATION)

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes planting soils specified according to performance requirements of the mixes.

B. Related Requirements:

1. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
2. Section 329200 "Turf and Grasses" for placing planting soil for turf and grasses.
3. Section 329300 "Plants" for placing planting soil for plantings.

1.2 DEFINITIONS

A. AAPFCO: Association of American Plant Food Control Officials.

B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or unamended soil as indicated.

C. CEC: Cation exchange capacity.

D. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.

E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.

F. Imported Soil: Soil that is transported to Project site for use.

G. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.

H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.

I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.

J. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

L. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

M. SSSA: Soil Science Society of America.

N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

O. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

P. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

Q. USCC: U.S. Composting Council.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include recommendations for application and use.
2. Include test data substantiating that products comply with requirements.
3. Include sieve analyses for aggregate materials.
4. Material Certificates: For each type of imported soil, soil amendment, and fertilizer before delivery to the site, according to the following:

    a. Manufacturer's qualified testing agency's certified analysis of standard products.
    b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
    c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

B. Samples: For each bulk-supplied material, 1-quart volume of each in sealed containers labeled with content, source, and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For each testing agency.

B. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.

C. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.

1. Multiple Laboratories: At Contractor's option, work may be divided among qualified testing laboratories specializing in physical testing, chemical testing, and fertility testing.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction soil analyses on existing, on-site soil.

1. Notify Landscape Architect seven days in advance of the dates and times when laboratory samples will be taken.

B. Preconstruction Soil Analyses: For each unamended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment and fertilizer recommendations by a qualified testing agency performing the testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.

1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

1.8 SOIL-SAMPLING REQUIREMENTS

A. General: Extract soil samples according to requirements in this article.

B. Sample Collection and Labeling: Have samples taken and labeled by Contractor in presence of Architect under the direction of the testing agency.

1. Number and Location of Samples: Minimum of eight representative soil samples where directed by Architect for each soil to be used or amended for landscaping purposes.
2. Procedures and Depth of Samples: According to USDA-NRCS's "Field Book for Describing and Sampling Soils."

3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.
4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.9 TESTING REQUIREMENTS

A. General: Perform tests on soil samples according to requirements in this article.

B. Physical Testing:

1. Soil Texture: Soil-particle, size-distribution analysis by the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":

    a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
    b. Hydrometer Method: Report percentages of sand, silt, and clay.

2. Bulk Density: Analysis according to core method of SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
3. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
4. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
5. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85 percent compaction according to ASTM D698 (Standard Proctor).

C. Chemical Testing:

1. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
2. Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.
4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.

D. Fertility Testing: Soil fertility analysis according to standard laboratory protocol of SSSA NAPT NEC-67, including the following:

1. Percentage of organic matter.
2. CEC, calcium percent of CEC, and magnesium percent of CEC.
3. Soil reaction (acidity/alkalinity pH value).
4. Buffered acidity or alkalinity.
5. Nitrogen ppm.
6. Phosphorous ppm.
7. Potassium ppm.
8. Manganese ppm.
9. Manganese-availability ppm.
10. Zinc ppm.
11. Zinc availability ppm.
12. Copper ppm.
13. Sodium ppm and sodium absorption ratio.
14. Soluble-salts ppm.
15. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
16. Other deleterious materials, including their characteristics and content of each.

E. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3-Chemical Methods."

F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.

1. Fertilizers and Soil Amendment Rates: State recommendations in weight per 1000 sq. ft. for 6-inch depth of soil.
2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight per 1000 sq. ft. for 6-inch depth of soil.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Do not move or handle materials when they are wet or frozen.
4. Accompany each delivery of bulk fertilizers and soil amendments with

appropriate certificates.

PART 2 - PRODUCTS

2.1 PLANTING SOIL TYPE A: NEW TOPSOIL

A. Manufactured soil blended in a manufacturing facility with sand, stabilized organic soil amendments, and other materials as specified in other articles of this Section to produce viable planting soil.

1. Less than 10% #4 gravel,
2. 45-75% of #18, very coarse sand, #35 Corse Sand, #60 Medium Sand, #140 Fin Sand, #200 Very fine Sand
3. 5.0-35% silt
4. 5.0-20% Clay
5. Acceptable Textural soil types: Loam, Silt Loam, Sandy Loam, Clay Loam
6. Ph: 6-7.7
7. Organic Matter: 5-7%
8. Soluble Salts: less than 2%
9. Cation Exchange capacity: 5-25%

2.2 PLANTING SOIL TYPE B: AMENDED FOR PLANTINGS

A. Existing, on-site surface soil, with all existing lawn removed; modified to produce viable planting soil.

1. Remediate existing soils within proposed planting areas prior to planting to improve soil structure, biological activity, water-holding capacity, aeration, and organic matter while avoiding unnecessary additions of nutrients already present at elevated levels.
2. Soil amendments shall be incorporated only after completion of rough grading and confirmation that soils are reasonably dry and friable.
3. Do not perform soil amendment operations when soil is saturated, frozen, or sufficiently wet that compaction or smearing may occur.

B. Using preconstruction soil analyses and materials from the September 2025 report from University of Arkansas Soil Test & Research Laboratory, amend existing, on-site surface soil to become planting soil complying with the following requirements:

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
pH	5.8	6.2	6.0	6.2	6.2
Phosphorus	64	164	68	44	30 ppm
Potassium	203	260	166	174	171 ppm
Zinc	9.2	31.5	15.2	11.3	10.3 ppm
Organic Matter	4.0%	3.6%	4.5%	3.8%	2.9%
CEC	12	18	9	11	15

1. Organic amendment

    a. Mature, stable, low-salt compost
    b. Preferably low phosphorus
    c. Incorporate approximately 1–2 inches into the planting soil
    d. Target a finished organic matter level around 4–5%, rather than trying to drive it extremely high.
    e. Compost shall be fully mature and free of viable weed seeds.
    f. Compost shall be derived primarily from composted plant material, not composted manure.
    g. Compost shall have a low soluble-salt content.
    h. Compost shall have a documented nutrient analysis.
    i. Do not use compost with excessive phosphorus or potassium.
    j. Contractor shall submit compost analysis to Landscape Architect for approval prior to delivery.
    k. Application: apply 1.5 inches compost per 1,000 SF for turf areas

        1) perennial planting beds, ornamental grasses, groundcovers, and shrub planting areas:
        2) Incorporate compost uniformly into the existing soil to a depth of 12 inches.
        3) Do not incorporate large quantities of compost throughout the root zone of existing mature trees.

2. pH

    a. No blanket liming.
    b. Adjust only areas testing below the desired range.
    c. Sample #1 warrants further lime-requirement testing because pH is 5.8.

3. Fertilizer

    a. No phosphorus fertilizer
    b. No routine potassium fertilizer
    c. No zinc-containing fertilizer
    d. Don't use a standard "complete" fertilizer such as 10-10-10.

e. Do not apply gypsum as a general soil amendment

4. Biological/structural improvement

a. Prioritize compost and organic matter.
b. Minimize unnecessary soil disturbance.
c. Avoid compaction during construction.
d. Maintain a surface mulch layer around trees and shrubs.

5. Soil Compaction

a. Prior to planting, remediate compacted areas by scarifying or loosening existing soil to a minimum depth of 12 inches.
b. Where construction traffic has resulted in severe compaction, loosen soil to the maximum practical depth without damaging existing utilities, roots, drainage systems, or adjacent structures.
c. Do not work saturated soils

6. Final Soil Condition

a. Upon completion of remediation, planting soil shall:
b. Be friable and capable of being worked by hand.
c. Be free of construction debris, concrete, asphalt, trash, and deleterious material.
d. Be free of large clods and compacted layers.
e. Drain freely without excessive ponding.
f. Contain uniformly distributed organic amendment.
g. Have adequate pore space for root growth.
h. Not contain visible concentrations of fertilizer salts.
i. Not contain excessive phosphorus or potassium from amendments.

2.3 PLANTING SOIL TYPE C: AMENDED FOR LAWN RECONSTRUCTION

A. Planting Soil Type A as described above, combined with soil reconstruction as described in relevant sections below.

2.4 PLANTING TYPE D: SURFACE LEVEL AMENDMENTS FOR EXISTING LAWN

A. No new products; surface amendments only. See relevant sections below.

2.5 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: O, with a minimum of 95 percent passing through No. 8 sieve and a minimum of 55 percent passing through a No. 60 sieve.
2. Form: Provide lime in form of ground dolomitic limestone.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C33/C33M.

2.6 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:

1. Feedstock: Limited to leaves.
2. Reaction: pH of 5.5 to 8.
3. Soluble-Salt Concentration: Less than 4 dS/m.
4. Moisture Content: 35 to 55 percent by weight.
5. Organic-Matter Content: 30 to 40 percent of dry weight.
6. Particle Size: Minimum of 98 percent passing through a 1-inch sieve.

B. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture with 100 percent passing through a 1/2-inch sieve, a pH of 6 to 7.5, a soluble-salt content measured by electrical conductivity of maximum 5 dS/m, having a water-absorbing capacity of 1100 to 2000 percent, and containing no sand.

PART 3 - EXECUTION

3.1 GENERAL

A. Place planting soil and fertilizers according to requirements in other Specification Sections.

B. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in planting soil.

C. Proceed with placement only after unsatisfactory conditions have been corrected.

3.2 EXAMINATION

A. Verify that rough grading is substantially complete.

B. Verify that drainage patterns and elevations are established.

C. Verify that planting areas are free of construction debris, concrete, asphalt, petroleum contamination, and other deleterious materials.

D. Notify Landscape Architect of unsuitable conditions prior to proceeding.

3.3 PREPARATION OF UNAMENDED, ON-SITE SOIL BEFORE AMENDING

A. Existing lawn area excavation: For existing lawn areas to become plant beds, excavate soil from designated areas to a depth of 4 inches and dispose off-site. After amendments to subgrade, regrade to existing grades or new finish grades as noted on Drawings with Planting Soil Type A. See Section 3.5 below.

B. Unacceptable Materials: Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.

C. Unsuitable Materials: All new soil to contain a combined maximum of 8 percent by dry weight of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.

D. Protect existing soils designated to remain from compaction.

E. Limit construction traffic within future planting areas to the extent possible. Any soil areas compacted by construction access or activity shall be reconstructed according to Soil Type C.

F. Do not stockpile construction materials, equipment, or excavated materials within planting areas unless specifically approved

G. Protect existing trees and their root zones from construction traffic and excessive soil disturbance.

3.4 REMOVAL OF UNSUITABLE MATERIAL

A. Construction debris.

B. Concrete.

C. Asphalt.

D. Rubble.

E. Excessive gravel or stones.

F. Contaminated soil.

G. Other deleterious materials.

H. Notify Landscape Architect where unsuitable soil extends beyond anticipated excavation limits.

3.5 PLACING AND MIXING PLANTING SOIL OVER AMENDED SUBGRADE (PLANTING SOIL TYPES B AND C ONLY)

A. General: Apply and mix unamended soil with amendments on-site to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Subgrade Preparation: After turf layer is removed, till existing soil to a depth of 8 inches. Remove stones larger than 2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Apply, add soil amendments, and mix approximately half the thickness of unamended soil over prepared, loosened subgrade according to "Mixing" Paragraph below. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.

C. Mixing: Spread unamended soil to total depth of 12 inches, but not less than required to meet finish grades after mixing with amendments and natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.

1. Amendments: Apply soil amendments, except compost, and fertilizer, if required, evenly on surface, and thoroughly blend them with unamended soil to produce planting soil.

a. Mix lime, and, sulfur with dry soil before mixing fertilizer.
b. Mix fertilizer with planting soil no more than seven days before planting.

2. Lifts: Apply and mix unamended soil and amendments in lifts not exceeding 12 inches in loose depth for material compacted by compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

D. Compaction: Compact each blended lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D698.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.6 BLENDING PLANTING SOIL IN PLACE (SOIL TYPE D)

A. General: Mix amendments with in-place, unamended soil to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen,

muddy, or excessively wet.

B. Preparation: Till unamended, existing soil in planting areas to a minimum depth of 12 inches. Remove stones larger than 2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

C. Mixing: Apply soil amendments, except compost, and fertilizer, if required, evenly on surface, and thoroughly blend them into full depth of unamended, in-place soil to produce planting soil.

Compaction: Compact blended planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D698.

D. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.7 APPLYING COMPOST TO SURFACE OF PLANTING SOIL

A. Application: Apply compost component of planting-soil mix to surface of in-place planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Finish Grading: Grade surface to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.8 FINAL SOIL PREPARATION

A. A. After amendment incorporation, rake planting areas smooth and remove stones and debris greater than 1 inch in any dimension.

B. Soil shall be:

1. Friable.
2. Uniformly amended.
3. Free of compacted layers.
4. Free-draining.
5. Free of construction debris.
6. Suitable for root development.
7. C. Avoid excessive compaction from construction equipment following soil preparation.

3.9 POST-AMENDMENT SOIL TESTING

A. Following soil amendment and prior to final planting, collect representative samples of amended soil.

B. Test for, at minimum:

1. pH.

C. Organic matter.

D. Phosphorus.

E. Potassium.

F. Calcium.

G. Magnesium.

H. CEC.

I. Electrical conductivity/soluble salts.

J. Submit laboratory results to Landscape Architect for review prior to planting.

K. If post-amendment testing indicates excessive phosphorus, potassium, zinc, soluble salts, or other nutrients, do not apply additional amendments without written approval.

3.10 ORGANIC MULCH INSTALLATION

A. Install approved organic mulch after completion of planting.

B. Provide uniform finished depth of:

C. 2 to 3 inches.

D. Keep mulch away from:

1. Tree trunks.
2. Shrub stems.
3. Perennial crowns.
4. Building foundations.
5. Drainage structures.
6. D. Do not incorporate mulch into soil.

3.11 ACCEPTANCE CRITERIA

A. Planting areas shall be considered acceptable when:

1. Soil has been loosened to the specified depth.
2. Approved compost has been uniformly incorporated.
3. No distinct amendment layer is present.
4. Soil is free of construction debris.
5. Soil is not visibly compacted.

6. Final grades are established.
7. Post-amendment soil testing has been submitted.
8. Required corrective amendments have been completed.

3.12 POST CONSTRUCTION LAWN AMENDMENT

A. Following completion of construction operations, inspect all lawn areas for soil compaction, rutting, settlement, erosion, debris, and other conditions resulting from construction activities.

B. Remove construction debris, unsuitable soil, rocks, and other deleterious materials from lawn areas. Scarify or till compacted soil to a minimum depth of 6 inches to restore suitable soil structure and infiltration.

C. Amend existing soil with approved topsoil and/or compost as required to restore soil fertility and establish suitable growing conditions. Incorporate amendments uniformly into the upper 6 inches of existing soil.

D. Regrade lawn areas to provide a smooth, uniform surface conforming to proposed grades and draining positively without low areas, ponding, or abrupt transitions.

E. Reseed, overseed, or resod lawn areas disturbed by construction in accordance with Section 32 92 00 – Turf and Grasses. Restore lawn areas to a condition equal to or better than that existing prior to construction.

F. Water and maintain restored lawn areas until established, including mowing, watering, fertilizing, and repair of bare or damaged areas as required.

G. Lawn areas shall be considered established when turf is uniformly rooted, actively growing, free of bare areas, weeds, erosion, and construction damage, and provides a consistent appearance with adjacent lawn areas.

3.13 SURFACE LEVEL AMENDMENTS TO LAWN

A. Evaluate existing lawn areas following completion of construction and identify areas requiring surface-level amendment due to minor compaction, settlement, thinning, or construction disturbance.

B. Mow existing lawn to a height of approximately 2 inches and remove clippings, leaves, debris, and other organic matter from the lawn surface.

C. Apply approved screened topsoil or lawn soil amendment uniformly over existing lawn at a maximum depth of 1/2 inch per application. Do not bury existing turf or create abrupt grade transitions at adjacent paving, curbs, walks, or planting areas.

D. Where additional amendment is required, apply in multiple light applications rather than a single deep application. Lightly rake or brush amendment into the

existing turf canopy to achieve uniform distribution and maintain existing turf growth.

E. Overseed amended lawn areas with specified turf seed mix in accordance with Section 32 92 00 – Turf and Grasses. Incorporate seed into the upper surface of the amendment without disturbing established turf.

F. Repair areas exhibiting bare soil, erosion, settlement, or inadequate turf establishment. Maintain amended lawn areas until a uniform, healthy stand of turf is established.

G. Protect adjacent paving, curbs, planting areas, drainage structures, and other finished surfaces from amendment materials and seed during application.

3.14 PROTECTION

A. Protection Zone: Identify protection zones according to Section 015639 "Temporary Tree and Plant Protection."

B. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Vehicle traffic.
4. Foot traffic.
5. Erection of sheds or structures.
6. Impoundment of water.
7. Excavation or other digging unless otherwise indicated.

C. If planting soil or subgrade is overcompacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by Architect and replace contaminated planting soil with new planting soil.

3.15 CLEANING

A. Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.

B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.

1. Dispose of excess subsoil and unsuitable materials on-site where directed by Owner.

END OF SECTION 32 91 15

SECTION 32 92 00 - TURF AND GRASSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

~~***1. Hydroseeding.***~~
2. Lawn seed.
3. Sodding.
~~***4. Plugging.***~~
~~***5. Meadow grasses and wildflower.***~~
6. Erosion-control materials.
~~***7. Grass-paving materials.***~~

1.2 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329115 "Soil Preparation (Performance Specification)" and drawing designations for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of turf and meadows during a calendar year. Submit before expiration of required maintenance periods.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf and meadow establishment.

1. Professional Membership: Installer shall be a member in good standing of either the National Association of Landscape Professionals or AmericanHort.
2. Experience: Five years' experience in turf installation in addition to requirements in Section 014000 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in all of the following categories from the National Association of Landscape Professionals:

    a. Landscape Industry Certified Technician - Exterior.
    b. Landscape Industry Certified Lawn Care Manager.
    c. Landscape Industry Certified Lawn Care Technician.

5. Pesticide Applicator: State licensed, commercial.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Sod: Harvest, deliver, store, and handle sod according to requirements in

"Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

1.8 FIELD CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion.

1. Spring Planting: June 01 - May 31.
2. Fall Planting: September 15 - October 31.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions. Landscape Architect to make final determination as to suitability of weather at time of planting.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species:

1. Quality, State Certified: State-certified seed of grass species as listed below for solar exposure.
2. Full Sun, warm season grass:

a. 70% Bermuda Grass – (Cynodon dactylon)
b. 10% Bermuda Grass (Cynodon transvaalensis)
c. 20% Zoysia Grass (Zoysia japonica)

3. Sun and Partial Shade,

a. 50 percent Kentucky bluegrass (Poa pratensis).

b. 50 percent chewings Tall Fescue (Festuca arundinacea).

2.2 TURFGRASS SOD

A. Utilize turfgrass sod if grass seed will not have sufficient time to establish a complete and stable lawn prior to substantial completion.

B. Turfgrass Sod: Approved, Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.

C. Turfgrass Species, warm-Season Grass:

1. Full Sun: Bermuda Grass – (Cynodon dactylon), a minimum of three cultivars.

2. Shade: Proportioned by weight as follows:

a. 50 percent Kentucky bluegrass (Poa pratensis).
b. 50 percent chewings Tall Fescue (Festuca arundinacea).

2.3 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition:

a. 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
b. Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.4 MULCHES

A. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.

2.5 EROSION-CONTROL MATERIALS

A. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

B. Erosion-Control Coir Logs: Biodegradable spun coir fiber, 12" diameter, with a minimum of 5.5 lb/linear foot, minimum of 10 foot lengths, 2" x 2" openings.

C. Erosion-Control Stakes: Biodegradable, 4" length. Spacing to meet manufacturer standards.

~~***2.6 GRASS-PAVING MATERIALS***~~

~~***A. Base Course: Sound crushed stone or gravel complying with ASTM D448 for Size No. 8.***~~

~~***B. Sod Stabilizing Panel: Core Grass 65-45, by Core Landscape Products, Comox, BC, Canada, or approved equal.***~~

~~***C. Sandy Loam Soil Mix: Sound, sharp, washed, natural sand or crushed stone complying with gradation requirements in ASTM C33/C33M for fine aggregate blended with planting soil A. Use blend consisting of ½ sand and ½ planting soil.***~~

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

A. General: Prepare planting area for soil placement and mix planting soil according to Section 329115 "Soil Preparation (Performance Specification)."

B. Placing Planting Soil: Blend planting soil in place.

1. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

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

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Turf Area Preparation" Article.

B. For erosion-control blanket, mesh, or coir log, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

C. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

~~***3.5 PREPARATION FOR GRASS-PAVING MATERIALS***~~

~~***A. Reduce subgrade elevation soil to allow for thickness of grass-paving system. Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade so that installed paving is within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions.***~~

~~***B. Install base course, and and sandy loam soil mix as recommended by paving-material manufacturer for site conditions and according to details***~~

~~***indicated on Drawings. Compact according to paving-material manufacturer's written instructions.***~~

~~***C. Install paving mat and fasten according to paving-material manufacturer's written instructions.***~~

~~***D. Before planting, fill cells of paving mat with sandy loam soil mix and compact according to manufacturer's written instructions.***~~

~~***E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.***~~

3.6 SEEDING

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph.

1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
2. Do not use wet seed or seed that is moldy or otherwise damaged.
3. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow seed at a total rate of 5 to 8 lb/1000 sq. ft..

C. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes exceeding 1:6 with erosion-control fiber mesh installed and stapled according to manufacturer's written instructions.

E. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.

1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.

F. Protect seeded areas from hot, dry weather or drying winds by applying compost mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 3/16 inch, and roll surface smooth.

3.7 HYDROSEEDING

A. Hydroseeding: Mix specified seed, commercial fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.

2. Spray-apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.
3. Spray-apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry coat at a rate so that mulch component is deposited at not less than 500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate. Apply slurry cover coat of fiber mulch (hydromulching) at a rate of 1000 lb/acre.

3.8 SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil or sod during installation. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than two anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.9 TURF RENOVATION

A. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
2. Install new planting soil as required.

B. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

C. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

D. Mow, dethatch, core aerate, and rake existing turf.

E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.

H. Apply soil amendments and initial fertilizer required for establishing new turf and mix thoroughly into top 4 inches of existing soil. Install new planting soil to fill low spots and meet finish grades.

1. Soil Amendment(s): Amend according to requirements of Section 329115 "Soil Preparation (Performance Specification)." Apply soil amendments at the rate of necessary levels to achieve specified ratios.
2. Initial Fertilizer: Commercial fertilizer applied according to manufacturer's recommendations.

I. Apply sod as required for new turf.

J. Water newly planted areas and keep moist until new turf is established.

3.10 TURF MAINTENANCE

A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow Kentucky bluegrass, buffalograss, annual ryegrass, chewings red fescue to a height of 1-1/2 to 2 inches.

D. Turf Postfertilization: Apply commercial fertilizer after initial mowing and when grass is dry.

1. Use fertilizer that provides actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.

3.11 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Architect:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

3.12 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove nondegradable erosion-control measures after grass establishment period.

3.13 MAINTENANCE SERVICE

A. Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in "Turf Maintenance" Article. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:

1. Seeded Turf: 60 days from date of Substantial Completion.

a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

2. Sodded Turf: 30 days from date of Substantial Completion.

END OF SECTION 329200

SECTION 32 93 00 - PLANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plant materials.
2. Fertilizers.
3. Weed-control barriers.
4. Mulches.
5. Herbicides and pesticides.
6. Tree-stabilization materials.
7. Landscape edgings.
8. Tree-watering devices.
9. Riparian Upland Seed Mix.
10. Perennial and Bulb Mixes.

B. Related Requirements:

1. Section 015639 "Temporary Tree and Plant Protection" for protecting, trimming, pruning, repairing, and replacing existing trees to remain that interfere with, or are affected by, execution of the Work.
2. Section 328400 "Planting Irrigation" for complete irrigation systems.
3. Section 329200 "Turf and Grasses" for turf (lawn), hydroseeding, and erosion-control materials.
4. Section 329600 "Transplanting" for transplanting non-nursery-grown trees.

1.2 COORDINATION

A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Plant materials.
2. Fertilizers.
3. Weed-control barriers.
4. Mulches.
5. Tree-stabilization materials.
6. Landscape edgings.
7. Tree-watering devices

B. Product Data Submittals: For each product.

1. Plant Materials: Include quantities, sizes, quality, and verified sources for plant materials.

C. Samples for Verification: Actual sample of finished products for each of the following:

1. Organic Mulch: 1-quart volume of each organic mulch required; typical of the lot of material to be furnished, in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Provide an accurate representation of color, texture, and organic makeup.
2. Weed-Control Barrier: 12 by 12 inches.
3. Landscape Edging: 12 inch length.

D. Riparian Upland Seed Mix:

1. Seed vendor's certified analysis for each species, including botanical name, PLS percentage, germination and dormant seed percentages, purity, weed seed content, lot number, and source location. Include vendor's conversion of specified seed count percentages and total seeding density to pounds of PLS per species for the total area indicated. Submit for Landscape Architect approval prior to procurement.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Statements: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with manufacturer's certified analysis of standard products.

C. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

B. Riparian Upland Seed Mix Maintenance Plan: Written management recommendations for the second and third growing seasons, including annual late-winter mowing or cutting schedule and height, spot weed control methods, identification of target invasive species, and prohibition on fertilizer and broadleaf-selective herbicide use.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.

1. Professional Membership: Member in good standing of either the National Association of Landscape Professionals or American Hort.
2. Experience: Five years' experience in landscape installation in addition to requirements in Section 014000 "Quality Requirements."
3. Installer's Field Supervision: Maintain an experienced full-time supervisor on Project site when work is in progress.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

C. Measurements: Measure in accordance with ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Landscape Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Landscape Architect of sources of planting materials seven days in advance of delivery to site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if

applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, or walkways and pavements; or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

D. Handle planting stock by root ball.

E. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

F. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
2. Do not remove container-grown stock from containers before time of planting.
3. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.9 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: April 1 - May 31.
2. Fall Planting: October 1 - November 30.

C. Seeding Restrictions:

1. Riparian Upland Seed Mix Areas:

a. Install riparian upland seed mix during periods recommended by the seed vendor for the species specified, as approved by the Landscape Architect. Dormant seeding is acceptable where approved. Coordinate site preparation so that final herbicide application and seeding occur within the approved seeding period.

D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions in accordance with manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
b. Structural failures, including plantings falling or blowing over.
c. Faulty performance of tree stabilization.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods: From date of Substantial Completion.

a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.

3. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

B. Riparian Upland Seed Mix Areas:

1. Warranty requirements for individual plants do not apply to seeded areas. Seeded areas shall meet acceptance criteria in Part 3 at the end of the first full growing season following seeding. Reseed areas not meeting

acceptance criteria at no additional cost to Owner.

1.11 MAINTENANCE SERVICE

A. Maintenance Period: Begin maintenance immediately after each plant is installed and each area is seeded, and **continue through Substantial Completion**. This includes trees, shrubs, ground covers, perennials, and riparian upland seed mix areas. Maintenance shall be performed by skilled employees of the landscape Installer, as required in Part 3.

B. Watering: Contractor is responsible for providing all water required to establish and maintain plantings and seeded areas for the duration of the maintenance period.

1. Where a permanent irrigation system is not installed, is not yet operational, or does not serve a planted or seeded area, provide temporary watering by temporary irrigation, water truck, hoses, or other means acceptable to the Landscape Architect.
2. Operation of a permanent irrigation system does not relieve Contractor of responsibility for adequate watering. Supplement irrigation where coverage or volume is insufficient.

C. Transfer of Maintenance: At the end of the maintenance period, and following acceptance by the Landscape Architect, maintenance responsibility transfers to Owner. Coordinate a walkthrough with Owner's maintenance personnel prior to transfer to review the maintenance plan submitted under Article 1.6.

PART 2 - PRODUCTS

2.1 PLANT MATERIALS

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; with tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); with crossing trunks; with cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots are unacceptable.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare in accordance with ANSI Z60.1.

D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for plant.

E. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to ensure symmetry in planting.

F. Annuals and Biennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but are not yet in bloom.

G. FERTILIZERS

Granular Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition:

    a. 0.75 lb/1000 sq. ft.3 percent of actual nitrogen, 4 percent phosphorous, and 3 percent potassium, by weight.
    b. Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

H. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb of ectomycorrhizal fungi, 33 percent hydrogel, and maximum of 5.5 percent inert material.

2.2 RIPARIAN UPLAND SEED MIX

A. Seed: Fresh, clean, new-crop seed, labeled in accordance with state and federal seed laws. Straight species only; cultivars and selections are not acceptable. Source-identified seed from the Ozark ecoregion or within 250 miles of Project site, unless otherwise approved by the Landscape Architect.

B. Weed Seed Content: Not to exceed 0.5 percent by weight. Seed shall be free of state-listed noxious weed seed.

C. **Seeding Density: Minimum 100 PLS seeds per square foot.**

D. Seed Mix Composition: Percentages are by count of PLS seeds per square foot, not by weight

BOTANICAL NAME	**COMMON NAME**	**% of total PLS seed count**
GRASSES		
Schizachyrium scoparium	Little Bluestem	16
Bouteloua curtipendula	Side Oats Grama	12
Elymus hystrix	Bottlebrush Grass	6
Muhlenbergia capillaris	Pink Muhly	6
GRASSES SUBTOTAL		**40**
FORBS		
Echinacea purpurea	Purple Coneflower	9
Rudbeckia hirta	Black-Eyed Susan	***13***
Liatris aspera	Rough Blazing Star	7
Monarda fistulosa	Wild Bergamot	6
Penstemon digitalis	Foxglove Beardtongue	6
Asclepias tuberosa	Butterfly Milkweed	6
~~***Rudbeckia fulgida***~~	~~***Perennial Black-Eyed Susan***~~	~~***5***~~
Pycnanthemum tenuifolium	Slender Mountain Mint	5
Amsonia tabernaemontana	Eastern Bluestar	4

Amsonia illustris	Ozark Bluestar	4
FORBS SUBTOTAL		**60**

E. Substitutions: Where a specified species is unavailable from approved sources, submit proposed substitution of a regionally native species of similar height, habit, and bloom period for Landscape Architect approval. Do not substitute without written approval.

F. Nurse Crop: Annual cover crop appropriate to the seeding season, such as oats (Avena sativa) for spring and summer seeding or winter wheat (Triticum aestivum) for fall seeding, applied at a light rate as recommended by the seed vendor and approved by the Landscape Architect. The nurse crop is not included in the composition percentages.

G. Reserve Seed: In addition to the quantity required for initial seeding, furnish reserve seed equal to not less than 20 percent of the total initial seed quantity, of the same mix composition and from the same seed lots. Store reserve seed in sealed, labeled containers in a cool, dry, rodent-proof location until use.

2.3 PERENNIAL AND BULB MIXES

A. Plant material to be procured in the quantities indicated on Drawings at the ratios indicated below.

B. *Hosta* varieties:

1. ‘Blue Mouse Ears’
2. ‘Diamond Lake Hosta’
3. ‘Elegans’
4. ‘Halcyon Hosta’
5. ‘Guacamole’
6. ‘Empress Wu’
7. ‘Blueberry muffin’
8. ‘Abiqua Drinking Gourd’
9. ‘White Feather’
10. ‘Sum and Substance’
11. ‘Olive Bailey Langdon’
12. ‘Gentle Giant’

C. *Helleborus* varieties:

1. Helleborus ‘Ivory Prince’
2. Helleborus lividus
3. Helleborus Winter Jewels ‘Harlequin Gem’
4. Helleborus x hybridus ‘White Lady Spotted’

5. Helleborus ‘Dark and Handsome’
6. Helleborus ‘First Dance’
7. Helleborus ‘Onyx Odyssey’
8. Helleborus ‘Penny’s Pink’

D. *Paeonia* varieties:

1. Paeonia ‘Pieterje Vriend Wagenaar’
2. Paeonia ‘Raspberry Sundae”
3. Paeonia ‘Moonstone’
4. Paeonia ‘Angel Cheeks’
5. Paeonia ‘Big Ben’

E. Bulb varieties:

1. Narcissus Palmares
2. Narcissus Dialogs
3. Narcissus Audbon
4. Narcissus Pom Pom Rose
5. Narcissus Replete
6. Narcissus bulbocodium White Petticote
7. Narcissus Regeneration
8. Crocus Chrys. Panda
9. Scilla bifolia rosea
10. Muscari latifolium ‘Grape Ice’
11. Muscari Pink Sunrise
12. Camassia quamash
13. Fritillaria perscia Twin Towers Tribute
14. Fritillaria perscia Green Dreams

2.4 HERBICIDE

A. Glyphosate Herbicide:

1. EPA-registered glyphosate formulation labeled for use in and adjacent to aquatic sites. Products containing surfactants not labeled for aquatic use are not acceptable. Adjuvants, if used, shall be labeled for aquatic use.

2.5 WEED-CONTROL BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum, composed of fibers inert to biological degradation and naturally resistant to chemicals, alkalis, and acids, formed into a stable network so that fibers retain their relative position.

B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd..

C. Seeded Area Mulch: Certified weed-free straw, applied lightly as indicated in Part 3, or as otherwise approved by the Landscape Architect.

2.6 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Shredded hardwood.
2. Size Range: 3 inches maximum, 1/2 inch minimum.

B. Pine Straw: Interlocking needles dried pine needles suitable as top dressing of sloped areas

1. Type: Pine Straw, natural dried with no artificial dyes.
2. Size: Long needle and Slash/ Loblolly

C. Fiber Reinforced Mulch: shredded virgin wood fiber with Fibar Mat

1. Product: Fibar Playground Safety Surfaces, 80 Business Park Drive, Suite 300 Armonk NY 10504, info@fibar.com
2. Depth: 12 in depth with 1% downward grade to ensure proper drainage to FibarDrain Drain Strip.
3. Drain Strip: 2 inch wide by 6 in depth: all perimeter area of all Fibar mulch
4. FibarFelt: 100% non woven geotextile material
5. Fibar Engineer Wood Fiber

D. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through a 1-inch sieve; soluble-salt content of 2 to 5 dS/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

E. No dyes or additives of any kind shall be present in any type of mulch.

F. Mulch products displaying any significant quantity of deleterious material (any material other than shredded hardwood) after installation will be rejected. Should mulch prove to include deleterious material in significant quantities, as defined by the Landscape Architect, the contractor shall either manually remove all deleterious material or remove and replace the mulch, as directed by the Landscape Architect.

2.7 TREE-STABILIZATION MATERIALS

A. Trunk-Stabilization Materials:

1. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass

grommets.

~~***B. Root-Ball Stabilization Materials:***~~

~~***1. Tree Staples: models indicated on drawings, by Tree Staples, Stirling, NJ, or approved equal.***~~

2.8 TREE-WATERING DEVICES

A. Slow-Release Watering Bags: UV-resistant polyethylene bag designed to release water to the root ball over 5 to 9 hours through perforations in the bag base.

1. Single-Trunk Trees: Upright zippered bag, 20-gallon capacity. Basis of design: Treegator Original by Spectrum Products, Inc., or approved equal.
2. Multi-Stem and Low-Branching Trees: Ring-style bag that sits flat on the root ball, 15-gallon capacity. Basis of design: Treegator Jr. by Spectrum Products, Inc., or approved equal.

2.9 ALUMINUM EDGING

A. Acceptable Products:

1. Manufacturer: Planterworx 987 Essex Street Brooklyn, NY 11208

a. Model: Curved Edging System
b. Size: As indicated on drawings.
c. Material: .25” aluminum, alloy 5052.
d. Finish: Polyester-based marine-grade powdercoat finish.
e. Color: Carbon.

2. Manufacturer: Permaloc, Holland, MI 49424

a. Model: CleanLine Commercial Grade Landscape Edging
b. Size: As indicated on drawings.
c. Material: 3/16” aluminum.
d. Finish: Anodized.
e. Color: Black.

3. Approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
3. Suspend planting operations during periods of excessive soil moisture until moisture content reaches acceptable levels to attain required results.
4. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove soil and contamination as directed by Architect and replace with new planting soil.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

3.3 RIPARIAN UPLAND SEED MIX AREA PREPARATION

A. Areas with Existing Vegetation:

1. Mow existing vegetation and allow regrowth to 4 to 6 inches of actively growing foliage before initial application.
2. Apply glyphosate herbicide to all existing vegetation within areas indicated. Do not apply when wind exceeds 10 mph, when rain is forecast within 24 hours, or in any manner that allows drift or runoff to the creek or adjacent areas.
3. Following a label-specified interval of not less than 14 days, apply a second treatment to any surviving vegetation and any new weed flush. Repeat as necessary until the area is free of live vegetation, as verified by the Landscape Architect.

4. Following final application, mow dead vegetation to 2 inches or less and remove clippings.

B. Disturbed Areas and Areas Where Topsoil Has Been Removed:

1. Restore topsoil and finish grades as specified in Section 329115 "Soil Preparation (Performance Specification)" and as indicated on the Drawings.
2. Following final grading, allow weed seedlings to germinate and reach 2 to 4 inches in height. Treat with glyphosate herbicide as specified above. Repeat until germination of weed seedlings has substantially ceased, as verified by the Landscape Architect.

C. All Areas: Do not till or disc after final herbicide application. Limit soil disturbance to what is needed for seed-to-soil contact, to avoid bringing dormant weed seed to the surface.

3.4 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement and mix planting soil in accordance with Section 329115 "Soil Preparation (Performance Specification)."

B. Placing Planting Soil: Blend planting soil in place.

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

D. Application of Mycorrhizal Fungi: At time directed by Architect, broadcast dry product uniformly over prepared soil at application rate in accordance with manufacturer's written instructions.

3.5 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.

1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
2. Excavate approximately three times as wide as ball diameter for balled and burlapped, container-grown stock.
3. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
4. Do not excavate deeper than depth of root ball, measured from the root flare to the bottom of root ball.
5. If area under the plant was initially dug too deep, add soil to raise it to correct level and thoroughly tamp the added soil to prevent settling.

6. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
7. Maintain supervision of excavations during working hours.
8. Keep excavations covered or otherwise protected when unattended by Installer's personnel.

B. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil unless otherwise indicated.

C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

D. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.6 TREE, SHRUB, AND VINE PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball in accordance with ANSI Z60.1. If root flare is not visible, remove soil in a level manner from root ball to where the top-most root emerges from the trunk. After soil removal to expose root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Backfill: Planting soil as specified in Section 329115 "Soil Preparation (Performance Specification)." For trees, use excavated soil for backfill.
2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Distribute granular fertilizer around each planting pit when pit is approximately one-half filled. Do not place in bottom of the hole.

    a. Quantity: Two per plant.

5. Continue backfilling process. Water again after placing and tamping final

layer of soil.

D. Balled and Potted, and Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Backfill: Planting soil as specified in Section 329115 "Soil Preparation (Performance Specification)." For trees, use excavated soil for backfill.
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Distribute granular fertilizer around each planting pit when pit is approximately one-half filled. Do not place in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of root ball.

3.7 TREE, SHRUB, AND VINE PRUNING

A. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.

B. Prune, thin, and shape trees, shrubs, and vines in accordance with standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

C. Do not apply pruning paint to wounds.

3.8 INSTALLATION OF TREE-WATERING DEVICES

A. A. Install one tree-watering device at each new tree immediately after planting and mulching, in accordance with manufacturer's written instructions. Install bags of the type indicated in Part 2 per the tree form.

B. Fill bags at installation and refill as required to maintain root ball moisture, but not less than once per week during the growing season when rainfall is less than 1 inch per week.

3.9 INSTALLATION OF TREE-STABILIZATION MATERIALS

A. Root-Ball Stabilization: Install at- or below-grade stabilization system to secure each new planting by root ball unless otherwise indicated.

1. Proprietary Root-Ball Stabilization Device: Install root-ball stabilization system sized and positioned as recommended by manufacturer unless otherwise indicated and in accordance with manufacturer's written instructions.

3.10 INSTALLATION OF ROOT BARRIER

A. Install root barrier where trees are planted within 60 inches of paving or other hardscape elements, such as walls, curbs, and walkways, unless otherwise indicated on Drawings.

B. Align root barrier with bottom edge angled at 20 degrees away from the paving or other hardscape element, and run it linearly along and adjacent to paving or other hardscape elements to be protected from invasive roots.

3.11 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on Drawings in even rows with triangular spacing.

B. Use planting soil for backfill, as specified in Section 329115 "Soil Preparation (Performance Specification)."

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.12 SEEDING

A. Broadcast seed in two passes at right angles, half the quantity per pass. Mix fine seed with an inert carrier, such as sand or sawdust, for uniform distribution. Roll or cultipack to ensure seed-to-soil contact. Do not bury seed deeper than 1/4 inch.

B. Apply seeded area mulch lightly, with approximately 50 percent of the soil surface visible, or omit as directed by the Landscape Architect.

3.13 INSTALLATION OF MULCHES

A. Install weed-control barriers before mulching in accordance with manufacturer's written instructions. Completely cover area to be mulched, overlapping edges minimum of 12 inches, and secure seams with galvanized pins.

B. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees and Treelike Shrubs in Turf Areas: Apply organic mulch ring of average thickness, with radius around trunks or stems. Do not create a mulch cone or place mulch within of trunks or stems.

C. Fibar Engineered Mulch:

1. Excavate area 8" (for 8" installation) or 12" deep (for 12" installation) with a 1% downward grade to ensure proper drainage to FibarDrain Drain Strip. It is not recommended that a Fibar System be installed on a grade greater than 10%. All roots, stones, and vegetation must be removed.
2. The area should be well-compacted and accurately graded, especially in areas where additional fill has been brought in.
3. Cut a trench 2"wide by 6" deep all along the inside edge perpendicular to the grade and install FibarDrain Drain Strip. Connect low end of FibarDrain Drain Strip to storm drain or similar device to take water collected from playground away from site.
4. Cover sub-grade with FibarFelt 100% non-woven geotextile. Overlap all seams 3".
5. Spread Fibar®Engineered Wood Fiber using a Bobcat or small front-end loader. Operator should be careful not to travel on the FibarFelt. Geotextile or turn sharply on the wood fiber. It will also be necessary to use hand labor to spread. To allow for natural compaction, we supply additional wood fiber. Important: Install all the Fibar Engineered Wood Fiber delivered. The fiber will be several inches above grade or border until it compacts. Feather the edges to make a smooth transition to existing grade or border.
6. Hand-rake for a smooth & level finished surface. Natural compaction will occur over time and is dependent on the amount of playground use and environmental conditions.
7. After two weeks of active use, surface should be raked level again.

3.14 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils

free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

D. Watering: Water plantings and seeded areas as required under Article 1.11. Refill tree-watering devices as required in Part 3. Inspect devices monthly for damage, leaks, and girdling or abrasion of bark, and replace or adjust as necessary. Empty tree-watering devices before the onset of freezing weather and reinstall at the start of the following growing season.

3.15 SEED ESTABLISHMENT MAINTENANCE AND ACCEPTANCE

A. Establishment Mowing: During the first growing season, mow seeded areas to a height of 6 to 8 inches whenever growth reaches 12 to 18 inches, to control annual weeds and admit light to seedlings. Do not mow lower than 6 inches.

B. Weed Control: Hand-pull or spot-treat invasive and noxious species. Do not use broadleaf-selective herbicides in seeded areas.

C. Watering: Do not water seeded areas on a routine schedule. Provide supplemental water under Article 1.11 only as follows:

1. During Germination and Early Establishment: When less than 1 inch of rainfall occurs over any 14-day period during the first 8 weeks following seeding, apply water to moisten the soil to a depth of approximately 2 inches without causing runoff, ponding, or seed displacement.
2. After Early Establishment: Provide supplemental water only during extended drought, as directed by the Landscape Architect. Apply deeply and infrequently.
3. Requirements of this paragraph govern over general watering requirements of Article 1.11 for riparian upland seed mix areas.

D. Overseeding

a. Prior to the start of the second growing season following seeding, and within the maintenance period, overseed thin or sparse areas with reserve seed as directed by the Landscape Architect. Broadcast in accordance with seeding requirements of this Section. Turn over any unused reserve seed to Owner at the end of the maintenance period, with seed tags and storage instructions.
b. Overseeding with reserve seed does not relieve Contractor of reseeding obligations under the acceptance criteria. Areas failing acceptance criteria shall be reseeded with additional seed furnished by Contractor at no additional cost to Owner.

E. Acceptance Criteria:

1. At the end of the maintenance period, seeded areas shall meet the following, as verified by the Landscape Architect:

a. No bare areas larger than 2 SF.
b. Average density of not less than 5 seedlings of specified species per SF, measured in not fewer than 10 randomly located 1-SF sample plots.
c. Not fewer than 8 of the 14 specified species present, including not fewer than 2 grass species.
d. Invasive and noxious species not exceeding 10 percent cover.

2. Reseed areas not meeting acceptance criteria at no additional cost to Owner. Reseeded areas are subject to a maintenance period extended through the following growing season.

3.16 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Tests and Inspections:

1. Perform tree pit percolation tests.
2. Tree pit construction will be considered defective if it does not pass percolation tests and inspections.
3. Do not proceed with planting in tree pits until satisfactory percolation is demonstrated.

C. Prepare test and inspection reports.

3.17 REPAIR AND REPLACEMENT

A. Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Landscape Architect.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Landscape Architect.

B. Remove and replace trees that are more than 25 percent dead or in unhealthy condition before end of corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.

1. Provide new trees of same size as those being replaced for each tree of 6 inches or smaller in caliper size.
2. Provide two new tree(s) of 4-inch caliper size for each tree being replaced that measures more than 6 inches in caliper size.
3. Species of Replacement Trees: Species selected by Landscape Architect.

3.18 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

E. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices. At the end of the maintenance period, remove tree-watering devices unless otherwise directed by the Landscape Architect.

END OF SECTION 32 93 00

SECTION 32 98 00 – FOUNTAIN

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. Provide and furnish all design, labor, incidental materials, equipment, controls, testing, start-up, commissioning, and services necessary for a complete, safe, operational, and maintainable decorative water feature indicated on the Drawings. Work includes:
      a. Chamber basin to collect and recirculate water.
      b. Limestone fascia to water feature.
      c. Structural construction of water feature.
      d. Coordination of fountain waterproofing interfaces and penetrations.
      e. Decorative tile finishes.
      f. Stone coping.
      g. Spouting sculptures.
      h. Connection to stormwater piping where indicated.
      i. Recirculation water supply piping, submersible pump, valves, drains, skimmers, and water treatment system.
      j. Equipment, controls, electrical connections, and power for water feature.
      k. Testing, commissioning, Owner instruction, and closeout documentation.
   2. Provide a minimum three-year warranty period as specified herein.

1.3 RELATED WORK

A. Coordinate installation and fitting with work of other trades:
   1. Section 32 32 19 – Garden Wall.
   2. Section 32 14 00 – Unit Paving.
   3. Section 32 33 00 – Site Furnishings.
   4. Section 32 93 00 – Plants.

B. Coordinate dimensions, elevations, embedded items, sleeves, penetrations, electrical requirements, drainage, waterproofing, and finish interfaces with related Sections and Drawings.

1.4 DEFINITIONS

A. Water Feature Contractor: Contractor or specialty subcontractor responsible for complete fountain system installation, including mechanical components, piping, equipment, controls, testing, and coordination of interfaces.

B. Operating Water Level: Water elevation established by the fountain overflow, skimmer, or other level-control component and indicated on the approved shop drawings.

C. Substantial Completion of Fountain: Point at which the fountain is fully assembled, finish work is complete, equipment is operational, circulation and treatment systems are functioning, and required testing has been successfully completed.

1.5 SUBMITTALS

A. Contractor Qualifications. Minimum of 5 projects of similar type and scale and minimum of 5 years of experience.

B. Installer Qualifications. Submit a minimum of 3 examples of highly detailed water features for commercial, residential, or institutional clients, including fountain and associated mechanical systems. Each example shall be a minimum of $50,000 budget and shall include photographs or drawings, final cost, date of completion, Owner reference, and contact information.

C. Contractor provides complete design drawings and shop drawings through General Contractor. Shop Drawings shall show full detail including:
   a. Plan, sections, dimensions, elevations, basin geometry, operating water level, and finish interfaces.
   b. Mechanical connections, pipe sizes, valves, drains, skimmers, overflow, pump, treatment equipment, and maintenance access.
   c. Flow specifications for all components and hydraulic calculations indicating design flow, total dynamic head, and pump selection.
   d. Electrical connections, controls, disconnects, motor data, wiring diagrams, and control sequence.
   e. Sleeves, penetrations, anchors, supports, and coordination with structural and waterproofing work.

D. Manufacturer’s specifications and product data for each type of fountain component, equipment, finish material, and accessory.

E. Submit water-treatment equipment data, operating requirements, dosing requirements, maintenance requirements, and safety provisions.

F. Submit one sample, minimum 3 inch x 3 inch, of each material for Landscape Architect’s review and approval prior to delivery to site:
   1. Limestone fascia.
   2. Limestone cap.
   3. Vertical wall tile.
   4. Sample mosaic by Artist.
   5. Skimmers and visible drains.

G. Submit full-size or appropriately scaled mosaic shop drawing and color rendering for review by Landscape Architect and Artist. Coordinate final mosaic dimensions and installation sequence with waterproofing and fountain construction.

H. Submit operation and maintenance manuals, final as-built drawings, equipment schedules, warranty documentation, testing reports, and Owner training documentation at closeout.

1.6 QUALITY ASSURANCE

A. Codes and Standards. In addition to complying with all pertinent codes and regulations, comply with the latest adopted rules of the National Electrical Code and applicable local amendments for all electrical work and materials.

B. Installer shall specialize in water features and associated mechanical systems and shall employ personnel experienced with the type of work required.

C. Provide at least one person who shall be present during execution of this portion of the Work, shall be thoroughly familiar with the materials and equipment being installed, and shall direct all work performed under this Section.

D. Install manufactured equipment in accordance with published manufacturer's recommendations except where more stringent requirements are specified herein.

E. Where requested by Landscape Architect, provide a representative mockup of visible fountain finish interfaces, including stone, tile, grout, sealant, coping, and mosaic.

1.7 JOB CONDITIONS

A. Utilities: Determine location of underground utilities and perform work in a manner which will avoid all possible damage. Hand excavate, as required. Repair damage to utility owner's satisfaction at no additional cost.

B. Site Inspection: Examine conditions under which Work is to be performed and notify Landscape Architect in writing of unsatisfactory conditions. Do not perform Work until conditions are satisfactory and acceptable.

C. Protection: Protect the Work, adjacent construction, existing utilities, finishes, landscaping, and the general public.

D. Installer shall coordinate with other trades for proper installation of embedded items, sleeves, conduits, piping, anchors, supports, drainage, and waterproofing interfaces.

E. Protect materials and installed Work from freezing, excessive moisture, precipitation, construction traffic, and other conditions that could impair installation or performance.

1.8 WARRANTY

A. Fountains shall be warranted against defects in materials and workmanship for a minimum of three years from date of Substantial Completion.

B. Warranty shall include labor and materials necessary to correct defects attributable to the Work.

C. Manufacturer warranties for individual components shall be in addition to, and shall not limit, the Contractor's system warranty.

D. Warranty shall include correction of leaks, pump or circulation failures, defective valves or controls, and defective installation of fountain components, except where damage is caused by Owner abuse, vandalism, or conditions specifically excluded in the Contract.

PART 2 - PRODUCTS

2.1 GENERAL

A. Furnish and install components in the size, shape, materials, finishes, and quantities indicated on the Drawings. System design, components, and installation shall meet all applicable federal, state, and city codes.

B. Contractor is required to obtain all permits necessary to complete the Work.

C. Provide equipment access and service clearances necessary for safe inspection, cleaning, repair, and replacement.

D. Provide corrosion-resistant components appropriate for continuous outdoor service and exposure to treated water.

2.2 FOUNTAIN BASIN AND STRUCTURAL COMPONENTS

A. Basin: Construct basin and chamber as indicated on Drawings. Provide structural construction suitable to support water loads, finish materials, equipment, and adjacent construction.

B. Basin surfaces shall be sound, clean, properly cured, and suitable to receive specified waterproofing and finish systems.

C. Provide sleeves, blockouts, embedded items, anchors, and penetrations required for complete installation.

D. Coordinate all penetrations with waterproofing system requirements. Do not field-drill or core through completed waterproofing without approved repair procedures.

2.3 VESSEL FASCIA

A. Limestone.
   1. Size: per Drawings.
   2. Color: Cottonwood, or approved match to unit paving.
   3. Pattern: Egg and dart as shown on Drawings.
   4. Provide sound, durable stone free from cracks, spalls, or defects that impair appearance or performance.

2.4 POOL COPING

A. Limestone.
   1. Size: per Drawings.

2. Color: Cottonwood, or approved match to unit paving.
3. Provide coping with uniform appearance, consistent joints, and positive drainage away from finished fountain surfaces where indicated.

2.5 POOL VERTICAL WALL TILE

A. Size: 2 inch by 8 inch.

B. Type: Brickart Glazed Porcelain Tile.

C. Vendor: Tilefly, www.tilefly.com, ***or approved equal.***

D. Color: Sage, or as approved by Landscape Architect from manufacturer's complete range.

E. Provide setting materials, grout, movement joints, and installation accessories compatible with continuous wet-service exterior conditions and the approved waterproofing system.

2.6 MOSAIC

A. Decorative custom mosaic art piece applied per Drawings and discussion with Landscape Architect and Artist.

B. Mosaic materials and setting system shall be suitable for continuous wet-service exposure.

C. Coordinate substrate preparation, waterproofing, setting materials, grout, sealants, and transitions to prevent water intrusion behind the mosaic.

D. Provide a complete finished mosaic installation to the satisfaction of Landscape Architect and Owner, without exposed sharp edges or projections.

2.7 FROG SCULPTURES, WATER SPOUT

A. Quantity: 4.

B. Size: 4 1/2 inch by 6 1/2 inch by 7 1/2 inch.

C. Material: Natural Lead.

D. Vendor: Kenneth Lynch & Sons, www.klynchandsons.com/spouting-frog/, ***or approved equal.***

E. Provide secure attachment, piping connection, and sealing method appropriate to the sculpture and fountain construction.

F. Coordinate final spout elevation, orientation, and flow with hydraulic calculations and approved shop drawings.

2.8 RECIRCULATION SYSTEM

A. Provide a complete recirculation system sized for the required flow and turnover indicated by approved hydraulic calculations.

B. Pump: Submersible pump or approved pump configuration indicated by the approved shop drawings. Provide pump selected for continuous duty at required flow and total dynamic head.

C. Provide pump with manufacturer's recommended inlet protection, strainer, and service access.

D. Piping: Provide piping, fittings, valves, unions, supports, and accessories suitable for fountain service and compatible with water-treatment conditions.

E. Provide isolation valves and unions necessary to permit removal and maintenance of pumps and major equipment without draining the entire fountain where practical.

F. Provide overflow, drain, make-up water, and recirculation connections as indicated on Drawings.

2.9 WATER TREATMENT

A. Provide complete water-treatment system appropriate for fountain volume, operating conditions, and applicable health and safety requirements.

B. Treatment equipment shall include all pumps, feeders, sensors, controls, valves, fittings, and accessories required for a complete operating system.

C. Provide means of maintaining water quality and controlling algae, scale, and other conditions that could impair appearance or equipment operation.

2.10 SKIMMERS, DRAINS, OVERFLOW, AND FITTINGS

A. Provide skimmers, drains, strainers, overflow fittings, visible drains, grates, covers, and fittings as indicated on Drawings.

B. Visible components shall be corrosion-resistant and coordinated with adjacent finishes.

C. Provide removable components necessary for routine cleaning and maintenance.

D. Provide drain and overflow capacity adequate for anticipated operating conditions.

2.11 CONTROLS AND ELECTRICAL

A. Provide controls, timers, switches, disconnects, motor controls, wiring, and accessories required for a complete operating fountain system.

B. Coordinate electrical service, grounding, bonding, GFCI protection, disconnects, and equipment locations with Electrical Contractor and applicable codes.

C. Provide control logic and operating sequence on shop drawings.

D. Locate controls and electrical components in accessible, protected locations.

E. All equipment shall be properly grounded and bonded as required by applicable codes.

F. Coordinate exact equipment locations with Landscape Architect and Mechanical Engineer in field and according to Drawings prior to any utility installation.

2.12 SEALANTS AND WATERPROOFING INTERFACES

A. Provide sealants, gaskets, penetrations, sleeves, and accessory materials compatible with the fountain waterproofing and finish systems.

B. Coordinate waterproofing system with the party responsible for structural waterproofing. Fountain Contractor shall be responsible for complete and watertight installation of fountain-system penetrations and accessories within their scope.

C. Do not use materials incompatible with the approved waterproofing membrane, tile setting materials, stone, grout, sealants, or water-treatment system.

2.13 ANCHORS AND FASTENERS

A. Provide corrosion-resistant anchors, fasteners, brackets, supports, and accessories required for secure installation.

B. Provide stainless steel or other approved corrosion-resistant materials suitable for wet and exterior conditions.

2.14 WALL

A. Seat wall and stone cladding are by other subcontractors of the GC. Fountain Contractor is responsible for installation of all piping, conduit, and accessories required for complete installation of fountains and securely fastening fountain to seat wall, including coordination of installation with other trades. Refer to Section 32 32 19.

PART 3 - EXECUTION

3.1 GENERAL

A. Stake out location indicated for approval by the Landscape Architect prior to beginning installation.

B. Verify dimensions, elevations, substrates, adjacent construction, utility locations, and readiness of surfaces before beginning installation.

C. Install items according to approved shop drawings, manufacturer’s recommendations, and applicable codes.

D. Provide and install all necessary anchors, fasteners, sleeves, fittings, supports, and accessories.

E. Coordinate installation and fitting with the work of other trades.

3.2 WATERPROOFING AND FINISH COORDINATION

A. Coordinate all fountain penetrations and embedded components with waterproofing installation.

B. Provide compatible sealants, gaskets, sleeves, and termination details required for watertight installation.

C. Do not conceal fountain penetrations, piping, or waterproofing interfaces until required inspections and testing have been completed.

D. Repair damage to waterproofing caused by Work of this Section using approved compatible materials and methods.

3.3 PIPING AND HYDRAULIC TESTING

A. Test piping systems before concealment and before final operation.

B. Test piping in accordance with applicable code and manufacturer requirements, but not less than the pressure and duration recommended for the installed piping system.

C. Inspect all joints, valves, penetrations, and connections for leakage.

D. Repair leaks and retest until the system passes.

3.4 TESTING

A. Notify the Landscape Architect in writing when testing will be conducted. Conduct tests in presence of Landscape Architect, Architect, and Facilities Manager when requested.

B. Fill fountain to operating level and perform a minimum 24-hour water-retention observation before final acceptance, unless a longer period is required by the Contract Documents.

C. During testing, verify water-retention performance, overflow operation, drains, skimmers, pump operation, circulation, spout performance, water levels, controls, and treatment equipment.

D. No unexplained loss of water or leakage attributable to the Work will be accepted.

E. Correct deficiencies and repeat testing at no additional cost to Owner.

3.5 SYSTEM COMMISSIONING

A. Commission the complete fountain system after installation and successful water-retention testing.

B. Verify pump flow, water circulation, water levels, spout performance, treatment operation, controls, timers, valves, and safety devices.

C. Balance individual spouts and outlets to provide the appearance indicated on the Drawings.

D. Verify that pump operation does not produce excessive vibration, noise, cavitation, or objectionable turbulence.

E. Record final operating settings and equipment information for inclusion in closeout documents.

3.6 CLEAN UP AND PROTECTION

A. Remove construction debris, excess grout, mortar, sealant, protective films, labels, and other materials from fountain surfaces and equipment.

B. Clean limestone, tile, mosaic, coping, grates, sculptures, and visible fittings using methods and products recommended by manufacturers.

C. Protect installed product until completion of project.

D. Touch up, repair or replace damaged products.

E. Do not operate the fountain for extended periods before final commissioning unless approved by Landscape Architect.

3.7 OWNER TRAINING

A. Instruct Owner and Facility Manager in operation, shutdown, seasonal operation, cleaning, water treatment, routine maintenance, winterization, troubleshooting, and emergency procedures.

B. Training shall occur after commissioning and before final acceptance.

C. Provide written operating and maintenance instructions as part of closeout documentation.

3.8 CLOSEOUT DOCUMENTATION

A. Submit final as-built drawings showing actual installed equipment, piping routes, valves, drains, skimmers, electrical connections, controls, and equipment locations.

B. Submit final equipment schedule identifying manufacturer, model, serial number, motor horsepower, voltage, and replacement information.

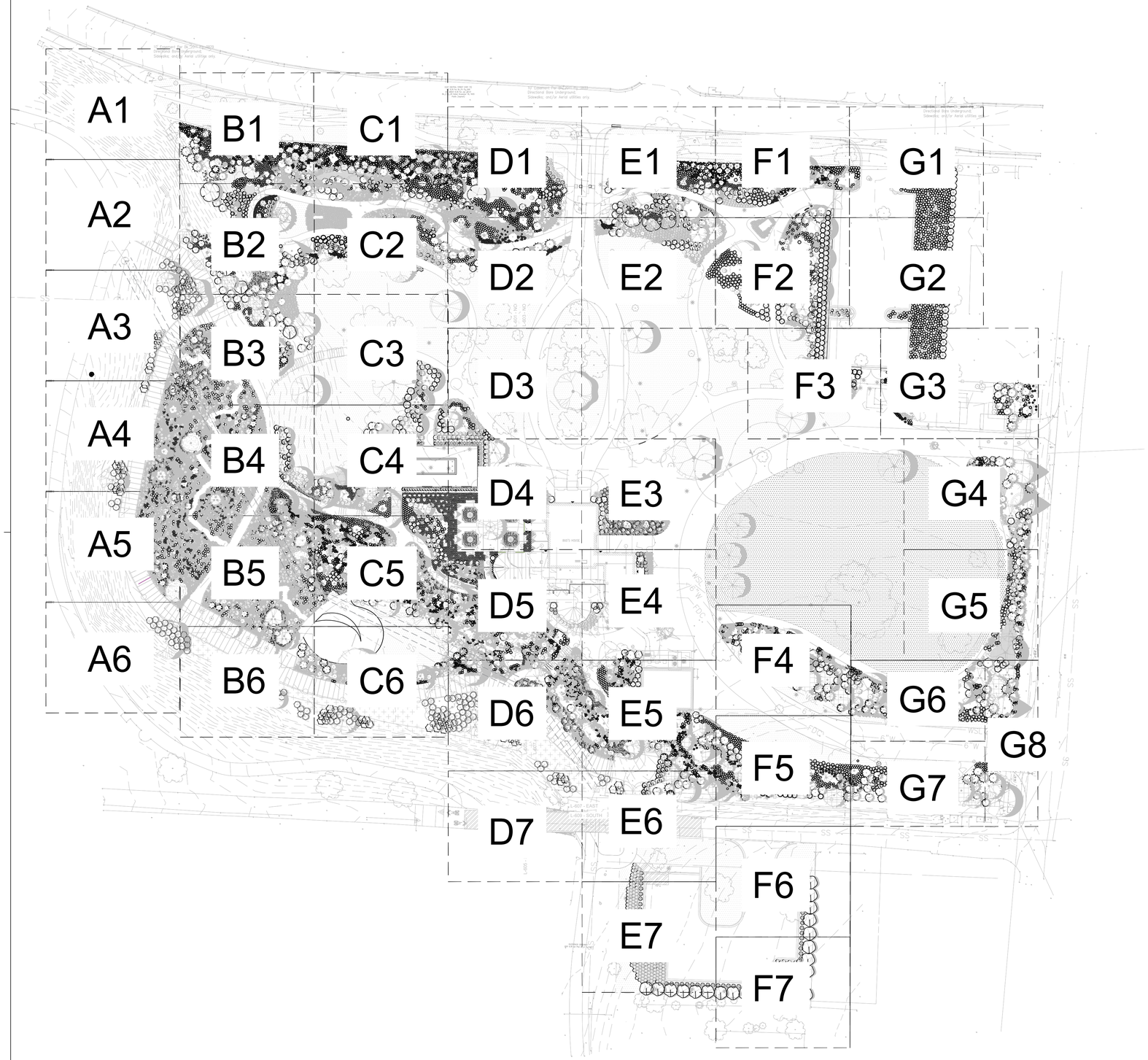
C. Submit final hydraulic and control settings.

D. Submit warranty certificates and manufacturer documentation.

E. Submit water-treatment operating and maintenance procedures.

F. Fountain shall be considered complete only when all components are installed, tested, commissioned, cleaned, operational, and accepted by Owner.

END OF SECTION 32 98 00



1 PLANTING PLAN - SITE

1"=40'-0"

0 40' 80'

1" = 40'-0"

N

Dirtworks

561 SEVENTH AVENUE FLOOR 11
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WER

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ACOUSTICAL ENGINEERS
ACENTECH
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PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

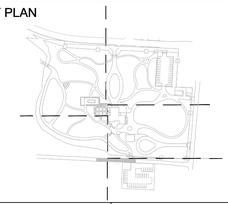
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
	2 ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

DRAWN BY

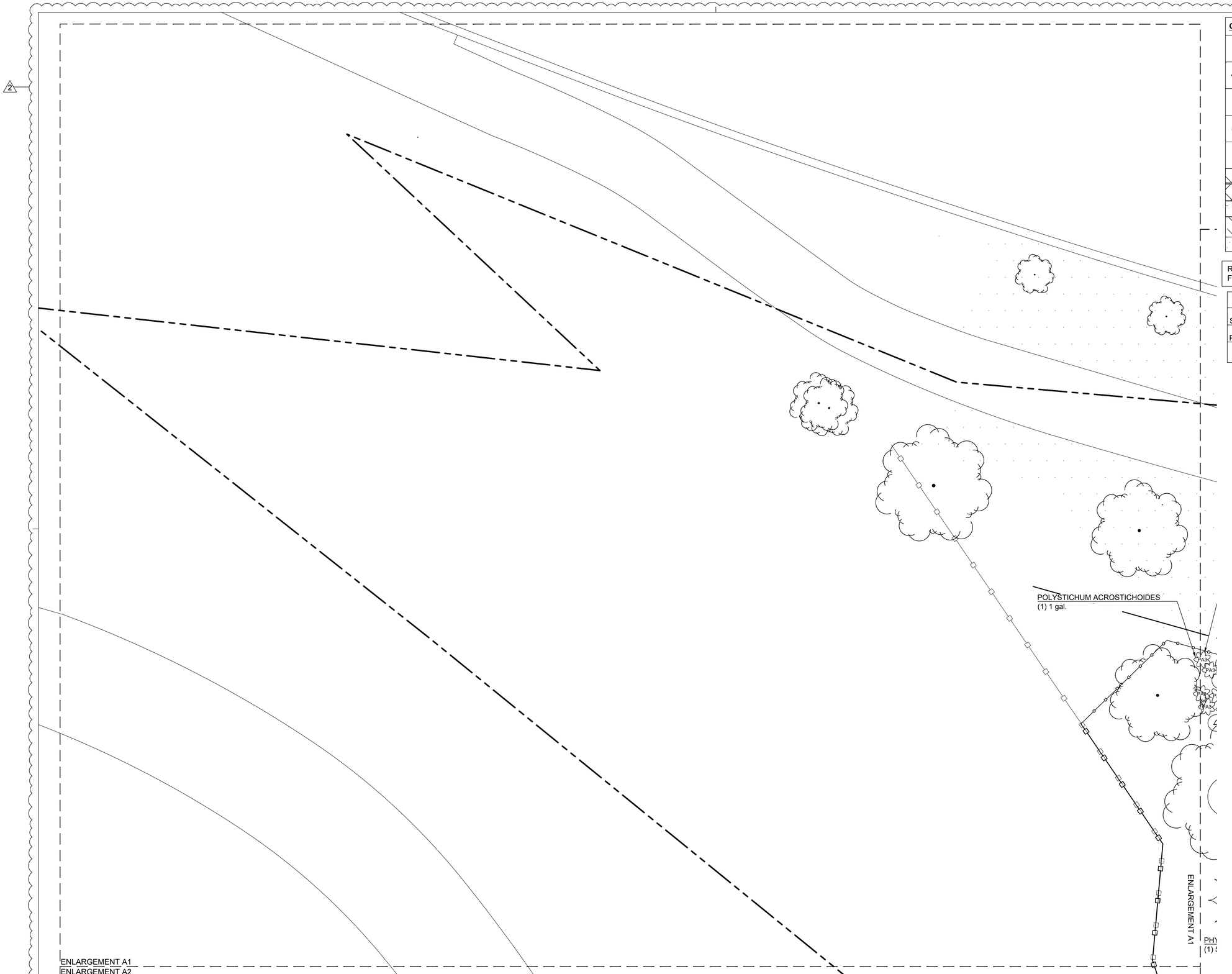
CHECKED BY

SHEET TITLE

ENLARGEMENTS SITE PLAN

SHEET NUMBER

L-611



GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE A1

SYMBOL	BOTANICAL NAME
PERENNIALS	
PA3	POLYSTICHUM ACROSTICHOIDES

1 PLANTING ENLARGEMENT A1
1/4"=1'-0"

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PROJECT TITLE

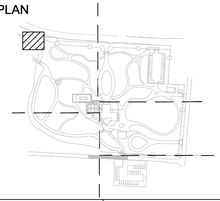
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

DRAWN BY

CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT A1

SHEET NUMBER

L-612

ENLARGEMENT A1

2

ENLARGEMENT A3

1

PLANTING ENLARGEMENT A2

1/4"=1'-0"

RHUS AROMATICA

0 1' 4' 8'

1/4" = 1'-0"

N

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE A2

SYMBOL	BOTANICAL NAME
SHRUBS	
	RHUS AROMATICA

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PROJECT TITLE

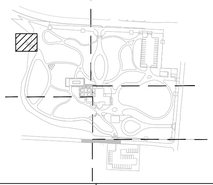
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
2	ADDENDUM 02	10/19/2026

KEY PLAN



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REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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SHEET TITLE

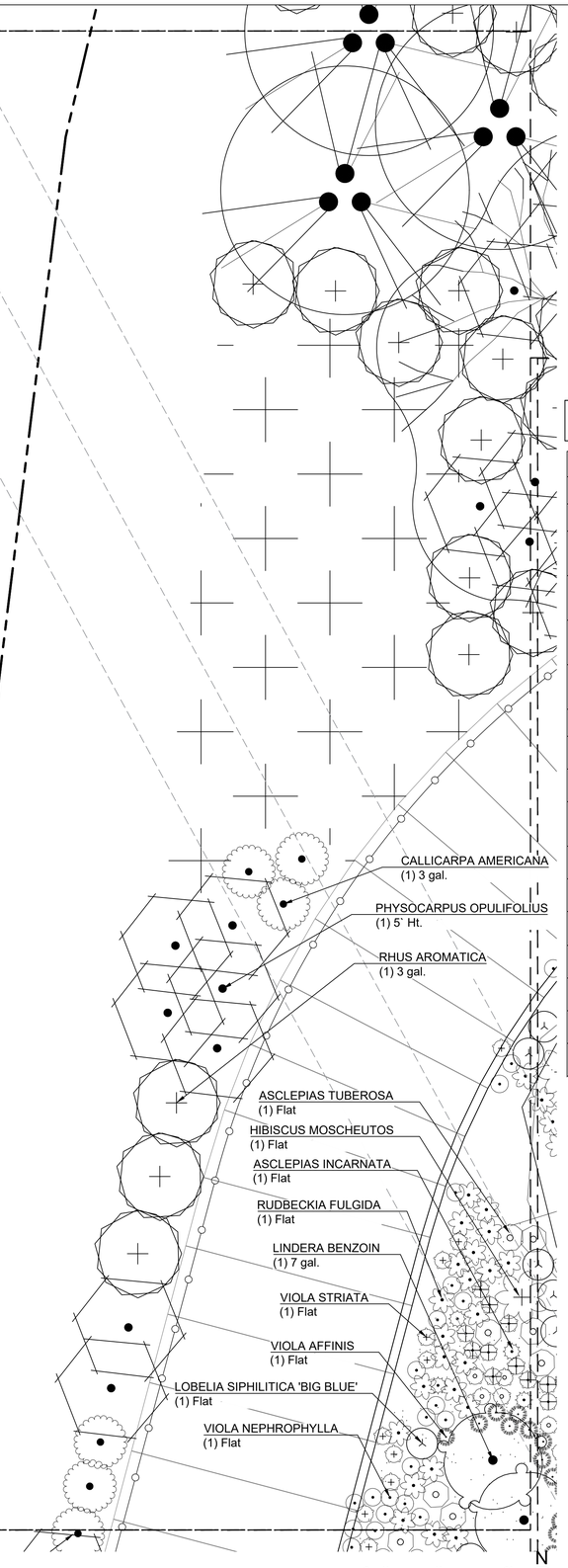
PLANTING ENLARGEMENT A2

SHEET NUMBER

L-613

ENLARGEMENT A2

2



GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE A3

SYMBOL	BOTANICAL NAME
SHRUBS	
	CALLICARPA AMERICANA
	LINDERA BENZOIN
	PHYSOCARPUS OPULIFOLIUS
	RHUS AROMATICA
PERENNIALS	
	ASCLEPIAS INCARNATA
	ASCLEPIAS TUBEROSA
	HIBISCUS MOSCHEUTOS
	IRIS VERSICOLOR
	LIATRIS LIGULISTYLIS
	LOBELIA SIPHILITICA 'BIG BLUE'
	RUDBECKIA FULGIDA
	VIOLA AFFINIS
	VIOLA NEPHROPHYLLA
	VIOLA STRIATA

ENLARGEMENT A4

1 PLANTING ENLARGEMENT A3

1/4"=1'-0"

0 1' 4' 8'

1/4" = 1'-0"

N

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CIVIL ENGINEERS
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MEP ENGINEERS
INSIGHT ENGINEERING
322 S STATE STREET, STE 201
LITTLE ROCK, AR 72201
(501) 237 3077

STRUCTURAL ENGINEERS
ENFRA TME, LLC
BUILDING 2, 1 ALLIED DRIVE, STE 2600
LITTLE ROCK, AR 72202
(501) 666 6776

FOOD SERVICE CONSULTANT
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1807 DODSON AVE
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(479) 629 4572

ACOUSTICAL ENGINEERS
ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
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PROJECT TITLE

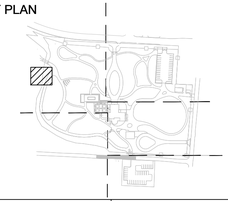
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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SHEET TITLE

PLANTING ENLARGEMENT A3

SHEET NUMBER

L-614

ENLARGEMENT A3

2

CALLICARPA AMERICANA

VIOLA STRIATA
(1) Flat

VIOLA NEPHROPHYLLA
(1) Flat

LINDERA BENZOIN

RUDBECKIA FULGIDA
(1) Flat

VIOLA AFFINIS
(1) Flat

LOBELIA SIPHILITICA 'BIG BLUE'
(1) Flat

IRIS VERSICOLOR (1) Bulb

LIATRIS LIGULISTYLIS

IRIS VERSICOLOR (1) Flat

ASCLEPIAS SYRIACA
(1) Flat

ASCLEPIAS INCARNATA
(1) Flat

VIOLA AFFINIS
(1) Flat

PHYSOCARPUS OPULIFOLIUS

HIBISCUS MOSCHEUTOS
(1) 1 gal.

RHUS AROMATICA

ASCLEPIAS TUBEROSA
(1) Flat

ENLARGEMENT A5

1 PLANTING ENLARGEMENT A4
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND

- BUILDING ACCESS
- BUILDING FOOTPRINT
- PROPERTY LINE
- MATCH LINE
- EXISTING TREE
- VARIOUS BULBS
- VARIOUS ANNUALS
- RIPARIAN SEED MIX
- PLATYCODON GRANDIFLORUS
- TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE A4

SYMBOL	BOTANICAL NAME
SHRUBS	
	CALLICARPA AMERICANA
	LINDERA BENZOIN
	PHYSOCARPUS OPULIFOLIUS
	RHUS AROMATICA
BULBS	
	IRIS VERSICOLOR
PERENNIALS	
	ASCLEPIAS INCARNATA
	ASCLEPIAS SYRIACA
	ASCLEPIAS TUBEROSA
	HIBISCUS MOSCHEUTOS
	IRIS VERSICOLOR
	LIATRIS LIGULISTYLIS
	LOBELIA SIPHILITICA 'BIG BLUE'
	RUDBECKIA FULGIDA
	VIOLA AFFINIS
	VIOLA NEPHROPHYLLA
	VIOLA STRIATA

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PROJECT TITLE

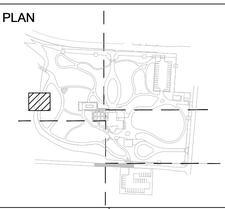
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



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REGISTERED LANDSCAPE ARCHITECT
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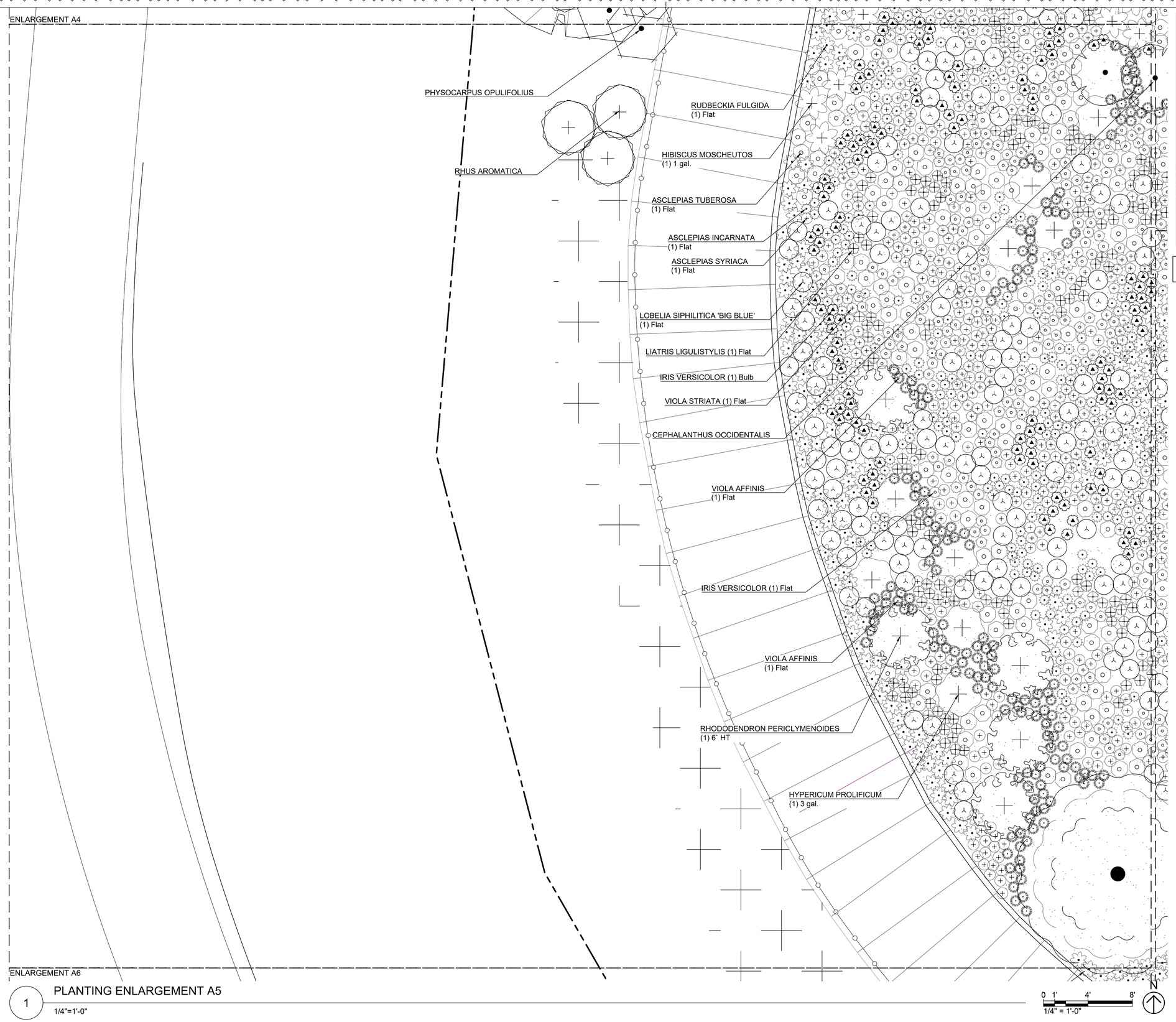
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SHEET TITLE

PLANTING ENLARGEMENT A4

SHEET NUMBER

L-615



1 PLANTING ENLARGEMENT A5

1/4"=1'-0"

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE A5

SYMBOL	BOTANICAL NAME
SHRUBS	
	CEPHALANTHUS OCCIDENTALIS
	HYPERICUM PROLIFICUM
	PHYSOCARPUS OPULIFOLIUS
	RHODODENDRON PERICLYMENOIDES
	RHUS AROMATICA
BULBS	
	IRIS VERSICOLOR
PERENNIALS	
	ASCLEPIAS INCARNATA
	ASCLEPIAS SYRIACA
	ASCLEPIAS TUBEROSA
	HIBISCUS MOSCHEUTOS
	IRIS VERSICOLOR
	LIATRIS LIGULISTYLIS
	LOBELIA SIPHILITICA 'BIG BLUE'
	RUDBECKIA FULGIDA
	VIOLA AFFINIS
	VIOLA STRIATA

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PROJECT TITLE

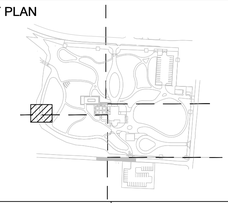
CENTRAL HOUSE & GARDEN

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SHEET TITLE

PLANTING ENLARGEMENT A5

SHEET NUMBER

L-616

ENLARGEMENT A5

2

RUDBECKIA FULGIDA (1) Flat

RHUS AROMATICA
(1) 3 gal.

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE A6

SYMBOL	BOTANICAL NAME
SHRUBS	
	RHUS AROMATICA
PERENNIALS	
	RUDBECKIA FULGIDA

N

0 1' 4' 8'
1/4" = 1'-0"

1 PLANTING ENLARGEMENT A6
1/4"=1'-0"

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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
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(215) 245 8244

PROJECT TITLE

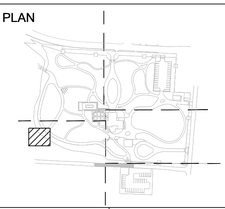
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

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KEY PLAN



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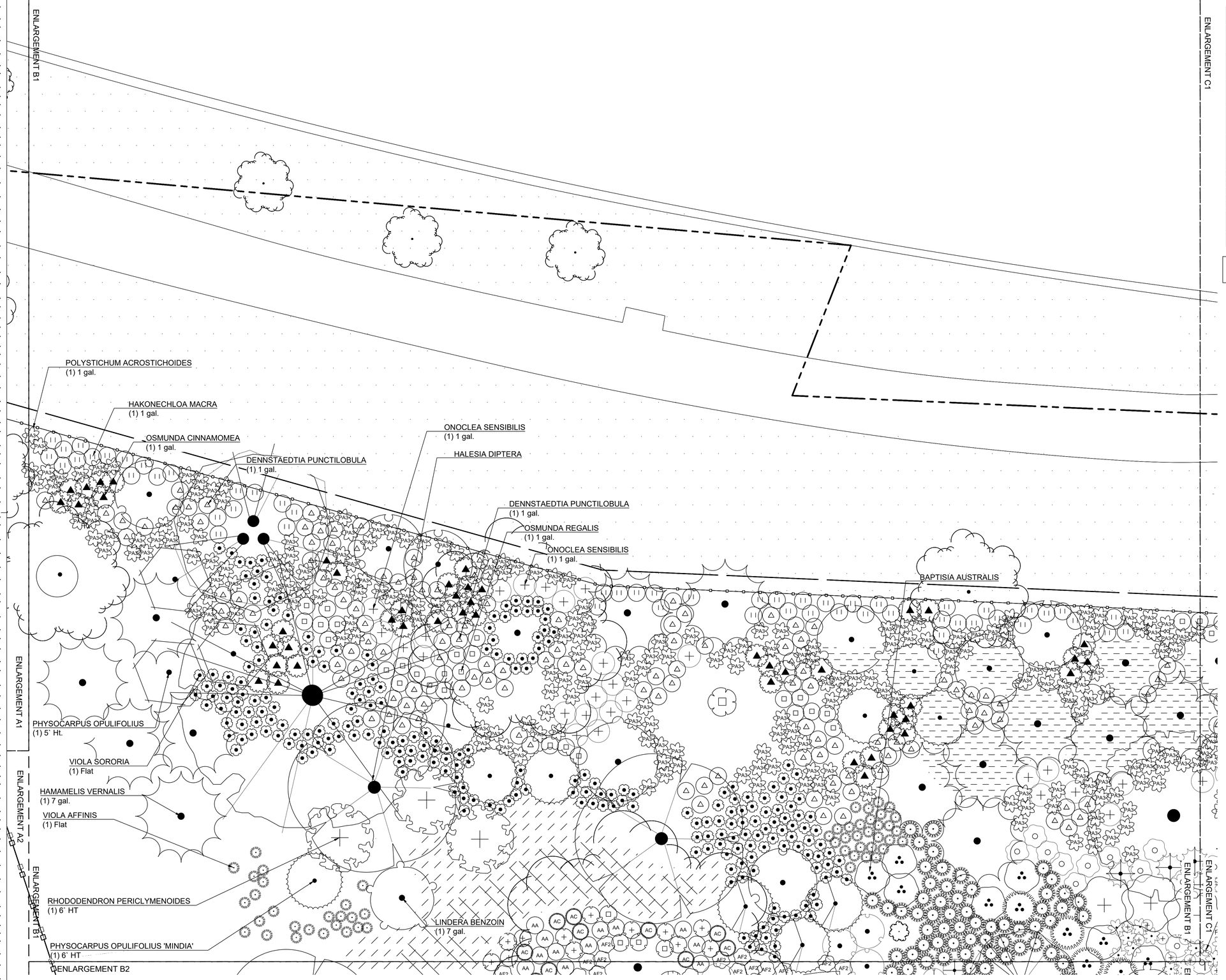
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SHEET TITLE

PLANTING ENLARGEMENT A6

SHEET NUMBER

L-617



1 PLANTING ENLARGEMENT B1

1/4"=1'-0"

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE B1

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	BUDDLEJA DAVIDII 'NANHO BLUE'
	CLETHRA ALNIFOLIA
	HALESIA DIPTERA
	HAMAMELIS VERNALIS
	ITEA VIRGINICA 'HENRY'S GARNET'
	LINDERA BENZOIN
	PHYSOCARPUS OPULIFOLIUS
	PHYSOCARPUS OPULIFOLIUS 'MINDIA'
	RHODODENDRON PERICLYMENOIDES
	VIBURNUM PLICATUM TOMENTOSUM
PERENNIALS	
	ACHILLEA MILLEFOLIUM 'SUMMER BERRIES'
AF	ASTILBE CHINENSIS 'FINALE'
AA	ASTILBE X ARENDSII 'AMETHYST'
	ASTILBE X ARENDSII 'DEUTSCHLAND'
AF2	ASTILBE X ARENDSII 'FANAL'
	BAPTISIA ALBA
	BAPTISIA AUSTRALIS
	CAREX CHEROKEENSIS
	DENNSTAEDTIA PUNCTILOBULA
	GAURA LINDHEIMERI 'WHIRLING BUTTERFLIES'
	GYPSOPHILA PANICULATA 'VIETTE'S DWARF'
	HAKONECHLOA MACRA
	NEPETA X 'WALKER'S LOW'
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	OSMUNDA REGALIS
PA3	POLYSTICHUM ACROSTICHOIDES
	VIOLA AFFINIS
	VIOLA SORORIA

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STRUCTURAL ENGINEERS
ENFRA TME, LLC
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(501) 666 6776

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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

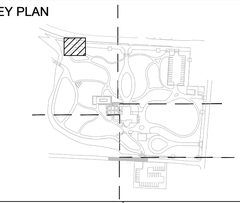
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
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SHEET TITLE

PLANTING ENLARGEMENT B1

SHEET NUMBER

L-618

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

LINDERA BENZOIN
(1) 7 gal.

BAPTISIA AUSTRALIS
(1) 5 gal.

OENOTHERA MISSOURIENSIS
(1) Flat

VIOLA SORORIA
(1) Flat

CAREX CHEROKEENSIS
(1) Flat

FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
(1) 5 gal.

NEPETA X 'WALKER'S LOW'
(1) 1 gal.

ASTILBE X ARENDSII 'AMETHYST'
(1) 1 gal.

ASTILBE CHINENSIS 'FINALE'
(1) 1 gal.

ASTILBE X ARENDSII 'FANAL'
(1) 1 gal.

SAMBUCUS RACEMOSA 'SMNSRD4'
(1) 3 gal.

SAMBUCUS NIGRA 'BLACK LACE'
(1) 3 gal.

CLETHRA ALNIFOLIA
(1) 7 gal.

HAMAMELIS VERNALIS
(1) 7 gal.

BUDDLEJA DAVIDII 'NANHO BLUE'
(1) 5 gal.

GAURA LINDHEIMERI 'PINK'
(1) 1 gal.

ENLARGEMENT C2

ENLARGEMENT A2

ENLARGEMENT A3

ENLARGEMENT B3

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

1 PLANTING ENLARGEMENT B2
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

PLANT SCHEDULE B2	
SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	BUDDLEJA DAVIDII 'NANHO BLUE'
	CLETHRA ALNIFOLIA
	CLETHRA ALNIFOLIA 'HUMMINGBIRD'
	CLETHRA ALNIFOLIA 'RUBY SPICE'
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HALESIA DIPTERA
	HAMAMELIS VERNALIS
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN'
	ITEA VIRGINICA 'HENRY'S GARNET'
	LINDERA BENZOIN
	PHYSOCARPUS OPULIFOLIUS
	PINUS STROBUS 'HORSFORD'
	RHUS AROMATICA
	SAMBUCUS NIGRA 'BLACK LACE'
	SAMBUCUS RACEMOSA 'SMNSRD4'
	VIBURNUM PLICATUM TOMENTOSUM
	VIBURNUM PRUNIFOLIUM
	VIBURNUM X BURKWOODII 'DUVONE'
PERENNIALS	
	ACHILLEA MILLEFOLIUM 'SUMMER BERRIES'
	AMSONIA HUBRICHTII
AF	ASTILBE CHINENSIS 'FINALE'
AA	ASTILBE X ARENDSII 'AMETHYST'
	ASTILBE X ARENDSII 'DEUTSCHLAND'
AF2	ASTILBE X ARENDSII 'FANAL'
	BAPTISIA ALBA
	BAPTISIA AUSTRALIS
	BAPTISIA X 'CHERRIES JUBILEE'
	BAPTISIA X 'LEMON MERINGUE'
	CAREX CHEROKEENSIS
	ECHINACEA PURPUREA 'MAGNUS'
	GAURA LINDHEIMERI 'PINK'
	GERANIUM X CANTABRIGIENSE 'BIOKOVO'
	GEUM X 'ORANGE PUMPKIN'
	GEUM X 'TEQUILA SUNRISE'
	GYPSOPHILA PANICULATA 'VIETTE'S DWARF'
	NEPETA X 'WALKER'S LOW'
	OENOTHERA MISSOURIENSIS
	VIOLA AFFINIS
	VIOLA SORORIA

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PROJECT TITLE

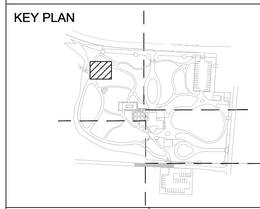
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

DRAWN BY

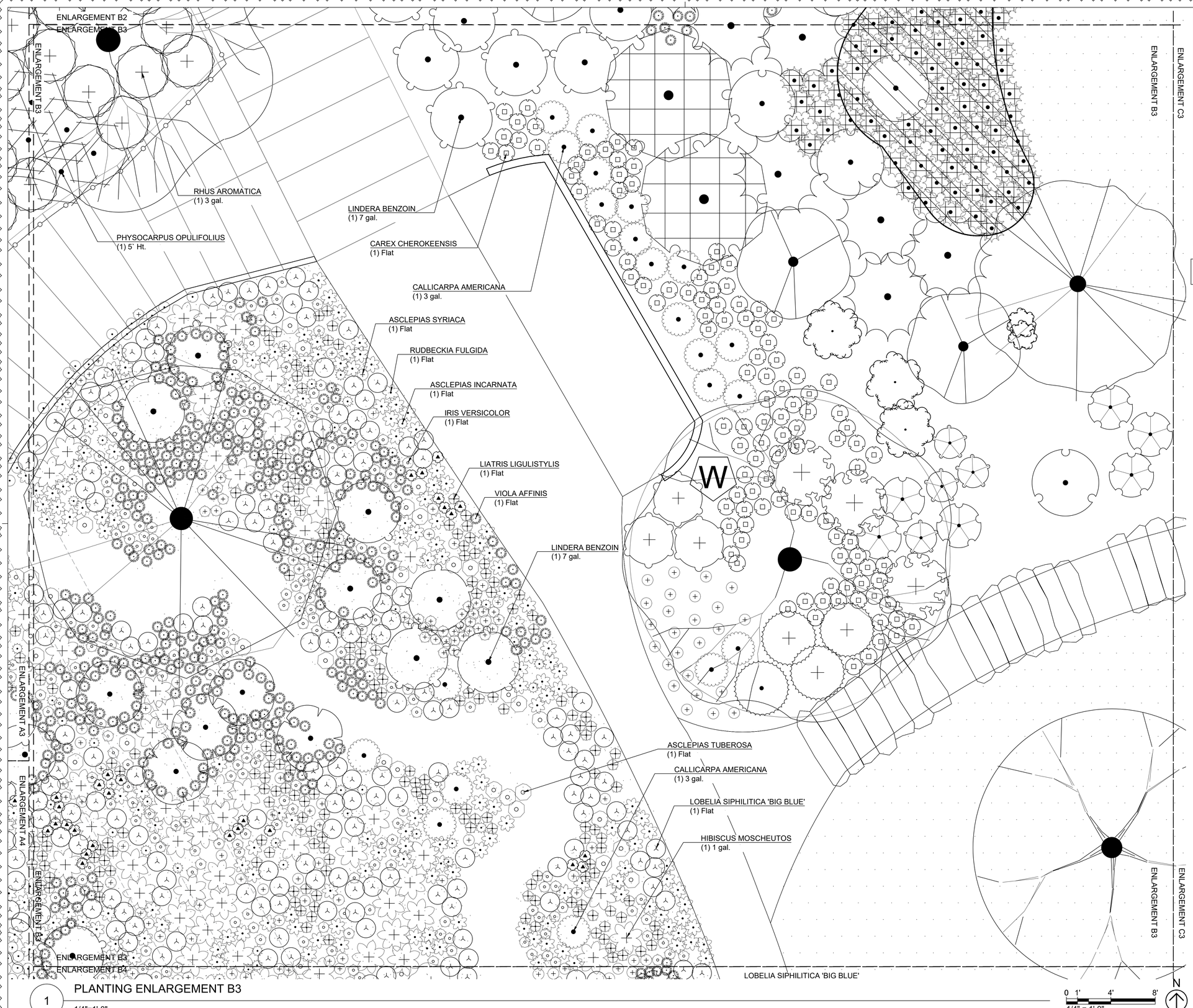
CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT B2

SHEET NUMBER

L-619



1 PLANTING ENLARGEMENT B3

1/4"=1'-0"

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE B3	
SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	CALLICARPA AMERICANA
	CEPHALANTHUS OCCIDENTALIS
	CLETHRA ALNIFOLIA 'HUMMINGBIRD'
	CLETHRA ALNIFOLIA 'RUBY SPICE'
	HAMAMELIS VERNALIS
	LINDERA BENZOIN
	PHYSOCARPUS OPULIFOLIUS
	PHYSOCARPUS OPULIFOLIUS 'MINDIA'
	PHYSOCARPUS OPULIFOLIUS 'SMNPOBLR'
	RHODODENDRON PERICLYMENOIDES
	RHUS AROMATICA
	SAMBUCUS NIGRA 'BLACK LACE'
	VIBURNUM PRUNIFOLIUM
BULBS	
	IRIS X GERMANICA 'BLACK IS BLACK'
PERENNIALS	
	ACHILLEA MILLEFOLIUM 'SUMMER BERRIES'
	ASCLEPIAS INCARNATA
	ASCLEPIAS SYRIACA
	ASCLEPIAS TUBEROSA
	CAREX CHEROKEENSIS
	GAURA LINDHEIMERI 'PINK'
	HIBISCUS MOSCHEUTOS
	IRIS VERSICOLOR
	LIATRIS LIGULISTYLIS
	LOBELIA SIPHILITICA 'BIG BLUE'
	RUDBECKIA FULGIDA
	VIOLA AFFINIS
	VIOLA NEPHROPHYLLA
	VIOLA STRIATA

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INSIGHT ENGINEERING
322 S STATE STREET, STE 201
LITTLE ROCK, AR 72201
(501) 237 3077

STRUCTURAL ENGINEERS
ENFRA TME, LLC
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(501) 666 6776

FOOD SERVICE CONSULTANT
MCKAY-LANE CONSULTING, LTD
1807 DODSON AVE
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(479) 629 4572

ACOUSTICAL ENGINEERS
ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

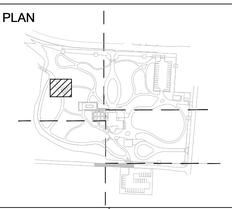
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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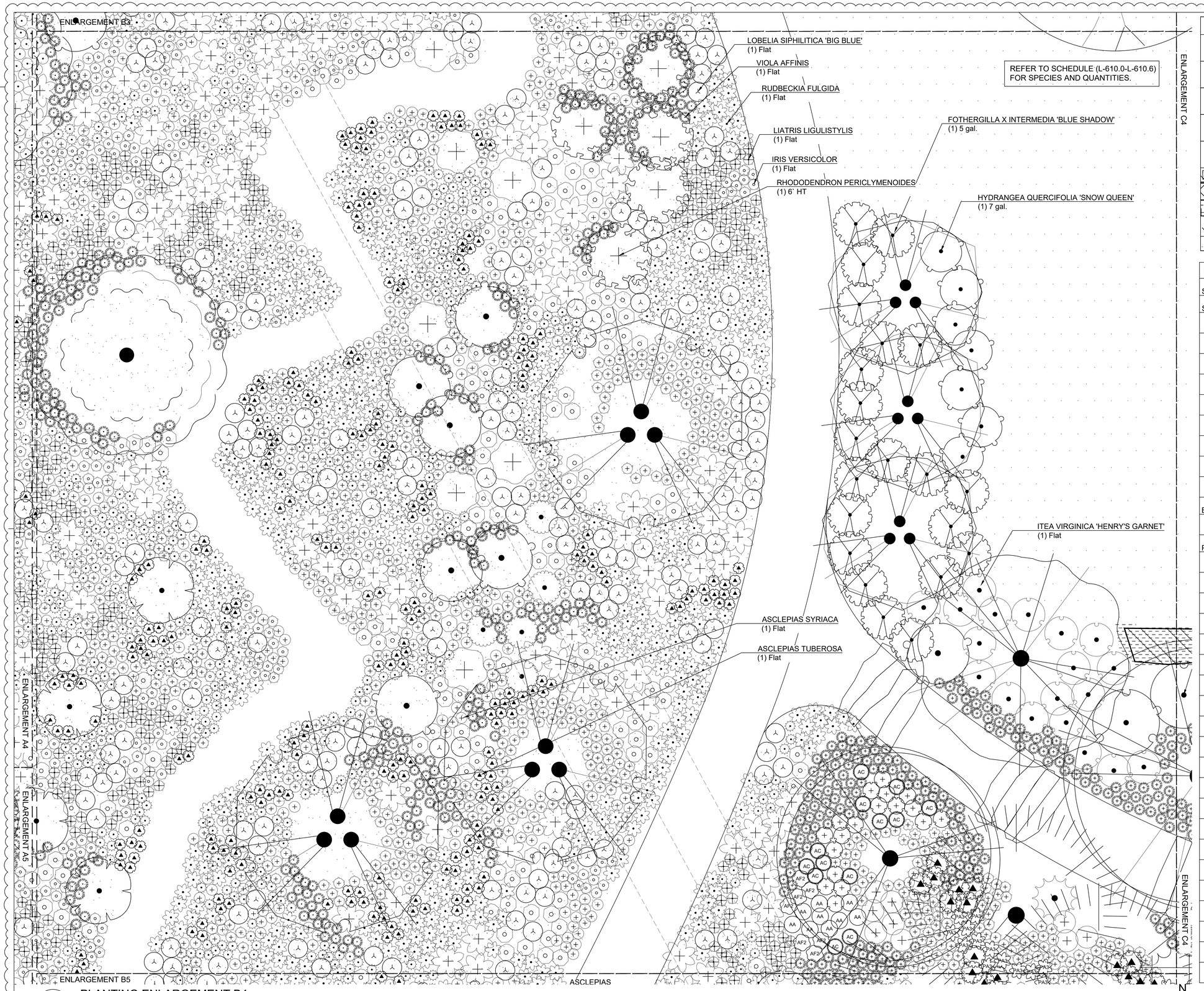
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SHEET TITLE

PLANTING ENLARGEMENT B3

SHEET NUMBER

L-620



1 PLANTING ENLARGEMENT B4

1/4"=1'-0"

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

PLANT_SCHEDULE_B4	
SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	CALLICARPA AMERICANA
	CEPHALANTHUS OCCIDENTALIS
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN'
	HYPERICUM PROLIFICUM
	ITEA VIRGINICA 'HENRY'S GARNET'
	LINDERA BENZOIN
	RHODODENDRON PERICLYMENOIDES
BULBS	
	IRIS VERSICOLOR
PERENNIALS	
	ASCLEPIAS INCARNATA
	ASCLEPIAS SYRIACA
	ASCLEPIAS TUBEROSA
AF	ASTILBE CHINENSIS 'FINALE'
AA	ASTILBE X ARENDSII 'AMETHYST'
	ASTILBE X ARENDSII 'DEUTSCHLAND'
AF2	ASTILBE X ARENDSII 'FANAL'
	HIBISCUS MOSCHEUTOS
	IRIS VERSICOLOR
	LIATRIS LIGULISTYLIS
	LOBELIA SIPHILITICA 'BIG BLUE'
	MATTEUCCIA STRUTHIOPTERIS
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	POLYSTICHUM ACROSTICHOIDES
	RUDBECKIA FULGIDA
	STYLOPHORUM DIPHYLLUM
	TIARELLA CORDIFOLIA 'BRANDYWINE'
	VIOLA AFFINIS
	VIOLA NEPHROPHYLLA
	VIOLA STRIATA

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ENFRA TME, LLC
BUILDING 2, 1 ALLIED DRIVE, STE 2600
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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

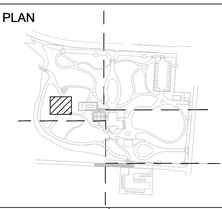
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
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	2 ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
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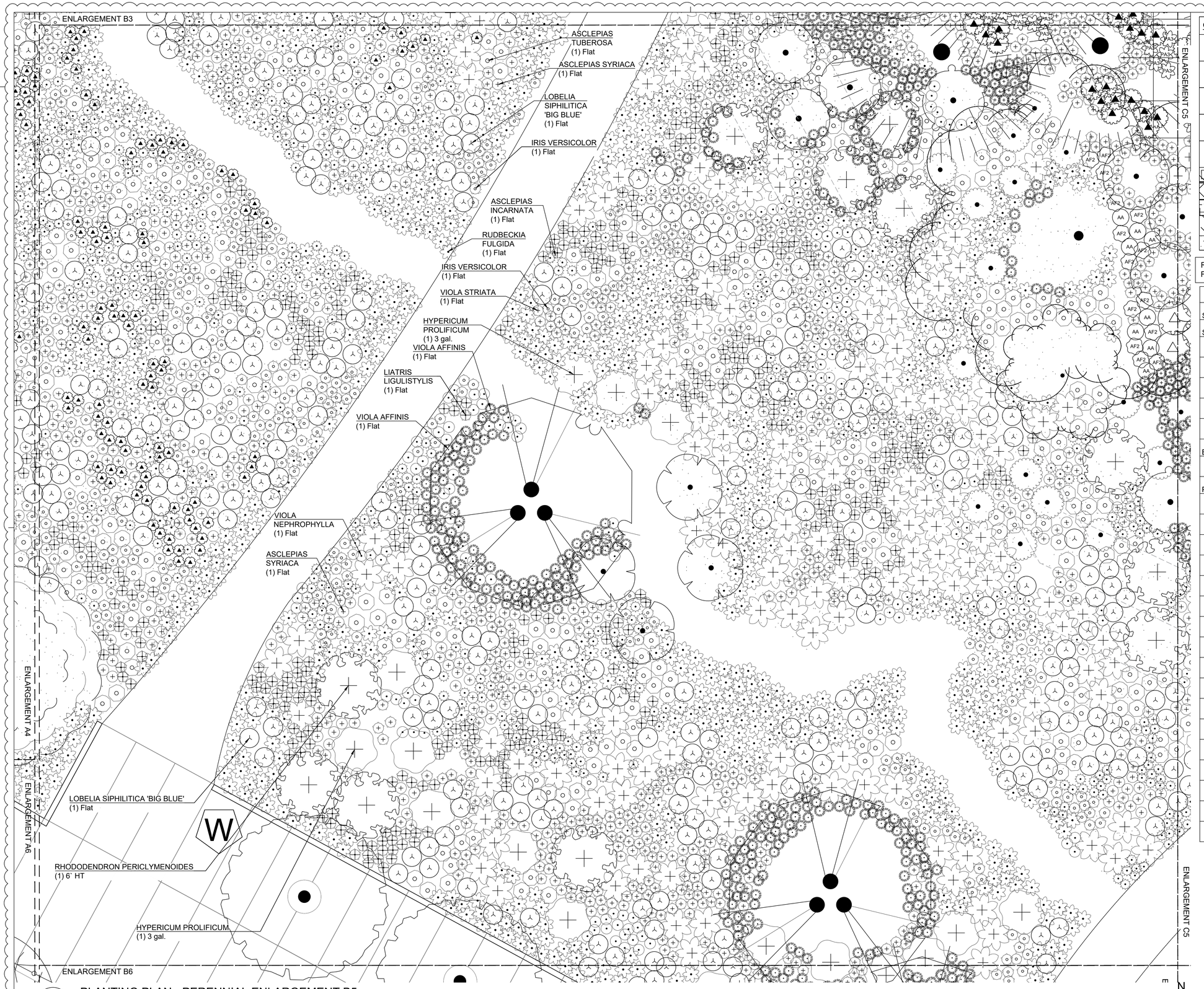
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SHEET TITLE

PLANTING ENLARGEMENT B4

SHEET NUMBER

L-621



1 PLANTING PLAN - PERENNIAL ENLARGEMENT B5

1/4"=1'-0"

GENERAL LEGEND

- BUILDING ACCESS
- BUILDING FOOTPRINT
- PROPERTY LINE
- MATCH LINE
- EXISTING TREE
- VARIOUS BULBS
- VARIOUS ANNUALS
- RIPARIAN SEED MIX
- PLATYCODON GRANDIFLORUS
- TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE B5

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	CALLICARPA AMERICANA
	HYPERICUM PROLIFICUM
	LINDERA BENZOIN
	RHODODENDRON PERICLYMENOIDES
BULBS	
	IRIS X GERMANICA 'BLACK IS BLACK'
PERENNIALS	
	ASCLEPIAS INCARNATA
	ASCLEPIAS SYRIACA
	ASCLEPIAS TUBEROSA
AA	ASTILBE X ARENDSII 'AMETHYST'
AF2	ASTILBE X ARENDSII 'FANAL'
	CIMICIFUGA RACEMOSA
	HIBISCUS MOSCHEUTOS
	IRIS VERSICOLOR
	LIATRIS LIGULISTYLIS
	LOBELIA SIPHILITICA 'BIG BLUE'
	OSMUNDA CINNAMOMEA
PA3	POLYSTICHUM ACROSTICHOIDES
	RUDBECKIA FULGIDA
	TIARELLA CORDIFOLIA 'BRANDYWINE'
	VIOLA AFFINIS
	VIOLA NEPHROPHYLLA
	VIOLA STRIATA

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(215) 245 8244

PROJECT TITLE

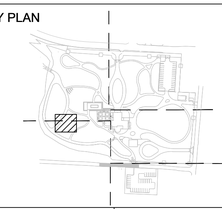
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



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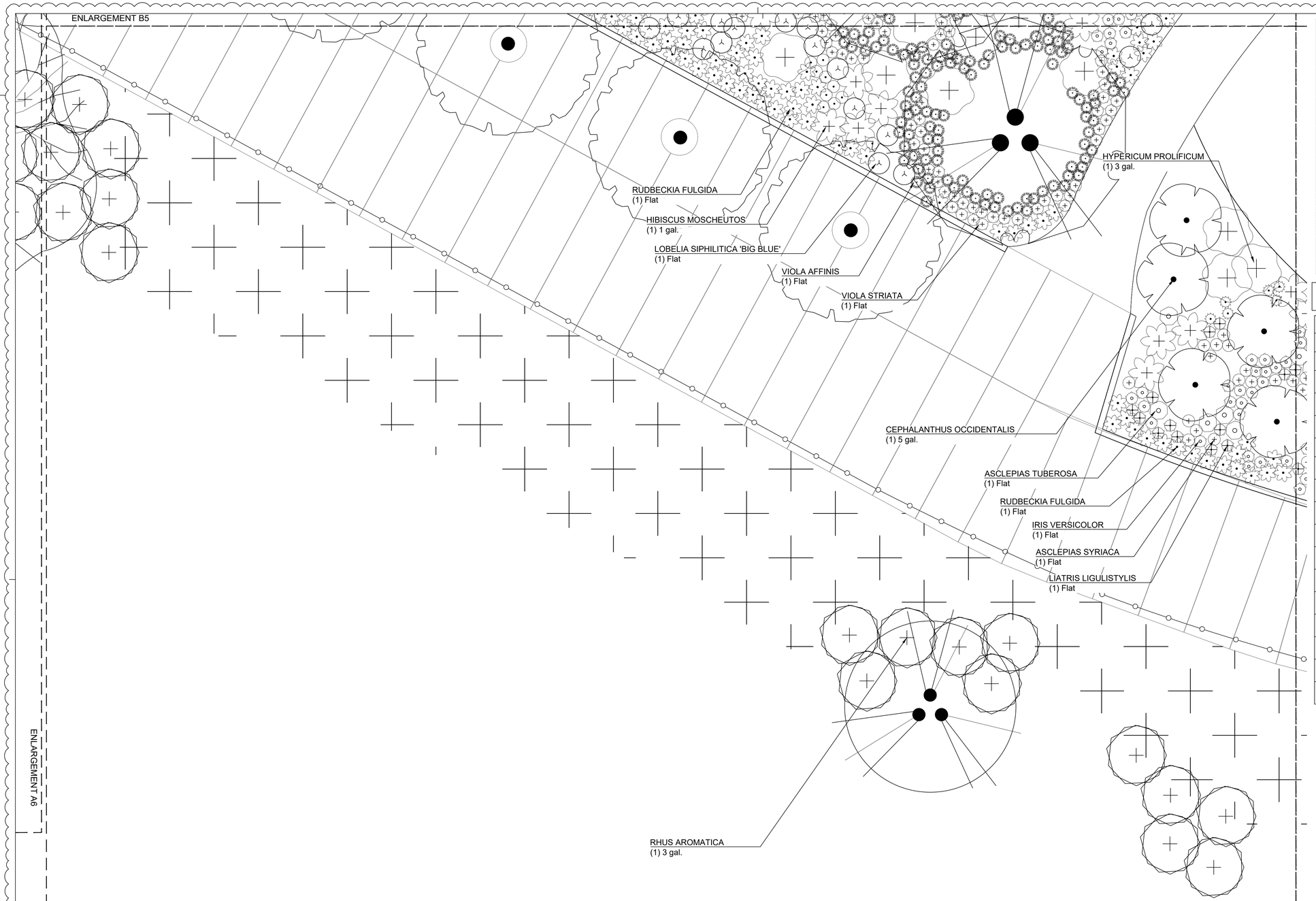
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SHEET TITLE

PLANTING ENLARGEMENT B5

SHEET NUMBER

L-622



GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE B6	
SYMBOL	BOTANICAL NAME
SHRUBS	
	CEPHALANTHUS OCCIDENTALIS
	HYPERICUM PROLIFICUM
	RHUS AROMATICA
PERENNIALS	
	ASCLEPIAS INCARNATA
	ASCLEPIAS SYRIACA
	ASCLEPIAS TUBEROSA
	HIBISCUS MOSCHEUTOS
	IRIS VERSICOLOR
	LIATRIS LIGULISTYLIS
	LOBELIA SIPHILITICA 'BIG BLUE'
	RUDBECKIA FULGIDA
	VIOLA AFFINIS
	VIOLA NEPHROPHYLLA
	VIOLA STRIATA

1 PLANTING ENLARGEMENT B6
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

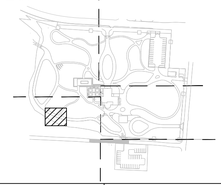
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



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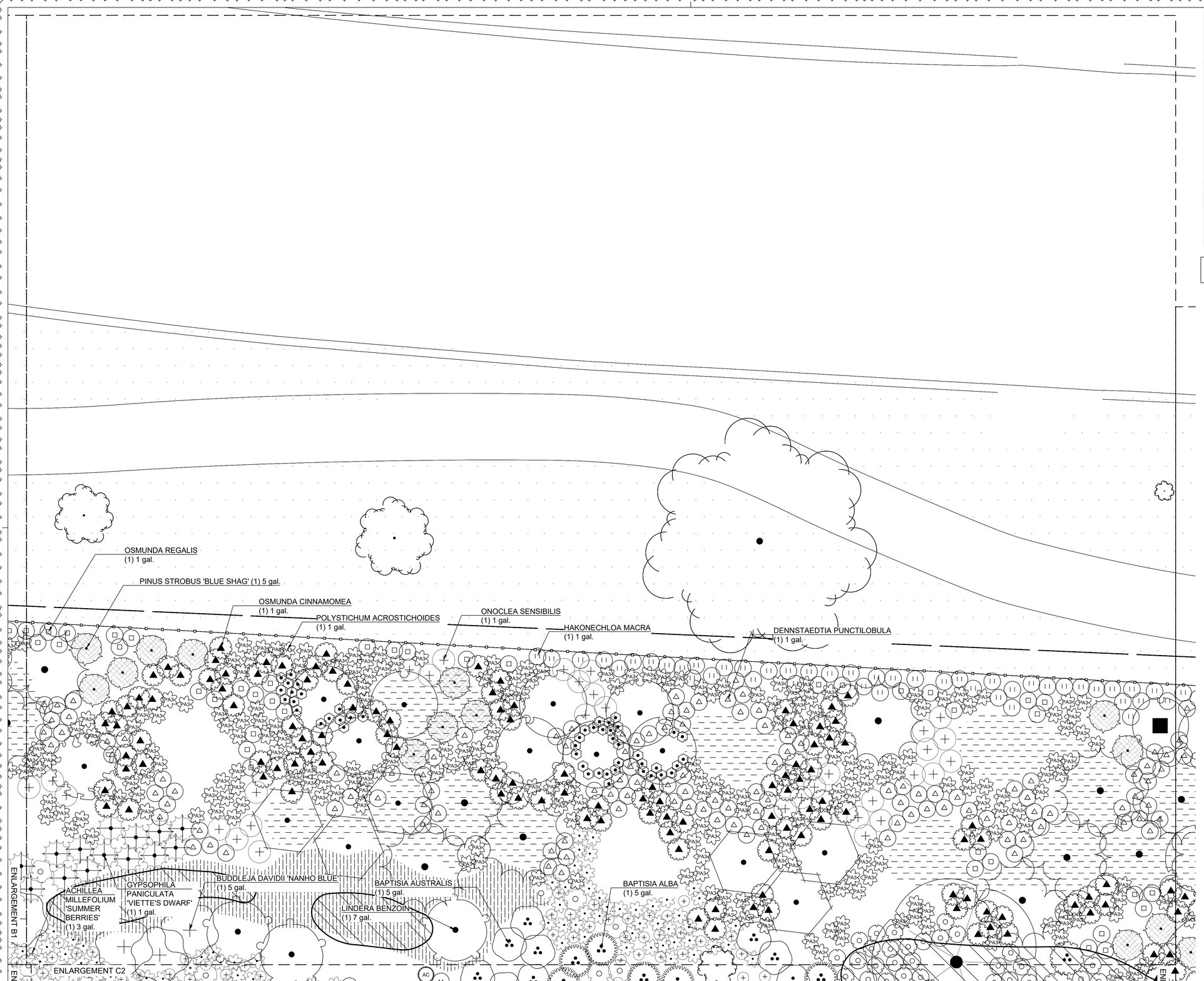
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SHEET TITLE

PLANTING ENLARGEMENT B6

SHEET NUMBER

L-623



1 PLANTING ENLARGEMENT C1

1/4"=1'-0"

0 1' 4' 8'

1/4" = 1'-0"

N

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE C1

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	BUDDLEJA DAVIDII 'NANHO BLUE'
	HALESIA DIPTERA
	HYDRANGEA SERRATA 'SMNHSDD'
	LINDERA BENZOIN
	MAGNOLIA GRANDIFLORA 'LITTLE GEM'
	PHYSOCARPUS OPULIFOLIUS
	PINUS STROBUS 'BLUE SHAG'
	RHODODENDRON LUTEUM
PERENNIALS	
	ANEMONE SYLVESTRIS
	ASCLEPIAS SYRIACA
	BAPTISIA ALBA
	BAPTISIA AUSTRALIS
	BAPTISIA X 'LEMON MERINGUE'
	CAREX FLACCA 'BLUE ZINGER'
	DENNSTAEDTIA PUNCTILOBULA
	GAURA LINDHEIMERI 'WHIRLING BUTTERFLIES'
	GYPSOPHILA PANICULATA 'VIETTE'S DWARF'
	HAKONECHLOA MACRA
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	OSMUNDA REGALIS
	POLYSTICHUM ACROSTICHOIDES
	RUDBECKIA FULGIDA
	RUDBECKIA TRILOBA

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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

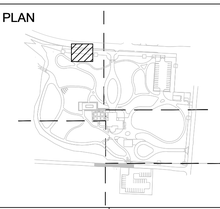
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
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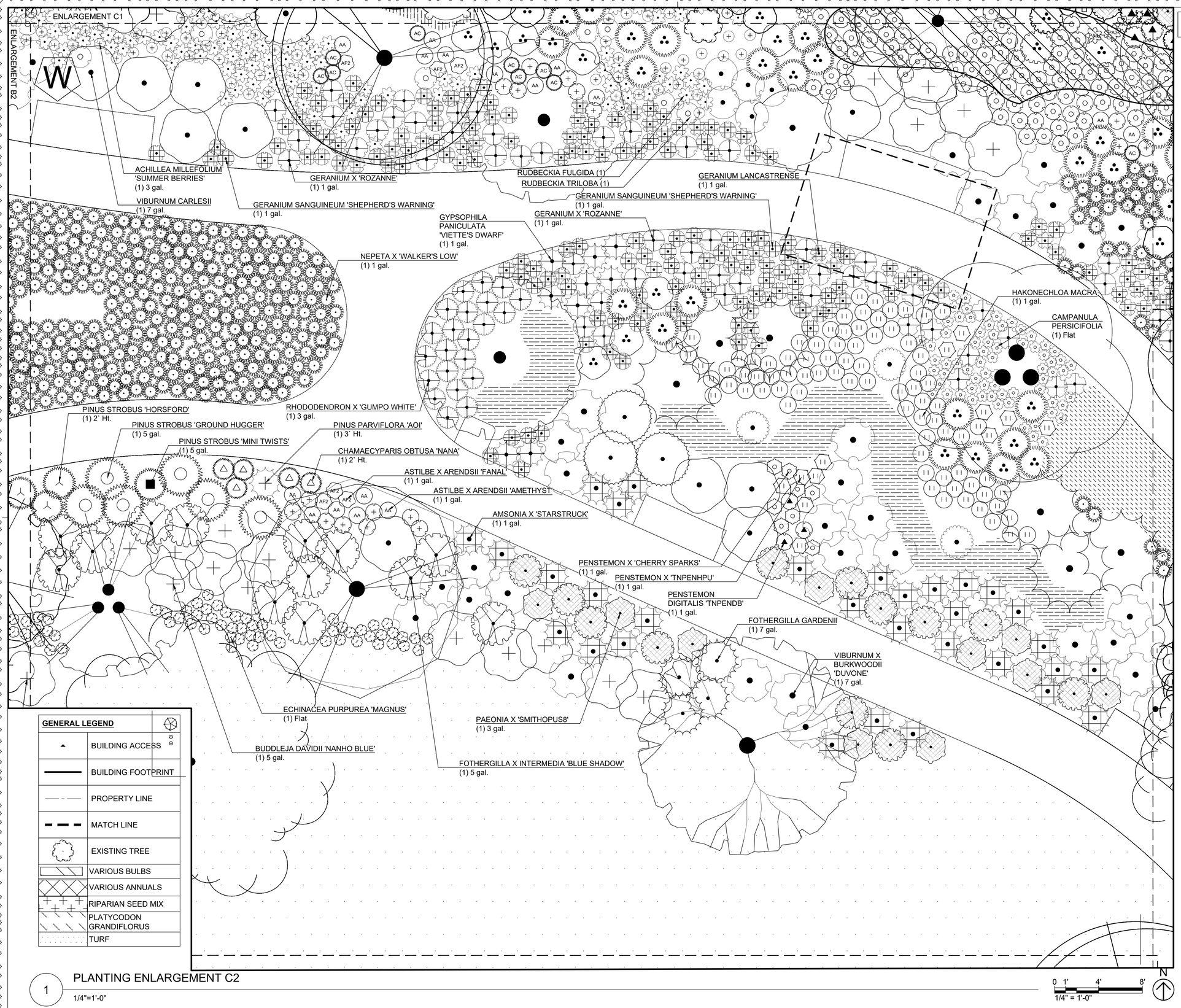
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SHEET TITLE

PLANTING ENLARGEMENT C1

SHEET NUMBER

L-624



1 PLANTING ENLARGEMENT C2

1/4"=1'-0"

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE C2

SYMBOL	BOTANICAL NAME
SHRUBS	
	BUDDLEJA DAVIDII 'NANHO BLUE'
	CHAMAECYPARIS OBTUSA 'NANA'
	FOTHERGILLA GARDENII
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HAMAMELIS VERNALIS
	ITEA VIRGINICA 'HENRY'S GARNET'
	PHYSOCARPUS OPULIFOLIUS 'MINDIA'
	PINUS PARVIFLORA 'AOI'
	PINUS STROBUS 'GROUND HUGGER'
	PINUS STROBUS 'HORSFORD'
	PINUS STROBUS 'MINI TWISTS'
	RHODODENDRON X 'GUMPO WHITE'
	VIBURNUM CARLESII
	VIBURNUM PLICATUM TOMENTOSUM
	VIBURNUM X BURKWOODII 'DUVONE'
PERENNIALS	
	ACHILLEA MILLEFOLIUM 'SUMMER BERRIES'
	AMSONIA X 'STARSTRUCK'
	ANEMONE SYLVESTRIS
AF	ASTILBE CHINENSIS 'FINALE'
AA	ASTILBE X ARENDSII 'AMETHYST'
	ASTILBE X ARENDSII 'DEUTSCHLAND'
AF2	ASTILBE X ARENDSII 'FANAL'
	BAPTISIA ALBA
	BAPTISIA AUSTRALIS
	BAPTISIA X 'LEMON MERINGUE'
	CAMPANULA PERSICIFOLIA
	DIGITALIS PURPUREA 'DALMATIAN PEACH'
	ECHINACEA PURPUREA 'MAGNUS'
	GERANIUM LANCASTRENSE
	GERANIUM SANGUINEUM 'SHEPHERD'S WARNING'
	GERANIUM X 'ROZANNE'
	GYPSOPHILA PANICULATA 'VIETTE'S DWARF'
	HAKONECHLOA MACRA
	NEPETA X 'WALKER'S LOW'
	OSMUNDA CINNAMOMEA
	PAEONIA X 'BARTZELLA'
	PAEONIA X 'SMITHOPUS8'
	PENSTEMON DIGITALIS 'TNPENDB'
	PENSTEMON X 'CHERRY SPARKS'
	PENSTEMON X 'TNPENHPU'
PA3	POLYSTICHUM ACROSTICHOIDES

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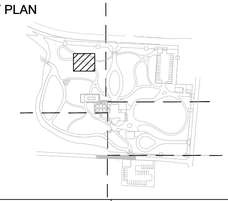
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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	2 ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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SHEET TITLE

PLANTING ENLARGEMENT C2

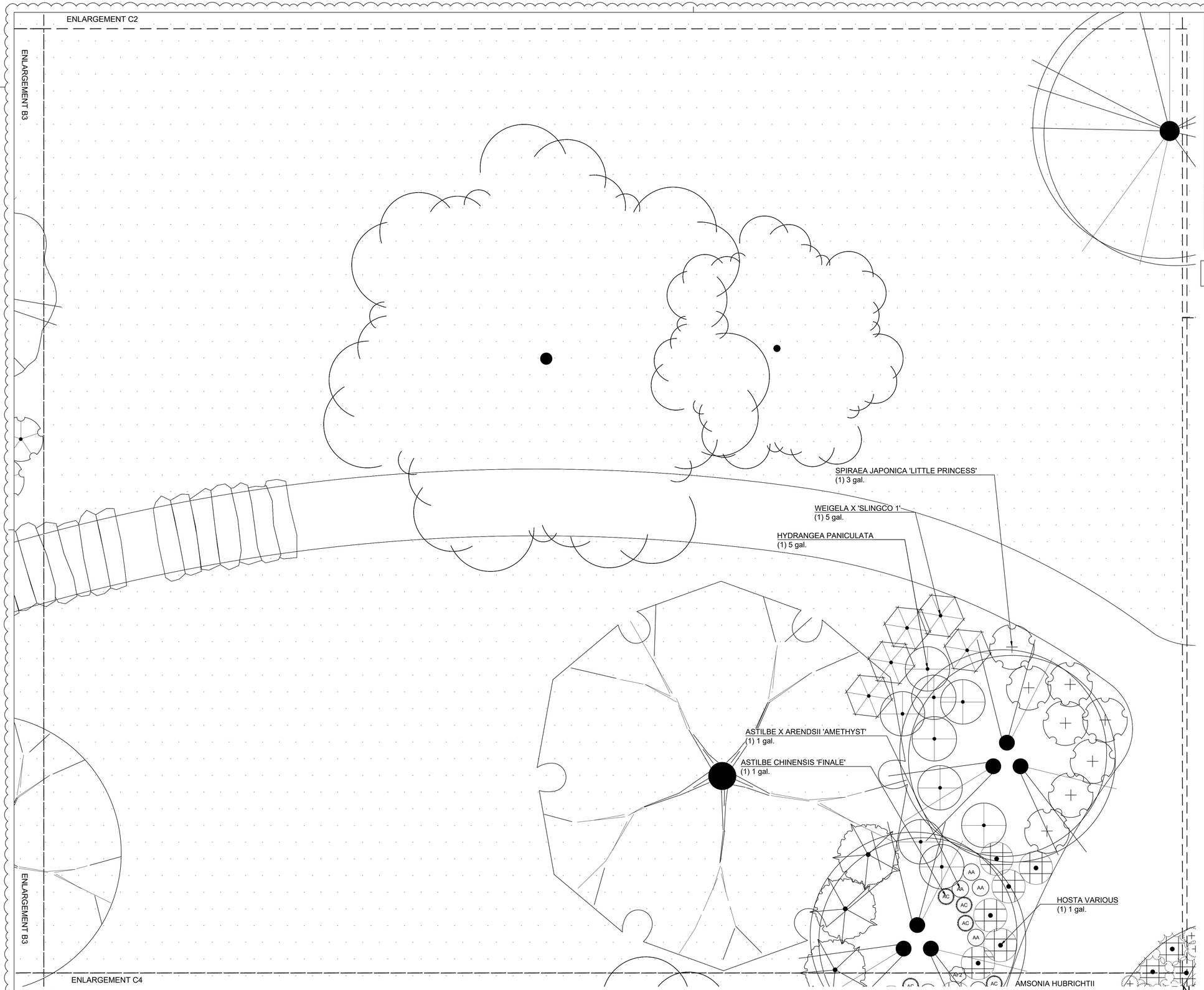
SHEET NUMBER

L-625

ENLARGEMENT C2

ENLARGEMENT B3

2



ENLARGEMENT B3

ENLARGEMENT C4

1

PLANTING ENLARGEMENT C3

1/4"=1'-0"

0 1' 4' 8'

1/4" = 1'-0"

N

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE C3

SYMBOL	BOTANICAL NAME
SHRUBS	
	ABELIA X GRANDIFLORA 'KALEIDOSCOPE'
	HYDRANGEA PANICULATA 'SMHPLQF'
	SPIRAEA JAPONICA 'LITTLE PRINCESS'
	WEIGELA FLORIDA 'BOKRASOPIN'
	WEIGELA X 'SLINGCO 1'
PERENNIALS	
AC	ASTILBE CHINENSIS 'FINALE'
AA	ASTILBE X ARENDSII 'AMETHYST'
	HOSTA VARIOUS

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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

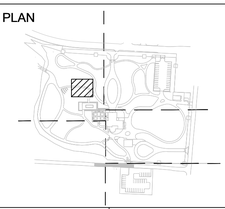
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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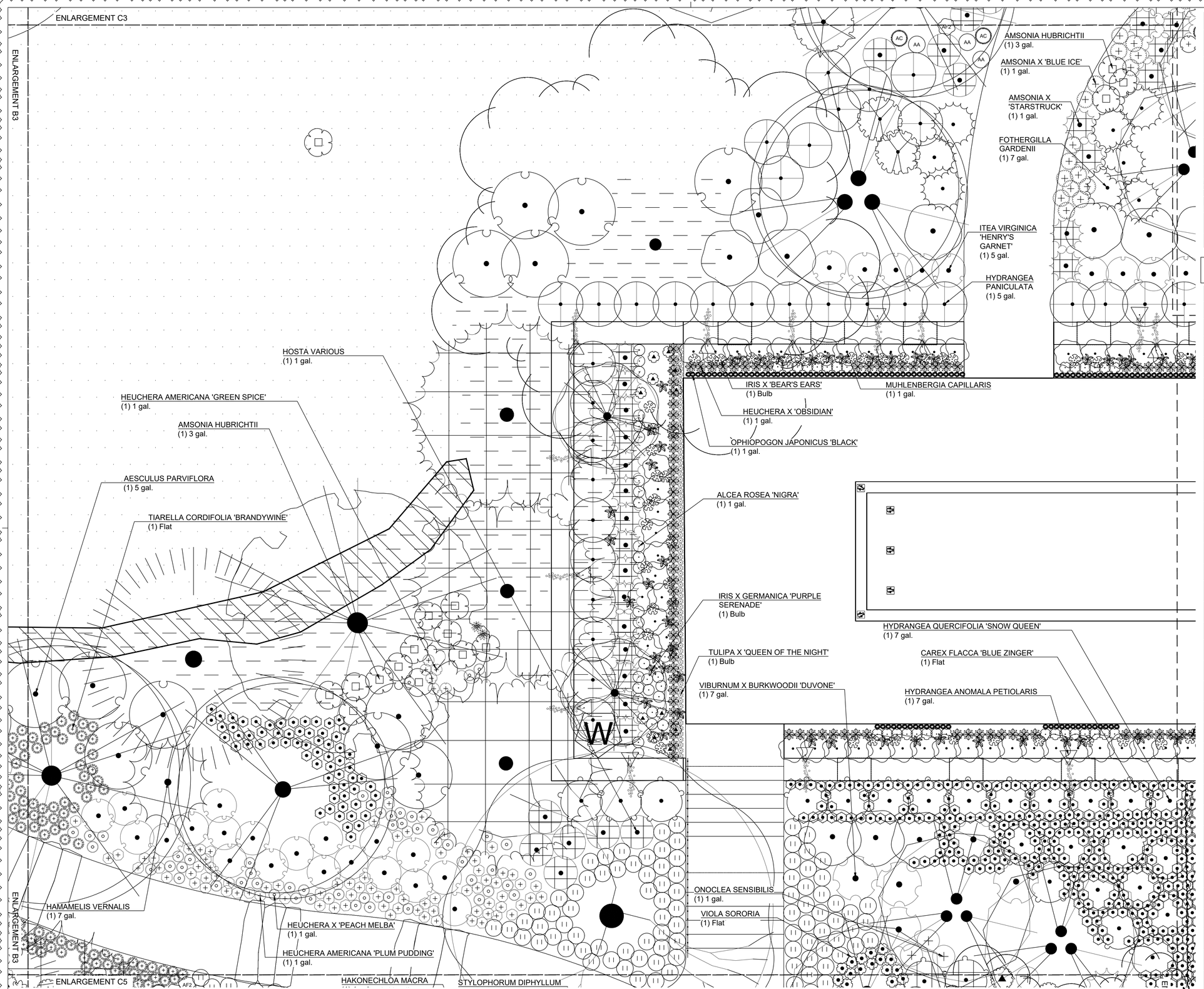
CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT C3

SHEET NUMBER

L-626



1 PLANTING ENLARGEMENT C4

1/4"=1'-0"

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE C4

SYMBOL	BOTANICAL NAME
SHRUBS	
	ABELIA X GRANDIFLORA 'KALEIDOSCOPE'
	AESCULUS PARVIFLORA
	FOTHERGILLA GARDENII
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HYDRANGEA PANICULATA 'PHANTOM'
	HYDRANGEA PANICULATA 'SMHPLQF'
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN'
	HYDRANGEA SERRATA 'SMNHSDD'
	ITEA VIRGINICA 'HENRY'S GARNET'
	VIBURNUM CARLESII
	VIBURNUM X BURKWOODII 'DUVONE'
BULBS	
	IRIS X 'BEAR'S EARS'
	IRIS X GERMANICA 'PURPLE SERENADE'
PERENNIALS	
	AMSONIA HUBRICHTII
	AMSONIA X 'BLUE ICE'
AC	ASTILBE CHINENSIS 'FINALE'
AA	ASTILBE X ARENDSII 'AMETHYST'
AF2	ASTILBE X ARENDSII 'FANAL'
	CAREX FLACCA 'BLUE ZINGER'
	HAKONECHLOA MACRA
	HELLEBORUS X HYBRIDUS - VARIOUS
	HEUCHERA AMERICANA 'GREEN SPICE'
	HEUCHERA AMERICANA 'PLUM PUDDING'
	HEUCHERA X 'OBSIDIAN'
	HEUCHERA X 'PEACH MELBA'
	HOSTA VARIOUS
	MUHLENBERGIA CAPILLARIS
	ONOCLEA SENSIBILIS
	OPHIOPOGON JAPONICUS 'BLACK'
	TIARELLA CORDIFOLIA 'BRANDYWINE'
	VIOLA SORORIA

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620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

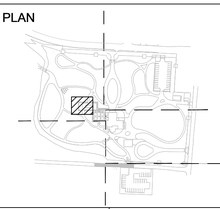
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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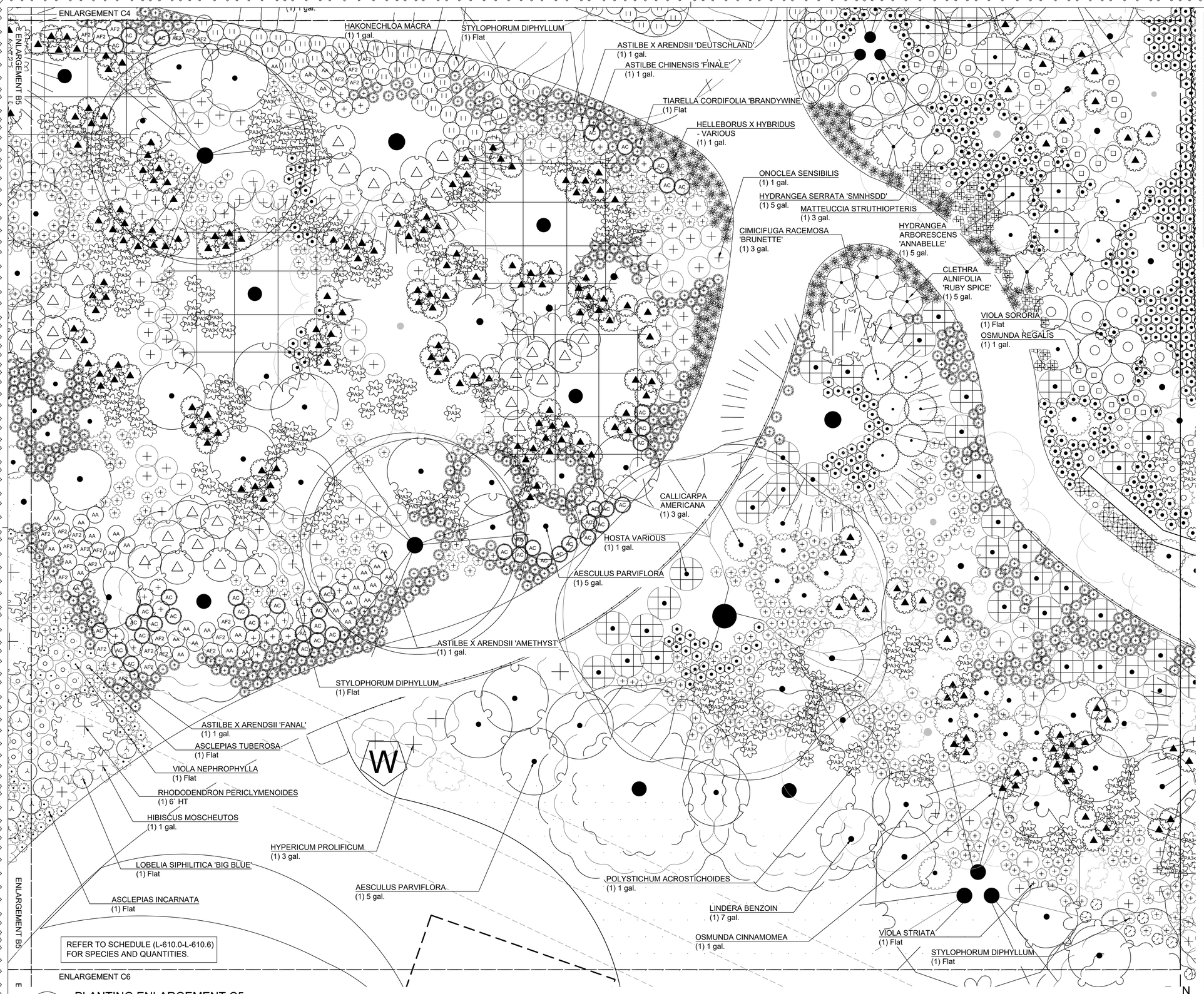
CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT C4

SHEET NUMBER

L-627



1 PLANTING ENLARGEMENT C5

1/4"=1'-0"

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

PLANT SCHEDULE C5

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	CALLICARPA AMERICANA
	CLETHRA ALNIFOLIA 'HUMMINGBIRD'
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HYDRANGEA ANOMALA PETIOLARIS
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN'
	HYDRANGEA SERRATA 'SMNHSDD'
	LINDERA BENZOIN
	RHODODENDRON PERICLYMENOIDES
	VIBURNUM PLICATUM TOMENTOSUM
	VIBURNUM X BURKWOODII 'DUVONE'
PERENNIALS	
AC	ASTILBE CHINENSIS 'FINALE'
AA	ASTILBE X ARENDSII 'AMETHYST'
	ASTILBE X ARENDSII 'DEUTSCHLAND'
AF2	ASTILBE X ARENDSII 'FANAL'
	BRUNNERA MACROPHYLLA 'JACK FROST'
	CAREX FLACCA 'BLUE ZINGER'
	CIMICIFUGA RACEMOSA
	CIMICIFUGA RACEMOSA 'BRUNETTE'
	DICENTRA SPECTABILIS
	DICENTRA SPECTABILIS 'ALBA'
	ECHINACEA PURPUREA 'MAGNUS'
	HAKONECHLOA MACRA
	HELLEBORUS X HYBRIDUS - VARIOUS
	HOSTA VARIOUS
	MATTEUCCIA STRUTHIOPTERIS
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	OSMUNDA REGALIS
PA3	POLYSTICHUM ACROSTICHOIDES
	STYLOPHORUM DIPHYLLUM
	TIARELLA CORDIFOLIA 'BRANDYWINE'
	VIOLA SORORIA
	VIOLA STRIATA

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PROJECT TITLE

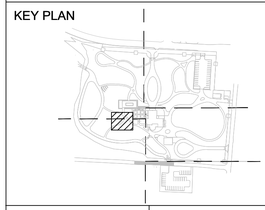
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
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2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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SHEET TITLE

PLANTING ENLARGEMENT C5

SHEET NUMBER

L-628

ENLARGEMENT C5

ENLARGEMENT B6

2

CEPHALANTHUS OCCIDENTALIS
(1) 5 gal.

HIBISCUS MOSCHEUTOS
(1) 1 gal.

ASCLEPIAS INCARNATA
(1) Flat

VIOLA NEPHROPHYLLA
(1) Flat

ASCLEPIAS SYRIACA
(1) Flat

LOBELIA SIPHILITICA 'BIG BLUE'
(1) Flat

RHODODENDRON PERICLYMENOIDES
(1) 6` HT

HYPERICUM PROLIFICUM
(1) 3 gal.

STYLOPHORUM DIPHYLLUM
(1) Flat

HIBISCUS MOSCHEUTOS
(1) 1 gal.

LIATRIS LIGULISTYLIS
(1) Flat

IRIS VERSICOLOR
(1) Flat

PHYSOCARPUS OPULIFOLIUS
(1) 5` Ht.

RHUS AROMATICA
(1) 3 gal.

1 PLANTING ENLARGEMENT C6
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND

- BUILDING ACCESS
- BUILDING FOOTPRINT
- PROPERTY LINE
- MATCH LINE
- EXISTING TREE
- VARIOUS BULBS
- VARIOUS ANNUALS
- RIPARIAN SEED MIX
- PLATYCODON GRANDIFLORUS
- TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE C6

SYMBOL	BOTANICAL NAME
SHRUBS	
	CEPHALANTHUS OCCIDENTALIS
	HYPERICUM PROLIFICUM
	PHYSOCARPUS OPULIFOLIUS
	RHODODENDRON PERICLYMENOIDES
	RHUS AROMATICA
PERENNIALS	
	ASCLEPIAS INCARNATA
	ASCLEPIAS SYRIACA
	ASCLEPIAS TUBEROSA
	HIBISCUS MOSCHEUTOS
	IRIS VERSICOLOR
	LIATRIS LIGULISTYLIS
	LOBELIA SIPHILITICA 'BIG BLUE'
	RUDBECKIA FULGIDA
	VIOLA NEPHROPHYLLA
	VIOLA STRIATA

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ACENTECH
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PROJECT TITLE

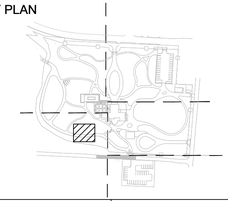
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

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REGISTERED LANDSCAPE ARCHITECT
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License Number 712062
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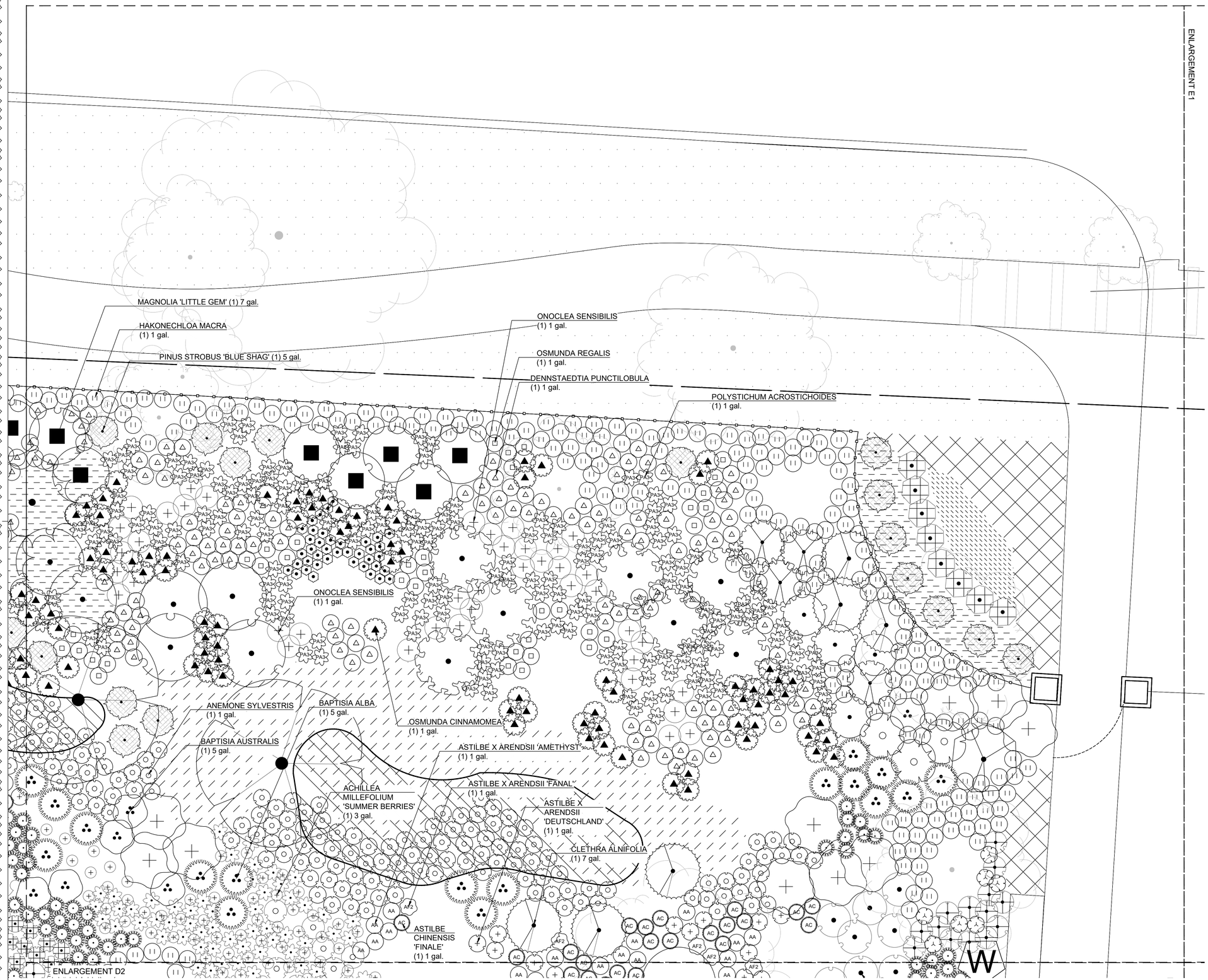
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SHEET TITLE

PLANTING ENLARGEMENT C6

SHEET NUMBER

L-629



1 PLANTING ENLARGEMENT D1

1/4"=1'-0"

0 1' 4' 8'

1/4" = 1'-0"

N

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE D1

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	BUDDLEJA DAVIDII 'KALEIDOSCOPE'
	BUDDLEJA DAVIDII 'NANHO BLUE'
	BUDDLEJA DAVIDII 'PINK CASCADE II'
	CALLICARPA AMERICANA
	CLETHRA ALNIFOLIA 'COMPACTA'
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN'
	HYDRANGEA SERRATA 'SMNHSDD'
	ITEA VIRGINICA 'HENRY'S GARNET'
	MAGNOLIA GRANDIFLORA 'LITTLE GEM'
	PINUS STROBUS 'BLUE SHAG'
	RHODODENDRON LUTEUM
PERENNIALS	
	ANEMONE SYLVESTRIS
AC	ASTILBE CHINENSIS 'FINALE'
AA	ASTILBE X ARENDSII 'AMETHYST'
	ASTILBE X ARENDSII 'DEUTSCHLAND'
AF2	ASTILBE X ARENDSII 'FANAL'
	BAPTISIA ALBA
	BAPTISIA AUSTRALIS
	CALLIRHOE INVOLUCRATA
	DENNSTAEDTIA PUNCTILOBULA
	GERANIUM X 'ROZANNE'
	GEUM X 'TEQUILA SUNRISE'
	HAKONECHLOA MACRA
	NEPETA X 'WALKER'S LOW'
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	OSMUNDA REGALIS
	POLYSTICHUM ACROSTICHOIDES

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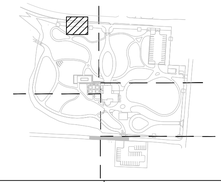
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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SHEET TITLE

PLANTING ENLARGEMENT D1

SHEET NUMBER

L-630

ENLARGEMENT D1

ENLARGEMENT E2

ENLARGEMENT D3

HAKONECHLOA MACRA
(1) 1 gal.

GERANIUM SANGUINEUM 'SHEPHERD'S WARNING'
(1) 1 gal.

TROPAEOLUM MAJUS 'KALEIDOSCOPE'
(1) Quart

NEPETA X 'WALKER'S LOW'
(1) 1 gal.

ASTILBE X ARENDSII 'AMETHYST'
(1) 1 gal.

ASTILBE CHINENSIS 'FINALE'
(1) 1 gal.

ASTILBE X ARENDSII 'FANAL'
(1) 1 gal.

ITEA VIRGINICA 'HENRY'S GARNET'
(1) 5 gal.

SAMBUCUS NIGRA 'BLACK LACE'
(1) 3 gal.

GERANIUM X CANTABRIGIENSE 'BIOKOVO'
(1) 1 gal.

VIBURNUM PLICATUM TOMENTOSUM
(1) 7 gal.

SAMBUCUS NIGRA 'BLACK LACE'
(1) 3 gal.

VIBURNUM X BURKWOODII 'DUVONE'
(1) 7 gal.

HAKONECHLOA MACRA
(1) 1 gal.

VIBURNUM CARLESII
(1) 7 gal.

HAMAMELIS VERNALIS
(1) 7 gal.

1 PLANTING ENLARGEMENT D2
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE D2

SYMBOL	BOTANICAL NAME
SHRUBS	
	HAMAMELIS VERNALIS
	ITEA VIRGINICA 'HENRY'S GARNET'
	SAMBUCUS NIGRA 'BLACK LACE'
	VIBURNUM CARLESII
	VIBURNUM X BURKWOODII 'DUVONE'
PERENNIALS	
	ACHILLEA MILLEFOLIUM 'SUMMER BERRIES'
AF	ASTILBE CHINENSIS 'FINALE'
AA	ASTILBE X ARENDSII 'AMETHYST'
	ASTILBE X ARENDSII 'DEUTSCHLAND'
AF2	ASTILBE X ARENDSII 'FANAL'
	ECHINACEA X 'CHEYENNE SPIRIT'
	GERANIUM LANCASTRENSE
	GERANIUM SANGUINEUM 'SHEPHERD'S WARNING'
	GERANIUM X 'ROZANNE'
	GERANIUM X CANTABRIGIENSE 'BIOKOVO'
	HAKONECHLOA MACRA
	NEPETA X 'WALKER'S LOW'
	TROPAEOLUM MAJUS 'KALEIDOSCOPE'

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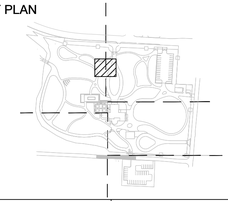
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

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KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

DRAWN BY

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SHEET TITLE

PLANTING ENLARGEMENT D2

SHEET NUMBER

L-631

ENLARGEMENT D2

2

AMSONIA X 'STARSTRUCK'
(1) 1 gal.

AMSONIA HUBRICHTII
(1) 3 gal.

AMSONIA X 'BLUE ICE'
(1) 1 gal.

ITEA VIRGINICA 'HENRY'S GARNET'
(1) 5 gal.

HYDRANGEA PANICULATA
(1) 5 gal.

ENLARGEMENT D4

1 PLANTING ENLARGEMENT D3
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT_SCHEDULE_D3	
SYMBOL	BOTANICAL NAME
SHRUBS	
	FOTHERGILLA GARDENII
	VIBURNUM CARLESII
	ITEA VIRGINICA 'HENRY'S GARNET'
	HYDRANGEA PANICULATA
PERENNIALS	
	AMSONIA X 'BLUE ICE'
	AMSONIA X 'STARSTRUCK'
	AMSONIA HUBRICHTII

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LITTLE ROCK, AR 72201
(501) 374 5300

CONSULTANTS

CIVIL ENGINEERS
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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

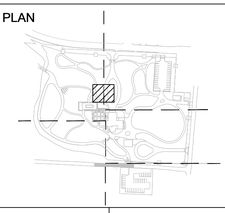
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
	2 ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

DRAWN BY

CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT D3

SHEET NUMBER

L-632

ENLARGEMENT D3

2

MUHLENBERGIA CAPILLARIS
(1) 1 gal.

HYDRANGEA PANICULATA
(1) 5 gal.

TULIPA X 'QUEEN OF THE NIGHT'
(1) Bulb

HEUCHERA X 'OBSIDIAN'
(1) 1 gal.

OPHIOPOGON JAPONICUS 'BLACK'
(1) 1 gal.

MUHLENBERGIA CAPILLARIS
(1) 1 gal.

IRIS X 'BEAR'S EARS'
(1) Bulb

HYDRANGEA ANOMALA PETIOLARIS
(1) 7 gal.

PINUS STROBUS 'BLUE SHAG'
(1) 3` Ht.

HYDRANGEA PANICULATA 'ILVOBO'
(1) 5 gal.

CAREX FLACCA 'BLUE ZINGER'
(1) Flat

CLETHRA ALNIFOLIA 'COMPACTA'
(1) 3 gal.

AMSONIA X 'BLUE ICE'
(1) 1 gal.

TIARELLA CORDIFOLIA 'BRANDYWINE'
(1) Flat

AMSONIA X 'BLUE ICE'
(1) 1 gal.

WEIGELA FLORIDA 'BOKRASOPIN'
(1) 5 gal.

HYDRANGEA SERRATA 'SMNHSI'
(1) 5 gal.

VIBURNUM CARLESII
(1) 7 gal.

ILEX CRENATA 'DWARF PAGODA'
(1) 5 gal.

ARTEMISIA X 'SILVERMOUND'
(1) 1 gal.

NEPETA X 'LITTLE TRUDY'
(1) 1 gal.

ECHINACEA PURPUREA 'MAGNUS'
(1) Flat

LILIUM X 'BLACK BEAUTY'
(1) Bulb

CAREX FLACCA 'BLUE ZINGER'
(1) Flat

HYD
(1) 5

PINU
(1) 3`

ENLARGEMENT E3

ENLARGEMENT D5

1 PLANTING ENLARGEMENT D4
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT_SCHEDULE_D4

SYMBOL	BOTANICAL NAME
SHRUBS	
	ABELIA X GRANDIFLORA 'KALEIDOSCOPE'
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HYDRANGEA PANICULATA 'SMHPLQF'
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN'
	ITEA VIRGINICA 'HENRY'S GARNET'
	PINUS STROBUS 'BLUE SHAG'
	VIBURNUM CARLESII
PERENNIALS	
	AMSONIA X 'BLUE ICE'
	CAREX CHEROKEENSIS
	NEPETA X 'WALKER'S LOW'
	TIARELLA CORDIFOLIA 'BRANDYWINE'

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620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

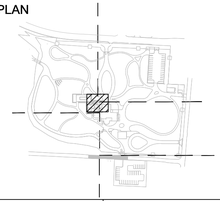
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
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2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

DRAWN BY

CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT D4

SHEET NUMBER

L-633

ENLARGEMENT D4

ENLARGEMENT E4

2

HYDRANGEA PANICULATA 'PHANTOM'
(1) 5` Ht.

ASTILBE CHINENSIS 'FINALE'
(1) 1 gal.

ASTILBE X ARENDSII 'AMETHYST'
(1) 1 gal.

HEUCHERA AMERICANA 'PLUM PUDDING'
(1) 1 gal.

ABELIA X GRANDIFLORA 'KALEIDOSCOPE'
(1) 3 gal.

HOSTA VARIOUS
(1) 1 gal.

HYDRANGEA MACROPHYLLA 'BAILMER'
(1) 5 gal.

HELLEBORUS X HYBRIDUS - VARIOUS
(1) 1 gal.

BRUNNERA MACROPHYLLA 'JACK FROST'
(1) 1 gal.

POLYSTICHUM ACROSTICHOIDES
(1) 1 gal.

OSMUNDA REGALIS
(1) 1 gal.

HEUCHERA X 'PEACH MELBA'
(1) 1 gal.

HEUCHERA AMERICANA 'GREEN SPICE'
(1) 1 gal.

BRUNNERA MACROPHYLLA 'JACK FROST'
(1) 1 gal.

VIBURNUM CARLESII
(1) 7 gal.

CLETHRA ALNIFOLIA 'COMPACTA'
(1) 3 gal.

VIOLA STRIATA
(1) Flat

HEUCHERA X 'OBSIDIAN'
(1) 1 gal.

OSMUNDA CINNAMOMEA
(1) 1 gal.

STYLOPHORUM DIPHYLLUM
(1) Flat

OSMUNDA CINNAMOMEA
(1) 1 gal.

CAREX FLACCA 'BLUE ZINGER'
(1) Flat

ENLARGEMENT D6

1 PLANTING ENLARGEMENT D5
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND

- BUILDING ACCESS
- BUILDING FOOTPRINT
- PROPERTY LINE
- MATCH LINE
- EXISTING TREE
- VARIOUS BULBS
- VARIOUS ANNUALS
- RIPARIAN SEED MIX
- PLATYCODON GRANDIFLORUS
- TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE D5

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	CALLICARPA AMERICANA
	HYDRANGEA PANICULATA 'PHANTOM'
	PINUS STROBUS 'BLUE SHAG'
	RHODODENDRON X 'GOLDEN LIGHTS'
	VIBURNUM CARLESII
PERENNIALS	
	BRUNNERA MACROPHYLLA 'JACK FROST'
	CAREX CHEROKEENSIS
	CAREX FLACCA 'BLUE ZINGER'
	CIMICIFUGA RACEMOSA
	DICENTRA SPECTABILIS
	DICENTRA SPECTABILIS 'ALBA'
	HEUCHERA AMERICANA 'GREEN SPICE'
	HEUCHERA AMERICANA 'PLUM PUDDING'
	HEUCHERA X 'OBSIDIAN'
	HEUCHERA X 'PEACH MELBA'
	HOSTA VARIOUS
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	OSMUNDA REGALIS
	POLYSTICHUM ACROSTICHOIDES
	STYLOPHORUM DIPHYLLUM
	VIOLA STRIATA

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620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

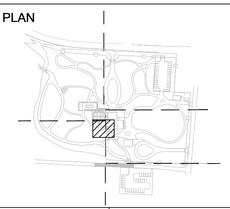
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
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	2 ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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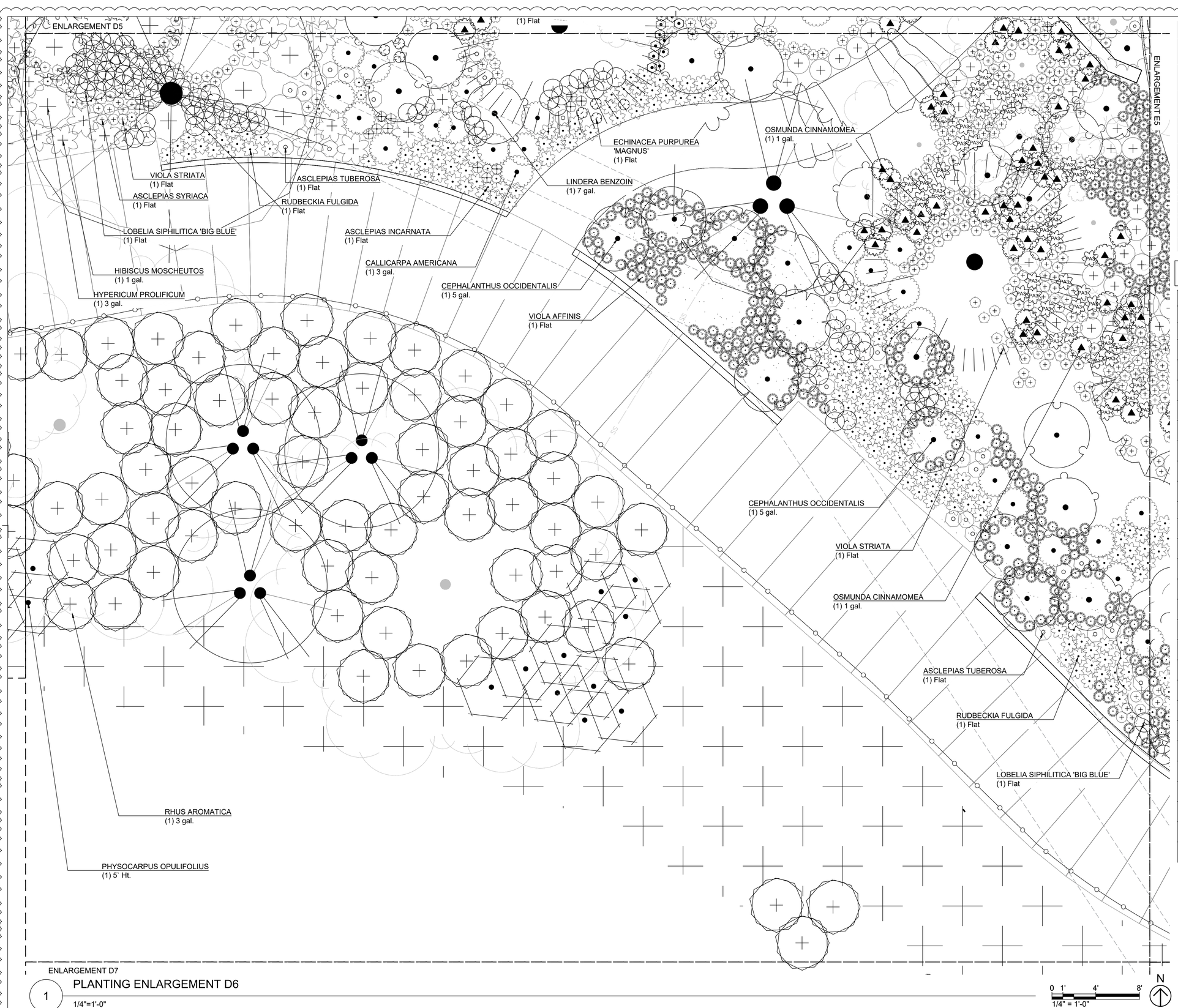
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SHEET TITLE

PLANTING ENLARGEMENT D5

SHEET NUMBER

L-634



1 PLANTING ENLARGEMENT D6

1/4"=1'-0"

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE D6

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	CALLICARPA AMERICANA
	CEPHALANTHUS OCCIDENTALIS
	HYPERICUM PROLIFICUM
	LINDERA BENZOIN
	PHYSOCARPUS OPULIFOLIUS
	RHODODENDRON PERICLYMENOIDES
	RHUS AROMATICA
PERENNIALS	
	ASCLEPIAS INCARNATA
	ASCLEPIAS SYRIACA
	ASCLEPIAS TUBEROSA
	CAREX FLACCA 'BLUE ZINGER'
	ECHINACEA PURPUREA 'MAGNUS'
	HIBISCUS MOSCHEUTOS
	LIATRIS LIGULISTYLIS
	LOBELIA SIPHILITICA 'BIG BLUE'
	MATTEUCCIA STRUTHIOPTERIS
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	POLYSTICHUM ACROSTICHOIDES
	RUDBECKIA FULGIDA
	STYLOPHORUM DIPHYLLUM
	TIARELLA CORDIFOLIA 'BRANDYWINE'
	VIOLA AFFINIS
	VIOLA STRIATA

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PLYMOUTH MEETING PA 19462
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PROJECT TITLE

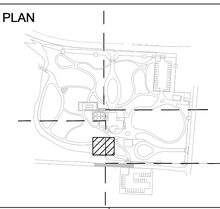
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



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ALEX HART
License Number 712062
STATE OF ARKANSAS

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SHEET TITLE

PLANTING ENLARGEMENT D6

SHEET NUMBER

L-635

ENLARGEMENT D6

2

ENLARGEMENT E6

RHUS AROMATICA
(1) 3 gal.

PHYSOCARPUS OPULIFOLIUS
(1) 5` Ht.

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE D7

SYMBOL	BOTANICAL NAME
SHRUBS	
	PHYSOCARPUS OPULIFOLIUS
	RHUS AROMATICA

1 PLANTING ENLARGEMENT D7
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

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ACOUSTICAL ENGINEERS
ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

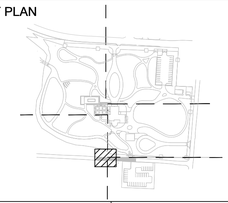
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



SIGN & SEAL

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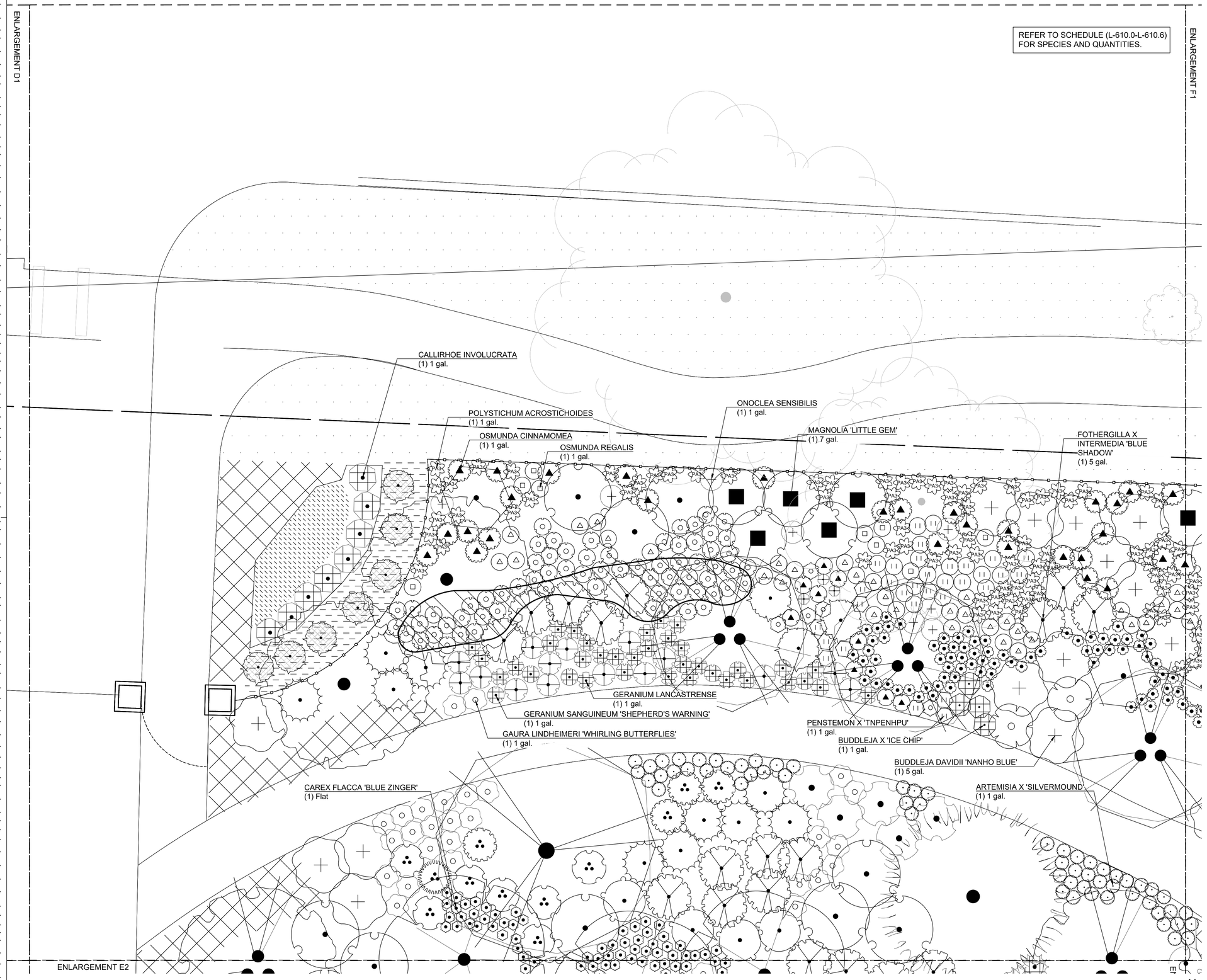
CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT D7

SHEET NUMBER

L-636



1 PLANTING ENLARGEMENT E1

1/4"=1'-0"

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

PLANT SCHEDULE E1

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	BUDDLEJA DAVIDII 'NANHO BLUE'
	BUDDLEJA DAVIDII 'PINK CASCADE II'
	BUDDLEJA X 'ICE CHIP'
	FOTHERGILLA GARDENII
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HALESIA DIPTERA
	HYDRANGEA PANICULATA 'ILVOBO'
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN'
	MAGNOLIA GRANDIFLORA 'LITTLE GEM'
	PHYSOCARPUS OPULIFOLIUS
	PINUS STROBUS 'BLUE SHAG'
	VIBURNUM X BURKWOODII 'DUVONE'
PERENNIALS	
	ANEMONE SYLVESTRIS
	ARTEMISIA X 'SILVERMOUND'
	BAPTISIA ALBA
	BAPTISIA X 'CHERRIES JUBILEE'
	BAPTISIA X 'LEMON MERINGUE'
	CALLIRHOE INVOLUCRATA
	CAREX FLACCA 'BLUE ZINGER'
	DENNSTAEDTIA PUNCTILOBULA
	GAURA LINDHEIMERI 'WHIRLING BUTTERFLIES'
	GERANIUM SANGUINEUM 'SHEPHERD'S WARNING'
	GERANIUM X 'ROZANNE'
	HAKONECHLOA MACRA
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	OSMUNDA REGALIS
	PENSTEMON DIGITALIS
	PENSTEMON DIGITALIS 'TNPENDB'
	PENSTEMON X 'CHERRY SPARKS'
	PENSTEMON X 'TNPENHPU'
	POLYSTICHUM ACROSTICHOIDES
	VIOLA SORORIA

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PROJECT TITLE

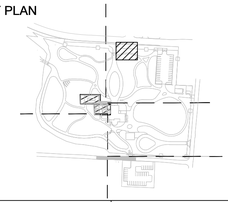
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

DRAWN BY

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SHEET TITLE

PLANTING ENLARGEMENT E1

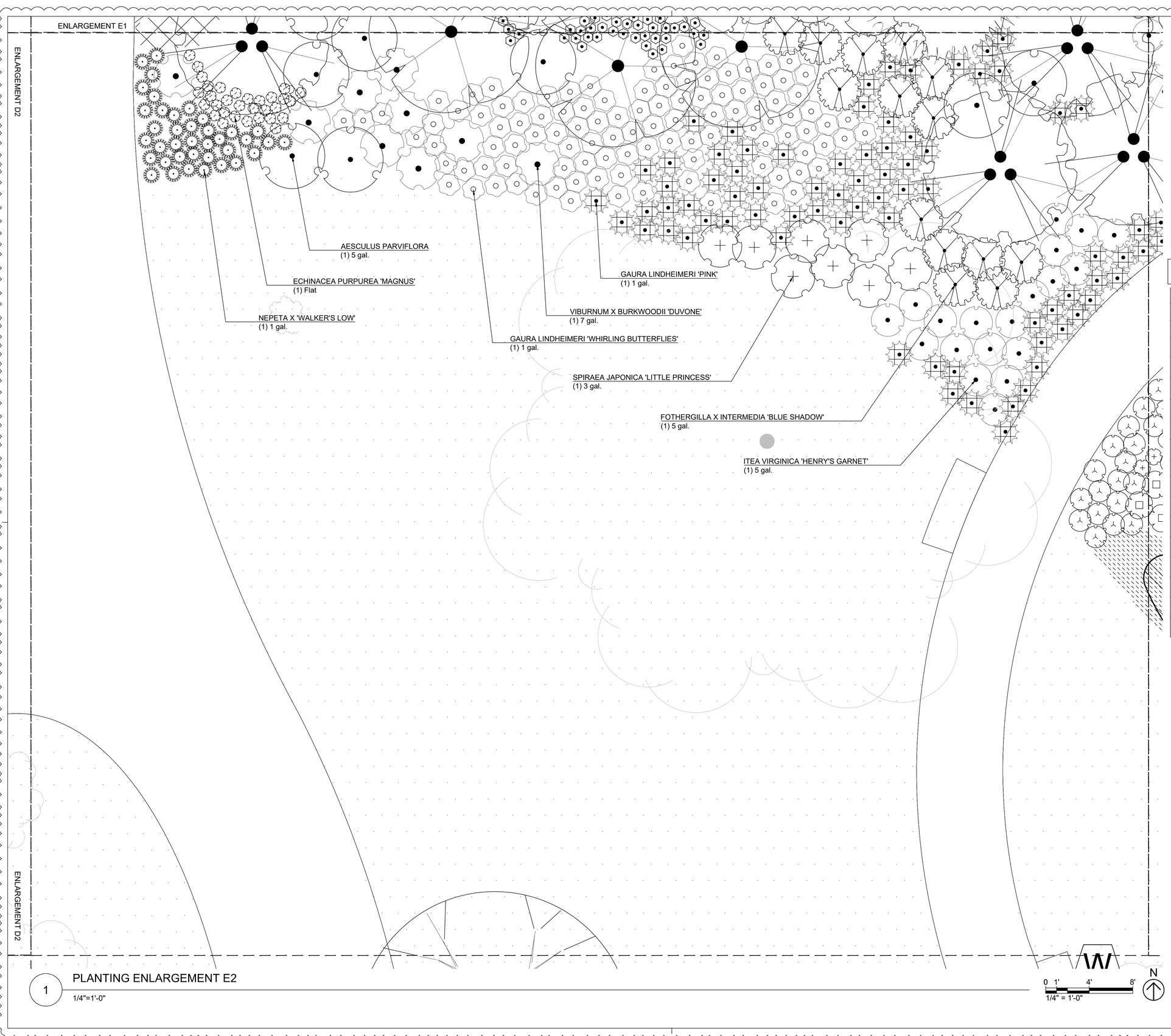
SHEET NUMBER

L-637

ENLARGEMENT E1

ENLARGEMENT D2

2



ENLARGEMENT D2

1 PLANTING ENLARGEMENT E2

1/4"=1'-0"

0 1' 4' 8'

1/4" = 1'-0"

N

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE E2

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HALESIA DIPTERA
	ITEA VIRGINICA 'HENRY'S GARNET'
	SPIRAEA JAPONICA 'LITTLE PRINCESS'
	VIBURNUM X BURKWOODII 'DUVONE'
PERENNIALS	
	AMSONIA HUBRICHTII
	CAREX FLACCA 'BLUE ZINGER'
	CARYOPTERIS INCANA 'PAVILION PINK'
	ECHINACEA PURPUREA 'MAGNUS'
	GAURA LINDHEIMERI 'PINK'
	GAURA LINDHEIMERI 'WHIRLING BUTTERFLIES'
	NEPETA X 'WALKER'S LOW'
	VERBENA BONARIENSIS

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STRUCTURAL ENGINEERS
ENFRA TME, LLC
BUILDING 2, 1 ALLIED DRIVE, STE 2600
LITTLE ROCK, AR 72202
(501) 666 6776

FOOD SERVICE CONSULTANT
MCKAY-LANE CONSULTING, LTD
1807 DODSON AVE
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(479) 629 4572

ACOUSTICAL ENGINEERS
ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

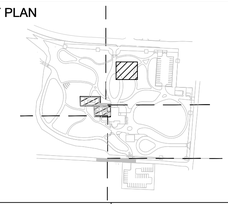
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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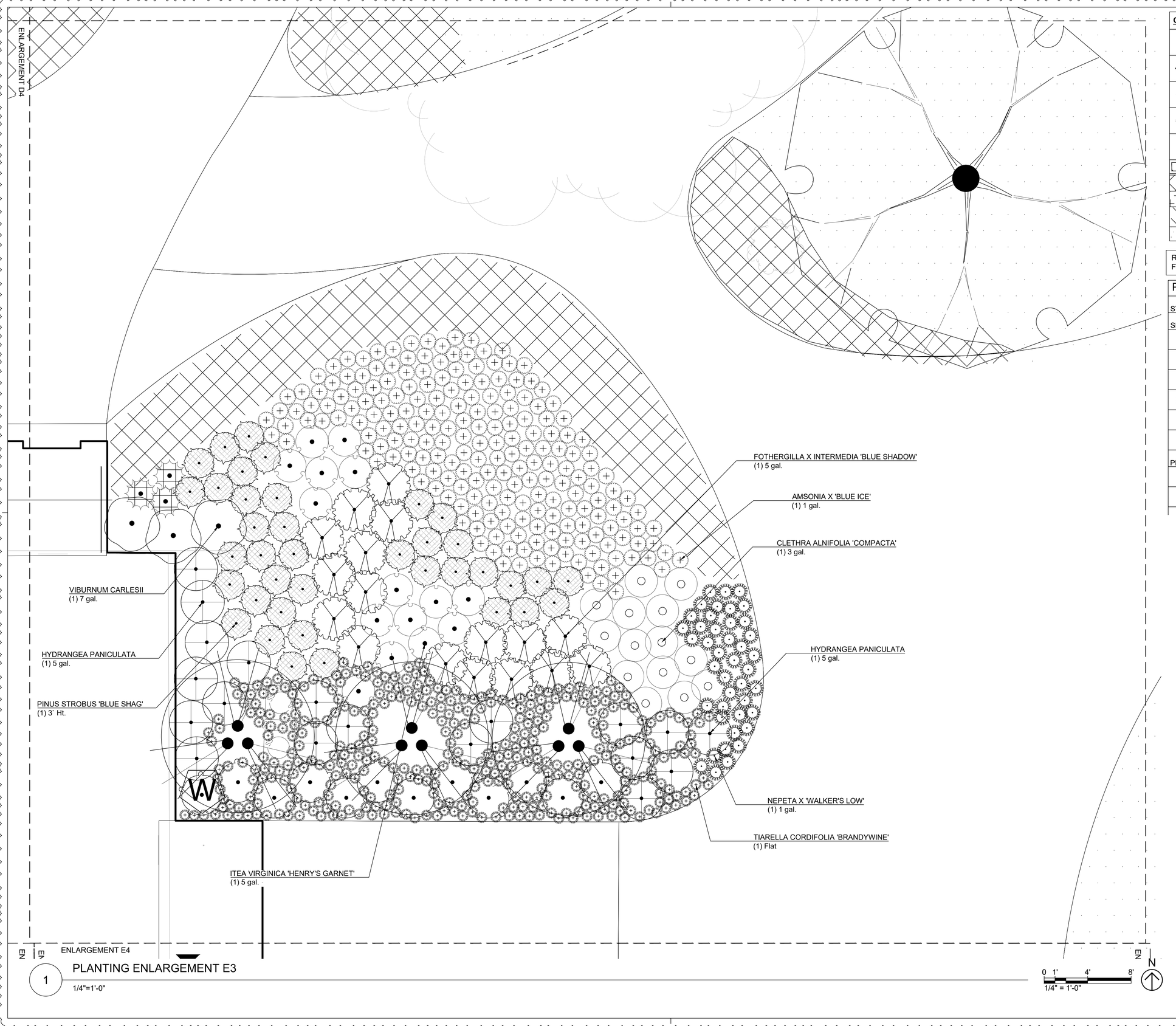
CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT E2

SHEET NUMBER

L-638



GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT_SCHEDULE_E3

SYMBOL	BOTANICAL NAME
SHRUBS	
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	CLETHRA ALNIFOLIA 'COMPAC
	PINUS STROBUS 'BLUE SHAG'
	ITEA VIRGINICA 'HENRY'S GAR
	VIBURNUM CARLESII
	HYDRANGEA PANICULATA
PERENNIALS	
	AMSONIA X 'BLUE ICE'
	TIARELLA CORDIFOLIA 'BRANDYWINE'

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(501) 374 5300

CONSULTANTS

CIVIL ENGINEERS
CRAFTON TULL & ASSOCIATES, INC.
901 N. 47TH STREET, SUITE 400
ROGERS, AR 72756
(479) 636 4838

MEP ENGINEERS
INSIGHT ENGINEERING
322 S STATE STREET, STE 201
LITTLE ROCK, AR 72201
(501) 237 3077

STRUCTURAL ENGINEERS
ENFRA TME, LLC
BUILDING 2, 1 ALLIED DRIVE, STE 2600
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MCKAY-LANE CONSULTING, LTD
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FT. SMITH, AR 72901
(479) 629 4572

ACOUSTICAL ENGINEERS
ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

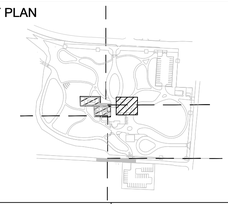
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
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2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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SHEET TITLE

PLANTING ENLARGEMENT E3

SHEET NUMBER

L-639

ENLARGEMENT E3

ENLARGEMENT D5

2

NEPETA X 'WALKER'S LOW'
(1) 1 gal.

MUHLENBERGIA CAPILLARIS
(1) 1 gal.

RHODODENDRON LUTEUM
(1) 7 gal.

PINUS STROBUS 'BLUE SHAG'
(1) 3` Ht.

NEPETA X 'WALKER'S LOW'
(1) 1 gal.

ITEA VIRGINICA 'HENRY'S GARNET'
(1) 5 gal.

AMSONIA X 'BLUE ICE'
(1) 1 gal.

VIBURNUM CARLESII
(1) 7 gal.

HYDRANGEA SERRATA 'SMNHSI'
(1) 5 gal.

PRUNUS LAUROCERASUS 'SCHIPKAENSIS'
(1) 7 gal.

VIBURNUM PLICATUM TOMENTOSUM
(1) 7 gal.

ONOCLEA SENSIBILIS
(1) 1 gal.

POLYSTICHUM ACROSTICHOIDES
(1) 1 gal.

PHYSOCARPUS OPULIFOLIUS
(1) 5` Ht.

VIOLA STRIATA
(1) Flat

ENLARGEMENT E5

ENLARGEMENT F4

E1

PLANTING ENLARGEMENT E4

1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE E4

SYMBOL	BOTANICAL NAME
SHRUBS	
	CALLICARPA AMERICANA
	ITEA VIRGINICA 'HENRY'S GARNET'
	MAGNOLIA GRANDIFLORA 'LITTLE GEM'
	PHYSOCARPUS OPULIFOLIUS
	PINUS STROBUS 'BLUE SHAG'
	RHODODENDRON LUTEUM
	VIBURNUM CARLESII
	VIBURNUM PLICATUM TOMENTOSUM
PERENNIALS	
	AMSONIA X 'BLUE ICE'
	HEUCHERA AMERICANA 'GREEN SPICE'
	MUHLENBERGIA CAPILLARIS
	NEPETA X 'WALKER'S LOW'
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
PA3	POLYSTICHUM ACROSTICHOIDES

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CONSULTANTS

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CRAFTON TULL & ASSOCIATES, INC.
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INSIGHT ENGINEERING
322 S STATE STREET, STE 201
LITTLE ROCK, AR 72201
(501) 237 3077

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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

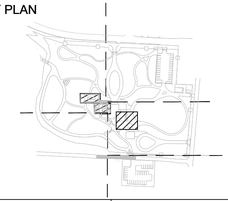
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
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License Number 712062
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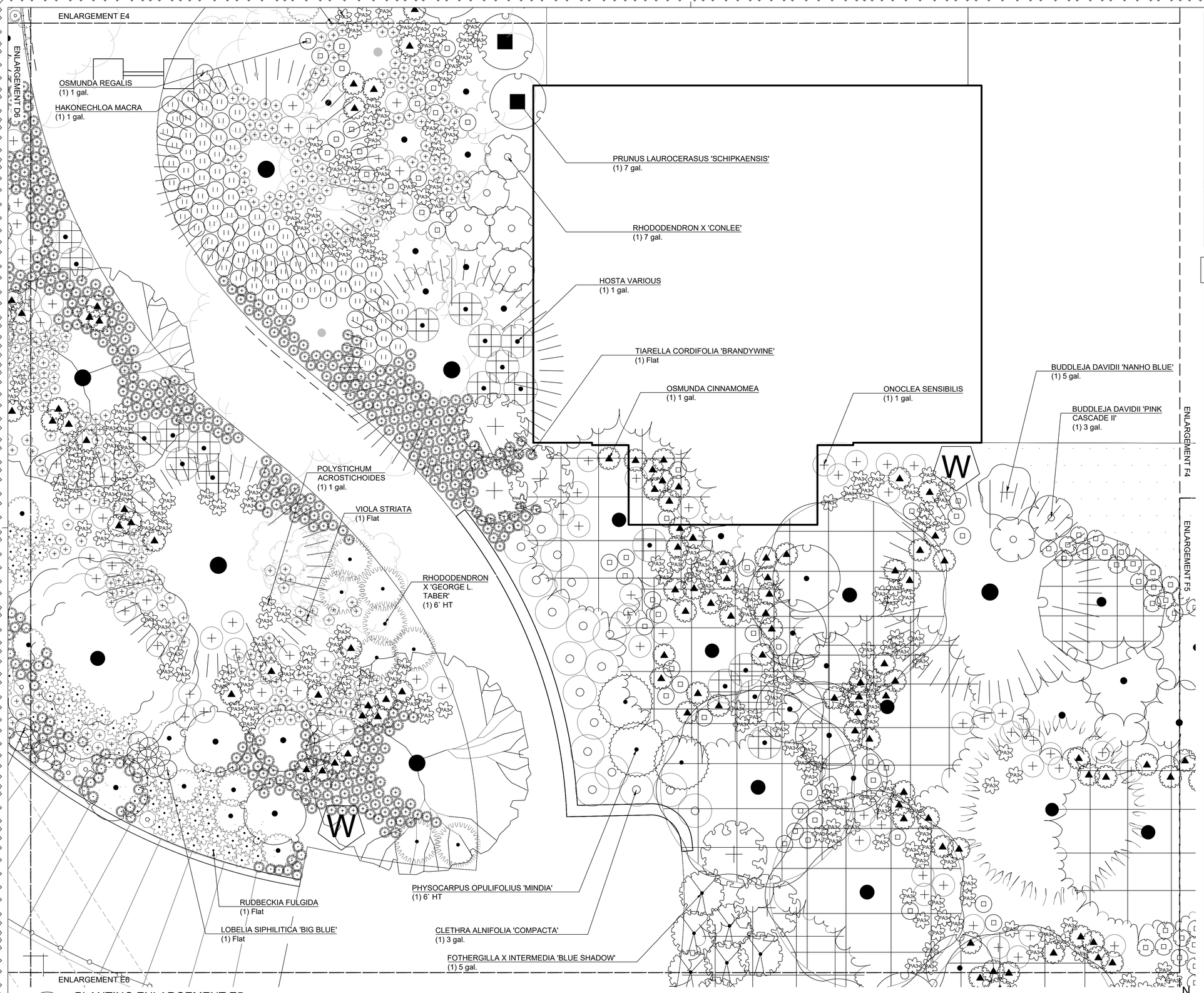
CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT E4

SHEET NUMBER

L-640



1 PLANTING ENLARGEMENT E5

1/4"=1'-0"

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE E5

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	BUDDLEJA DAVIDII 'NANHO BLUE'
	BUDDLEJA DAVIDII 'PINK CASCADE II'
	CALLICARPA AMERICANA
	CEPHALANTHUS OCCIDENTALIS
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HYDRANGEA SERRATA 'SMNHSDD'
	LINDERA BENZOIN
	MAGNOLIA GRANDIFLORA 'LITTLE GEM'
	PHYSOCARPUS OPULIFOLIUS 'MINDIA'
	RHODODENDRON PERICLYMENOIDES
	RHODODENDRON X 'CONLEE'
	RHODODENDRON X 'GEORGE L. TABER'
PERENNIALS	
	ASCLEPIAS INCARNATA
	ASCLEPIAS SYRIACA
	ASCLEPIAS TUBEROSA
	CAREX CHEROKEENSIS
	HAKONECHLOA MACRA
	HOSTA VARIOUS
	LOBELIA SIPHILITICA 'BIG BLUE'
	MATTEUCCIA STRUTHIOPTERIS
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	OSMUNDA REGALIS
	POLYSTICHUM ACROSTICHOIDES
	RUDBECKIA FULGIDA
	STYLOPHORUM DIPHYLLUM
	TIARELLA CORDIFOLIA 'BRANDYWINE'
	VIOLA AFFINIS
	VIOLA STRIATA

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CONSULTANTS

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INSIGHT ENGINEERING
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(501) 237 3077

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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

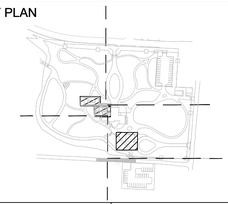
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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SHEET TITLE

PLANTING ENLARGEMENT E5

SHEET NUMBER

L-641

ENLARGEMENT E5

ENLARGEMENT D7

2

FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
(1) 5 gal.

FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
(1) 5 gal.

PHYSOCARPUS OPULIFOLIUS
(1) 5` Ht.

RHUS AROMATICA
(1) 3 gal.

RHODODENDRON PERICLYMENOIDES
(1) 6` HT

ONOCLEA SENSIBILIS
(1) 1 gal.

OSMUNDA CINNAMOMEA
(1) 1 gal.

MATTEUCCIA STRUTHIOPTERIS
(1) 3 gal.

POLYSTICHUM ACROSTICHOIDES
(1) 1 gal.

PRUNUS LAUROCERASUS 'OTTO LUYKEN'
(1) 5 gal.

MUHLENBERGIA CAPILLARIS
(1) 1 gal.

ENLARGEMENT F5

ENLARGEMENT F6

ENLARGEMENT E7

1 PLANTING ENLARGEMENT E6
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE E6

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HYDRANGEA SERRATA 'SMNHSDD'
	PHYSOCARPUS OPULIFOLIUS
	RHODODENDRON PERICLYMENOIDES
	RHUS AROMATICA
PERENNIALS	
	MATTEUCCIA STRUTHIOPTERIS
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
PA3	POLYSTICHUM ACROSTICHOIDES

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CONSULTANTS

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901 N. 47TH STREET, SUITE 400
ROGERS, AR 72756
(479) 636 4838

MEP ENGINEERS
INSIGHT ENGINEERING
322 S STATE STREET, STE 201
LITTLE ROCK, AR 72201
(501) 237 3077

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(479) 629 4572

ACOUSTICAL ENGINEERS
ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

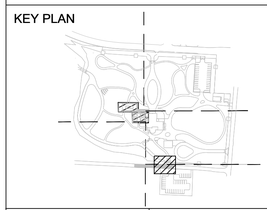
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

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ALEX HART
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SHEET TITLE

PLANTING ENLARGEMENT E6

SHEET NUMBER

L-642

ENLARGEMENT E6

2

ENLARGEMENT F6

ENLARGEMENT F7

MUHLENBERGIA CAPILLARIS
(1) 1 gal.

PRUNUS LAUROCERASUS 'OTTO LUYKEN'
(1) 5 gal.

VIBURNUM PRUNIFOLIUM
(1) 7 gal.

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE E7

SYMBOL	BOTANICAL NAME
SHRUBS	
	PINUS STROBUS 'BLUE SHAG'
	VIBURNUM PRUNIFOLIUM
PERENNIALS	
	MUHLENBERGIA CAPILLARIS

1 PLANTING ENLARGEMENT E7
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

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901 N. 47TH STREET, SUITE 400
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INSIGHT ENGINEERING
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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

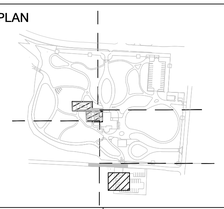
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

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KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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SHEET TITLE

PLANTING ENLARGEMENT E7

SHEET NUMBER

L-643

ENLARGEMENT E1

ENLARGEMENT F1

ENLARGEMENT G1

2

OSMUNDA CINNAMOMEA
(1) 1 gal.

OSMUNDA REGALIS
(1) 1 gal.

MAGNOLIA 'LITTLE GEM'(1) 7 gal.

POLYSTICHUM ACROSTICHOIDES
(1) 1 gal.

HAKONECHLOA MACRA
(1) 1 gal.

VIOLA AFFINIS
(1) Flat

BUDDLEJA DAVIDII 'NANHO BLUE'
(1) 5 gal.

ONOCLEA SENSIBILIS
(1) 1 gal.

WISTERIA FRUTESCENS 'AMETHYST FALLS'
(1) 15 gal.

HYDRANGEA ANOMALA PETIOLARIS
(1) 7 gal.

TROPAEOLUM MAJUS 'KALEIDOSCOPE'
(1) Quart

PINUS STROBUS 'BLUE SHAG'
(1) 3` Ht.

GAURA LINDHEIMERI 'WHIRLING BUTTERFLIES'
(1) 1 gal.

1 PLANTING ENLARGEMENT F1
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE F1

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	BUDDLEJA DAVIDII 'NANHO BLUE'
	FOTHERGILLA X INTERMEDIA 'BLUE SHADOW'
	HYDRANGEA PANICULATA 'ILVOBO'
	HYDRANGEA PANICULATA 'SMHPLQF'
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN'
	HYDRANGEA SERRATA 'SMNHSDD'
	ILEX GLABRA 'COMPACTA'
	LINDERA BENZOIN
	MAGNOLIA GRANDIFLORA 'LITTLE GEM'
	PHYSOCARPUS OPULIFOLIUS
	PINUS STROBUS 'BLUE SHAG'
	SPIRAEA JAPONICA 'LITTLE PRINCESS'
	VIBURNUM PLICATUM TOMENTOSUM
PERENNIALS	
	AMSONIA HUBRICHTII
	ARTEMISIA X 'SILVERMOUND'
	CAMPANULA PERSICIFOLIA
	DENNSTAEDTIA PUNCTILOBULA
	GAURA LINDHEIMERI 'WHIRLING BUTTERFLIES'
	HAKONECHLOA MACRA
	HELIOPSIS HELIANTHOIDES SCABRA 'BLEEDING HEARTS'
	HEUCHERA AMERICANA 'PLUM PUDDING'
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	OSMUNDA REGALIS
	PAEONIA X 'SMITHOPUS8'
	PENSTEMON X 'TNPENHPU'
PA3	POLYSTICHUM ACROSTICHOIDES
	TROPAEOLUM MAJUS 'KALEIDOSCOPE'
	VIOLA AFFINIS
	VIOLA SORORIA
VINES	
	WISTERIA FRUTESCENS 'AMETHYST FALLS'

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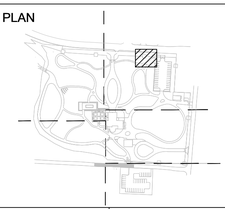
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BENTONVILLE, AR

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KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

DRAWN BY

CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT F1

SHEET NUMBER

L-644

ENLARGEMENT F1

2

ITEA VIRGINICA 'HENRY'S GARNET'
(1) 5 gal.

NEPETA X 'WALKER'S LOW'
(1) 1 gal.

GAURA LINDHEIMERI 'PINK'
(1) 1 gal.

PENSTEMON X 'CHERRY SPARKS'
(1) 1 gal.

CAMPANULA PERSICIFOLIA
(1) Flat

PENSTEMON DIGITALIS 'TNPENDB'
(1) 1 gal.

PENSTEMON X 'TNPENHPU'
(1) 1 gal.

VIBURNUM X BURKWOODII 'DUVONE'
(1) 7 gal.

BAPTISIA AUSTRALIS
(1) 5 gal.

SPIRAEA JAPONICA 'LITTLE PRINCESS'
(1) 3 gal.

ASTILBE X ARENDSII 'AMETHYST'
(1) 1 gal.

ASTILBE X ARENDSII 'DEUTSCHLAND'
(1) 1 gal.

ASTILBE X ARENDSII 'FANAL'
(1) 1 gal.

CAMPANULA PERSICIFOLIA
(1) Flat

ILEX GLABRA 'COMPACTA'
(1) 5 gal.

PINUS STROBUS 'BLUE SHAG' (1) 5 gal.

ASTILBE X ARENDSII 'DEUTSCHLAND'
(1) 1 gal.

ASCLEPIAS TUBEROSA
(1) Flat

SCHIZACHYRIUM SCOPARIUM 'STANDING OVATION'
(1) Flat

ASCLEPIAS TUBEROSA
(1) Flat

NEPETA X 'WALKER'S LOW'
(1) 1 gal.

ENLARGEMENT F3

ENLARGEMENT G2

1 PLANTING ENLARGEMENT F2
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND

- BUILDING ACCESS
- BUILDING FOOTPRINT
- PROPERTY LINE
- MATCH LINE
- EXISTING TREE
- VARIOUS BULBS
- VARIOUS ANNUALS
- RIPARIAN SEED MIX
- PLATYCODON GRANDIFLORUS
- TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE F2

SYMBOL	BOTANICAL NAME
SHRUBS	
	BUDDLEJA DAVIDII 'NANHO BLUE'
	CALLICARPA AMERICANA
	HYDRANGEA SERRATA 'SMNHSDD'
	ILEX GLABRA 'COMPACTA'
	ITEA VIRGINICA 'HENRY'S GARNET'
	LINDERA BENZOIN
	PHYSOCARPUS OPULIFOLIUS
	PHYSOCARPUS OPULIFOLIUS 'MINDIA'
	PINUS STROBUS 'BLUE SHAG'
	SPIRAEA JAPONICA 'LITTLE PRINCESS'
	VIBURNUM PLICATUM TOMENTOSUM
	VIBURNUM X BURKWOODII 'DUVONE'
PERENNIALS	
	AMSONIA HUBRICHTII
	ASCLEPIAS TUBEROSA
AA	ASTILBE X ARENDSII 'AMETHYST'
	ASTILBE X ARENDSII 'DEUTSCHLAND'
AF2	ASTILBE X ARENDSII 'FANAL'
	BAPTISIA AUSTRALIS
	CAMPANULA PERSICIFOLIA
	CARYOPTERIS INCANA 'PAVILION BLUE'
	CARYOPTERIS INCANA 'PAVILION PINK'
	GAURA LINDHEIMERI 'PINK'
	HEUCHERA AMERICANA 'PLUM PUDDING'
	NEPETA X 'WALKER'S LOW'
	PENSTEMON DIGITALIS 'TNPENDB'
	PENSTEMON X 'CHERRY SPARKS'
	PENSTEMON X 'TNPENHPU'
	RUDBECKIA TRILOBA
	SCHIZACHYRIUM SCOPARIUM 'STANDING OVATION'
	VERBENA BONARIENSIS

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CONSULTANTS

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(479) 629 4572

ACOUSTICAL ENGINEERS
ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

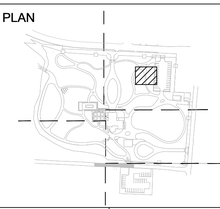
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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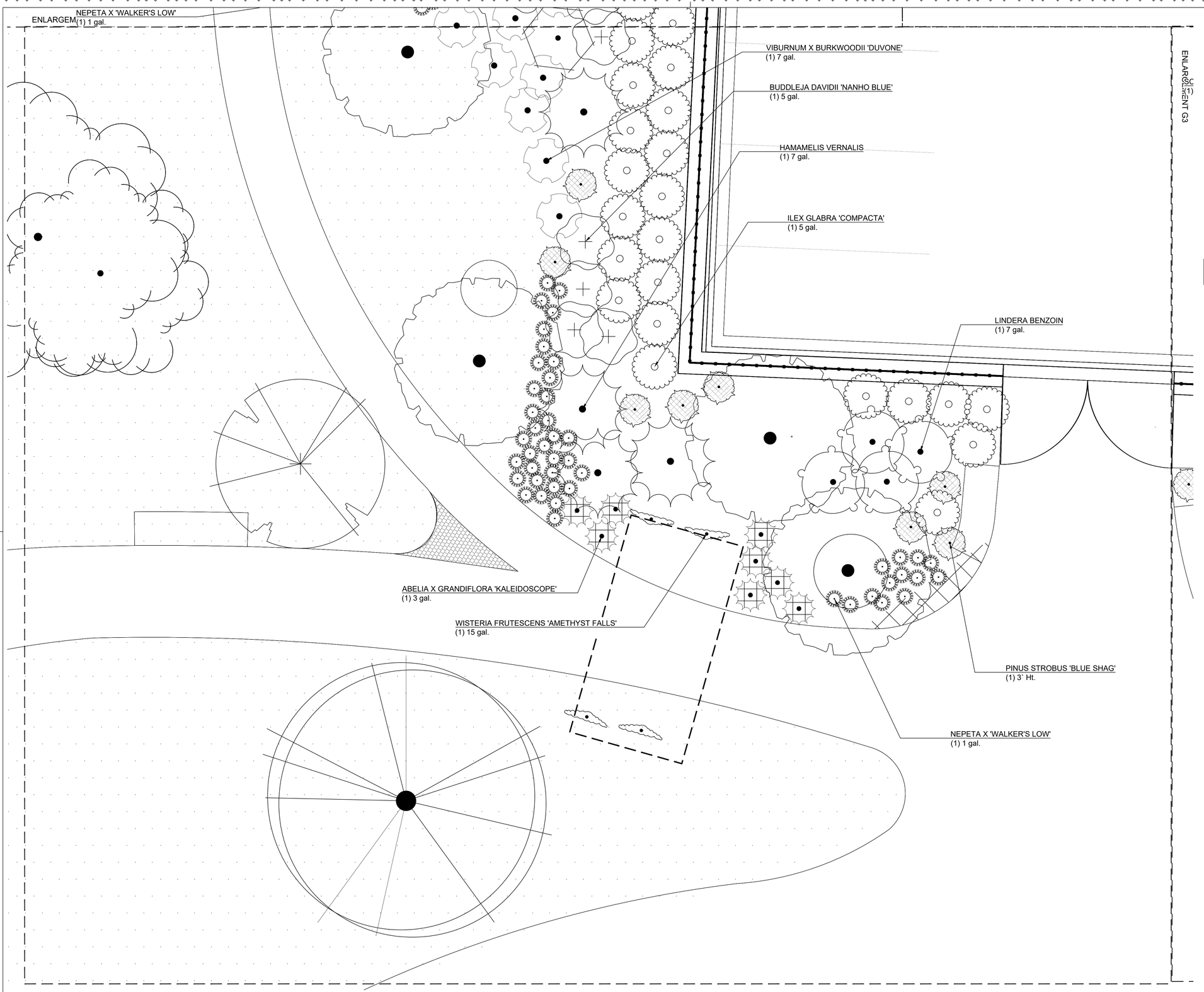
CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT F2

SHEET NUMBER

L-645



GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE F3	
SYMBOL	BOTANICAL NAME
SHRUBS	
	ABELIA X GRANDIFLORA 'KALEIDOSCOPE'
	BUDDLEJA DAVIDII 'NANHO BLUE'
	HYDRANGEA SERRATA 'SMNHSDD'
	ILEX GLABRA 'COMPACTA'
	LINDERA BENZOIN
	PHYSOCARPUS OPULIFOLIUS
	PINUS STROBUS 'BLUE SHAG'
	VIBURNUM X BURKWOODII 'DUVONE'
PERENNIALS	
	NEPETA X 'WALKER'S LOW'
VINES	
	WISTERIA FRUTESCENS 'AMETHYST FALLS'

1 PLANTING ENLARGEMENT F3
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

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PROJECT TITLE

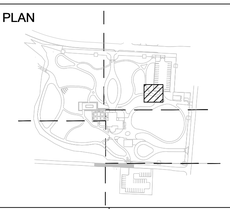
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



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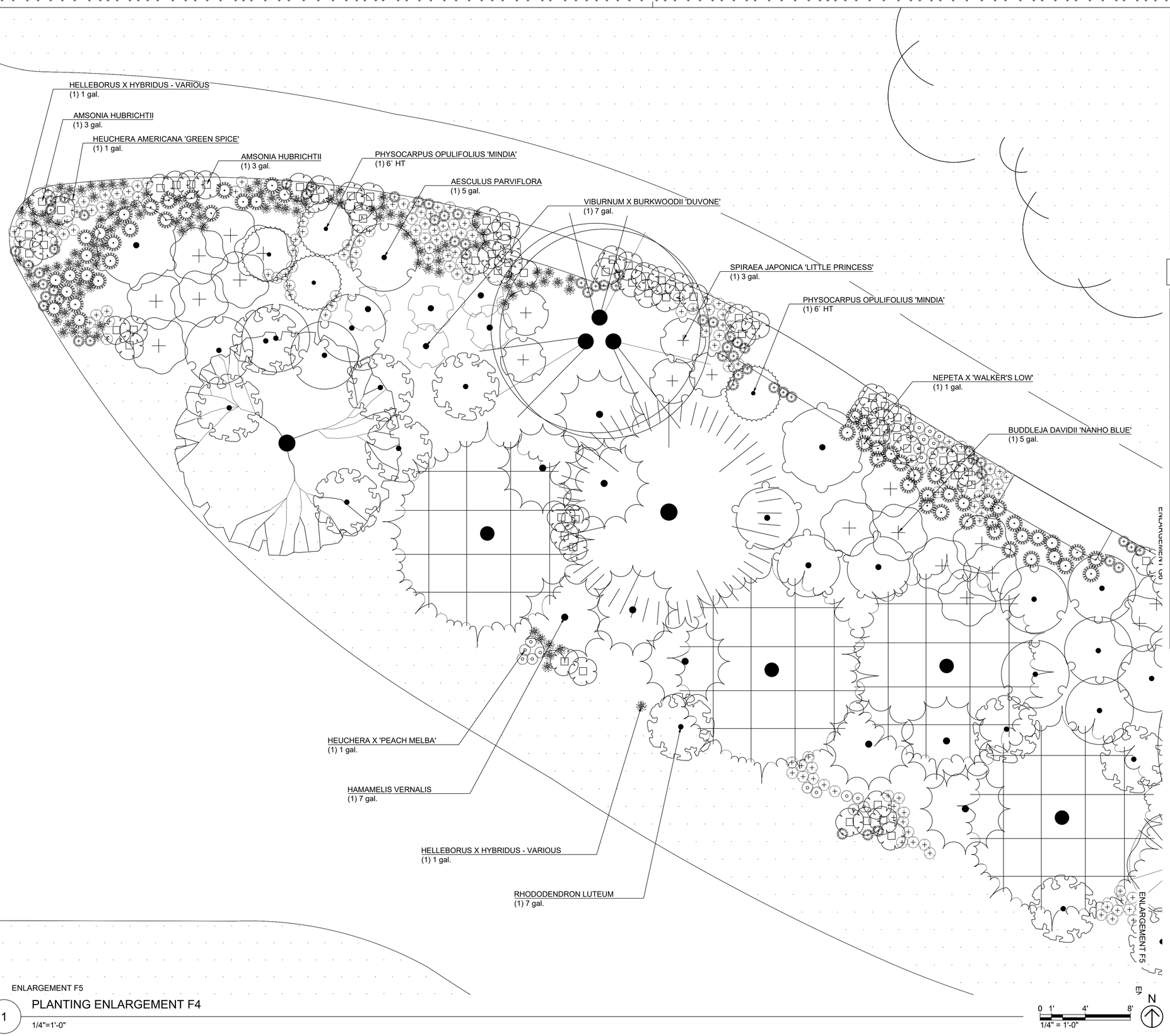
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SHEET TITLE

PLANTING ENLARGEMENT F3

SHEET NUMBER

L-646



ENLARGEMENT F5

1 PLANTING ENLARGEMENT F4

1/4"=1'-0"

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE F4	
SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	BUDDLEJA DAVIDII 'NANHO BLUE'
	HYDRANGEA SERRATA 'SMNHSDD'
	LINDERA BENZOIN
	PHYSOCARPUS OPULIFOLIUS 'MINDIA'
	RHODODENDRON LUTEUM
	VIBURNUM PLICATUM TOMENTOSUM
	VIBURNUM X BURKWOODII 'DUVONE'
PERENNIALS	
	AMSONIA HUBRICHTII
	HELLEBORUS X HYBRIDUS - VARIOUS
	HEUCHERA AMERICANA 'GREEN SPICE'
	HEUCHERA X 'PEACH MELBA'
	NEPETA X 'WALKER'S LOW'
	TIARELLA CORDIFOLIA 'BRANDYWINE'

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PROJECT TITLE

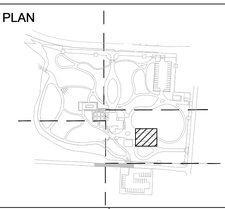
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

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SHEET TITLE

PLANTING ENLARGEMENT F4

SHEET NUMBER

L-647

ENLARGEMENT F4

HAMAMELIS VERNALIS
(1) 7 gal.

LINDERA BENZOIN
(1) 7 gal.

CLETHRA ALNIFOLIA
(1) 7 gal.

CLETHRA ALNIFOLIA 'HUMMINGBIRD'
(1) 5 gal.

POLYSTICHUM ACROSTICHOIDES
(1) 1 gal.

CAREX CHEROKEENSIS
(1) Flat

ILEX GLABRA 'COMPACTA'
(1) 5 gal.

AMSONIA HUBRICHTII
(1) 3 gal.

POLYSTICHUM ACROSTICHOIDES
(1) 1 gal.

ONOCLEA SENSIBILIS
(1) 1 gal.

RHODODENDRON LUTEUM
(1) 7 gal.

AESCULUS PARVIFLORA
(1) 5 gal.

ENLARGEMENT E5

ENLARGEMENT E6

ENLARGEMENT F6

1 PLANTING ENLARGEMENT F5
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT_SCHEDULE_F5

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	ILEX GLABRA 'COMPACTA'
	RHODODENDRON LUTEUM
PERENNIALS	
	AMSONIA HUBRICHTII
	CAREX FLACCA 'BLUE ZINGER'
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	OSMUNDA REGALIS
	POLYSTICHUM ACROSTICHOIDES

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PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

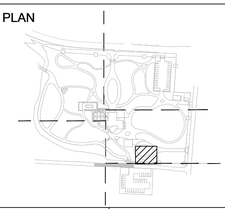
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BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



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SHEET TITLE

PLANTING ENLARGEMENT F5

SHEET NUMBER

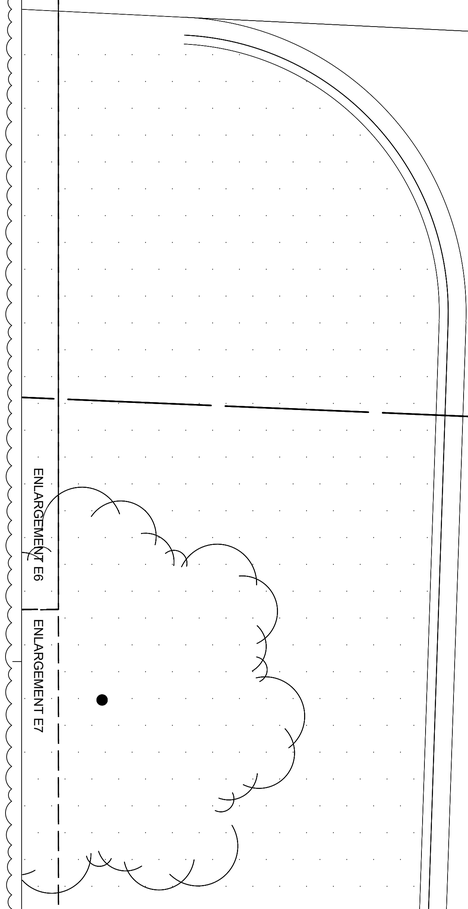
L-648

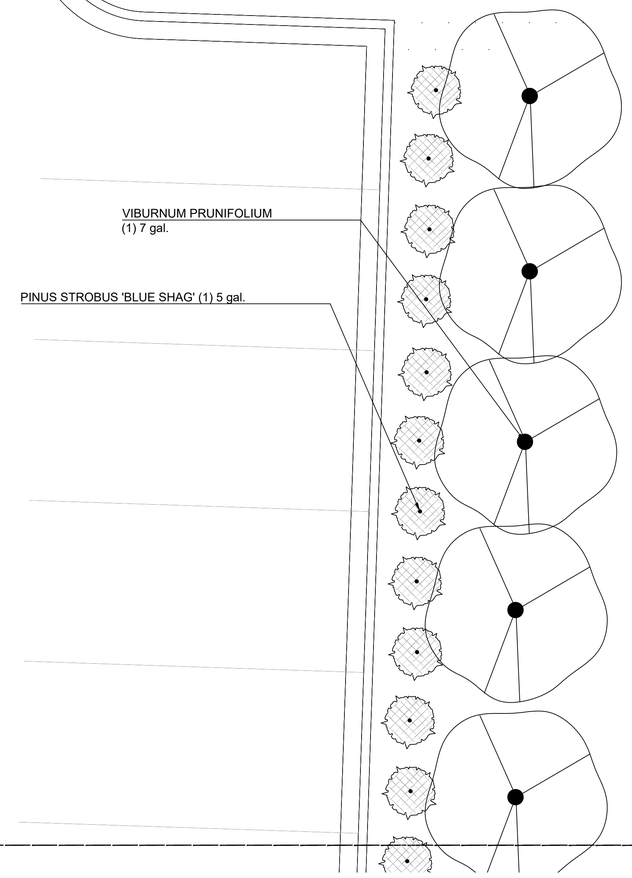
ENLARGEMENT F5

2

ENLARGEMENT E6

ENLARGEMENT E7





ENLARGEMENT F7

EN

1 PLANTING ENLARGEMENT F6

1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE F6	
SYMBOL	BOTANICAL NAME
SHRUBS	
	PINUS STROBUS 'BLUE SHAG'
	VIBURNUM PRUNIFOLIUM

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ACENTECH
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PROJECT TITLE

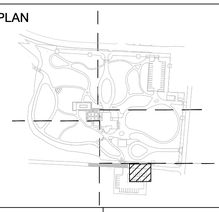
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

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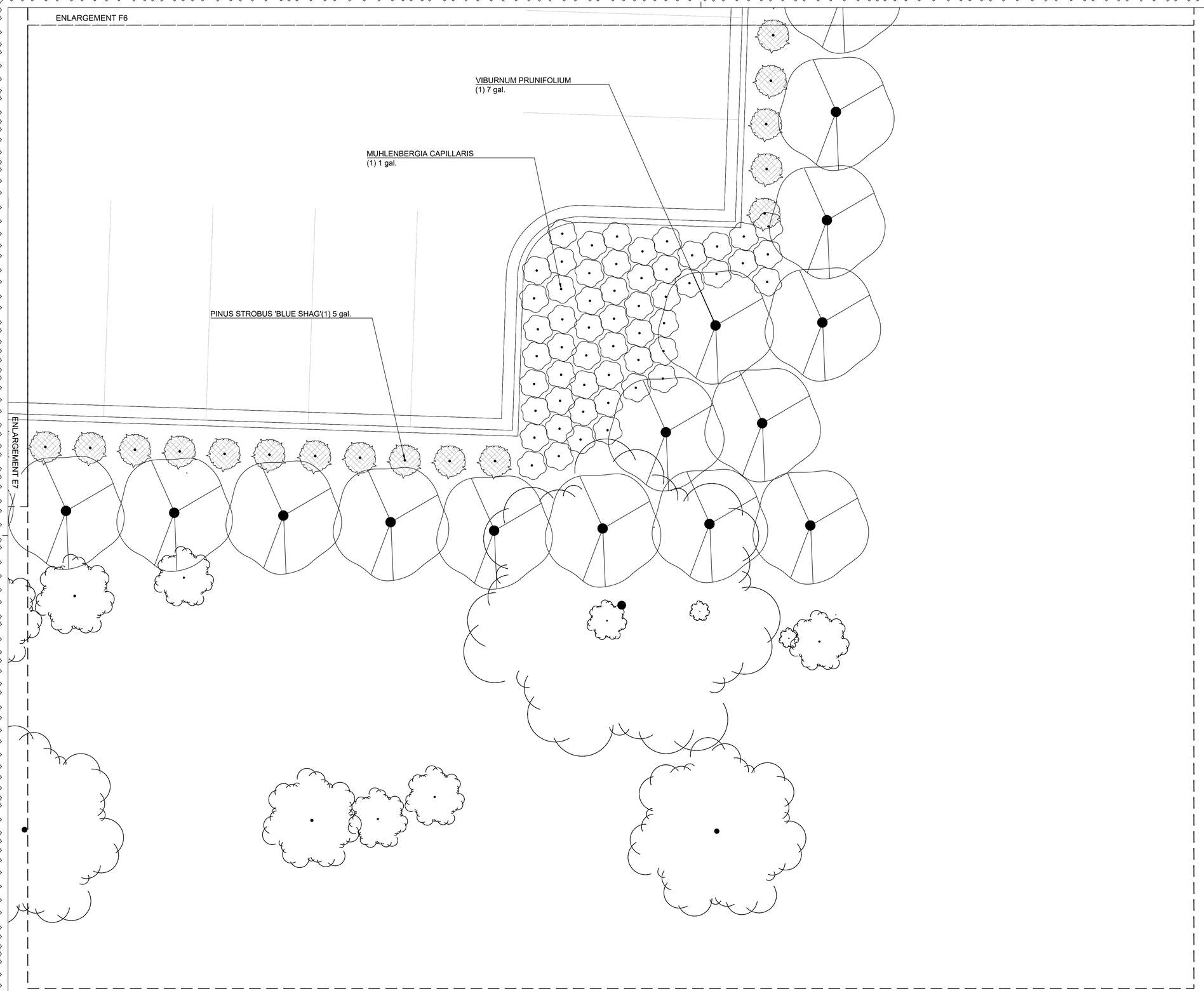
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SHEET TITLE

PLANTING ENLARGEMENT F6

SHEET NUMBER

L-649



1 PLANTING ENLARGEMENT F7

1/4"=1'-0"

0 1' 4' 8'

1/4" = 1'-0"

N

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE F7

SYMBOL	BOTANICAL NAME
SHRUBS	
	PINUS STROBUS 'BLUE SHAG'
	VIBURNUM PRUNIFOLIUM
PERENNIALS	
	MUHLENBERGIA CAPILLARIS

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620 W. GERMANTOWN PIKE, STE. 210
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(215) 245 8244

PROJECT TITLE

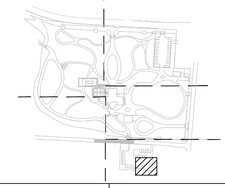
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
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License Number 712062
STATE OF ARKANSAS

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SHEET TITLE

PLANTING ENLARGEMENT F7

SHEET NUMBER

L-650

ENLARGEMENT F1

2

OSMUNDA CINNAMOMEA
(1) 1 gal.

SCHIZACHYRIUM SCOPARIUM 'STANDING OVATION'
(1) Flat

ONOCLEA SENSIBILIS
(1) 1 gal.

ASCLEPIAS TUBEROSA
(1) Flat

OSMUNDA REGALIS
(1) 1 gal.

MAGNOLIA 'LITTLE GEM' (1) 7 gal.

RUDBECKIA TRILOBA
(1) 1 gal.

ENLARGEMENT G2

1 PLANTING ENLARGEMENT G1
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE G1

SYMBOL	BOTANICAL NAME
SHRUBS	
	MAGNOLIA GRANDIFLORA 'LITTLE GEM'
PERENNIALS	
	ASCLEPIAS TUBEROSA
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	OSMUNDA REGALIS
	RUDBECKIA TRILOBA
	SCHIZACHYRIUM SCOPARIUM 'STANDING OVATION'

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620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

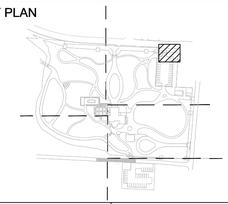
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
	2 ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

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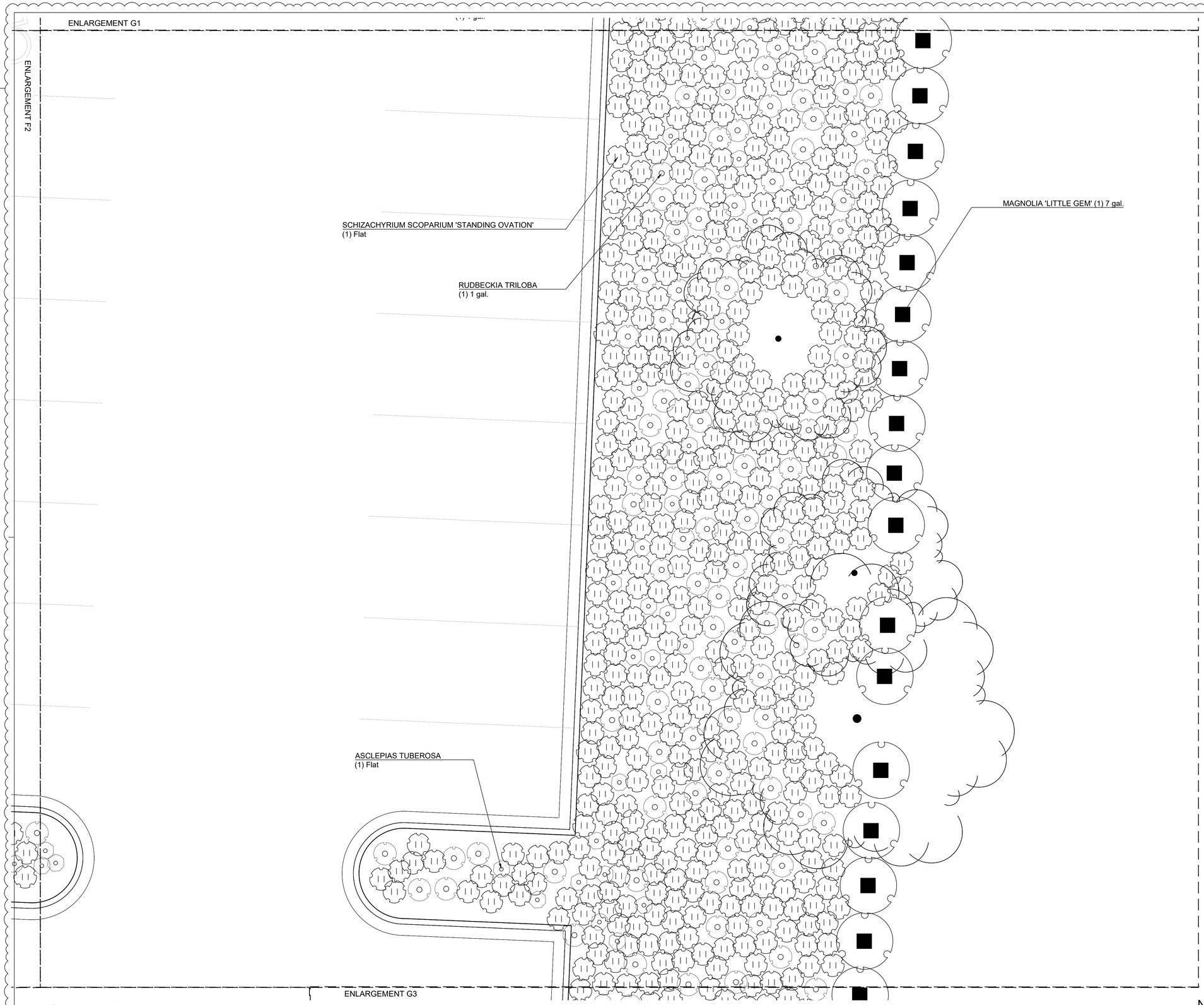
CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT - G1

SHEET NUMBER

L-651



1 PLANTING ENLARGEMENT G2

1/4"=1'-0"

0 1' 4' 8'

1/4" = 1'-0"

N

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE G2

SYMBOL	BOTANICAL NAME
SHRUBS	
	MAGNOLIA GRANDIFLORA 'LITTLE GEM'
PERENNIALS	
	ASCLEPIAS TUBEROSA
	RUDBECKIA TRILOBA
	SCHIZACHYRIUM SCOPARIUM 'STANDING OVATION'

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(501) 374 5300

CONSULTANTS

CIVIL ENGINEERS
CRAFTON TULL & ASSOCIATES, INC.
901 N. 47TH STREET, SUITE 400
ROGERS, AR 72756
(479) 636 4838

MEP ENGINEERS
INSIGHT ENGINEERING
322 S STATE STREET, STE 201
LITTLE ROCK, AR 72201
(501) 237 3077

STRUCTURAL ENGINEERS
ENFRA TME, LLC
BUILDING 2, 1 ALLIED DRIVE, STE 2600
LITTLE ROCK, AR 72202
(501) 666 6776

FOOD SERVICE CONSULTANT
MCKAY-LANE CONSULTING, LTD
1807 DODSON AVE
FT. SMITH, AR 72901
(479) 629 4572

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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

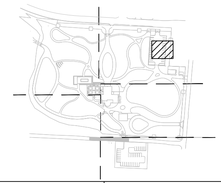
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
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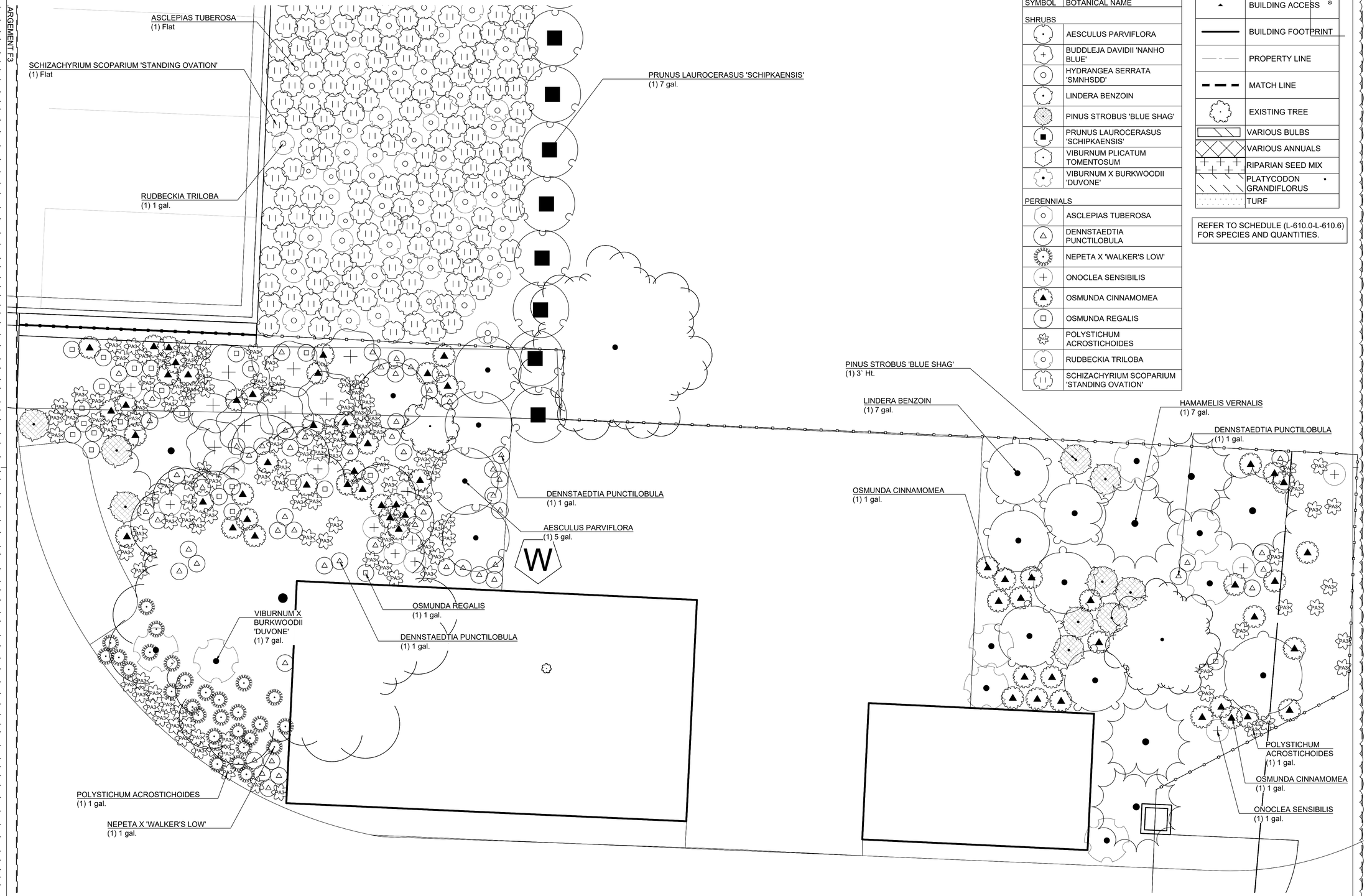
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SHEET TITLE

PLANTING ENLARGEMENT - G2

SHEET NUMBER

L-652



PLANT_SCHEDULE_G3	
SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	BUDDLEJA DAVIDII 'NANHO BLUE'
	HYDRANGEA SERRATA 'SMNHSDD'
	LINDERA BENZOIN
	PINUS STROBUS 'BLUE SHAG'
	PRUNUS LAUROCERASUS 'SCHIPKAENSIS'
	VIBURNUM PLICATUM TOMENTOSUM
	VIBURNUM X BURKWOODII 'DUVONE'
PERENNIALS	
	ASCLEPIAS TUBEROSA
	DENNSTAEDTIA PUNCTILOBULA
	NEPETA X 'WALKER'S LOW'
	ONOCLEA SENSIBILIS
	OSMUNDA CINNAMOMEA
	OSMUNDA REGALIS
	POLYSTICHUM ACROSTICHOIDES
	RUDBECKIA TRILOBA
	SCHIZACHYRIUM SCOPARIUM 'STANDING OVATION'

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

1 PLANTING ENLARGEMENT G3
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"
N

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(215) 245 8244

PROJECT TITLE

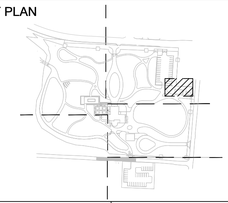
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
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2	ADDENDUM 02	10/19/2026

KEY PLAN



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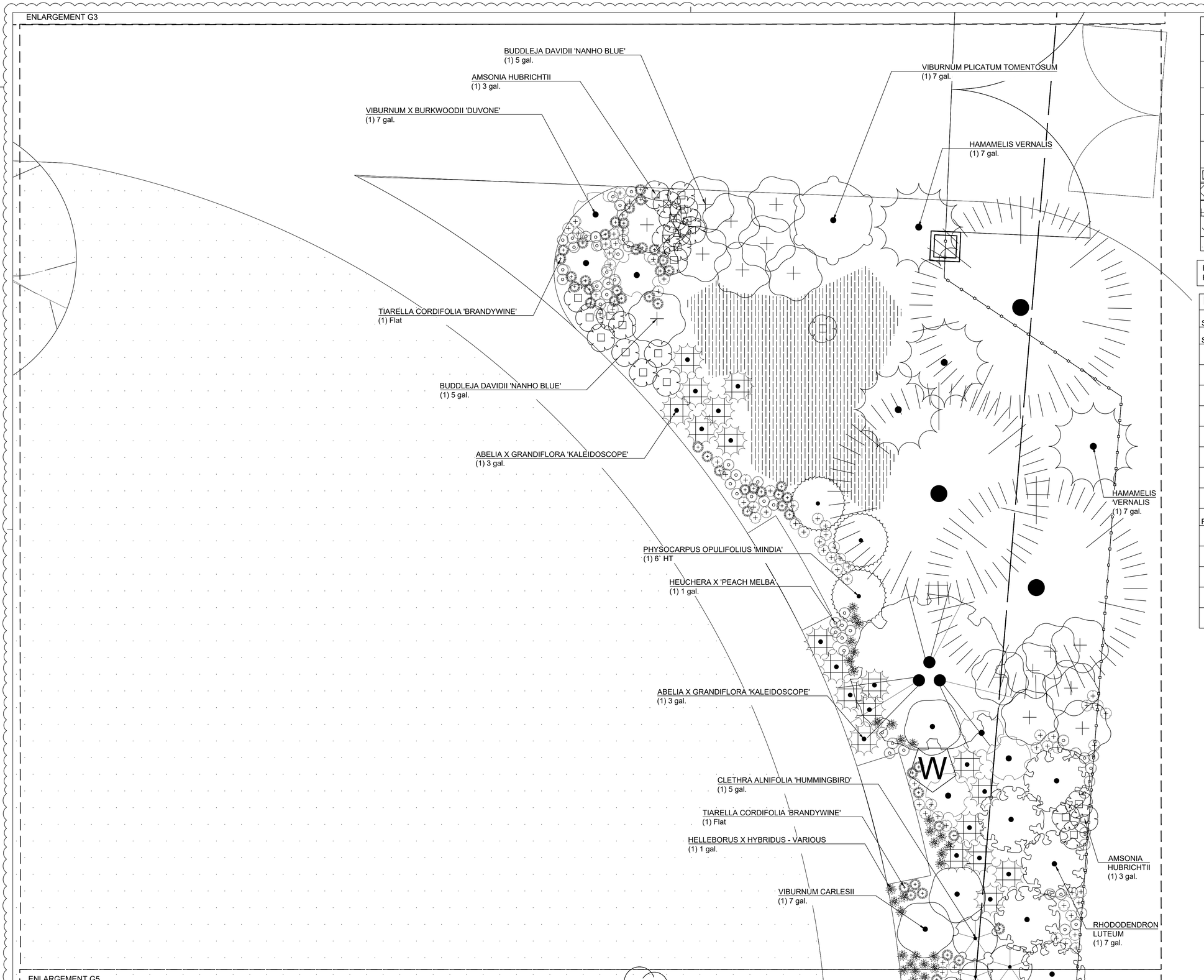
SHEET TITLE

PLANTING ENLARGEMENT - G3

SHEET NUMBER

L-653

ENLARGEMENT G3



GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE G4

SYMBOL	BOTANICAL NAME
SHRUBS	
	ABELIA X GRANDIFLORA 'KALEIDOSCOPE'
	BUDDLEJA DAVIDII 'NANHO BLUE'
	CLETHRA ALNIFOLIA 'HUMMINGBIRD'
	HYDRANGEA SERRATA 'SMNHSDD'
	RHODODENDRON LUTEUM
	VIBURNUM CARLESII
	VIBURNUM PLICATUM TOMENTOSUM
	VIBURNUM X BURKWOODII 'DUVONE'
PERENNIALS	
	AMSONIA HUBRICHTII
	HELLEBORUS X HYBRIDUS - VARIOUS
	HEUCHERA AMERICANA 'GREEN SPICE'
	HEUCHERA X 'PEACH MELBA'
	TIARELLA CORDIFOLIA 'BRANDYWINE'

ENLARGEMENT G5

1 PLANTING ENLARGEMENT G4

1/4"=1'-0"

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PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

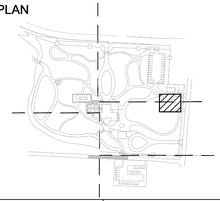
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BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



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SHEET TITLE

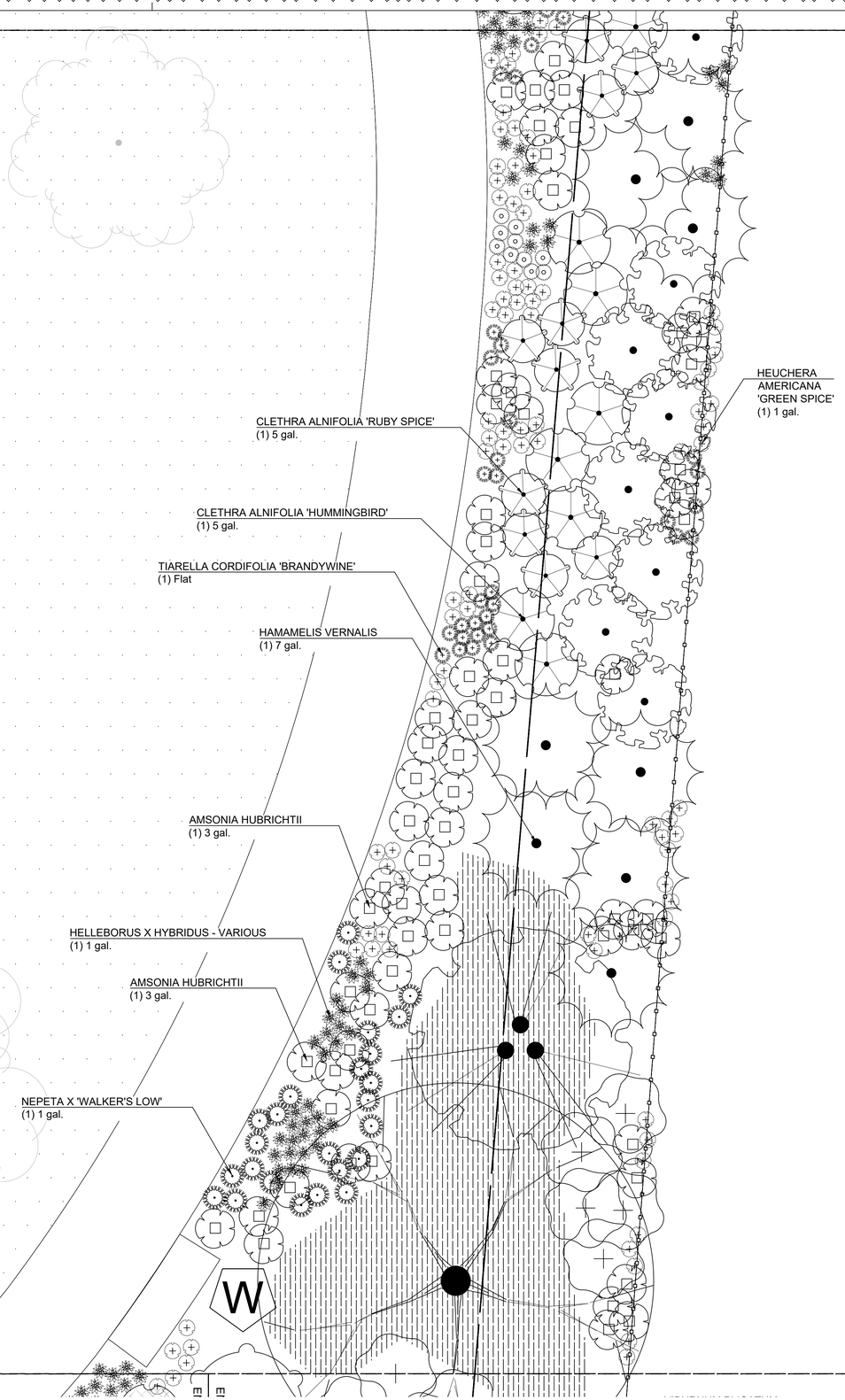
PLANTING ENLARGEMENT - G4

SHEET NUMBER

L-654

ENLARGEMENT G4

2



ENLARGEMENT G6

1 PLANTING ENLARGEMENT G5

1/4"=1'-0"

0 1' 4' 8'

1/4" = 1'-0"

N

GENERAL LEGEND

	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE G5

SYMBOL	BOTANICAL NAME
SHRUBS	
	BUDDLEJA DAVIDII 'NANHO BLUE'
	CLETHRA ALNIFOLIA 'HUMMINGBIRD'
	CLETHRA ALNIFOLIA 'RUBY SPICE'
	HYDRANGEA SERRATA 'SMNHSDD'
	RHODODENDRON LUTEUM
PERENNIALS	
	AMSONIA HUBRICHTII
	HELLEBORUS X HYBRIDUS - VARIOUS
	HEUCHERA AMERICANA 'GREEN SPICE'
	HEUCHERA X 'PEACH MELBA'
	NEPETA X 'WALKER'S LOW'
	TIARELLA CORDIFOLIA 'BRANDYWINE'

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ACENTECH
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PROJECT TITLE

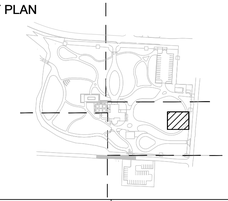
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

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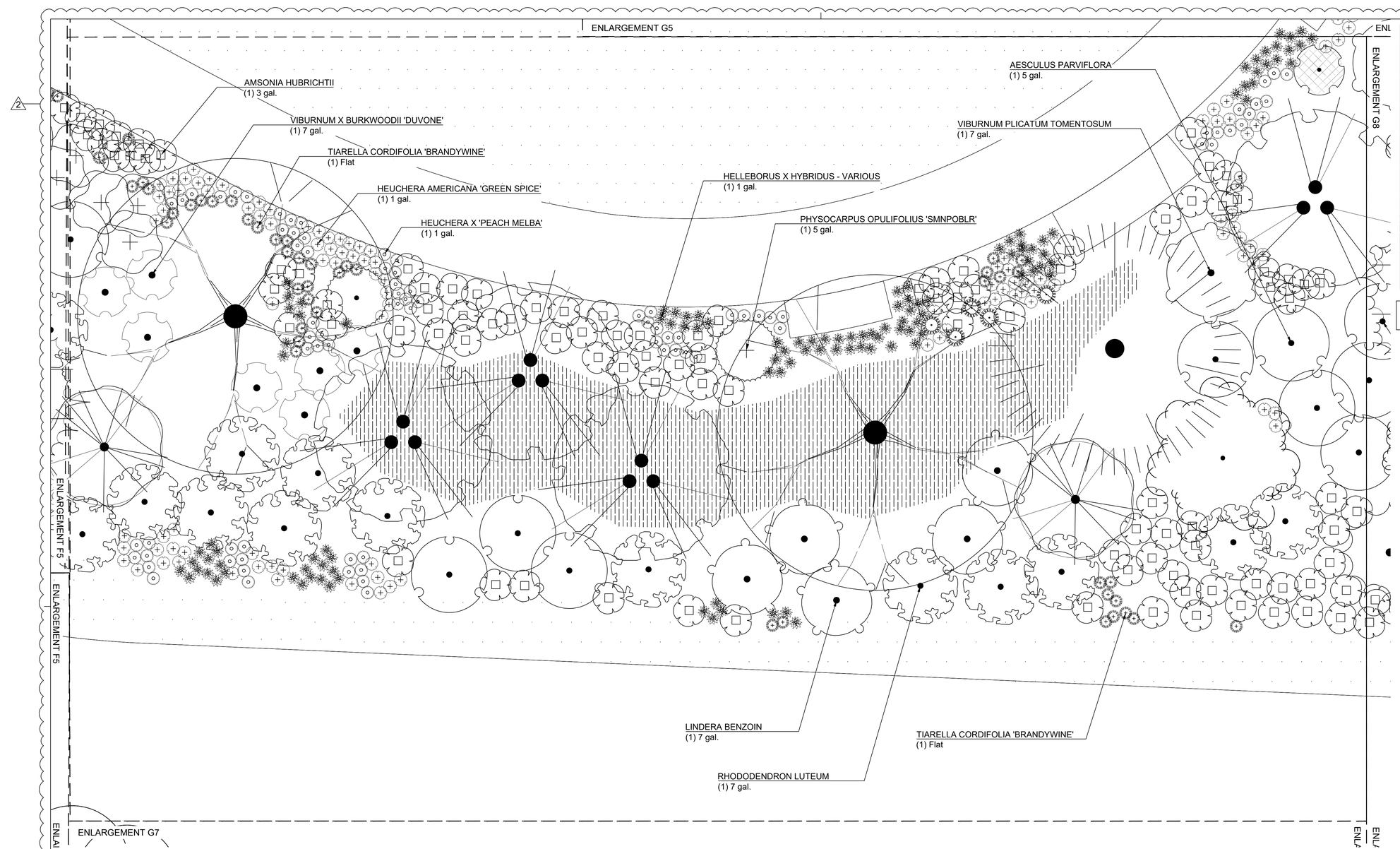
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SHEET TITLE

PLANTING ENLARGEMENT - G5

SHEET NUMBER

L-655



GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

1 PLANTING ENLARGEMENT G6

1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

PLANT SCHEDULE G6

SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	BUDDLEJA DAVIDII 'NANHO BLUE'
	HYDRANGEA PANICULATA 'PHANTOM'
	LINDERA BENZOIN
	PHYSOCARPUS OPULIFOLIUS 'MINDIA'
	PHYSOCARPUS OPULIFOLIUS 'SMNPOBLR'
	RHODODENDRON LUTEUM
	VIBURNUM PLICATUM TOMENTOSUM
	VIBURNUM X BURKWOODII 'DUVONE'

PERENNIALS	
	AMSONIA HUBRICHTII
	HELLEBORUS X HYBRIDUS - VARIOUS
	HEUCHERA AMERICANA 'GREEN SPICE'
	HEUCHERA X 'PEACH MELBA'
	NEPETA X 'WALKER'S LOW'
	TIARELLA CORDIFOLIA 'BRANDYWINE'

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STRUCTURAL ENGINEERS
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(479) 629 4572

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ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

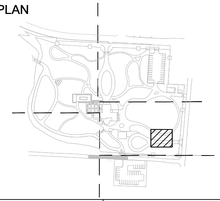
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

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REGISTERED LANDSCAPE ARCHITECT
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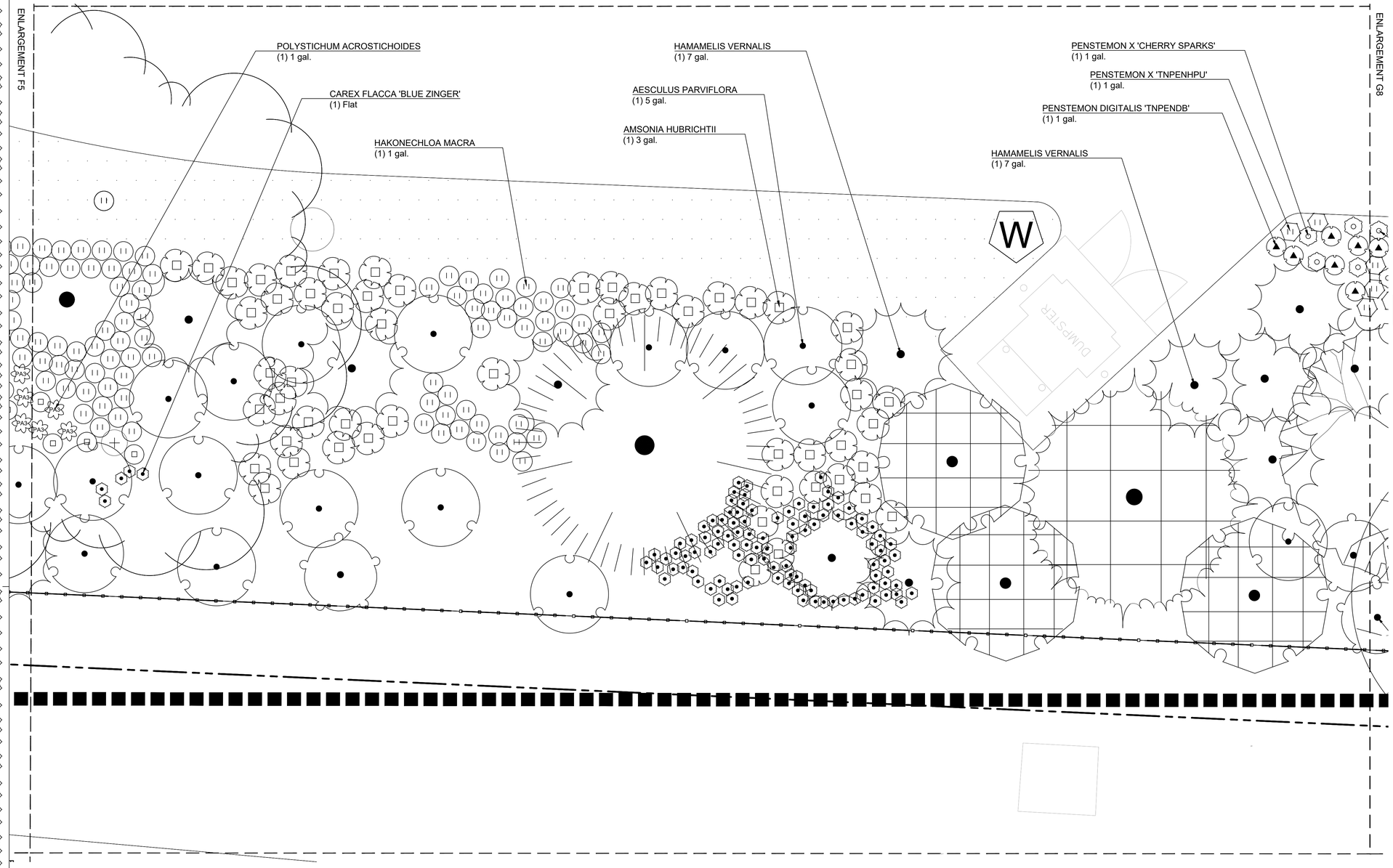
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SHEET TITLE

PLANTING ENLARGEMENT - G6

SHEET NUMBER

L-656



GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

1 PLANTING ENLARGEMENT G7

1/4"=1'-0"

0 1' 4' 8'

1/4" = 1'-0"

N

PLANT SCHEDULE G7	
SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	HAMAMELIS VERNALIS
	HYDRANGEA SERRATA 'SMNHSDD'
	LINDERA BENZOIN

PERENNIALS	
	AMSONIA HUBRICHTII
	CAREX FLACCA 'BLUE ZINGER'
	HAKONECHLOA MACRA
	ONOCLEA SENSIBILIS
	OSMUNDA REGALIS
	PENSTEMON DIGITALIS 'TNPENDB'
	PENSTEMON X 'CHERRY SPARKS'
	PENSTEMON X 'TNPENHPU'
PA3	POLYSTICHUM ACROSTICHOIDES

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PROJECT TITLE

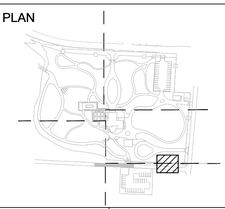
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

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KEY PLAN



SIGN & SEAL

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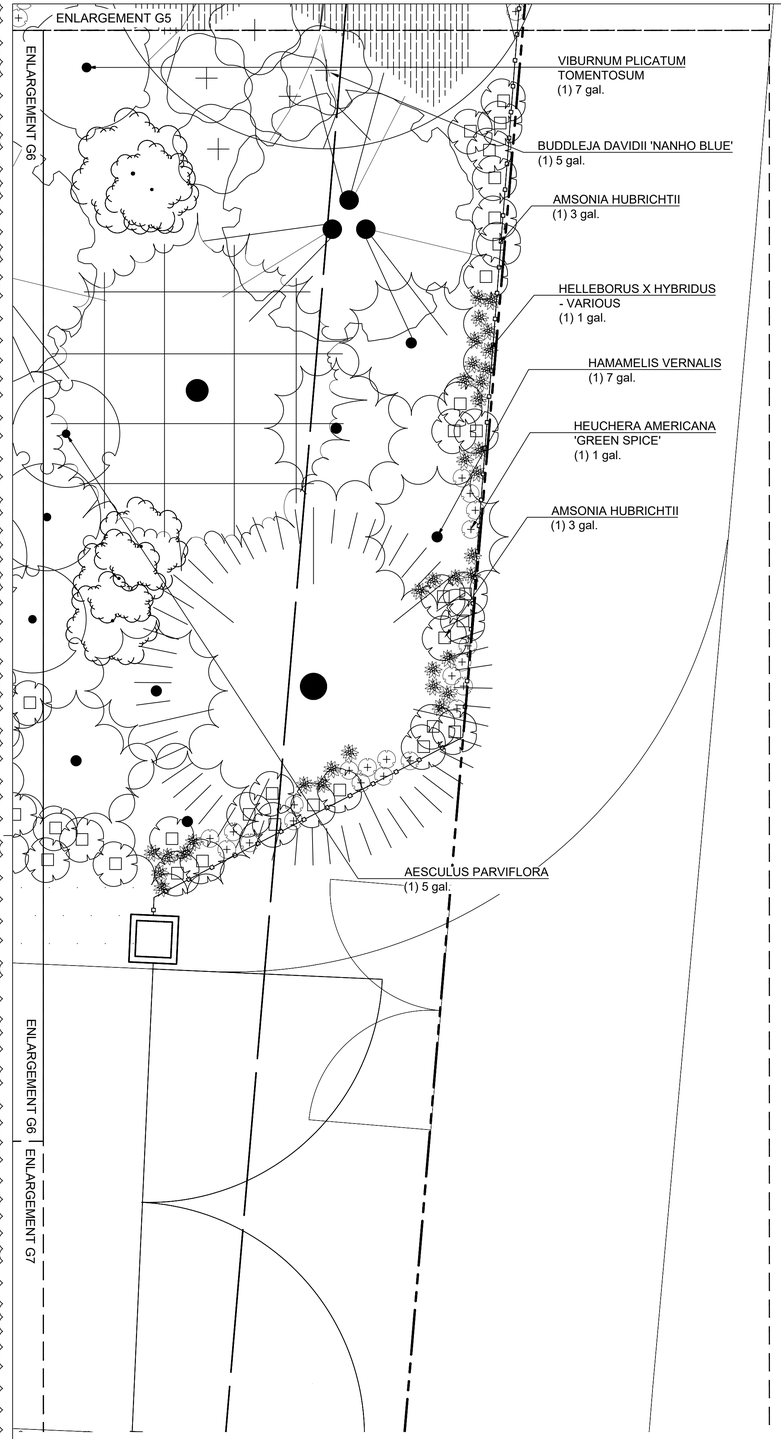
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SHEET TITLE

PLANTING ENLARGEMENT - G7

SHEET NUMBER

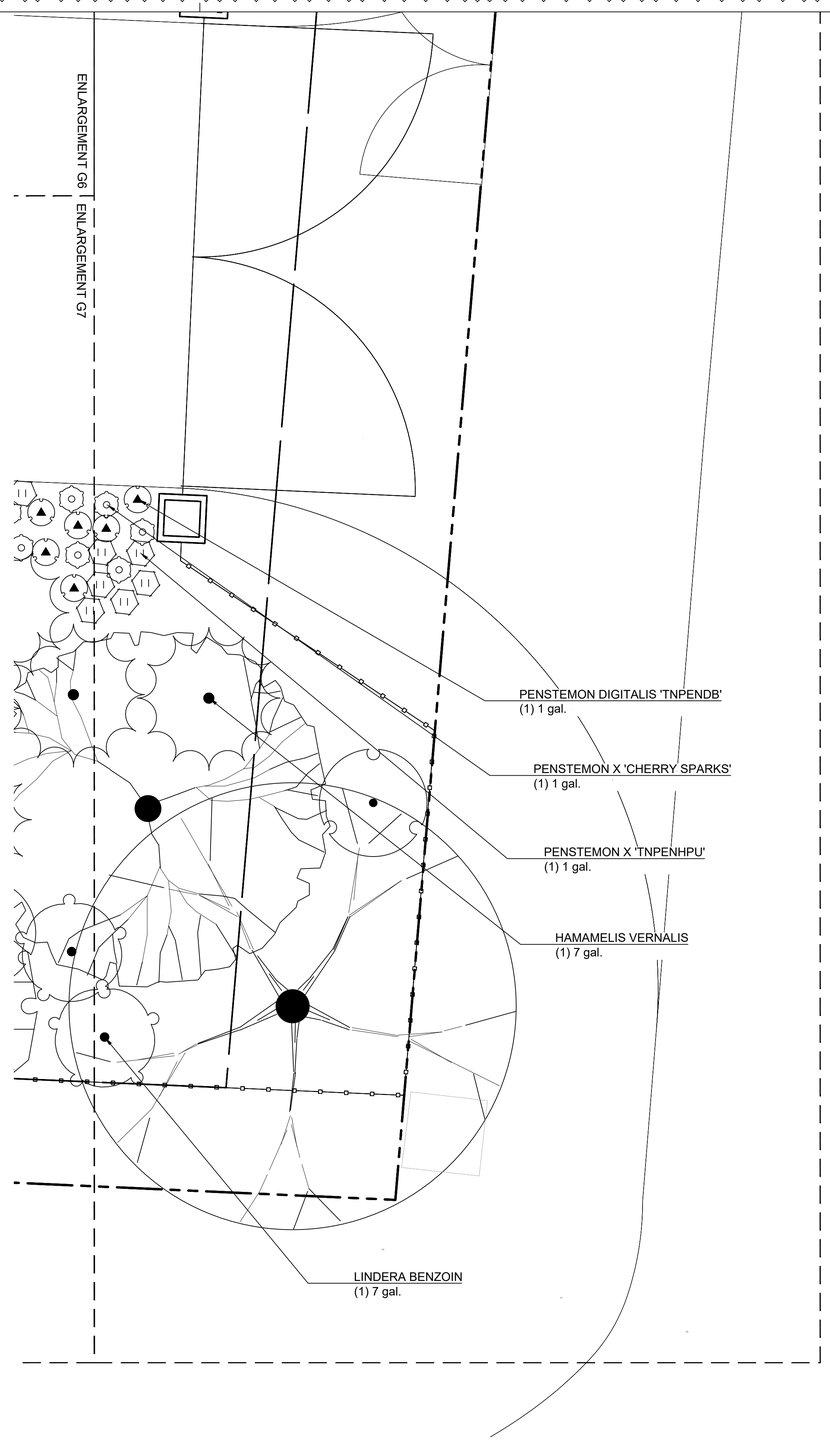
L-657



1 PLANTING ENLARGEMENT G8 NORTH
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N



2 PLANTING ENLARGEMENT G8 SOUTH
1/4"=1'-0"

0 1' 4' 8'
1/4" = 1'-0"

N

GENERAL LEGEND	
	BUILDING ACCESS
	BUILDING FOOTPRINT
	PROPERTY LINE
	MATCH LINE
	EXISTING TREE
	VARIOUS BULBS
	VARIOUS ANNUALS
	RIPARIAN SEED MIX
	PLATYCODON GRANDIFLORUS
	TURF

REFER TO SCHEDULE (L-610.0-L-610.6) FOR SPECIES AND QUANTITIES.

PLANT SCHEDULE G8	
SYMBOL	BOTANICAL NAME
SHRUBS	
	AESCULUS PARVIFLORA
	BUDDLEJA DAVIDII 'NANHO BLUE'
	HYDRANGEA SERRATA 'SMNHSDD'
	LINDERA BENZOIN
	VIBURNUM PLICATUM TOMENTOSUM
PERENNIALS	
	AMSONIA HUBRICHTII
	HELLEBORUS X HYBRIDUS - VARIOUS
	HEUCHERA AMERICANA 'GREEN SPICE'
	PENSTEMON DIGITALIS 'TNPENDB'
	PENSTEMON X 'CHERRY SPARKS'
	PENSTEMON X 'TNPENHPU'

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STRUCTURAL ENGINEERS
ENFRA TME, LLC
BUILDING 2, 1 ALLIED DRIVE, STE 2600
LITTLE ROCK, AR 72202
(501) 666 6776

FOOD SERVICE CONSULTANT
MCKAY-LANE CONSULTING, LTD
1807 DODSON AVE
FT. SMITH, AR 72901
(479) 629 4572

ACOUSTICAL ENGINEERS
ACENTECH
620 W. GERMANTOWN PIKE, STE. 210
PLYMOUTH MEETING PA 19462
(215) 245 8244

PROJECT TITLE

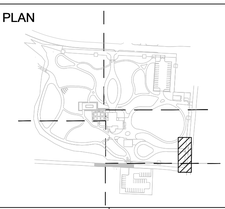
CENTRAL HOUSE & GARDEN

BENTONVILLE, AR

PROJECT NUMBER: 31483

#	ISSUED FOR	DATE
	FINAL CD's	10/2/2026
2	ADDENDUM 02	10/19/2026

KEY PLAN



SIGN & SEAL

REGISTERED LANDSCAPE ARCHITECT
ALEX HART
License Number 712062
STATE OF ARKANSAS

DRAWN BY

CHECKED BY

SHEET TITLE

PLANTING ENLARGEMENT - G8

SHEET NUMBER

L-658