CITY OF BLOOMINGTON

PLAT COMMITTEE

June 10, 2024 @ 4:00 p.m.

401 N. Morton Street
Kelly Conference Room #155 & via Zoom:

https://bloomington.zoom.us/j/86714253039?pwd=SXJ2bmNwRFhLeVZSRW44TVI0T3hZUT09

Meeting ID: 867 1425 3039 **Passcode: 064896**

CITY OF BLOOMINGTON
PLAT COMMITTEE **401 N. Morton Street, City Hall**
June 10, 2024 at 4:00 p.m. **Kelly Conference Room #155**

HYBRID MEETING:

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Meeting ID: 867 1425 3039 **Password: 064896**

PETITION MAP: https://arcg.is/1WeP8m

ROLL CALL

MINUTES TO BE APPROVED:

REPORTS, RESOLUTIONS, AND COMMUNICATIONS:

PETITIONS:

DP-23-24/PLAT2024-05-0029 **City of Bloomington Engineering Dept.**
501,601,707,711, and 719 W 2nd Street
Secondary plat approval to create new lots and new Right-of-way in the Hopewell neighborhood.
Case Manager: Gabriel Holbrow

**Next Meeting Date: July 15, 2024 Updated: 6/7/2024

The City is committed to providing equal access to information. However, despite our efforts, at times, portions of our board and commission packets are not accessible for some individuals. If you encounter difficulties accessing material in this packet, please contact the **Melissa Hirtzel** at **hirtzelm@bloomington.in.gov** and provide your name, contact information, and a link to or description of the document or web page you are having problems with

Auxiliary aids for people with disabilities are available upon request with adequate notice. Please call 812-349-3429 or e-mail human.rights@bloomington.in.gov.

BLOOMINGTON PLAT COMMITTEE **CASE #: DP-23-24 / PLAT2024-05-0029**
STAFF REPORT **DATE: June 10, 2024**

Location: West of South Rogers Street between West 1st Street and West 2nd Street (addresses of current parcels: 501, 601, 707, and 711 West 2nd Street)

PETITIONER: City of Bloomington Engineering Department
401 North Morton Street
Bloomington, IN

OWNER: Bloomington Redevelopment Commission
401 North Morton Street, Suite 130
Bloomington, IN

CONSULTANTS: Crossroad Engineers
115 North 17th Avenue
Beech Grove, IN

REQUEST: The petitioner is requesting secondary plat approval to create new lots and new right-of-way in the Hopewell neighborhood.

BACKGROUND:

Area: 11.33 acres
Current Zoning: Mixed-Use Medium Scale (MM) within the Transform Redevelopment Overlay (TRO)
Comprehensive Plan Designation: Mixed Urban Residential / Former Bloomington Hospital Focus Area
Existing Land Use: Vacant (former hospital site)
Proposed Land Use: No change proposed
Surrounding Uses: North – Park; Office; Medical Clinic; Personal Services
South – Vacant buildings (former hospital site)
East – Vacant land; Office; Medical Clinic
West – Vacant buildings; Office

REPORT: The property is located west of South Rogers Street between West 1st Street and West 2nd Street. The petition site is a portion of the former site of the IU Health Bloomington Hospital. Development of the larger area is guided by the Bloomington Hospital Site Redevelopment Master Plan (Master Plan), released in January 2021. The petition site is occasionally called Hopewell West, part of the future Hopewell neighborhood. The property is owned by the City of Bloomington Redevelopment Commission (RDC).

The entire petition site is located in the Mixed-Use Medium Scale (MM) zoning district within the Transform Redevelopment Overlay (TRO). Adjacent properties to the north across West 2nd Street include Building and Trades Park, zoned Parks and Open Space (PO), as well as several properties zoned MM within the TRO which contain office, medical clinic, and personal services uses. To the south across West 1st Street, the property at the southwest corner of Rogers and 1st is zoned Residential Multifamily (RM) within the TRO, while the properties immediately west of that are zoned Residential Urban Lot (R4) and are not within the TRO. The properties to the south contain vacant buildings or recently demolished buildings that were formally used as part of the hospital

site. To the east across South Rogers Street is the area occasionally known as Hopewell Phase I East which contains vacant land currently under development and is zoned MM within the TRO, as well as the Centerstone building and property which is zoned Mixed-Use Neighborhood Scale (MN) within the TRO. Adjacent properties to the west are zoned MM and Mixed-Use Institutional (MI) within the TRO and contain vacant buildings and office space owned by the Monroe County Community School Corporation (MCCSC), as well as one privately owned office building.

The petitioner is requesting secondary plat approval to reconfigure the existing lots and rights-of-way in this portion of the Master Plan area to re-create an urban pattern of streets, alleys, and blocks to facilitate redevelopment. The plat creates new public right-of-way for two new north-south streets, South Fairview Street and South Jackson Street; an east-west greenway street bordered by green space and park amenities, West University Street; as well as five alleys. The plat contains 19 lots, including lots for the two existing buildings that remain: a parking garage in the center north of the site and the Kohr building in the southeast corner of the site. The Kohr building, formerly part of the hospital complex, has been locally designated as a one-building historic district and is intended to be redeveloped as affordable housing. Lots 7, 11, 12, and 16 along West University Street are intended to be greenspace lots managed by the City of Bloomington Parks and Recreation Department as public park space containing park amenities as well as stormwater drainage facilities for the neighborhood.

The primary plat was approved by the Plan Commission as DP-23-23 on July 10, 2023 with five conditions, all of which have been met as explained below.

Primary Plat condition 1: Right-of-way vacation for the existing alleys on the petition site shall be approved by City of Bloomington Common Council prior to secondary plat recording.

- City Council approved vacation of the existing alleys as Ordinance 23-22 on October 4, 2023.

Primary Plat condition 2: Greenspace lots intended for public use that are labeled as “common area 2” through “common area 5” on the primary plat shall be correctly labeled as lots on the secondary plat.

- On the secondary plat, these lots are labeled lot 3, lot 7, lot 11, lot 12, and lot 16.

Primary Plat condition 3: The secondary plat shall provide public right-of-way for West University Street west of South Fairview Street, NC-45 in the Transportation Plan, to provide the opportunity for a future street connection to the west. The 332 foot long portion of the proposed common area 1 parcel shall be included in the Fairview Street right-of-way. The northern portion may need to be absorbed into Lot 2.

- The secondary plat dedicates right-of-way west of Fairview Street within the continuation of the alignment of West University Street. Although this continuation right-of-way is not wide enough be a street on its own, it could be expanded into full street width for a continuation of West University Street if the property to the west were ever subdivided or acquired by the City.
- The right-of-way of Fairview Street south of West University Street has been widened to the west 15 feet, all the way to west edge of the RDC-owned property, to avoid creating an unbuildable sliver of a lot. Only the eastern 60 feet of this right-of-way is proposed to be constructed as a street. The remaining 15 feet will be a graded slope to up from the constructed Fairview Street to the existing grade of the property to the west.

- What had been the northern portion of common area 1 on the primary plat has become lot 3 on the secondary plat. It did not need to be absorbed into lot 2.

Primary Plat condition 4: The seven lots labeled 19 through 25 shall be reduced to six lots on the secondary plat so that all six lots have a depth-to-width ratio not exceeding four-to-one.

- What had been lots 18-26 on the primary plat has been combined into one lot, numbered lot 15, on the secondary plat. This lot 15 has a depth-to-width ratio of 0.52 to one, which is less than four-to-one, which complies with the intent of condition 4.

Primary Plat condition 5: The secondary plat shall provide eight additional feet of right-of-way dedication along South Rogers Street between West 2nd Street and West University Street to bring the total right-of-way dedication in this segment to 50 feet from the established apparent centerline of the roadway.

- The secondary plat provides 50 feet of right-of-way to the west of the established apparent centerline of South Rogers Street between West 2nd Street and West University Street.

Typically, in conjunction with the approval of a secondary plat, the subdivision petitioner is required to provide a financial performance guarantee that all public facility improvements and installations shall be completed within two years, with possible extensions for up to one additional year. However, the UDO provides an exception that the posting of a performance guarantee is not required when the petitioner is the City of Bloomington. As the petitioner for this subdivision is the City Engineering Department and the property owner is the Bloomington Redevelopment Commission, both constituent bodies of the City of Bloomington, no performance guarantee is required.

20.06.060(c)(3)(D) SECONDARY PLAT REVIEW AND DECISION: The Plan Commission or Plat Committee shall review the secondary subdivision petition and approve, approve with conditions, or deny the petition in accordance with Section 20.06.040(g) (Review and Decision), based on the general approval criteria in Section 20.06.040(d)(6)(B) (General Compliance Criteria).

20.06.040(d)(6)(B) General Compliance Criteria

i. Compliance with this UDO
ii. Compliance with Other Applicable Regulations
iii. Compliance with Utility, Service, and Improvement Standards
iv. Compliance with Prior Approvals

PROPOSED FINDING: The plat complies with all of the requirements of the UDO. The plat is compliant with the Transportation Plan. The subdivision follows the guidance of the Bloomington Hospital Site Redevelopment Master Plan. The drainage infrastructure and utilities have been designed in consultation with the City of Bloomington Utilities Department and final approval from the City of Bloomington Utilities Department is required prior to the issuance of any permits to construct the public infrastructure for the subdivision. The secondary plat complies with the primary plat for this subdivision as approved by the Plan Commission on July 10, 2023.

PLAT REVIEW: The proposed subdivision follows the Infill Subdivision (IS) design standards with modifications as required by the Transform Redevelopment Overlay (TRO) in the City of Bloomington Unified Development Ordinance (UDO)

Infill Subdivision Standards as modified by TRO section 20.02.050(b)(11)(A):

Parent tract size: No minimum parent tract size. Maximum parent tract size is three acres. The parent tract is 11.33 acres. The Plan Commission granted a waiver with primary plat approval to allow the parent tract size to exceed the maximum. The larger tract size is a necessary and integral aspect of this unique early stage of the development of the Hopewell neighborhood.

Open space: Not required. The proposal provides four greenspace lots intended to be open space managed by the City of Bloomington Parks and Recreation Department.

Lots served by alleys: Minimum 100 percent. 14 of the 19 proposed lots (73 percent) are served by public alleys. The Plan Commission granted a waiver with primary plat approval to allow five lots along the West University Street greenway to lack alley access. The proposal establishes pedestrian easements to all five lots along the West University Street greenway, providing access from the side opposite the street frontage.

Block length: Maximum 400 feet. All proposed blocks are between 217 feet and 332 feet.

Cul-de-sac length: Not permitted. No culs-de-sac are proposed. The proposal includes three dead-end alleys; however, because alleys are not streets, these are not considered culs-de-sac.

Transportation facilities: Required to meet Transportation Plan guidance. In the Transportation Plan, West 2nd Street and South Rogers Street are designated as the General Urban street typology with 84 feet of right-of-way width, while West 1st Street and the new interior street grid are designated as the Neighborhood Residential street typology with 60 feet of right-of-way width. The proposal provides additional right-of-way dedication along West 2nd Street and South Rogers Street to bring both streets up to the proposed width. The proposal shows West 1st Street, South Fairview Street, and South Jackson Street designed to Neighborhood Residential street guidance with at least 60 feet of right-of-way width. As guided by the Master Plan, the proposed West University Street greenway follows a modified Shared Street typology with a 55-foot right-of-way width.

On-street parking: Per Transportation Plan guidance. Where provided, on-street parking shall comply with City standards. The proposal shows on-street parking on all block faces along South Jackson Street and South Fairview Street as well as on the north side of both blocks of the West University Street greenway. The proposed parking complies with width guidance in the Transportation Plan and complies with other City standards.

Tree plot width: Per Transportation Plan, or seven feet, whichever is greater. The proposal shows greenscapes on both sides of South Fairview Street and South Jackson Street and on the west side of South Rogers Street that vary from five feet, which is the minimum per the Transportation Plan, to 12 feet. Along the West University Street greenway, the proposal shows stormwater garden and activity zones up to 41 ½ feet on the adjacent greenspace

lots. Greenscape facilities in the public right-of-way of West 2nd Street and West 1st Street will be provided by separate City projects to redesign and reconstruct these existing streets. The Plan Commission granted a waiver with primary plat approval to allow the proposed tree plots widths.

Sidewalk/multiuse path width: Per Transportation Plan, or eight feet, whichever is greater. The proposal shows six-foot-wide pedestrian zones within the public right-of-way along both sides of all new streets, supplemented by 15-foot-wide sidewalk/café zones on the greenspace lots adjacent to the West University Street greenway. The proposal shows a ten-foot-wide sidewalk on the west side of South Rogers Street as well as five-foot-wide center-curb-separated bicycle lanes on both sides of South Rogers Street. Pedestrian and bicycle facilities in the public right-of-way of West 2nd Street and West 1st Street are not shown, but will be provided by separate City projects to redesign and reconstruct these existing streets. The Plan Commission granted a waiver with primary plat approval to allow for a minimum of six feet in width for pedestrian facilities on the new streets.

Lot Establishment Standards:

Lot area and lot width: There is no minimum lot area for lots in mixed-use and nonresidential zoning districts, including MM, within the TRO. The minimum lot width within the TRO is 35 feet. There is no maximum lot width for lots in mixed-use and nonresidential zoning districts within the TRO. All proposed lots have between 41 and 316 feet of frontage on public streets.

Intersection radii: Property lines corners are required to be rounded by arcs at street and alley intersections. The Plan Commission granted a waiver with primary plat approval to allow all lots to have right-angle corners to accommodate the goals of the development and in recognition that the street right-of-way designs provide adequate space for vehicle turning movements and sight lines.

Lot shape: All lots shall be designed with a depth-to-width ratio not to exceed four to one. All proposed lots comply with the required depth-to-width ratio. Some of the greenspace lots, such as lot 7, appear long and skinny. However, in the case of all of these lots the long dimension is the width along the adjacent street while the skinny dimension is the depth, meaning that their depth-to-width ratio is very small and well below the maximum of four to one.

Lot access: All new lots in the TRO shall have frontage on a public street right-of-way, per TRO section 20.02.050(b)(11)(B). All proposed lots have frontage on one of the existing or proposed public streets.

Stormwater Standards: All proposed subdivisions shall provide for the collection and management of all surface water drainage, and all subdivision requests shall include the submittal of a drainage plan to the City of Bloomington Utilities (CBU). The proposal indicates underground detention areas within greenspace lot 11. Although the proposed subdivision has not yet achieved CBU approval for the drainage plan, the plat provides enough area to meet the needs of required stormwater management facilities.

Right-of-Way Standards:

Street Layout: The proposed new streets are laid out in an orderly and logical manner, provide for pedestrian and vehicular safety, and provide direct access to existing public streets, as required by the UDO.

ROW width: West 2nd Street is designated as the General Urban street typology in the Transportation Plan, requiring an 84-foot right-of-way (42 feet from centerline). The adjacent segment of West 2nd Street is the subject of a street redesign project by the City of Bloomington Engineering Department, and plans for the West 2nd Street project show a right-of-way width requiring more than 42 feet from centerline near the intersection with South Rogers Street to accommodate turn lanes and other street infrastructure. The proposed plat dedicates additional right-of-way width along West 2nd Street to at least 42 feet from centerline per Transportation Plan guidance where the West Second Street project plans call for that much width or less, and dedicates greater width in accordance with the street project plans where those plan call for greater width. In this way, the proposed plat complies with both the Transportation Plan and the West 2nd Street project.

South Rogers Street is also designated as the General Urban street typology in the Transportation Plan, requiring an 84-foot right-of-way (42 feet from centerline). Condition 5 of the primary plat approval required 50 feet of right-of-way width from the centerline on the west side South Rogers Street between West 2nd Street and West University Street. The proposed plat dedicates additional right-of-way width along South Rogers Street to provide 50 feet from centerline north of West University Street and 42 feet ofrom centerline south of West University Street.

West 1st Street is designated as the Neighborhood Residential street typology with a 60-foot right-of-way in the Transportation Plan. The existing right-of-way of West 1st Street adjacent to the petition site is 66 feet, already more than called for in the Transportation Plan. No new right-of-way dedication is required. The proposal maintains the existing right-of-way of West 1st Street.

A new street grid for the former hospital site is identified in the Transportation Plan as part of new connection NC-45, with a Neighborhood Residential street typology and 60 feet of right-of-way width. The proposal dedicates 60 feet of new right-of-way width for South Fairview Street and South Jackson Street. As guided by the Master Plan, the proposed West University Street greenway follows a modified Shared Street typology with a 55-foot right-of-way width.

Street Trees: The minimum number of required street trees to be planted shall be one large canopy tree for every 30 feet of property that abuts a public right-of-way. The proposal shows 116 new street trees along both sides of the proposed new streets as well as along the west side of South Rogers Street, with typical spacing of 24 feet. The proposed trees are all permitted street tree species per the UDO, comprising ten species from eight different genera. In accordance with best practice and UDO requirements, no genus accounts for more than 20 percent of the street trees.

Alleys: Alleys must have a minimum 20-foot-wide right-of-way and a minimum 14-foot-wide pavement width. All alleys in the proposal show 20 feet of pavement width within 20-foot-wide rights-of-way.

Three of the proposed alleys are proposed to be dead-end alleys. Dead-end alleys are not prohibited by the UDO, but are discouraged where avoidable. One alley on the west side of the site connects with South Fairview Street but dead-ends at the west property line. The proposal shows that this alley is to be constructed as a stub alley providing the opportunity for an alley connection to the west in the future. A second alley in the northeast quadrant connects with South Fairview Street but appears to dead-end at lot 6. In fact, however, drive access will continue directly into the existing parking garage on lot 6 and the parking garage will serve as a possible turn-around for vehicles. A third alley in the southwest quadrant connects with South Jackson Street but dead-ends before it reaches Rogers Street due to the significant grade difference between the needed alley access to the Kohr building redevelopment and the level of Rogers Street below.

Street lighting: All subdivisions shall be required to have a street lighting plan approved by the City Engineering Department and submitted to the City Board of Public Works. Additionally, the street lighting plans must be accepted by the City Board of Public Works prior to secondary plat signing. In the TRO, street lighting must be pedestrian-scaled and no more than 15 feet in height. The proposal includes 49 lantern-style street lights mounted on 12-foot poles along South Rogers Street, South Jackson Street, and South Fairview Street. Along the West University Street greenway, the proposal includes 39 dual-fixture modern-style street lights mounted on 14-foot poles as well as lights strung on wires at 11 feet in height and ground lights. The street lighting plan has been submitted to the Board of Public Works for consideration of approval at the Board's meeting on June 18, 2024.

Environmental Considerations: A tree study of the larger Master Plan site was done, and no closed canopy areas were identified, though some specimen trees were located. The proposal maintains as many of the high-quality existing trees as possible. There are no other known sensitive environmental features.

Utilities: The proposal shows public water and sanitary sewer service to all lots. A utility plan must be approved by City of Bloomington Utilities (CBU) prior to secondary plat approval. The petitioner has submitted the proposed plans to CBU and is working toward approval. After secondary plat approval and recording, during development of lots in the subdivision, CBU approval will be required before any permits for development are issued for the lots in the subdivision.

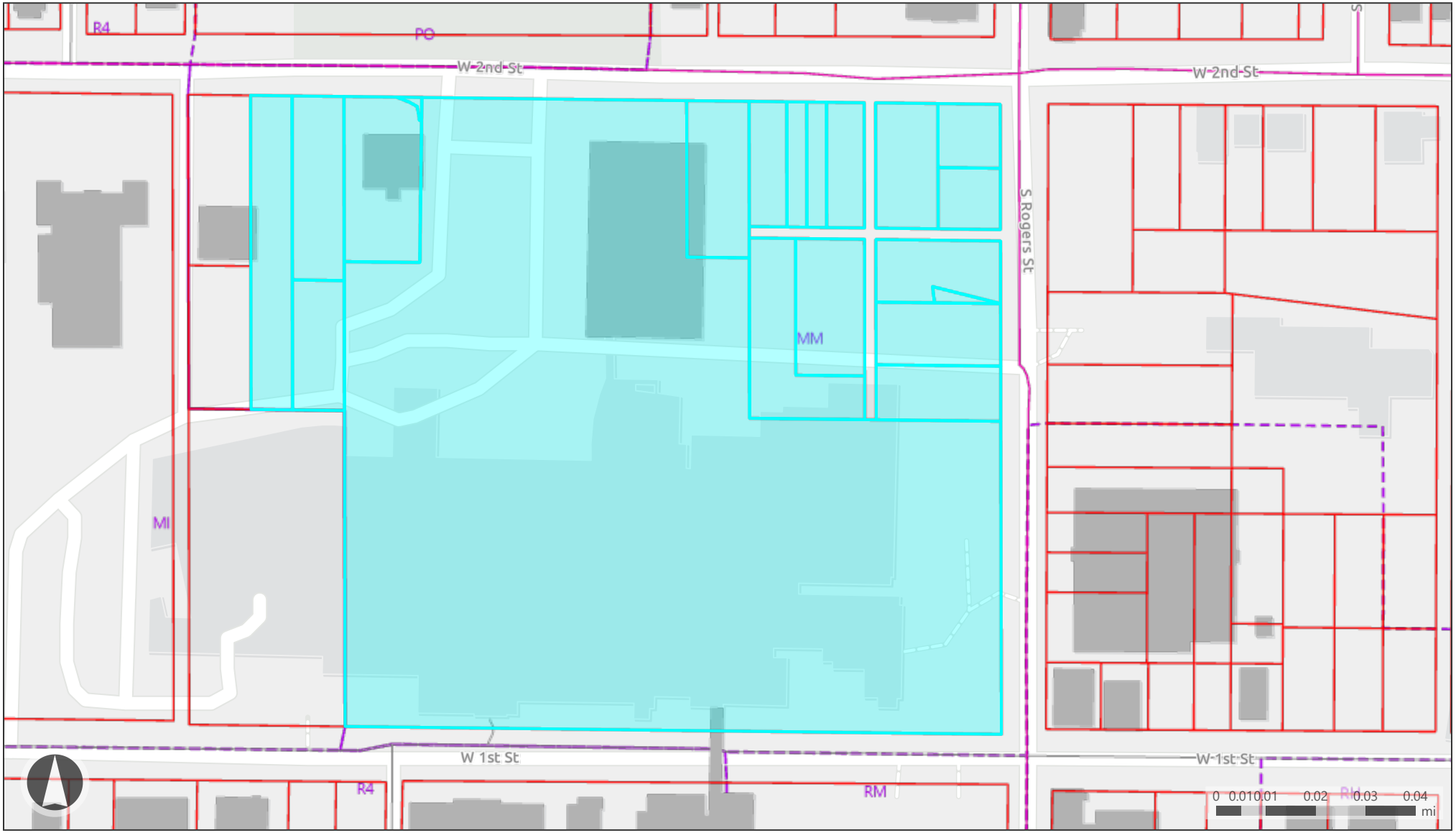
CONCLUSION: The secondary plat for the proposed subdivision complies with all standards in UDO and meets the design and conditions of the associated primary plat. As part of the redevelopment of the area included in the Bloomington Hospital Site Redevelopment Master Plan, the subdivision will set up Hopewell West with improved public ways and new amenities, as well as create new developable parcels.

RECOMMENDATION: The Planning and Transportation Department recommends that the Plat Committee approve the secondary plat of DP-23-24 / PLAT2024-05-0029.

City of Bloomington

Hopewell West

Location Map

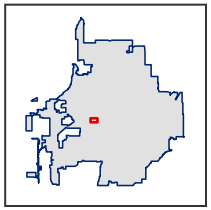


Map Legend

- Parcels
- Buildings

Street Typology

- General Urban
- Neighborhood Residential
- Zoning District Boundary

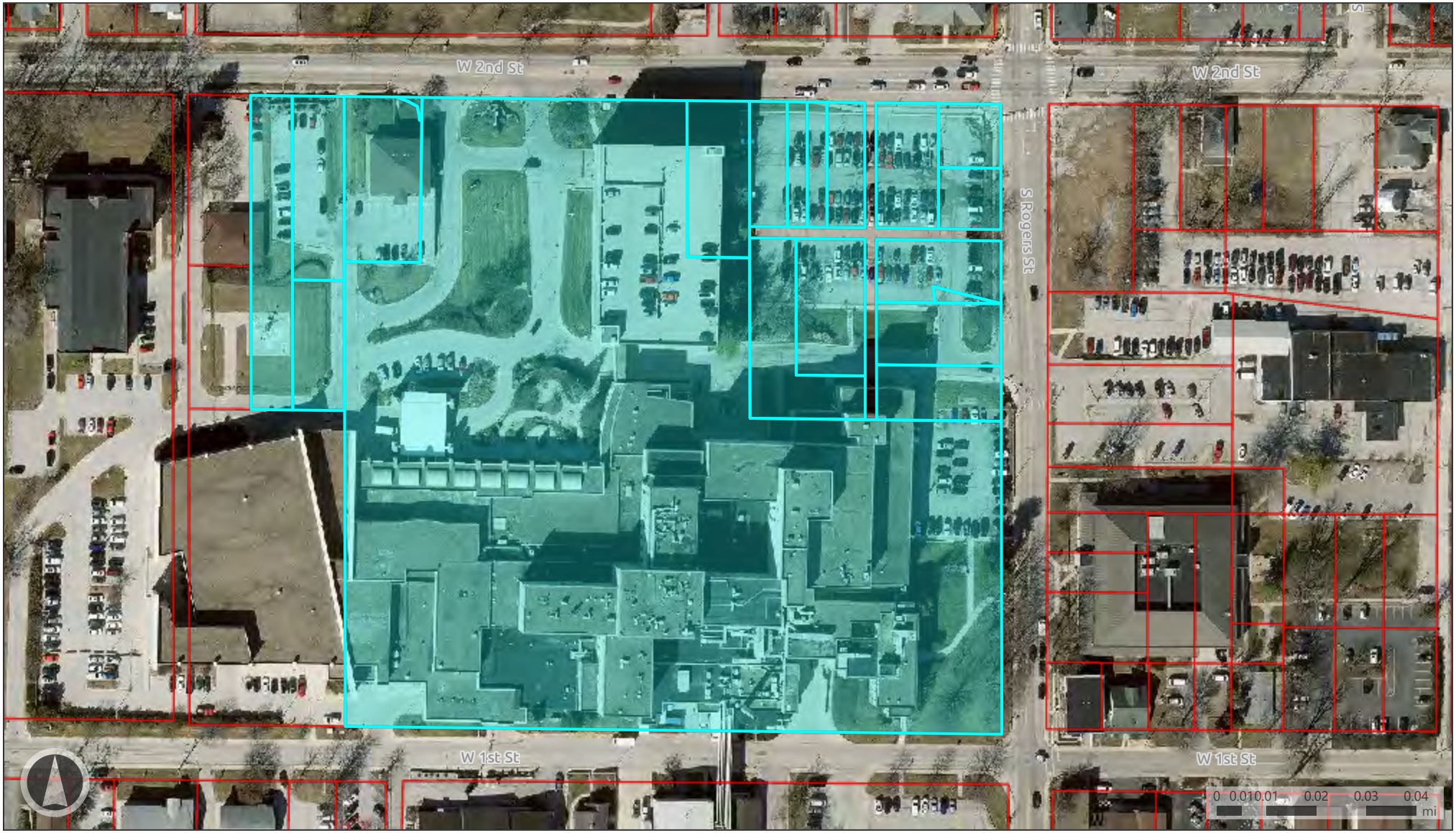


Created: 5/25/2023 *Map By: Gabriel Holbrow*

City of Bloomington

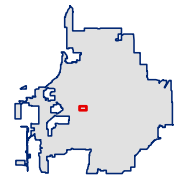
Hopewell West

Context Aerial



Map Legend

Parcels



Created: 5/25/2023 *Map By: Gabriel Holbrow*

April 19, 2024

Gabriel Holbrow, AICP
Zoning Planner
Planning & Transportation Department
City of Bloomington, Indiana

Re: Hopewell West Petitioner's Statement – Secondary Plat

Mr. Holbrow,

Please accept this letter as the Petitioner's Statement for the Hopewell West Subdivision Secondary Plat submission. CrossRoad Engineers, P.C. and the City of Bloomington Engineering Department presents this statement on behalf of the City of Bloomington Redevelopment Commission. The goal of this project is to subdivide the former Bloomington Hospital site into new streets, alleys, and lots that will facilitate redevelopment in accordance with the vision established by the community in the Bloomington Hospital Site Redevelopment Master Plan. The Kohr building and the existing parking garage on the site will be retained. Utility infrastructure and stormwater control will also be part of this project.

Primary Plat Approval was achieved on July 11, 2023. We have updated the Secondary Plat according to all conditions outlined in the Notice of Approval. As recommended by the Hopewell Development Advisory Group, we have combined lots 3-6, 9-13, and 18-26 (lot numbers as shown on the approved Primary Plat) into 3 larger lots. This provides one single lot having a depth-to-width ration not exceeding four-to-one, meeting the spirit of condition 4. Further, we wanted to note three waivers were granted. The first waiver was to allow the subdivision of a parent tract greater than three acres. The second was a waiver to allow the greenspace lots to lack alley access. The third was a waiver to allow right-angle corners of development lots at street and alley corners. The fourth and fifth waivers were alterations to tree plot and pedestrian facility widths in the right-of-way.

We thank you for your thoughtful consideration of this Secondary Plat Submission. If you have any questions or need additional information, please feel free to contact me at your convenience.

Sincerely,

Andrew J. Wolf, PE
CrossRoad Engineers, P.C.
317-780-1555 x124
awolf@crossroadengineers.com

Kendall Knoke, PE
City of Bloomington Engineering Dept.
812-339-3467
kendall.knoke@bloomington.in.gov

24-36
RESOLUTION
OF THE
REDEVELOPMENT COMMISSION
OF THE
CITY OF BLOOMINGTON INDIANA

APPROVAL OF SECONDARY PLAT FOR HOPEWELL WEST

WHEREAS, pursuant to Indiana Code 36-7-14 *et seq.*, the Redevelopment Commission of the City of Bloomington ("RDC") and the Common Council of the City of Bloomington created an economic development area known as the Consolidated Economic Development Area ("Consolidated TIF"); and

WHEREAS, in Resolution 18-10, the RDC approved a Project Review and Approval Form ("Form") which sought the support of the RDC for the purchase and redevelopment the Old Bloomington Hospital Site ("Hopewell"); and

WHEREAS, part of the redevelopment of the site includes making infrastructure improvements to the Hopewell western parcels ("Hopewell West"), which included the former main building that was IU Health Bloomington Hospital ("Project"); and

WHEREAS, in Resolution 23-48, the RDC approved a primary plat for Hopewell West; and

WHEREAS, City staff have prepared a secondary plat for Hopewell West, which is attached to this Resolution as Exhibit A; and

WHEREAS, if approved, the secondary plat will be submitted for approval to the Plat Committee of the Bloomington Plan Commission or other designee by the Plan Commission to complete the plat approval process.

NOW, THEREFORE, BE IT RESOLVED BY THE BLOOMINGTON REDEVELOPMENT COMMISSION THAT:

1. The RDC reaffirms its support of the Project and reiterates that it serves the public's best interests.

2. The RDC approves the secondary plat for Hopewell West and authorizes its submission for all necessary approvals.

3. The RDC authorizes the RDC President, or any available and duly elected RDC officer, to sign all documents necessary to record the secondary plat for Hopewell West.

BLOOMINGTON REDEVELOPMENT COMMISSION

Deborah Hutton, President

ATTEST:

Sue Sgambelluri, Secretary

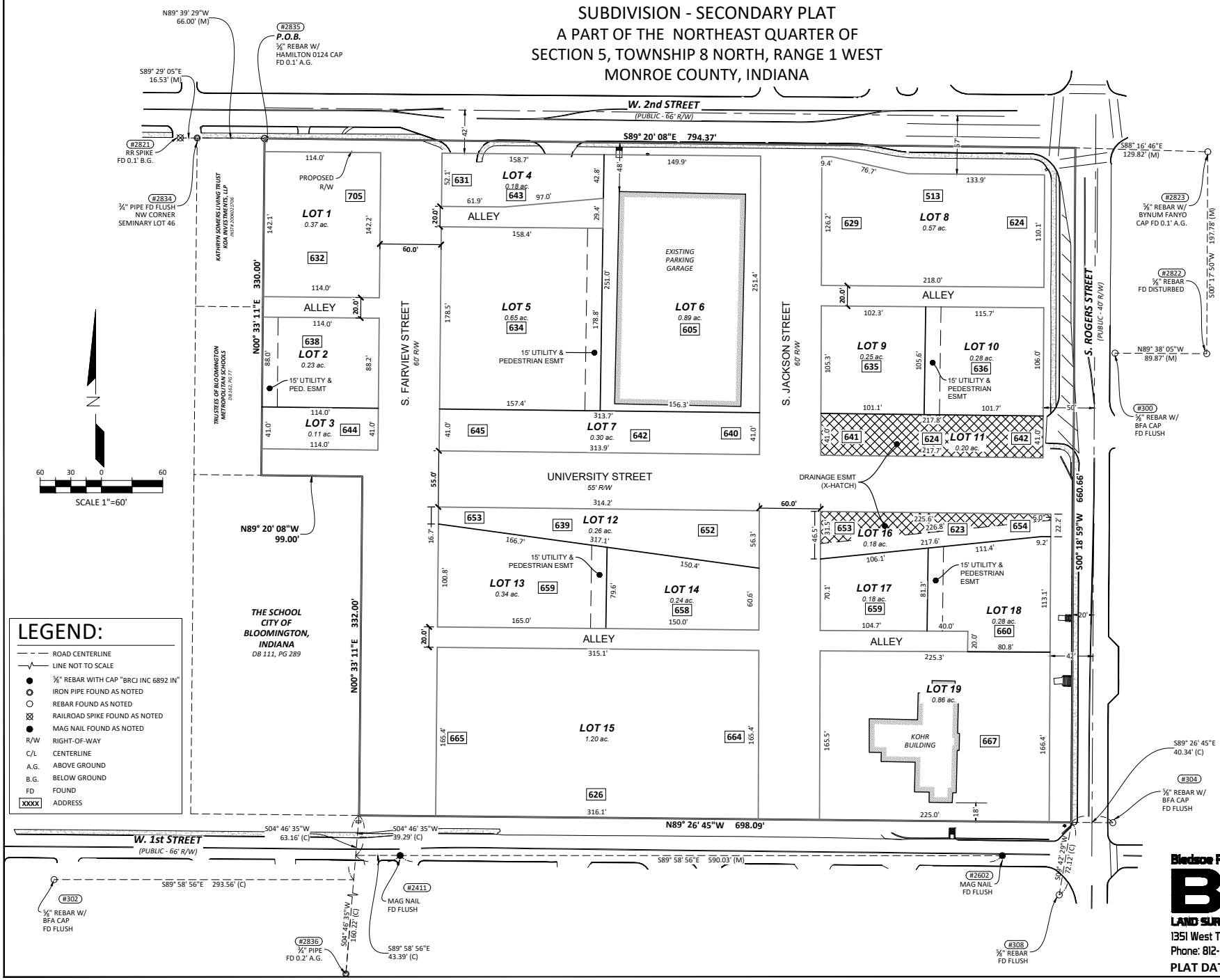
4-22-24

Date

HOPEWELL WEST

SUBDIVISION - SECONDARY PLAT

A PART OF THE NORTHEAST QUARTER OF
SECTION 5, TOWNSHIP 8 NORTH, RANGE 1 WEST
MONROE COUNTY, INDIANA



LEGEND:

- ROAD CENTERLINE
- LINE NOT TO SCALE
- ⅝" REBAR WITH CAP "BRCJ INC 6892 IN"
- IRON PIPE FOUND AS NOTED
- REBAR FOUND AS NOTED
- RAILROAD SPIKE FOUND AS NOTED
- MAG NAIL FOUND AS NOTED
- R/W RIGHT-OF-WAY
- C/L CENTERLINE
- A.G. ABOVE GROUND
- B.G. BELOW GROUND
- FD FOUND
- XXXX ADDRESS

OWNER/DEVELOPER:
City of Bloomington Redevelopment Commission
401 North Morton Street, Suite 210
Bloomington, Indiana 47402
Phone: 812-349-3420

RECORD INFORMATION:
City of Bloomington Redevelopment Commission
INST# 2024000173
53-08-05-100-057.000-009,
53-08-05-100-058.000-009,
53-08-05-100-059.000-009,
53-08-05-100-119.000-009,
53-08-05-100-120.000-009,
53-08-05-100-127.000-009,
53-08-05-100-132.000-009,
53-08-05-115-012.000-009

ZONING:
Subject: MM/TRO
Adjoiners: MM, MI/TRO

TRANSFORM REDEVELOPMENT OVERLAY (TRO) SETBACKS:
FRONT = 0 TO 15 FEET
SIDE = 0 FEET (5' ABUTTING RESIDENTIAL ZONING)
REAR = 0 FEET (25' ABUTTING RESIDENTIAL ZONING)

FLOOD ZONE:
PROPERTY IS LOCATED IN FLOOD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.) PER FEMA FLOOD INSURANCE RATE MAP NUMBER 18105C0141D, DATED DECEMBER 17, 2010.

NOTES:

1. FIELD WORK PERFORMED MAY 3-12, 2023.
2. ⅝ INCH REBAR WITH YELLOW PLASTIC CAP STAMPED "BRCJ, INC 6892 IN" TO BE SET AT ALL LOT CORNERS.
3. THE BASIS OF BEARINGS ON THIS SURVEY IS THE MONROE COUNTY ZONE OF THE INDIANA GEOSPACIAL COORDINATE SYSTEM (InGCS), NAD83 (2011).
4. ALL LOTS, NUMBERED 1 THROUGH 8, SHOWN ON THE PLAT OF ST. CLAIR'S SUB-DIVISION OF PARTS OF SEMINARY LOTS 37 AND 46 AND AS FOUND IN PLAT CABINET B, ENVELOPE 9 IN THE MONROE COUNTY RECORDER'S OFFICE ARE HEREBY VACATED.
5. ALL ALLEYS SHOWN ON THE PLAT OF ST. CLAIR'S SUB-DIVISION OF PARTS OF SEMINARY LOTS 37 AND 46 AND AS FOUND IN PLAT CABINET B, ENVELOPE 9 IN THE MONROE COUNTY RECORDER'S OFFICE HAVE BEEN VACATED PER DOCUMENT No. 2023012648.

Bledsoe Riggert Cooper James
BRCJ
LAND SURVEYING • CIVIL ENGINEERING • GIS
1351 West Tapp Road Bloomington, Indiana 47403
Phone: 812-336-8277 Email: cporter@brcjcivil.com

PLAT DATED: May 28, 2024 JOB # 11335

HOPEWELL WEST
SUBDIVISION - SECONDARY PLAT
A PART OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 8 NORTH, RANGE 1 WEST MONROE COUNTY, INDIANA

LEGAL DESCRIPTION

A part of Seminary Lots 37 and 46 and St. Clair's Subdivision of parts of Seminary Lots 37 and 46 in the City of Bloomington, Monroe County, Indiana, and more particularly described by Christopher L. Porter, LS21200022, on May 15, 2023, as part of Bledsoe Riggert Cooper James, Inc. Job Number 11335, as follows:

Commencing at a 3/4-inch diameter iron pipe marking the northwest corner of Seminary Lot 46; thence along the north line of said Lot 46 SOUTH 89 degrees 39 minutes 29 seconds EAST a distance of 66.00 feet to a 5/8-inch diameter rebar with cap and the Point of Beginning; thence continuing along said north line SOUTH 89 degrees 20 minutes 08 seconds EAST a distance of 794.37 feet to the northeast corner of Lot 1 of St. Clair's Subdivision as recorded in Plat Book 15, Page 65 in the Monroe County Recorder's office and the west right of way line of Rogers Street; thence along said right of way line SOUTH 00 degrees 18 minutes 59 seconds WEST a distance of 660.66 feet to the north right of way line of First Street; thence along said right of way line NORTH 89 degrees 26 minutes 45 seconds WEST a distance of 698.09 feet to the east line of Deed Book 111, Page 289 in said Recorder's office; thence along the east line of said Deed Book NORTH 00 degrees 33 minutes 11 seconds EAST a distance of 332.00 feet; thence NORTH 89 degrees 20 minutes 08 seconds WEST a distance of 99.00 feet to the southeast corner of Deed Book 162, Page 77; thence along the east line of said Deed Book and the east line of Instrument Number 2004021706 NORTH 00 degrees 33 minutes 11 seconds EAST a distance of 330.00 feet to the point of beginning, containing 11.33 acres, more or less.

This description includes the platted alleys in St. Clair's Subdivision.

REPORT OF SURVEY

In accordance with Title 865, 1-12-1 through 1-12-30 of the Indiana Administrative Code, the following observations and opinions are submitted regarding the various uncertainties in the locations of the lines and corners established on this survey as a result of:

(a) Reference monuments of record
(b) Title documents of record
(c) Evidence of active lines of occupation
(d) Relative Positional Accuracy "RPA"

The Relative Positional Accuracy "RPA" (due to random errors in measurement) of this survey is within that allowable for an Urban survey (0.07 feet (21 millimeters) plus 50 parts per million) as defined in IAC, Title 865 ("Relative Positional Accuracy" means the value expressed in feet or meters that represents the uncertainty due to random errors in measurements in the location of any point on a survey relative to any other point on the same survey at the 95 percent confidence level.).

In regard to "ACTIVE LINES OF OCCUPATION", point (c) above: ACTIVE refers to lines which are marked by visible, obvious, well defined and maintained, man-made or placed objects, such as, but not limited to, fences, hedges and retaining walls. The uncertainty cited for a line of occupation is general in nature and is NOT intended to be specific for every point along the line. Therefore, portions of the occupation line may vary from the surveyed line by a distance greater or less than uncertainty cited in this report.

This is a partial Retracement Survey and an Original Survey performed at the request of the City of Bloomington Redevelopment Commission.

The surveyed property was in the name of Bloomington Hospital, Inc. (Deed Book 364, Page 240, Instrument No. 2004018581 and Instrument Number 2010019969) at the time the field work was conducted, and when the legal description and report of survey were written. At the time of certification of this plat, the property is in the name of The City of Bloomington, Indiana, by and through the Bloomington Redevelopment Commission (Instrument No. 2024000173).

The field work was performed May, 2023.

SURVEYS & PLATS OF RECORD:

1. ALTA/NSPS Land Title Survey for Indiana University Health, Inc. by Terry D. Wright, Hamilton Designs Job Number 2018-147, dated May 25, 2018, provided by Indiana University Health, Inc.
2. Plat of Seminary Square and Lots, found in Plat Cabinet B, Envelope 5 in the Monroe County Recorder's office.
3. Plat of St. Claire's Subdivision of Parts of Seminary Lots 37 and 46, found in Plat Cabinet B, Envelope 9 in said Recorder's office.
4. Survey of Seminary Lots 11, 12, 13, 14 and Part of Lot 10 and Part of Seminary Lot 37 by Charles D. Graham, found recorded as Instrument Number 2021024040 in said Recorder's Office.

MONUMENTS FOUND:

300. A 5/8-inch diameter rebar with Bynum Fanyo Associates cap was found flush with grade. This monument is shown as number 500 on the Graham survey.
302. A 5/8-inch diameter rebar with Bynum Fanyo Associates cap was found flush with grade. This monument is shown on the Hamilton survey as the northwest corner of Tract 6, PCL 3 per Deed Record 371, Page 479.
304. A 5/8-inch diameter rebar with Bynum Fanyo Associates cap was found flush with grade. This monument is shown as number 504 on the Graham survey.
308. A 5/8-inch diameter rebar with illegible cap was found flush with grade. The origin of this monument is unknown.
2821. A railroad spike was found 0.1 foot below grade. The origin of this monument is unknown.
2822. A 5/8-inch diameter rebar was found disturbed. This monument is shown as number 501 on the Graham survey.
2823. A 5/8-inch diameter rebar with Bynum Fanyo Associates cap was found 0.1 foot above grade. This monument is shown as number 502 on the Graham survey.
2834. A 3/4-inch diameter iron pipe was found flush with grade and accepted as the northwest corner of Seminary Lot 46 per survey 1.
2835. A 5/8-inch diameter rebar with Hamilton 0124 cap was found 0.1 foot above grade and accepted as the northwest corner of Instrument Number 2004018581 per survey 1.
2836. A 3/4-inch diameter iron pipe was found 0.2 feet above grade. This monument is shown on the Hamilton survey as the southeast corner of Tract 6, PCL 2 per Deed Record 371, Page 478.

DEED ANALYSIS:

No discrepancies were found when comparing the legal descriptions for the western adjoiners with the Bloomington Hospital, Inc. descriptions.

ESTABLISHMENT OF LINES AND CORNERS:

Monument 2835 as held for the geometry shown on the Hamilton survey. Said geometry was then rotated to monument 2836 to establish the perimeter lines of the Bloomington Hospital, Inc. parcels.

As a result of the above observations, it is my opinion that the uncertainties in the location of the lines and corners established on this survey are as follows:

Due to Availability and condition of reference monuments: Up to 1.5 feet when comparing the distance between monuments 2835 and 2836 calculated per the Hamilton survey with the measured distance.

Due to Occupation or possession lines: No discrepancies noted.

Due to Clarity or ambiguity of the record description used and of adjoiners' descriptions and the relationship of the lines of the subject tract with adjoiners' lines: No discrepancies noted.

EASEMENT DEFINITIONS

Drainage Easements: (A) Shall be required for any surface swales or other minor drainage improvements that are intended to serve the lots on which they are located. (B) Shall prohibit any alteration within the easement that would hinder or redirect flow. (C) Shall provide that the owner of the lot on which the easement is placed shall be responsible for maintenance of the drainage features within such easement. (D) Shall be enforceable by the City utilities department and by owners of properties that are adversely affected by conditions within the easement. (E) Shall allow the City utilities department to enter upon the easement for the purpose of maintenance, to charge the costs of such maintenance to the responsible parties, to construct drainage facilities within the easement, and to assume responsibility for the drainage features at its discretion.

Utility Easements: (A) Shall allow both private and public utility providers access associated with the installation, maintenance, repair, or removal of utility facilities. (B) Prohibits the placement of any unauthorized obstruction within the easement area unless authorized by the City utilities department and the easement holder(s).

Pedestrian Easements: (A) Grants the general public the right to access the pedestrian easement for purposes of walking, running, bicycling, skating, or using small motorized and non-motorized vehicles approved by the City. (B) Grants the City the right to construct, alter, repair, maintain, or remove improvements within the easement area. (C) Prohibits the placement of any obstruction within the pedestrian easement.

OWNER CERTIFICATION

City of Bloomington Redevelopment Commission, Owner of the real estate shown and described herein, does hereby certify, layoff, and plat (19) tracts, numbered 1-19.

Rights-of-way not heretofore dedicated are hereby dedicated to the public. In accordance with this plat and certificate, this plat shall be known as Hopewell West Subdivision.

IN WITNESS WHEREOF, the undersigned Owner set their hand and seal this_____ day of

_____, 2024.

_____
Deborah Hutton, President
City of Bloomington Redevelopment Commission

STATE OF INDIANA COUNTY OF MONROE

Before me, a Notary Public in and for said County and State, personally appeared City of Bloomington Redevelopment Commission, owner, who acknowledged the execution of the above referenced plat, to be their voluntary act for the uses and purposes therein set forth.

WITNESS my hand and Notarial Seal this ____day of _____,2024.

_____
Notary Public (Signature)

_____
Notary Public (Printed Name)

My Commission Expires:_____

My County of Residence:_____

PLAN COMMISSION AND BOARD OF PUBLIC WORKS

Under the authority provided by Chapter 174, Acts of 1947, enacted by the General Assembly of the State of Indiana and ordinance adopted by the Common Council of the City of Bloomington, Indiana, this plat was given approval by the City of Bloomington as follows:

APPROVED BY THE PLAT COMMITTEE AT A MEETING HELD: _____, 2024

_____
Director of Planning & Transportation Department

SURVEYOR'S CERTIFICATION

This survey was executed according to survey requirements contained in Section 1 through 19 of 865 IAC 1-12.

This certification does not take into consideration additional facts that an accurate and correct title search and/or examination might disclose.

Evidence of easements have not been located in the field and are not shown on this survey drawing.

Subject to the above reservation, I hereby certify that the survey work performed on the project shown hereon was performed either by me or under my direct supervision and control and that all information shown is true and correct to the best of my knowledge and belief.

Certified this 28th day of May, 2024.

Christopher L. Porter
Professional Surveyor No. LS21200022
State of Indiana

CHRISTOPHER L. PORTER REGISTERED No. LS21200022 STATE OF INDIANA LAND SURVEYOR

Bledsoe Riggert Cooper James
BRCJ
LAND SURVEYING • CIVIL ENGINEERING • GIS
1351 West Tapp Road Bloomington, Indiana 47403
Phone: 812-336-8277 Email: cporter@brcjcivil.com

PLAT DATED: May 28, 2024 JOB # 11335

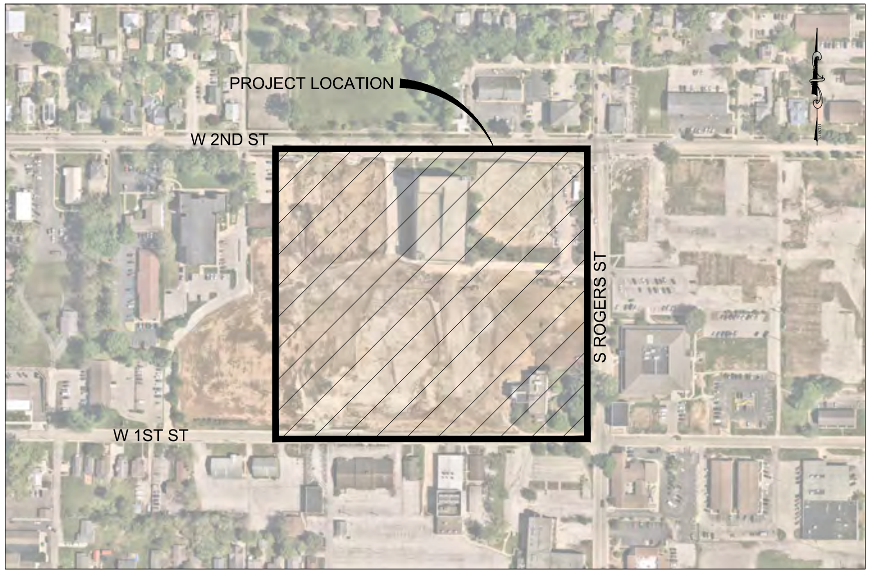
60% CONSTRUCTION PLANS

HOPEWELL INFRASTRUCTURE & SITE WEST

BLOOMINGTON, INDIANA

VICINITY MAP

NO SCALE



LOCATION MAP

NO SCALE

PLAN INDEX	
SHEET #	SUBJECT
100	TITLE SHEET & INDEX
200	TYPICAL SECTIONS
300	TOPOGRAPHIC SURVEY
400–405	SITE PLANS
500	GRADING PLAN
501	INTERSECTION GRADING PLAN
600–605	ROAD PLAN & PROFILE
700	DETENTION BASIN PLAN
800–804	MISCELLANEOUS DETAILS
E101–E103	ELECTRICAL PLANS
LA101–LA102	LANDSCAPE LAYOUT
LA201–LA202	LANDSCAPE GRADING
LA301–LA304	LANDSCAPE PLANS
XS1–XS10	S FAIRVIEW ST. CROSS SECTIONS
XS11–XS24	S JACKSON ST. CROSS SECTIONS
XS25–XS34	W UNIVERSITY ST. CROSS SECTIONS
XS35–XS44	S ROGERS ST. CROSS SECTIONS
XS45–XS49	"F&J ALLEY" CROSS SECTIONS
XS50–XS53	"F EAST ALLEY" CROSS SECTIONS
XS54–XS57	"J EAST ALLEY" CROSS SECTIONS

UTILITY CONTACTS

Note: Listed below are the Indiana Underground Plant Protection Services Contacts; Others not listed may exist. The underground utilities shown have been located from field survey information and existing drawings. The surveyor makes no guarantees that the underground utilities comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated although the surveyor does certify that they are located as accurately as possible from information available. The surveyor has not physically located the underground utilities.

UTILITY	COMPANY	CONTACT	PHONE	EMAIL
COMMUNICATIONS	AT&T INDIANA BELL	ANDY MULLIS	(812)–334–4597	am5495@att.com
COMMUNICATIONS	COMCAST	SCOTT TEMPLETON	(812)–332–4152	scott_templeton@comcast.com
COMMUNICATIONS	ITS	DIRECTOR	(812)–349–3454	–
COMMUNICATIONS	TCI OF INDIANA	–	(812)–332–9185	–
ELECTRIC	DUKE ENERGY	BRANDON WILSON	(812)–336–6371	brandon.wilson2@duke–energy.com
SANITARY & WATER	UTILITIES DEPARTMENT	UTILITY ENGINEER	(812)–339–1444	–
GAS	CENTERPOINT GAS	SUPERINTENDENT	(812) 330–4008	publicproject@centerpointenergy.com
FIRE & AMBULANCE	BLOOMINGTON FIRE DEPARTMENT	FIRE CHIEF	(812)–332–9763	–
POLICE	BLOOMINGTON POLICE DEPT.	CHIEF DIEKOFF	(812)–349–4477	–
UTILITIES	BOARD OF PUBLIC WORKS	ADAM WASON	(812)–349–3410	–

INDIANA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS DATED 2024 TO BE USED WITH THESE PLANS.

CONSTRUCTION SPECIFICATIONS FOR CITY OF BLOOMINGTON UTILITIES (LATEST EDITION) SHALL BE USED FOR ALL WASTEWATER, WATER AND STORM INFRASTRUCTURE

OWNER/DEVELOPER

CITY OF BLOOMINGTON
401 N. MORTON ST.
BLOOMINGTON, IN 47404
PHONE: (812) 349-3913
CONTACT: KENDALL KNOKE
EMAIL: kendall.knoke@bloomington.in.gov

LEGAL DESCRIPTION

INSTRUMENT #2024000173

A PART OF SEMINARY LOTS 37 AND 46 AND ST. CLAIR'S SUBDIVISION OF PARTS OF SEMINARY LOTS 37 AND 46 IN THE CITY OF BLOOMINGTION, MONROE COUNTY, INDIANA, AND MORE PARTICULARLY DESCRIBED BY CHRISTOPHER L. PORTER, LS21200022, ON MAY 15, 2023, AS PART OF BLEDSOE RIGGERT COOPER JAMES, INC. JOB NUMBER 11335, AS FOLLOWS:

COMMENCING AT A ¾–INCH DIAMETER IRON PIPE MARKING THE NORTHWEST CORNER OF SEMINARY LOT 46; THENCE ALONG THE NORTH LINE OF SAID LOT 46 SOUTH 89 DEGREES 39 MINUTES 29 SECONDS EAST A DISTANCE OF 66.00 FEET TO A 5/8–INCH DIAMETER REBAR WITH CAP AND THE POINT OF BEGINNING; THENCE CONTINUING ALONG SAID NORTH LINE SOUTH 89 DEGREES 20 MINUTES 08 SECONDS EAST A DISTANCE OF 794.37 FEET TO THE NORTHEAST CORNER OF LOT 1 OF ST. CLAIR'S SUBDIVISION AS RECORDED IN PLAT BOOK 15, PAGE 65 IN THE MONROE COUNTY RECORDER'S OFFICE AND THE WEST RIGHT OF WAY LINE OF ROGERS STREET; THENCE ALONG SAID RIGHT OF WAY LINE SOUTH 00 DEGREES 18 MINUTES 59 SECONDS WEST A DISTANCE OF 660.66 FEET TO THE NORTH RIGHT OF WAY LINE OF FIRST STREET; THENCE ALONG SAID RIGHT OF WAY LINE NORTH 89 DEGREES 26 MINUTES 45 SECONDS WEST A DISTANCE OF 698.09 FEET TO THE EAST LINE OF DEED BOOK 111, PAGE 289 IN SAID RECORDER'S OFFICE; THENCE ALONG THE EAST LINE OF SAID DEED BOOK NORTH 00 DEGREES 33 MINUTES 11 SECONDS EAST A DISTANCE OF 332.00 FEET; THENCE NORTH 89 DEGREES 20 MINUTES 08 SECONDS WEST A DISTANCE OF 99.00 FEET TO THE SOUTHEAST CORNER OF DEED BOOK 162, PAGE 77; THENCE ALONG THE EAST LINE OF SAID DEED BOOK AND THE EAST LINE OF INSTRUMENT NUMBER 2004021706 NORTH 00 DEGREES 33 MINUTES 11 SECONDS EAST A DISTANCE OF 330.00 FEET TO THE POINT OF BEGINNING, CONTAINING 11.33, ACRES MORE OR LESS.

FLOODPLAIN INFORMATION

BY GRAPHIC PLOTTING ONLY, THIS TRACT OF LAND DESCRIBED HEREON LIES WITHIN ZONE 'X' (AREAS OUTSIDE THE 500–YEAR FLOODPLAIN) AND IS NOT IN A SPECIAL FLOOD HAZARD AREA AS PLOTTED ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP FOR MONROE COUNTY, INDIANA, COMMUNITY PANEL NO. 18105C0141D, WHICH BEARS AN EFFECTIVE DATE OF 12/17/2010.

ENGINEER

CROSSROAD ENGINEERS, PC
115 N. 17TH AVENUE
BEECH GROVE, IN 46107
PHONE: (317) 780-1555
CONTACT: ANDREW J. WOLF
EMAIL: awolf@crossroadengineers.com

LANDSACAPE ARCHITECT

RUNDELL ERNSTBERGER ASSOCIATES
618 EAST MARKET STREET
INDIANAPOLIS, IN 46202
PHONE: (317) 263-0127
CONTACT: CECIL PENLAND, PLA, ASLA
EMAIL: cpenland@reasite.com

TRAFFIC DATA	S FAIRVIEW ST	S JACKSON ST	W UNIVERSITY ST	ALLEYS	S ROGERS ST
A.A.D.T. (2022)	- V.P.D.	- V.P.D.	- V.P.D.	- V.P.D.	8,553 V.P.D.
A.A.D.T. (2042)	- V.P.D.	- V.P.D.	- V.P.D.	- V.P.D.	- V.P.D.
D.H.V (2042)	- V.P.H.	- V.P.H.	- V.P.H.	- V.P.H.	- V.P.H.
DIRECTIONAL DISTRIBUTION	- POS.	- POS.	- POS.	- POS.	- POS.
TRUCKS	- A.A.D.T.	- A.A.D.T.	- A.A.D.T.	- A.A.D.T.	- A.A.D.T.
	- D.H.V.	- D.H.V.	- D.H.V.	- D.H.V.	- D.H.V.
DESIGN DATA					
DESIGN SPEED	20 M.P.H.	20 M.P.H.	20 M.P.H.	20 M.P.H.	25 M.P.H.
PROJECT DESIGN CRITERIA	NEW CONSTRUCTION	NEW CONSTRUCTION	NEW CONSTRUCTION	NEW CONSTRUCTION	3R
FUNCTIONAL CLASSIFICATION	LOCAL (NEIGHBORHOOD RES.)	LOCAL (NEIGHBORHOOD RES.)	LOCAL (SHARED STREET)	LOCAL (ALLEY)	SECONDARY ARTERIAL (GENERAL URBAN STREET)
RURAL/URBAN	URBAN (BUILT-UP)	URBAN (BUILT-UP)	URBAN (BUILT-UP)	URBAN (BUILT-UP)	URBAN (BUILT-UP)
TERRAIN	ROLLING	ROLLING	ROLLING	ROLLING	ROLLING
ACCESS CONTROL	NONE	NONE	NONE	NONE	NONE

CROSSROAD ENGINEERS, PC
TRANSPORTATION & DEVELOPMENT CONSULTANTS

SHEET 100

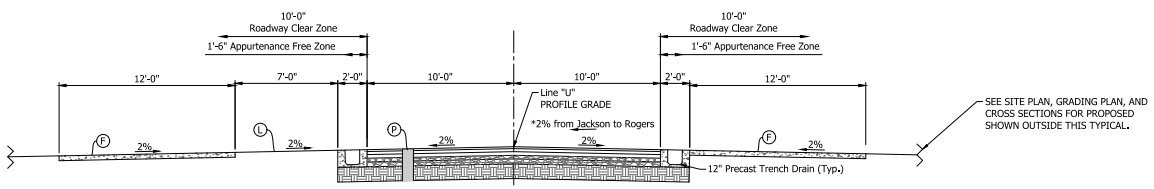
TITLE SHEET & INDEX

BLOOMINGTON HOPEWELL WEST

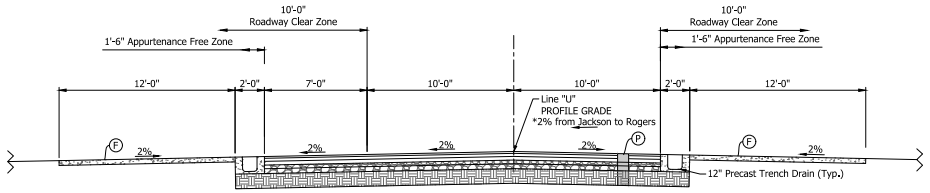
HORIZ. SCALE | VERT. SCALE
CHECKED MAM | APPR. AJW
DRAWN DEP | DESIGNED AJW
JOB No. - | DATE SEPTEMBER 28, 2024

60% PLANS
NOT FOR
CONSTRUCTION

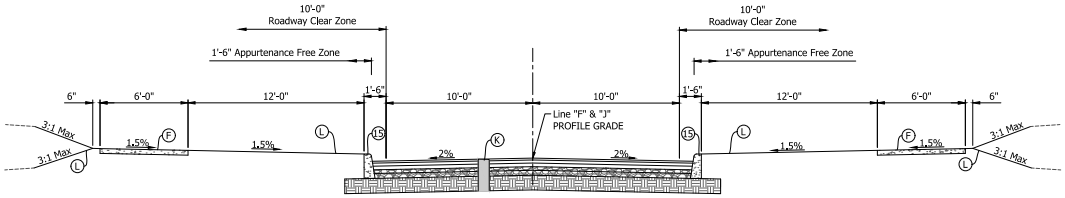
SHEET 100



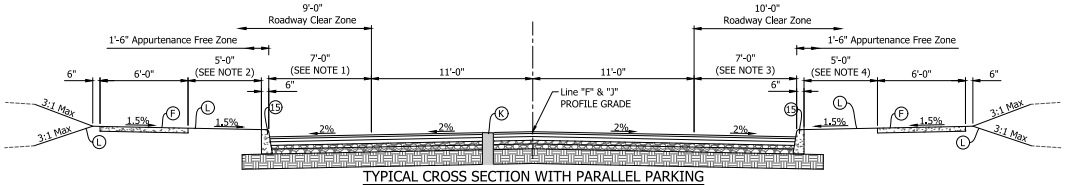
TYPICAL CROSS SECTION WITHOUT PARALLEL PARKING
WEST UNIVERSITY STREET



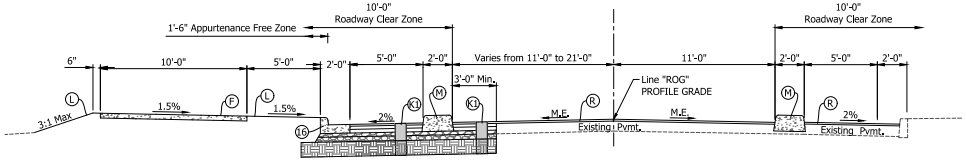
TYPICAL CROSS SECTION WITH PARALLEL PARKING
WEST UNIVERSITY STREET



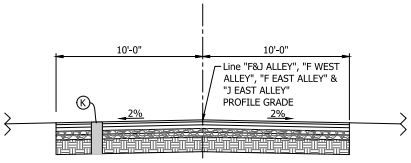
TYPICAL CROSS SECTION WITHOUT PARALLEL PARKING
SOUTH FAIRVIEW STREET & SOUTH JACKSON STREET



TYPICAL CROSS SECTION WITH PARALLEL PARKING
SOUTH FAIRVIEW STREET & SOUTH JACKSON STREET



TYPICAL CROSS SECTION
SOUTH ROGERS STREET



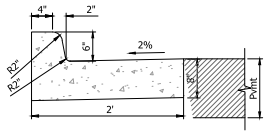
TYPICAL ALLEY CROSS SECTION

NOTES

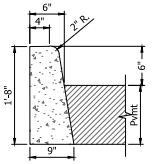
1. 12'-0" FROM STA 24+21 F TO STA 24+45 F
   12'-0" FROM STA 12+40 J TO STA 12+64 J
2. 0'-0" FROM STA 24+21 F TO STA 24+45 F
   0'-0" FROM STA 12+40 J TO STA 12+64 J
3. 12'-0" FROM STA 22+82 F TO STA 23+06 F
   12'-0" FROM STA 12+40 J TO STA 12+64 J
4. 0'-0" FROM STA 22+82 F TO STA 23+06 F
   0'-0" FROM STA 12+40 J TO STA 12+64 J

LEGEND

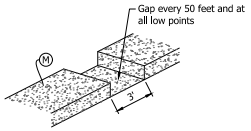
- (F) Sidewalk, Concrete, 4 in.
- (M) Concrete Center Curb, Type 'D'
- (15) Concrete Curb, Barrier
- (16) Combined Concrete Curb and Gutter
- (K) Full Depth Pavement
  1.5" (165 lb/sy) QC/QA-HMA, 2, 64, Surface, 9.5 mm on
  2.5" (275 lb/sy) QC/QA-HMA, 2, 64, Intermediate, 19.0 mm on
  3" (330 lb/sy) QC/QA-HMA, 2, 64, Base, 19.0 mm on
  3" Compacted Aggregate, No. 8 on
  4" Compacted Aggregate, No, 53 on
  Geotextile, Type IA on
  Subgrade Treatment, Type IC *
  *Where bedrock is encountered, Subgrade Treatment, Type II may be used in lieu of Subgrade Treatment, Type IC
- (K1) Full Depth Pavement
  1.5" (165 lb/sy) QC/QA-HMA, 2, 64, Surface, 9.5 mm on
  2.5" (275 lb/sy) QC/QA-HMA, 2, 64, Intermediate, 19.0 mm on
  4" (440 lb/sy) QC/QA-HMA, 2, 64, Base, 25.0 mm on
  6" Compacted Aggregate, No, 53 on
  Subgrade Treatment, Type IC *
  *Where bedrock is encountered, Subgrade Treatment, Type II may be used in lieu of Subgrade Treatment, Type IC
- (R) Mill & Overlay Pavement
  1.5" (165 lb/sy) QC/QA-HMA, 2, 64, Surface, 9.5 mm on
  Surface Milling, 1.5"
- (L) See Landscape Sheets



COMBINED CONCRETE CURB AND GUTTER DETAIL
Not to Scale



CONCRETE BARRIER CURB DETAIL
Not to Scale



CONCRETE CENTER CURB GAP DETAIL
Not to Scale

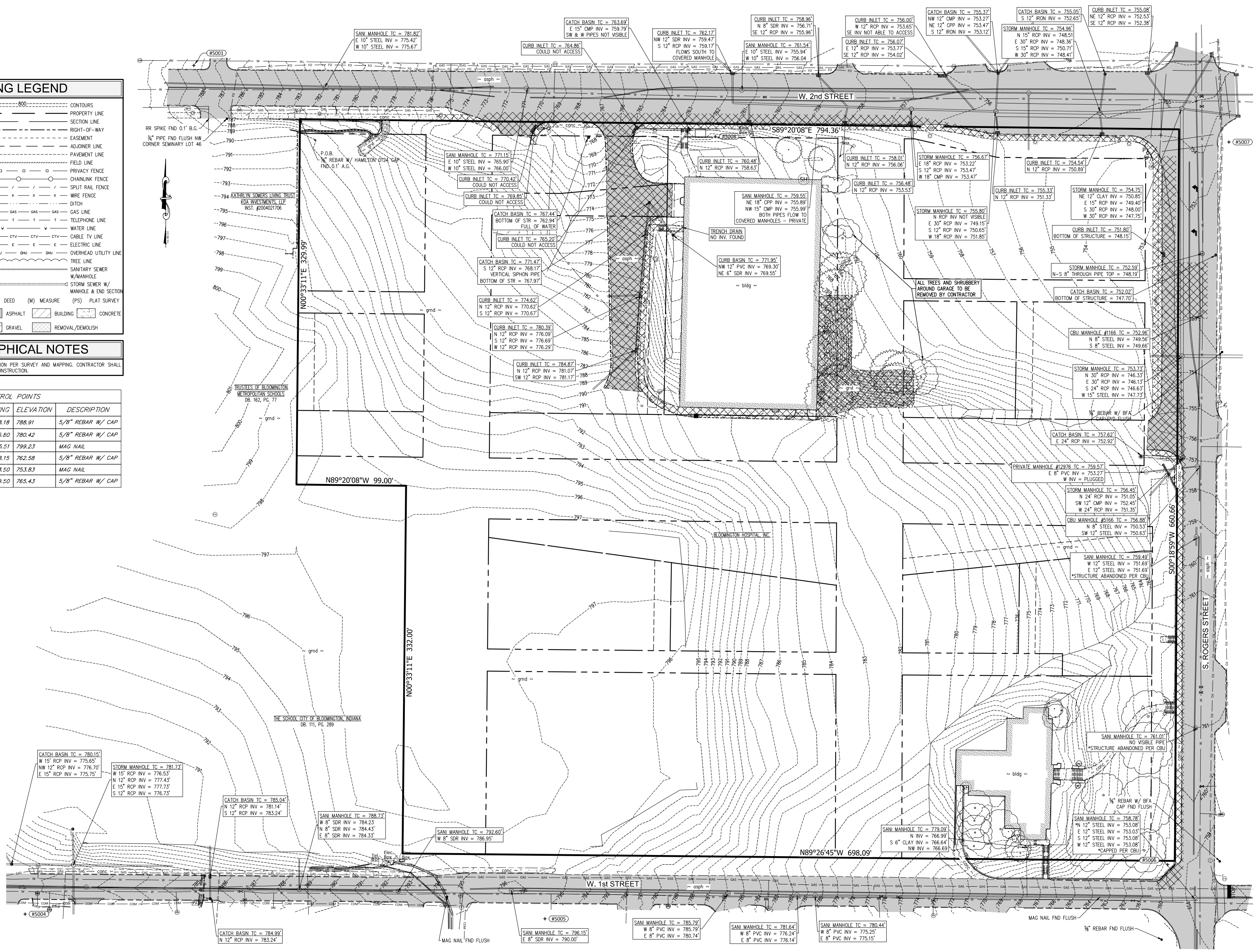
TYPICAL CROSS SECTIONS

BLOOMINGTON HOPEWELL WEST

JOB No.	.	DRAWN	DEP	CHECKED	MAM	HORZ. SCALE	1/4" = 1'-0"
DATE	SEPTEMBER 28, 2024	DESIGNED	AJW	APPR.	AJW	VERT. SCALE	N/A

60% PLANS
NOT FOR
CONSTRUCTION

SHEET 200



EXISTING LEGEND

POWERPOLE	CONTOURS
POWERPOLE W/RISER	PROPERTY LINE
POWERPOLE W/LIGHT	SECTION LINE
LIGHT POLE	RIGHT-OF-WAY
ELECTRIC METER	EASEMENT
ELECTRIC BOX	ADJOINER LINE
YARD LIGHT	PAVEMENT LINE
GUIDE WIRE	FIELD LINE
TELEPHONE MANHOLE	PRIVACY FENCE
TELEPHONE RISER	CHAINLINK FENCE
WATER VALVE	SPLIT RAIL FENCE
FIRE HYDRANT	WIRE FENCE
WELL	DITCH
WATER MANHOLE	GAS LINE
WATER METER	TELEPHONE LINE
GAS VALVE	WATER LINE
GAS VALVE	CABLE TV LINE
CABLE TV RISER	ELECTRIC LINE
CLEANOUT	OVERHEAD UTILITY LINE
SIGN	TREE LINE
MAILBOX	SANITARY SEWER W/MANHOLE
STORM ROUND INLET	
STORM CURB INLET	STORM SEWER W/ MANHOLE & END SECTION
RIGHT-OF-WAY MARKER	
TREE, BUSH & STUMP	(D) DEED (M) MEASURE (PS) PLAT SURVEY
TEMP. BENCHMARK	ASPHALT, BUILDING, CONCRETE
MONUMENT FOUND	GRAVEL, REMOVAL/DEMOLISH

TOPOGRAPHICAL NOTES

1. UTILITIES ARE GRAPHICAL REPRESENTATION PER SURVEY AND MAPPING. CONTRACTOR SHALL FIELD VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION.

CONTROL POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
5001	195140.09	775528.18	788.91	5/8" REBAR W/ CAP
5004	194373.68	775375.80	780.42	5/8" REBAR W/ CAP
5005	194369.46	775845.51	799.23	MAG NAIL
5006	194418.39	776408.15	762.58	5/8" REBAR W/ CAP
5007	195070.92	776463.50	753.83	MAG NAIL
5008	195075.95	775999.50	765.43	5/8" REBAR W/ CAP

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115 N 17th AVENUE, BEECH GROVE, IN 46107 (317) 780-1555

TOPOGRAPHIC SURVEY

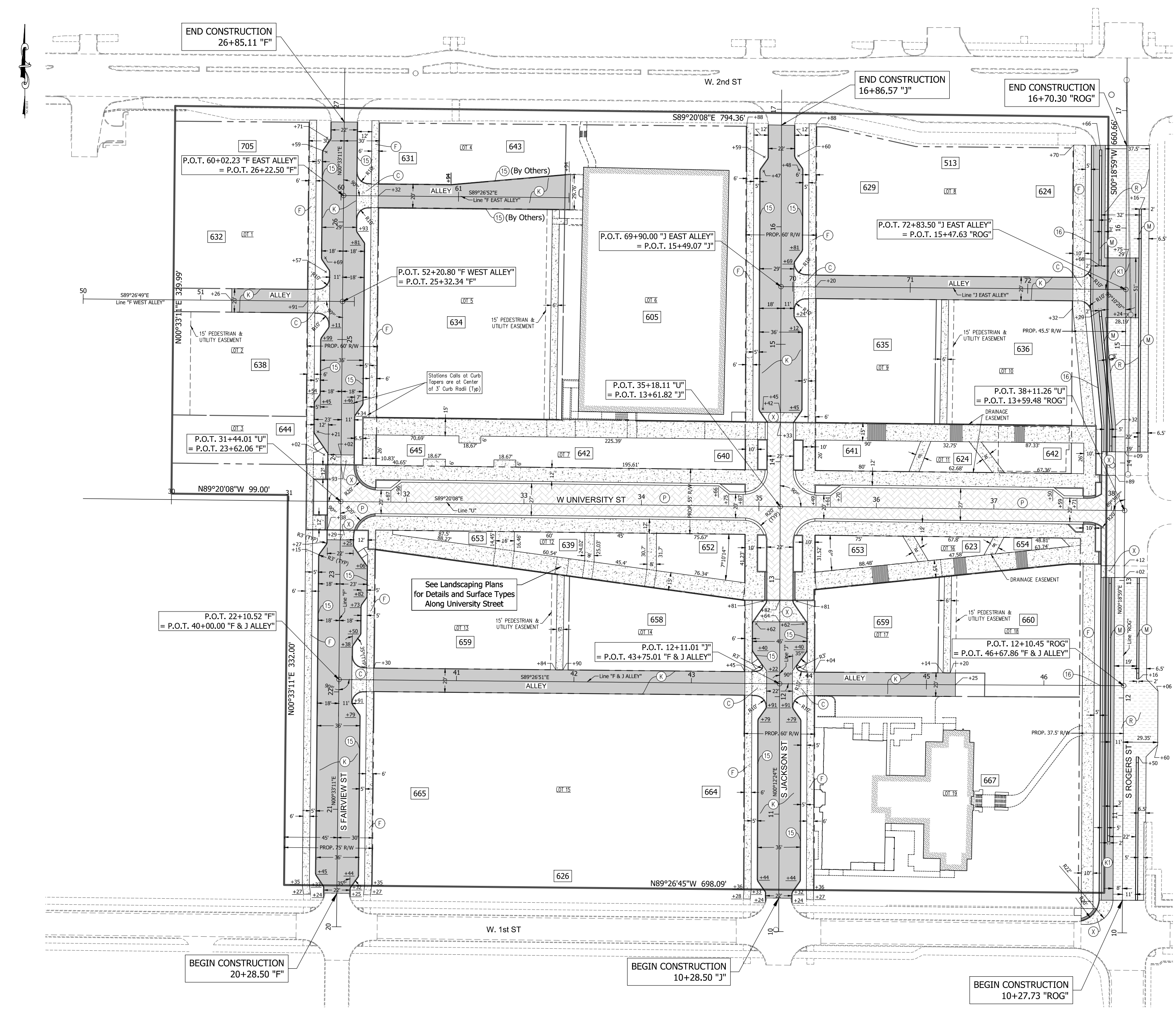
BLOOMINGTON HOPEWELL WEST

JOB No.	.	DRAWN	DEP	CHECKED	MAM
DATE	SEPTEMBER 28, 2024	DESIGNED	AJW	APPR.	AJW
HORIZ. SCALE	1" = 40'	VERT. SCALE	N/A	SHEET	300

60% PLANS NOT FOR CONSTRUCTION

DIRECTORY PATH : R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
FILENAME : 300 TOPOGRAPHIC SURVEY.dwg
DATE/USER : 5/28/2024 1:38 PM / AwolF

SHEET 300


END CONSTRUCTION 26+85.11 "F"
W. 2nd ST
END CONSTRUCTION 16+86.57 "J"
END CONSTRUCTION 16+70.30 "ROG"
S89°20'08"E 794.36'
P.O.T. 60+02.23 "F EAST ALLEY" = P.O.T. 26+22.50 "F"
P.O.T. 69+90.00 "J EAST ALLEY" = P.O.T. 15+49.07 "J"
P.O.T. 72+83.50 "J EAST ALLEY" = P.O.T. 15+47.63 "ROG"
P.O.T. 52+20.80 "F WEST ALLEY" = P.O.T. 25+32.34 "F"
Stations Calls at Curb Tapers are at Center of 3' Curb Radii (Typ)
P.O.T. 35+18.11 "U" = P.O.T. 13+61.82 "J"
P.O.T. 38+11.26 "U" = P.O.T. 13+59.48 "ROG"
P.O.T. 31+44.01 "U" = P.O.T. 23+62.06 "F"
N89°20'08"W 99.00'
W UNIVERSITY ST
See Landscaping Plans for Details and Surface Types Along University Street
P.O.T. 22+10.52 "F" = P.O.T. 40+00.00 "F & J ALLEY"
P.O.T. 12+11.01 "J" = P.O.T. 43+75.01 "F & J ALLEY"
P.O.T. 12+10.45 "ROG" = P.O.T. 46+67.86 "F & J ALLEY"
S FAIRVIEW ST
S JACKSON ST
S ROGERS ST
N89°26'45"W 698.09'
W. 1st ST
BEGIN CONSTRUCTION 20+28.50 "F"
BEGIN CONSTRUCTION 10+28.50 "J"
BEGIN CONSTRUCTION 10+27.73 "ROG"

LEGEND

- Property Line or Lot Line
- R/W Line
- Easement Line

Symbol	Description
C	PCCP for Approaches, 9 in. on Dense Graded Subbase, 6 in. on Geogrid Type 1B on Subgrade Treatment Type II (6 in. Coarse Aggregate No. 53)
F	Sidewalk, Concrete, 4 in.
M	Concrete Center Curb, Type 'D'
15	Concrete Curb, Barrier
16	Combined Concrete Curb and Gutter
K	Full Depth Pavement 1.5" (165 lb/sy) QC/QA-HMA, 2, 64, Surface, 9.5 mm on 2.5" (275 lb/sy) QC/QA-HMA, 2, 64, Intermediate, 19.0 mm on 3" (330 lb/sy) QC/QA-HMA, 2, 64, Base, 19.0 mm on 3" Compacted Aggregate, No. 8 on 4" Compacted Aggregate, No, 53 on Geotextile, Type 1A on Subgrade Treatment, Type IC * *Where bedrock is encountered, Subgrade Treatment, Type II may be used in lieu of Subgrade Treatment, Type IC
K1	Full Depth Pavement 1.5" (165 lb/sy) QC/QA-HMA, 2, 64, Surface, 9.5 mm on 2.5" (275 lb/sy) QC/QA-HMA, 2, 64, Intermediate, 19.0 mm on 4" (440 lb/sy) QC/QA-HMA, 2, 64, Base, 25.0 mm on 6" Compacted Aggregate, No. 53 on Subgrade Treatment, Type IC * *Where bedrock is encountered, Subgrade Treatment, Type II may be used in lieu of Subgrade Treatment, Type IC
P	PERMEABLE PAVERS TYPE 1 SEE LANDSCAPE PLANS FOR DETAILS
R	Mill & Overlay Pavement 1.5" (165 lb/sy) QC/QA-HMA, 2, 64, Surface, 9.5 mm on Surface Milling, 1.5"
X	Raised Crosswalk (See Details on Sheet No. 800)

TOTAL PERVIOUS/IMPERVIOUS AREA

OVERALL SITE

• PRE-DEVELOPED AREA	=	10.83 ACRES
• PRE-DEVELOPED IMPERVIOUS AREA	=	9.16 ACRES
• PRE-DEVELOPED PERVIOUS AREA	=	1.67 ACRES
• POST-DEVELOPED DRAINAGE AREA	=	10.83 ACRES
• POST-DEVELOPED IMPERVIOUS AREA	=	9.2 ACRES
• POST-DEVELOPED PERVIOUS AREA	=	1.63 ACRES
• NET IMPERVIOUS AREA INCREASE	=	0.04 ACRES

NOTES

1. CONTRACTOR SHALL NOTIFY ENGINEER, IF PROOF ROLL OF SUBGRADE FAILS, TO DETERMINE IF CHEMICAL MODIFICATION OF SUBGRADE IS NECESSARY.
2. ALL RADII DIMENSIONS ARE TO THE FACE OF PROPOSED CURB.
3. REMOVAL OF ON STREET PARKING REQUIRES APPROVAL OF CITY COUNCIL. AN ALTERNATIVE DESIGN ALONG SOUTH ROGERS MAY BE REQUIRED BY CITY ENGINEERING.

CROSSROAD ENGINEERS, PC
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115 N 17th AVENUE, BEECH GROVE, IN 46107 (317) 780-1555

SHEET 400

SITE DIMENSION PLAN

BLOOMINGTON HOPEWELL WEST

JOB No.	.	DRAWN	DEP	CHECKED	MAM	HORIZ. SCALE	1" = 40'
DATE	SEPTEMBER 28, 2024	DESIGNED	AJW	APPR.	AJW	VERT. SCALE	N/A

60% PLANS
NOT FOR
CONSTRUCTION

DIRECTORY PATH : R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
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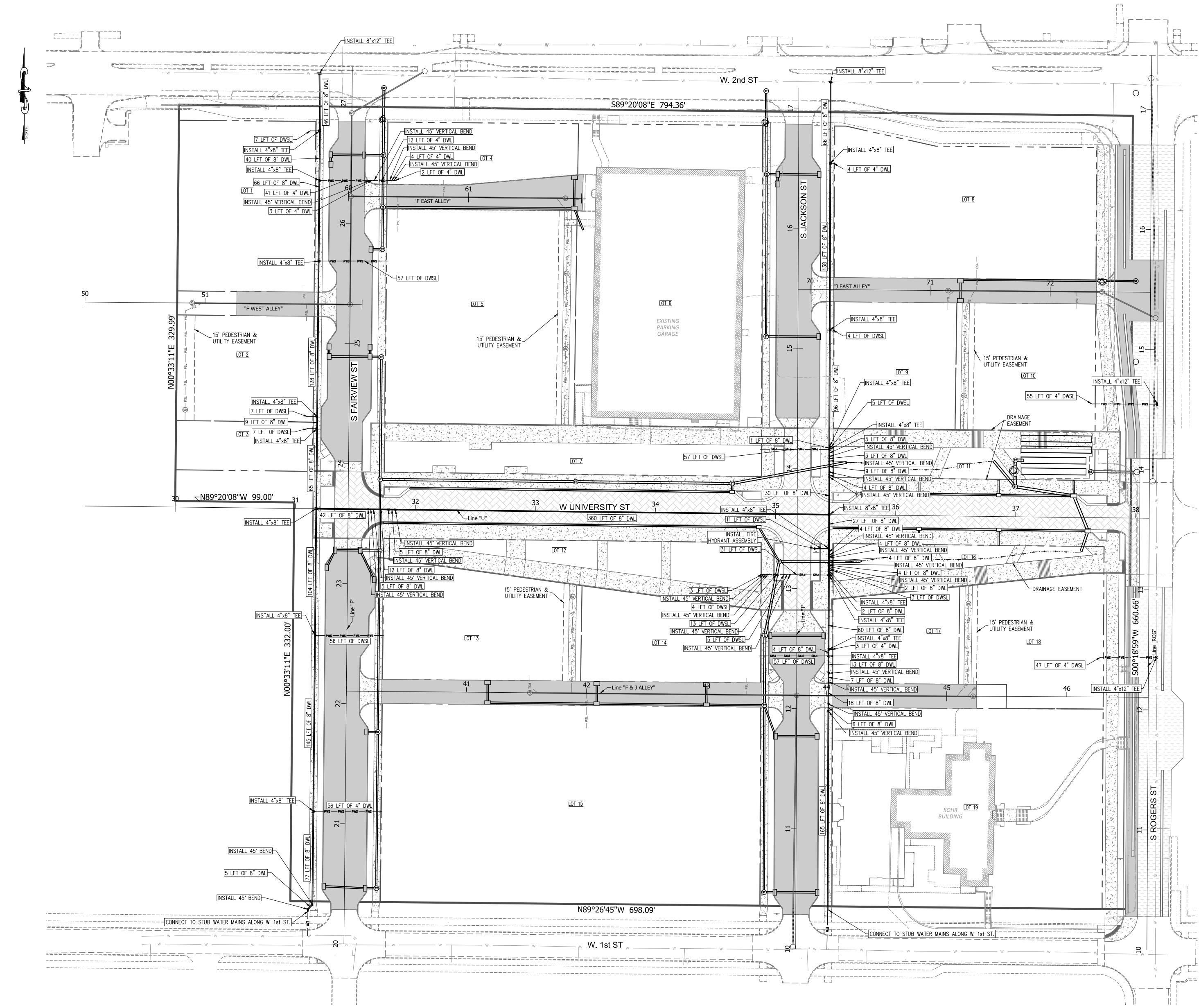

LEGEND

	PROPERTY LINE
	R/W LINE
	EASEMENT LINE
	WATER LINE
PWS	WATER SERVICE LINE
	FIRE HYDRANT
DWL	DUCTILE IRON WATER LINE
DWSL	DUCTILE IRON WATER SERVICE LINE

NOTES

1. WATER MAIN INSTALLATION SHALL BE IN ACCORDANCE WITH THE CITY OF BLOOMINGTON UTILITY STANDARDS AND SPECIFICATIONS. CONTRACTOR SHALL COORDINATE WITH CITY OF BLOOMINGTON UTILITY FOR PERMITTING, CONNECTION AND TESTING PROCEDURES AND REQUIREMENTS.
2. CONTRACTOR SHALL COORDINATE WITH APPLICABLE UTILITY COMPANY'S AND BUILDING PLANS FOR SEWER, WATER, CABLE, ELECTRIC, GAS, AND TELEPHONE CONNECTION SERVICE POINTS.
3. EXISTING UTILITY SIZE AND MATERIAL INFORMATION SHOWN ON THESE PLANS ARE PER THE BEST GRAPHICAL AND VISIBLE INFORMATION AVAILABLE. CONFLICTS MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL SIZING AND MATERIAL INFORMATION PROVIDED. IF ACTUAL CONDITIONS DIFFER FROM THAT INFORMATION SHOWN ON THE PLANS, THE CONTRACTOR SHALL, PRIOR TO THE INSTALLATION OF ANY PROPOSED INFRASTRUCTURE, NOTIFY THE DESIGN ENGINEER IMMEDIATELY.

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SHEET 401

SITE WATER PLAN

BLOOMINGTON HOPEWELL WEST

JOB No.	.	DRAWN	DEP	CHECKED	MAM
DATE	SEPTEMBER 28, 2024	DESIGNED	AJW	APPR.	AJW

HORIZ. SCALE 1" = 40'
VERT. SCALE N/A

60% PLANS NOT FOR CONSTRUCTION

DIRECTORY PATH : R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
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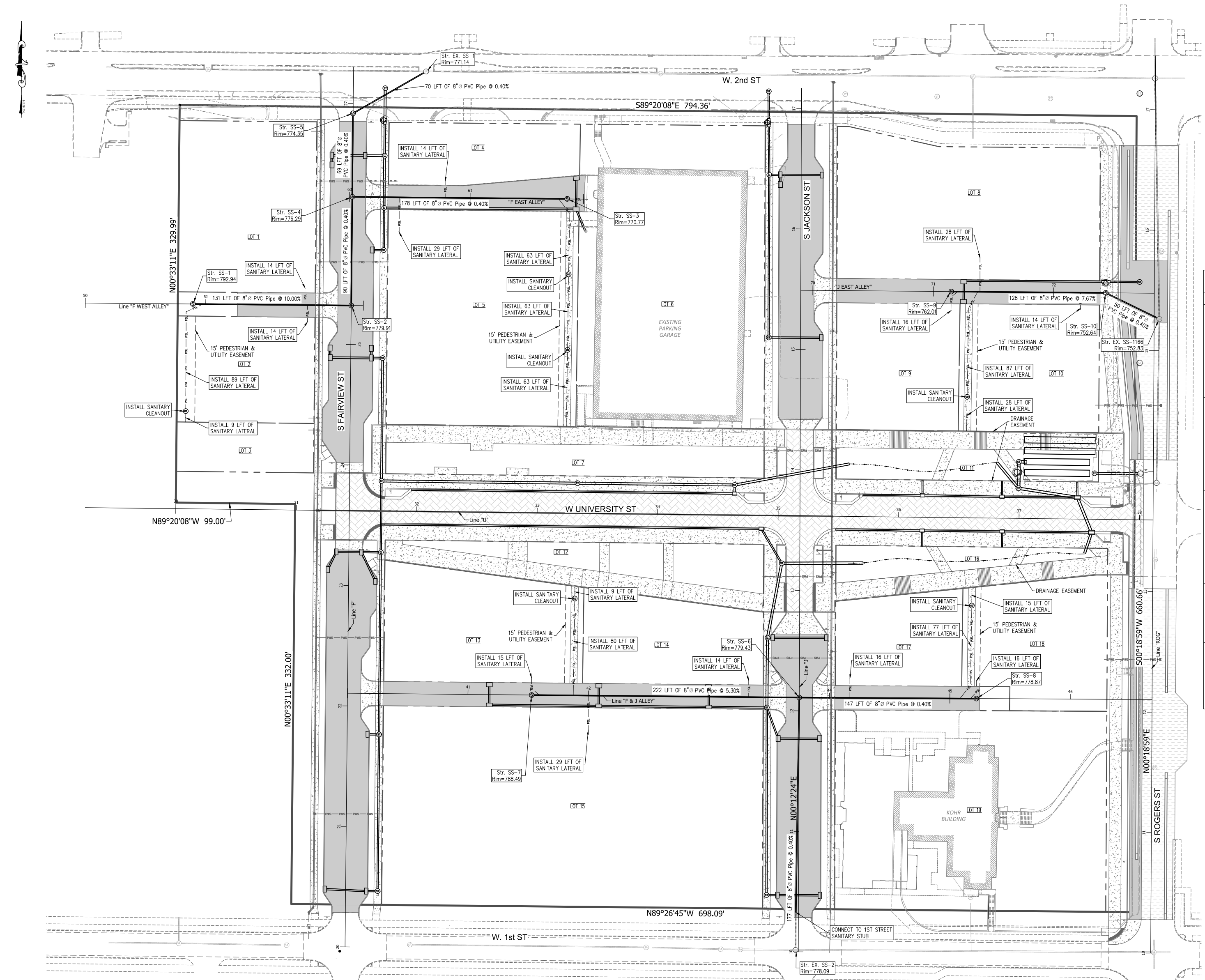

LEGEND

- PROPERTY LINE
- R/W LINE
- EASEMENT LINE
- SANITARY SEWER WITH MANHOLE
- SANITARY SEWER LATERAL WITH CLEANOUT

NOTES

1. SANITARY SEWER INSTALLATION SHALL BE IN ACCORDANCE WITH THE CITY OF BLOOMINGTON UTILITY STANDARDS AND SPECIFICATIONS. CONTRACTOR SHALL COORDINATE WITH CITY OF BLOOMINGTON UTILITY FOR PERMITTING, CONNECTION AND TESTING PROCEDURES AND REQUIREMENTS.
2. CONTRACTOR SHALL COORDINATE WITH APPLICABLE UTILITY COMPANY'S AND BUILDING PLANS FOR SEWER, WATER, CABLE, ELECTRIC, GAS, AND TELEPHONE CONNECTION SERVICE POINTS.
3. EXISTING UTILITY SIZE AND MATERIAL INFORMATION SHOWN ON THESE PLANS ARE PER THE BEST GRAPHICAL AND VISIBLE INFORMATION AVAILABLE. CONFLICTS MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL SIZING AND MATERIAL INFORMATION PROVIDED. IF ACTUAL CONDITIONS DIFFER FROM THAT INFORMATION SHOWN ON THE PLANS, THE CONTRACTOR SHALL, PRIOR TO THE INSTALLATION OF ANY PROPOSED INFRASTRUCTURE, NOTIFY THE DESIGN ENGINEER IMMEDIATELY.

SANITARY SEWER STRUCTURE TABLE
STR. DATA
STR. NO. EX. SS-1 CONTRACTOR TO FIELD VERIFY ALL EXISTING ELEVATIONS PRIOR TO ANY SANITARY INSTALLATION. PROPOSED INVERT SHALL BE CORE DRILLED INTO EXISITING MANHOLE PER MONROE COUNTY REQUIREMENTS. 2 LFT OF 10"ø PVC @ 0.43% RIM=771.14 INV IN (8"~SW)=766.15 INV IN (10"~W)=766.00 INV OUT (10"~E)=765.90
STR. NO. EX. SS-2 CONTRACTOR TO FIELD VERIFY ALL EXISTING ELEVATIONS PRIOR TO ANY SANITARY INSTALLATION. PROPOSED INVERT SHALL BE CORE DRILLED INTO EXISITING MANHOLE PER MONROE COUNTY REQUIREMENTS. 2 LFT OF 8"ø PVC @ 0.44% RIM=778.09 INV IN (8"~N)=772.38 INV IN (8"~W)=772.20 INV OUT (8"~E)=772.20
STR. NO. EX. SS-1166 CONTRACTOR TO FIELD VERIFY ALL EXISTING ELEVATIONS PRIOR TO ANY SANITARY INSTALLATION. PROPOSED INVERT SHALL BE CORE DRILLED INTO EXISITING MANHOLE PER MONROE COUNTY REQUIREMENTS. 200 LFT OF 10"ø PVC @ 0.55% RIM=752.83 INV IN (8"~NW)=749.86 INV IN (8"~S)=749.66 INV OUT (10"~N)=749.56
STR. NO. SS-1 INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPORVED EQUAL AND 132 LFT OF 8"ø PVC @ 10.00% RIM=792.94 INV OUT (8"~E)=781.62
STR. NO. SS-2 INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPORVED EQUAL AND 90 LFT OF 8"ø PVC @ 0.40% RIM=779.91 INV IN (8"~W)=768.47 INV OUT (8"~N)=767.47

SANITARY SEWER STRUCTURE TABLE
STR. DATA
STR. NO. SS-3 INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPORVED EQUAL AND 178 LFT OF 8"ø PVC @ 0.40% RIM=770.77 INV OUT (8"~W)=768.12
STR. NO. SS-4 INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPORVED EQUAL AND 69 LFT OF 8"ø PVC @ 0.40% RIM=776.29 INV IN (8"~S)=767.11 INV IN (8"~E)=767.40 INV OUT (8"~N)=767.01
STR. NO. SS-5 INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPORVED EQUAL AND 70 LFT OF 8"ø PVC @ 0.40% RIM=774.35 INV IN (8"~S)=766.73 INV OUT (8"~NE)=766.43
STR. NO. SS-6 INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPORVED EQUAL AND 177 LFT OF 8"ø PVC @ 0.40% RIM=779.43 INV IN (8"~W)=774.22 INV IN (8"~E)=774.12 INV OUT (8"~S)=773.22
STR. NO. SS-7 INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPORVED EQUAL AND 223 LFT OF 8"ø PVC @ 5.30% RIM=788.49 INV OUT (8"~E)=786.00

SANITARY SEWER STRUCTURE TABLE
STR. DATA
STR. NO. SS-8 INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPORVED EQUAL AND 147 LFT OF 8"ø PVC @ 0.40% RIM=778.87 INV OUT (8"~W)=774.71
STR. NO. SS-9 INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPORVED EQUAL AND 129 LFT OF 8"ø PVC @ 7.67% RIM=762.01 INV OUT (8"~E)=760.00
STR. NO. SS-10 INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPORVED EQUAL AND 50 LFT OF 8"ø PVC @ 0.40% RIM=752.64 INV IN (8"~W)=750.16 INV OUT (8"~SE)=750.06

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115 N 17th AVENUE, BEECH GROVE, IN 46107 (317) 780-1555

SHEET 402

SITE SANITARY PLAN

BLOOMINGTON HOPEWELL WEST

JOB No.	DRAWN DEP	CHECKED MAM	HORIZ. SCALE 1" = 40'
DATE SEPTEMBER 28, 2024	DESIGNED AJW	APPR. AJW	VERT. SCALE N/A

60% PLANS NOT FOR CONSTRUCTION

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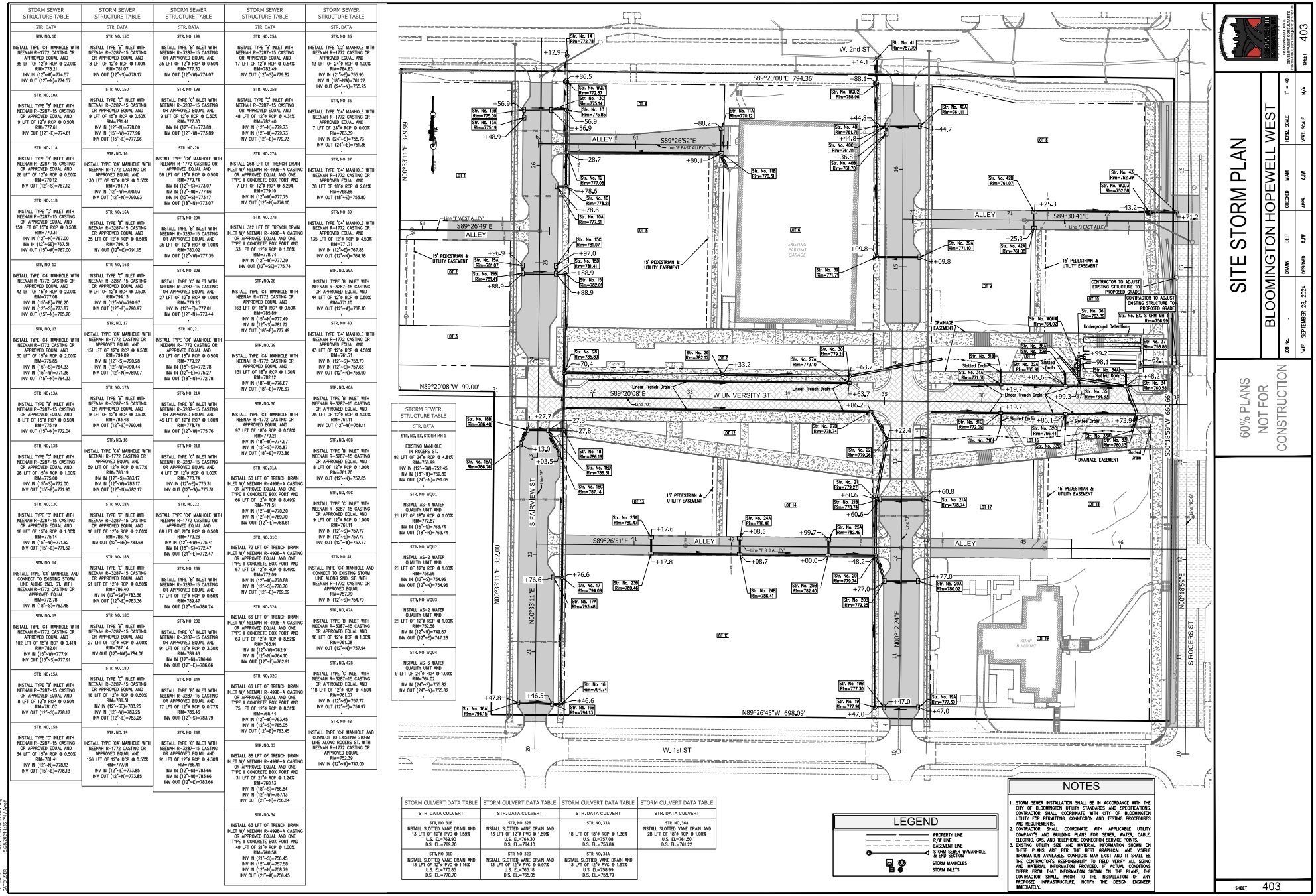

BLOOMINGTON HOPEWELL WEST

SITE STORM PLAN

JOB No.	DRAWN	CHECKED	HORIZ. SCALE	SHEET
.	DEP	MAM	1" = 40'	403
DATE: SEPTEMBER 28, 2024	DESIGNED	APPR.	VERT. SCALE	
	AJW	AJW	N/A	

60% PLANS NOT FOR CONSTRUCTION

DIRECTORY PATH: ...R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
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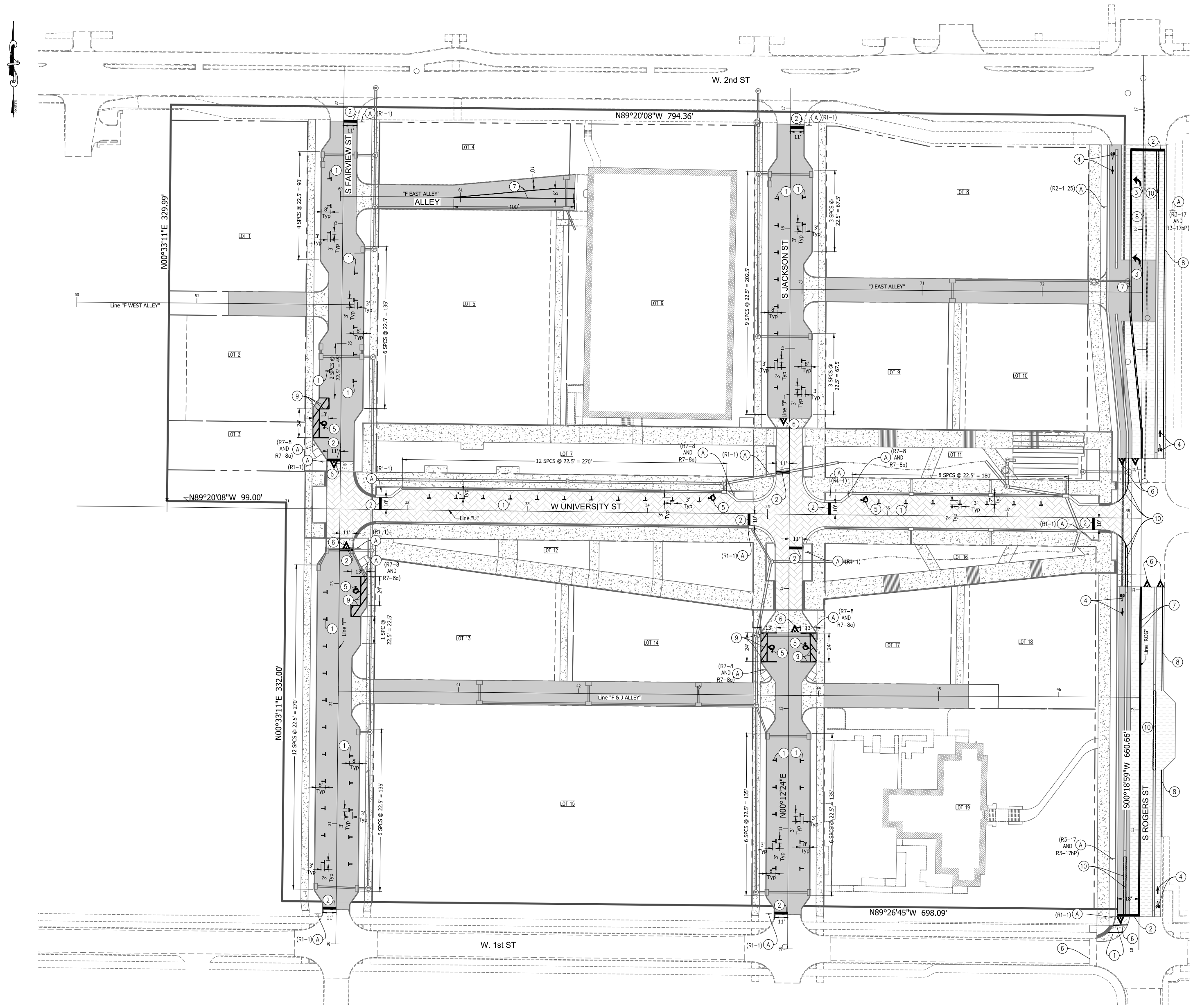
LAYOUT: SITE STORM PLAN



LEGEND

PROPERTY LINE
R/W LINE
EASEMENT LINE

1. TRANSVERSE MARKING, THERMOPLASTIC, SOLID, WHITE, 4 IN.
2. TRANSVERSE MARKING, THERMOPLASTIC, SOLID, WHITE, 24 IN.
3. PAVEMENT MESSAGE MARKING, THERMOPLASTIC, LANE INDICATION ARROW
4. PAVEMENT MESSAGE MARKING, THERMOPLASTIC, BICYCLE LANE MARKING
5. PAVEMENT MESSAGE MARKING, THERMOPLASTIC, ACCESSIBILITY SYMBOL
6. PAVEMENT MESSAGE MARKING, THERMOPLASTIC, SPEED HUMP MARKING
7. LINE, THERMOPLASTIC, SOLID, YELLOW, 4 IN.
8. LINE, THERMOPLASTIC, SOLID, WHITE, 4 IN.
9. LINE, THERMOPLASTIC, SOLID, BLUE, 4 IN.
10. LINE, THERMOPLASTIC, DOTTED, WHITE, 4 IN.

A. NEW STREET SIGN

PARKING ANALYSIS

STANDARD PARKING SPACES	=	78 SPACES
REQ'D ACCESSIBLE SPACES PER PROWAG TABLE R211	=	4 SPACES
PROVIDED ACCESSIBLE SPACES	=	6 SPACES
TOTAL PARKING SPACES	=	82 SPACES

NOTES

1. STREET SIGNAGE AND LIGHTING SHALL CONFORM TO CITY OF BLOOMINGTON STANDARDS, INDOT STANDARD DRAWINGS, INDOT STANDARDS AND SPECIFICATIONS, AND LATEST EDITION OF MUTCD.
2. ALL SIGN POSTS SHALL BE BREAKAWAY TYPE.
3. ALL SIGNS SHALL BE OF STANDARD SIZE PER MUTCD FOR SINGLE LANE CONVENTIONAL ROADS.
4. THE BACKING MATERIAL FOR PERMANENT SHEET SIGNS SHALL BE SHEET ALUMINUM IN ACCORDANCE WITH ASTM B209, ALLOY 5052H38, OR ALLOY 6061-T6. THE MINIMUM THICKNESS OF THE SHEET SHALL BE AS SHOWN FOR THE APPROPRIATE SIGN WIDTH:

WIDTH, IN.	THICKNESS, IN.
Up to 30	0.080
31 to 60	0.100
61 and Over	0.125

CROSSROAD ENGINEERS, PC
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SHEET 404

SITE SIGN-MARKING PLAN

BLOOMINGTON HOPEWELL WEST

JOB No.	.	DRAWN	DEP	CHECKED	MAM	HORIZ. SCALE	1" = 40'
DATE	SEPTEMBER 28, 2024	DESIGNED	AJW	APPR.	AJW	VERT. SCALE	N/A

60% PLANS NOT FOR CONSTRUCTION

DIRECTORY PATH : R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
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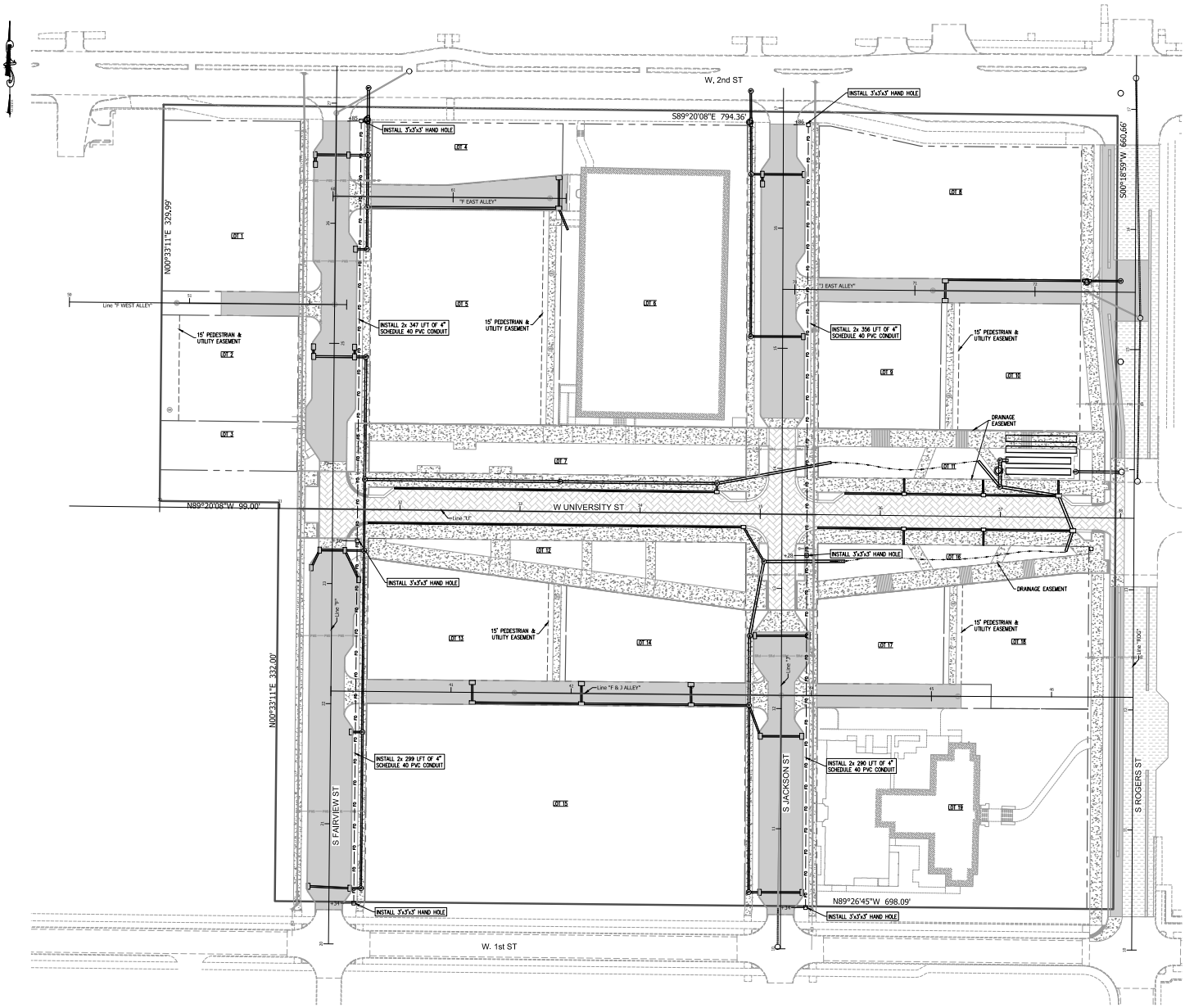

LEGEND

- Property Line
- R/W Line
- Easement Line
- FO — FO — FO — 2 x 4 in. PVC SCH 40 Conduit
- 3 ft x 3 ft x 3 ft Handhole

NOTES

1. ALL CITY FIBER INFRASTRUCTURE SHALL BE IN ACCORDANCE WITH CITY OF BLOOMINGTON FIBER/CONDUIT STANDARDS.

SITE FIBER PLAN

BLOOMINGTON HOPEWELL WEST

JOB No.	-	DRAWN	DEP	HORIZ. SCALE	1" = 40'
DATE	SEPTEMBER 28, 2024	DESIGNED	AJW	CHECKED	MAM
				APPR.	AJW
				VERT. SCALE	N/A
				SHEET	405

60% PLANS NOT FOR CONSTRUCTION

SHEET 405

DIRECTORY PATH : R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
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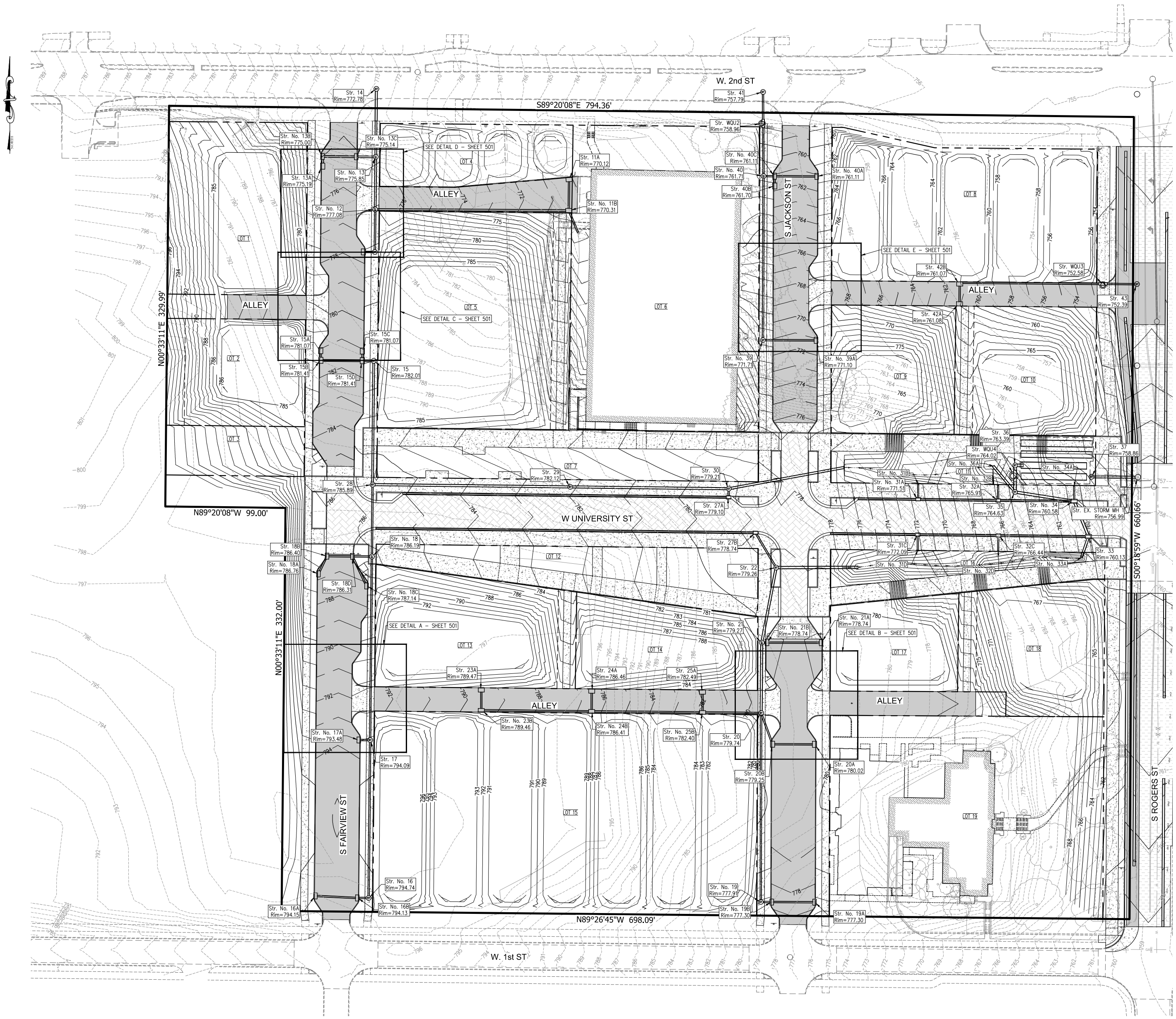

LEGEND

——— ———	Property Line
— — —	R/W Line
- - - -	Easement Line
800	EXISTING CONTOURS
800	PROPOSED CONTOURS
GRADE BREAK	GRADE BREAK
— · — · —	PROPOSED DRAINAGE SWALE

NOTES

1. NO EARTHWORK DISTURBING ACTIVITY MAY COMMENCE UNTIL BLOOMINGTON GRADING PERMIT AND IDEM CSGP IS OBTAINED.

CROSSROAD ENGINEERS, PC
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115 N 17th AVENUE, BEECH GROVE, IN 46107 (317) 780-1555

SHEET 500

GRADING PLAN

BLOOMINGTON HOPEWELL WEST

JOB No.	.	DRAWN	DEP	CHECKED	MAM
HORIZ. SCALE	1" = 40'				
DATE	SEPTEMBER 28, 2024	DESIGNED	AJW	APPR.	AJW
VERT. SCALE	N/A				

60% PLANS NOT FOR CONSTRUCTION

SHEET 500

DIRECTORY PATH : R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
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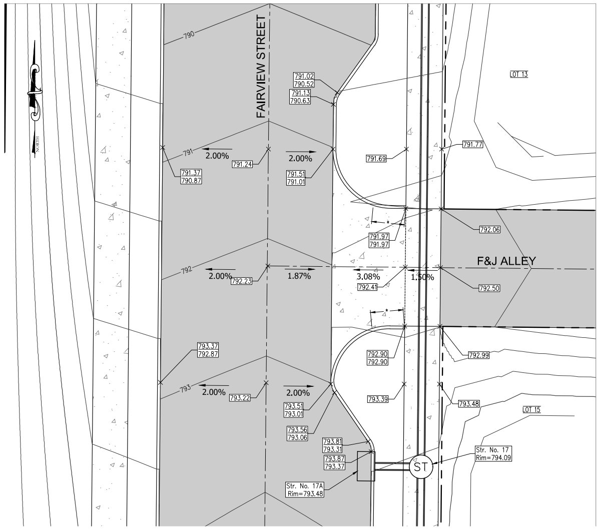
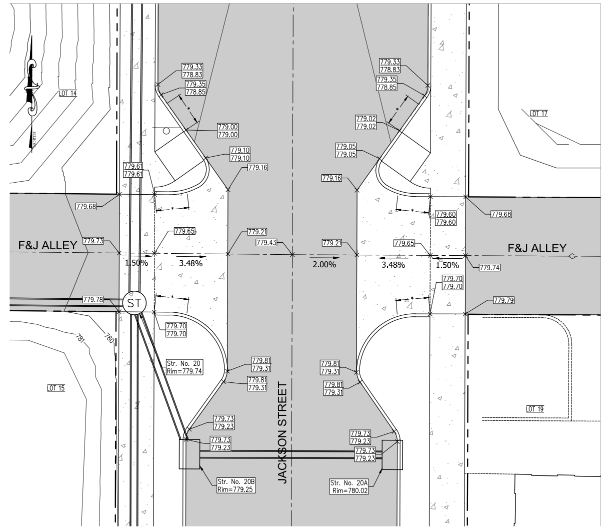
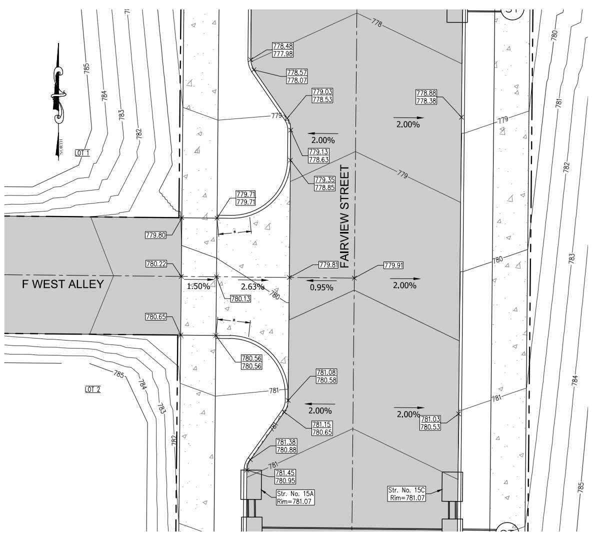


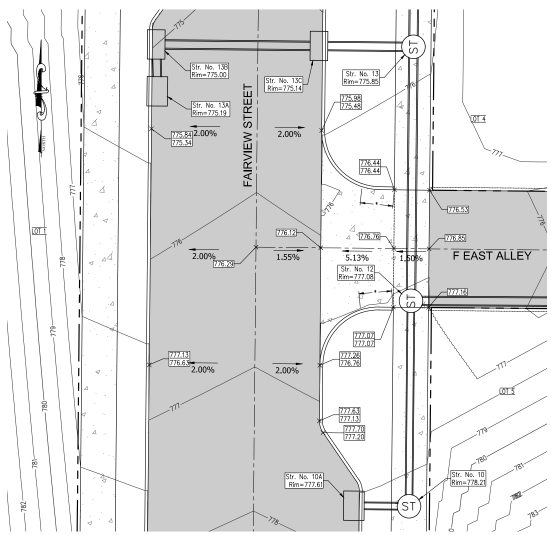
DETAIL A - FAIRVIEW & SOUTH ALLEY INTERSECTION
SCALE: 1" = 10'



DETAIL B - JACKSON & SOUTH ALLEY INTERSECTION
SCALE: 1" = 10'



DETAIL C - FAIRVIEW & NORTH WEST ALLEY INTERSECTION
SCALE: 1" = 10'



DETAIL D - FAIRVIEW & NORTH EAST ALLEY INTERSECTION
SCALE: 1" = 10'

DETAIL E - JACKSON & NORTH EAST ALLEY INTERSECTION
SCALE: 1" = 10'

LEGEND

Property Line
R/W Line
Easement Line

860.00 TOP OF CURB
859.50 EDGE OF PAVEMENT — PROPOSED ELEVATIONS
860.00 FINISH GRADE
860.00 #
859.50 # — PROPOSED ELEVATIONS (TO BE FIELD VERIFIED)
860.00 #
CURB HEIGHT TO TAPER FROM 0.5" TO 0.0" IN 6 LFT.

CROSSROAD ENGINEERS, PC
TRANSPORTATION & DEVELOPMENT CONSULTANTS

SHEET 501

INTERSECTION GRADING PLAN

BLOOMINGTON HOPEWELL WEST

JOB No.	-	HORIZ. SCALE	AS NOTED
DATE	SEPTEMBER 28, 2024	VERT. SCALE	N/A
DRAWN	DEP	CHECKED	MAM
DESIGNED	AJW	APPR.	AJW

60% PLANS
NOT FOR
CONSTRUCTION

SHEET 501

DIRECTORY PATH : R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
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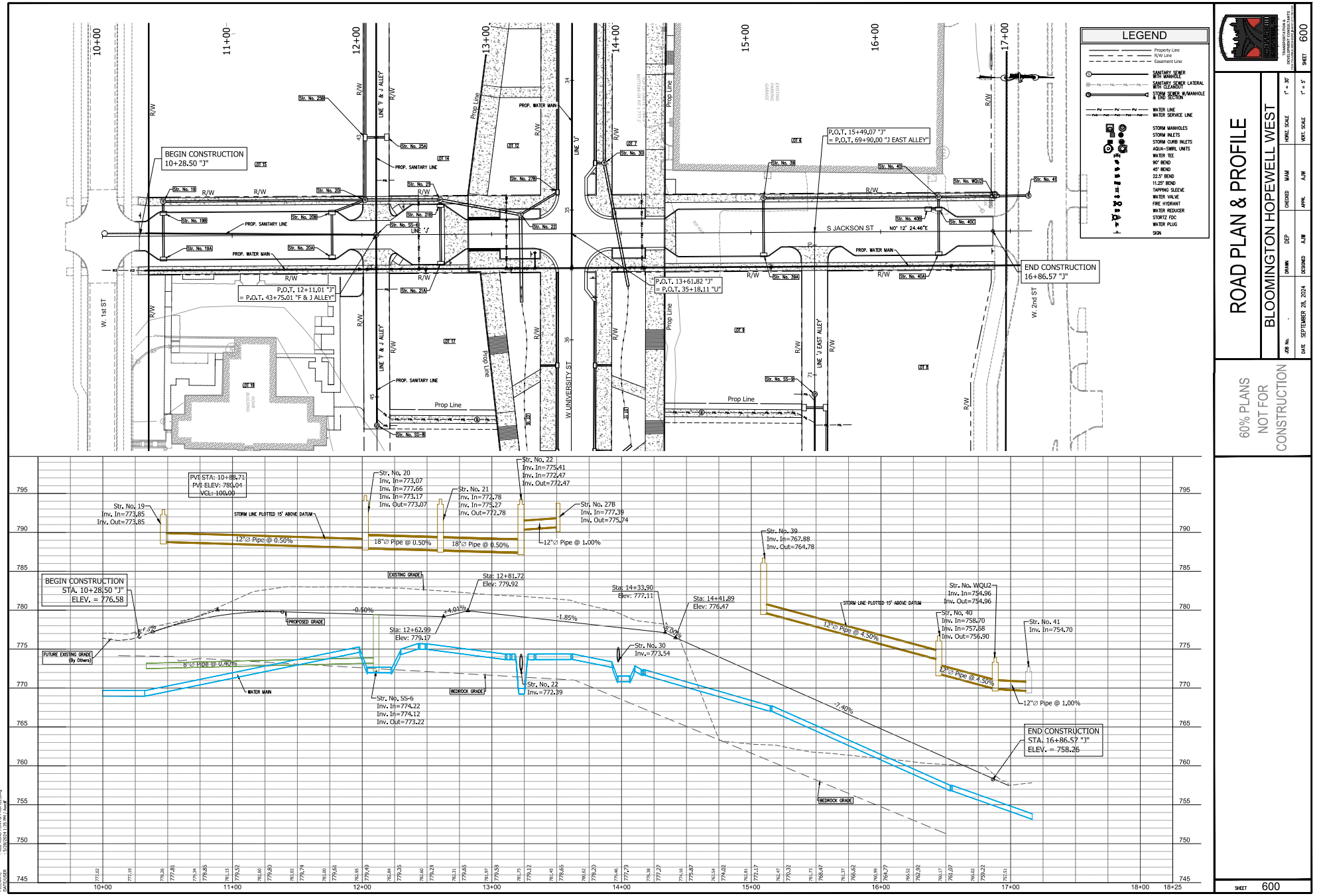

ROAD PLAN & PROFILE

BLOOMINGTON HOPEWELL WEST

JOB No.	-		
DATE	SEPTEMBER 28, 2024	HORIZ. SCALE	1" = 30'
DESIGNED	AJW	VERT. SCALE	1" = 5'
DRAWN	DEP	APPR.	AJW
CHECKED	MAM		

SHEET 600

60% PLANS NOT FOR CONSTRUCTION

DIRECTORY PATH : R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
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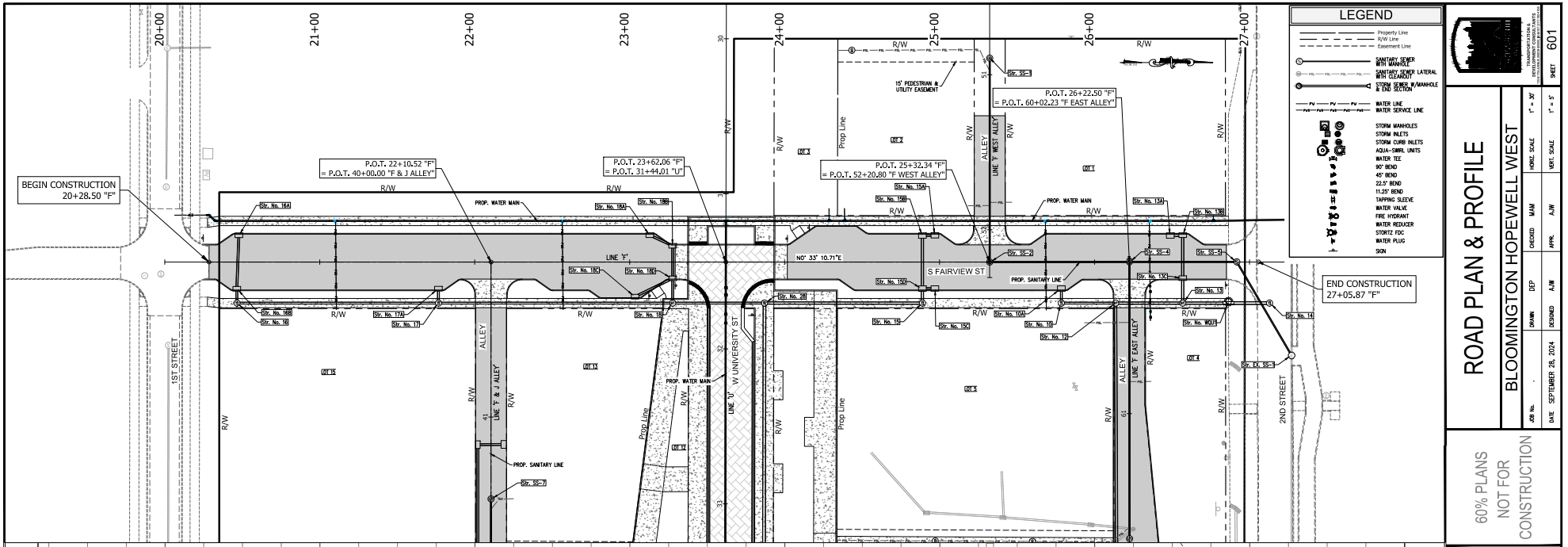

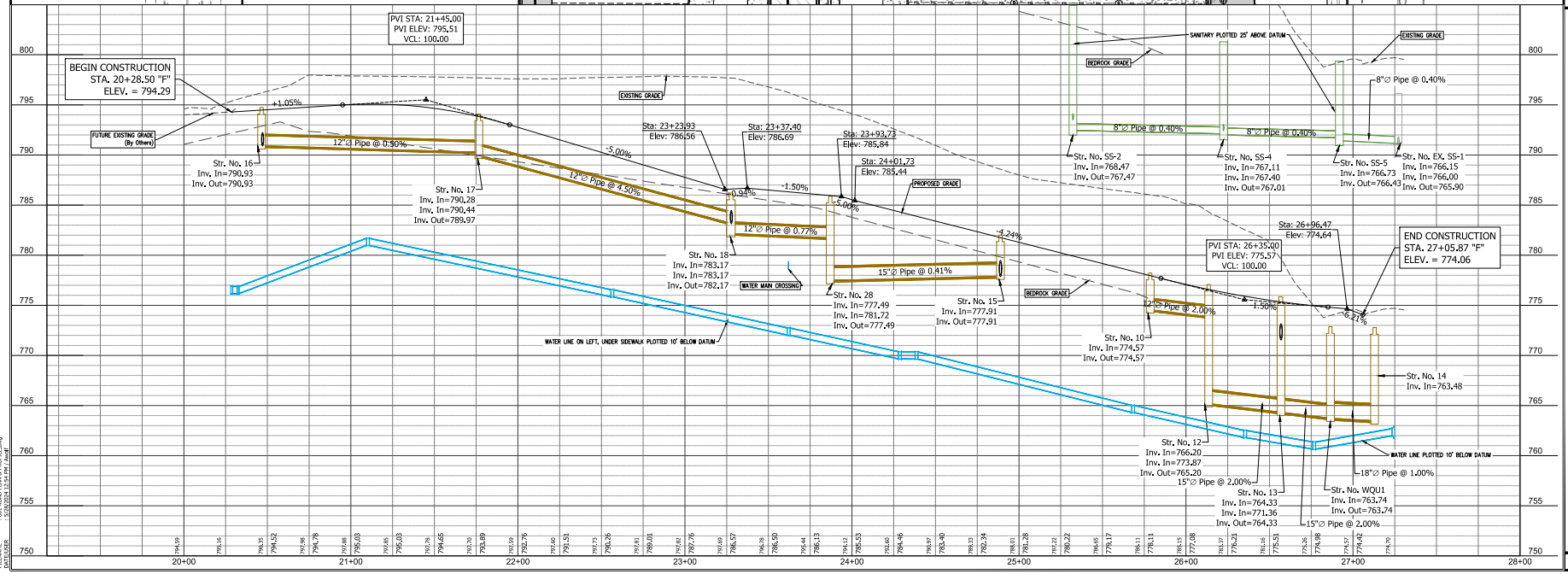

ROAD PLAN & PROFILE

BLOOMINGTON HOPEWELL WEST

JOB No.	-
DATE	SEPTEMBER 28, 2024
DESIGNED	AJW
DRAWN	DEP
CHECKED	MAM
APPR.	AJW
HORIZ. SCALE	1" = 30'
VERT. SCALE	1" = 5'
SHEET	601

60% PLANS NOT FOR CONSTRUCTION

SHEET 601

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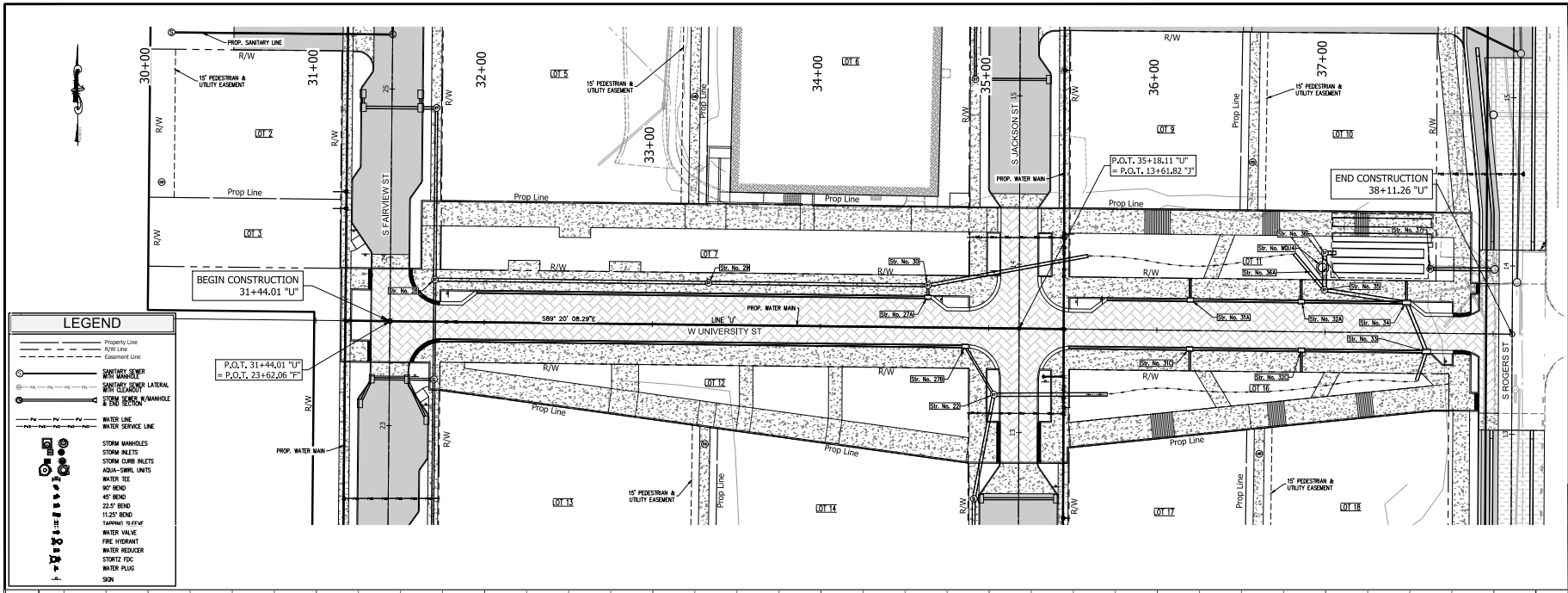
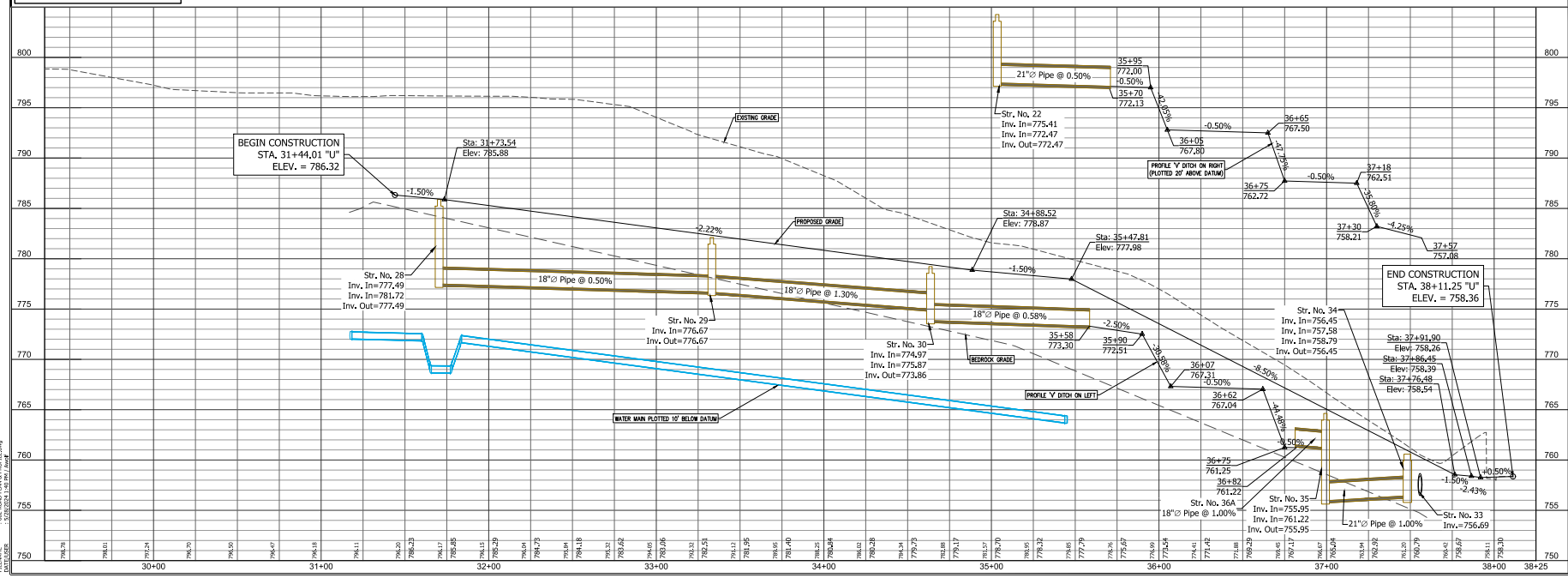
LAYOUT NAME : 601 ROAD PLAN & PROFILE





ROAD PLAN & PROFILE

BLOOMINGTON HOPEWELL WEST

JOB No.	-				HORIZ. SCALE	1" = 30'
DATE	SEPTEMBER 28, 2024	DESIGNED	AJW	CHECKED	VERT. SCALE	1" = 5'
		DRAWN	DEP	APPR.		

60% PLANS NOT FOR CONSTRUCTION

SHEET 602

DIRECTORY PATH : R:\Active\Bloomington, City Of\Proposed West\Design\CAD\Plans
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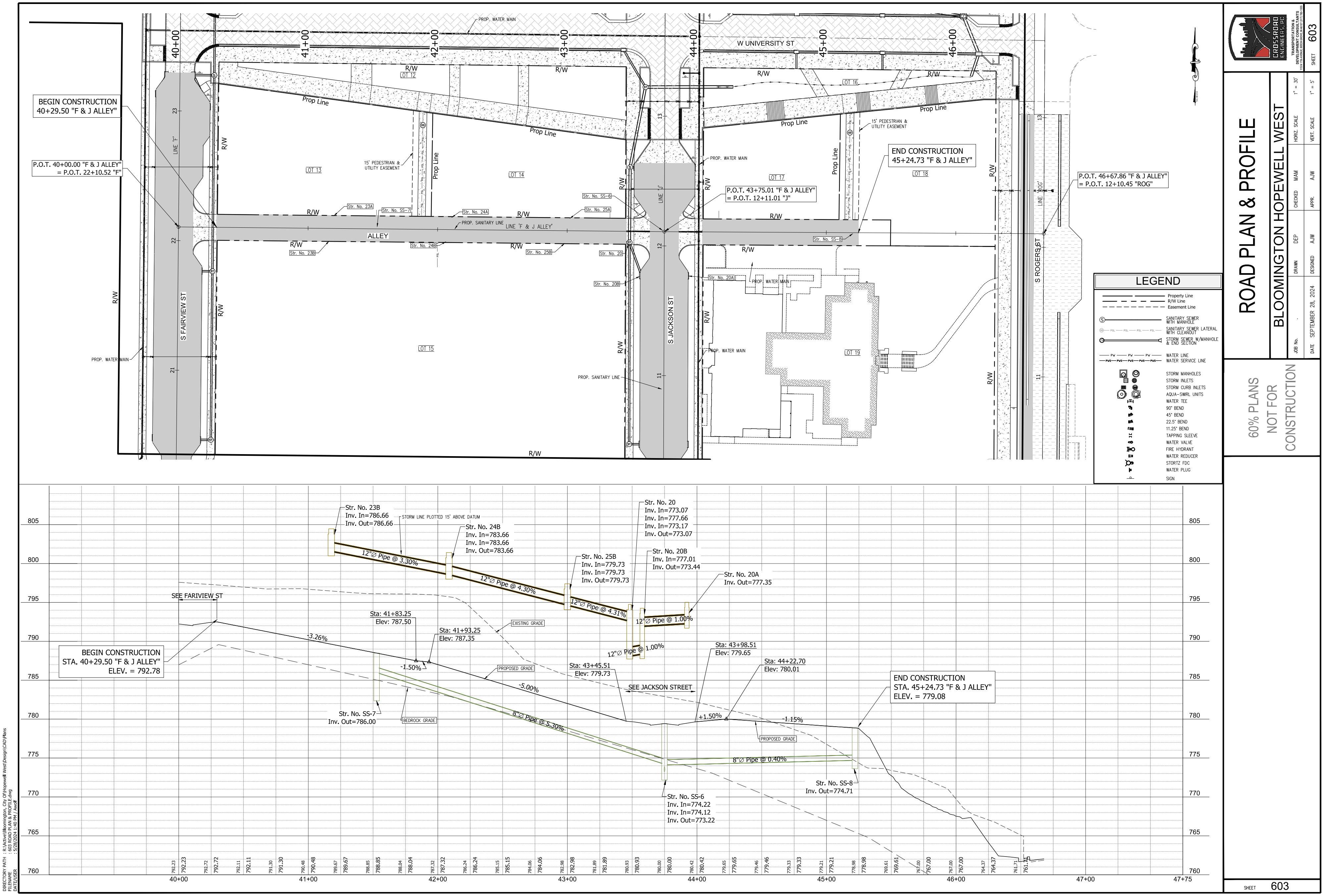
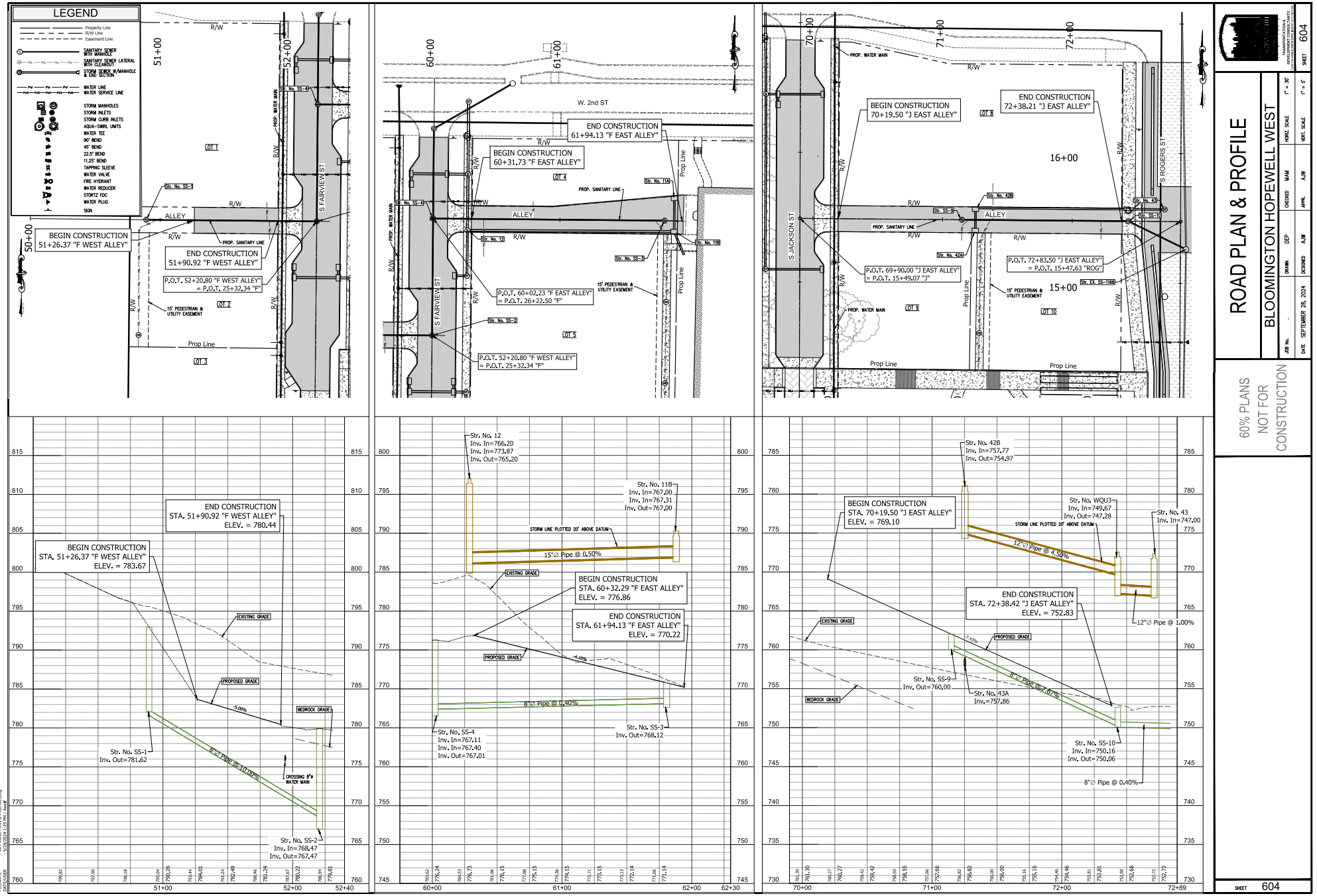

ROAD PLAN & PROFILE
BLOOMINGTON HOPEWELL WEST
60% PLANS NOT FOR CONSTRUCTION
CROSSROAD ENGINEERS, PC
TRANSPORTATION & DEVELOPMENT CONSULTANTS
SHEET 603
HORIZ. SCALE 1" = 30'
VERT. SCALE 1" = 5'
DRAWN DEP
CHECKED MAM
APPR. AJW
DESIGNED AJW
DATE SEPTEMBER 28, 2024
W UNIVERSITY ST
S FAIRVIEW ST
S JACKSON ST
S ROGERS ST
ALLEY
LINE 'F & J ALLEY'
BEGIN CONSTRUCTION 40+29.50 "F & J ALLEY"
P.O.T. 40+00.00 "F & J ALLEY" = P.O.T. 22+10.52 "F"
P.O.T. 43+75.01 "F & J ALLEY" = P.O.T. 12+11.01 "J"
END CONSTRUCTION 45+24.73 "F & J ALLEY"
P.O.T. 46+67.86 "F & J ALLEY" = P.O.T. 12+10.45 "ROG"
15' PEDESTRIAN & UTILITY EASEMENT
PROP. WATER MAIN
PROP. SANITARY LINE
Prop Line
R/W
LOT 12
LOT 13
LOT 14
LOT 15
LOT 16
LOT 17
LOT 18
LOT 19
LEGEND
Property Line
R/W Line
Easement Line
SANITARY SEWER WITH MANHOLE
SANITARY SEWER LATERAL WITH CLEANOUT
STORM SEWER W/MANHOLE & END SECTION
WATER LINE
WATER SERVICE LINE
STORM MANHOLES
STORM INLETS
STORM CURB INLETS
AQUA-SWIRL UNITS
WATER TEE
90° BEND
45° BEND
22.5° BEND
11.25° BEND
TAPPING SLEEVE
WATER VALVE
FIRE HYDRANT
WATER REDUCER
STORTZ FDC
WATER PLUG
SIGN
Str. No. 23B Inv. In=786.66 Inv. Out=786.66
STORM LINE PLOTTED 15' ABOVE DATUM
Str. No. 24B Inv. In=783.66 Inv. In=783.66 Inv. Out=783.66
Str. No. 25B Inv. In=779.73 Inv. In=779.73 Inv. Out=779.73
Str. No. 20 Inv. In=773.07 Inv. In=777.66 Inv. In=773.17 Inv. Out=773.07
Str. No. 20B Inv. In=777.01 Inv. Out=773.44
Str. No. 20A Inv. Out=777.35
12"∅ Pipe @ 3.30%
12"∅ Pipe @ 4.30%
12"∅ Pipe @ 4.31%
12"∅ Pipe @ 1.00%
SEE FARIVIEW ST
BEGIN CONSTRUCTION STA. 40+29.50 "F & J ALLEY" ELEV. = 792.78
Sta: 41+83.25 Elev: 787.50
Sta: 41+93.25 Elev: 787.35
Sta: 43+45.51 Elev: 779.73
Sta: 43+98.51 Elev: 779.65
Sta: 44+22.70 Elev: 780.01
SEE JACKSON STREET
END CONSTRUCTION STA. 45+24.73 "F & J ALLEY" ELEV. = 779.08
EXISTING GRADE
PROPOSED GRADE
BEDROCK GRADE
-3.26%
-1.50%
-5.00%
+1.50%
-1.15%
8"∅ Pipe @ 5.30%
8"∅ Pipe @ 0.40%
Str. No. SS-7 Inv. Out=786.00
Str. No. SS-6 Inv. In=774.22 Inv. In=774.12 Inv. Out=773.22
Str. No. SS-8 Inv. Out=774.71
40+00
41+00
42+00
43+00
44+00
45+00
46+00
47+00
47+75



ROAD PLAN & PROFILE

BLOOMINGTON HOPEWELL WEST

JOB No.	-	DRAWN	DEP	CHECKED	MJM	HORIZ. SCALE	1" = 30'
DATE	SEPTEMBER 28, 2024	DESIGNED	AJW	APPR.	AJW	VERT. SCALE	1" = 5'

SHEET 604

60% PLANS NOT FOR CONSTRUCTION

SHEET 604

DIRECTORY PATH : R:\Active\Bloomington, City Of\Proposed West\Design\CADD\Plans
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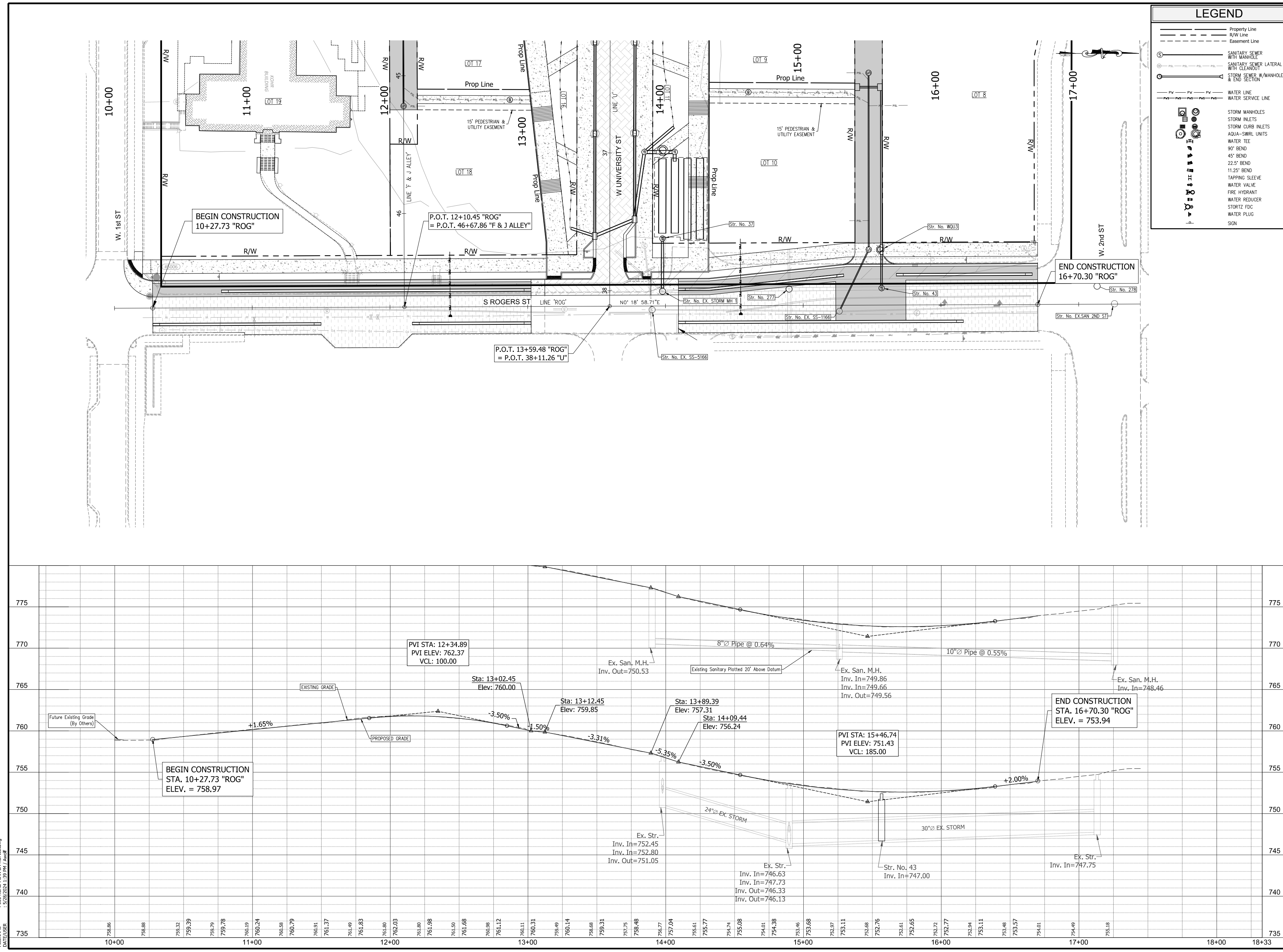
FILE SAVED : 9/27/2024 1:35:39 PM by AJW


LEGEND
Property Line
R/W Line
Easement Line
SANITARY SEWER WITH MANHOLE
SANITARY SEWER LATERAL WITH CLEANOUT
STORM SEWER W/MANHOLE & END SECTION
WATER LINE
WATER SERVICE LINE
STORM MANHOLES
STORM INLETS
STORM CURB INLETS
AQUA-SWIRL UNITS
WATER TEE
90° BEND
45° BEND
22.5° BEND
11.25° BEND
TAPPING SLEEVE
WATER VALVE
FIRE HYDRANT
WATER REDUCER
STORTZ FDC
WATER PLUG
SIGN
BEGIN CONSTRUCTION
10+27.73 "ROG"
P.O.T. 12+10.45 "ROG"
= P.O.T. 46+67.86 "F & J ALLEY"
P.O.T. 13+59.48 "ROG"
= P.O.T. 38+11.26 "U"
END CONSTRUCTION
16+70.30 "ROG"
S ROGERS ST
W UNIVERSITY ST
W. 1st ST
W. 2nd ST
LINE "F & J ALLEY"
LINE "ROG"
LINE "U"
N0° 18' 58.71"E
15' PEDESTRIAN & UTILITY EASEMENT
Prop Line
R/W
LOT 8
LOT 9
LOT 10
LOT 16
LOT 17
LOT 18
LOT 19
Str. No. 37
Str. No. WQU3
Str. No. EX. STORM MH 1
Str. No. 277
Str. No. 43
Str. No. EX. SS-1166
Str. No. EX. SS-5166
Str. No. 278
Str. No. EX.SAN 2ND ST
PVI STA: 12+34.89
PVI ELEV: 762.37
VCL: 100.00
Sta: 13+02.45
Elev: 760.00
Sta: 13+12.45
Elev: 759.85
Sta: 13+89.39
Elev: 757.31
Sta: 14+09.44
Elev: 756.24
PVI STA: 15+46.74
PVI ELEV: 751.43
VCL: 185.00
EXISTING GRADE
PROPOSED GRADE
Future Existing Grade (By Others)
+1.65%
-3.50%
-1.50%
-3.31%
-5.35%
-3.50%
+2.00%
BEGIN CONSTRUCTION
STA. 10+27.73 "ROG"
ELEV. = 758.97
END CONSTRUCTION
STA. 16+70.30 "ROG"
ELEV. = 753.94
8"∅ Pipe @ 0.64%
10"∅ Pipe @ 0.55%
Existing Sanitary Plotted 20' Above Datum
Ex. San. M.H.
Inv. Out=750.53
Ex. San. M.H.
Inv. In=749.86
Inv. In=749.66
Inv. Out=749.56
Ex. San. M.H.
Inv. In=748.46
24"∅ EX. STORM
30"∅ EX. STORM
Ex. Str.
Inv. In=752.45
Inv. In=752.80
Inv. Out=751.05
Ex. Str.
Inv. In=746.63
Inv. In=747.73
Inv. Out=746.33
Inv. Out=746.13
Str. No. 43
Inv. In=747.00
Ex. Str.
Inv. In=747.75
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
18+33

DIRECTORY PATH : R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
FILENAME : 605 ROAD PLAN & PROFILE.dwg
DATE/USER : 5/28/2024 1:39 PM / Awolf

CROSSROAD ENGINEERS, PC
TRANSPORTATION & DEVELOPMENT CONSULTANTS

SHEET 605

ROAD PLAN & PROFILE

BLOOMINGTON HOPEWELL WEST

HORIZ. SCALE	1" = 30'
VERT. SCALE	1" = 5'
DRAWN	DEP
CHECKED	MAM
DESIGNED	AJW
APPR.	AJW
JOB No.	-
DATE	SEPTEMBER 28, 2024

60% PLANS
NOT FOR
CONSTRUCTION

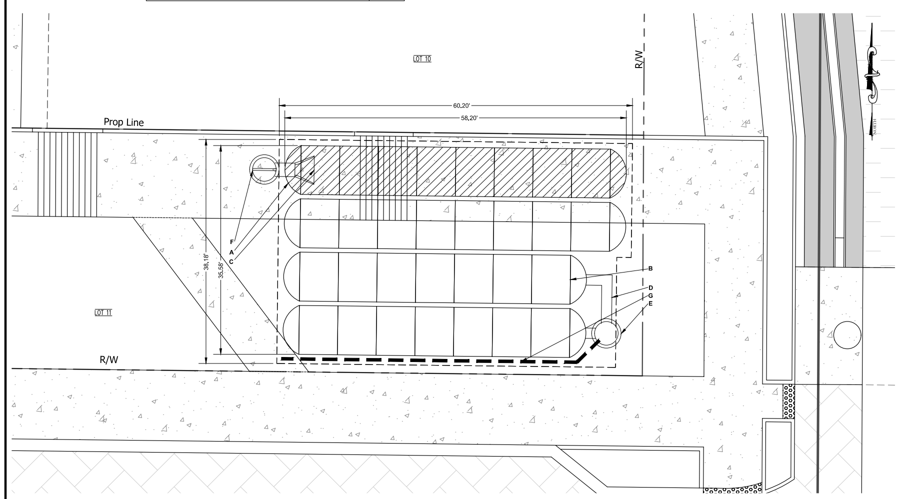
SHEET 605

PROPOSED LAYOUT	
30	STORMTECH MC-7200 CHAMBERS
8	STORMTECH MC-7200 END CAPS
12	STONE ABOVE (in)
9	STONE BELOW (in)
40	STONE VOID
9438	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)
2252	SYSTEM AREA (SF)
196.8	SYSTEM PERIMETER (ft)

CONCEPTUAL ELEVATIONS:	
MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	12.75
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	8.25
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	7.75
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	7.75
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	7.75
TOP OF STONE:	6.75
TOP OF MC-7200 CHAMBER:	5.75
24" ISOLATOR ROW PLUS INVERT:	0.94
18" x 18" BOTTOM MANIFOLD INVERT:	0.91
18" BOTTOM CONNECTION INVERT:	0.91
BOTTOM OF MC-7200 CHAMBER:	0.75
UNDERDRAIN INVERT:	0.00
BOTTOM OF STONE:	0.00

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	24" BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP24B / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.26"	
PREFABRICATED END CAP	B	18" BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP18B / TYP OF ALL 18" BOTTOM CONNECTIONS	1.97"	
FLAMP	C	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MCFLAMP		
MANIFOLD	D	18" x 18" BOTTOM MANIFOLD, ADS N-12	1.97"	
CONCRETE STRUCTURE	E	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		8.0 CFS OUT
CONCRETE STRUCTURE W/WEIR	F	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		
UNDERDRAIN	G	6" ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		

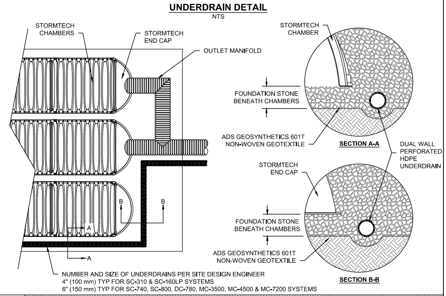


NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

UNDERDRAIN DETAIL

NTS

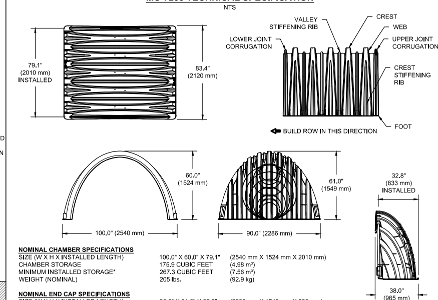


4 UNDERDRAIN DETAIL

SPACE INTENTIONALLY LEFT BLANK

MC-7200 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
CHAMBER STORAGE	175.9 CUBIC FEET	(4.98 m³)
MINIMUM INSTALLED STORAGE*	267.3 CUBIC FEET	(7.56 m³)
WEIGHT (NOMINAL)	205 lbs.	(92.9 kg)

NOMINAL END CAP SPECIFICATIONS

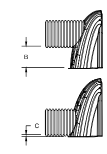
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

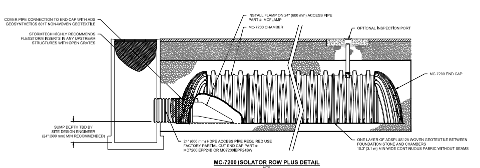
PART #	STUB	B	C
MC7200IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC7200IEPP06B		—	0.86" (22 mm)
MC7200IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC7200IEPP08B		—	1.01" (26 mm)
MC7200IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC7200IEPP10B		—	1.33" (34 mm)
MC7200IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC7200IEPP12B		—	1.55" (39 mm)
MC7200IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC7200IEPP15B		—	1.70" (43 mm)
MC7200IEPP18T	18" (450 mm)	29.36" (746 mm)	--
MC7200IEPP18TW			
MC7200IEPP18B		—	1.97" (50 mm)
MC7200IEPP18BW			
MC7200IEPP24T	24" (600 mm)	23.05" (585 mm)	--
MC7200IEPP24TW			
MC7200IEPP24B		—	2.26" (57 mm)
MC7200IEPP24BW			
MC7200IEPP30BW	30" (750 mm)	—	2.95" (75 mm)
MC7200IEPP36BW	36" (900 mm)	—	3.25" (83 mm)
MC7200IEPP42BW	42" (1050 mm)	—	3.55" (90 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

2 MC-7200 TECHNICAL SPECIFICATION



MC-7200 ISOLATOR ROW PLUS DETAIL

NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

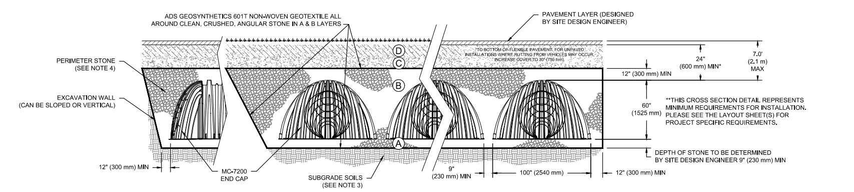
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

3 MC-7200 ISOLATOR ROW PLUS DETAIL

ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

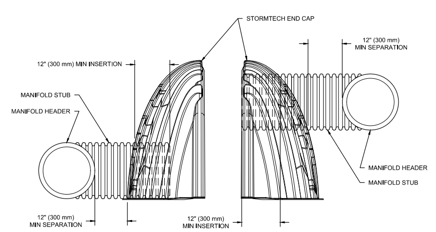
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-7200 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

1 MC-7200 CROSS SECTION DETAIL

SPACE INTENTIONALLY LEFT BLANK

MC-SERIES END CAP INSERTION DETAIL

NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

5 MC-SERIES END CAP INSERTION DETAIL

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FILENAME : 700 DETENTION BASIN PLAN.dwg
DATE/USER : 5/28/2024 12:06 PM / Axolf

CROSSROAD ENGINEERS, PC
TRANSPORTATION & DEVELOPMENT CONSULTANTS
115 N 17th AVENUE, BEECH GROVE, IN 46107 (317) 780-1555

SHEET 700

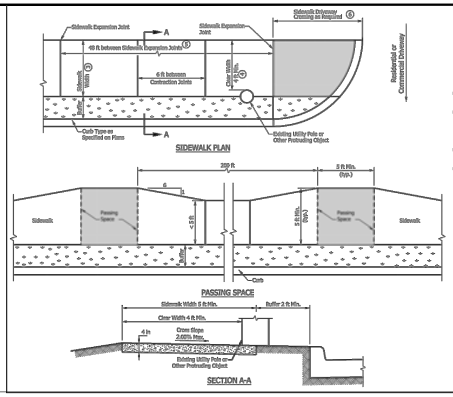
DETENTION BASIN PLAN

BLOOMINGTON HOPEWELL WEST

HORIZ. SCALE	NOT TO SCALE	CHECKED	MAM	DRAWN	DEP
VERT. SCALE	NOT TO SCALE	APPR.	AJW	DESIGNED	AJW
JOB No.	.	DATE	SEPTEMBER 28, 2024		

60% PLANS NOT FOR CONSTRUCTION

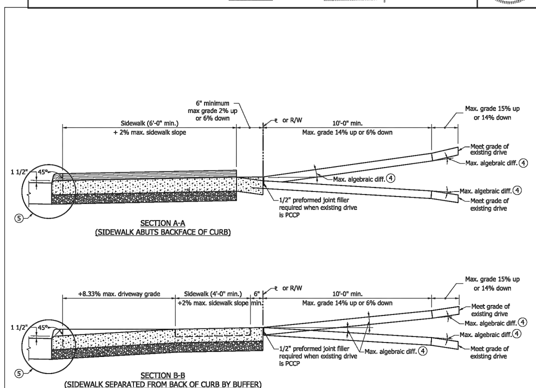
SHEET 700



NOTES:

1. All slopes are absolute rather than relative to the sidewalk or roadway grade. Slopes at least 0.50% less than the maximum are preferred.
2. The grade of the sidewalk is measured in the direction of pedestrian travel. The grade of the sidewalk shall not exceed the grade of the adjacent roadway. The cross slope is measured perpendicular to the direction of pedestrian travel. The cross slope of the sidewalk shall not exceed 2.00%.
3. Where there is a buffer between the sidewalk and curb, the preferred minimum sidewalk clear width is 5 ft.
4. A 4-ft minimum clear width shall be provided adjacent to street furniture, mailbox, utility pole, or other protruding object. Where the sidewalk clear width is less than 5 ft, a passing space shall be provided at 200 ft intervals. The passing space minimum clear dimension shall be 5 ft x 5 ft.
5. See Standard Drawing E 604-CCSJ-01 for sidewalk expansion joint details.
6. See Standard Drawing E 604-SDWK-03 for sidewalk driveway crossing configurations.

INDIANA DEPARTMENT OF TRANSPORTATION
SIDEWALK DETAILS
SIDEWALK WITH BUFFER
SEPTEMBER 2016
STANDARD DRAWING NO. E 604-SDWK-01
/s/ Elizabeth W. Phillips 03/16/16 DESIGN STANDARDS ENGINEER DATE
/s/ Mark A. Miller 03/18/16 CHIEF ENGINEER DATE



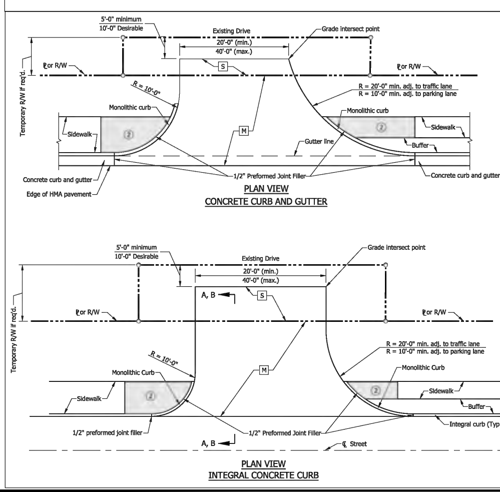
NOTES:

1. See Standard Drawing E 610-DRIV-02 Class I Drive pavement section.
2. See Standard Drawing E 610-DRIV-04 Class III Drive pavement section.
3. See Standard Drawing E 604-SDWK-03 for sidewalk driveway crossing details.
4. The maximum algebraic difference in grades shall not exceed 8% for crested grade nor 12% for sagged grade
5. See Standard Drawing E 610-DRIV-14 joint placement, monolithic curb, and concrete curb and gutter details.

LEGEND

= Curb ramp or sidewalk elevation transition.
= PCCP

INDIANA DEPARTMENT OF TRANSPORTATION
CLASS I AND CLASS III DRIVE APPROACH GRADES
SEPTEMBER 2019
STANDARD DRAWING NO. E 610-DRIV-09
5/29/2019 DESIGN STANDARDS ENGINEER DATE
6/5/2019 CHIEF ENGINEER DATE



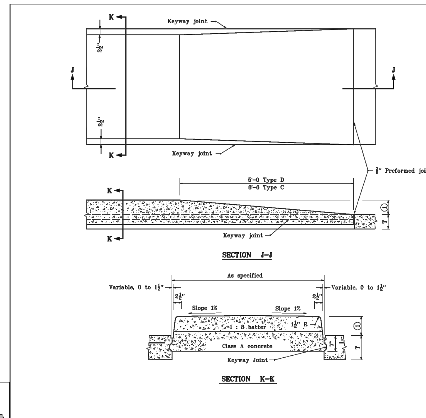
NOTES:

1. See Standard Drawing E 610-DRIV-09 for Section A-A, and Section B-B.
2. See Standard Drawing E 604-SDWK-03 for sidewalk driveway crossing details.
3. See Standard Drawing E 610-DRIV-14 for joint placement, monolithic curb, and concrete curb and gutter details.

LEGEND

M PCCP for Approaches, 9 in., on Dense Graded Subbase, 6 in., on Geogrid Type 1B, on Subgrade Treatment Type II (6 in. Coarse Aggregate No. 53)
S For type and thickness equivalent to surface in place, see plans.
Sidewalk elevation transitions.

INDIANA DEPARTMENT OF TRANSPORTATION
CLASS III DRIVE (COMMERCIAL)
SEPTEMBER 2019
STANDARD DRAWING NO. E 610-DRIV-04
5/1/2019 DESIGN STANDARDS ENGINEER DATE
6/5/2019 CHIEF ENGINEER DATE



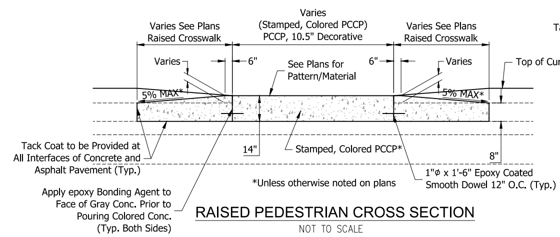
NOTES :

1. 6" for concrete center curb, type D and 8" for concrete center curb, type C.

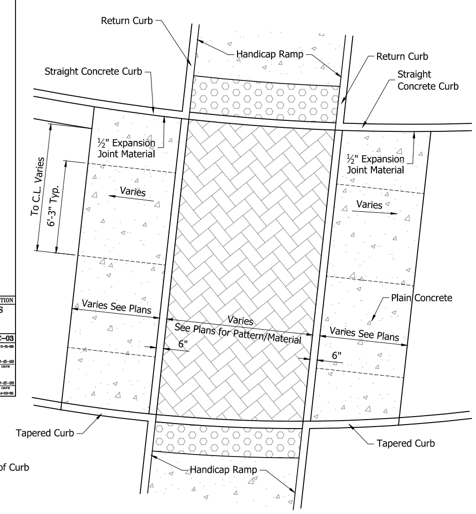
LEGEND

T = Normal pavement depth

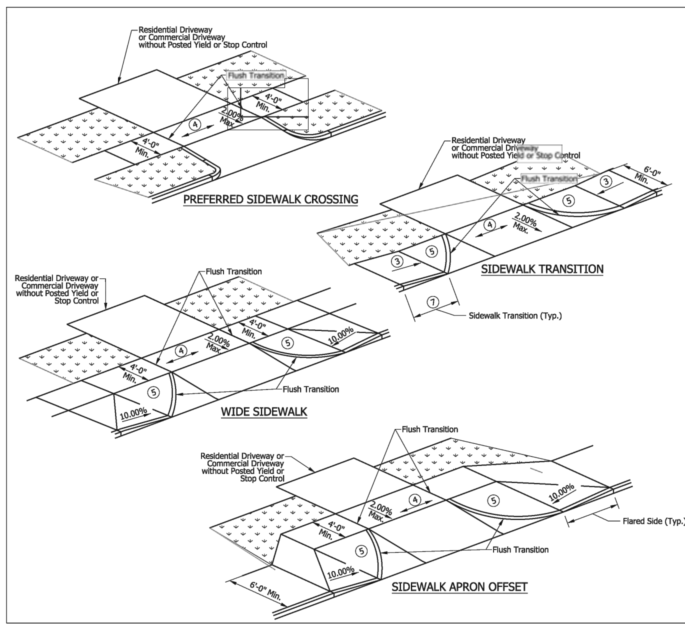
INDIANA DEPARTMENT OF TRANSPORTATION
CONCRETE CENTER CURBS TYPE C & D
APRIL 1995
STANDARD DRAWING NO. E 605-CNCC-03
DETAILS PLACED IN THIS FORMAT 11-15-99
/s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE
/s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE
ORIGINALLY APPROVED 4-03-95



RAISED PEDESTRIAN CROSS SECTION
NOT TO SCALE



RAISED PEDESTRIAN CROSSING DETAIL
NOT TO SCALE



NOTES:

1. All slopes are absolute rather than relative to the sidewalk or roadway grade. Slopes at least 0.50% less than the maximum are preferred.
2. A sidewalk driveway crossing shall only be used on a sidewalk at a residential driveway or a commercial driveway without posted yield or stop control. A curb ramp shall be used at all other crossings. See Standard Drawing Series E 604-SWCR for curb ramp details.
3. Where a sidewalk transition is used to lower or raise the sidewalk to connect with a residential driveway or a commercial driveway without posted yield or stop control, the running slope of the transition shall be 8.33% maximum.
4. The grade of the sidewalk across the driveway shall not exceed the grade of the adjacent roadway.
5. The area between the driveway and a flared side or sidewalk transition shall match the driveway profile and transverse slope.
6. A turning space is not required at the top of a sidewalk transition.
7. Objects such as a utility cover, vault frame, and grating shall be placed outside a sidewalk transition.
8. A detectable warning surface shall not be placed at the crossings of a residential driveway. A detectable warning surface may be placed at the crossing of a commercial driveway without yield or stop control.
9. See Standard Drawing E 604-SDWK-01 and -02 for Sidewalk Details.
10. See Standard Drawing Series E 610-DRIV for drives.

INDIANA DEPARTMENT OF TRANSPORTATION
SIDEWALK DRIVEWAY CROSSING
SEPTEMBER 2016
STANDARD DRAWING NO. E 604-SDWK-03
/s/ Elizabeth W. Phillips 03/16/16 DESIGN STANDARDS ENGINEER DATE
/s/ Mark A. Miller 03/18/16 CHIEF ENGINEER DATE

CROSSROAD ENGINEERS, PC
TRANSPORTATION & DEVELOPMENT CONSULTANTS

MISCELLANEOUS DETAILS
BLOOMINGTON HOPEWELL WEST

JOB No.	DATE	DRAWN	DESIGNED	CHECKED	APPR.	HORIZ. SCALE	VERT. SCALE
.	SEPTEMBER 28, 2024	DEP	AJW	MAM	AJW	NOT TO SCALE	NOT TO SCALE

SHEET 800

60% PLANS NOT FOR CONSTRUCTION

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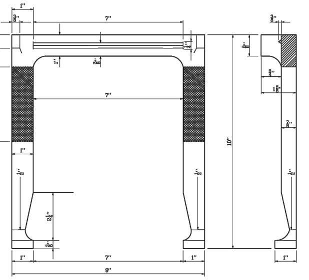


INDIANA DEPARTMENT OF TRANSPORTATION

MANHOLE STEP

APRIL 1995

STANDARD DRAWING NO. E 720-MHST-09

REINFORCING STEEL FOR MANHOLES																
	Manhole Type D				Manhole Type E				Manhole Type F				Manhole Type G			
Bars	Length	No.	Spa.	Size	Length	No.	Spa.	Size	Length	No.	Spa.	Size	Length	No.	Spa.	Size
B	8'–0	10	9"	#5	8'–0	12	9"	#5	8'–0	16	9"	#5	8'–0	19	9"	#5
B_1	6'–9	12	9"	#5	8'–6	12	9"	#5	11'–0	12	9"	#5	13'–3	12	9"	#5
E	7'–3	3	2"	#5	7'–3	3	2"	#5	7'–3	3	2"	#5	7'–3	3	2"	#5
H	8'–6	22	6"	#5	8'–6	33	6"	#5	8'–6	41	6"	#5	8'–6	58	6"	#5
L	3'–0	16	12"	#5	3'–0	16	12"	#5	3'–0	16	12"	#5	3'–0	16	12"	#5
T	1'–3	16	6"	#5	3'–0	16	6"	#5	5'–3	16	6"	#5	7'–6	16	6"	#5
V	5'–0	16	6"	#5	6'–9	16	6"	#5	9'–0	16	6"	#5	11'–6	16	6"	#5
V_1	4'–9	16	6"	#5	6'–6	16	6"	#5	8'–9	16	6"	#5	11'–3	16	6"	#5

INDIANA DEPARTMENT OF TRANSPORTATION

TABLE OF REINFORCING STEEL FOR MANHOLES

SEPTEMBER 1997

STANDARD DRAWING NO. E 720-MHST-10

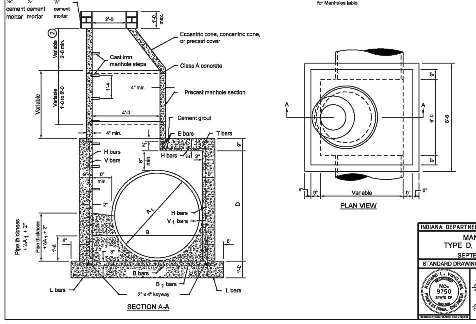
MANHOLE DIMENSIONS		
TYPE	A-1 PIPE SIZE DIA. (in)	B AND D
D	27 to 42	4'-9
E	48 to 60	6'-6
F	66 to 84	8'-10
G	90 to 108	11'-2

NOTES

1. Manhole type H, J, K, L, M, or N, may be substituted for manhole type C, D, E, or F for comparable pipe sizes. See Standard Drawing E 720-MHST-05 for manholes type H, J, K, L, M, and N details.

(2) For eccentric and concentric cone heights see Cone Heights Table on Standard Drawing 720-MHST-08.

3. See Standard Drawing 720-MHST-10 for Reinforcing Steel for Manholes table.



SECTION A-A

PLAN VIEW

INDIANA DEPARTMENT OF TRANSPORTATION

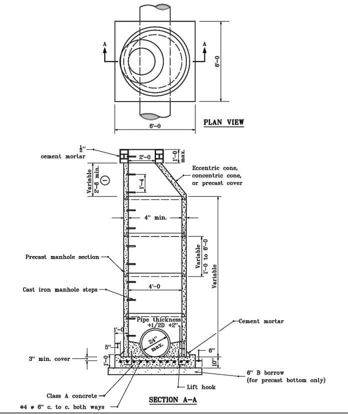
MANHOLES TYPE D, E, F, AND G

SEPTEMBER 2003

STANDARD DRAWING NO. E 720-MHST-04

GENERAL NOTES

(1) For eccentric and concentric cone heights see cone heights table on Standard Drawing E 720-MHST-08.



PLAN VIEW

SECTION A-A

INDIANA DEPARTMENT OF TRANSPORTATION

MANHOLE TYPE C

SEPTEMBER 1997

STANDARD DRAWING NO. E 720-MHST-02

SECTIONAL VIEW SANITARY MANHOLE

MANHOLE CONSTRUCTION
Manhole shall be 4500 p.s.i. concrete reinforced with 10 x 10 – W10 x W10 welded wire fabric. Wall and base thickness shall be a minimum of 5".

PRECAST CONCRETE RISER RINGS
No more than 12" of rings may be used to adjust the frame and cover to grade.

PRECAST ECCENTRIC TOP SECTION
Precast flat tops shall be used when the manhole is less than than 6' deep. See detail below.

JOINT SEALING
Joints between all manhole sections shall be sealed with an approved rubber gasket. Outside joints shall be sealed with a Trowelable Butyl Rubber.

PRECAST MANHOLE BARREL SECTION

COMBINED PRECAST MANHOLE BASE and BARREL SECTION
The base and first barrel section shall be monolithic and additionally reinforced with 4 – #4 bar eis 60" long.

CAST or CORE DRILLED OPENINGS
All openings shall be at least 3" from the top of the base part of the precast section.

BEDDING
4" of #11 stone on soil or 6" of #11 stone on rock

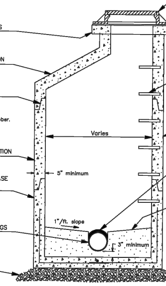
MANHOLE FRAME AND COVER
Frame shall be East Jordan Iron Works casting no. 1020, 1022 or an approved equivalent. Cover shall be East Jordan Iron Works casting no. 1020A or an approved equivalent. "SANITARY SEWER" shall be cast in each cover.
All castings shall be coated.
Frame shall be set on Butyl Rubber Rope.

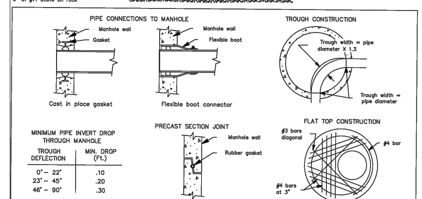
MANHOLE STEPS
Shall be constructed of Fiberglas reinforced polypropolene. Install with nonshrink mortar or epoxy grout 12" to 16" apart and at a location allowing access to the table.

MANHOLE SEALANT
See 4.4.2.2.6 of CBU Specifications.

GASKETS and BOOTS
Pipe to manhole connections shall be flexible boot or cast in place gasket. See special detail below and 4.4.2.2.5 of CBU Specifications.

TROUGH and TABLE
Construct with concrete brick, and non-shrink mortar. Troughs shall be smooth with a semicircular bottom and extend upward to the height of the pipe crown. The table shall be smooth and slope toward the trough at 1"/ft.





MINIMUM PIPE INVERT DROP THROUGH MANHOLE	
TROUGH DEFLECTION	MIN. DROP (FT.)
0° – 22°	.10
23° – 45°	.20
46° – 90°	.30

City of Bloomington Utilities Engineering Department

STANDARD SANITARY MANHOLE

STANDARD DETAIL NUMBER 1

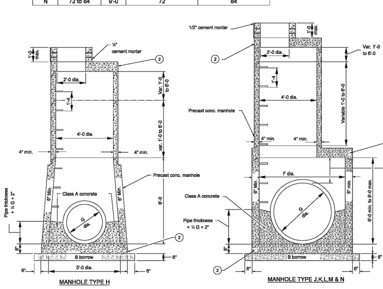
MANHOLE PIPE SIZES				
Type	G (in.)	F (ft. in.)	Maximum Pipe Size Rt. ∠ to Mainline (in.)	Maximum Pipe Size for Mainline (in.)
H	24 to 36	—	30	36
J	24 to 36	5'-0	30	36
K	36 to 48	6'-0	36	48
L	48 to 54	8'-0	48	54
M	54 to 72	8'-6	66	72
N	72 to 84	9'-0	72	84

NOTES

1. Drop pipe may be used with manholes Type H, J, K, L, M, or N. Such manhole shall be referred to as drop manholes type H, J, K, L, M, or N. For details of construction see Standard Drawing E 720-MHST-03.

(2) See Standard Drawing E 720-MHST-06 for Details A, B, and C.

(3) Manholes type C, D, E, or F. may be substituted for manholes type H, J, K, L, M, or N. for comparable pipe sizes. See Standard Drawings E 720-MHST-02 and -04 for manholes type D, E, F, and G details..



MANHOLE TYPE H

MANHOLE TYPE J,K,L,M & N

INDIANA DEPARTMENT OF TRANSPORTATION

MANHOLES TYPE H, J, K, L, M, AND N

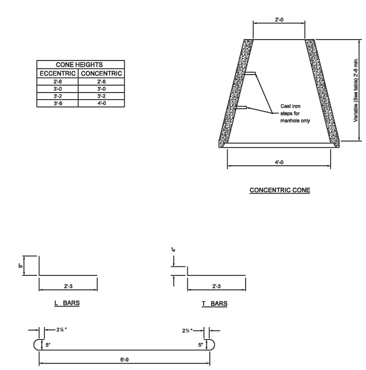
SEPTEMBER 2006

STANDARD DRAWING NO. E 720-MHST-05

CONE HEIGHTS	
ECCENTRIC	CONCENTRIC
2'-6	2'-6
3'-0	3'-0
3'-2	3'-2
3'-6	4'-0

NOTES

1. The concentric concrete section will not be permitted for manholes which are under the jurisdiction of the Indianapolis Sanitary District.



CONCENTRIC CONE

L BARS

T BARS

H BARS

INDIANA DEPARTMENT OF TRANSPORTATION

MANHOLE BARS AND CONECNTRIC CONE

SEPTEMBER 2003

STANDARD DRAWING NO. E 720-MHST-08

MISCELLANEOUS DETAILS

BLOOMINGTON HOPEWELL WEST

60% PLANS NOT FOR CONSTRUCTION

CROSSROAD ENGINEERS, PC — TRANSPORTATION & DEVELOPMENT CONSULTANTS

JOB No.	.	DATE	SEPTEMBER 28, 2024
DRAWN	DEP	DESIGNED	AJW
CHECKED	MAM	APPR.	AJW
HORIZ. SCALE	NOT TO SCALE	VERT. SCALE	NOT TO SCALE

SHEET 801

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FILENAME : 801 MISCELLANEOUS DETAILS.dwg
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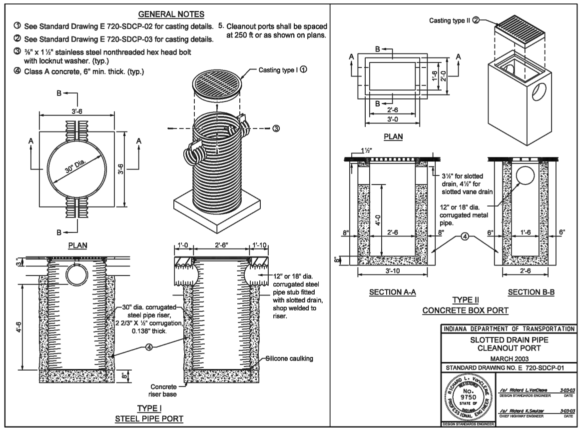
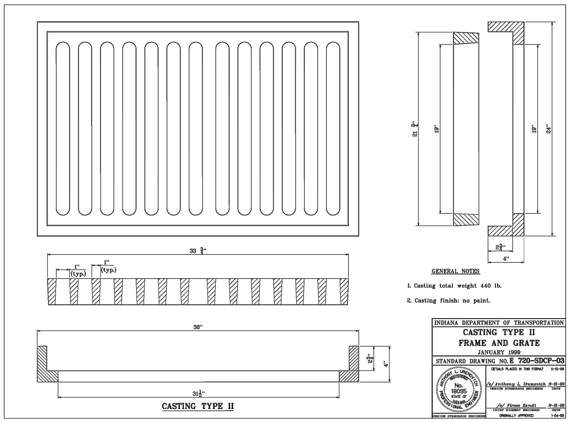
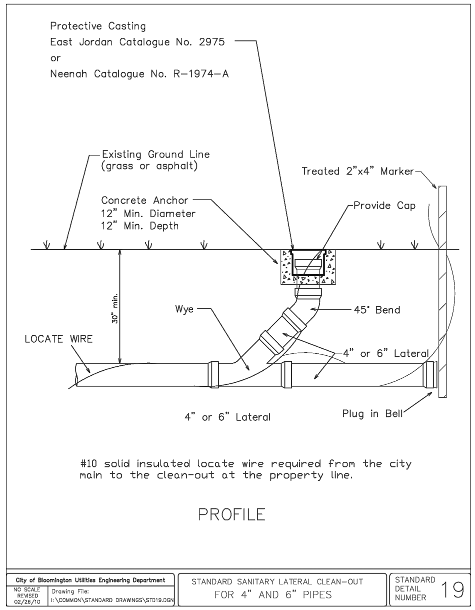
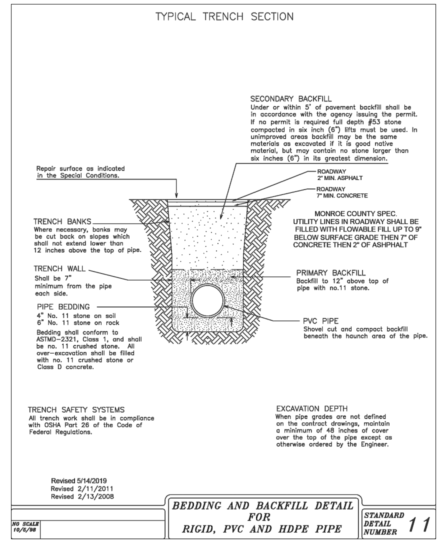
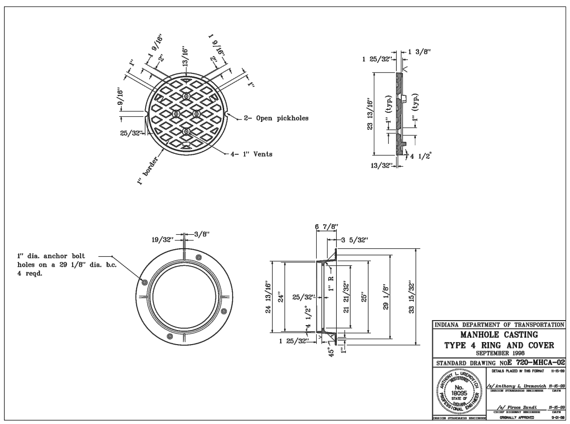
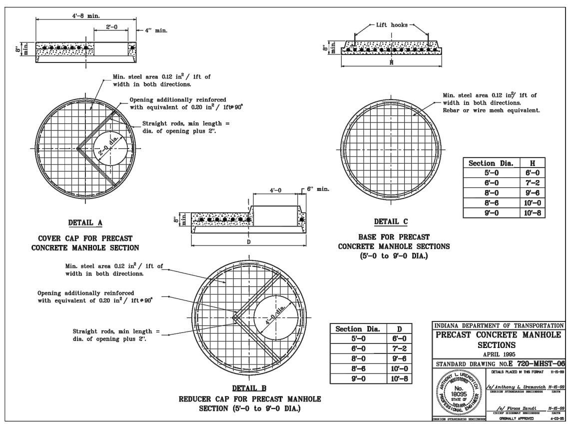

GENERAL NOTES
① See Standard Drawing E 720-SDCP-02 for casting details.
② See Standard Drawing E 720-SDCP-03 for casting details.
③ ⅜" x 1½" stainless steel nonthreaded hex head bolt with locknut washer. (typ.)
④ Class A concrete, 6" min. thick. (typ.)
5. Cleanout ports shall be spaced at 250 ft or as shown on plans.
Casting type I ①
30" Dia.
PLAN
30" dia. corrugated steel pipe riser, 2 2/3" X ½" corrugation, 0.138" thick.
12" or 18" dia. corrugated steel pipe stub fitted with slotted drain, shop welded to riser.
Silicone caulking
Concrete riser base
TYPE I
STEEL PIPE PORT
Casting type II ②
PLAN
3½" for slotted drain, 4½" for slotted vane drain
12" or 18" dia. corrugated metal pipe.
SECTION A-A
SECTION B-B
TYPE II
CONCRETE BOX PORT
INDIANA DEPARTMENT OF TRANSPORTATION
SLOTTED DRAIN PIPE CLEANOUT PORT
MARCH 2003
STANDARD DRAWING NO. E 720-SDCP-01
/s/ Richard L. VanCleave 3-03-03 DESIGN STANDARDS ENGINEER
/s/ Richard K. Smutzer 3-03-03 CHIEF HIGHWAY ENGINEER

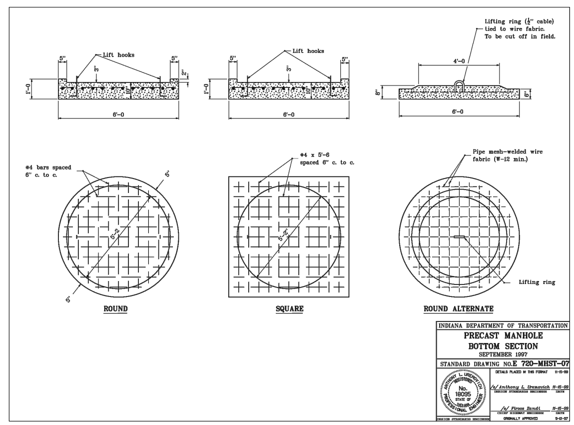



Protective Casting
East Jordan Catalogue No. 2975
or
Neenah Catalogue No. R-1974-A
Existing Ground Line (grass or asphalt)
Treated 2"x4" Marker
Concrete Anchor
12" Min. Diameter
12" Min. Depth
Provide Cap
30" min.
Wye
45° Bend
LOCATE WIRE
4" or 6" Lateral
4" or 6" Lateral
Plug in Bell
#10 solid insulated locate wire required from the city main to the clean-out at the property line.
PROFILE
City of Bloomington Utilities Engineering Department
STANDARD SANITARY LATERAL CLEAN-OUT FOR 4" AND 6" PIPES
STANDARD DETAIL NUMBER 19


TYPICAL TRENCH SECTION
SECONDARY BACKFILL
Under or within 5' of pavement backfill shall be in accordance with the agency issuing the permit. If no permit is required full depth #53 stone compacted in six inch (6") lifts must be used. In unimproved areas backfill may be the same materials as excavated if it is good native material, but may contain no stone larger than six inches (6") in its greatest dimension.
Repair surface as indicated in the Special Conditions.
ROADWAY 2" MIN. ASPHALT
ROADWAY 7" MIN. CONCRETE
MONROE COUNTY SPEC. UTILITY LINES IN ROADWAY SHALL BE FILLED WITH FLOWABLE FILL UP TO 9" BELOW SURFACE GRADE THEN 7" OF CONCRETE THEN 2" OF ASHPHALT
TRENCH BANKS
Where necessary, banks may be cut back on slopes which shall not extend lower than 12 inches above the top of pipe.
TRENCH WALL
Shall be 7" minimum from the pipe each side.
PRIMARY BACKFILL
Backfill to 12" above top of pipe with no.11 stone.
PIPE BEDDING
4" No. 11 stone on soil
6" No. 11 stone on rock
Bedding shall conform to ASTMD-2321, Class 1, and shall be no. 11 crushed stone. All over-excavation shall be filled with no. 11 crushed stone or Class D concrete.
PVC PIPE
Shovel cut and compact backfill beneath the haunch area of the pipe.
TRENCH SAFETY SYSTEMS
All trench work shall be in compliance with OSHA Part 26 of the Code of Federal Regulations.
EXCAVATION DEPTH
When pipe grades are not defined on the contract drawings, maintain a minimum of 48 inches of cover over the top of the pipe except as otherwise ordered by the Engineer.
Revised 5/14/2019
Revised 2/11/2011
Revised 2/13/2008
NO SCALE 10/5/98
BEDDING AND BACKFILL DETAIL FOR RIGID, PVC AND HDPE PIPE
STANDARD DETAIL NUMBER 11




Min. steel area 0.12 in² / 1ft of width in both directions.
Opening additionally reinforced with equivalent of 0.20 in² / 1ft ⊥ 90°
Straight rods, min length = dia. of opening plus 2'.
DETAIL A
COVER CAP FOR PRECAST CONCRETE MANHOLE SECTION
Lift hooks
Min. steel area 0.12 in² / 1ft of width in both directions. Rebar or wire mesh equivalent.
DETAIL C
BASE FOR PRECAST CONCRETE MANHOLE SECTIONS (5'-0 to 9'-0 DIA.)
Section Dia. | H
5'-0 | 6'-0
6'-0 | 7'-2
8'-0 | 9'-6
8'-6 | 10'-0
9'-0 | 10'-8
DETAIL B
REDUCER CAP FOR PRECAST MANHOLE SECTION (5'-0 to 9'-0 DIA.)
Section Dia. | D
5'-0 | 6'-0
6'-0 | 7'-2
8'-0 | 9'-6
8'-6 | 10'-0
9'-0 | 10'-8
INDIANA DEPARTMENT OF TRANSPORTATION
PRECAST CONCRETE MANHOLE SECTIONS
APRIL 1995
STANDARD DRAWING NO. E 720-MHST-06


Lift hooks
Lifting ring (½" cable) tied to wire fabric. To be cut off in field.
#4 bars spaced 6" c. to c.
#4 x 5'-6 spaced 6" c. to c.
Pipe mesh-welded wire fabric (W-12 min.)
Lifting ring
ROUND
SQUARE
ROUND ALTERNATE
INDIANA DEPARTMENT OF TRANSPORTATION
PRECAST MANHOLE BOTTOM SECTION
SEPTEMBER 1997
STANDARD DRAWING NO. E 720-MHST-07

CROSSROAD ENGINEERS, PC
TRANSPORTATION & DEVELOPMENT CONSULTANTS

SHEET 802

MISCELLANEOUS DETAILS

BLOOMINGTON HOPEWELL WEST

HORIZ. SCALE	NOT TO SCALE
VERT. SCALE	NOT TO SCALE
CHECKED	MAM
APPR.	AJW
DRAWN	DEP
DESIGNED	AJW
JOB No.	-
DATE	SEPTEMBER 28, 2024

60% PLANS
NOT FOR
CONSTRUCTION

DIRECTORY PATH : R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
FILENAME : 802 MISCELLANEOUS DETAILS.dwg
DATE/USER : 4/19/2024 10:55 AM / AuaE

TYPE OF ROADWAY / CLEARANCE	INTERSTATE AND DIVIDED HIGHWAY WITH SHOULDER, RURAL & URBAN	DIVIDED HIGHWAY WITH CURB, RURAL & URBAN	NON-DIVIDED HIGHWAY, RURAL OR CITY STREET	NON-DIVIDED HIGHWAY, URBAN
VERTICAL: EDGE OF TRAVELED WAY PAVEMENT TO BOTTOM OF SIGN OR SIGNS	7 ft TO 7.5 ft ①	7 ft TO 7.5 ft ②	5 ft TO 5.5 ft ④②	7 ft TO 7.5 ft ②
HORIZONTAL: EDGE OF TRAVELED WAY PAVEMENT TO EDGE OF SIGN OR SIGNS	12 ft min. or 6 ft min. from the shoulder, whichever is greater	6 ft min. ③	12 ft min. or 6 ft min. from the shoulder, whichever is greater	12 ft min. or 6 ft min. from the shoulder, whichever is greater ③

NOTES:

① If a secondary sign is mounted below another sign, the secondary sign shall be installed at least 5 ft. above the level of the pavement edge.

② The height to the bottom of a secondary sign mounted below another sign may be 1 ft. less than the height specified above.

③ In urban areas where lateral offsets are limited, a minimum lateral offset of 2 ft. may be used. A minimum offset of 1 ft. from the face of the curb may be used in urban areas where sidewalk width is limited or where existing poles are close to the curb.

④ Where parking or pedestrian movements occur on an expected recurring basis, the clearance to the bottom of the sign shall be at least 7 ft.

INDIANA DEPARTMENT OF TRANSPORTATION
HORIZONTAL AND VERTICAL SHEET SIGN CLEARANCE
SEPTEMBER 2003
STANDARD DRAWING NO. E 802-SNPL-02

RICHARD L. VANCLEAVE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER
DESIGN STANDARDS ENGINEER

/s/ Richard L.VanCleave 9-02-03
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K.Smutzer 9-02-03
CHIEF HIGHWAY ENGINEER DATE

WIDTH X HEIGHT ("W X H")	MOUNTING HEIGHT 5 FT U CHANNEL	5 FT SQUARE POST	6 FT U CHANNEL	6 FT SQUARE POST	7 FT U CHANNEL	7 FT SQUARE POST	8 FT U CHANNEL	8 FT SQUARE POST
12 x 12, 12 x 6, 12 x 9 12 x 12, 12 x 18, 12 x 30	1-A	1-Type 1	1-A	1-Type 1	1-A	1-Type 1	1-A	1-Type 1
12 x 36	1-A		1-A		1-A		1-A	
18 x 6, 18 x 12, 18 x 18	1-A		1-A		1-A		1-A	
18 x 24	1-A		1-A		1-A		1-A	
18 x 30	1-A		1-A		1-A		1-A	
18 x 48	1-A		1-A		1-A		1-A	
24 x 12, 24 x 18, 24 x 24	1-A		1-A		1-A		1-A	
24 x 30	1-A		1-A		1-A		1-A	
24 x 36	1-A		1-A		1-A		1-A	
30 x 18	1-A		1-A		1-A		1-A	
30 x 24	1-A		1-A		1-A		1-A	
30 x 30	1-A		1-A		1-A		1-A	
30 x 36	1-A		1-A		1-A		1-A	
30 x 42	1-B		1-B		1-B		1-B	
30 x 48	1-B		1-B		1-B		1-B	
36 x 12	2-A		2-A		2-A		2-A	
36 x 18	2-A		2-A		2-A		2-A	
36 x 24	2-A		2-A		2-A		2-A	
36 x 36	2-A		2-A		2-A		2-A	
36 x 48	2-A		2-A		2-A		2-A	
42 x 18	2-A		2-A		2-A		2-B	
42 x 24	2-A		2-A		2-A		2-A	
42 x 30	2-A		2-A		2-A		2-A	
42 x 36	2-A		2-A		2-A		2-A	
48 x 16	2-A		2-A		2-A		2-A	
48 x 18	2-A		2-A		2-A		2-A	
48 x 24	2-A		2-A		2-A		2-A	
48 x 30	2-A		2-A		2-A		2-A	
48 x 36	2-A	2-Type 2	2-A	2-Type 2	2-A	2-Type 2	2-A	2-Type 2
48 x 48	2-A		2-B		2-B		2-B	
48 x 60	2-B		2-B		2-B		2-B	
60 x 24	2-A		2-A		2-A		2-A	
60 x 30	2-A		2-A		2-A		2-A	
60 x 36	2-A		2-A		2-B		2-B	
60 x 48	2-B		2-B		2-B		2-B	
72 x 24	2-A		2-A		2-A		2-A	
72 x 36	2-B		2-B		2-B		2-B	
90 x 36 120 x 36	2-B	2-Type 3	2-B	2-Type 3	2-B	2-Type 3	2-B	2-Type 3

NOTES:

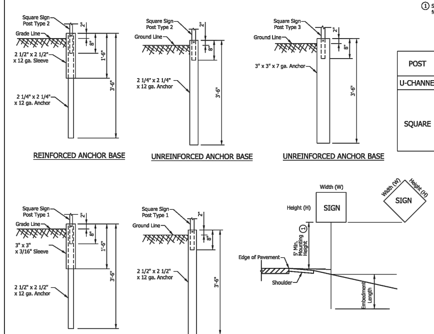
1. See Standard Drawing E 802-SNGS-08 and -09 for square steel sign post installation details.
2. The Type 1 post shall be 2 1/4 in. x 2 1/4 in. x 12 ga. wall thickness..
3. The Type 2 post shall be 2 in. x 2 in. x 12 ga. wall thickness.
4. The Type 3 post shall be 2 1/2 in. x 2 1/2 in. x 12 ga. wall thickness.
5. Flanged channel posts are as specified and as shown on the plans.

INDIANA DEPARTMENT OF TRANSPORTATION
STEEL SIGN POST SELECTION TABLE
SEPTEMBER 2017
STANDARD DRAWING NO. E 802-SNGS-07

DAVID H. BORUFF REGISTERED No. 60900348 STATE OF INDIANA PROFESSIONAL ENGINEER

/s/ David H. Boruff 03/16/17
DESIGN STANDARDS ENGINEER DATE

/s/ John Leckie 04/10/17
CHIEF ENGINEER DATE



NOTES:

① See Standard Drawing E 802-SNGS-09 for sign size and E 802-SNPL-02 for horizontal and vertical sheet sign clearance.

POST	TYPE	WALL THICKNESS	NO. OF POSTS PERMITTED IN 7 ft PATH	EMBEDMENT LENGTH
U-CHANNEL	A, B		1 OR 2	3'-6"
SQUARE	1	12 ga.	1	Anchor Base
	2	12 ga.	1 OR 2	
	3	12 ga.	1	

INDIANA DEPARTMENT OF TRANSPORTATION
STEEL SIGN POSTS ANCHOR BASE DETAILS
SEPTEMBER 2017
STANDARD DRAWING NO. E 802-SNGS-09

DAVID H. BORUFF REGISTERED No. 60900348 STATE OF INDIANA PROFESSIONAL ENGINEER

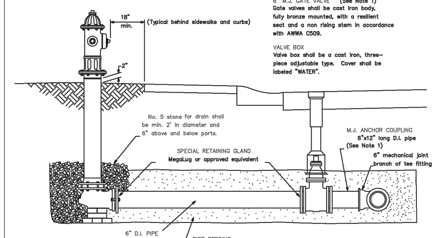
/s/ David H. Boruff 03/16/17
DESIGN STANDARDS ENGINEER DATE

/s/ John Leckie 04/10/17
CHIEF ENGINEER DATE

FIRE HYDRANT
Fire hydrants shall conform to ANSI/AWWA C502 and must be Kennedy Guardian model K81 or Mueller Super Centurion 200 (catalog no. A–423) or Waterous Pacer Classic. These are dry–barrel type firehydrants with a 5." main valve opening, two hose nozzles and one pumper nozzle. Hydrants shall have a mechanical joint type connection and shall be painted according to 4.4.4.4. FIRE HYDRANTS.

Install fire hydrant at a minimum of 2' from structures or obstructions and set the hydrant bury line 2" above finished grade. The pumper nozzle must face the street.

NOTES
1. For connection to existing water mains, a 6" tapping valve and saddle shall be used in place of the gate valve and anchor coupling.



6" M.J. GATE VALVE (See Note 1)
Gate valves shall be cast iron body, fully bronze mounted, with a resilient seat and a non rising stem in accordance with AWWA C509.

VALVE BOX
Valve box shall be a cast iron, three–piece adjustable type. Cover shall be labeled "WATER".

PIPE BEDDING
4" of no. 11 stone in soil or
6" of no. 11 stone in rock

BACKFILL
No. 11 stone from bedding to 1' over top of pipe. Compacted No. 53 stone beneath and within 5' of pavement or clean native soil in other areas.

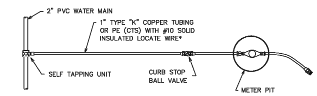
REVISED 02/15/2011 G.N.
REVISED 02/23/2010 T.L.
REVISED 02/08/2008 T.A.

City of Bloomington Utilities Engineering Department
NO SCALE 9/1/94 M. Hicks
Drawing File: I:\COMMON\STANDARD DRAWINGS\STD8.DGN

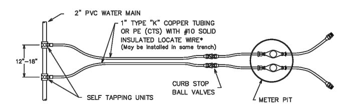
STANDARD FIRE HYDRANT AND CONNECTION DETAIL

STANDARD DETAIL NUMBER 8

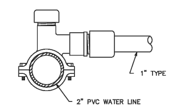
WATER SERVICE FROM A 2" PVC WATER MAIN TO A SINGLE METER SETUP



WATER SERVICE FROM A 2" PVC WATER MAIN TO A DOUBLE METER SETUP



SELF TAPPING UNIT WITH COMPRESSION CONNECTOR OUTLET
(2" MAIN X 1" COPPER TUBING STYLE)
Self tapping unit shall be FastTap by Continental Water Products or equal.



DRAWING FILE:
I\COMMON\STANDARD DRAWING\STD15.DWG

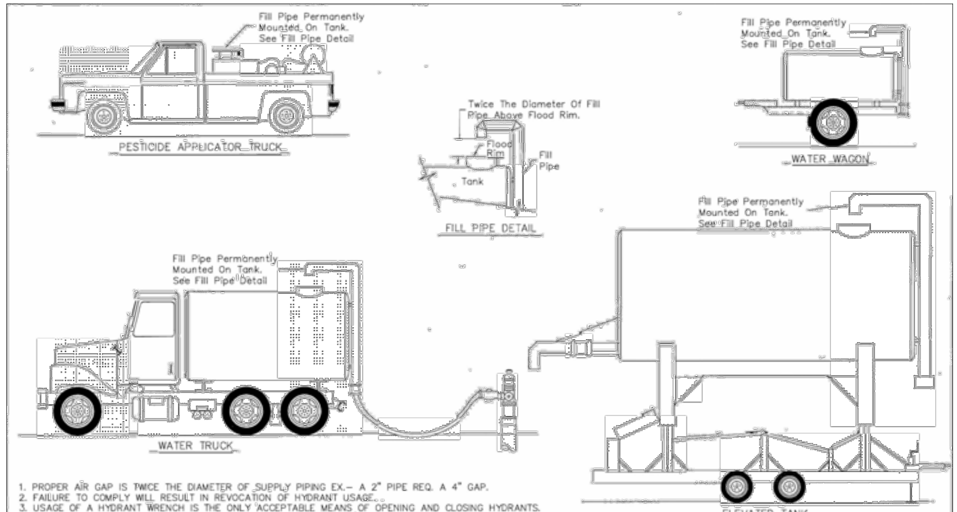
* SEE CBU CONSTRUCTION SPEC. SECTION 4.4.4.1.2.

City of Bloomington Utilities Engineering Department

STANDARD WATER SERVICE FROM A 2" PVC WATER MAIN

NO SCALE 1–20–17 by G.A.N

STANDARD DETAIL NUMBER 15



1. PROPER AIR GAP IS TWICE THE DIAMETER OF SUPPLY PIPING EX.– A 2" PIPE REQ. A 4" GAP.
2. FAILURE TO COMPLY WILL RESULT IN REVOCATION OF HYDRANT USAGE.
3. USAGE OF A HYDRANT WRENCH IS THE ONLY ACCEPTABLE MEANS OF OPENING AND CLOSING HYDRANTS.
4. MUST ONLY USE HYDRANTS DIRECTED FOR USE BY CBU REPRESENTATIVE.

CITY OF BLOOMINGTON UTILITIES ENGINEERING DEPARTMENT
STANDARD DETAIL NUMBER 35
Date: 04/26/2017
APPROVED BY: R. FIEDLER
DRAWN BY: J. STEPHENS
FILE LOCATION: I:\COMMON\STANDARD DRAWINGS\STD35.DWG
FILL PIPE DETAILS FOR PORTABLE TANKS WITH AIR GAP SEPERATION

CROSSROAD ENGINEERS, PC
TRANSPORTATION & DEVELOPMENT CONSULTANTS
115 N 17th AVENUE, BEECH GROVE, IN 46107 (317) 780-1555

SHEET 803

MISCELLANEOUS DETAILS

BLOOMINGTON HOPEWELL WEST

JOB No.	.	DRAWN	DEP	CHECKED	MAM
DATE	SEPTEMBER 28, 2024	DESIGNED	AJW	APPR.	AJW
HORIZ. SCALE	NOT TO SCALE	VERT. SCALE	NOT TO SCALE		

60% PLANS NOT FOR CONSTRUCTION

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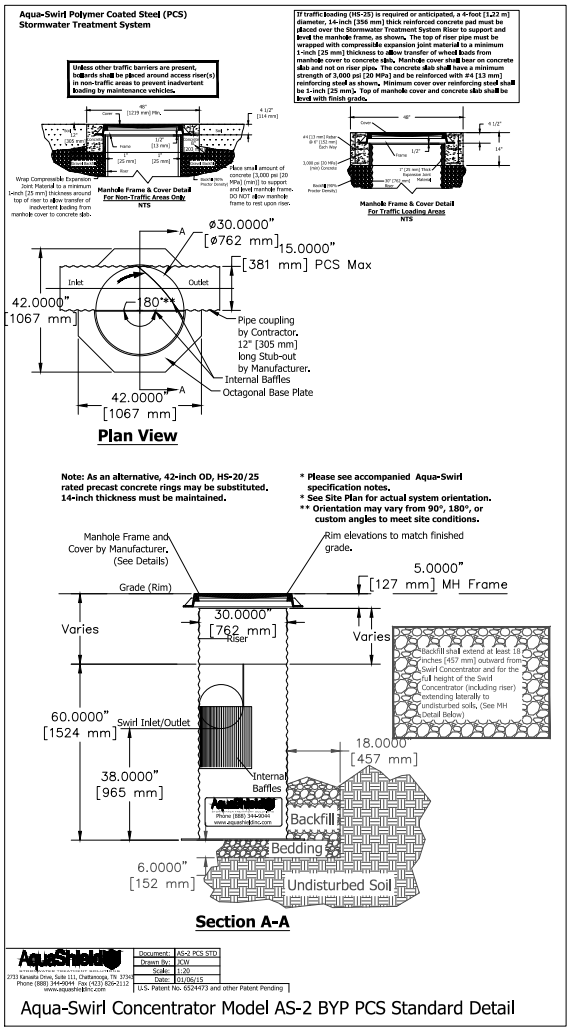
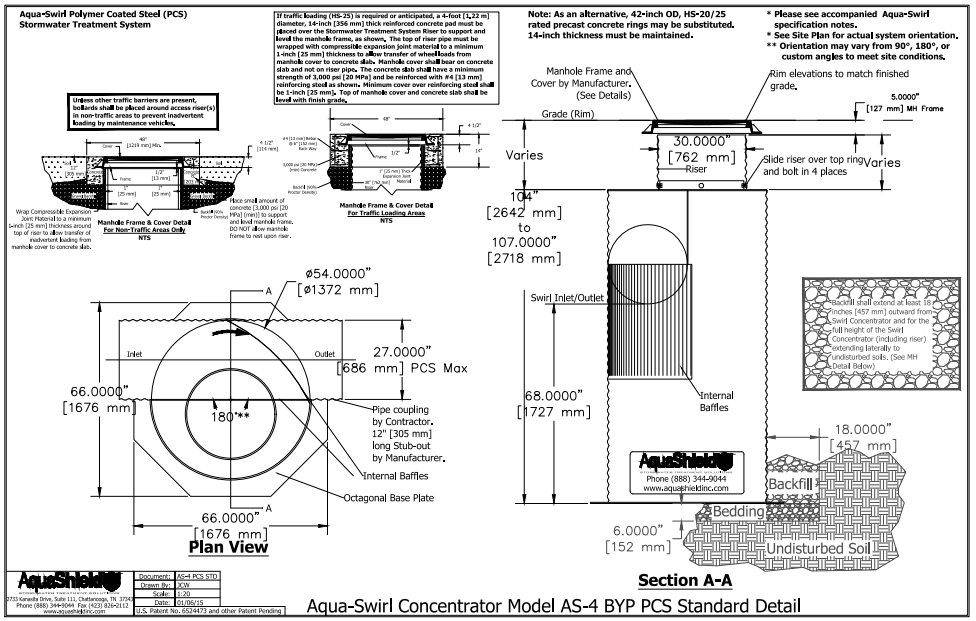
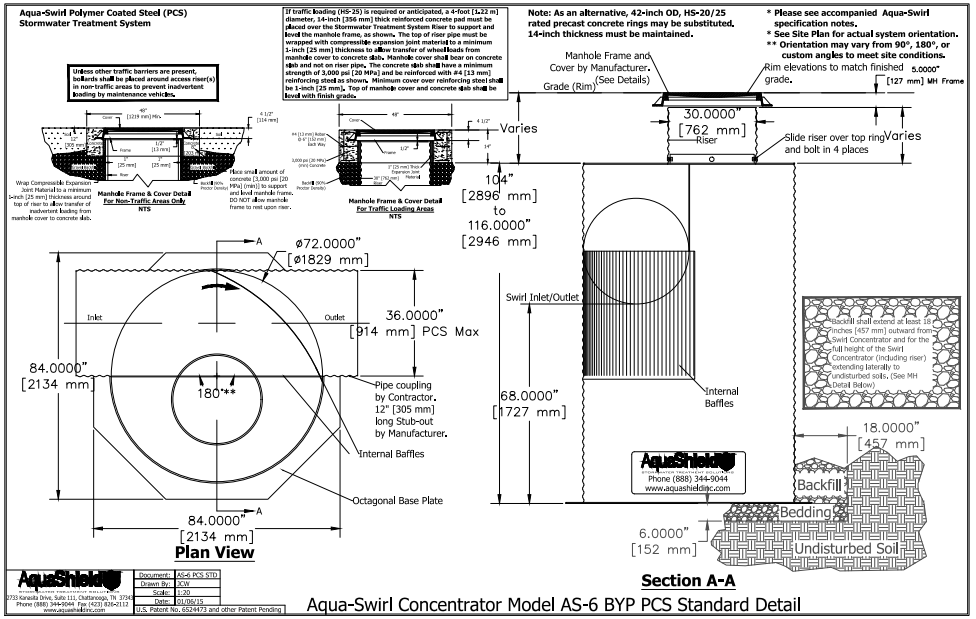
DATE/USER : 4/15/2024 2:57 PM / Dpdozo



Aqua-Swirl Concentrator Model AS-2 BYP PCS Standard Detail



Aqua-Swirl Concentrator Model AS-4 BYP PCS Standard Detail



Aqua-Swirl Concentrator Model AS-6 BYP PCS Standard Detail

TRANSPORTATION & DEVELOPMENT CONSULTANTS

AQUASWIRL DETAILS

BLOOMINGTON HOPEWELL WEST

JOB No.	-	SHEET	804
DATE	SEPTEMBER 28, 2024	HORIZ. SCALE	NOT TO SCALE
DESIGNED	AJW	VERT. SCALE	NOT TO SCALE
APPR.	AJW		
CHECKED	MAH		
DRAWN	DEP		

60% PLANS
NOT FOR
CONSTRUCTION

SHEET 804

DIRECTORY PATH : R:\Active\Bloomington, City Of\Proposed West\Design\CAD\Plans
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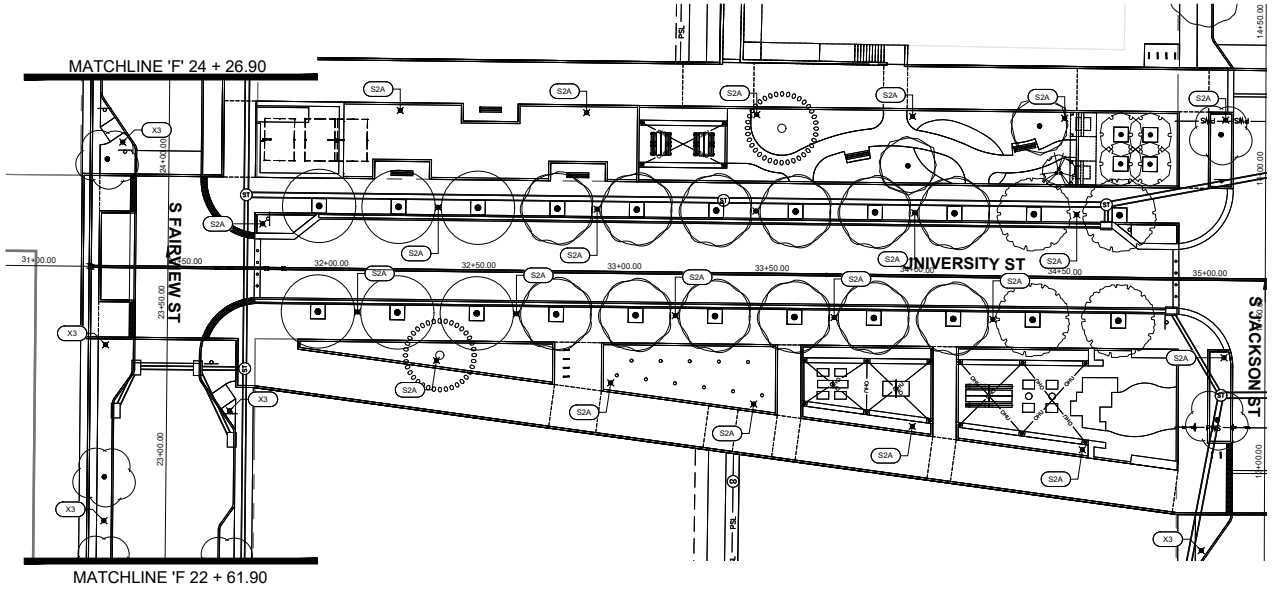
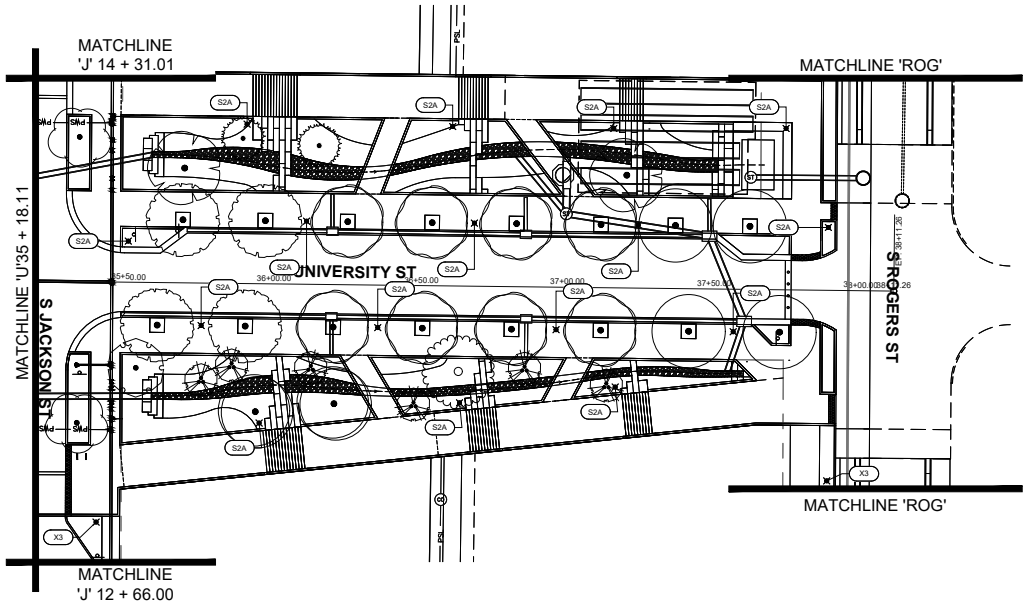




ELECTRICAL PLAN NOTES:

1. THESE PLANS INDICATE THE GENERAL ELECTRICAL SCOPE OF THE PROJECT AND ARE DIAGRAMMATIC IN NATURE. THEY DO NOT REPRESENT EVERY NECESSARY OFFSET, COUPLING, FITTING, HANDHOLE, ETC. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE PROPOSED JOBSITE PRIOR TO BIDDING AND VERIFY APPLICABLE CLEARANCES, ACCESS, AND CONSTRUCTABILITY OF EQUIPMENT, AND ANY OTHER ITEMS THAT ARE REQUIRED FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK RESULTING IN A CODE COMPLIANT, FULLY FUNCTIONING SYSTEM.
2. UNLESS OTHERWISE NOTED, ALL 120 VOLT, 20 AMP CIRCUITS OVER 60-FEET IN LENGTH SHALL BE #10 AWG, OVER 95-FEET SHALL BE #8, AND OVER 145-FEET SHALL BE #6.
3. CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES TO AVOID CONFLICTS OF SPACE.
4. CONTRACTOR SHALL COORDINATE THE EXACT LOCATION OF ALL DEVICES WITH ALL OTHER TRADES PRIOR TO ROUGH-IN. EXACT LOCATION TO BE DETERMINED IN THE FIELD.
5. CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL AND PLUMBING CONTRACTORS FOR EXACT LOCATIONS OF EQUIPMENT PRIOR TO ROUGH-IN.
6. REFER TO SHEET E103 FOR LIGHT FIXTURE SCHEDULE.

NORTH

0' 10' 20' 40'
SCALE: 1" = 20'

REVISIONS

NO.	DATE	DESCRIPTION

CLIENT:
CITY OF BLOOMINGTON
Bloomington, IN
47403

DESIGN TEAM:
REA

CERTIFIED BY:

HOPEWELL WEST

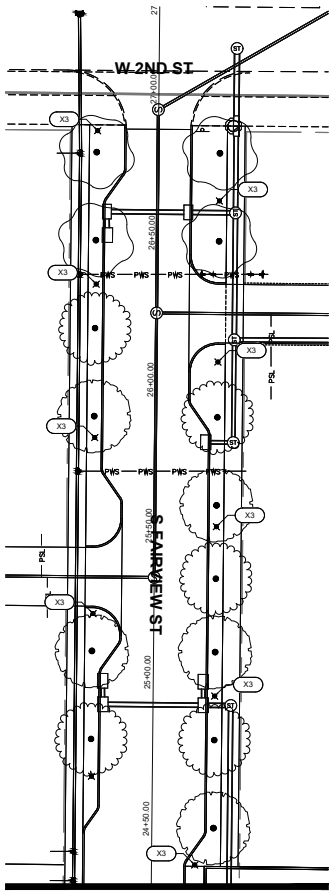
CITY OF BLOOMINGTON
BLOOMINGTON, INDIANA 47403

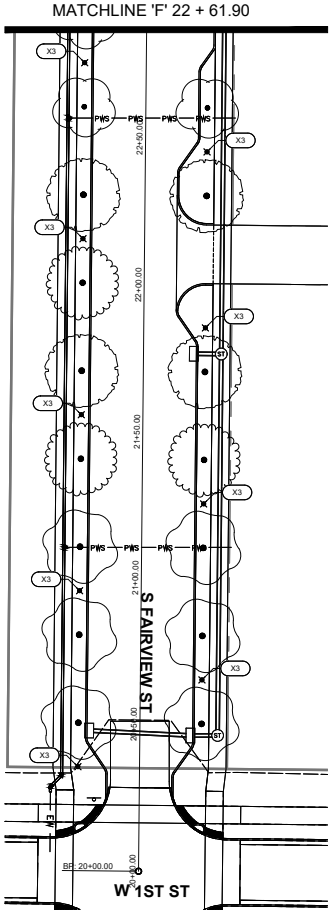
DATE:	PROJECT NO.:
05/28/2024	2023-1702
DRAWN BY: KK	CHECKED BY: CP

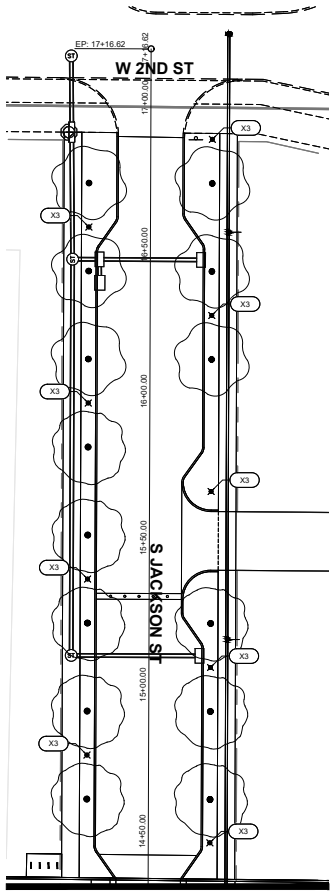
DRAWING STATUS:
60% PLANS
NOT FOR CONSTRUCTION

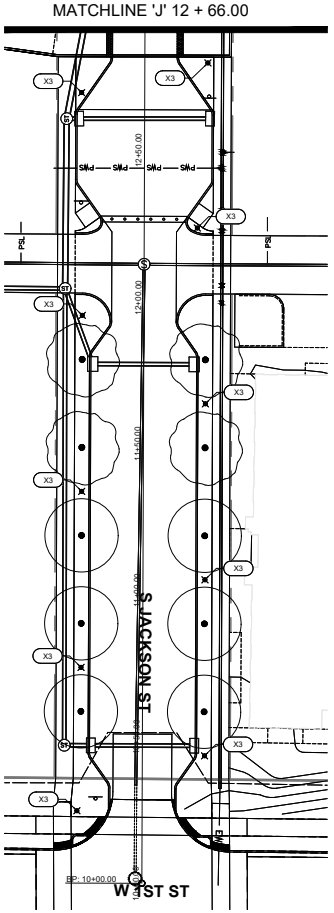
SHEET TITLE:
UNIVERSITY AVENUE
SITE ELECTRIC PLAN

SHEET NO.:
E101









NORTH

SCALE: 1" = 20'

REVISIONS

NO.	DATE	DESCRIPTION

CLIENT: CITY OF BLOOMINGTON
Bloomington, IN 47403

DESIGN TEAM: REA

CERTIFIED BY:

HOPEWELL WEST

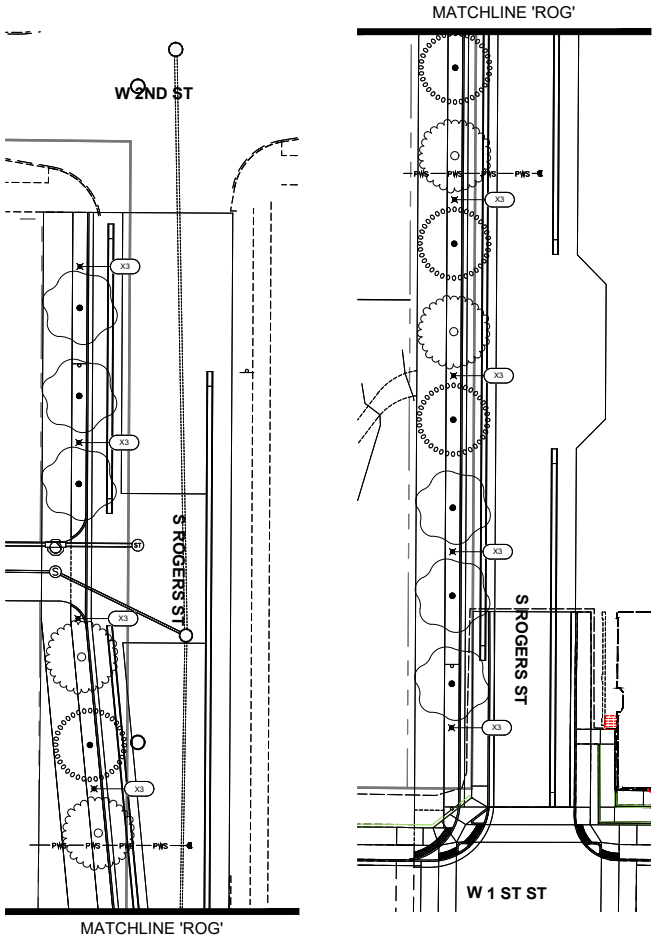
CITY OF BLOOMINGTON
BLOOMINGTON, INDIANA 47403

DATE:	PROJECT NO.:
05/28/2024	2023-1702
DRAWN BY: KK	CHECKED BY: CP

DRAWING STATUS:
60% PLANS
NOT FOR CONSTRUCTION

SHEET TITLE:
FAIRVIEW & JACKSON STREET
SITE ELECTRIC PLAN

SHEET NO.:
E102



Light Fixture Schedule

Type	Manufacturer	Model No.	Lamp Type	Voltage	Mounting	Description	Illustration (See Note 1)	Notes
'S2A'	Landscape Forms	AR1P18C2WF (2 @ 130° - 65° tilt - 13' mounting ht.) ARC42 (pole)	LED / 4000 K	---	Pole	Area lighting assembly. Four (2) LED luminaires with wide flood optics and mounting arms. 14' round tapered aluminum pole. Wet location listed. Matte black finish.		7
'X3'	Duke	Traditional, 12' pole	LED	---	Pole	12' mounting height, direct bury pole. Black finish.		

Notes:
1. Pictures are shown as a visual aid only and may not depict specific attributes listed in this schedule.
2. Emergency backup: Minimum of 90 minute runtime for emergency operation.
3. 0-10V LED dimmer driver. Provide manufacturer-approved compatible dimmer where applicable (refer to lighting plans for dimmer location[s]).
4. ELV reserve phasing dimming. Provide manufacturer-approved compatible dimmer where applicable (refer to lighting plans for dimmer location[s]).
5. Coordinate with ceiling and/or wall and/or bench structure prior to rough-in and adjust as necessary to avoid installation conflicts.
6. Provide all connections as required by the Manufacturer. Verify exact quantities of all system components prior to ordering. Install all system components per manufacturer's requirements.
7. Coordinate tilt/aiming of luminaire(s) in field with Engineer/Architect.

NORTH

0' 10' 20' 40'
SCALE: 1" = 20'

REVISIONS

NO.	DATE	DESCRIPTION

CLIENT:
CITY OF BLOOMINGTON
Bloomington, IN
47403

DESIGN TEAM:
REA

CERTIFIED BY:

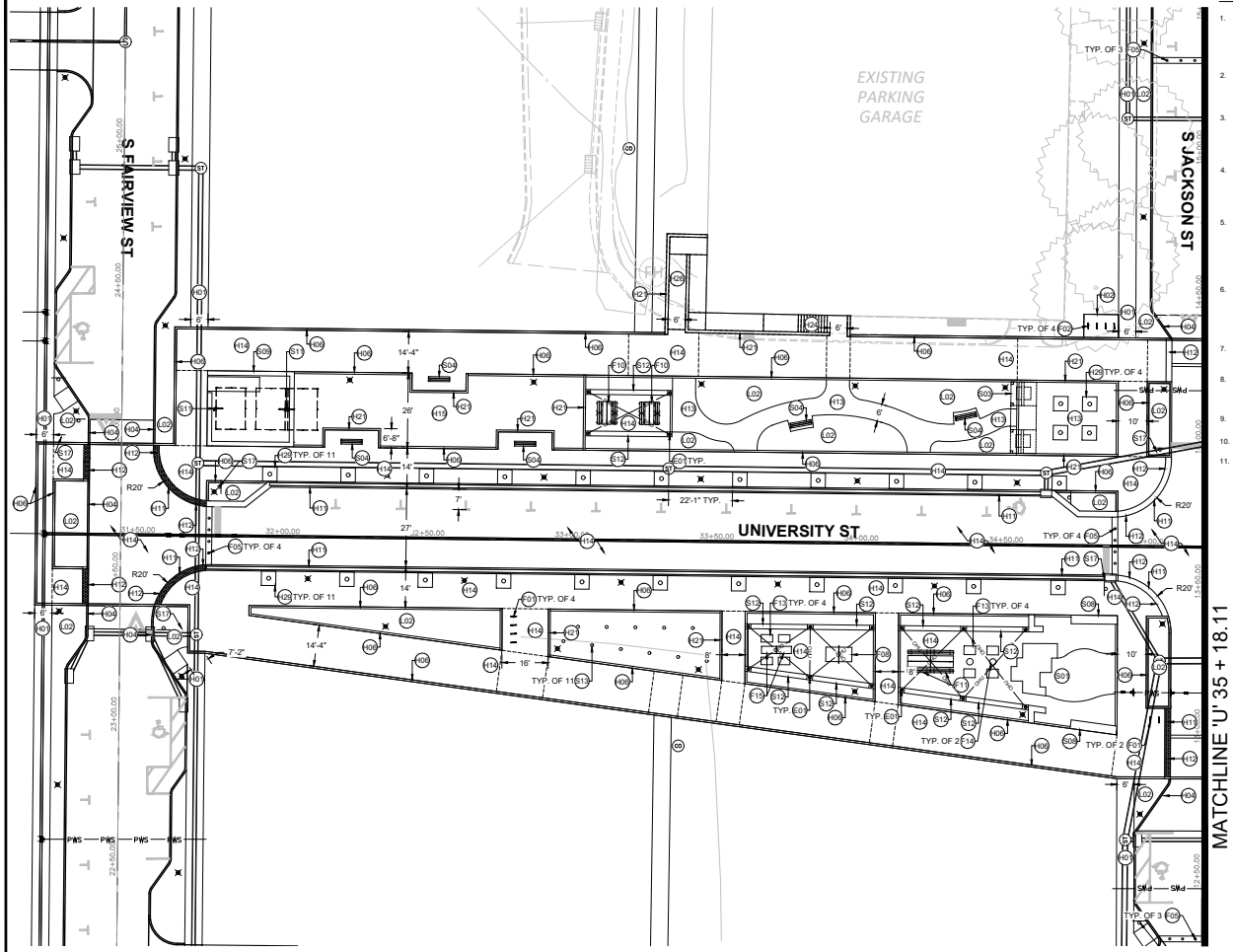
HOPEWELL WEST

CITY OF BLOOMINGTON
BLOOMINGTON, INDIANA 47403

DATE: 05/28/2024
PROJECT NO.: 2023-1702
DRAWN BY: KK
CHECKED BY: CP
DRAWING STATUS:
60% PLANS
NOT FOR CONSTRUCTION

SHEET TITLE:
ROGERS STREET
SITE ELECTRIC PLAN
& FIXTURE SCHEDULE

SHEET NO.:
E103



LAYOUT GENERAL NOTES

1. SITE LAYOUT DATE, INCLUDING COORDINATE POINTS, IS BASED ON A SURVEY PERFORMED BY, OTHERS. REPORT ANY DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS TO THE OWNER AND LANDSCAPE ARCHITECT IMMEDIATELY. RUNDELL ERNSTBERGER ASSOCIATES, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE SURVEY INFORMATION.
2. IF GIVEN, OR UNLESS NOTED OTHERWISE, ALL DIMENSIONS ARE TO THE FOLLOWING: FACE OF WALL, FACE OF BUILDING, FACE OF CURB, EDGE OF PAVEMENT, CENTERLINE OF PAVEMENT, OR CENTER OF LAYOUT POINT.
3. ALL CONSTRUCTION LAYOUT STAKING IS TO BE PERFORMED BY A LAND SURVEYOR OR PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF INDIANA. LAYOUT DATA WILL BE MADE AVAILABLE TO THE CONTRACTOR IN A DIGITAL FORMAT FOR USE IN LAYOUT STAKING BY A LAND SURVEYOR OR PROFESSIONAL ENGINEER.
4. THE SURVEYOR OR PROFESSIONAL ENGINEER EMPLOYED BY THE CONTRACTOR TO PERFORM CONSTRUCTION LAYOUT STAKING SHALL SET AND PROTECT ADDITIONAL TRAVERSE POINTS OUTSIDE THE AREAS OF CONSTRUCTION ACTIVITY IN ORDER TO MAINTAIN THE INTEGRITY OF HORIZONTAL AND VERTICAL CONTROL FOR THE SITE.
5. AS SOME OF THE HORIZONTAL CONTROL POINTS SHOWN ON THIS SURVEY AS EXISTING MAY HAVE BEEN REMOVED OR DAMAGED SINCE THEY WERE SET, THE CONTRACTOR SHALL DURING THE BIDDING PROCESS, VERIFY THE EXISTENCE AND INTEGRITY OF THE HORIZONTAL CONTROL POINTS SHOWN HEREON. THE CONTRACTOR SHALL INCLUDE ANY WORK NECESSARY TO ESTABLISH RELIABLE LAYOUT CONTROL FOR THE PROJECT IN THE BID.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE RESULTING FROM DEMOLITION OR CONSTRUCTION ACTIVITY TO EXISTING SITE ELEMENTS THAT ARE TO REMAIN. FAILURE TO REPORT OR DOCUMENT ANY DAMAGE PRIOR TO CONSTRUCTION NEAR CONSTRUCTION ACTIVITIES WILL RESULT IN REPAIRS BY THE CONTRACTOR AT NO COST TO THE OWNER.
7. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
8. THE CONTRACTOR SHALL SUBMIT HORIZONTAL AND VERTICAL JOINTING PLAN TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO CONSTRUCTION.
9. REFER TO SHEET LAXXX - LAXXX FOR FURNISHINGS PLAN.
10. REFER TO SHEET LAXXX - LAXXX FOR SOILS PLAN.
11. REFER TO LA103 THRU LA112 FOR PAVER LAYOUT, PATTERN, AND FINISH. EXTENTS OF STANDARD VS VEHICULAR PAVERS ARE SHOWN ON PLAN SCHEMATICALLY. TRANSITION SHALL OCCUR AT WHOLE PAVERS.

SITE LAYOUT KEYNOTES

ITEM	DESCRIPTION	DETAIL REFERENCE
H01	CONCRETE PAVEMENT, 4"	X/LAXXX
H02	CONCRETE PAVEMENT, 6"	X/LAXXX
H03	CONCRETE PAVEMENT, 8"	X/LAXXX
H04	CURB, CONCRETE	X/LAXXX
H05	CURB, CONCRETE, MODIFIED	X/LAXXX
H06	CONCRETE CONTAINMENT CURB, 8"	X/LAXXX
H07	NOT USED	X/LAXXX
H08	NOT USED	X/LAXXX
H09	UNIT PAVERS, TYPE 1	X/LAXXX
H10	UNIT PAVERS, TYPE 2	X/LAXXX
H11	UNIT PAVERS, TYPE 3 (DIRECTIONAL)	X/LAXXX
H12	DETECTABLE WARNING SURFACE (DWS)	X/LAXXX
H13	DECOMPOSED GRANITE	X/LAXXX
H14	PERMEABLE PAVERS, TYPE 1	X/LAXXX
H15	ARTIFICIAL TURF - STANDARD	X/LAXXX
H16	ARTIFICIAL TURF - FALL RATED	X/LAXXX
H17	METAL EDGE RESTRAINT, TYPE 1	X/LAXXX
H18	METAL EDGE RESTRAINT, TYPE 2	X/LAXXX
H19	METAL EDGE RESTRAINT, TYPE 3	X/LAXXX
H20	PERMEABLE PAVER/ CONCRETE PAVEMENT INTERFACE	X/LAXXX
H21	CONCRETE WALL	X/LAXXX
H22	LIMESTONE BLOCK	X/LAXXX
H23	CONCRETE STEPS, 8 RISERS	X/LAXXX
H23B	CONCRETE STEPS, 9 RISERS	X/LAXXX
H24	CONCRETE STEPS, 10 RISERS	X/LAXXX
H25	CONCRETE STEPS, 12 RISERS	X/LAXXX
H25B	CONCRETE STEPS, 15 RISERS	X/LAXXX
H26	CONCRETE RAMP	X/LAXXX
H27	NOT USED	X/LAXXX
H28	PAVER GRATE, TYPE 1	X/LAXXX
H29	PAVER GRATE, TYPE 2	X/LAXXX
H30	ACCESSIBLE CURB RAMP	X/LAXXX
H31	CONCRETE AT BUILDING THRESHOLD	X/LAXXX
L01	TURF LAWN	SEE LANDSCAPE PLANS
L02	PLANTING AREA	SEE LANDSCAPE PLANS
L03	PLANTING AREA, STORMWATER	SEE LANDSCAPE PLANS
S01	WATER FEATURE	X/LAXXX
S02	PEDESTRIAN BRIDGE	X/LAXXX
S03	URBAN PORCH SWING	X/LAXXX
S04	BENCH, TYPE 1	X/LAXXX
S05	BENCH, TYPE 2	X/LAXXX
S06	BENCH, TYPE 3	X/LAXXX
S07	NOT USED	X/LAXXX
S08	PLATFORM BENCH, TYPE 1	X/LAXXX
S09	PLATFORM BENCH, TYPE 2 (STAGE)	X/LAXXX
S10	PLATFORM BENCH, TYPE 3	X/LAXXX
S11	UMBRELLA ANCHOR @ PLATFORM	X/LAXXX
S12	SEAT WALL	X/LAXXX
S13	HAMMOCK POLES	X/LAXXX
S14	NOT USED	SEE SPECIFICATION
S15	NOT USED	X/LAXXX
S16	RESERVED (ADA) PARKING SIGN	SEE CIVIL PLANS
S17	REGULATORY SIGN	SEE CIVIL PLANS
E01	SITE LIGHTING	SEE ELECTRICAL PLANS

SITE FURNISHING LEGEND

(*CONTRACTOR FURNISHED, CONTRACTOR ASSEMBLED, CONTRACTOR INSTALLED*)

ITEM	DESCRIPTION	DETAIL REFERENCE
F01	BIKE RACK, TYPE 1	X/LAXXX
F02	BIKE RACK, TYPE 2	X/LAXXX
F03	UMBRELLA	X/LAXXX
F04	NOT USED	X/LAXXX
F05	REMOVEABLE BOLLARD	X/LAXXX
F06	NOT USED	SEE SPECS
F07	NOT USED	SEE SPECS
F08	PING PONG TABLE	SEE SPECS

SITE FURNISHING LEGEND

(*OWNER FURNISHED, CONTRACTOR ASSEMBLED, CONTRACTOR INSTALLED*)

ITEM	DESCRIPTION	DETAIL REFERENCE
F09	BAR HEIGHT TABLE	X/LAXXX
F10	BAR HEIGHT TABLE AND BENCHES	X/LAXXX
F11	DINING HEIGHT TABLE AND BENCHES	X/LAXXX
F12	LITTER & RECYCLING RECEPTACLES	X/LAXXX
F13	LOUNGE BENCH	X/LAXXX
F14	LOUNGE TABLE, TYPE 1	X/LAXXX
F15	LOUNGE TABLE, TYPE 2	X/LAXXX
F16	PLANTER BOX	

NORTH

0' 10' 20' 40'
SCALE: 1" = 20'

REVISIONS

NO.	DATE	DESCRIPTION

CLIENT:
CITY OF BLOOMINGTON
Bloomington, IN
47403

DESIGN TEAM:
REA

CERTIFIED BY:

HOPEWELL WEST

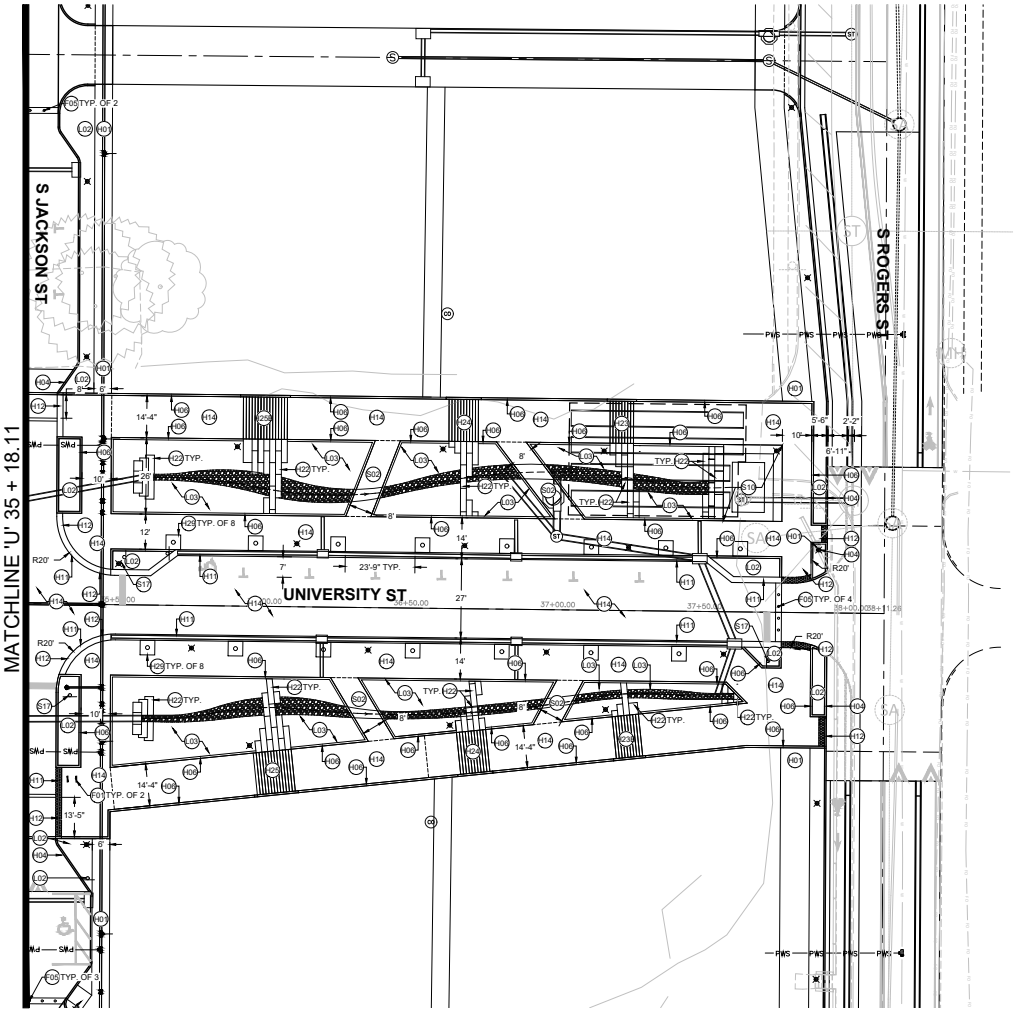
CITY OF BLOOMINGTON
BLOOMINGTON, INDIANA 47403

DATE: 05/28/2024
PROJECT NO.: 2023-1702
DRAWN BY:
CHECKED BY: CP

DRAWING STATUS:
60% PLANS
NOT FOR CONSTRUCTION

SHEET TITLE:
SITE LAYOUT PLAN

SHEET NO.:
LA101



LAYOUT GENERAL NOTES

1. SITE LAYOUT DATE, INCLUDING COORDINATE POINTS, IS BASED ON A SURVEY PERFORMED BY, OTHERS. REPORT ANY DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS TO THE OWNER AND LANDSCAPE ARCHITECT IMMEDIATELY. RUNDELL ERNSTBERGER ASSOCIATES, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE SURVEY INFORMATION.
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9. REFER TO SHEET LAXXX - LAXXX FOR FURNISHINGS PLAN.
10. REFER TO SHEET LAXXX - LAXXX FOR SOILS PLAN.
11. REFER TO LA103 THRU LA112 FOR PAVER LAYOUT, PATTERN, AND FINISH. EXTENTS OF STANDARD VS VEHICULAR PAVERS ARE SHOWN ON PLAN SCHEMATICALLY. TRANSITION SHALL OCCUR AT WHOLE PAVERS.

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H03	CONCRETE PAVEMENT, 8"	X/LAXXX
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H05	CURB, CONCRETE, MODIFIED	X/LAXXX
H06	CONCRETE CONTAINMENT CURB, 8"	X/LAXXX
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H08	NOT USED	X/LAXXX
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H10	UNIT PAVERS, TYPE 2	X/LAXXX
H11	UNIT PAVERS, TYPE 3 (DIRECTIONAL)	X/LAXXX
H12	DETECTABLE WARNING SURFACE (DWS)	X/LAXXX
H13	DECOMPOSED GRANITE	X/LAXXX
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H16	ARTIFICIAL TURF - FALL RATED	X/LAXXX
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H29	PAVER GRATE, TYPE 2	X/LAXXX
H30	ACCESSIBLE CURB RAMP	X/LAXXX
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L01	TURF LAWN	SEE LANDSCAPE PLANS
L02	PLANTING AREA	SEE LANDSCAPE PLANS
L03	PLANTING AREA, STORMWATER	SEE LANDSCAPE PLANS
S01	WATER FEATURE	X/LAXXX
S02	PEDESTRIAN BRIDGE	X/LAXXX
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S04	BENCH, TYPE 1	X/LAXXX
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S08	PLATFORM BENCH, TYPE 1	X/LAXXX
S09	PLATFORM BENCH, TYPE 2 (STAGE)	X/LAXXX
S10	PLATFORM BENCH, TYPE 3	X/LAXXX
S11	UMBRELLA ANCHOR @ PLATFORM	X/LAXXX
S12	SEAT WALL	X/LAXXX
S13	HAMMOCK POLES	X/LAXXX
S14	NOT USED	SEE SPECIFICATION
S15	NOT USED	X/LAXXX
S16	RESERVED (ADA) PARKING SIGN	SEE CIVIL PLANS
S17	REGULATORY SIGN	SEE CIVIL PLANS
E01	SITE LIGHTING	SEE ELECTRICAL PLANS

SITE FURNISHING LEGEND

(*CONTRACTOR FURNISHED, CONTRACTOR ASSEMBLED, CONTRACTOR INSTALLED*)

ITEM	DESCRIPTION	DETAIL REFERENCE
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F03	UMBRELLA	X/LAXXX
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F05	REMOVEABLE BOLLARD	X/LAXXX
F06	NOT USED	SEE SPECS
F07	NOT USED	SEE SPECS
F08	PING PONG TABLE	SEE SPECS

SITE FURNISHING LEGEND

(*OWNER FURNISHED, CONTRACTOR ASSEMBLED, CONTRACTOR INSTALLED*)

ITEM	DESCRIPTION	DETAIL REFERENCE
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F10	BAR HEIGHT TABLE AND BENCHES	X/LAXXX
F11	DINING HEIGHT TABLE AND BENCHES	X/LAXXX
F12	LITTER & RECYCLING RECEPTACLES	X/LAXXX
F13	LOUNGE BENCH	X/LAXXX
F14	LOUNGE TABLE, TYPE 1	X/LAXXX
F15	LOUNGE TABLE, TYPE 2	X/LAXXX
F16	PLANTER BOX	

NORTH

0' 10' 20' 40'
SCALE: 1" = 20'

NO.	DATE	DESCRIPTION
		REVISIONS

CLIENT:
CITY OF BLOOMINGTON
Bloomington, IN
47403

DESIGN TEAM:
REA

CERTIFIED BY:

HOPEWELL WEST

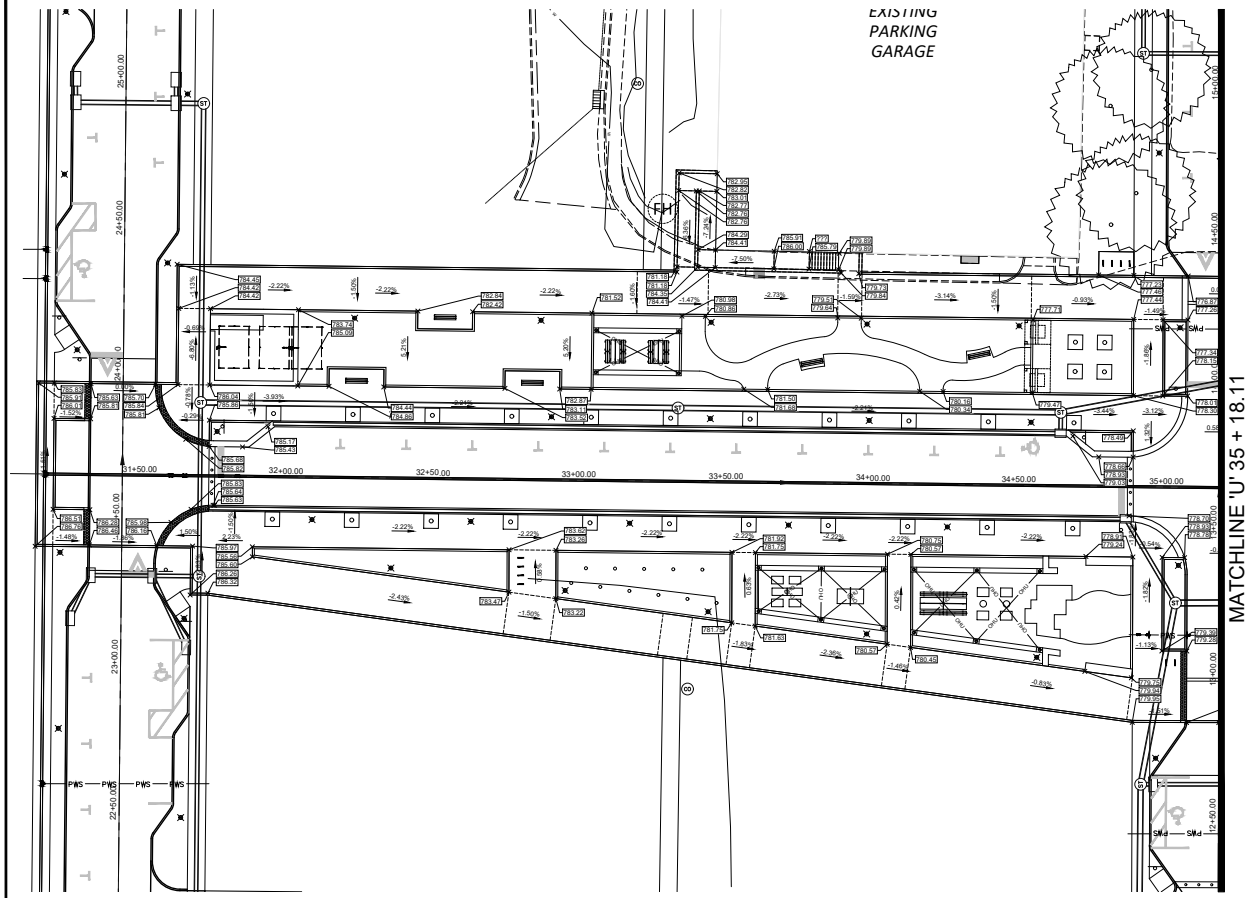
CITY OF BLOOMINGTON
BLOOMINGTON, INDIANA 47403

DATE: 05/28/2024
PROJECT NO.: 2023-1702
DRAWN BY:
CHECKED BY: CP

DRAWING STATUS:
60% PLANS
NOT FOR CONSTRUCTION

SHEET TITLE:
SITE LAYOUT PLAN

SHEET NO.:
LA102



GRADING LEGEND

	EXISTING CONTOUR LINE
950.84	EXISTING SPOT ELEVATION
(938.54)	VERIFY EXISTING SPOT ELEVATION
936.75	PROPOSED SPOT ELEVATION (FINISH)
.0%	PROPOSED SLOPE
TC=	PROPOSED TOP OF CURB ELEVATION
BC=	PROPOSED BOTTOM OF CURB ELEVATION
TW=	PROPOSED TOP OF WALL ELEVATION
BW=	PROPOSED BOTTOM OF WALL ELEVATION
TF=	PROPOSED TOP OF FRAME ELEVATION
TS=	PROPOSED TOP OF STEP ELEVATION
BS=	PROPOSED BOTTOM OF STEP ELEVATION
TR=	PROPOSED TOP OF RAMP
BR=	PROPOSED BOTTOM OF RAMP
FL=	PROPOSED FLOW LINE ELEVATION
HP=	PROPOSED HIGH POINT ELEVATION
LP=	PROPOSED LOW POINT ELEVATION
M.E.G.	MEET EXISTING GRADE
944	PROPOSED CONTOUR AND GRADE

GRADING GENERAL NOTES

1. SITE LAYOUT DATE, INCLUDING COORDINATE POINTS, IS BASED ON A SURVEY PERFORMED BY BYNUM, FANYO, AND ASSOCIATES. REPORT ANY DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS TO THE OWNER AND LANDSCAPE ARCHITECT IMMEDIATELY. RUNDELL ERNSTBERGER ASSOCIATES, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE SURVEY INFORMATION.
2. THE CONTRACTOR SHALL REPORT IMMEDIATELY TO THE LANDSCAPE ARCHITECT ANY DISCREPANCIES BETWEEN THE EXISTING GRADES SHOWN ON THESE PLANS AND ACTUAL FIELD CONDITIONS.
3. UNLESS NOTED OTHERWISE, PROPOSED SPOT ELEVATIONS REPRESENT FINISH GRADE OF PAVEMENTS AND GROUND. IN LAWN OR PLANT BED AREAS, PROPOSED ELEVATIONS INDICATE REQUIRED ELEVATIONS AFTER SETTLING OF SOIL.
4. THE CONTRACTOR SHALL REFER TO EARTHWORK SPECIFICATIONS AND THIS SHEET FOR SUBGRADE REQUIREMENT WORK TO ACCOMMODATE AND COORDINATE TOPSOILING AND LANDSCAPE WORK.
5. CONFINE WORK WITHIN THE LIMITS SHOWN ON THESE PLANS.
6. UNLESS NOTED OTHERWISE, ALL EXISTING STORM AND SANITARY SEWER CASTINGS TO REMAIN SHALL BE ADJUSTED TO GRADE.
7. REFER TO UTILITY PLAN FOR CASTINGS AND PIPING.

NORTH

0' 10' 20' 40'
SCALE: 1" = 20'

NO.	DATE	DESCRIPTION
		REVISIONS

CLIENT:
CITY OF BLOOMINGTON
Bloomington, IN
47403

DESIGN TEAM:
REA

CERTIFIED BY:

HOPEWELL WEST

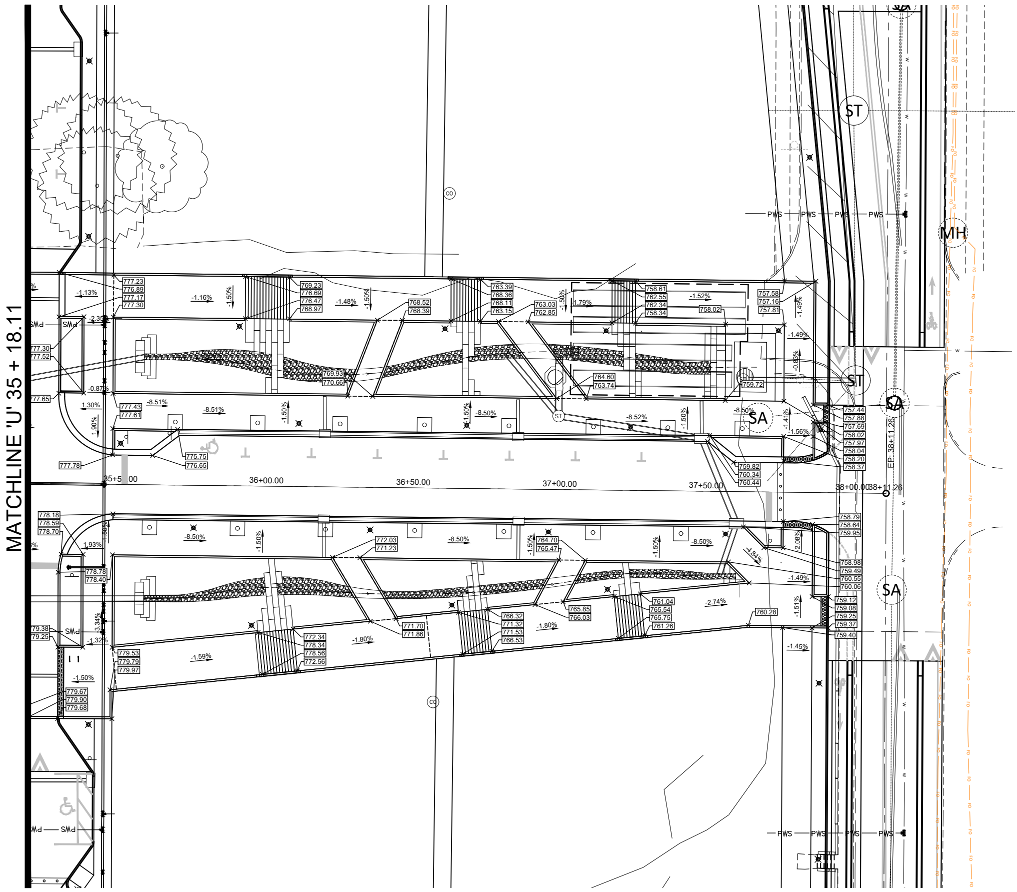
CITY OF BLOOMINGTON
BLOOMINGTON, INDIANA 47403

DATE:	PROJECT NO.:
05/28/2024	2023-1702
DRAWN BY:	CHECKED BY:
	CP

DRAWING STATUS:
60% PLANS
NOT FOR CONSTRUCTION

SHEET TITLE:
SITE GRADING PLAN

SHEET NO.:
LA201



GRADING LEGEND

(dashed line)	EXISTING CONTOUR LINE
950.84	EXISTING SPOT ELEVATION
(938.54)	VERIFY EXISTING SPOT ELEVATION
936.75	PROPOSED SPOT ELEVATION (FINISH)
0%	PROPOSED SLOPE
TC=	PROPOSED TOP OF CURB ELEVATION
BC=	PROPOSED BOTTOM OF CURB ELEVATION
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M.E.G.	MEET EXISTING GRADE
944	PROPOSED CONTOUR AND GRADE

GRADING GENERAL NOTES

1. SITE LAYOUT DATE, INCLUDING COORDINATE POINTS, IS BASED ON A SURVEY PERFORMED BY BYNUM, FANYO, AND ASSOCIATES. REPORT ANY DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS TO THE OWNER AND LANDSCAPE ARCHITECT IMMEDIATELY. RUNDELL ERNSTBERGER ASSOCIATES, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF THE SURVEY INFORMATION.
2. THE CONTRACTOR SHALL REPORT IMMEDIATELY TO THE LANDSCAPE ARCHITECT ANY DISCREPANCIES BETWEEN THE EXISTING GRADES SHOWN ON THESE PLANS AND ACTUAL FIELD CONDITIONS.
3. UNLESS NOTED OTHERWISE, PROPOSED SPOT ELEVATIONS REPRESENT FINISH GRADE OF PAVEMENTS AND GROUND. IN LAWN OR PLANT BED AREAS, PROPOSED ELEVATIONS INDICATE REQUIRED ELEVATIONS AFTER SETTLING OF SOIL.
4. THE CONTRACTOR SHALL REFER TO EARTHWORK SPECIFICATIONS AND THIS SHEET FOR SUBGRADE REQUIREMENT WORK TO ACCOMMODATE AND COORDINATE TOPSOILING AND LANDSCAPE WORK.
5. CONFINE WORK WITHIN THE LIMITS SHOWN ON THESE PLANS.
6. UNLESS NOTED OTHERWISE, ALL EXISTING STORM AND SANITARY SEWER CASTINGS TO REMAIN SHALL BE ADJUSTED TO GRADE.
7. REFER TO UTILITY PLAN FOR CASTINGS AND PIPING.

NORTH

0' 10' 20' 40'
SCALE: 1" = 20'

REVISIONS

NO.	DATE	DESCRIPTION

CLIENT:
CITY OF BLOOMINGTON
Bloomington, IN 47403

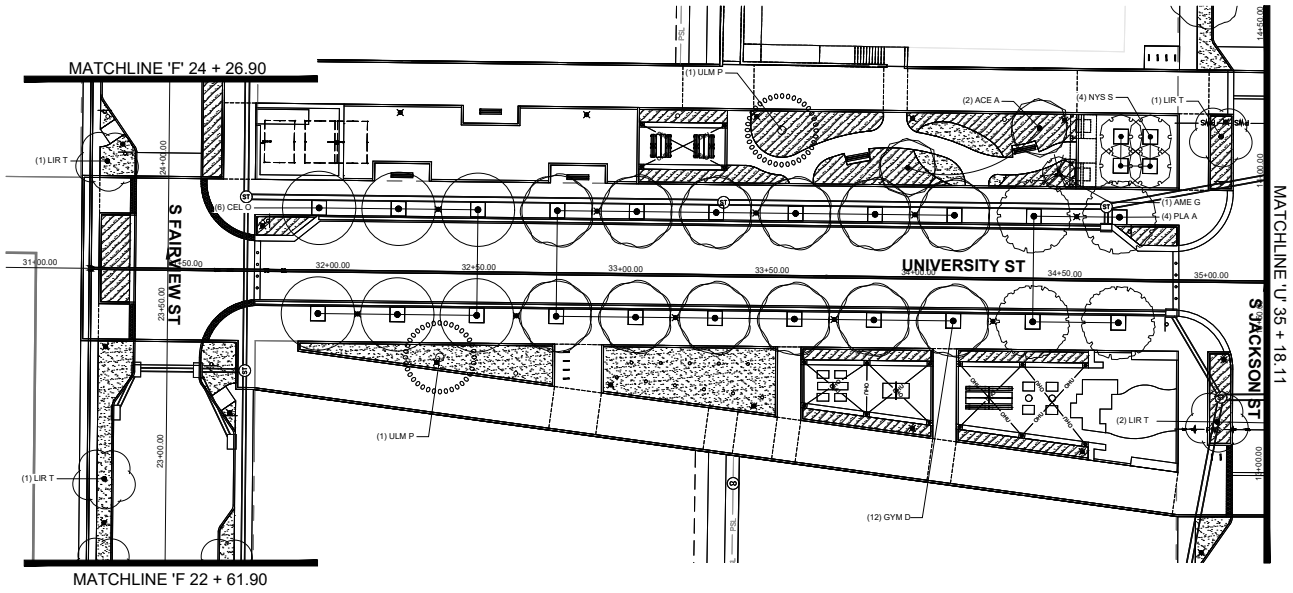
DESIGN TEAM:

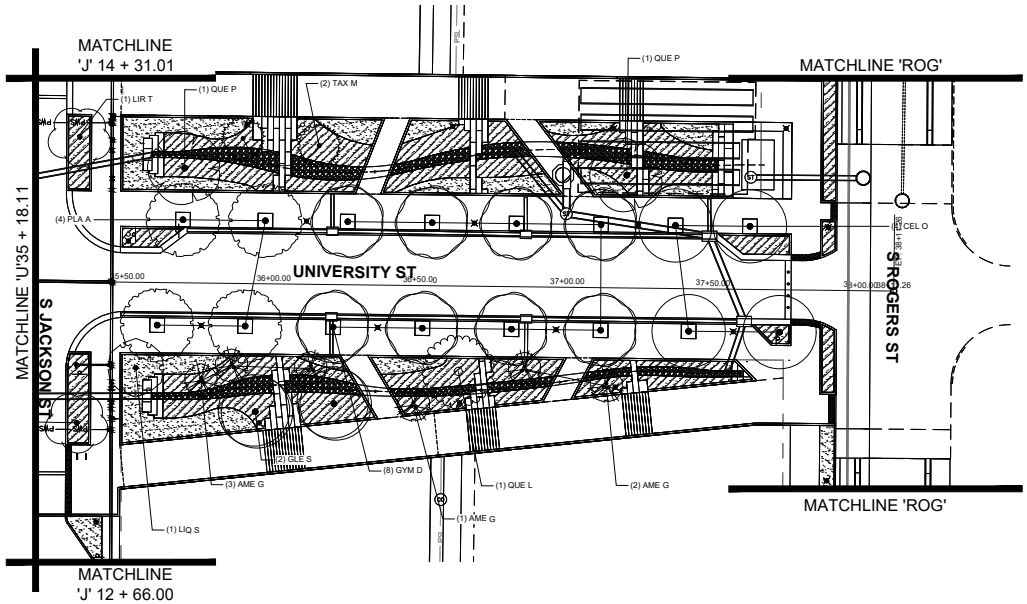
CERTIFIED BY:

HOPEWELL WEST

CITY OF BLOOMINGTON
BLOOMINGTON, INDIANA 47403

DATE: 05/28/2024
PROJECT NO.: 2023-1702
DRAWN BY:
CHECKED BY: CP
DRAWING STATUS: 60% PLANS NOT FOR CONSTRUCTION
SHEET TITLE: SITE GRADING PLAN
SHEET NO.: LA202





PLANTING NOTES:

1. NOTIFY OWNER/ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES BETWEEN THE SPECIFICATIONS AND DRAWINGS, PRIOR TO BID DATE, AND/OR PRIOR TO CONSTRUCTION.
2. LANDSCAPE ARCHITECT AND OWNER TO INSPECT ALL PLANT LOCATIONS AND PLANT BED EDGES PRIOR TO INSTALLATION. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO ADJUST PLANT LOCATIONS ON-SITE. ON-SITE ADJUSTMENTS WILL BE REQUIRED.
3. PLANT COUNTS INDICATED ON DRAWINGS ARE FOR LANDSCAPE ARCHITECT/OWNER'S USE ONLY. CONTRACTOR SHALL MAKE OWN PLANT QUANTITY TAKE-OFFS USING DRAWINGS, SPECIFICATIONS, AND PLANT SCHEDULE REQUIREMENTS (I.E. SPACING) - UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE ARCHITECT. CONTRACTOR TO VERIFY BED MEASUREMENTS AND INSTALL APPROPRIATE QUANTITIES AS GOVERNED BY PLANT SPACING PER THE SCHEDULE. CONTRACTOR SHALL ACCOUNT FOR ALL SLOPES IN MATERIAL QUANTITY CALCULATIONS.
4. IN CASE OF DISCREPANCIES BETWEEN THE PLANS AND PLANT LIST, THE PLAN SHALL DICTATE. IF IN QUESTION, CONTACT THE LANDSCAPE ARCHITECT.
5. DO NOT MAKE SUBSTITUTIONS. IF SPECIFIED LANDSCAPE MATERIAL IS NOT AVAILABLE, SUBMIT PROOF OF NON-AVAILABILITY TO LANDSCAPE ARCHITECT TOGETHER WITH A PROPOSAL FOR USE OF EQUIVALENT MATERIAL. LANDSCAPE ARCHITECT RESERVES THE RIGHT TO DETERMINE MATERIAL EQUIVALENCY.
6. CONTRACTOR SHALL INSTALL PLANTING SOIL IN ALL PROPOSED PLANT BED AREAS, AND TOPSOIL IN ALL LAWN AND DISTURBED AREAS, UNLESS NOTED OTHERWISE.
7. THE EARTHWORK CONTRACTOR SHALL COORDINATE THE PLACEMENT AND GRADING OF SUBSOIL TO ACCOMMODATE TOPSOIL. REFER TO SOIL DETAILS AND SPECIFICATIONS.
8. PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, AND OTHER FACILITIES AND EXISTING EXTERIOR PLANTS FROM DAMAGE CAUSED BY PLANTING OPERATIONS. RECONDITION AND SOD ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES THAT ARE NOT TO RECEIVE OTHER SURFACE TREATMENT (PRESERVED, RENOVATED AREAS, MULCH, GROUNDCOVER, ETC.).
9. PLANT AND ALL OTHER MATERIALS TO BE STORED ON-SITE WILL BE PLACED WHERE THEY WILL NOT CONFLICT WITH CONSTRUCTION OPERATIONS AND AS DIRECTED BY THE OWNER.
10. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT IN WRITING PRIOR TO BID DATE OF ANY PLANTS THAT HE/SHE FEELS MAY NOT SURVIVE TRANSPLANTING OPERATIONS OR IN LOCATIONS NOTED.
11. PLANT BEDS TO RECEIVE MIN. 3" OF SHREDDED HARDWOOD MULCH (UNLESS OTHERWISE NOTED) - SEE SPECIFICATIONS. THE USE OF COMPOST MIX IN PERENNIAL, ORNAMENTAL GRASS, AND GROUND COVER BEDS IS ACCEPTABLE UPON WRITTEN APPROVAL BY OWNER/ARCHITECT.
12. PROVIDE SHOVEL-CUT SPADE EDGE ADJACENT TO ALL PLANTING BED AREAS NOT BORDERED BY CONCRETE OR OTHER EDGING. SEE SPADE EDGE DETAIL.
13. ALL TREE PITS TO BE DUG IN ADVANCE OF PLANTING AND EACH TREE PIT TO BE TESTED FOR ADEQUATE DRAINAGE SEE SPECIFICATIONS FOR INSTRUCTIONS ON HOW TO ADMINISTER THE TEST FOR RATE OF PERCOLATION. PROVIDE DRY WELL IF DETERMINED NECESSARY BY LANDSCAPE ARCHITECT. SEE SPECIFICATIONS AND DETAIL.
14. USE SOIL EXCAVATED FROM TREE PLANTING HOLE AS BACKFILL FOR TREE PLANTINGS WHEN POSSIBLE.
15. AN APPROVED PRE-EMERGENT HERBICIDE SHALL BE APPLIED IN ALL PLANTING AND GROUNDCOVER BEDS AT RATES SPECIFIED BY THE MANUFACTURER FOR EACH VARIETY OF PLANT.
16. SEE PLANTING SCHEDULE AND LANDSCAPE DETAILS FOR FURTHER REQUIREMENTS.
17. REFER TO DEMOLITION PLANS, DETAILS, AND SPECIFICATIONS FOR EROSION CONTROL MEASURES - INCLUDING TEMPORARY SEEDING - AND ADDITIONAL REQUIREMENTS.
18. REFER TO EXISTING CONDITION PLAN FOR ALL EXISTING UNDERGROUND PIPE AND IRRIGATION LOCATIONS.

REFER TO SHEET LA304 FOR PLANTING SCHEDULE AND DETAILS.

NORTH

0' 10' 20' 40'
SCALE: 1" = 20'

REVISIONS

NO.	DATE	DESCRIPTION

CLIENT:
CITY OF BLOOMINGTON
Bloomington, IN
47403

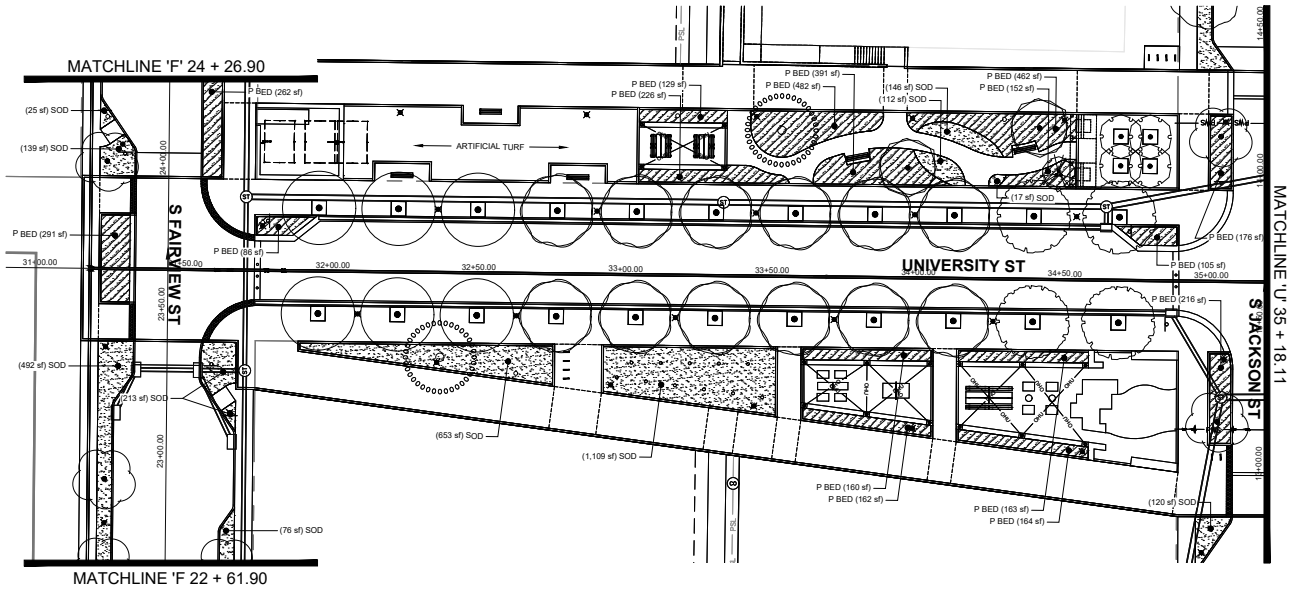
DESIGN TEAM:
REA

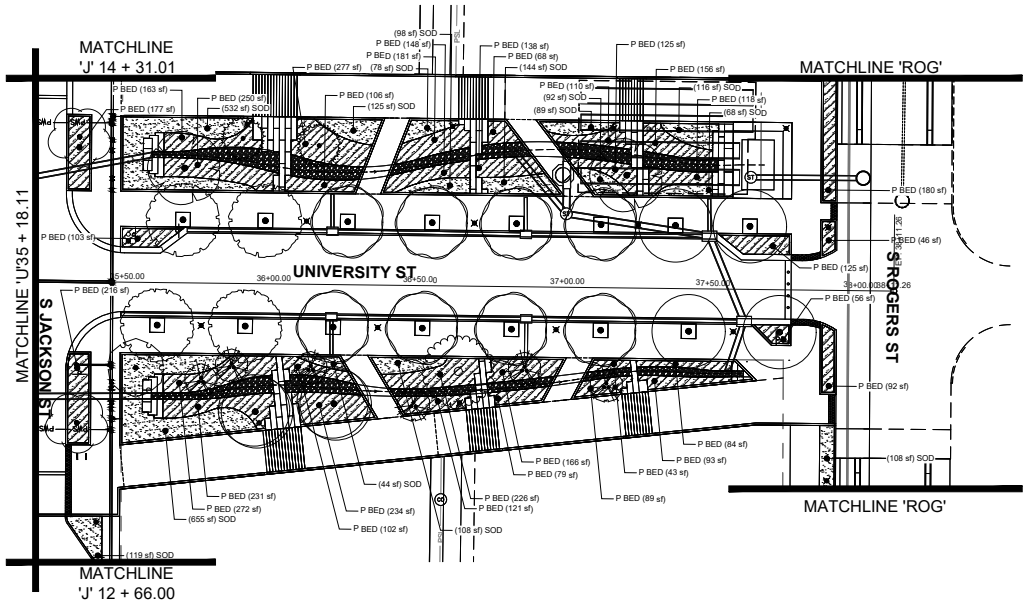
CERTIFIED BY:

HOPEWELL WEST

CITY OF BLOOMINGTON
BLOOMINGTON, INDIANA 47403

DATE: 05/28/2024
PROJECT NO.: 2023-1702
DRAWN BY: KK
CHECKED BY: CP
DRAWING STATUS:
60% PLANS
NOT FOR CONSTRUCTION
SHEET TITLE:
UNIVERSITY AVENUE
CANOPY LANDSCAPE PLAN
SHEET NO.:
LA301





PLANTING NOTES:

1. NOTIFY OWNER/ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES BETWEEN THE SPECIFICATIONS AND DRAWINGS, PRIOR TO BID DATE, AND/OR PRIOR TO CONSTRUCTION.
2. LANDSCAPE ARCHITECT AND OWNER TO INSPECT ALL PLANT LOCATIONS AND PLANT BED EDGES PRIOR TO INSTALLATION. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO ADJUST PLANT LOCATIONS ON-SITE. ON-SITE ADJUSTMENTS WILL BE REQUIRED.
3. PLANT COUNTS INDICATED ON DRAWINGS ARE FOR LANDSCAPE ARCHITECT/OWNER'S USE ONLY. CONTRACTOR SHALL MAKE OWN PLANT QUANTITY TAKE-OFFS USING DRAWINGS, SPECIFICATIONS, AND PLANT SCHEDULE REQUIREMENTS (I.E. SPACING) - UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE ARCHITECT. CONTRACTOR TO VERIFY BED MEASUREMENTS AND INSTALL APPROPRIATE QUANTITIES AS GOVERNED BY PLANT SPACING PER THE SCHEDULE. CONTRACTOR SHALL ACCOUNT FOR ALL SLOPES IN MATERIAL QUANTITY CALCULATIONS.
4. IN CASE OF DISCREPANCIES BETWEEN THE PLANS AND PLANT LIST, THE PLAN SHALL DICTATE. IF IN QUESTION, CONTACT THE LANDSCAPE ARCHITECT.
5. DO NOT MAKE SUBSTITUTIONS. IF SPECIFIED LANDSCAPE MATERIAL IS NOT AVAILABLE, SUBMIT PROOF OF NON-AVAILABILITY TO LANDSCAPE ARCHITECT TOGETHER WITH A PROPOSAL FOR USE OF EQUIVALENT MATERIAL. LANDSCAPE ARCHITECT RESERVES THE RIGHT TO DETERMINE MATERIAL EQUIVALENCY.
6. CONTRACTOR SHALL INSTALL PLANTING SOIL IN ALL PROPOSED PLANT BED AREAS, AND TOPSOIL IN ALL LAWN AND DISTURBED AREAS, UNLESS NOTED OTHERWISE.
7. THE EARTHWORK CONTRACTOR SHALL COORDINATE THE PLACEMENT AND GRADING OF SUBSOIL TO ACCOMMODATE TOPSOIL. REFER TO SOIL DETAILS AND SPECIFICATIONS.
8. PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, AND OTHER FACILITIES AND EXISTING EXTERIOR PLANTS FROM DAMAGE CAUSED BY PLANTING OPERATIONS. RECONDITION AND SOD ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES THAT ARE NOT TO RECEIVE OTHER SURFACE TREATMENT (PRESERVED, RENOVATED AREAS, MULCH, GROUNDCOVER, ETC.).
9. PLANT AND ALL OTHER MATERIALS TO BE STORED ON-SITE WILL BE PLACED WHERE THEY WILL NOT CONFLICT WITH CONSTRUCTION OPERATIONS AND AS DIRECTED BY THE OWNER.
10. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT IN WRITING PRIOR TO BID DATE OF ANY PLANTS THAT HE/SHE FEELS MAY NOT SURVIVE TRANSPLANTING OPERATIONS OR IN LOCATIONS NOTED.
11. PLANT BEDS TO RECEIVE MIN. 3" OF SHREDDED HARDWOOD MULCH (UNLESS OTHERWISE NOTED) - SEE SPECIFICATIONS. THE USE OF COMPOST MIX IN PERENNIAL, ORNAMENTAL GRASS, AND GROUND COVER BEDS IS ACCEPTABLE UPON WRITTEN APPROVAL BY OWNER/ARCHITECT.
12. PROVIDE SHOVEL-CUT SPADE EDGE ADJACENT TO ALL PLANTING BED AREAS NOT BORDERED BY CONCRETE OR OTHER EDGING. SEE SPADE EDGE DETAIL.
13. ALL TREE PITS TO BE DUG IN ADVANCE OF PLANTING AND EACH TREE PIT TO BE TESTED FOR ADEQUATE DRAINAGE SEE SPECIFICATIONS FOR INSTRUCTIONS ON HOW TO ADMINISTER THE TEST FOR RATE OF PERCOLATION. PROVIDE DRY WELL IF DETERMINED NECESSARY BY LANDSCAPE ARCHITECT. SEE SPECIFICATIONS AND DETAIL.
14. USE SOIL EXCAVATED FROM TREE PLANTING HOLE AS BACKFILL FOR TREE PLANTINGS WHEN POSSIBLE.
15. AN APPROVED PRE-EMERGENT HERBICIDE SHALL BE APPLIED IN ALL PLANTING AND GROUNDCOVER BEDS AT RATES SPECIFIED BY THE MANUFACTURER FOR EACH VARIETY OF PLANT.
16. SEE PLANTING SCHEDULE AND LANDSCAPE DETAILS FOR FURTHER REQUIREMENTS.
17. REFER TO DEMOLITION PLANS, DETAILS, AND SPECIFICATIONS FOR EROSION CONTROL MEASURES - INCLUDING TEMPORARY SEEDING - AND ADDITIONAL REQUIREMENTS.
18. REFER TO EXISTING CONDITION PLAN FOR ALL EXISTING UNDERGROUND PIPE AND IRRIGATION LOCATIONS.

REFER TO SHEET LA304 FOR PLANTING SCHEDULE AND DETAILS.

NORTH

SCALE: 1" = 20'

NO.	DATE	DESCRIPTION
		REVISIONS

CLIENT:
CITY OF BLOOMINGTON
Bloomington, IN
47403

DESIGN TEAM:
REA

CERTIFIED BY:

HOPEWELL WEST

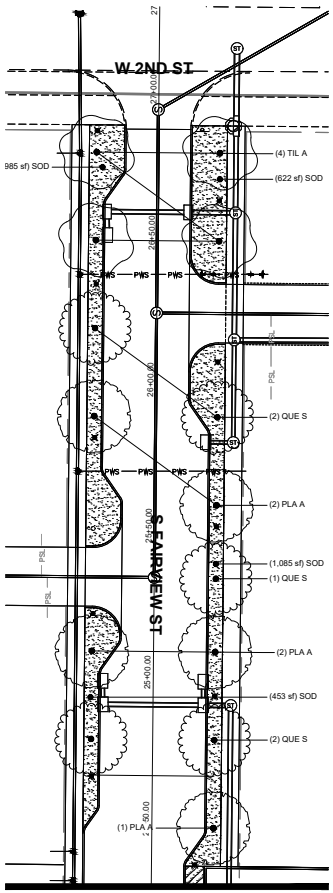
CITY OF BLOOMINGTON
BLOOMINGTON, INDIANA 47403

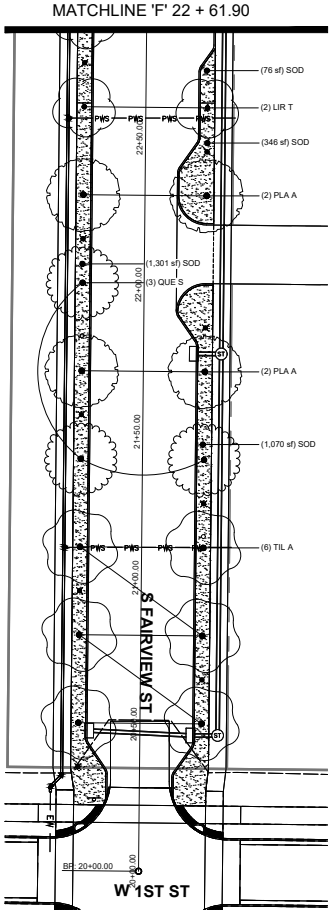
DATE:	PROJECT NO.:
05/28/2024	2023-1702
DRAWN BY: KK	CHECKED BY: CP

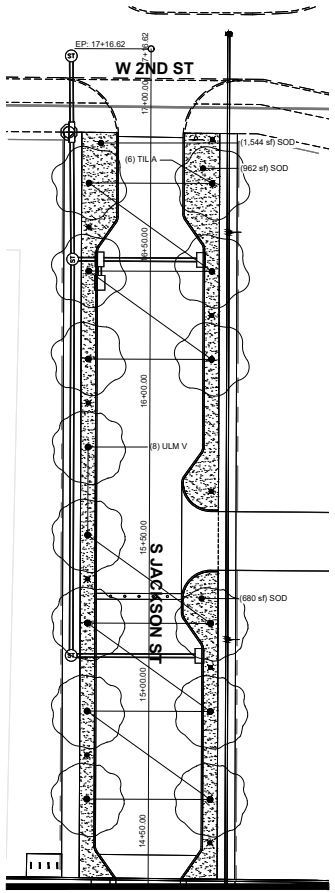
DRAWING STATUS:
60% PLANS
NOT FOR CONSTRUCTION

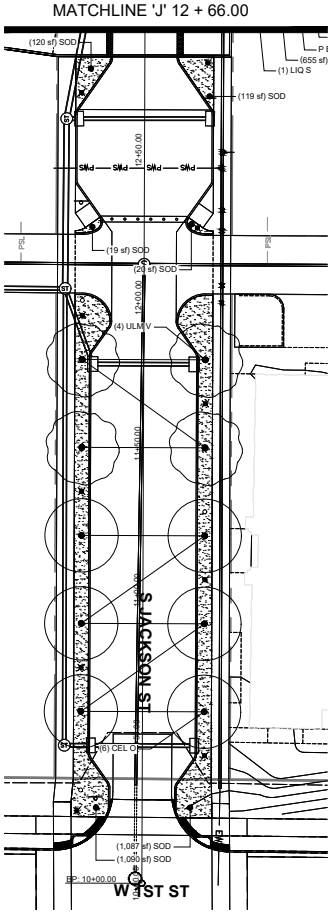
SHEET TITLE:
UNIVERSITY STREET
UNDERSTORY LANDSCAPE PLAN

SHEET NO.:
LA302









REFER TO SHEET LA304 FOR PLANTING SCHEDULE AND DETAILS.

NORTH

SCALE: 1" = 20'

REVISIONS

NO.	DATE	DESCRIPTION

CLIENT: CITY OF BLOOMINGTON
Bloomington, IN 47403

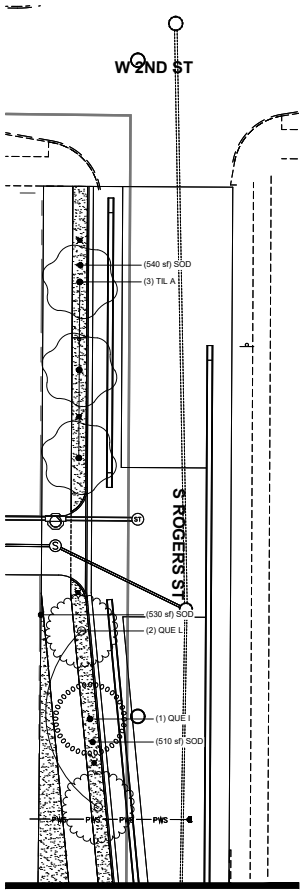
DESIGN TEAM: REA

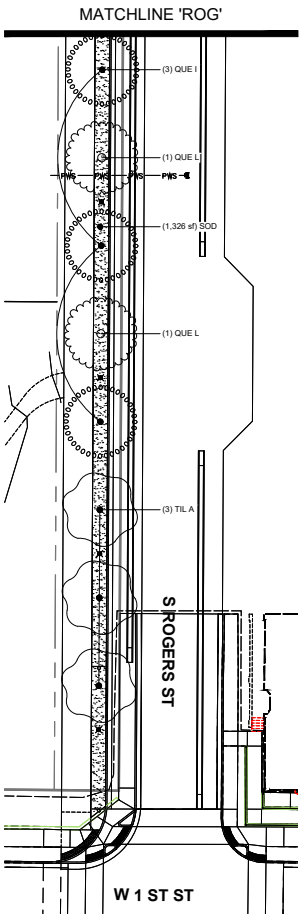
CERTIFIED BY:

HOPEWELL WEST

CITY OF BLOOMINGTON
BLOOMINGTON, INDIANA 47403

DATE: 05/28/2024
PROJECT NO.: 2023-1702
DRAWN BY: KK
CHECKED BY: CP
DRAWING STATUS: 60% PLANS NOT FOR CONSTRUCTION
SHEET TITLE: FAIRVIEW & JACKSON STREET LANDSCAPE PLAN
SHEET NO.: LA303

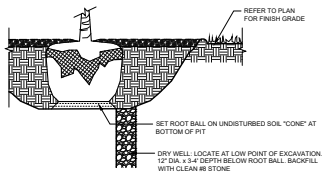




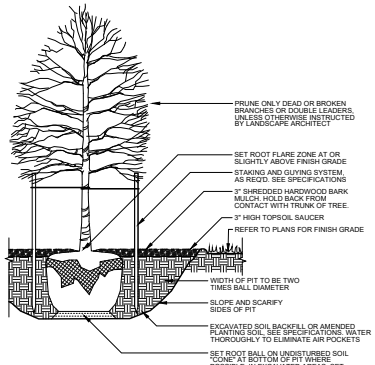
PLANT SCHEDULE

CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	SIZE	REMARKS
DECIDUOUS TREES							
ACE A	2	Acer saccharum `JFS-KW8`	Autumn Fest® Sugar Maple	B & B	3.0" Cal		
GLE S	2	Gleditsia triacanthos inermis 'Skycole'	Skyline® Honey Locust	B & B	2.0" Cal		Prune lower limbs 7' above grade.
LIQ S	1	Liquidambar styraciflua 'Happdell'	Happidaze® Sweet Gum	B & B	2.0" Cal		
QUE P	2	Quercus prinus	Chestnut Oak	B & B	2.0" Cal		
TAX M	2	Taxodium distichum `Mickelson`	Shawnee Brave™ Bald Cypress	B & B	2.5" Cal		
ULM P	2	Ulmus americana 'Lewis & Clark'	Prairie Expedition® American Elm	B & B	3.0" Cal		
ORNAMENTAL TREES							
AME G	7	Amelanchier x grandiflora 'Autumn Brilliance'	Autumn Brilliance Apple Serviceberry	B & B		8` Clump	Multi-Stem
STREET TREES							
CEL O	16	Celtis occidentalis 'Chicagoland'	Chicagoland Hackberry	B & B	2.0" Cal		Prune lower limbs 7' above grade.
GYM D	20	Gymnocladus dioica 'Espresso'	Kentucky Coffeetree	B & B	2.0" Cal		Prune lower limbs 7' above grade.
LIR T	8	Liriodendron tulipifera 'JFS-Oz'	Emerald City® Tulip Poplar	B & B	3.0" Cal		Prune lower limbs 7' above grade.
NYS S	4	Nyssa sylvatica `David Odom`	Afterburner® Tupelo	B & B	2.0" Cal		Prune lower limbs 7' above grade.
PLA A	17	Platanus x acerifolia 'Morton Euclid'	Ovation™ London Plane Tree	B & B	3.0" Cal		Prune lower limbs 7' above grade.
QUE I	4	Quercus imbricaria	Shingle Oak	B & B	3.0" Cal		Prune lower limbs 7' above grade.
QUE L	5	Quercus lyrata 'QLFTB'	Highbeam® Overcup Oak	B & B	3.0" Cal		Prune lower limbs 7' above grade.
QUE S	8	Quercus shumardii	Shumard Oak	B & B	3.0" Cal		Prune lower limbs 7' above grade.
TIL A	22	Tilia americana 'Boulevard'	Boulevard American Linden	B & B	2.5" Cal		Prune lower limbs 7' above grade.
ULM V	12	Ulmus americana 'Valley Forge'	Valley Forge American Elm	B & B	2.0" Cal		Prune lower limbs 7' above grade.

CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT	SPACING	REMARKS
TURF						
SOD	19,649 sf	Turf Sod	Turf Sod	sod		See specification



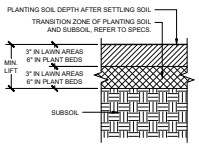
TREE PLANTING
NOT TO SCALE
THIS DETAIL FOR USE AS DETERMINED BY SITE CONDITIONS. REFER TO SPECIFICATIONS FOR REQUIREMENTS.



GENERAL NOTES:
1. REMOVE THE ENTIRE WIRE BASKET, IF PRESENT. BEFORE TREE IS IN THE HOLE, REMOVE THE BOTTOM OF THE BASKET, CUTTING HORIZONTALLY. AFTER TREE IS IN THE HOLE, REMOVE THE REST OF THE WIRE BASKET, CUTTING VERTICALLY.
2. REMOVE TRUNK WRAP, IF PRESENT. REMOVE ALL TAGS AND LABELS.
3. IMPORTANT: ROOT FLARE ZONE MAY BE BELOW TOP OF BURLAPPED ROOT BALL. REMOVE ROOT BALL SOIL DOWN TO LOCATE AND EXPOSE ROOT FLARE ZONE.
4. TREES SHALL NOT BE FERTILIZED WITHIN THE FIRST YEAR OF PLANTING, UNLESS INSTRUCTED OTHERWISE BY THE LANDSCAPE ARCHITECT.
5. STAKING AND GUYING IS REQUIRED ONLY WHERE TREE STABILITY PROBLEMS OCCUR AS DETERMINED BY THE LANDSCAPE ARCHITECT OR ARBORIST.
5.1. GUYING MATERIAL SHALL BE FLAT, WOVEN POLYPROPYLENE STRAPS, FASTENED TO WOOD STAKES TO ALLOW FOR TREE MOVEMENT. STAKES SHALL BE INSTALLED OUTSIDE OF ROOT BALL. ARBORTIE SYSTEM, OR ACCEPTABLE EQUIVALENT.

TREE PLANTING
NOT TO SCALE

GENERAL NOTE:
1. TOPSOIL IS NOT PLANTING SOIL. REFER TO SPECIFICATIONS FOR DEFINITIONS, TESTING, AND INSTALLATION REQUIREMENTS.

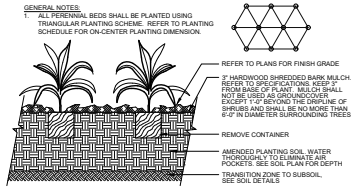


PLANTING SOIL
NOT TO SCALE

GENERAL NOTE:
ALIGN SPADE EDGE TO LINES INDICATED ON PLANS, SET STRAIGHT OR SET TO SMOOTH CURVES INDICATED. ALIGN EDGES SO AS TO MINIMIZE LARGE OPEN AREAS WITHOUT PLANT MATERIAL.

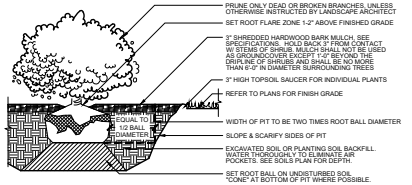
SPADE EDGE
NOT TO SCALE

GENERAL NOTES:
1. ALL PERENNIAL BEDS SHALL BE PLANTED USING TRIANGULAR PLANTING SCHEME. REFER TO PLANTING SCHEDULE FOR ON-CENTER PLANTING DIMENSION.



PERENNIAL / GROUNDCOVER / GRASS PLANTING
NOT TO SCALE

GENERAL NOTES:
1. REMOVE THE ENTIRE WIRE BASKET, IF PRESENT.
2. REMOVE CONTAINER OR AS MUCH BURLAP, TWINE AND LACING AS POSSIBLE
3. REMOVE ALL TAGS AND LABELS.
4. **IMPORTANT:** ROOT FLARE ZONE MAY BE BELOW TOP OF BURLAPPED ROOT BALL. REMOVE ROOT BALL SOIL DOWN TO LOCATE AND EXPOSE ROOT FLARE ZONE.
5. SEE SOILS PLANS FOR DEPTH OF SOIL ASSEMBLY.



SHRUB PLANTING
NOT TO SCALE

NORTH
0' 10' 20' 40'
SCALE: 1" = 20'

NO.	DATE	DESCRIPTION
		REVISIONS

CLIENT:
CITY OF BLOOMINGTON
Bloomington, IN
47403

DESIGN TEAM:
REA

CERTIFIED BY:

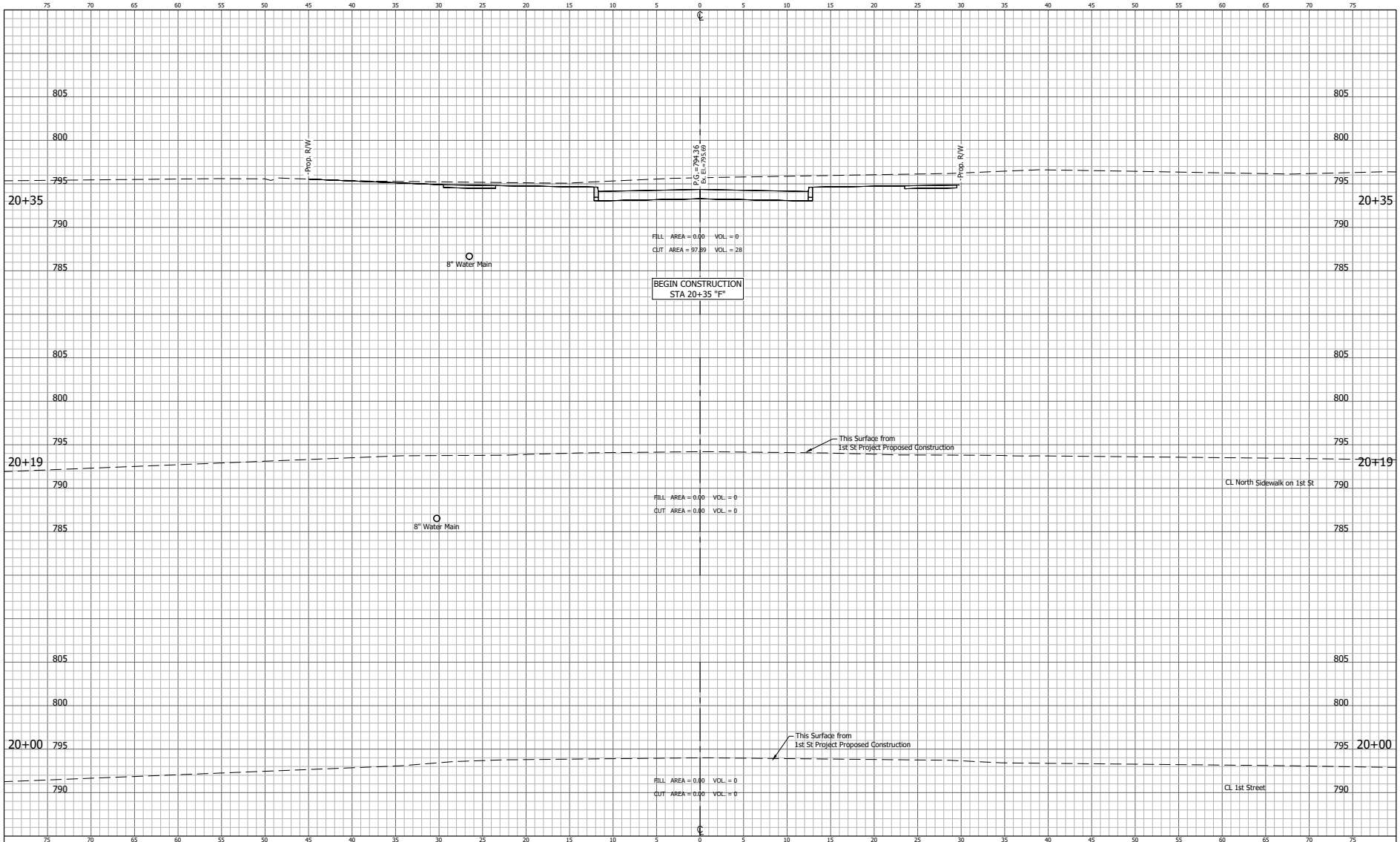
HOPEWELL WEST

CITY OF BLOOMINGTON
BLOOMINGTON, INDIANA 47403

DATE: 05/28/2024
PROJECT NO.: 2023-1702
DRAWN BY: KK
CHECKED BY: CP
DRAWING STATUS:
60% PLANS
NOT FOR CONSTRUCTION

SHEET TITLE:
ROGERS STREET
LANDSCAPE PLAN,
SCHEDULE, & DETAILS

SHEET NO.:
LA304



60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	1 of XS-12
CONTRACT	PROJECT
-	-

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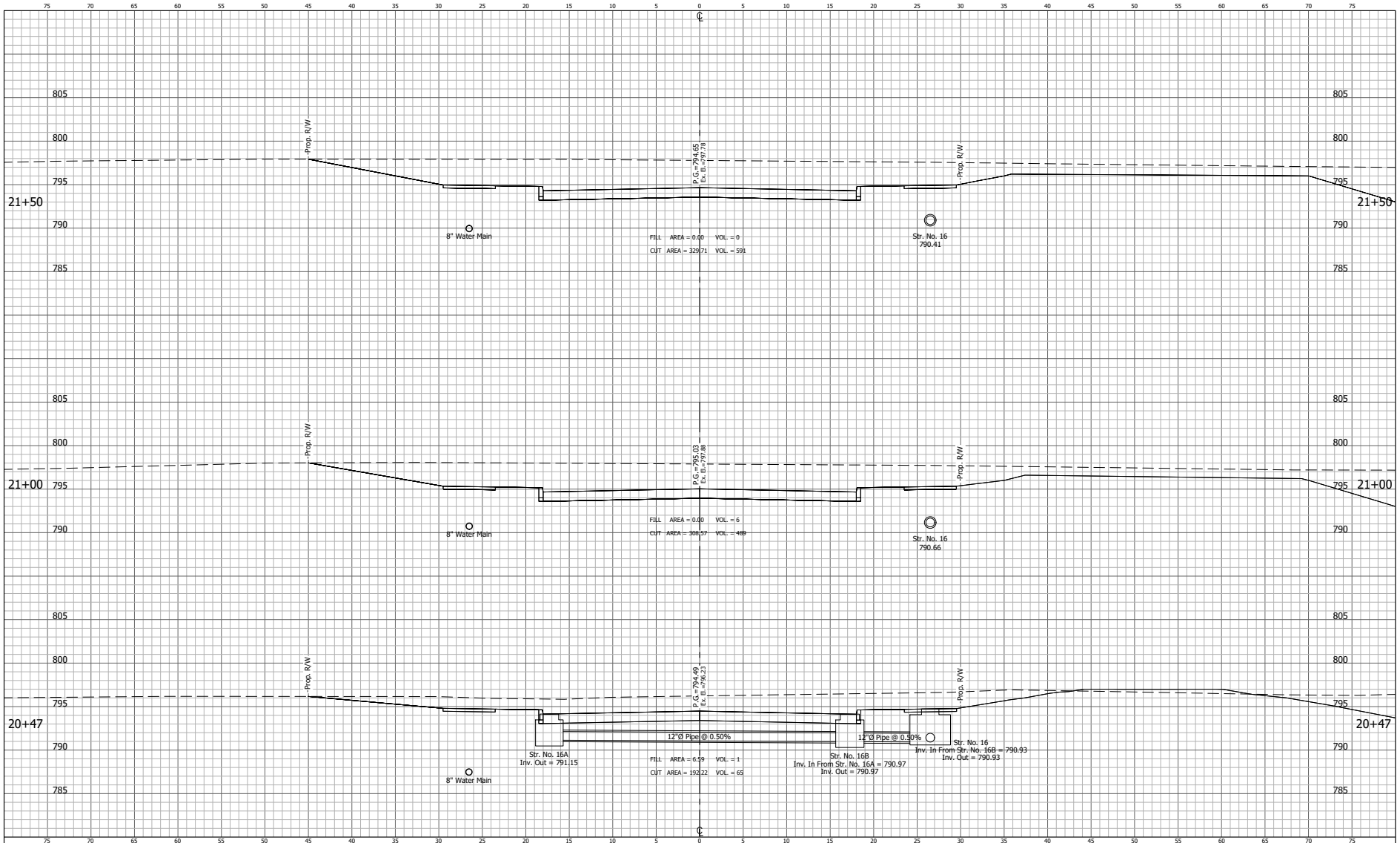

60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER _____ DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	2 of XS-12
CONTRACT	PROJECT
-	-

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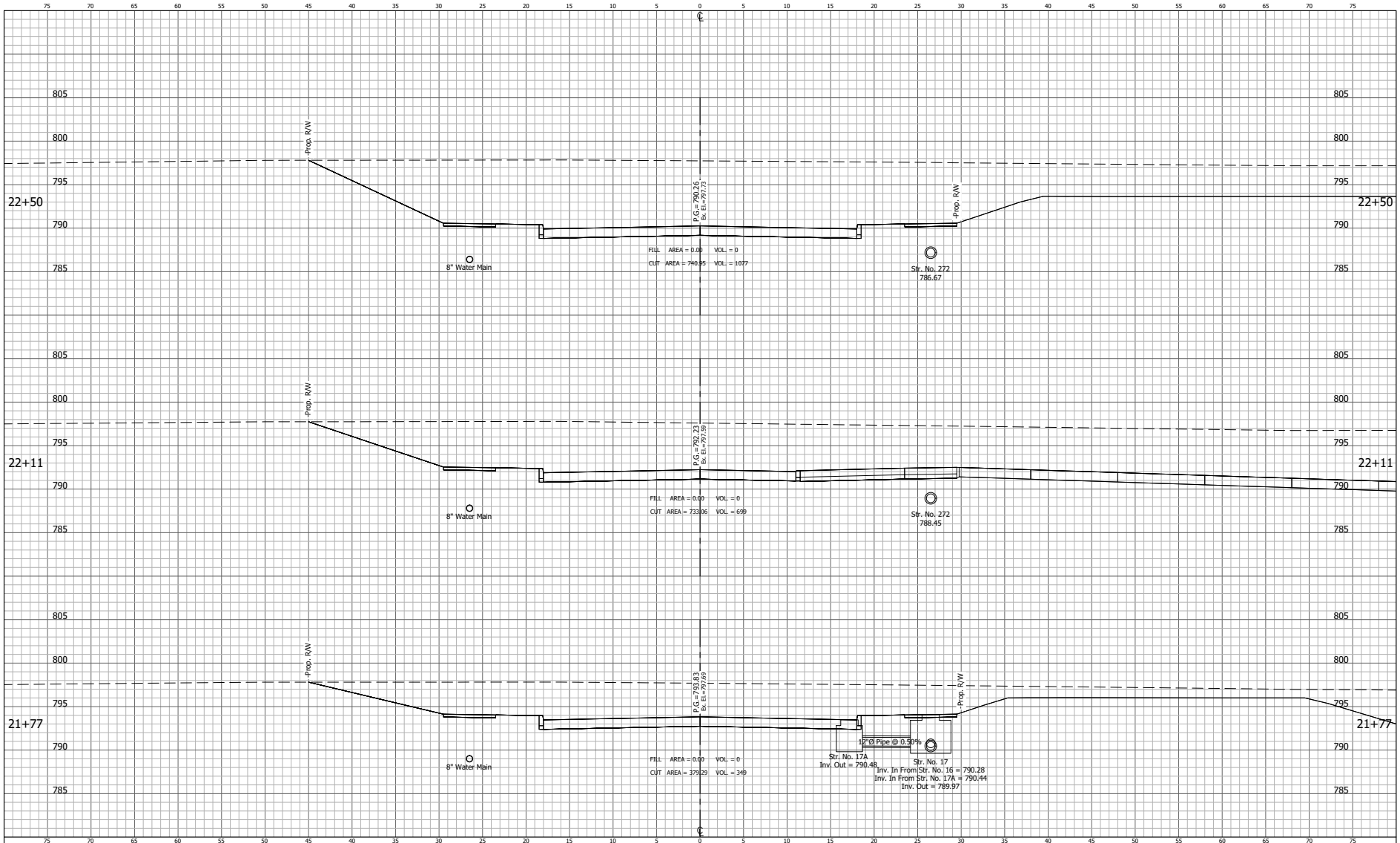

60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	3 of XS-12
CONTRACT	PROJECT
-	-

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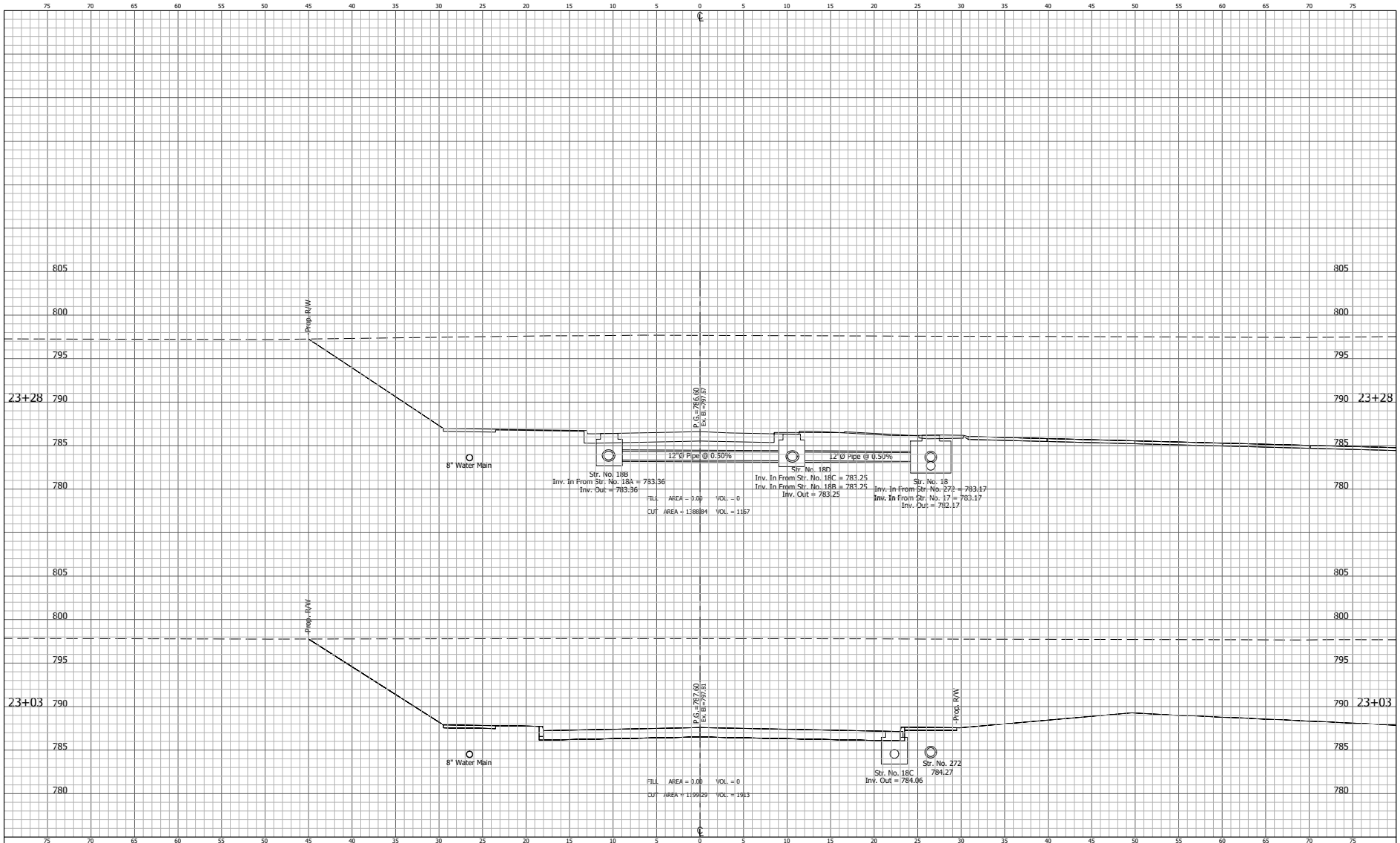

60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER _____ DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	4 of XS-12
CONTRACT	PROJECT
-	-

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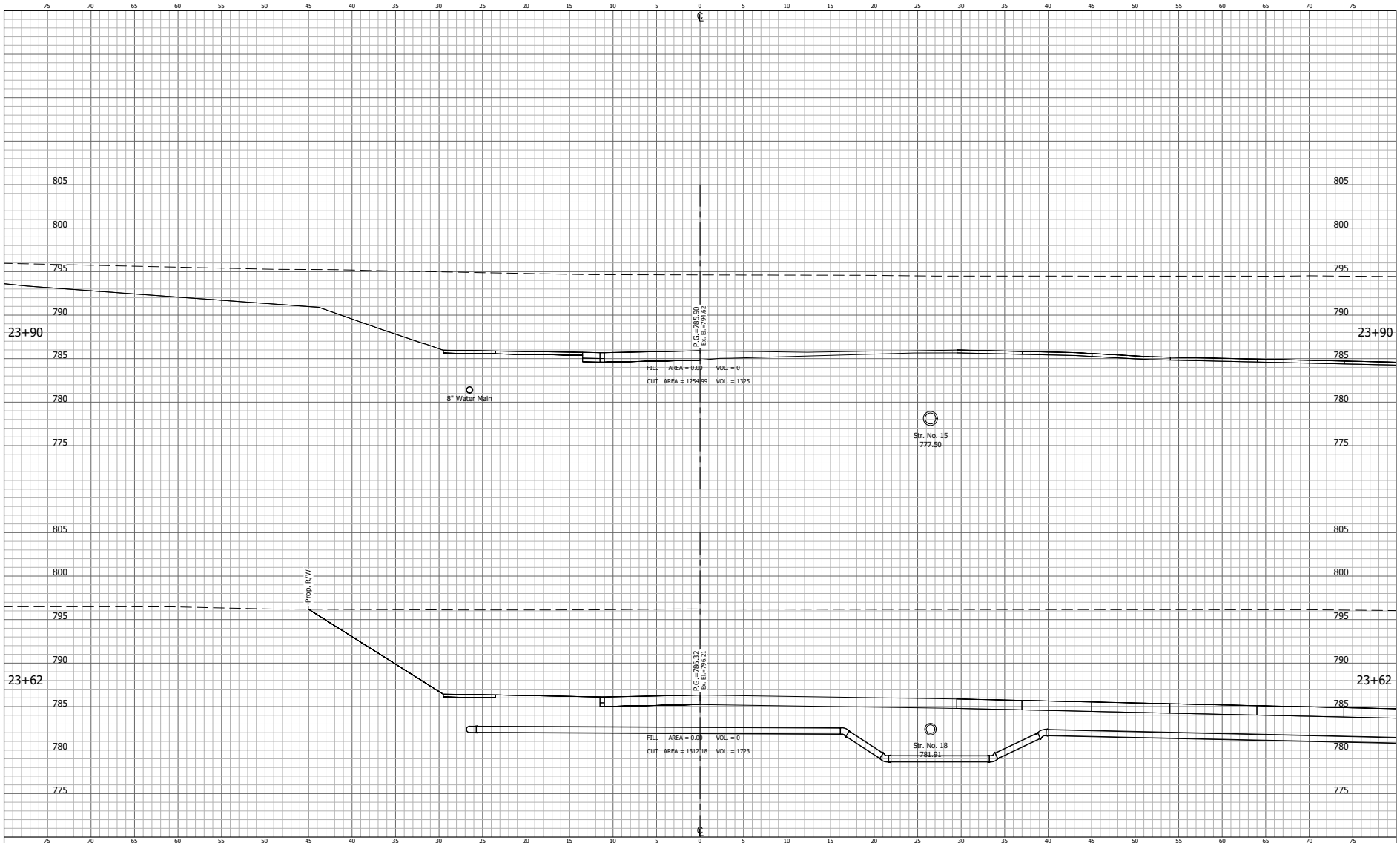

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DATE/USER : 4/24/2024 4:35 PM / Aaronfield

60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

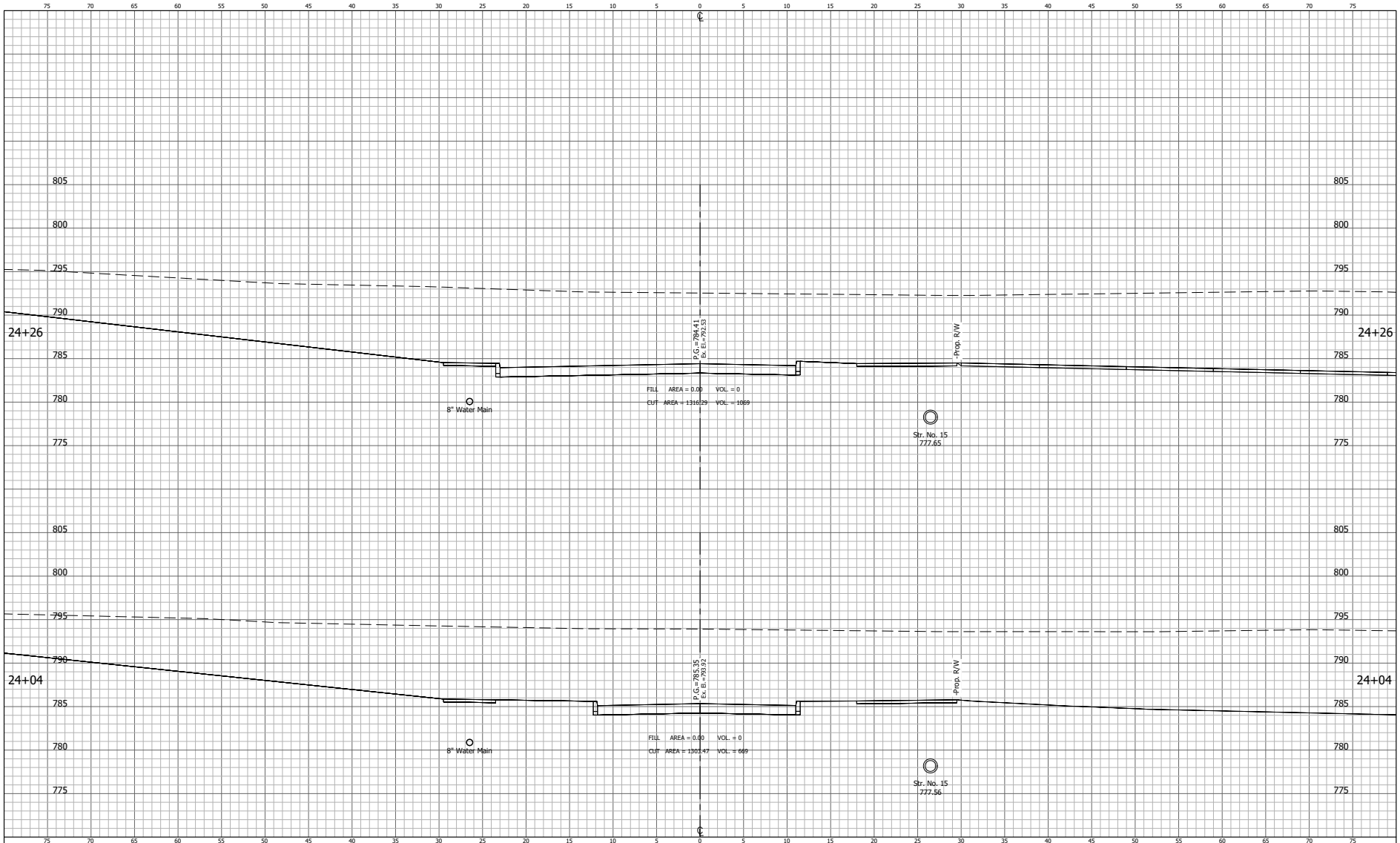
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	5 of XS-12
CONTRACT	PROJECT
-	-



60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	6 of XS-12
CONTRACT	PROJECT
-	-

DIRECTORY PATH : R:\Active\Bloomington, City Of\Hopewell West\Design\CAD\Plans
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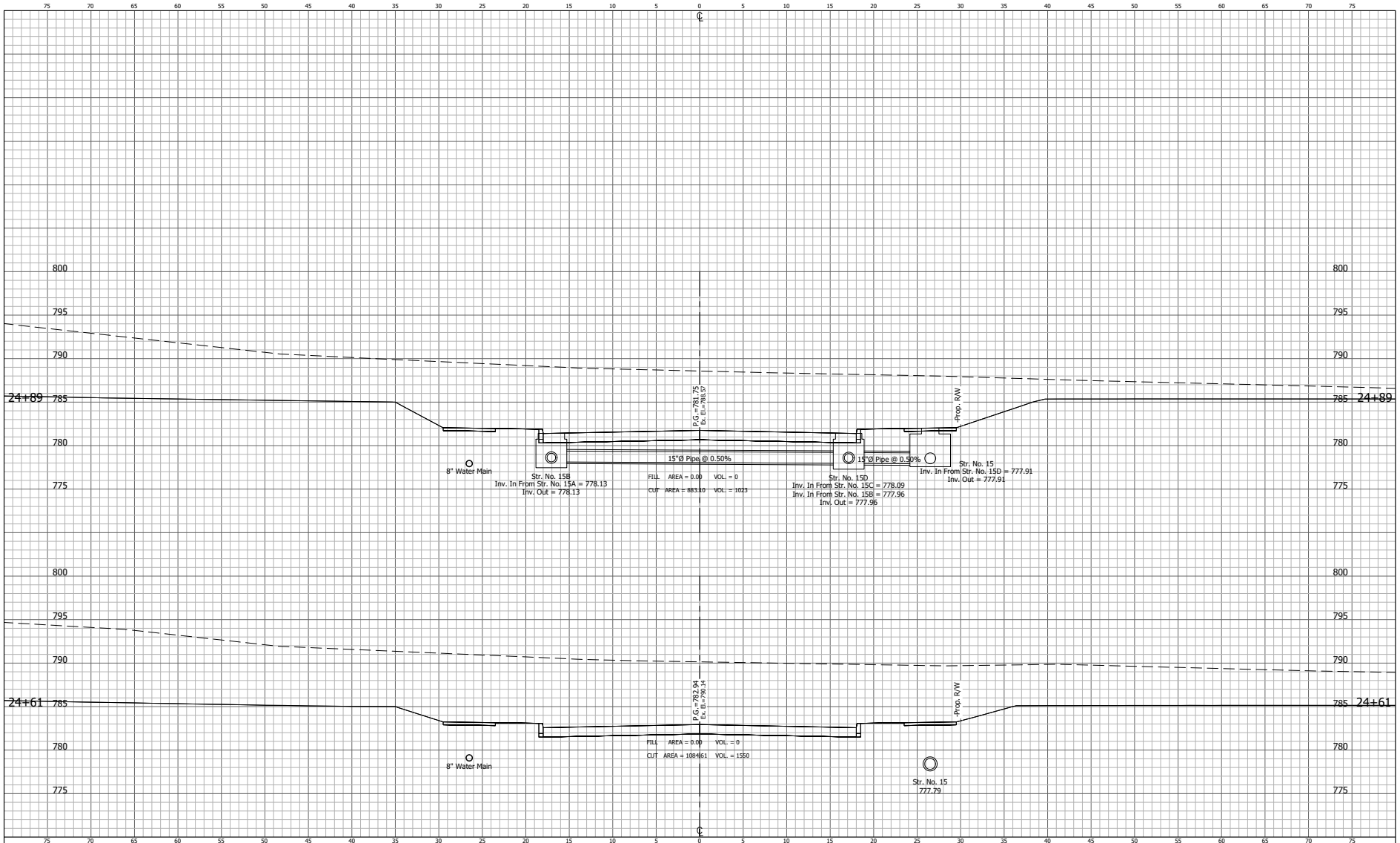

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FILENAME : XSEC.dwg
DATE/USER : 4/24/2024 4:35 PM / AaronHall

60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER _____ DATE

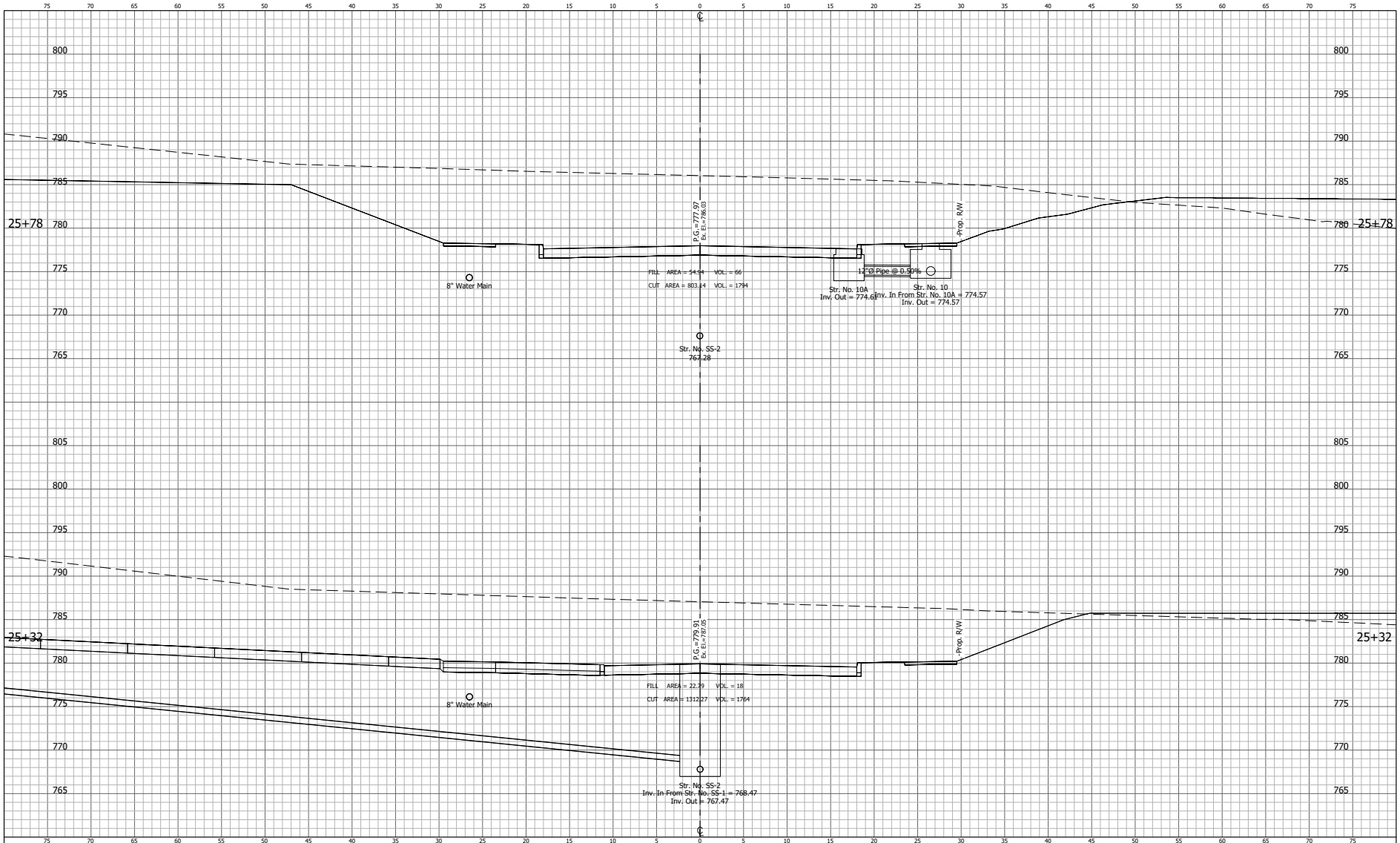
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	7 of XS-12
CONTRACT	PROJECT
-	-



60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER _____ DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	8 of XS-12
CONTRACT	PROJECT
-	-

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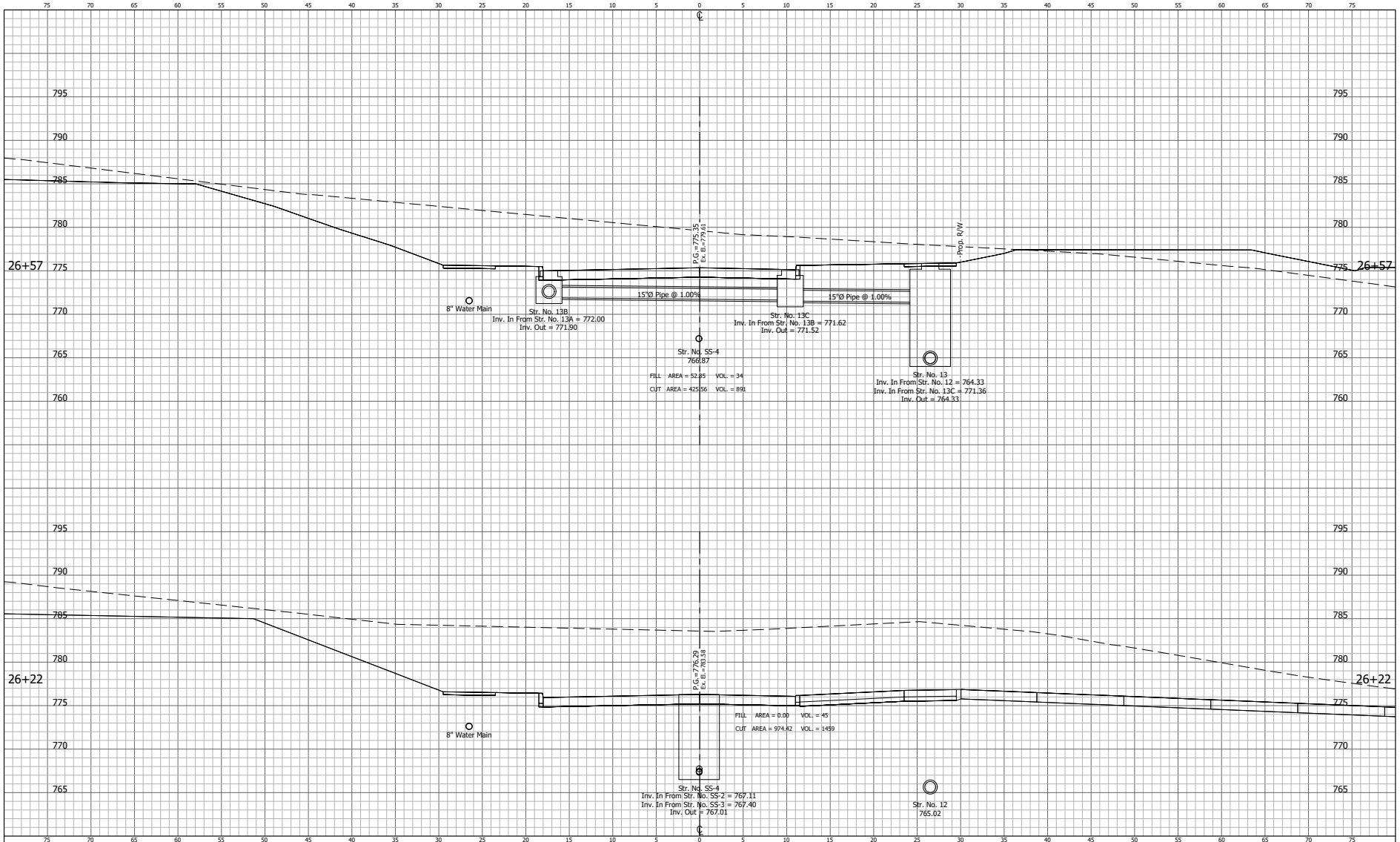

60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	9 of XS-12
CONTRACT	PROJECT
-	-

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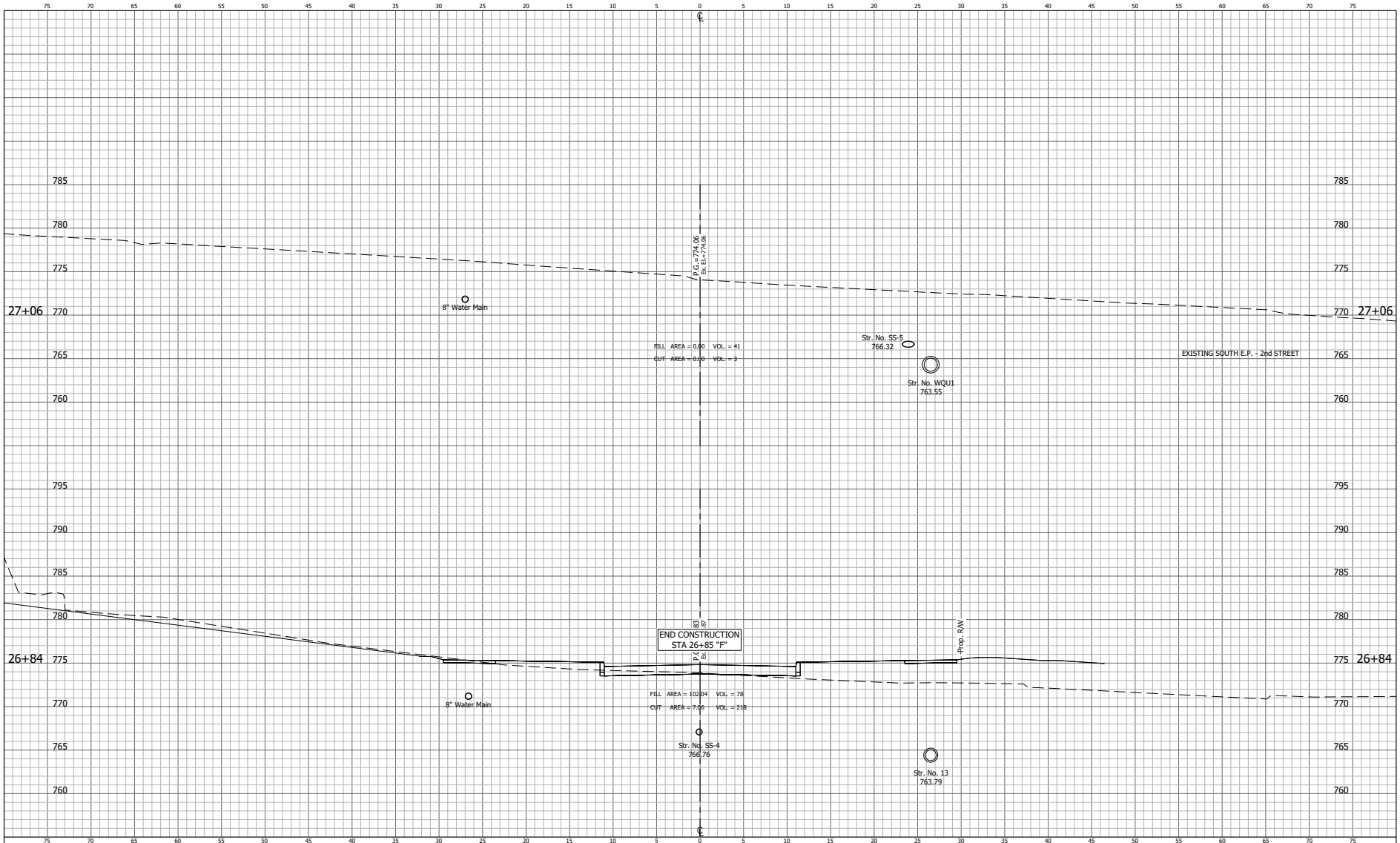

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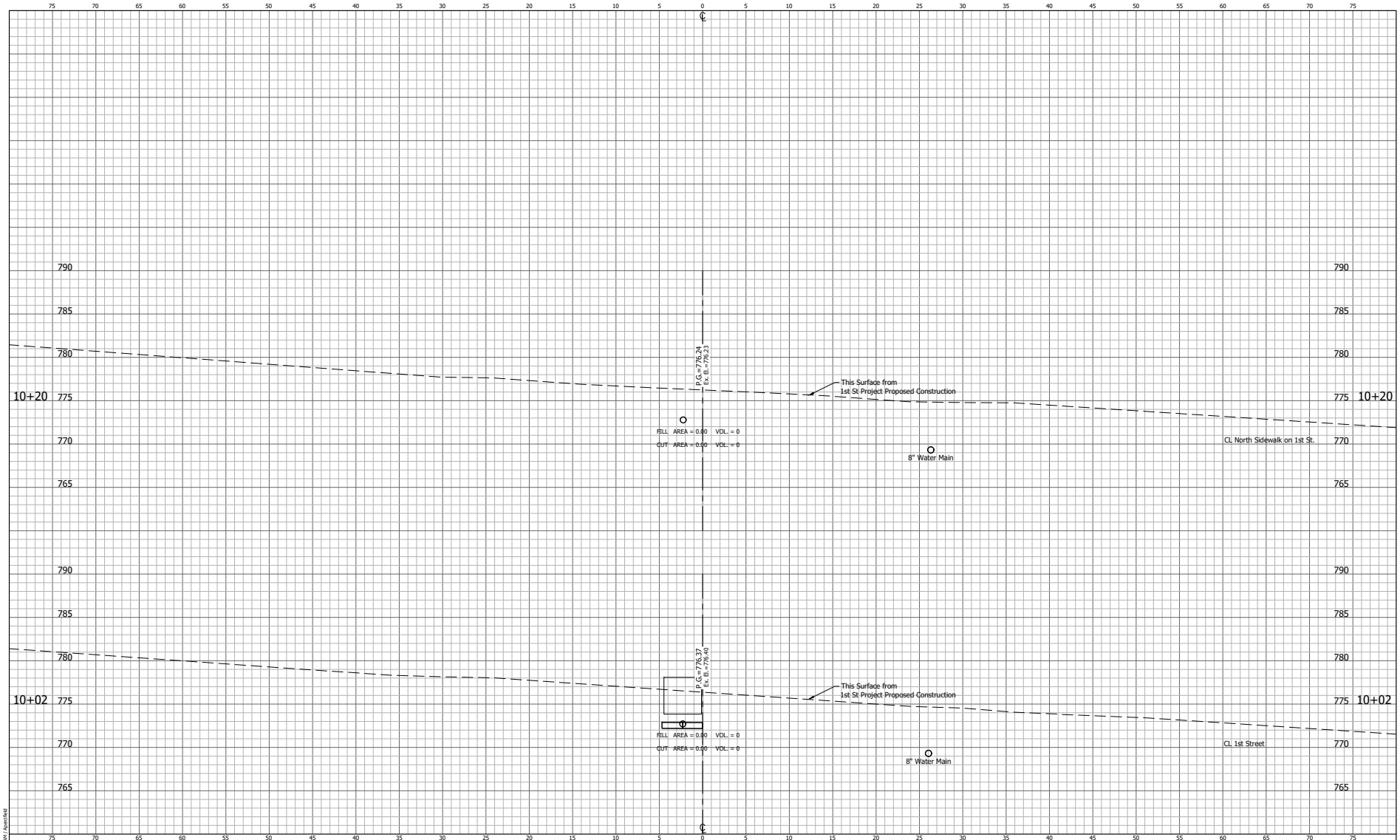
60% PLANS	RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE	CITY OF BLOOMINGTON HOPEWELL WEST	HORIZONTAL SCALE 1"=5' / BRIDGE FILE -
	DESIGNED: AJW DRAWN: DEP	CROSS SECTIONS LINE "F"	VERTICAL SCALE 1"=5' / DESIGNATION -
	CHECKED: TEN CHECKED: GJI		SURVEY BOOK - / SHEETS 10 of XS-12
			CONTRACT - / PROJECT -



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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	11 of XS-12
CONTRACT	PROJECT
-	-

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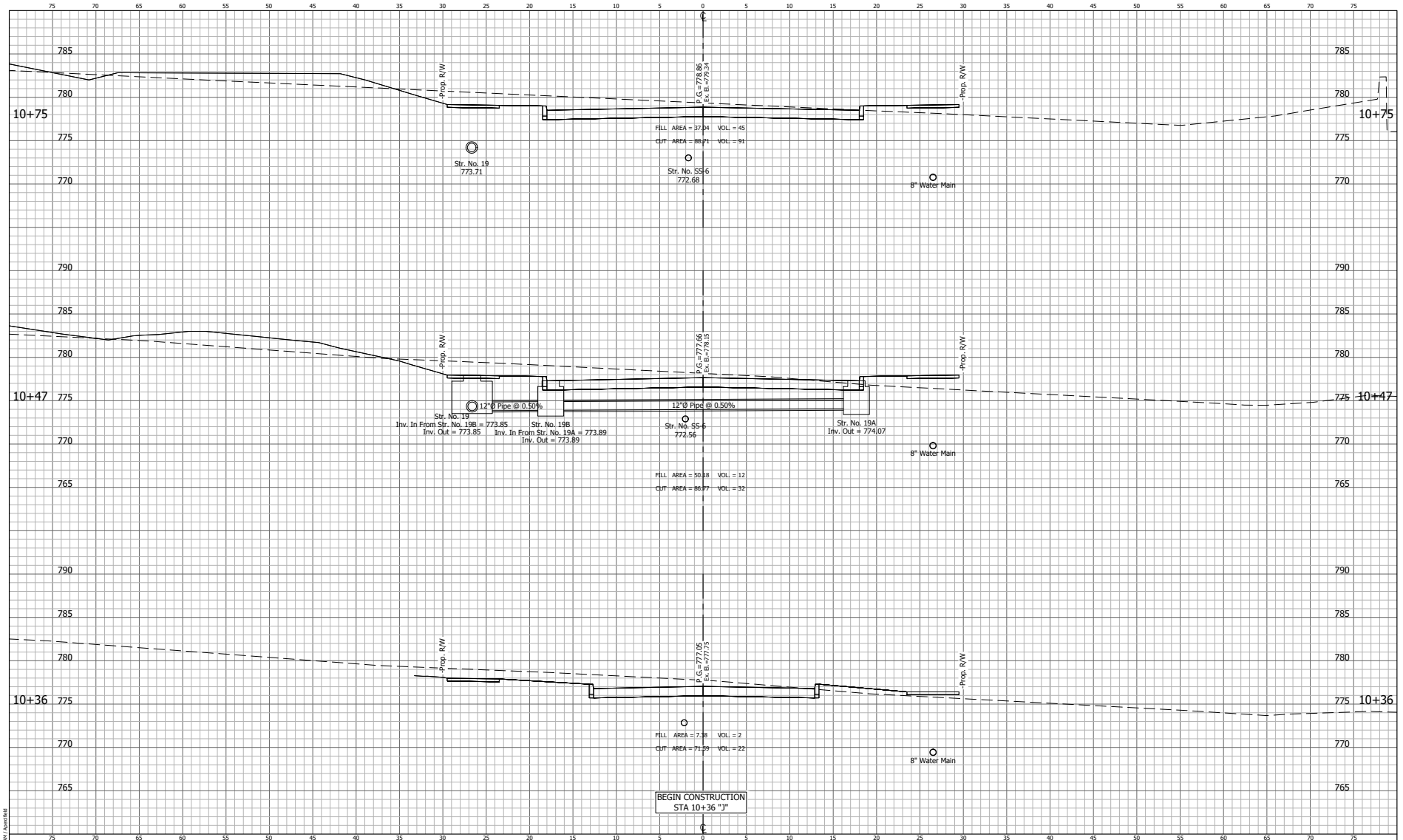

60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	12 of XS-12
CONTRACT	PROJECT
-	-

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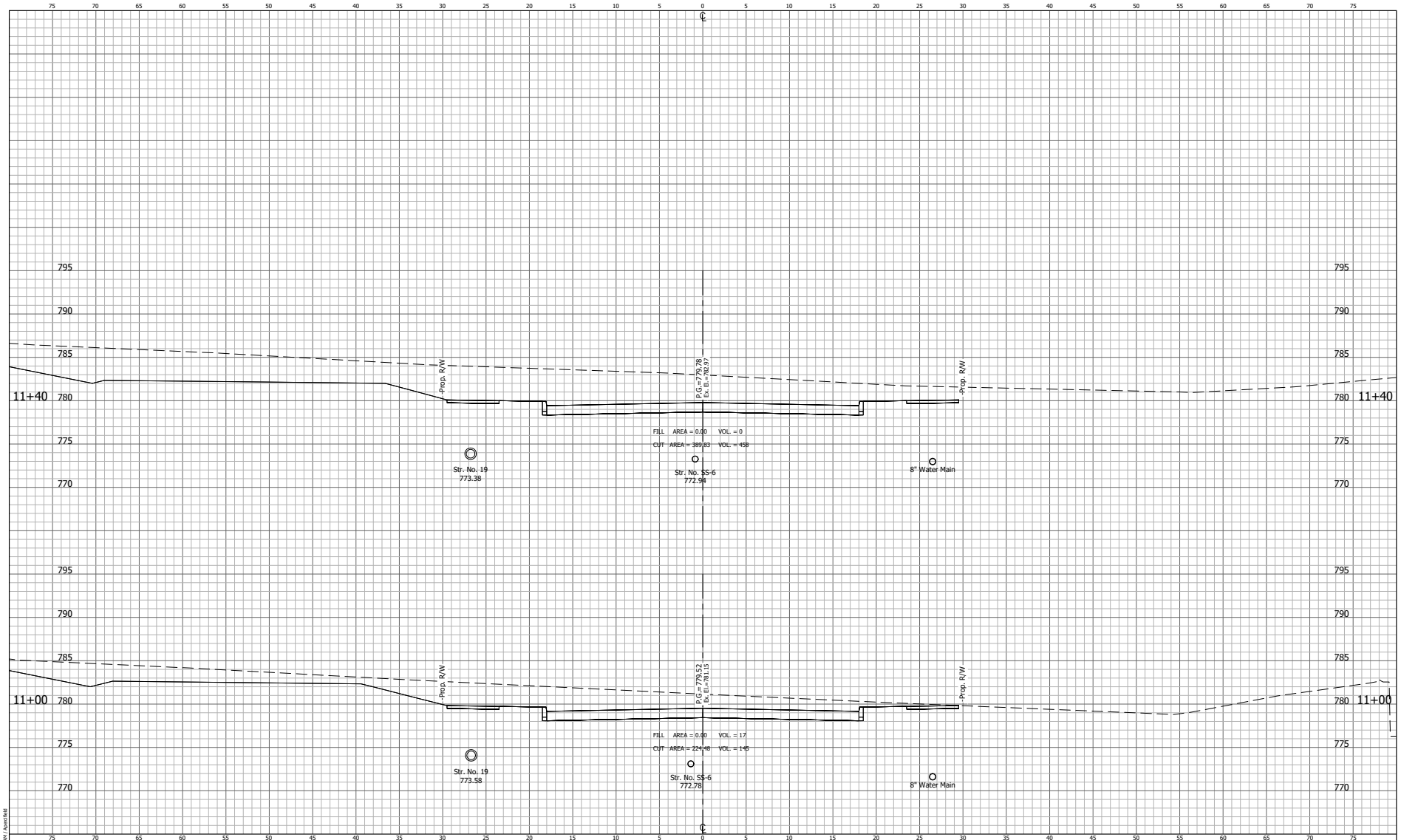

60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	13 of XS-12
CONTRACT	PROJECT
-	-

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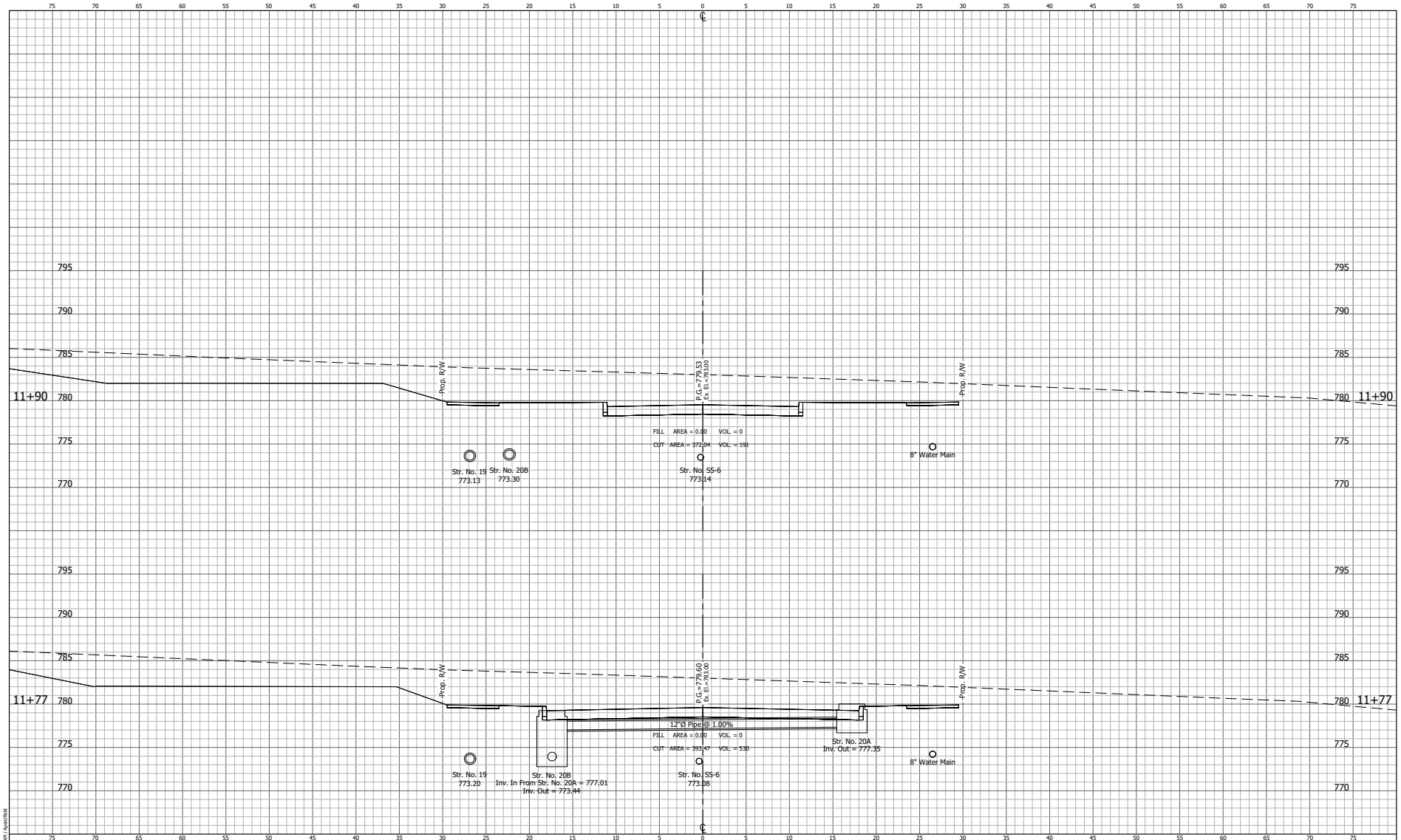

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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER _____ DATE

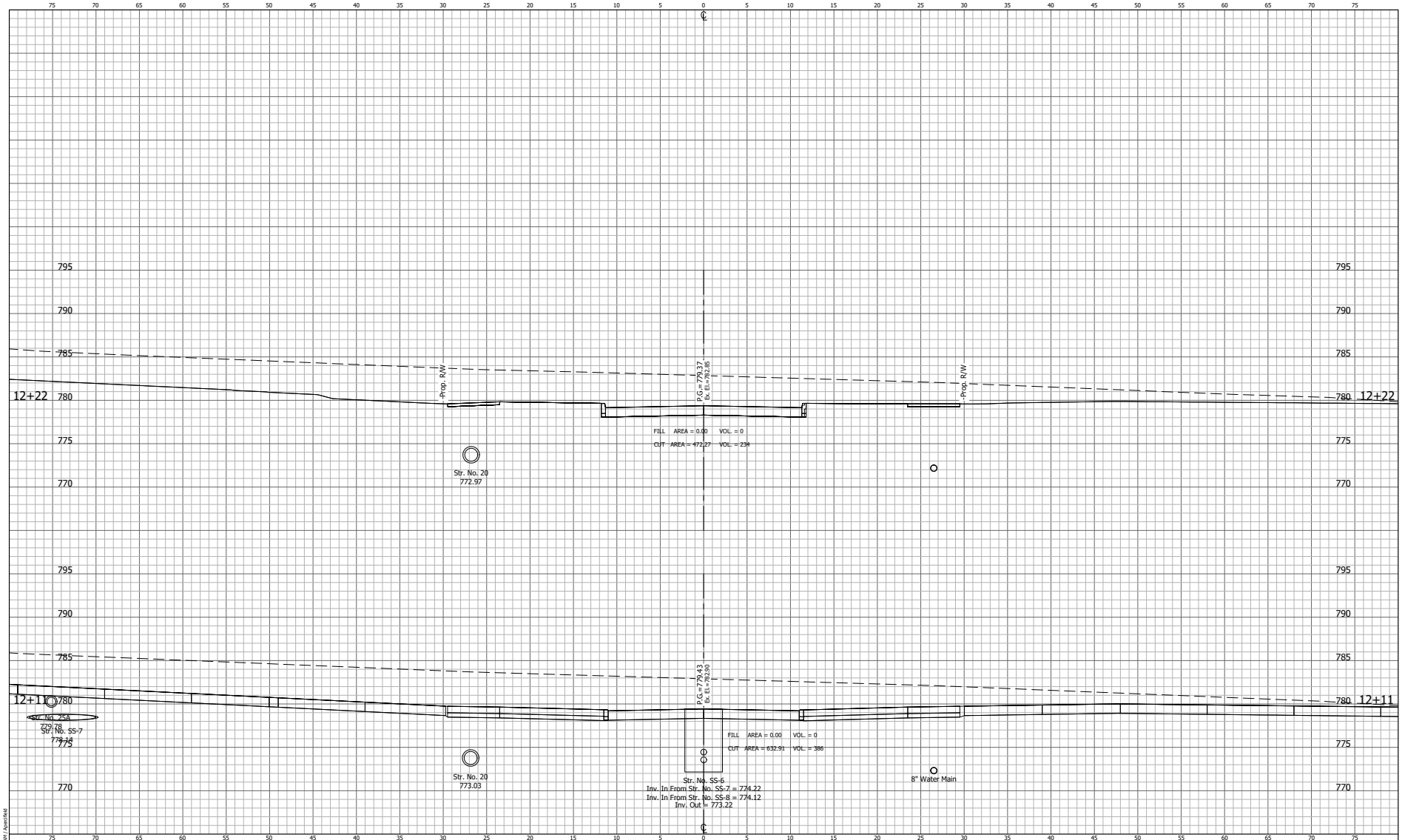
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	14 of XS-12
CONTRACT	PROJECT
-	-



60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	15 of XS-12
CONTRACT	PROJECT
-	-

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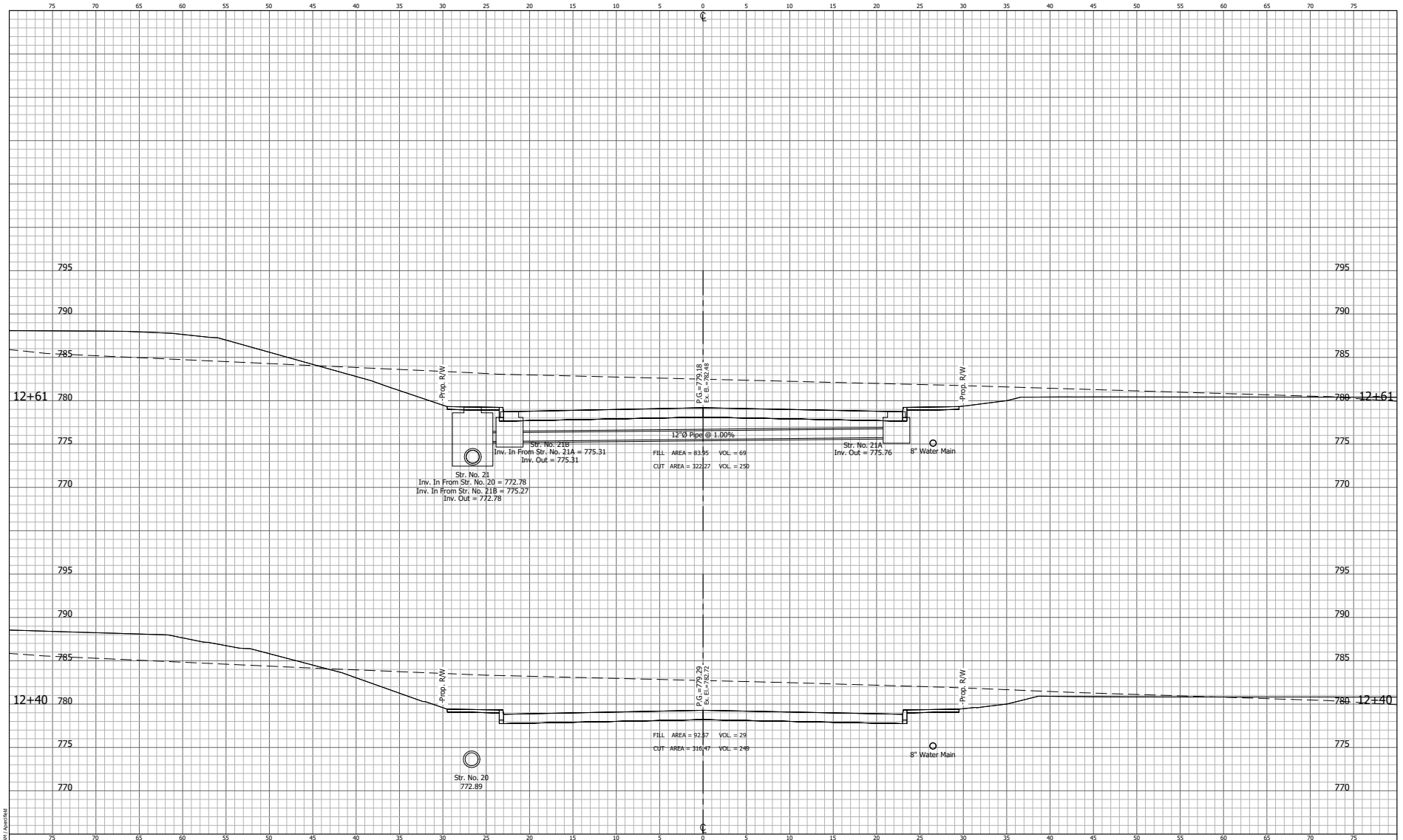

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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER _____ DATE

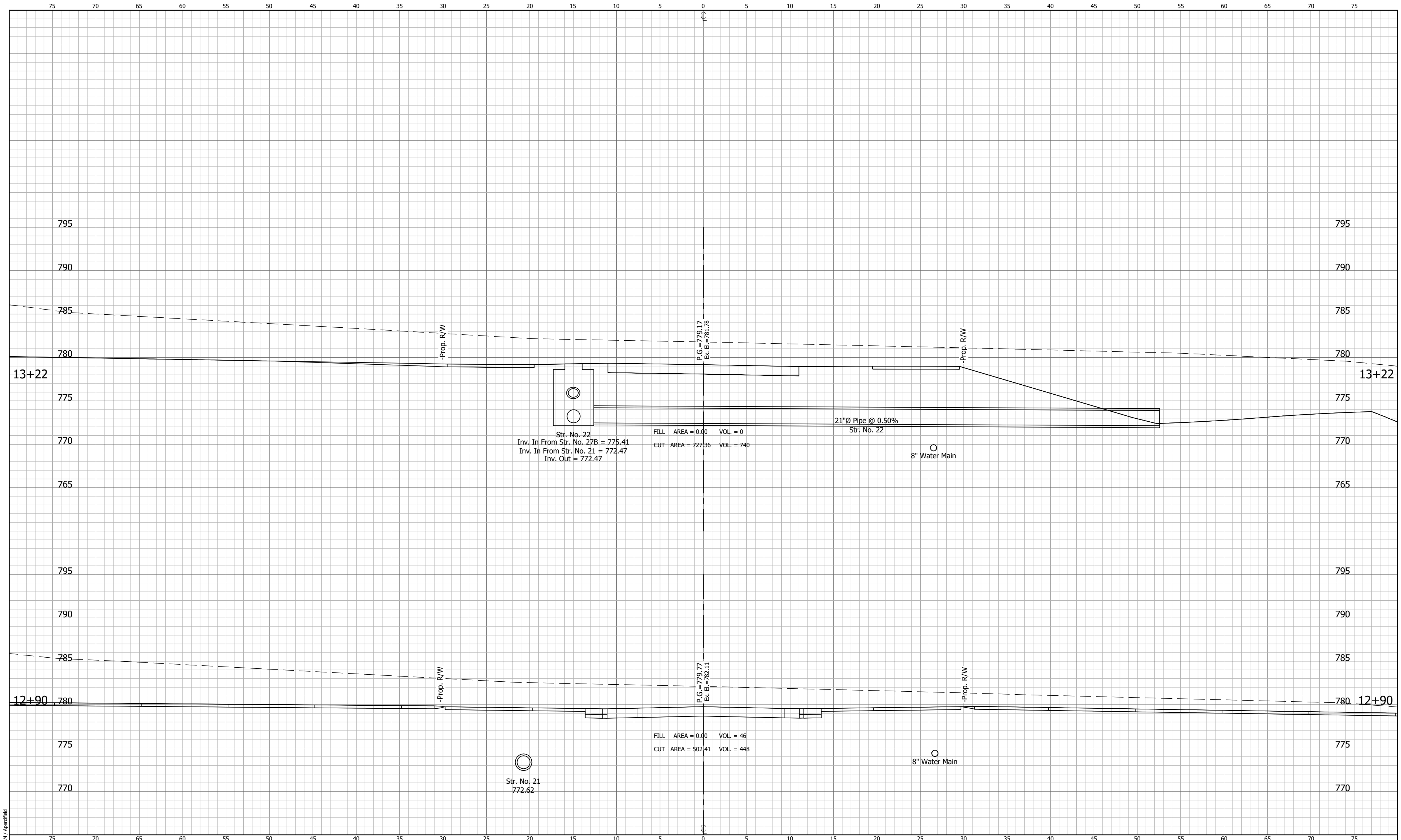
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	16 of XS-12
CONTRACT	PROJECT
-	-



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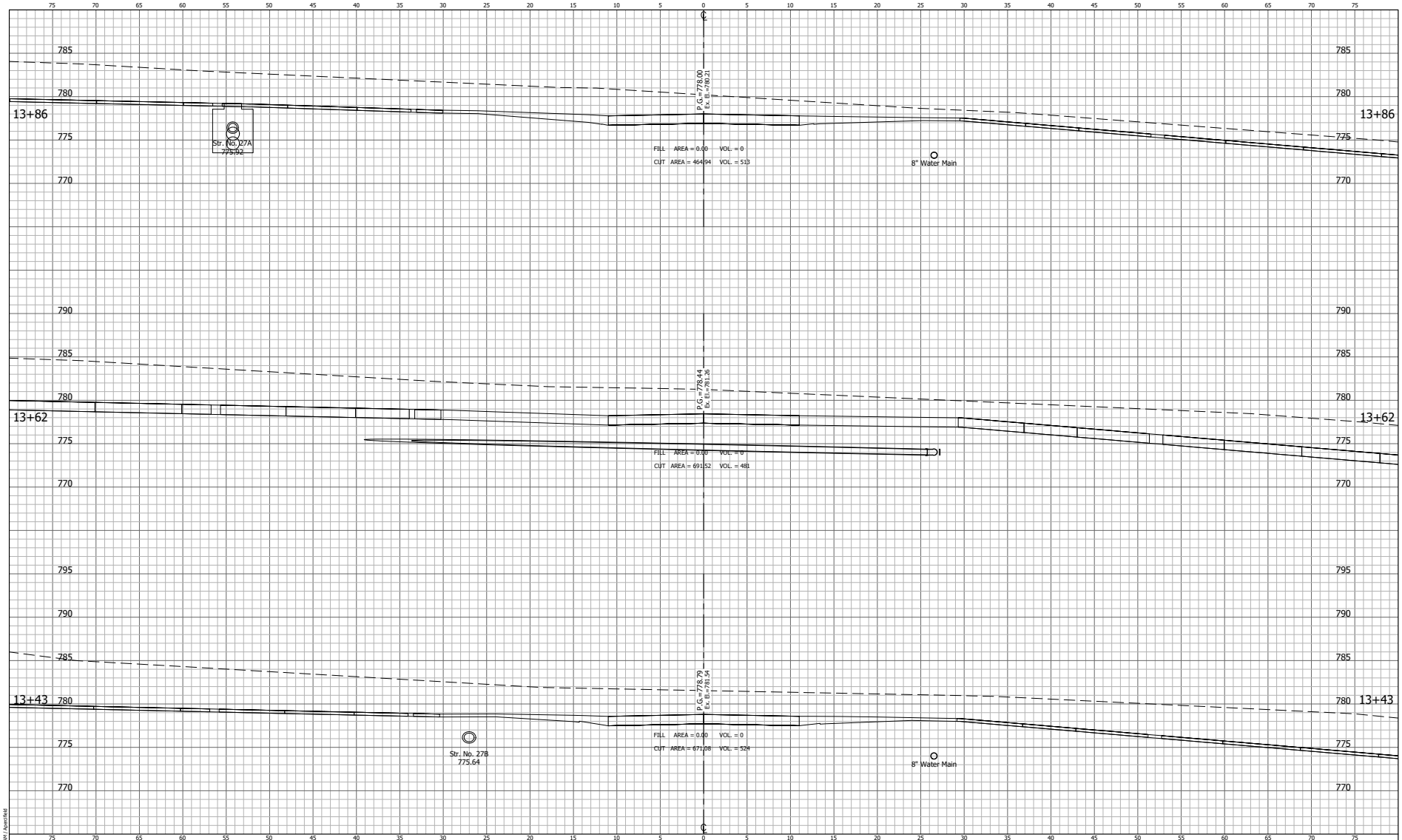
RECOMMENDED FOR APPROVAL ______ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP
CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	17 of XS-12
CONTRACT	PROJECT
-	-



60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	18 of XS-12
CONTRACT	PROJECT
-	-

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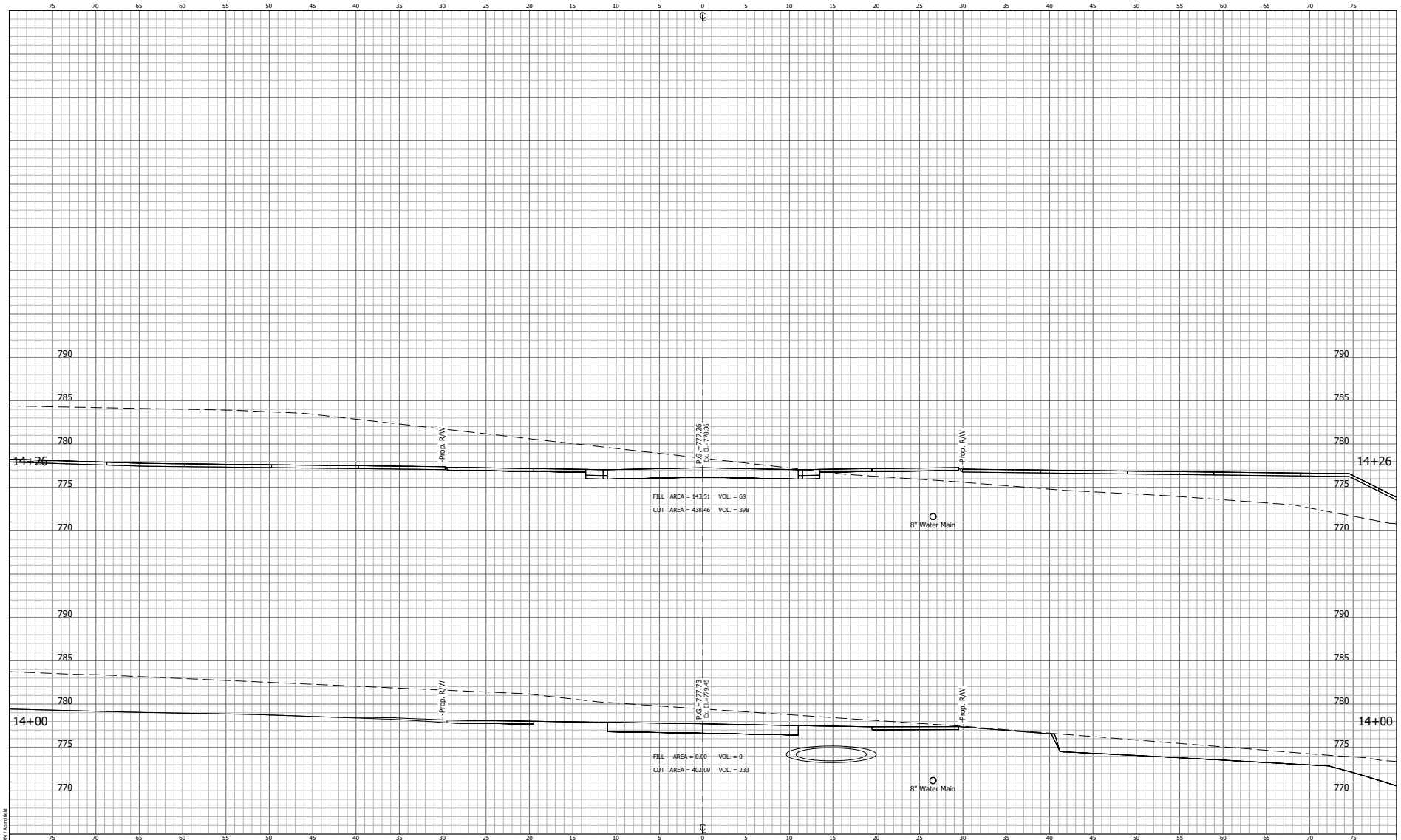

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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

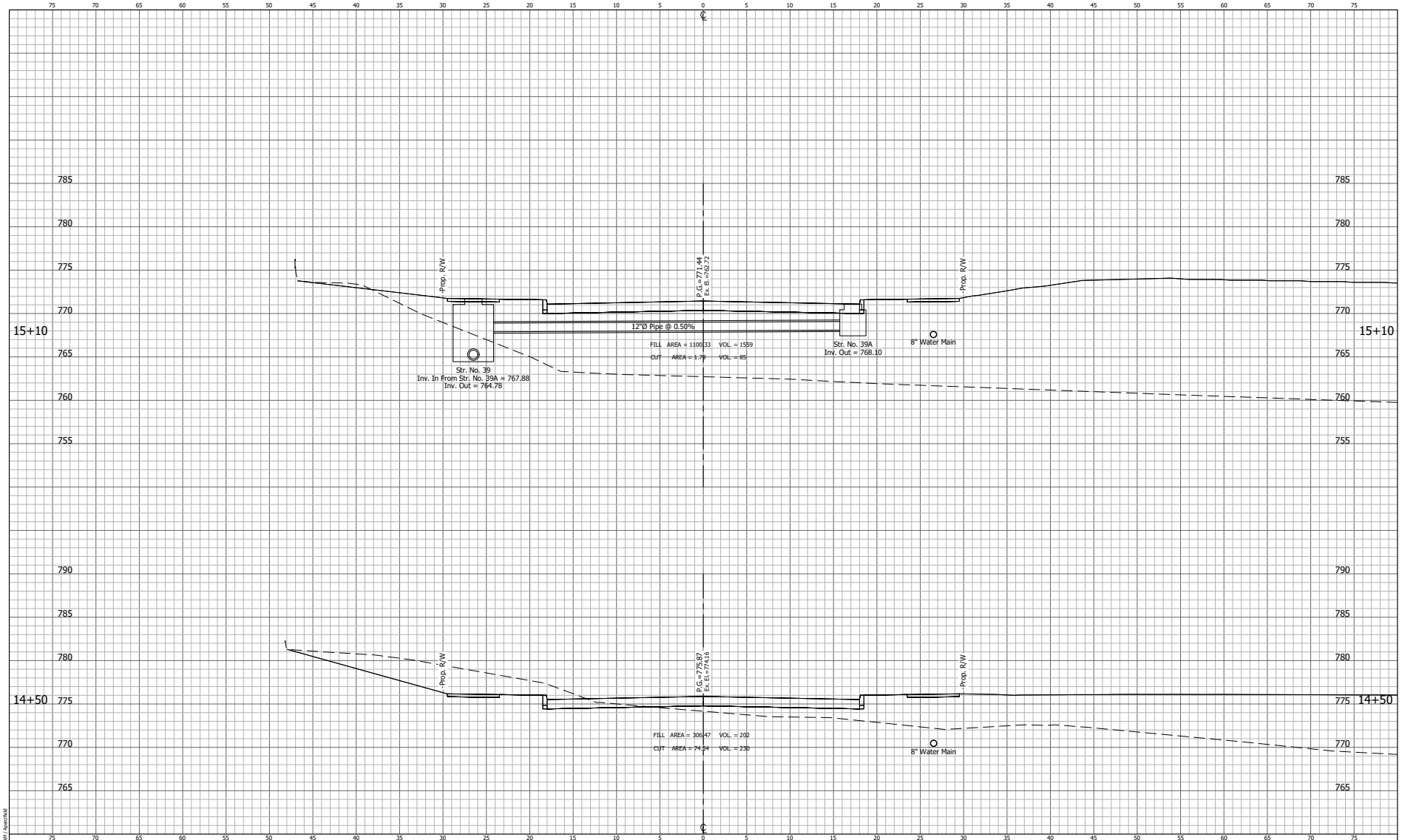
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	19 of XS-12
CONTRACT	PROJECT
-	-



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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER _____ DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	20 of XS-12
CONTRACT	PROJECT
-	-

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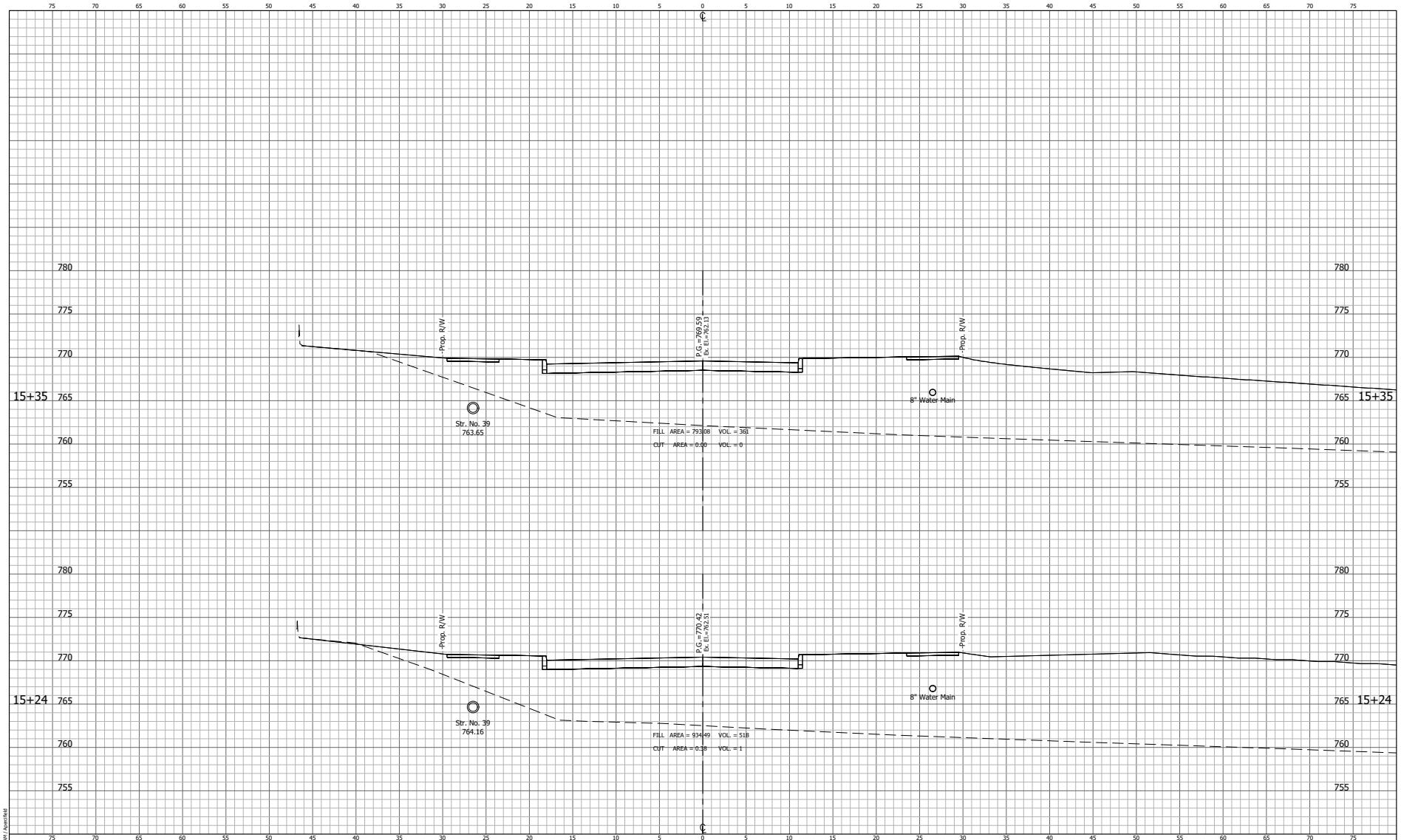

60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	21 of XS-12
CONTRACT	PROJECT
-	-

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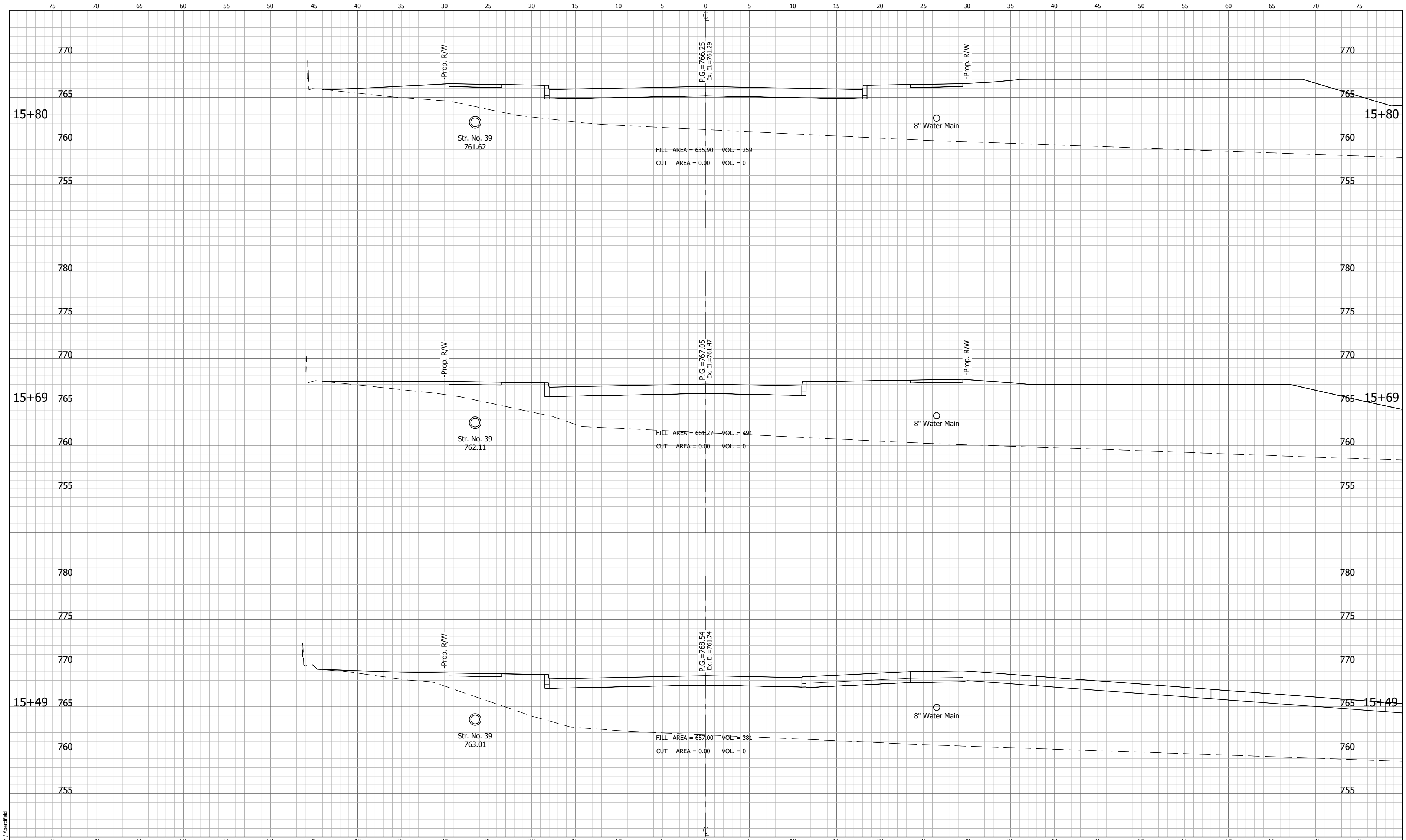

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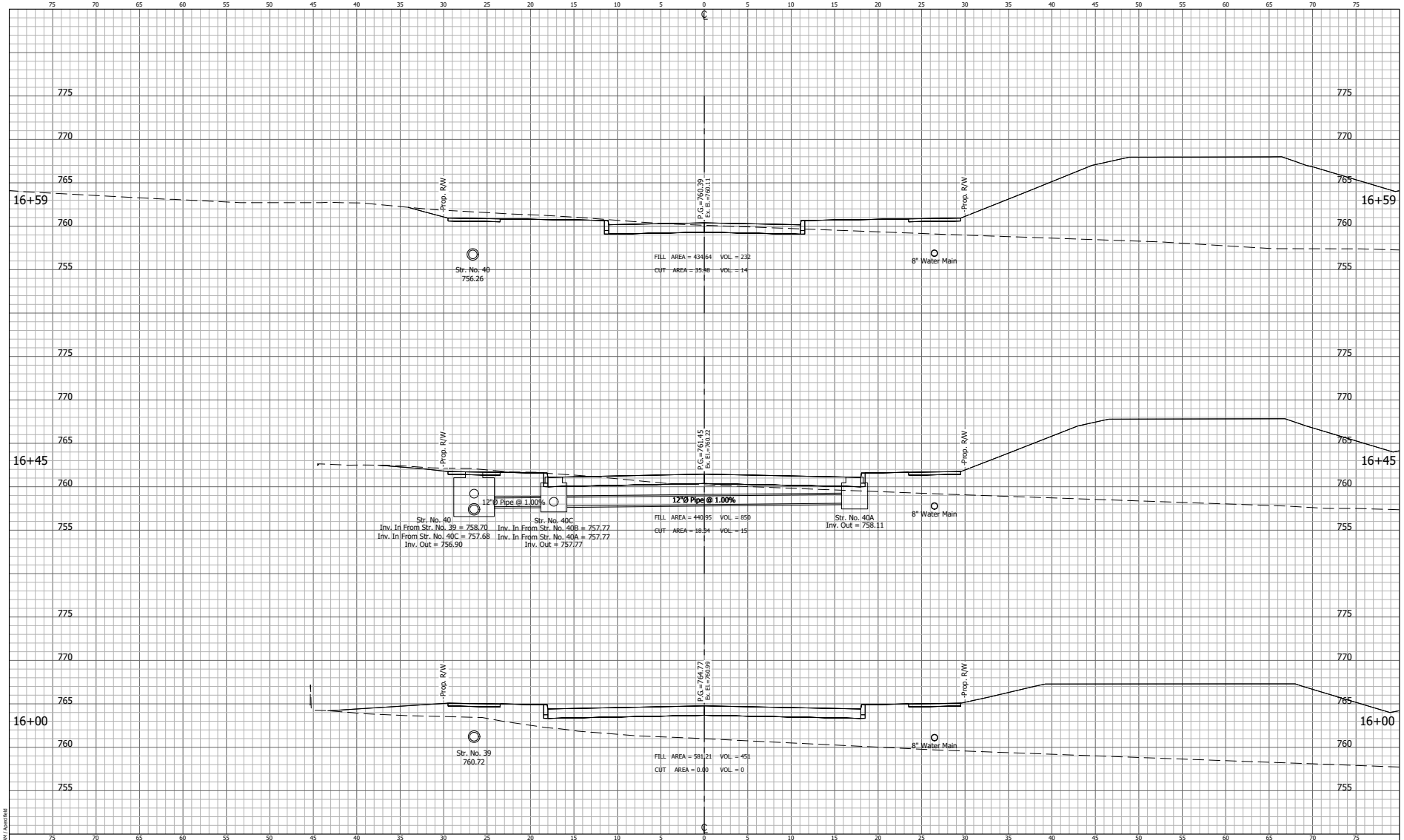
RECOMMENDED FOR APPROVAL ______ DESIGN ENGINEER DATE

DESIGNED: AJW	DRAWN: DEP
CHECKED: TEN	CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	22 of XS-12
CONTRACT	PROJECT
-	-



60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	23 of XS-12
CONTRACT	PROJECT
-	-

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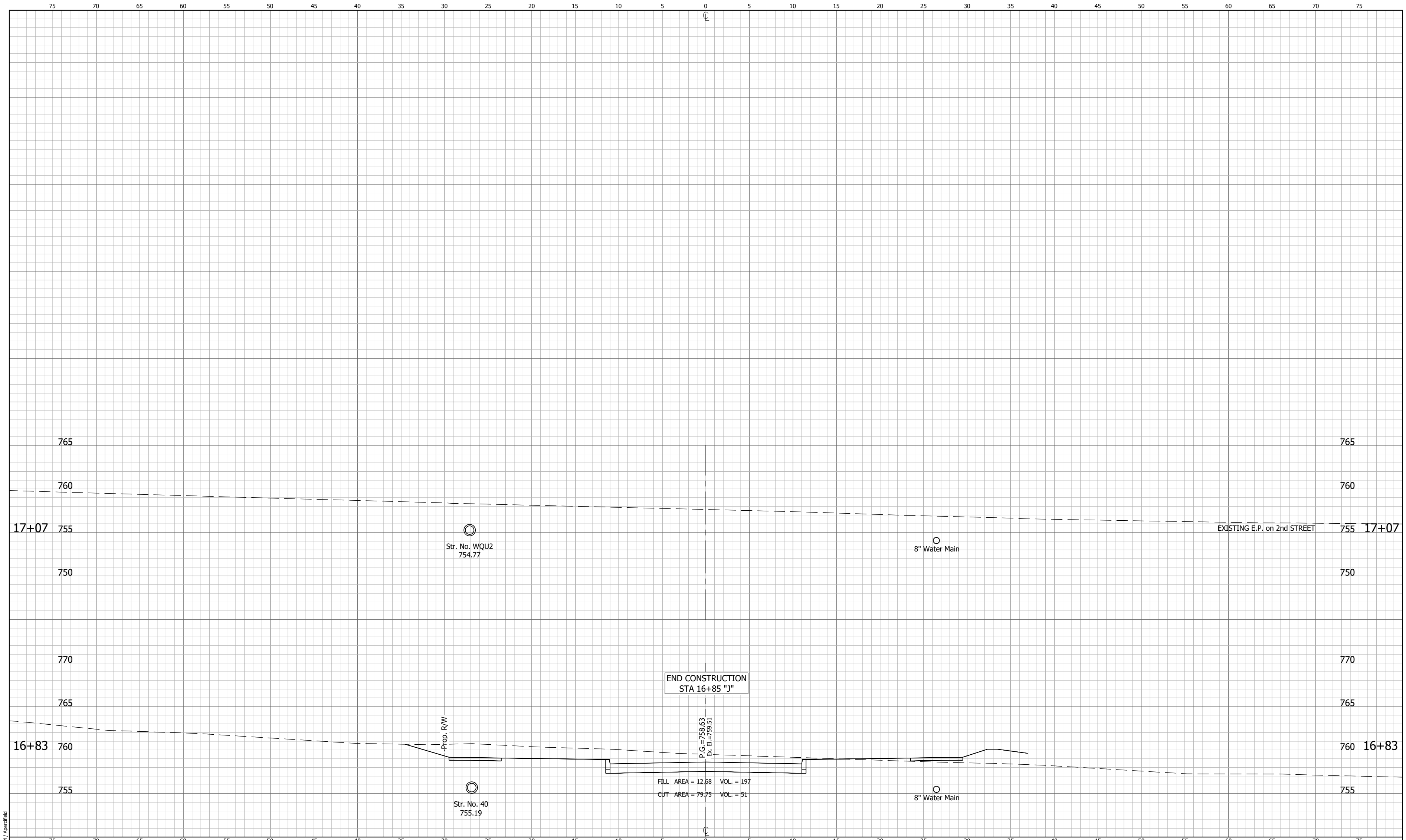

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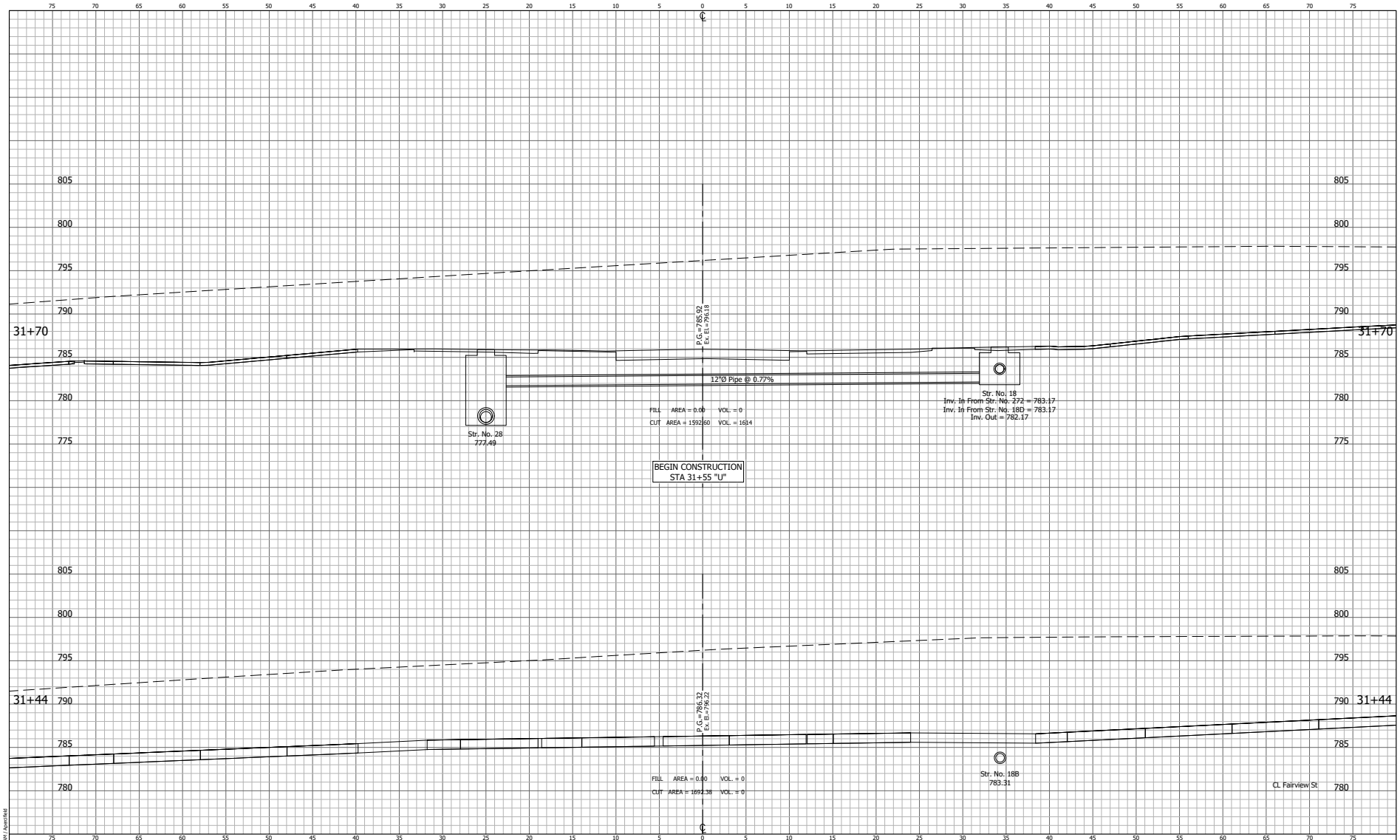
RECOMMENDED FOR APPROVAL ______________ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP
CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	24 of XS-12
CONTRACT	PROJECT
-	-



60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "U"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	25 of XS-12
CONTRACT	PROJECT
-	-

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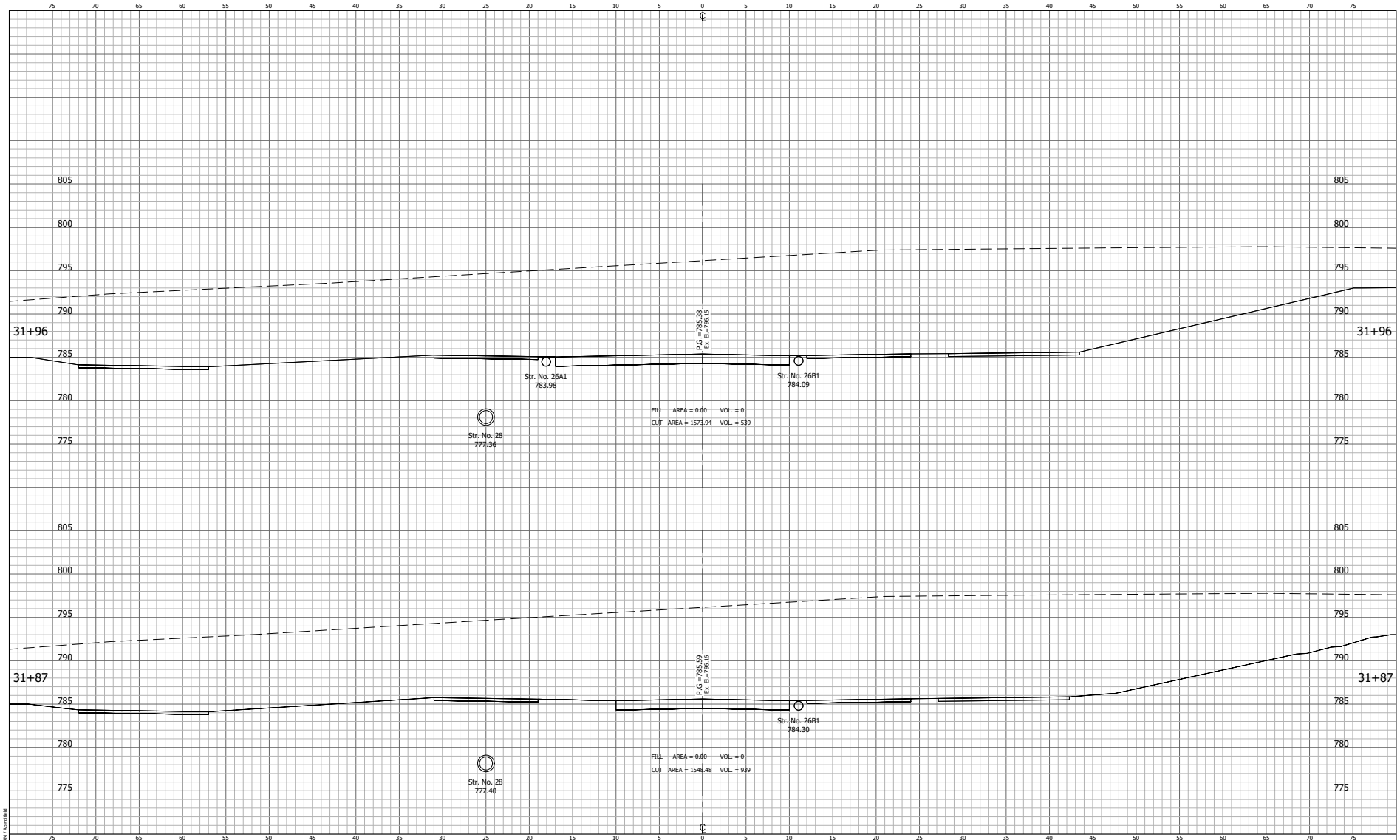

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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

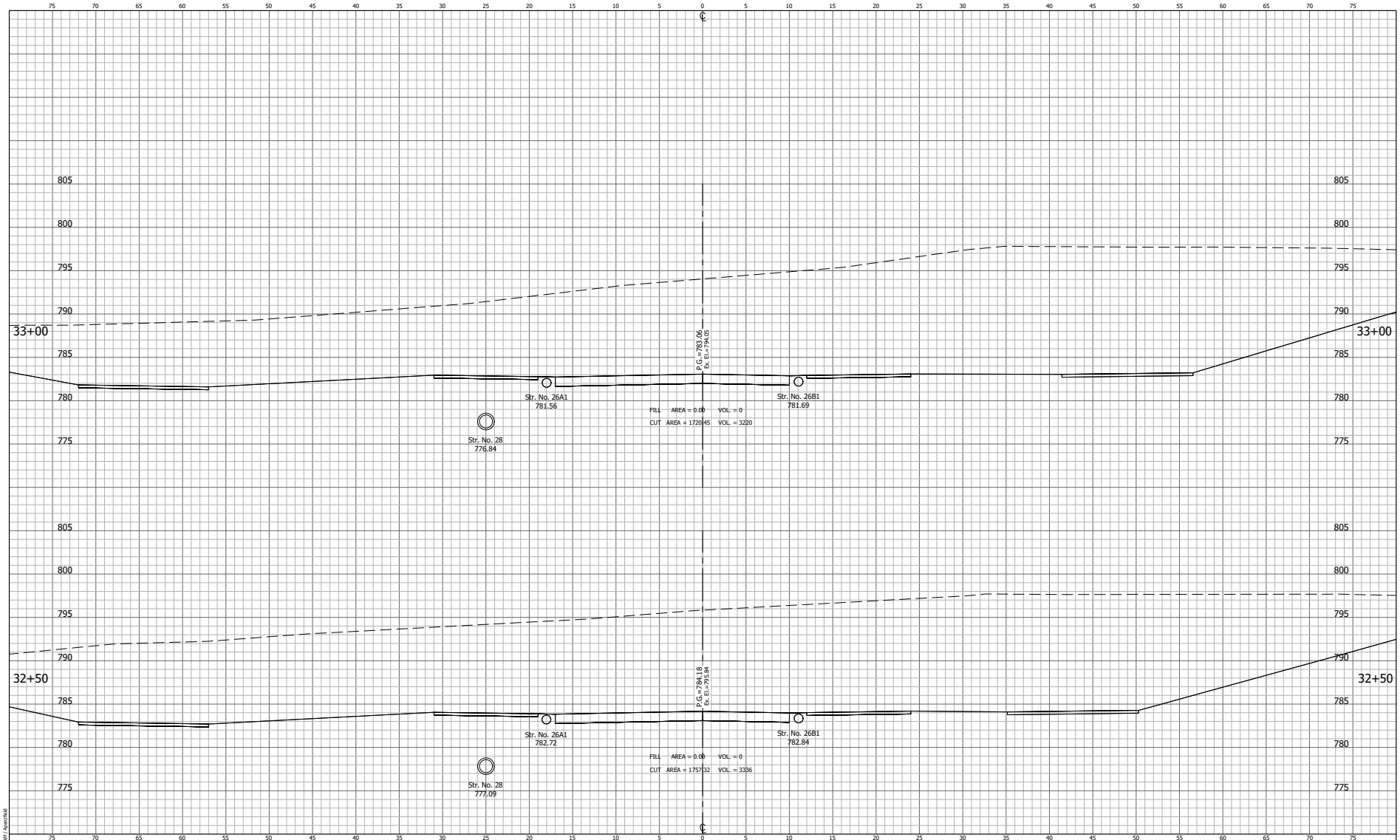
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "U"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	26 of XS-12
CONTRACT	PROJECT
-	-



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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "U"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	27 of XS-12
CONTRACT	PROJECT
-	-

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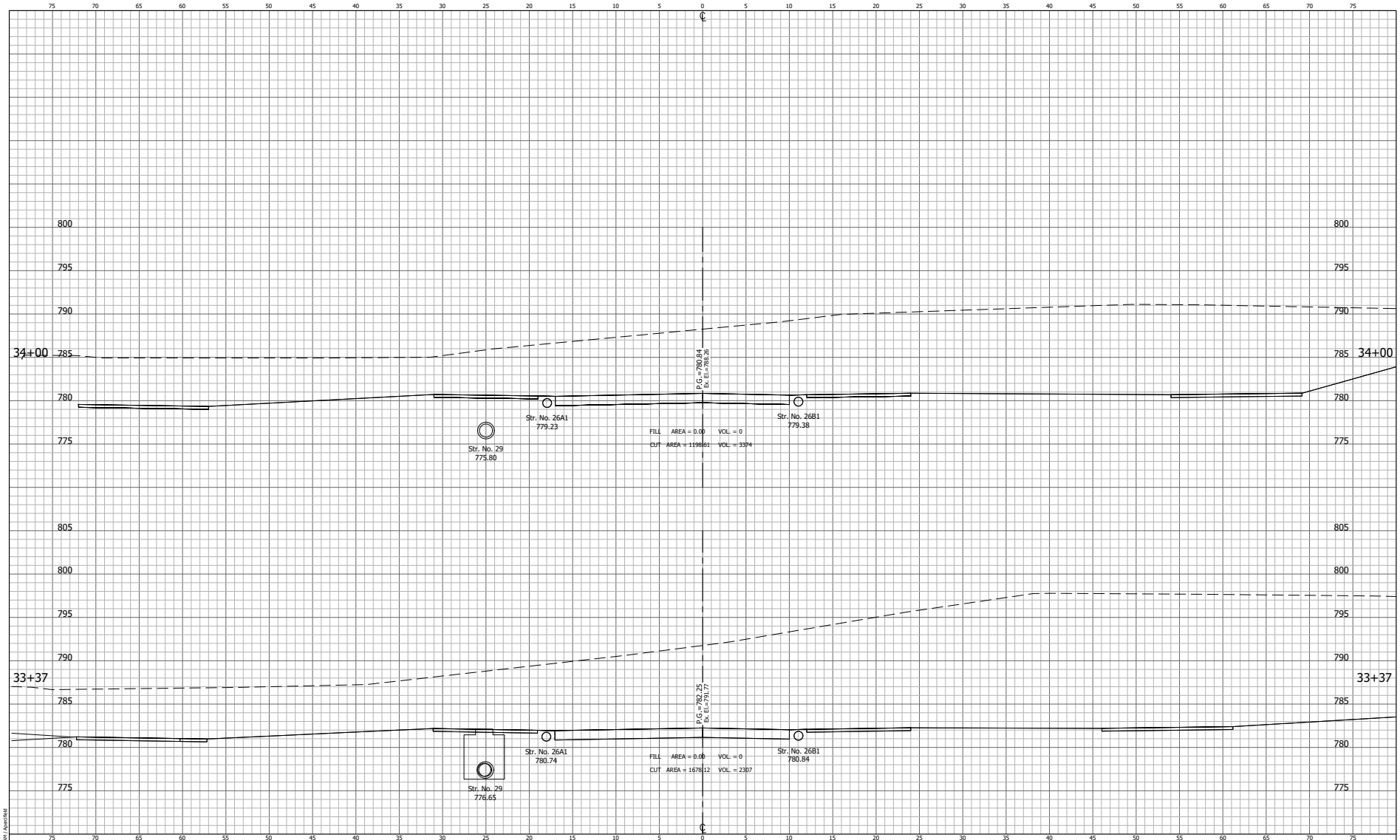

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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "U"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	28 of XS-12
CONTRACT	PROJECT
-	-

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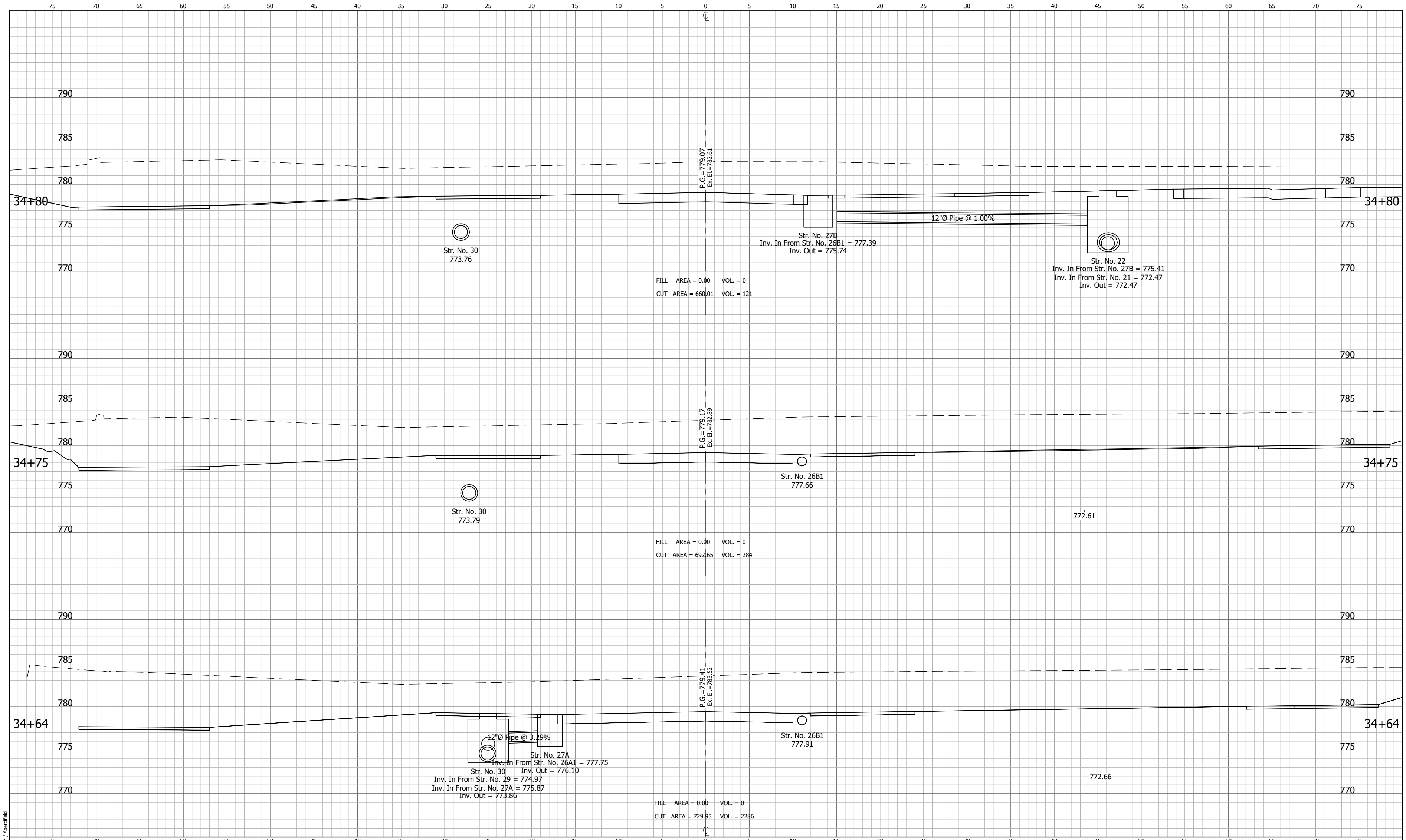
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Ex. El.=782.61
Str. No. 30
773.76
Str. No. 27B
Inv. In From Str. No. 26B1 = 777.39
Inv. Out = 775.74
12"Ø Pipe @ 1.00%
Str. No. 22
Inv. In From Str. No. 27B = 775.41
Inv. In From Str. No. 21 = 772.47
Inv. Out = 772.47
FILL AREA = 0.00 VOL. = 0
CUT AREA = 660.01 VOL. = 121
34+75
P.G.=779.17
Ex. El.=782.89
Str. No. 26B1
777.66
Str. No. 30
773.79
772.61
FILL AREA = 0.00 VOL. = 0
CUT AREA = 692.65 VOL. = 284
34+64
P.G.=779.41
Ex. El.=783.52
12"Ø Pipe @ 3.29%
Str. No. 27A
Inv. In From Str. No. 26A1 = 777.75
Inv. Out = 776.10
Str. No. 30
Inv. In From Str. No. 29 = 774.97
Inv. In From Str. No. 27A = 775.87
Inv. Out = 773.86
Str. No. 26B1
777.91
772.66
FILL AREA = 0.00 VOL. = 0
CUT AREA = 729.95 VOL. = 2286

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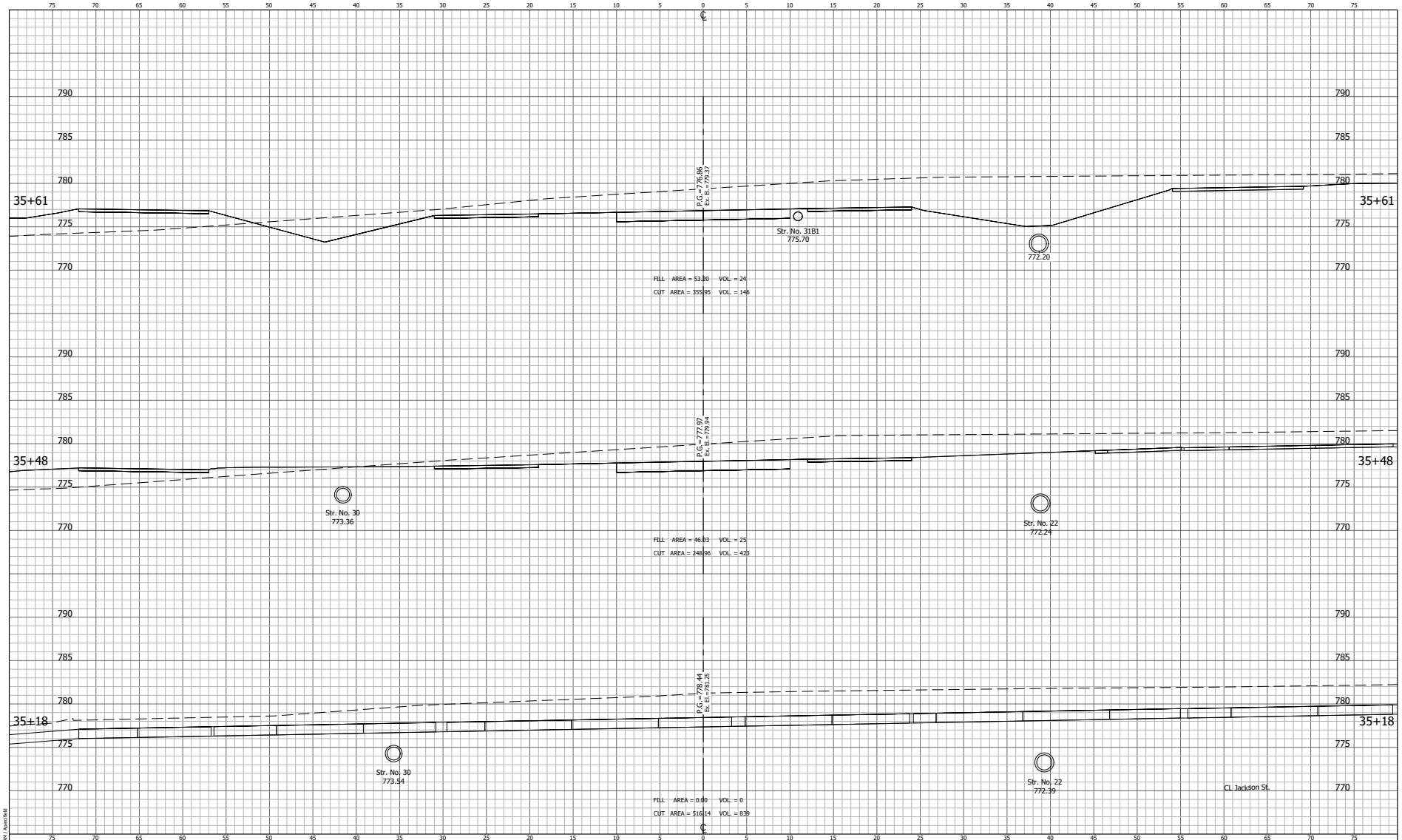
RECOMMENDED FOR APPROVAL ____ DESIGN ENGINEER DATE

DESIGNED: AJW | DRAWN: DEP
CHECKED: TEN | CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "U"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	29 of XS-12
CONTRACT	PROJECT
-	-



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FILENAME : XSEC.dwg
DATE/TIME : 4/4/2024 8:36 AM / AaronHall

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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

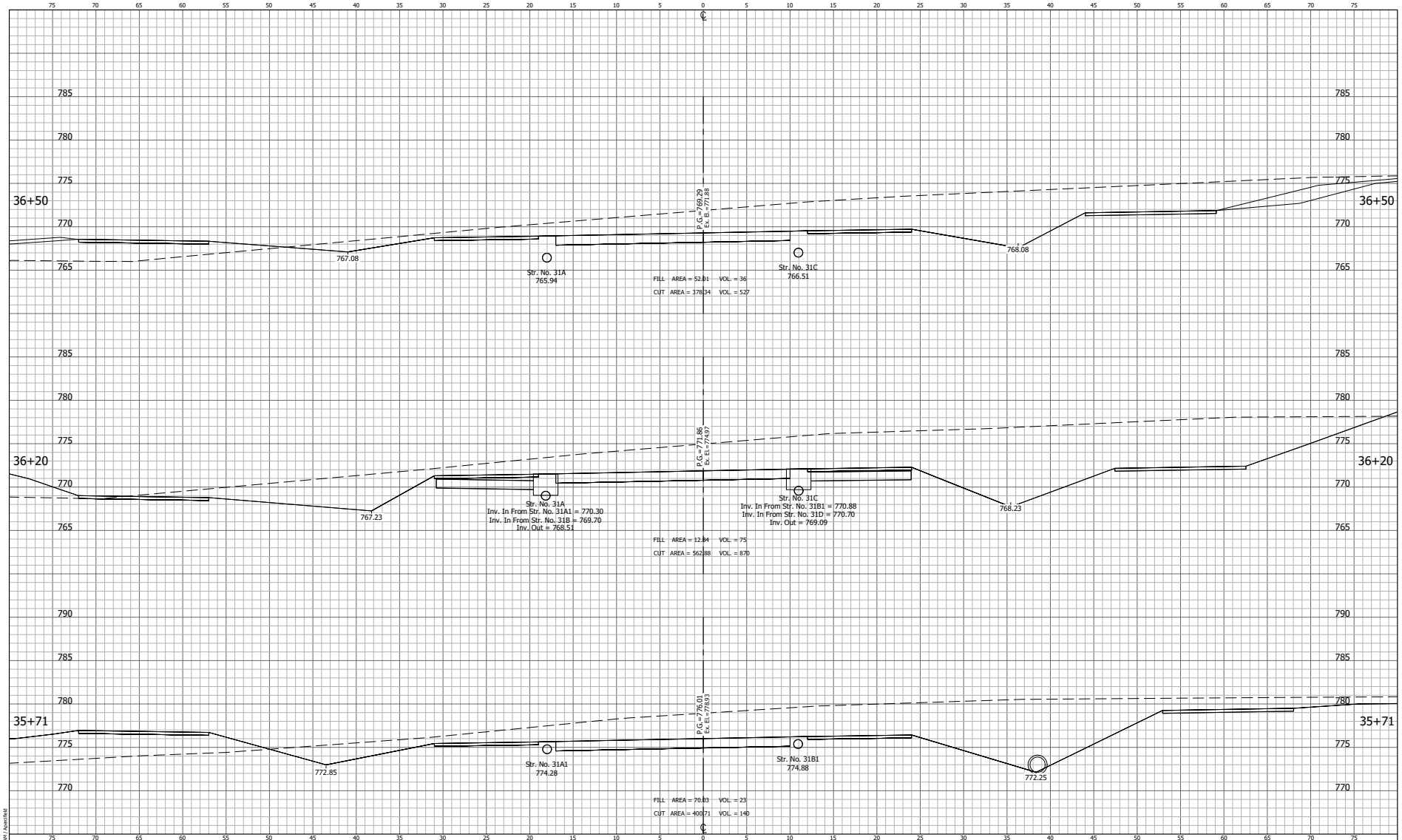
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "U"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	30 of XS-12
CONTRACT	PROJECT
-	-



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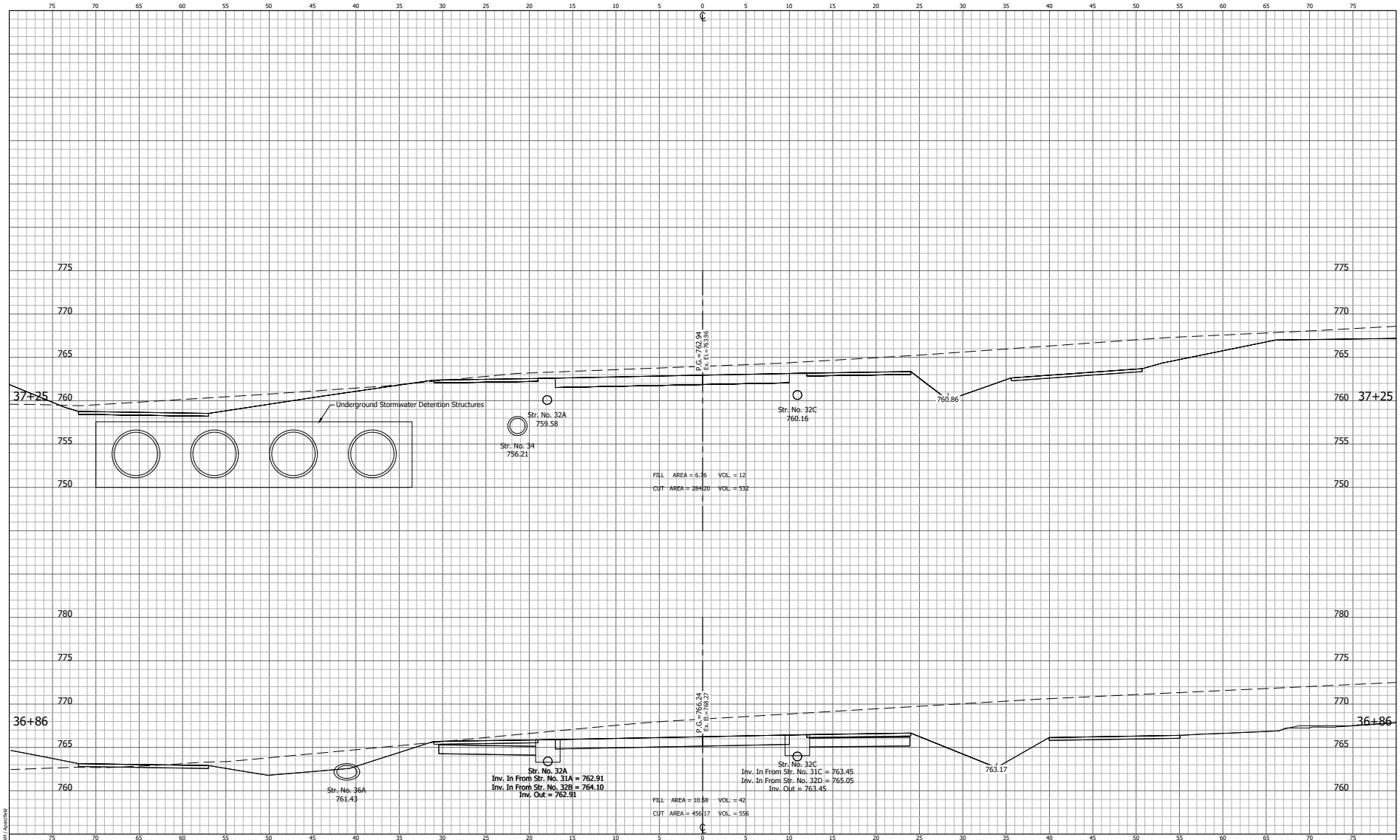
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "U"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	31 of XS-12
CONTRACT	PROJECT
-	-



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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "U"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	32 of XS-12
CONTRACT	PROJECT
-	-

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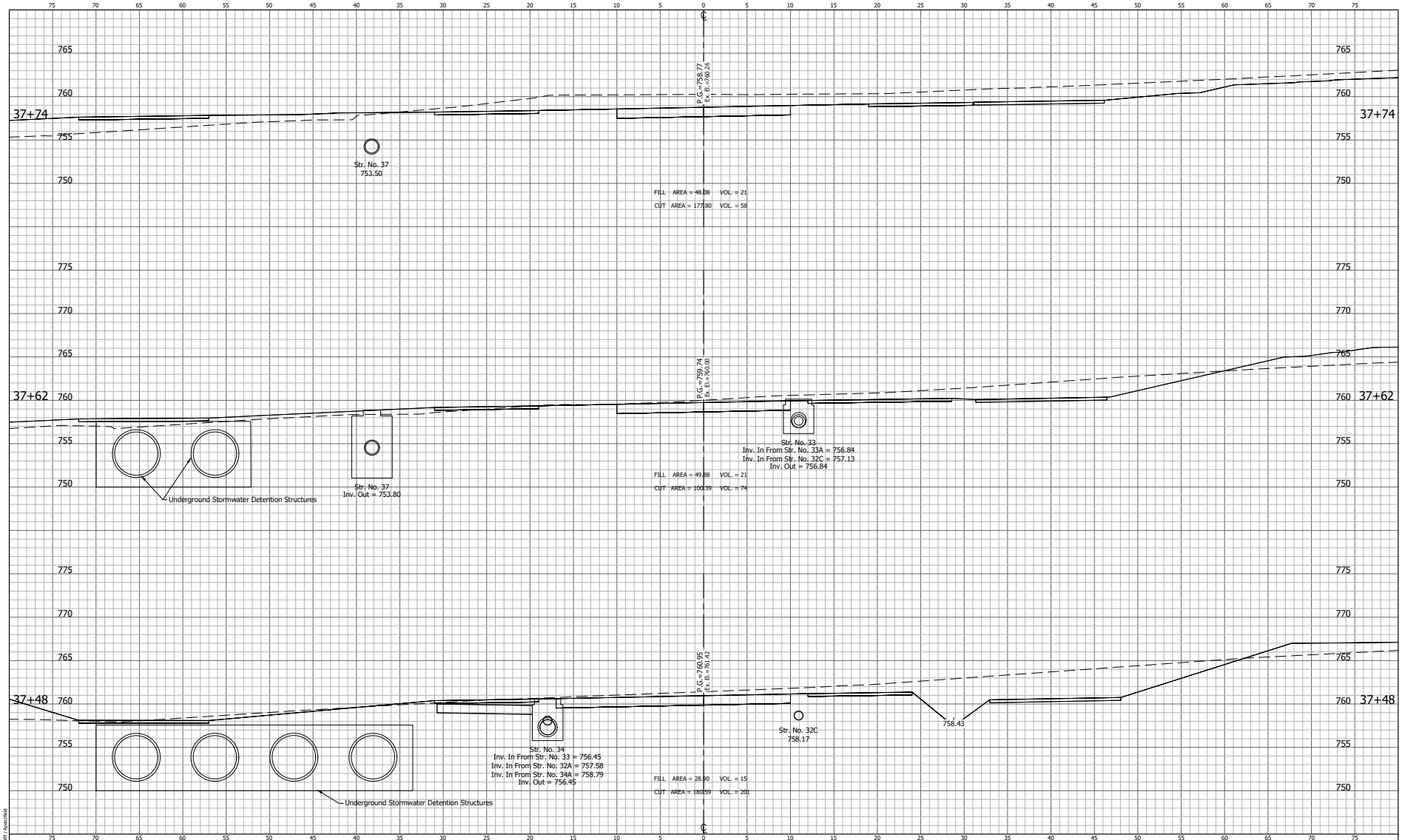

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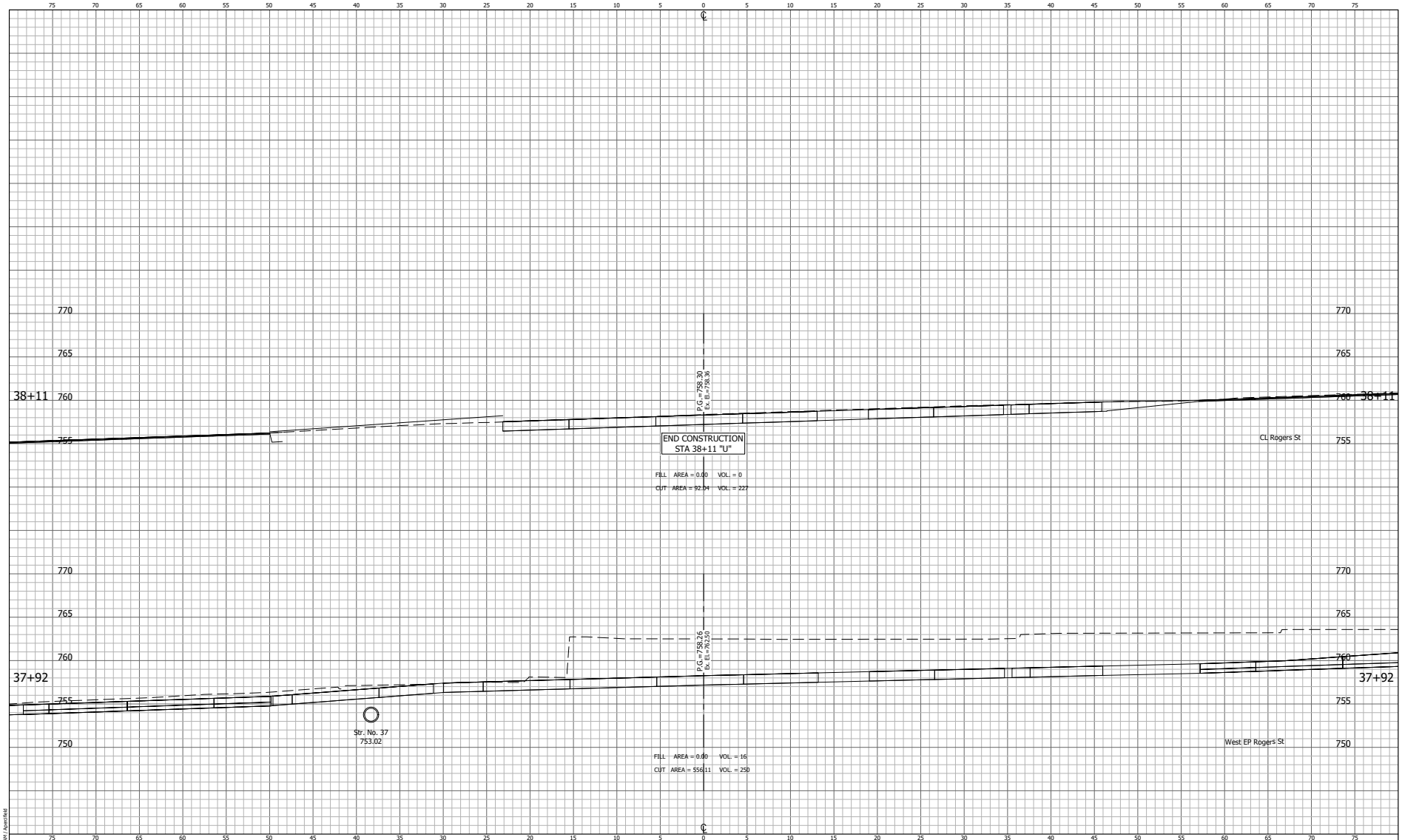
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "U"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	33 of XS-12
CONTRACT	PROJECT
-	-



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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

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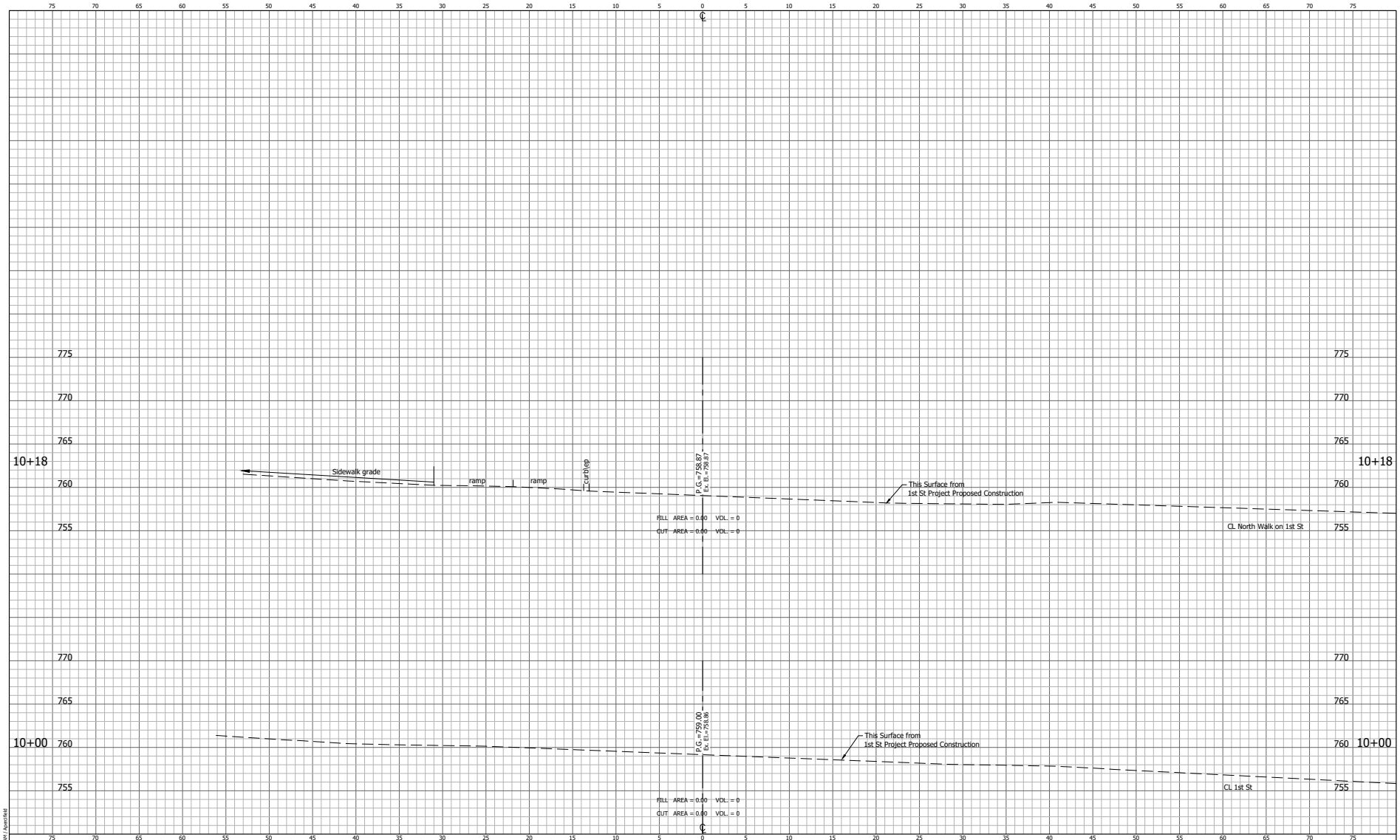
CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "U"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	34 of XS-12
CONTRACT	PROJECT
-	-



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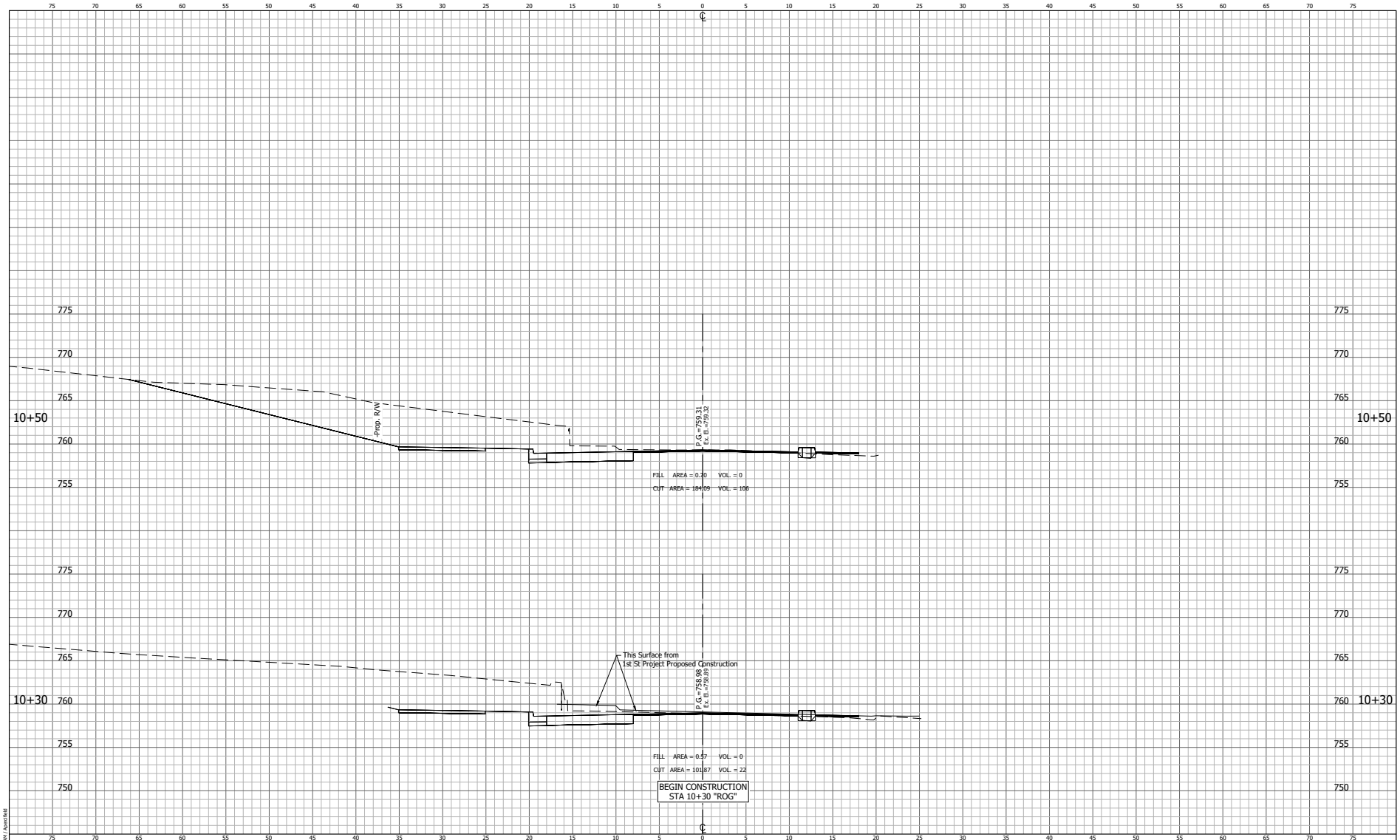
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "ROG"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	35 of XS-12
CONTRACT	PROJECT
-	-



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DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "ROG"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	36 of XS-12
CONTRACT	PROJECT
-	-

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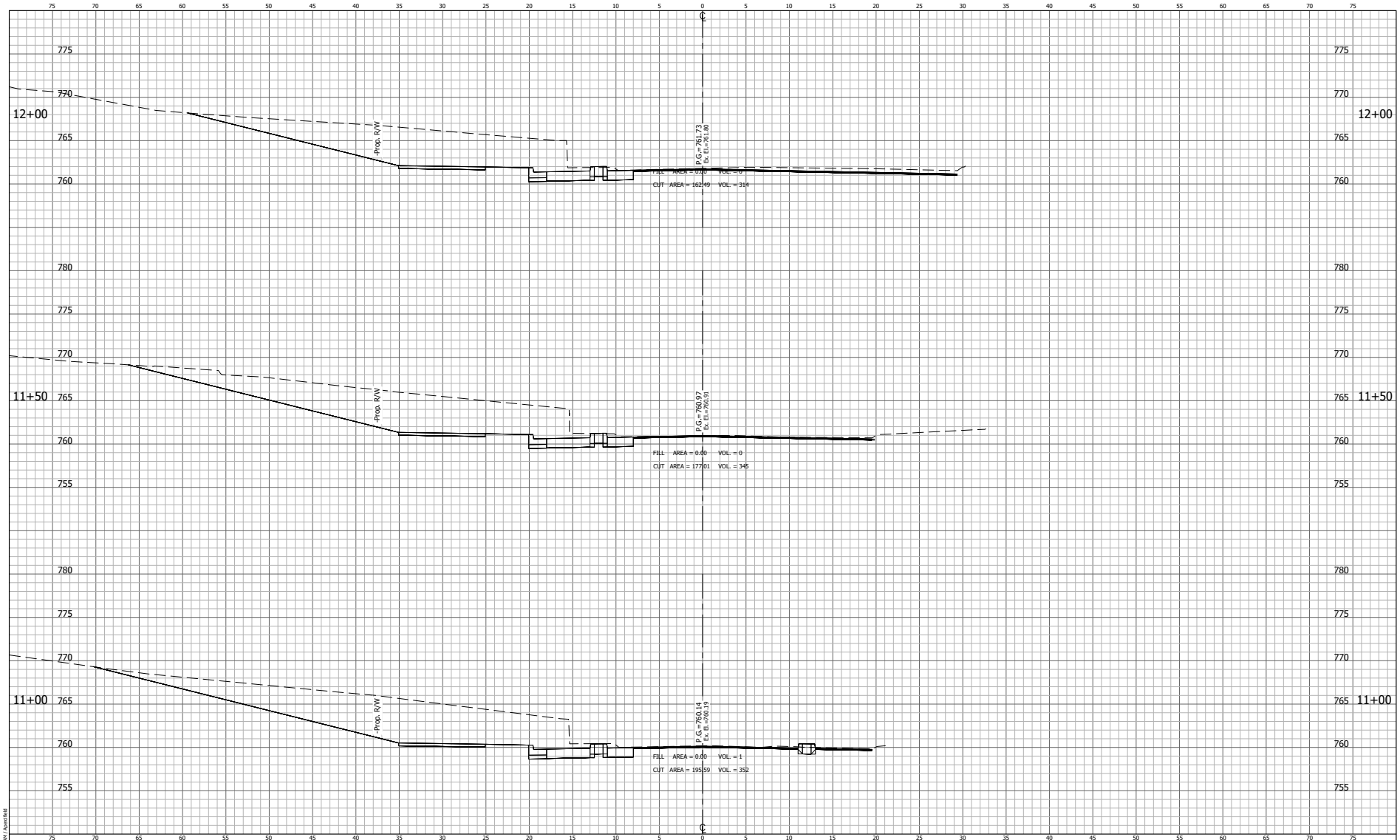

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DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "ROG"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	37 of XS-12
CONTRACT	PROJECT
-	-

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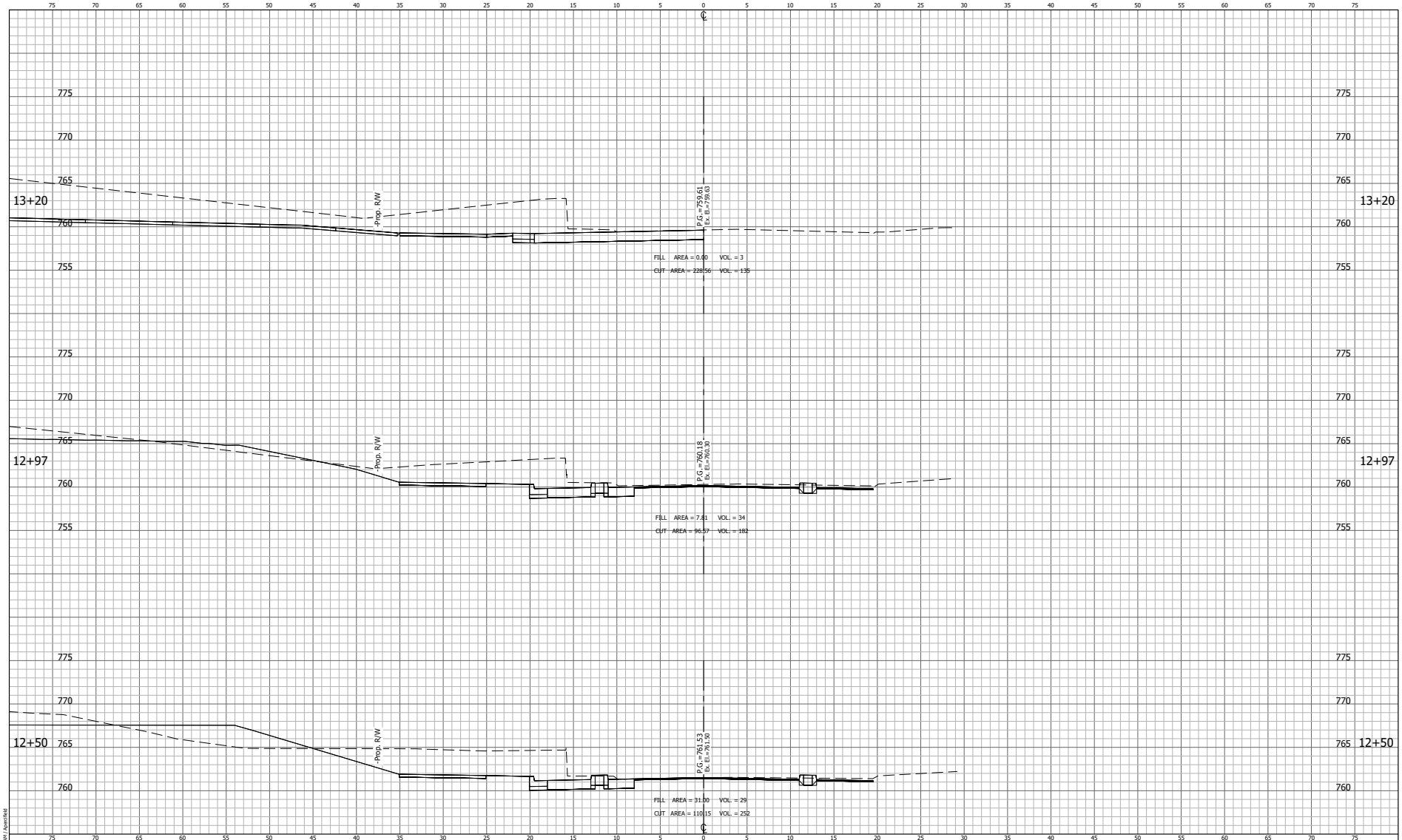

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CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "ROG"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	38 of XS-12
CONTRACT	PROJECT
-	-

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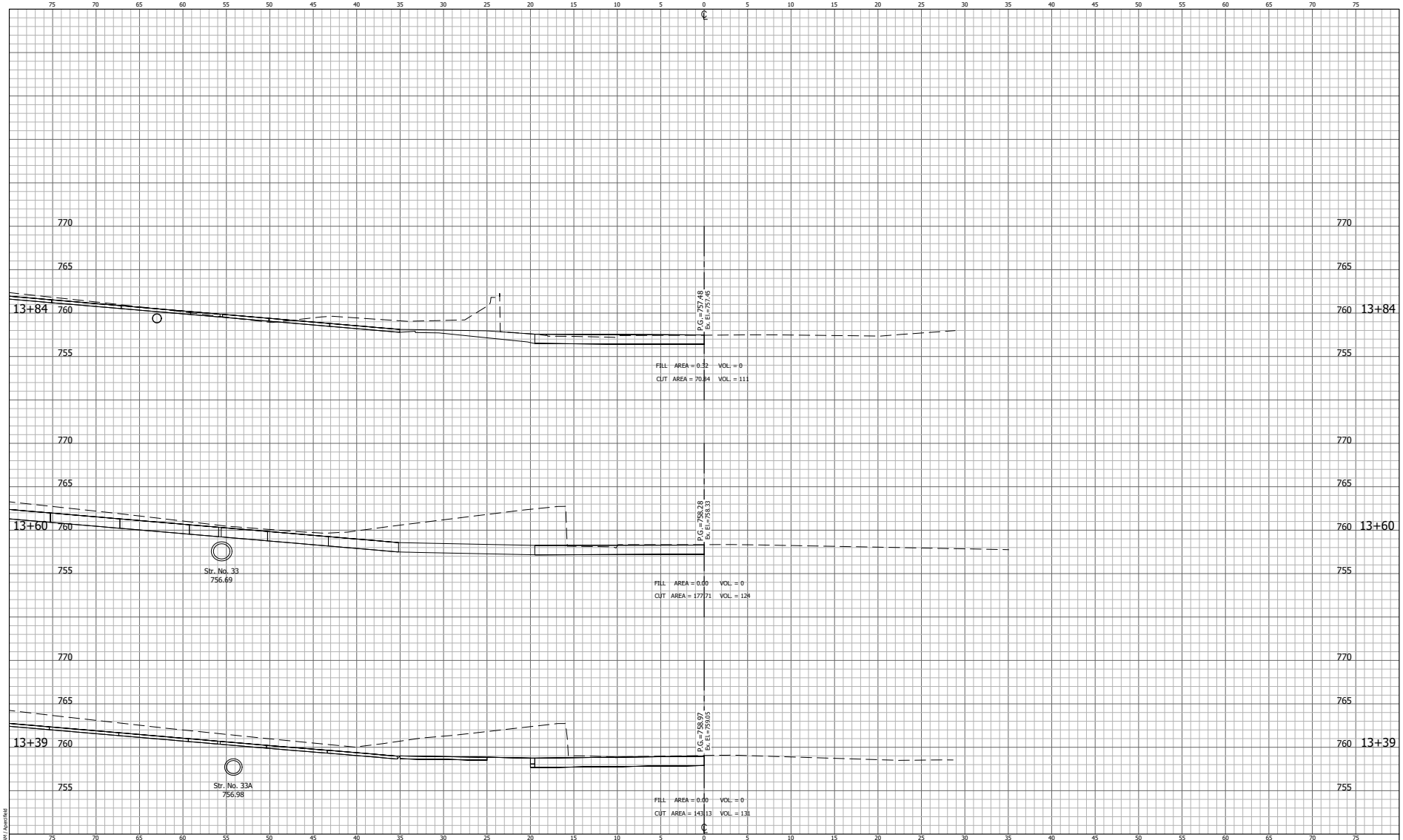

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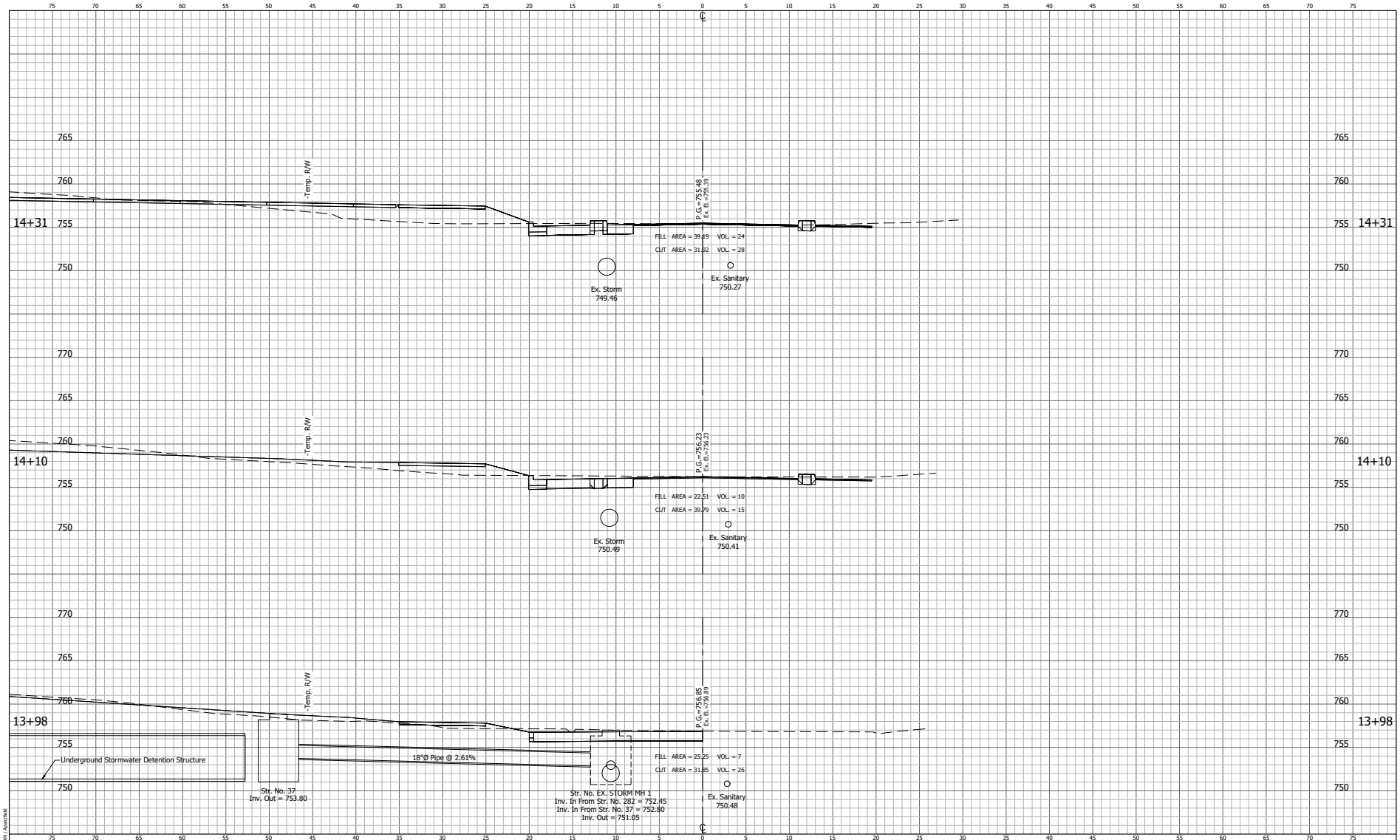
CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "ROG"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	39 of XS-12
CONTRACT	PROJECT
-	-



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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "ROG"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	40 of XS-12
CONTRACT	PROJECT
-	-

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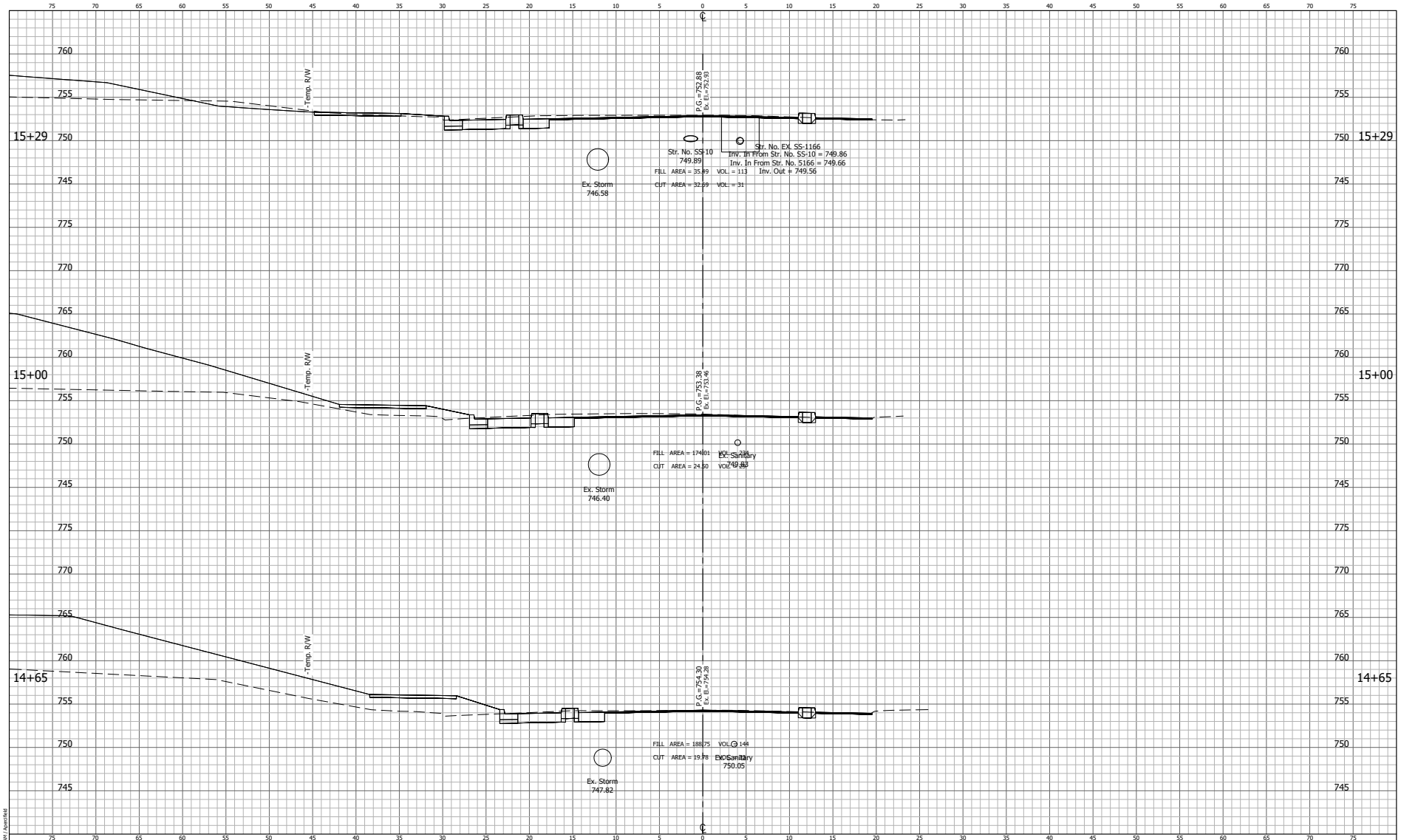

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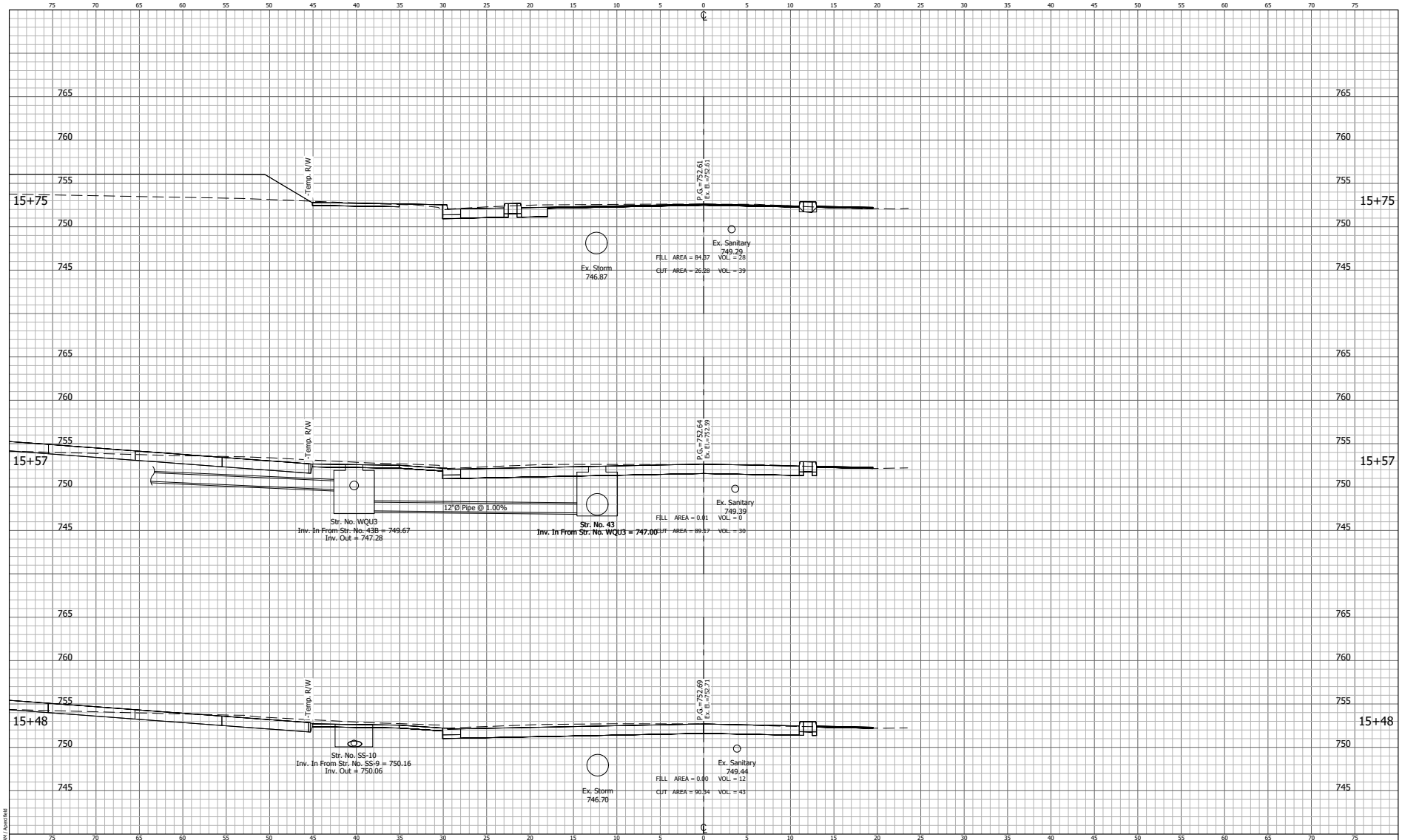
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "ROG"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	41 of XS-12
CONTRACT	PROJECT
-	-



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LOGIN NAME : AJW

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RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

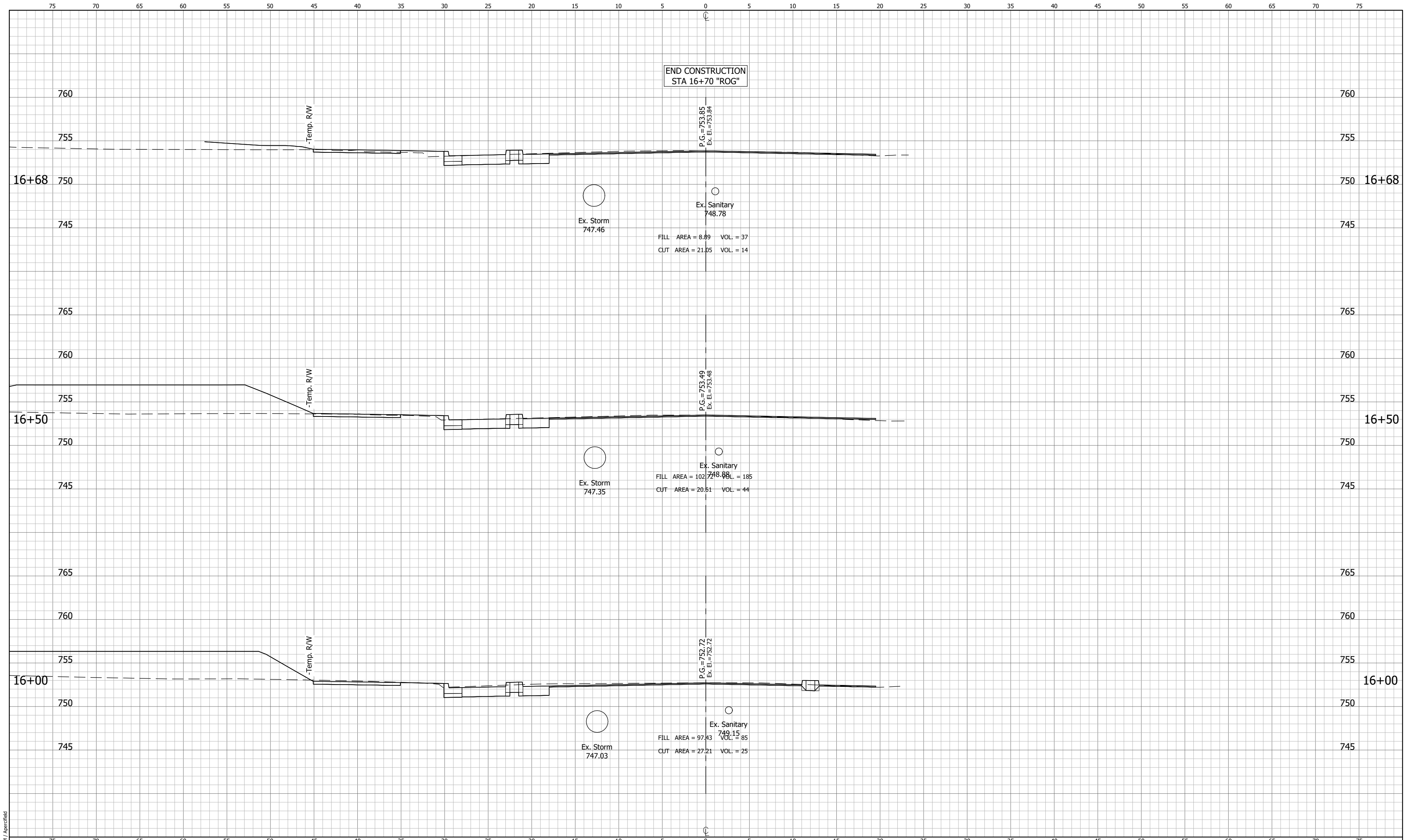
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "ROG"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	42 of XS-12
CONTRACT	PROJECT
-	-



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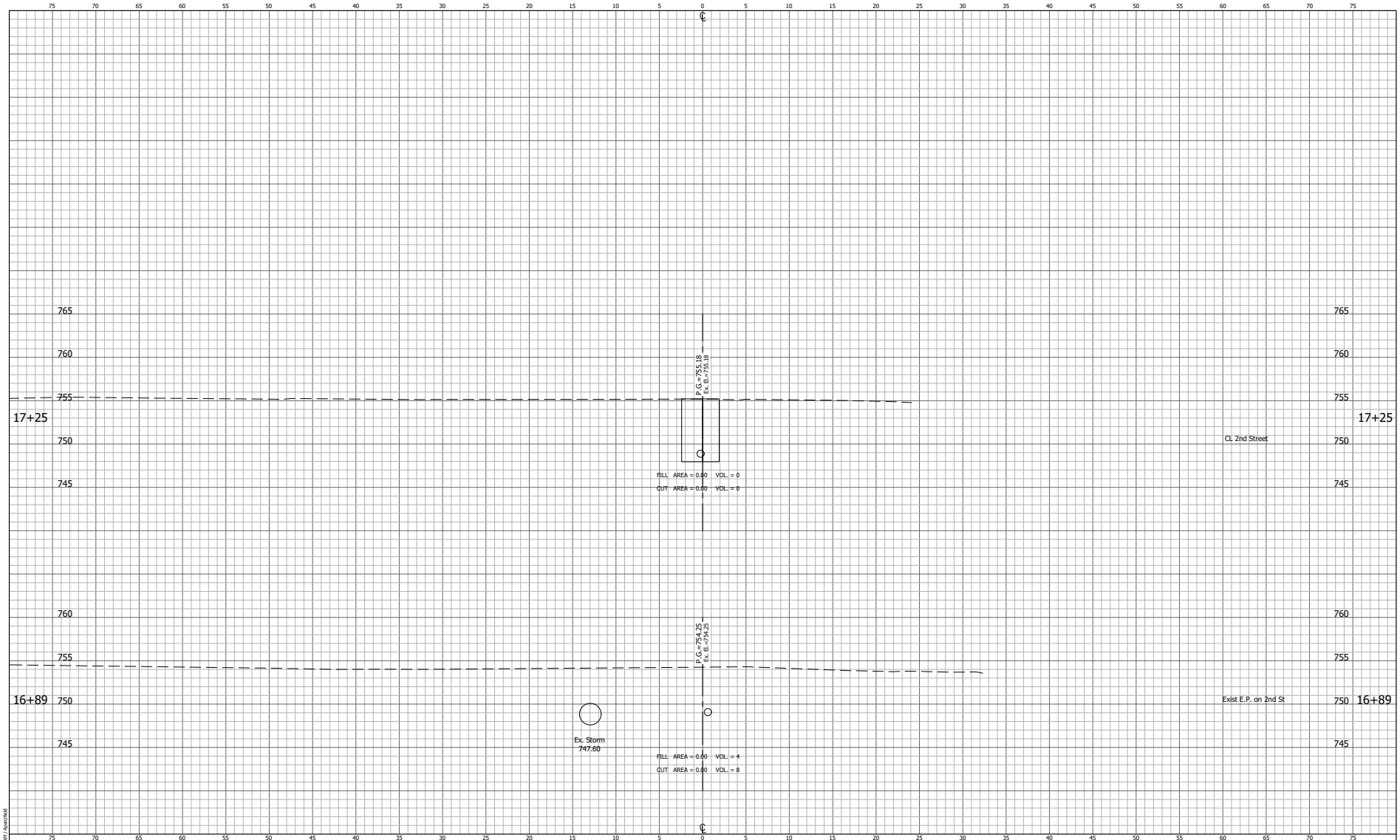
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "ROG"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	43 of XS-12
CONTRACT	PROJECT
-	-



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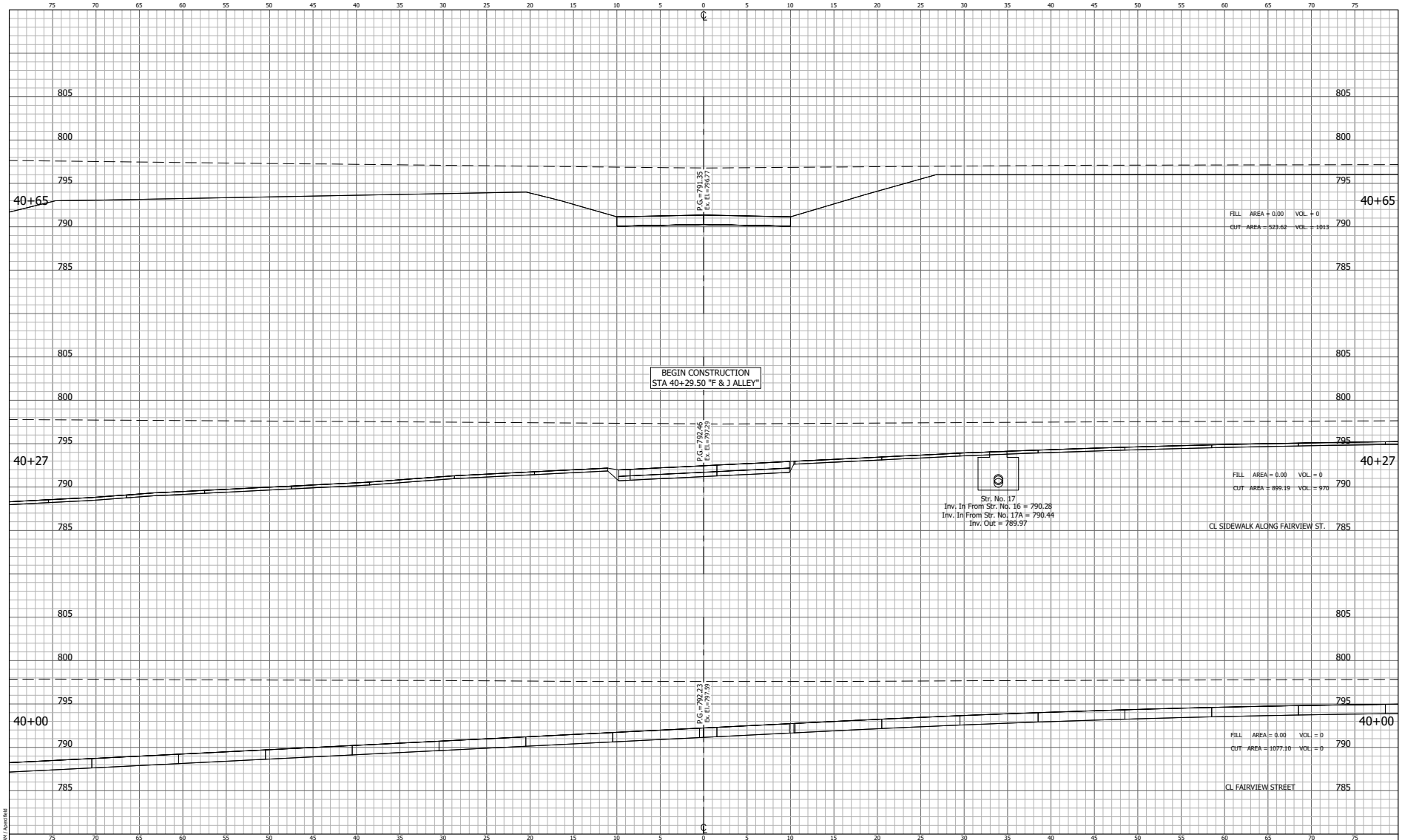
CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "ROG"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	44 of XS-12
CONTRACT	PROJECT
-	-



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DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F & J ALLEY"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	45 of XS-12
CONTRACT	PROJECT
-	-

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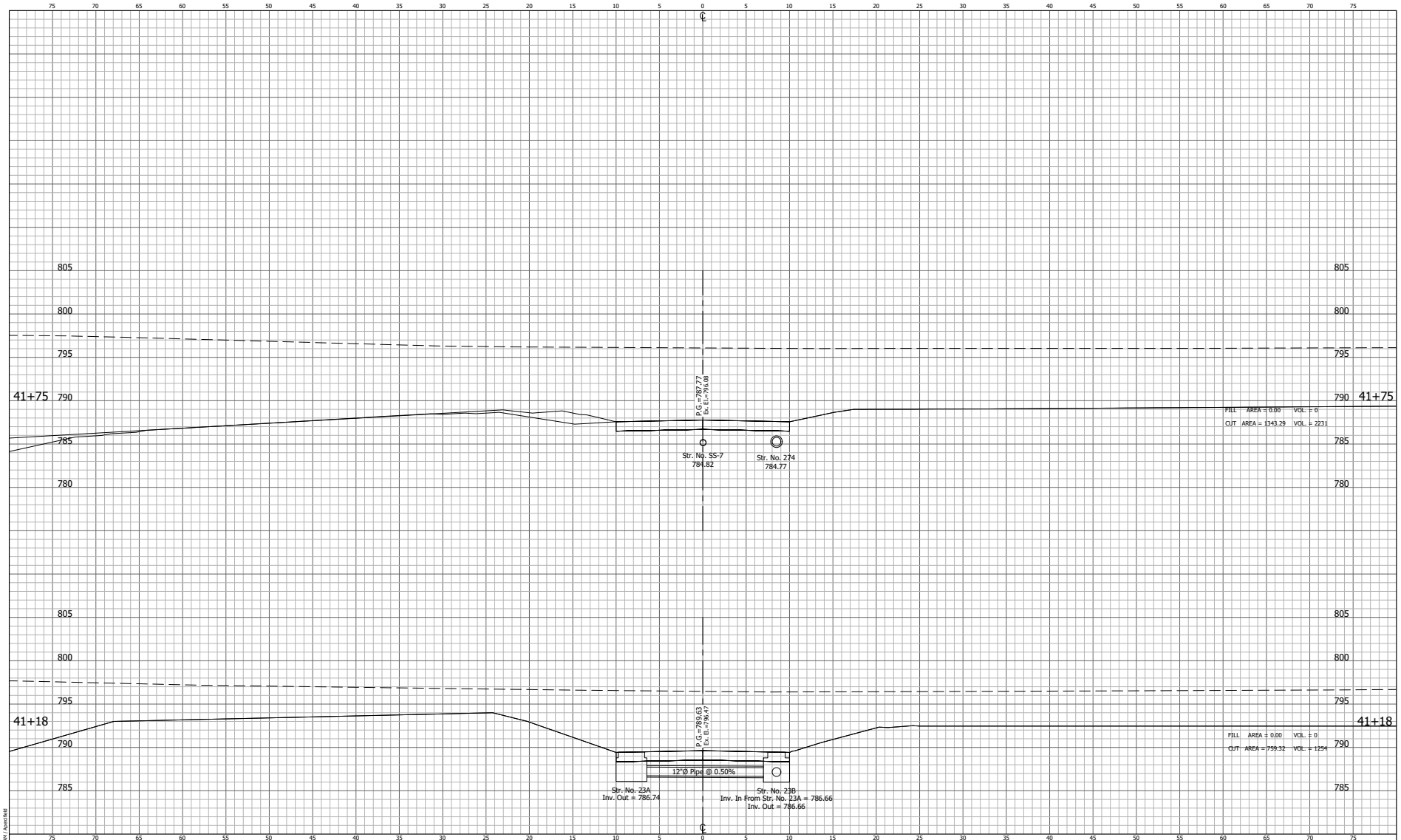

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DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F & J ALLEY"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	46 of XS-12
CONTRACT	PROJECT
-	-

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FILENAME : XSEC.dwg
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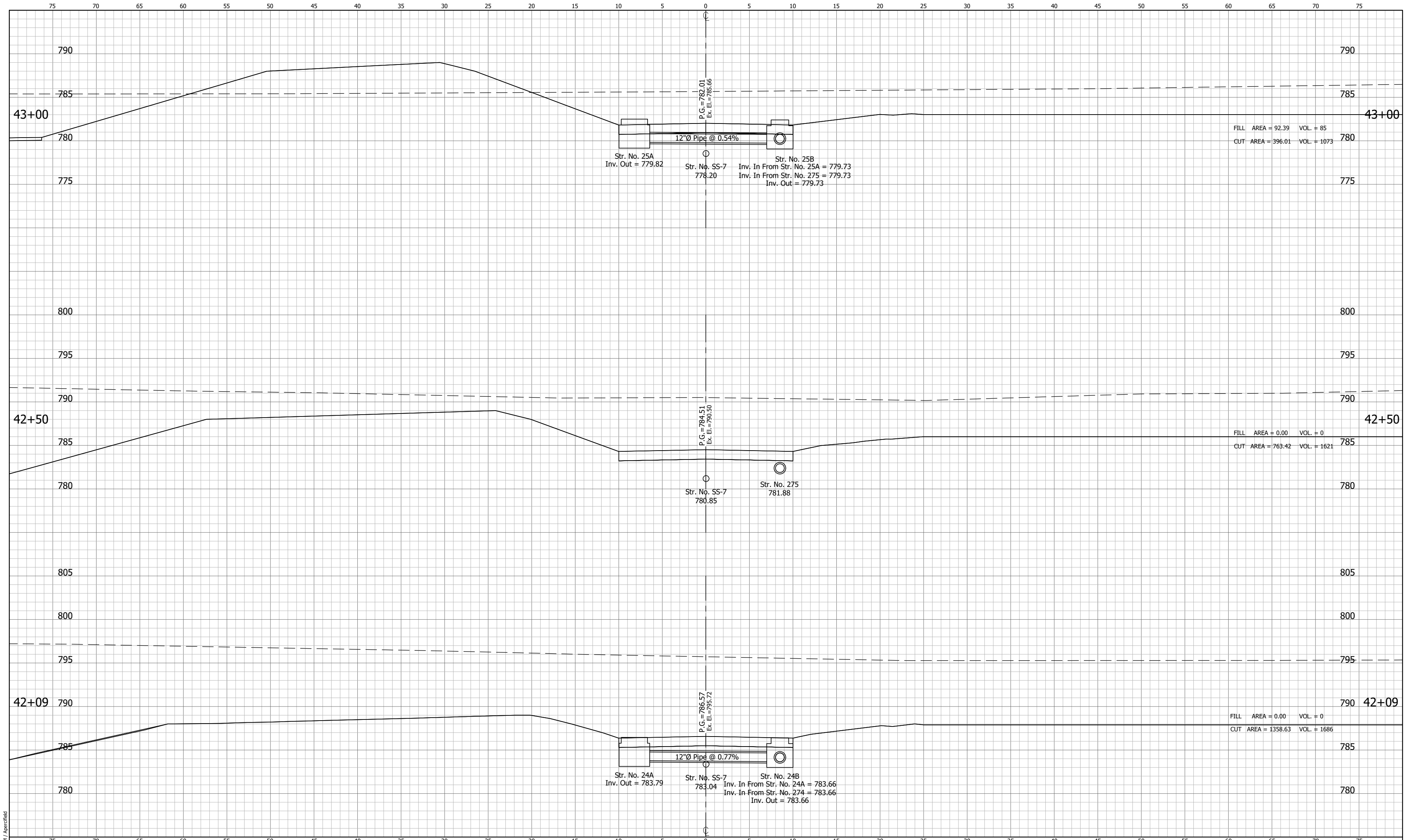
43+00
P.G.=782.01
Ex. El.=785.66
12"Ø Pipe @ 0.54%
Str. No. 25A
Inv. Out = 779.82
Str. No. SS-7
778.20
Str. No. 25B
Inv. In From Str. No. 25A = 779.73
Inv. In From Str. No. 275 = 779.73
Inv. Out = 779.73
FILL AREA = 92.39 VOL. = 85
CUT AREA = 396.01 VOL. = 1073
42+50
P.G.=784.51
Ex. El.=790.50
Str. No. SS-7
780.85
Str. No. 275
781.88
FILL AREA = 0.00 VOL. = 0
CUT AREA = 763.42 VOL. = 1621
42+09
P.G.=786.57
Ex. El.=795.72
12"Ø Pipe @ 0.77%
Str. No. 24A
Inv. Out = 783.79
Str. No. SS-7
783.04
Str. No. 24B
Inv. In From Str. No. 24A = 783.66
Inv. In From Str. No. 274 = 783.66
Inv. Out = 783.66
FILL AREA = 0.00 VOL. = 0
CUT AREA = 1358.63 VOL. = 1686

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FILENAME : XSEC.dwg
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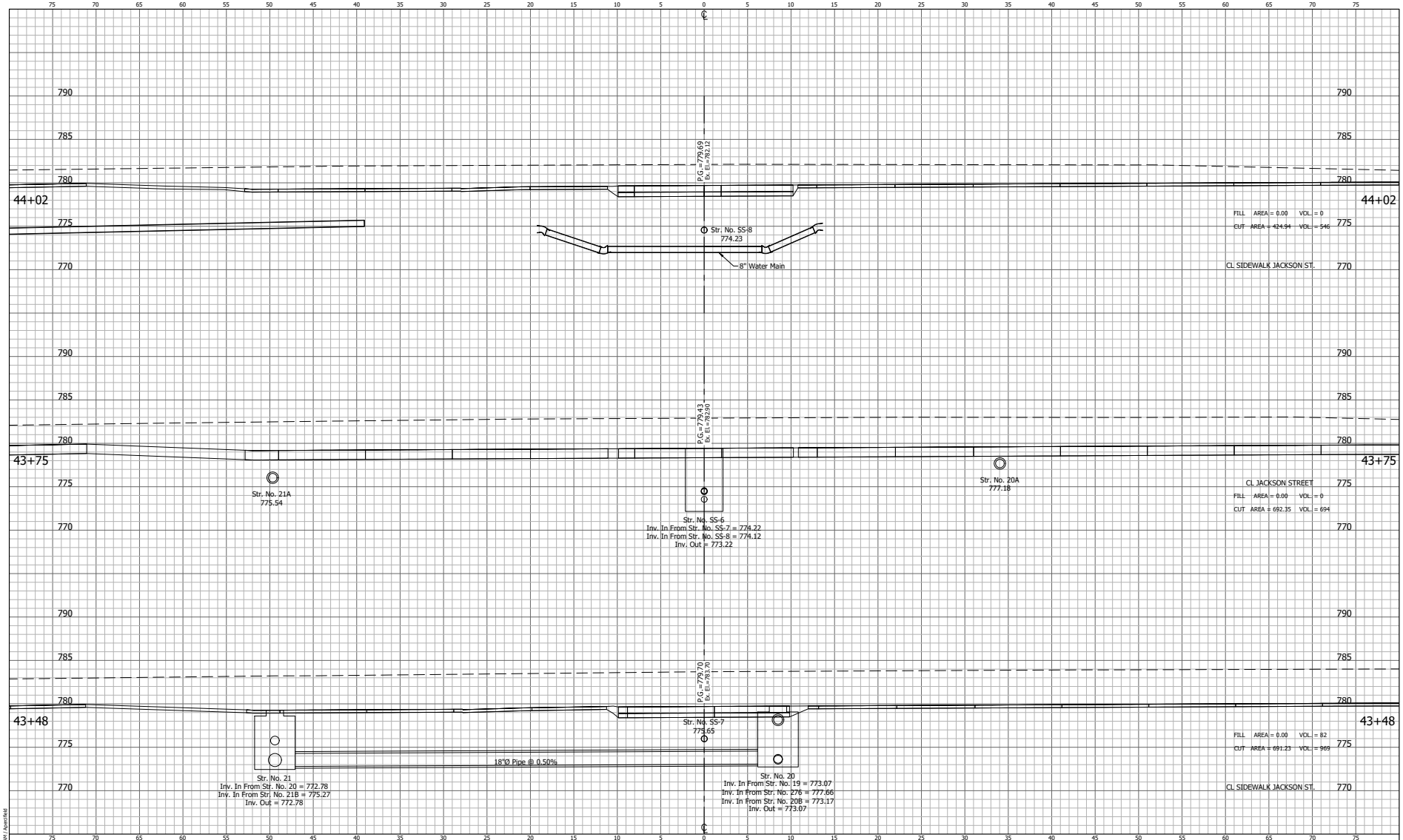
DESIGNED: AJW
DRAWN: DEP
CHECKED: TEN
CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F & J ALLEY"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	47 of XS-12
CONTRACT	PROJECT
-	-



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60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER _____ DATE

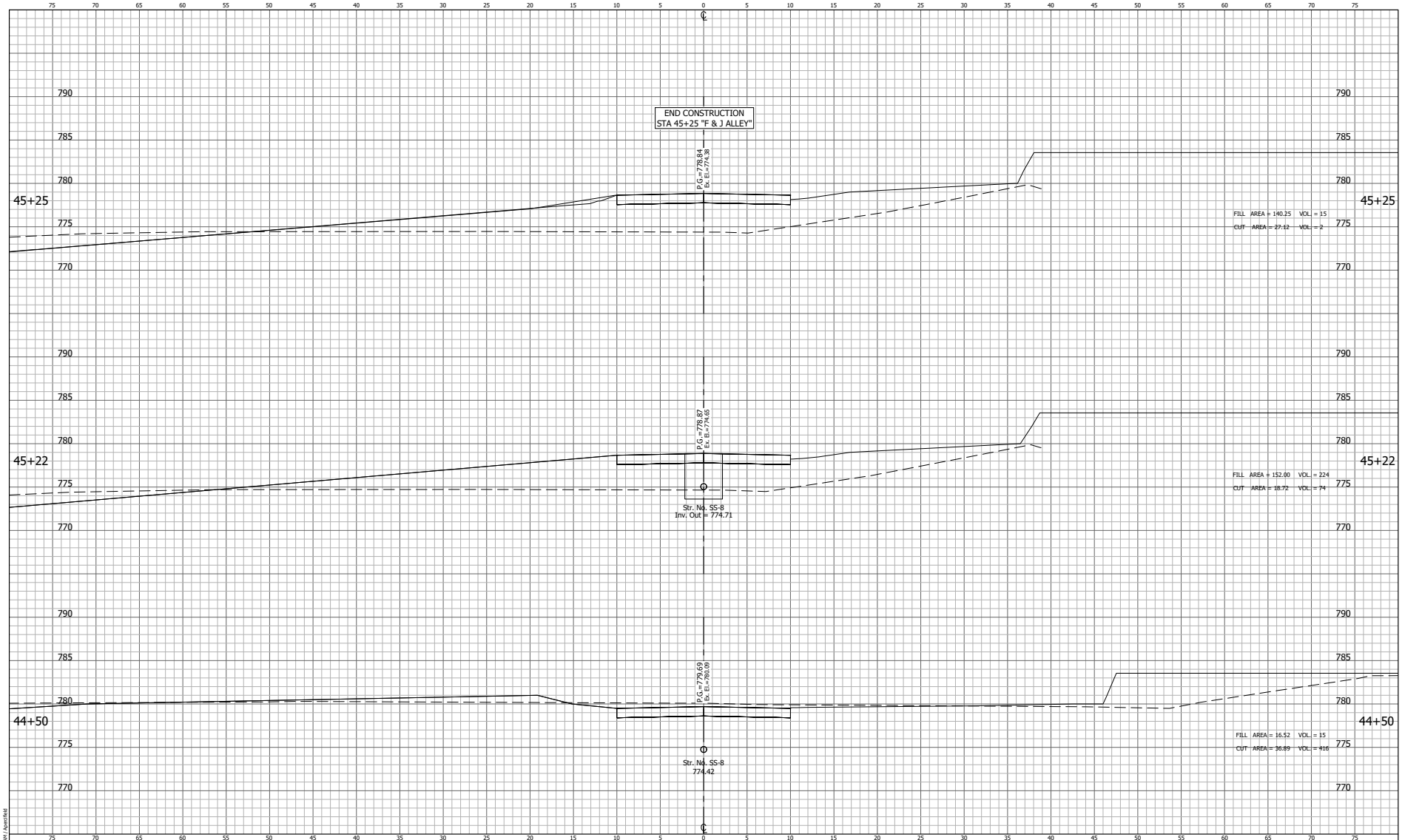
DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "F & J ALLEY"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	48 of XS-12
CONTRACT	PROJECT
-	-



60% PLANS

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CITY OF BLOOMINGTON
HOPEWELL WEST

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LINE "F & J ALLEY"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
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CONTRACT	PROJECT
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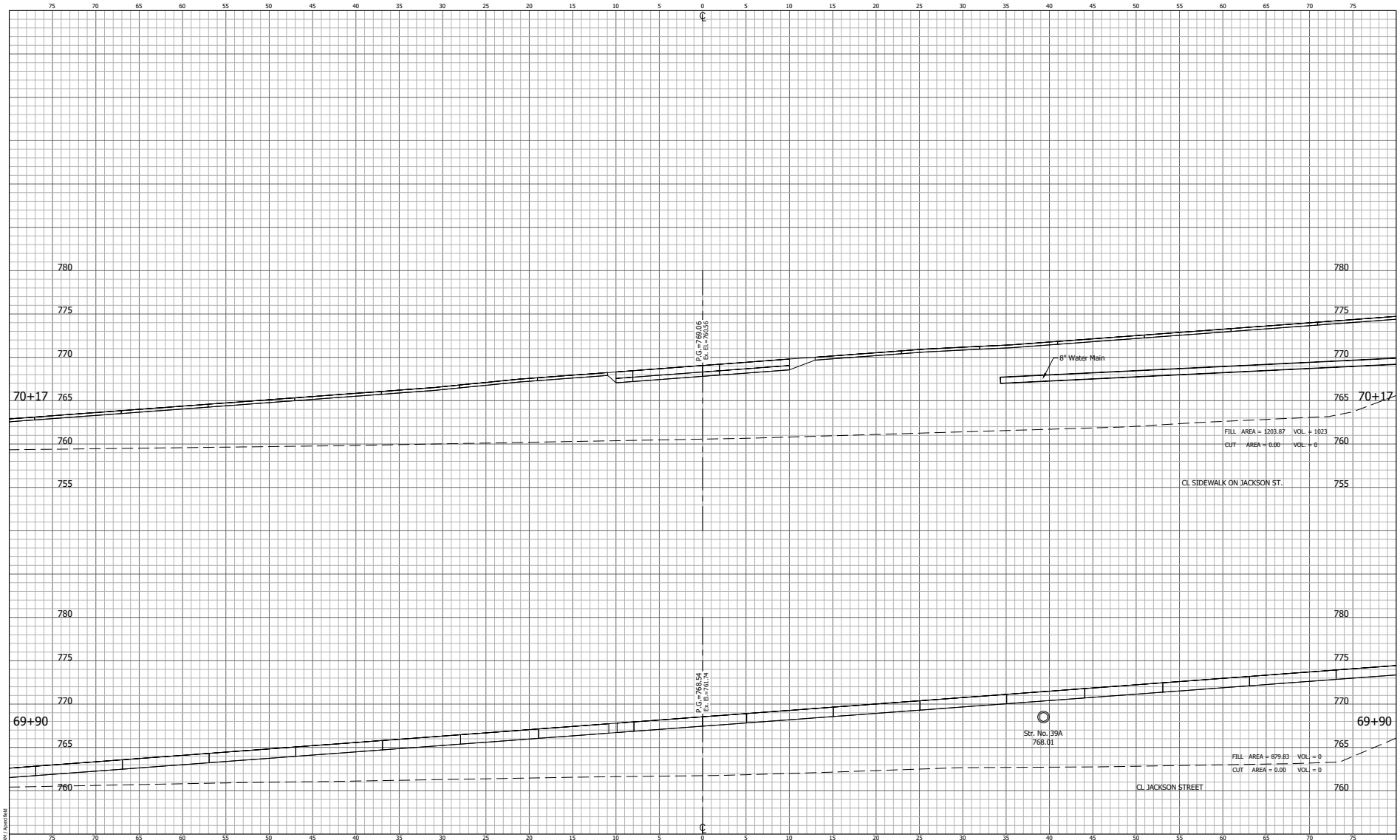

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60% PLANS

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J EAST ALLEY"

HORIZONTAL SCALE	BRIDGE FILE
1"=5'	
VERTICAL SCALE	DESIGNATION
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SURVEY BOOK	SHEETS
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CONTRACT	PROJECT
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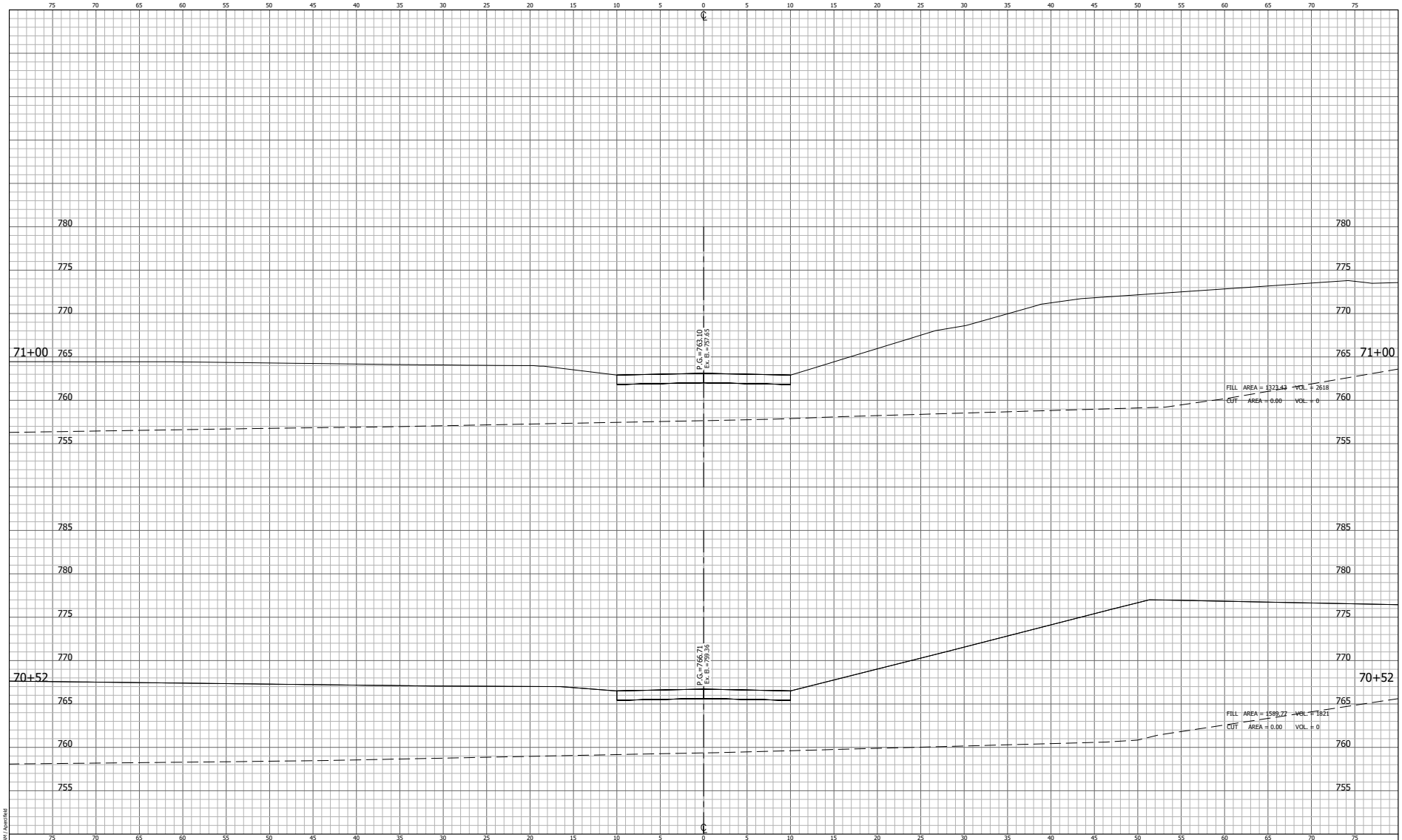

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CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J EAST ALLEY"

HORIZONTAL SCALE	BRIDGE FILE
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VERTICAL SCALE	DESIGNATION
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	55 of XS-12
CONTRACT	PROJECT
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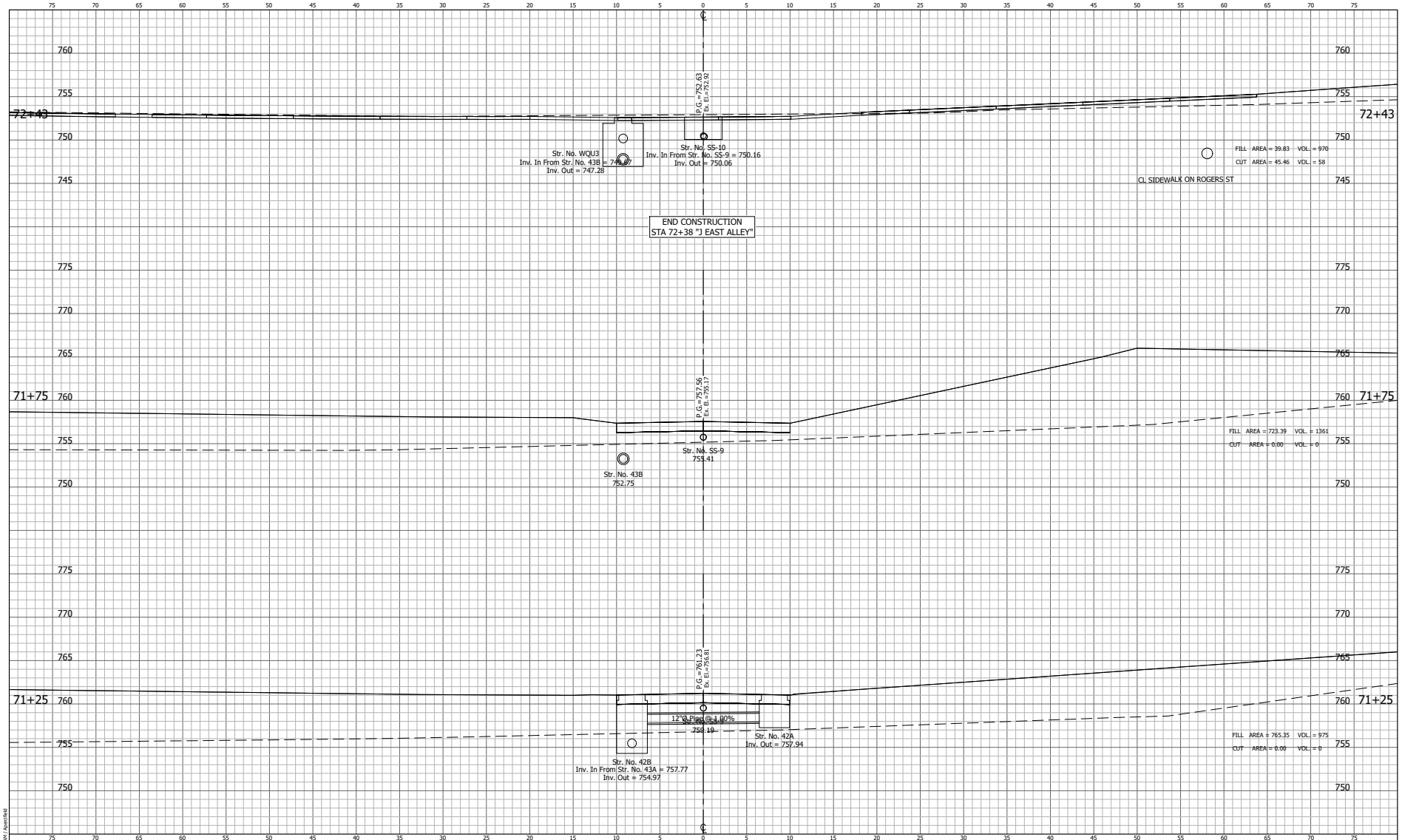

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CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J EAST ALLEY"

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VERTICAL SCALE	DESIGNATION
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CONTRACT	PROJECT
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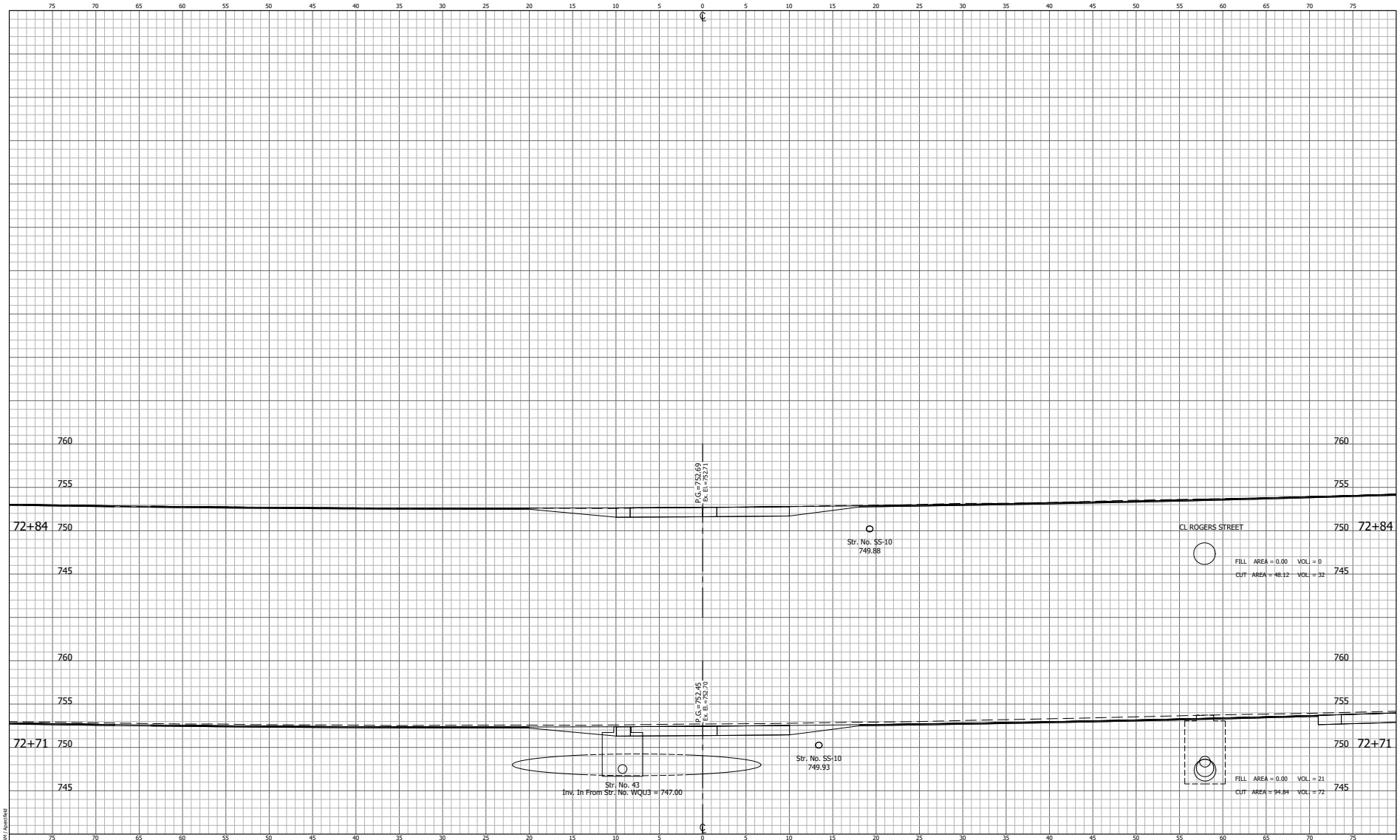

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DESIGNED: AJW DRAWN: DEP

CHECKED: TEN CHECKED: GJI

CITY OF BLOOMINGTON
HOPEWELL WEST

CROSS SECTIONS
LINE "J EAST ALLEY"

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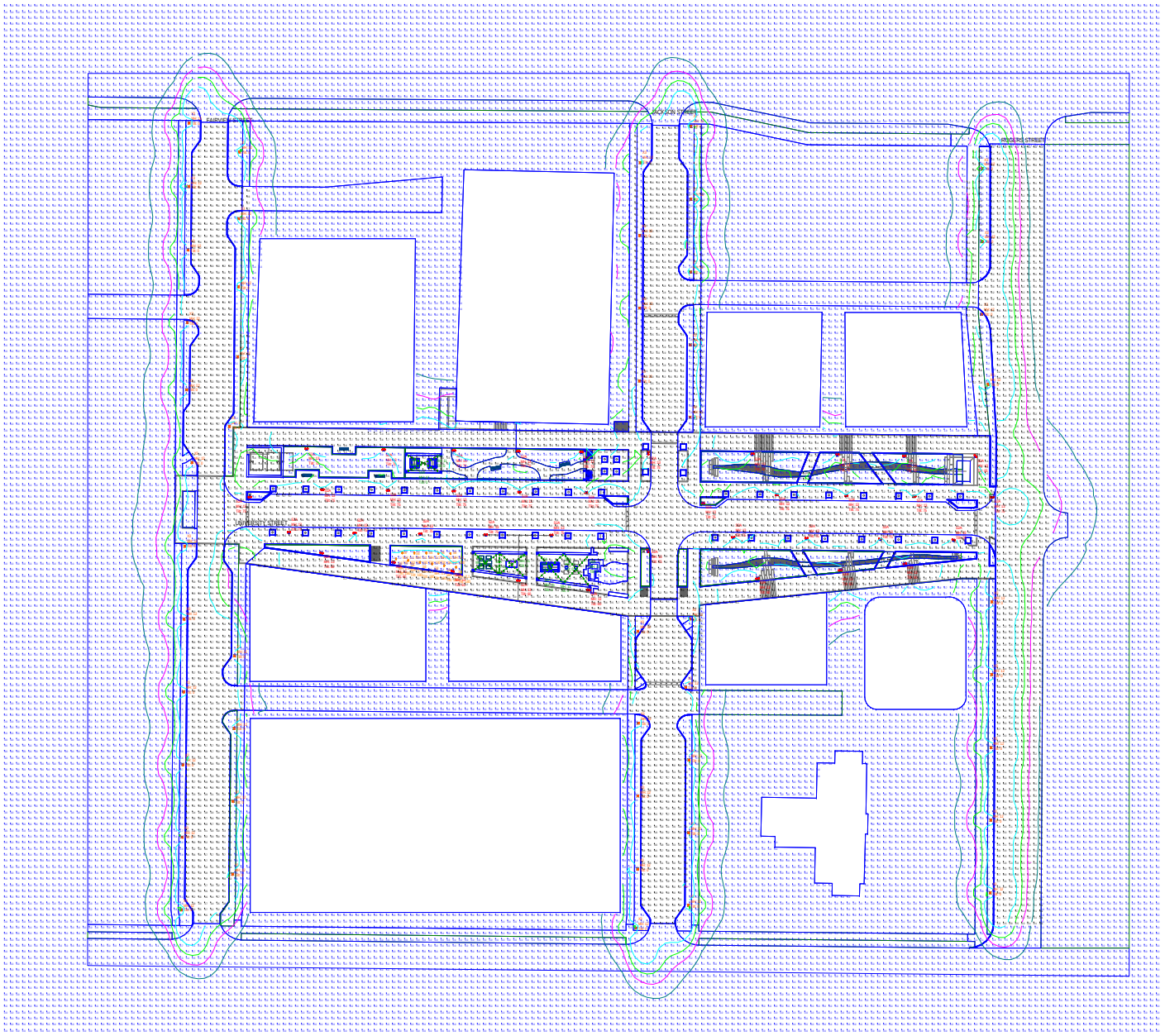
1"=5'	
VERTICAL SCALE	DESIGNATION
1"=5'	-
SURVEY BOOK	SHEETS
	57 of XS-12
CONTRACT	PROJECT
-	-

PROJECT NAME: BLOOMINGTON HOPEWELL SITE

PROJECT NUMBER: 20240024-SP

DATE: 5-24-24

PHOTOMETRIC PLAN DESIGNED BY ESL-SPECTRUM
WWW.ESL-SPECTRUM.COM
PHONE: 317.951.2300



SITE LIGHTING - PLAN VIEW
Scale: 1 inch= 30 Ft.

PHOTOMETRIC PLAN DESIGNED BY ESL-SPECTRUM
WWW.ESL-SPECTRUM.COM
PHONE: 317.951.2300

Luminaire Schedule
Project: 20240024-SP BLOOMINGTON HOPEWELL - SITE LIGHTING R2 5-24-24

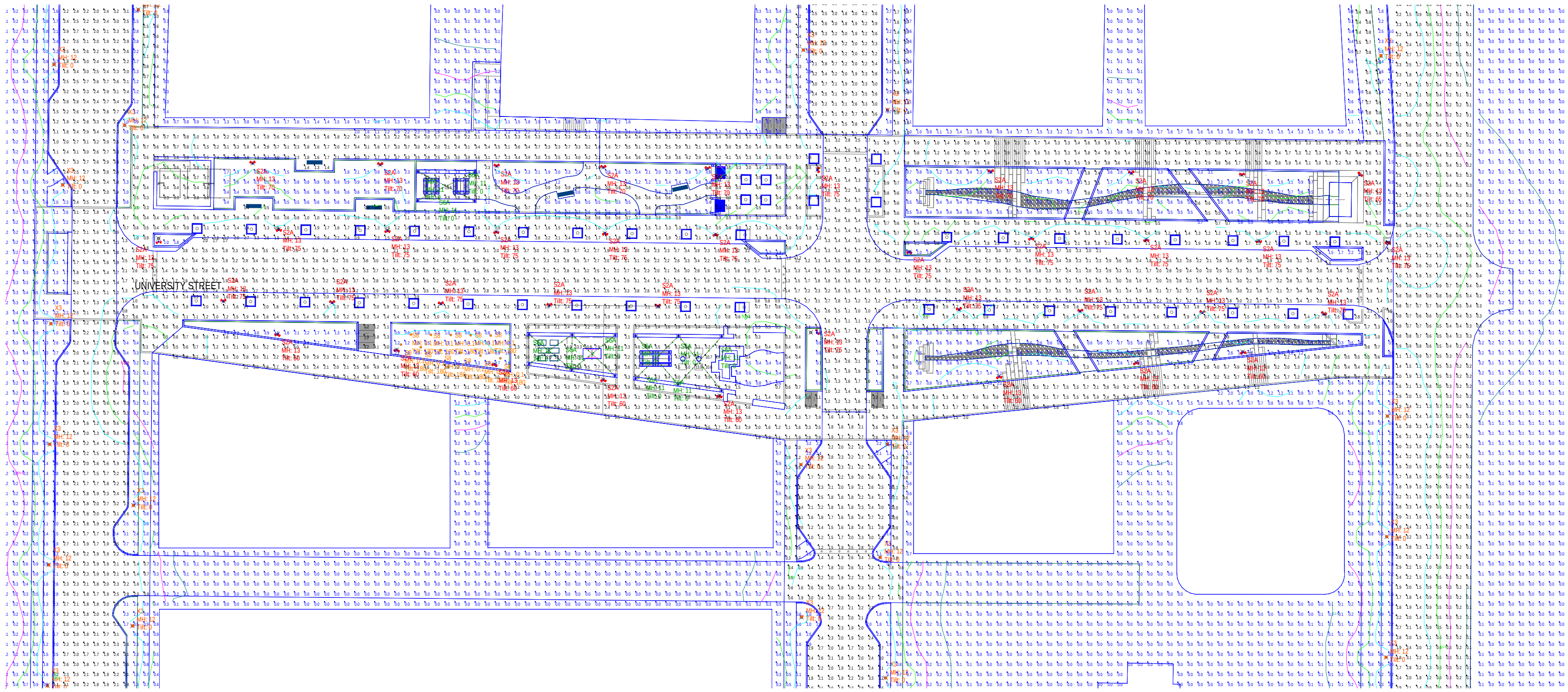
Symbol	Qty	Label	Arrangement	Lum. Watts	Lum. Lumens	LLF	Manufacturer	Description
	39	S2A	2 @ 130 DEGREES	30	3496	0.850	LANDSCAPE	ARoP1BB2WF - 14' POLE
	102	S6A	Single	2.83	309	0.850	TEGAN	EXS-X-C-P2-xx
	11	S8	SINGLE	13.6	1010	0.850	KIM LIGHTING	LTVERF-NF-13-4K
	49	X3	Single	50.02	4623	0.850	DUKE	AVPL2 P103 XXXX 30K R3 RNA

CALCULATIONS ARE MAINTAINED HORIZONTAL ILLUMINANCE FIGURES IN FOOT-CANDLES
POINTS SHOWN ARE AT GRADE
FIXTURE MOUNTING HEIGHTS ARE SPECIFIED NEXT TO FIXTURES AS "MH"
S6A FIXTURES ARE SPACED 3'-0" ON CENTER

Calculation Summary
Project: 20240024-SP BLOOMINGTON HOPEWELL - SITE LIGHTING R2 5-24-24

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
EAST SIDEWALKS 1_Grade	Illuminance	Fc	1.28	4.4	0.2	6.40	22.00
EAST SIDEWALKS 2_Grade	Illuminance	Fc	1.71	5.7	0.4	4.28	14.25
FAIRVIEW STREET_Grade	Illuminance	Fc	2.11	3.8	0.2	10.55	19.00
JACKSON ST NORTH_Grade	Illuminance	Fc	2.20	3.6	0.1	22.00	36.00
JACKSON ST SOUTH_Grade	Illuminance	Fc	2.15	3.5	0.2	10.75	17.50
PERIMETER_Grade	Illuminance	Fc	0.17	5.4	0.0	N.A.	N.A.
ROGERS STREET_Grade	Illuminance	Fc	0.90	3.2	0.0	N.A.	N.A.
UNIVERSITY STREET_Grade	Illuminance	Fc	2.34	4.2	0.8	2.93	5.25
WEST SIDEWALKS 1_Grade	Illuminance	Fc	1.52	15.6	0.2	7.60	78.00
WEST SIDEWALKS 2_Grade	Illuminance	Fc	2.75	15.5	0.3	9.17	51.67

ESL/SPECTRUM
LIGHTING / FIXTURES / DESIGN



SITE LIGHTING - ENLARGED PLAN VIEW
Scale: 1 inch= 20 Ft.

PHOTOMETRIC PLAN DESIGNED BY ESL-SPECTRUM
WWW.ESL-SPECTRUM.COM
PHONE: 317.951.2300

Luminaire Schedule
Project: 20240024-SP BLOOMINGTON HOPEWELL - SITE LIGHTING R2 5-24-24

Symbol	Qty	Label	Arrangement	Lum. Watts	Lum. Lumens	LLF	Manufacturer	Description
	39	S2A	2 @ 130 DEGREES	30	3496	0.850	LANDSCAPE	ARxP18B2WF - 14' POLE
	102	S6A	Single	2.83	309	0.850	TEGAN	EX5-K-C-FG-xx
	11	S8	SINGLE	13.6	1010	0.850	KIM LIGHTING	LTV83FF-NF-12L4K
	49	X3	Single	50.02	4623	0.850	DUKE	AVPL2 P103 XXXX 30K R3 RNA

CALCULATIONS ARE MAINTAINED HORIZONTAL ILLUMINANCE FIGURES IN FOOT-CANDLES
POINTS SHOWN ARE AT GRADE
FIXTURE MOUNTING HEIGHTS ARE SPECIFIED NEXT TO FIXTURES AS "MH"
S6A FIXTURES ARE SPACED 3'-0" ON CENTER

Calculation Summary
Project: 20240024-SP BLOOMINGTON HOPEWELL - SITE LIGHTING R2 5-24-24

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
EAST SIDEWALKS 1_Grade	Illuminance	Fc	1.28	4.4	0.2	6.40	22.00
EAST SIDEWALKS 2_Grade	Illuminance	Fc	1.71	5.7	0.4	4.28	14.25
FAIRVIEW STREET_Grade	Illuminance	Fc	2.11	3.8	0.2	10.55	19.00
JACKSON ST NORTH_Grade	Illuminance	Fc	2.20	3.6	0.1	22.00	36.00
JACKSON ST SOUTH_Grade	Illuminance	Fc	2.15	3.5	0.2	10.75	17.50
PERIMETER_Grade	Illuminance	Fc	0.17	5.4	0.0	N.A.	N.A.
ROGERS STREET_Grade	Illuminance	Fc	0.90	3.2	0.0	N.A.	N.A.
UNIVERSITY STREET_Grade	Illuminance	Fc	2.34	4.2	0.8	2.93	5.25
WEST SIDEWALKS 1_Grade	Illuminance	Fc	1.52	15.6	0.2	7.60	78.00
WEST SIDEWALKS 2_Grade	Illuminance	Fc	2.75	15.5	0.3	9.17	51.67

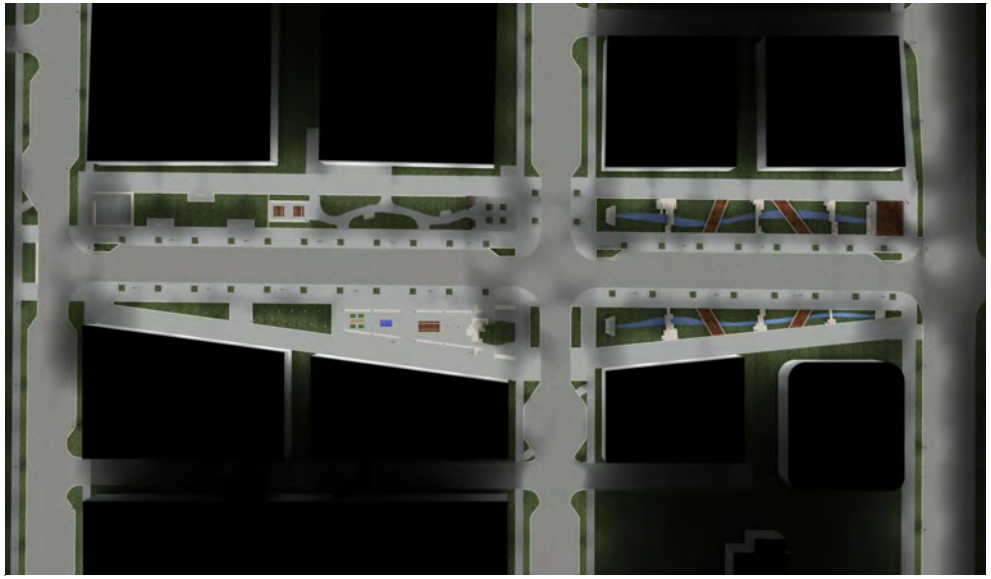
ESL-Spectrum's services are for estimation purposes only, and are not warranties.
Final design and illumination levels must be determined and specified by an electrical engineer.
Field results may differ from computer predictions because of many uncontrollable factors and adverse test conditions such as:
line voltage variations, lamp performance, product manufacturing tolerances, jobsite conditions, and other unrecoverable light-loss factors.

THE FIXTURE TYPE(S) AND LAMPING(S) SPECIFIED ON THIS LAYOUT MUST BE USED IN ORDER TO MEET THE EXACT CRITERIA AND PERFORMANCE DATA SHOWN.
IES RECOMMENDED ILLUMINANCE TARGETS USED WHERE APPLICABLE.

ESL SPECTRUM

RENDER IMAGE 1: NTS

RENDER IMAGE 2: NTS



RENDER IMAGE 3: NTS

RENDER IMAGE 4: NTS

DRAINAGE REPORT

HOPEWELL WEST SITE
CITY OF BLOOMINGTON, IN

FOR SECONDARY PLAT SUBMITTAL – APRIL 19, 2024

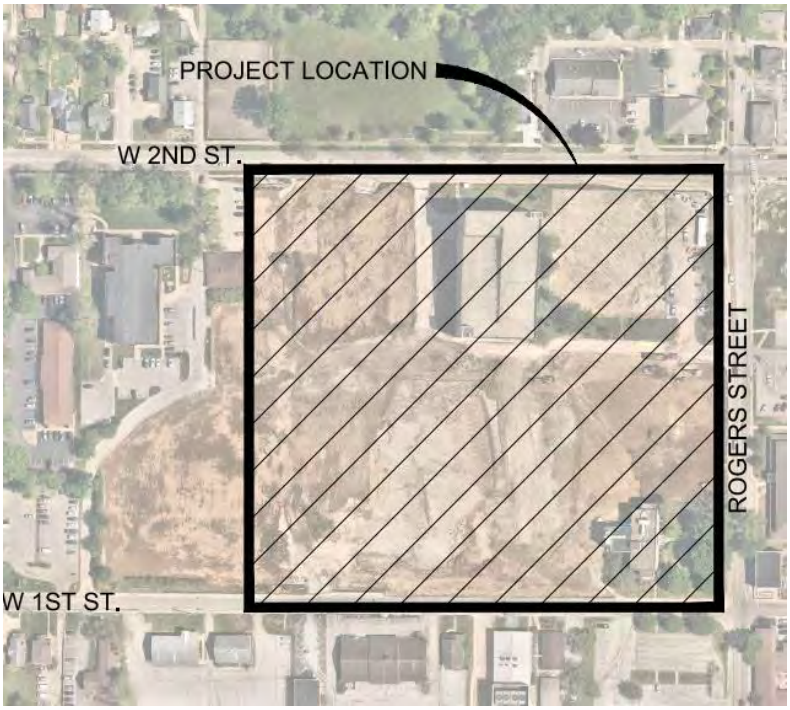
APPENDIX

HYDROLOGIC AND HYDRAULIC REPORT

INTRODUCTION

The City of Bloomington is planning to redevelop approximately 10 acres of the old IU Bloomington Hospital site into mixed-use areas and residential lots. Bloomington plans to reestablish the old "block" street grid system as part of this redevelopment and a new "greenway" street running east-west with landscape, streetscape, and multi-modal infrastructure features.

The site is bordered on the north by West 2nd Street, the east by South Rogers Street, and the south by West 1st Street. To the west, there are existing parcels owned by other entities that are remaining at this time.



FLOODZONE DESIGNATION

Based upon a scaled interpretation of the Flood Insurance Map No. 18105C0141D (Appendix pages A-1 through A-9) for Monroe County, Indiana, dated August 19, 2021, with data refreshed from October 2020, the subject tract is not located with Zone AE (Special Flood Hazard Area inundated by 100-year flood Base Flood Elevations determined) or Floodway Area Zone AE. The subject tract is located within Zone X (area of minimal risk between 1% and 0.2% annual chance floodplains. No base flood elevations or base flood depths are shown within the zone.

HYDROLOGIC ANALYSIS

The Rational Method is used as the basis of analysis for hydrologic design. Analysis for this project examined the 2-yr, 10-yr, and 100-year rainfall return period to determine the required pre-development and post-development runoffs for evaluation.

The existing storm sewer shall be demolished in preparation for development and public infrastructure. The existing site is well drained and over 75% is hilly with slopes ranging from 6% to 12% with approximately 80% of the soil identified as clay and silt according to the Web Soil Survey.

All proposed storm sewer will tie into water quality and detention facilities as required. There are portions of the site, mostly along the northern half, that cannot topographically connect to the proposed detention facilities. The proposed system will outlet to existing storm networks along West 2nd Street to the north, and South Rogers Street to the east. These networks ultimately converge at South Rogers Street and continue east.

RAINFALL

The Intensity-Duration-Frequency (IDF) rainfall data used in the Rational Method analysis was taken from the City of Bloomington Utilities Department (CBU Standard Detail No. 16). The time of concentration for pre-developed site was calculated using the TR-55 methodology by adding the travel times for sheet flow, shallow concentrated flow, and channel flow. A minimum Time of Concentration of 5 minutes was used.

DETENTION REQUIREMENTS

Detention for the site is required. According to City of Bloomington Utility Construction Specifications, Detention shall be in accordance with the standards set forth in the latest issue of the Monroe County Storm Water Design Ordinance. As such, we followed the Monroe County Ordinance Section 761 to determine detention requirements and allowable release rates.

PRE-DEVELOPMENT CONDITIONS

Since this is a redevelopment site, we determined the detention requirements and allowable release rates based on the planned land use as outlined in the Master Plan for this site. The following tables indicate the applicable runoff coefficients and the areas associated with those surface types for pre-developed conditions. Since we are using Rational Method, we are instructed to use 0.2 according to ordinance. CBU requested a forested condition as a modification to this standard. Per Table AG-2 of Monroe County Ordinance 761, a steep woodland site results in a Runoff Coefficient, C of 0.50.

Pre-Development Runoff Coefficient		
Surface Type	**Runoff Coefficient, C**	**Area, Ac.**
Steep (7%+) Woodland Condition 2-yr and 10-yr	0.50	10.83
Steep (7%+) Woodland Condition 100-yr	0.50 * 1.25 = 0.625	10.83

The existing drainage map and Time of Concentration path is shown in the Appendix (page A-14 & A-16 respectively). The resulting flows based on a 5-minute Time of Concentration are as follows:

Pre-Development Flows				
Return Period	**C**	**i**	**A**	**Flow Rate, cfs**
2-Yr	0.5	5.48	10.83	29.67
10-Yr	0.5	7.45	10.83	40.34
100-Yr	0.625	10.42	10.83	70.53

POST-DEVELOPMENT CONDITIONS

At this stage, ultimate development conditions have not been determined. As such, we are evaluating post-development conditions based on the ultimate plan as outlined in the Master Plan for the Hopewell West site. An exhibit of the site is shown below.

	Parcels		On-Parcel Greenspace	
	SF	AC	SF	AC
1	85,872	2.0	32,244	0.7
2	50,636	1.2	8,248	0.2
3	93,874	2.2	26,890	0.6
4	189,124	4.3	48,235	1.1
5	78,164	1.8	40,540	0.9
6	85,462	2.0	24,449	0.6
7	46,073	1.1	15,094	0.3
8	88,168	2.0	20,358	0.5
9	94,211	2.2	22,639	0.5
10	59,362	1.4	8,407	0.2
A	14,097	0.3	0.0	0.0
B	11,090	0.3	0.0	0.0
C	10,951	0.3	10,951	0.3
	907,083		258,056	
Total		21		6

As part of the master plan, greenspace areas, and parcel areas were determined. As previously mentioned, the total runoff area, to the ultimate convergence point, is 10.83 acres. The maximum allowable impervious coverage area in this zoning district is 85%. The proposed runoff calculations are based on this maximum allowable coverage to be conservative. The remainder of area will be assumed to fall within public R/W and will be treated as impervious. The site will be graded to soften the slopes, but will still be rolling (2-7% slope). A breakdown and calculation for weighted coefficient for the entire site is tabulated below.

Post-Development Runoff Coefficients		
Surface Type	**Runoff Coefficient, C**	**Area, Ac.**
Rolling (2-7%) Lawns 2-yr and 10-yr	0.21	10.83
Rolling (2-7%) Lawns 100-yr	0.21 * 1.25 = 0.2625	10.83
Asphalt 2-yr and 10-yr	0.82	10.83
Asphalt 100-yr	0.82 * 1.25 = 1.025	10.83

Post-Development Runoff Coefficient (2-YR and 10-YR)						
Area (sft)		**Pervious Area (sft)**	**Pervious Coeff.**	**Impervious Area (sft)**	**Impervious Coeff.**	**Weighted Coeff.**
4	189124	28368.6	0.21	160755.4	0.82	0.73
5	78164	11724.6	0.21	66439.4	0.82	0.73
6	85462	12819.3	0.21	72642.7	0.82	0.73
7	46073	6910.95	0.21	39162.05	0.82	0.73
C	10951	10951	0.21	0	0.82	0.21
ROW	61980	0	0.21	61980	0.82	0.82
Total	471754					**0.73**
Post-Development Runoff Coefficient (100-YR)						

Area (sft)		Pervious Area (sft)	Pervious Coeff.	Impervious Area (sft)	Impervious Coeff.	Weighted Coeff.
4	189124	28368.6	0.2625	160755.4	1.025	0.91
5	78164	11724.6	0.2625	66439.4	1.025	0.91
6	85462	12819.3	0.2625	72642.7	1.025	0.91
7	46073	6910.95	0.2625	39162.05	1.025	0.91
C	10951	10951	0.2625	0	1.025	0.26
ROW	61980	0	0.2625	61980	1.025	1.03
Total	471754					**0.91**

The proposed drainage map and Time of Concentration path is shown in the Appendix (page A-15 & A-17 respectively). The resulting flows based on a 7.07-minute Time of Concentration are as follows:

Post-Development Flows				
Return Period	**C**	**i**	**A**	**Flow Rate, cfs**
2-Yr	0.73	4.98	10.83	39.37
10-Yr	0.73	6.74	10.83	53.29
100-Yr	0.91	9.35	10.83	92.15

ALLOWABLE DISCHARGE RATE & REQUIRED VOLUMES

Our Detention Storage Calculations utilize the rational method to calculate the necessary storage volume for the various return periods. The analysis scenarios for the 2-yr, 10-yr, and 100-yr can be found in the appendix (pages A-18 through A-20) . Below is a summary of the peak results.

Required Storage Analysis	
Return Period	**Peak Storage, Acre-ft**
2-Yr	0.09
10-Yr	0.12
100-Yr	0.21

VOLUME CALCULATION

The maximum required storage volume in acre-ft comes from the 100-year analysis. A volume of 0.21 acre-ft is required. It is proposed to employ an ADS MC-7200 Chamber system to detain the required 0.21 acre-ft runoff. The layout is shown in the plans along with size and volume characteristics meeting the required detention volume.

PROPOSED OUTLET STRUCTURE

The proposed outlet control structure is designed to release the post-development storm water below or matching the pre-development flow rates that were previously calculated. The calculations for the outlet control structure are provided in the appendix (pages A-21 through A-28). Below is a summary of the outlet control structure flow rates and the required storage compared to the values previously calculated as well as the proposed orifice diameters and the proposed storage elevation for each return period.

Outlet Control Structure Analysis						
Return Period	Flow Rate (cfs)		Required Storage (Acre-ft)		Orifice Diameter (ft)	Storage Elevation
	Pre-Dev	Post-Dev	Pre-Dev	Post-Dev		
2-Yr	29.67	28.97	.09	.10	2.1	754.04
10-Yr	40.34	39.57	.12	.13	1.5	754.90
100-Yr	70.53	70.53	.21	.21	Weir	757.54

WATER QUALITY REQUIREMENTS

Water quality units have been provided at all outlet points. Water Quality units were designed by utilizing SCS Method Hydrographs for each of the outlet points. Below is a summary of the peak results and the proposed water quality units.

Required Water Quality Units Analysis			
Outlet Location	**Peak Flow (cfs)**	**Proposed Structure**	**Proposed Str. Peak Flow (cfs)**
S. Fairview & W. 2nd	1.94	AS-4	3.2
S. Jackson & W. 2nd	0.98	AS-2	1.1
S. Jackson & S. Rogers	0.32	AS-2	1.1
W University & S. Rogers	5.95	AS-6	6.3

WATER QUALITY UNIT SIZING

There are four outlet points as part of this project. The first is a small basin on South Fairview that directly outlets to West 2nd Street. An Aquaswirl AS-4 unit shall be used to treat runoff prior to connecting to the existing infrastructure along West 2nd Street. The second is a small basin on South Jackson Street that directly outlets to 2nd Street. An Aquaswirl AS-2 unit shall be used to treat runoff prior to connecting to the existing infrastructure along West 2nd Street. The third is a small basin on South Jackson Street that directly outlets to South Rogers Street. An Aquaswirl AS-2 unit shall be used to treat runoff prior to connecting to the existing infrastructure along West 2nd Street. The fourth and final outlet structure is at the intersection of West University Street and South Rogers Street. An Aquaswirl AS-6 unit shall be used to treat runoff prior to connecting to the existing infrastructure along South Rogers Street. Aquaswirl Sizing Chart provided in the Appendix (page A-29).

STORM SEWER

The proposed drainage will utilize curb inlets, roadside ditches, and new storm sewer to replicate the distribution of storm water in the existing condition. Linear trench drains will be utilized to collect runoff in areas where curbs aren't present and shared use spaces are prevalent.

The City of Bloomington Utility Standards and Design Guide, INDOT Design Manual (IDM 2013), and Monroe County Storm Water Standards and Ordinance were used to design the system. Applicable sections of the Manual are attached in the Appendx (pages A-10 through A-13) for reference and values used are highlighted. More specifics are discussed in the Hydrologic and Hydraulic Analysis sections of this report.

The proposed system was analyzed using the Rational Method. The weighted runoff coefficients were calculated using the Table AG-1 of Monroe County Ordinance 761. A coefficient for impervious areas (asphalt or concrete pavement) of 0.82 and a coefficient for pervious areas (Lawn, Clay,Rolling) of 0.21 were used for 10 year Storm analysis. A coefficient for impervious areas (asphalt or concrete pavement) of 1.03 and a coefficient for pervious areas (Lawn, Clay,Rolling) of 0.26 were used for 100 year Storm analysis. Drainage area tables summarizing drainage areas for each basin are provided in the Appendix (pages A-30 through A-32).

Where practical, a conservative approach was used, and the basins were evaluated using the 5-minute minimum time of concentration. The rainfall intensities and depths for various return periods and storm durations are provided by the City of Bloomington Utilities Department (CBU Standard Detail No. 16). Applicable Manning's n values used for sheet flow and channel flow calculations are located in the Appendix (page A-13). The proposed Time of Concentration Worksheets are presented in Appendix (pages A-33 and A-34).

PROPOSED SYSTEM HYDRAULIC ANALYSIS

The development's proposed structures were analyzed for a design frequency of 10% Annual (10-year storm) for gravity flow. Since this site is extremely sloped, there are no sags present and were not evaluated.

Inlets are spaced to meet the City of Bloomington's requirements for local roads by providing a minimum of one 8 ft lane for two-lane facilities. Per Table AG-4 of Monroe County Ordinance 761 a Manning's n of 0.013 was utilized for the concrete gutters proposed throughout the development. The inlet spacing and spread worksheet for the proposed structures is presented in the Appendix (page A-35).

The proposed system will utilize reinforced concrete pipe (RCP). A Manning's "n" for concrete pipe of 0.013 was used. The proposed system's pipe capacities are summarized in the Proposed Pipe Hydraulics table located in the Appendix (A-36). The pipe capacity table shows the Q10 Efficiency for the proposed system in Column 17.

SCOUR PROTECTION

A minimum full-flow velocity of 2.5 ft/s is desirable to prevent sedimentation from occurring in the pipes. The recommended maximum storm-sewer velocity is 10.0 ft/s. Per Indiana Design Manual Figure 203-2D (appendix page A-37), revetment riprap can be placed at the ends of the proposed pipes based on the outlet velocity being less than or equal to 6.5 ft/s. All outlet velocities at proposed pipes are less than 6.5 ft/s, so revetment riprap will be utilized.

PREPARER CONTACT INFORMATION

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CrossRoad Engineers, PC
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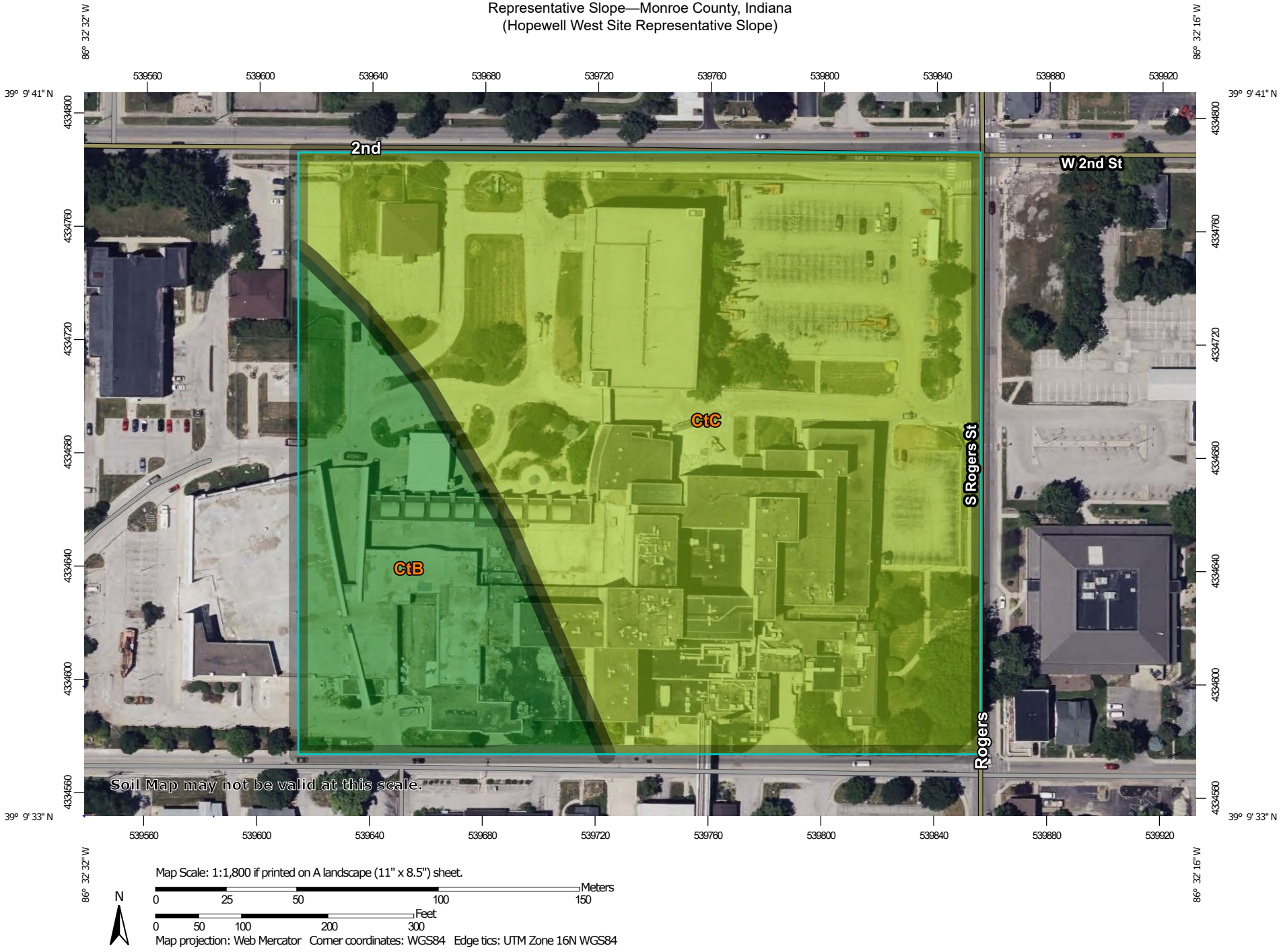
Beech Grove, IN 46107
(317) 780-1555 x124
awolf@crossroadengineers.com

APPENDIX

Representative Slope—Monroe County, Indiana
(Hopewell West Site Representative Slope)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- 0 - 5
- 5 - 15
- 15 - 45
- 45 - 60
- 60 - 100
- Not rated or not available

Soil Rating Lines
- 0 - 5
- 5 - 15
- 15 - 45
- 45 - 60
- 60 - 100
- Not rated or not available

Soil Rating Points
- 0 - 5
- 5 - 15
- 15 - 45
- 45 - 60
- 60 - 100
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monroe County, Indiana
Survey Area Data: Version 30, Sep 1, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 15, 2022—Jun 21, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Representative Slope

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
CtB	Crider-Urban land complex, 2 to 6 percent slopes	4.1	2.9	22.4%
CtC	Crider-Urban land complex, 6 to 12 percent slopes	9.0	9.9	77.6%
Totals for Area of Interest			**12.8**	**100.0%**

Description

Slope gradient is the difference in elevation between two points, expressed as a percentage of the distance between those points.

The slope gradient is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: percent

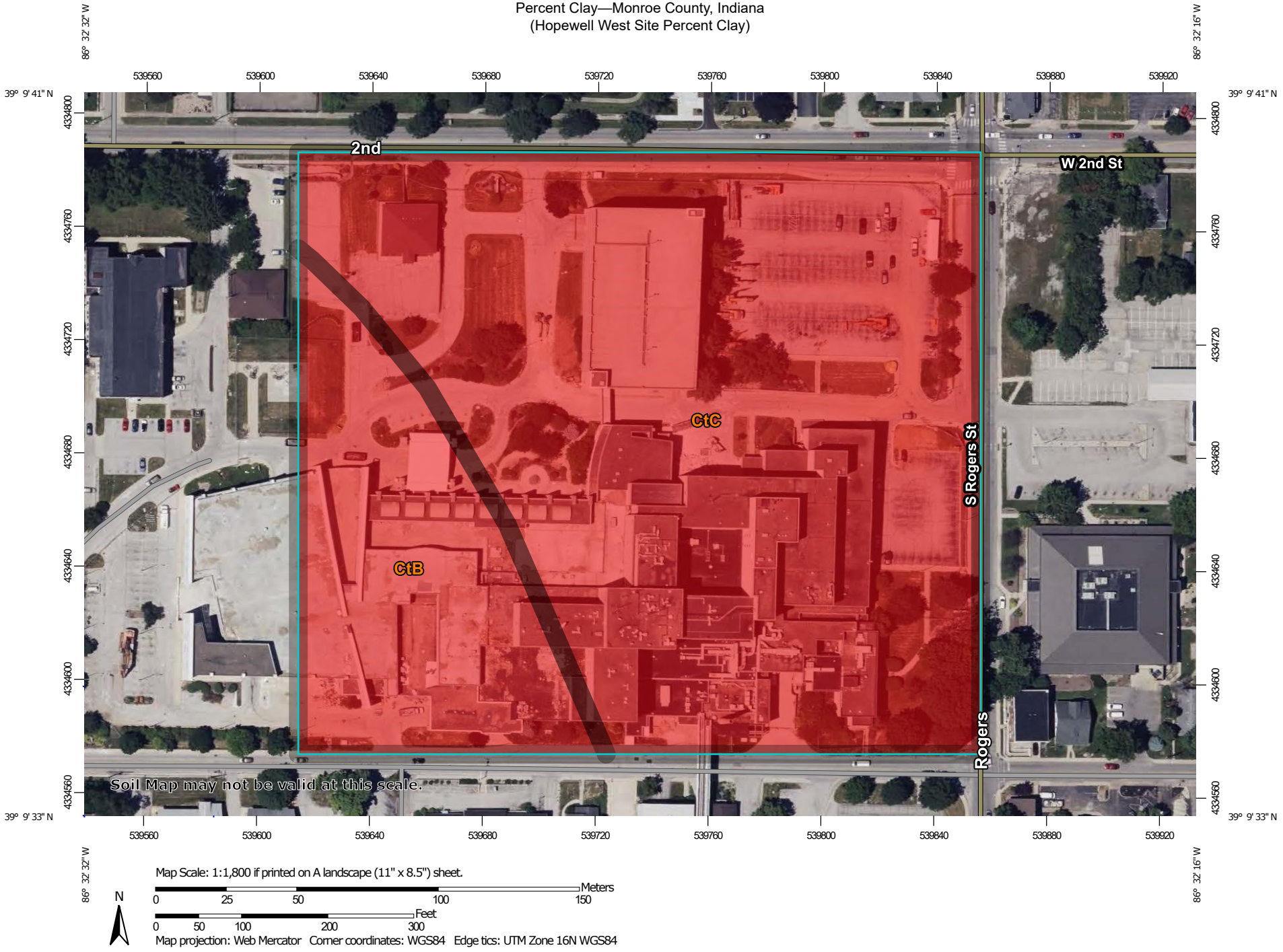
Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Percent Clay—Monroe County, Indiana
(Hopewell West Site Percent Clay)



Map Scale: 1:1,800 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 39.5

Not rated or not available

Soil Rating Lines

= 39.5

Not rated or not available

Soil Rating Points

= 39.5

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monroe County, Indiana
Survey Area Data: Version 30, Sep 1, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 15, 2022—Jun 21, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Percent Clay

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
CtB	Crider-Urban land complex, 2 to 6 percent slopes	39.5	2.9	22.4%
CtC	Crider-Urban land complex, 6 to 12 percent slopes	39.5	9.9	77.6%
Totals for Area of Interest			**12.8**	**100.0%**

Description

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. The estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Most of the material is in one of three groups of clay minerals or a mixture of these clay minerals. The groups are kaolinite, smectite, and hydrous mica, the best known member of which is illite.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: percent

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

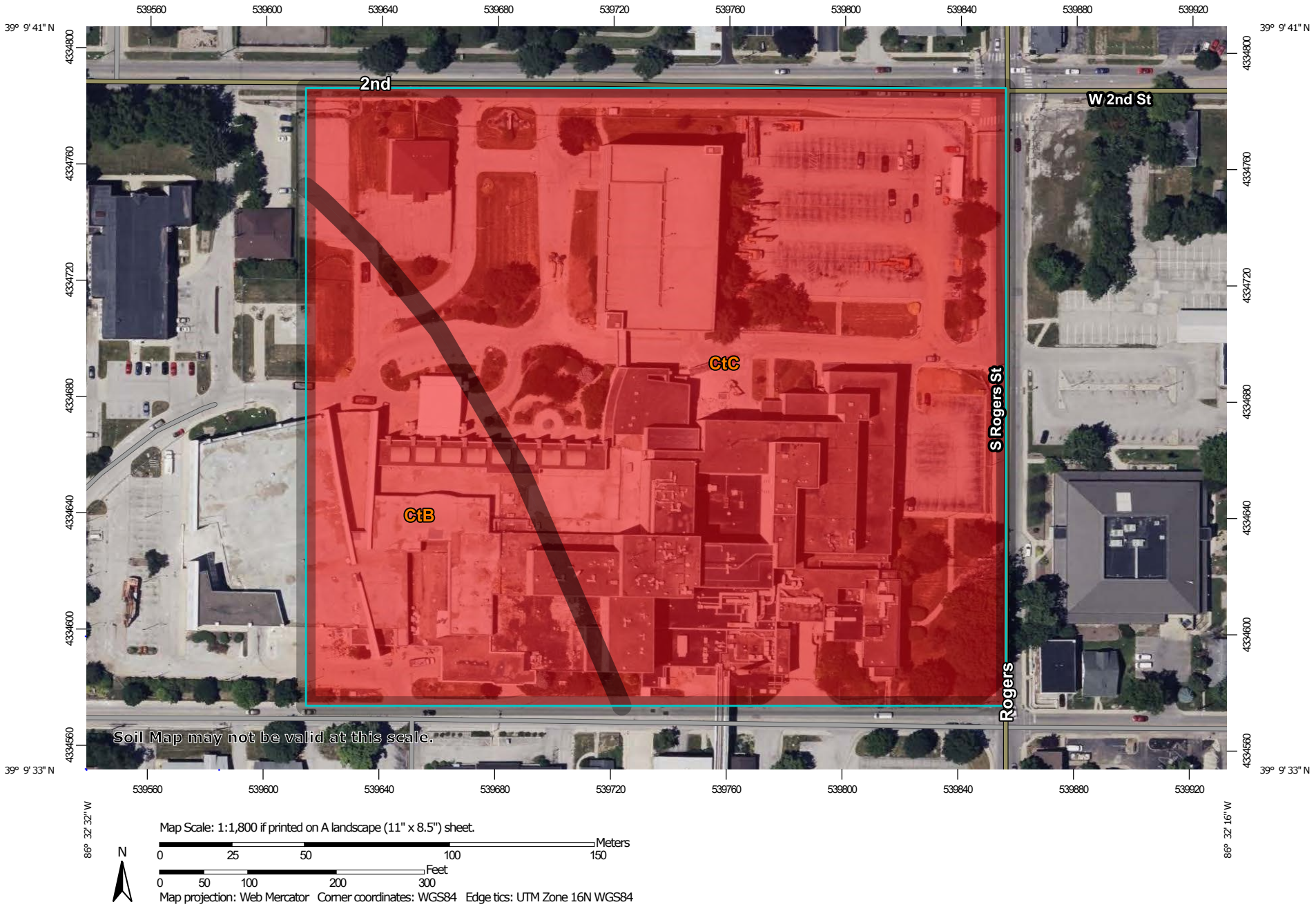
Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 12

Bottom Depth: 120

Units of Measure: Centimeters

Percent Silt—Monroe County, Indiana
(Hopewell West Site Percent Silt)



Map Scale: 1:1,800 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 41.3

Not rated or not available

Soil Rating Lines

= 41.3

Not rated or not available

Soil Rating Points

= 41.3

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 15, 2022—Jun 21, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Percent Silt

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
CtB	Crider-Urban land complex, 2 to 6 percent slopes	41.3	2.9	22.4%
CtC	Crider-Urban land complex, 6 to 12 percent slopes	41.3	9.9	77.6%
Totals for Area of Interest			**12.8**	**100.0%**

Description

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In the database, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: percent

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 12

Bottom Depth: 120

Units of Measure: Inches

TABLE AG-2

Rural Runoff Coefficients

Type of Surface	Runoff Coefficient
Woodland (Clay)	
Flat	0.30
Rolling	0.35
Steep	0.50
Pasture (Clay)	
Flat	0.30
Rolling	0.36
Steep	0.42

The coefficients of this tabulation are applicable to storms of five to ten year frequencies. Coefficients for less frequent higher intensity storms shall be modified as follows:

Return Period (yrs)	Multiply "C" by
25	1.1
50	1.2
100	1.25

TABLE AG-1

Urban Runoff Coefficients

Type of Surface	Runoff Coefficient
Asphalt	0.82
Concrete	0.85
Roof	0.85
Lawns (Clay)	
Flat (0-2% Slope)	0.16
Rolling (2-7% Slope)	0.21
Steep (Greater than 7%)	0.30

The coefficients of this tabulation are applicable to storms of five to ten year frequencies. Coefficients for less frequent higher intensity storms shall be modified as follows:

Return Period (yrs)	Multiply "C" by
25	1.1
50	1.2
100	1.25

Updated Rainfall Data
Source: http://hdsc.nws.noaa.gov/hdsc/pfds/index.html

Rainfall Duration

Duration		Return Period Rainfall Depth (in)						
Hours	Minutes	1 year	2 year	5 year	10 year	25 year	50 year	100 year
0.0833	5	0.38	0.46	0.55	0.62	0.72	0.79	0.87
0.1667	10	0.60	0.71	0.85	0.96	1.10	1.20	1.31
0.25	15	0.73	0.87	1.05	1.18	1.35	1.49	1.62
0.5	30	0.97	1.17	1.44	1.64	1.91	2.13	2.34
1	60	1.18	1.43	1.80	2.08	2.48	2.80	3.13
2	120	1.38	1.67	2.11	2.46	2.97	3.38	3.83
3	180	1.47	1.79	2.26	2.65	3.21	3.67	4.18
6	360	1.78	2.15	2.73	3.20	3.89	4.47	5.11
12	720	2.11	2.54	3.18	3.70	4.43	5.05	5.70
24	1440	2.55	3.07	3.82	4.44	5.31	6.04	6.80

Rainfall Intensity

Duration		Return Period Rainfall Intensity (in/hr)						
Hours	Minutes	1 year	2 year	5 year	10 year	25 year	50 year	100 year
0.0833	5	4.61	5.48	6.59	7.45	8.60	9.52	10.42
0.1667	10	3.58	4.28	5.12	5.75	6.58	7.21	7.84
0.25	15	2.92	3.49	4.19	4.72	5.42	5.95	6.49
0.5	30	1.93	2.34	2.87	3.28	3.83	4.25	4.69
1	60	1.18	1.43	1.80	2.08	2.48	2.80	3.13
2	120	0.69	0.84	1.05	1.23	1.48	1.69	1.91
3	180	0.49	0.59	0.75	0.88	1.07	1.22	1.39
6	360	0.30	0.36	0.46	0.53	0.65	0.75	0.85
12	720	0.18	0.21	0.26	0.31	0.37	0.42	0.47
24	1440	0.11	0.13	0.16	0.18	0.22	0.25	0.28

REVISED 10/13/2011 G.N.

City of Bloomington Utilities Engineering Department

NO SCALE 6/2/99 M. Hicks

DRAWING FILE: I:\COMMON\STANDARD DRAWINGS\STD16.DWG

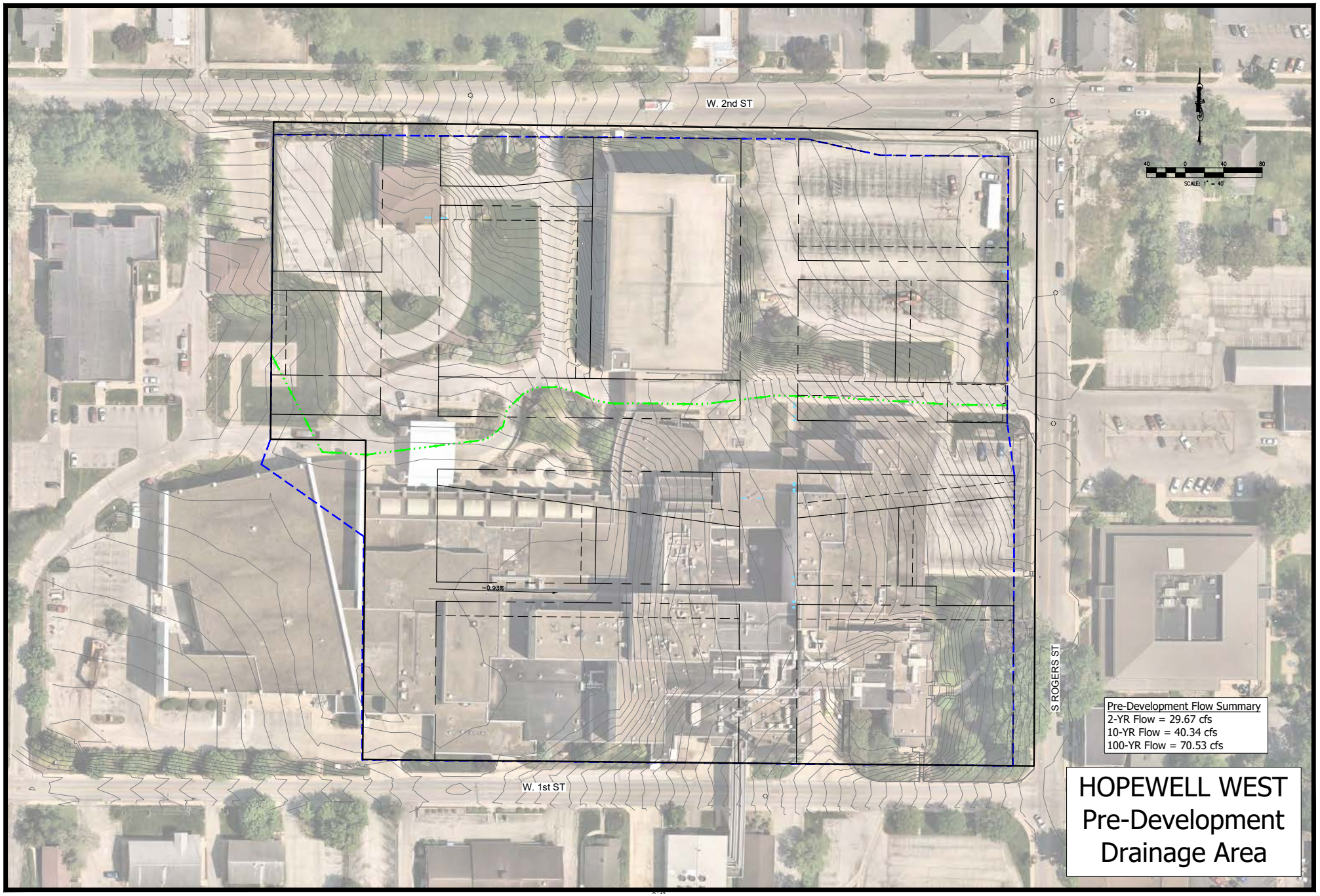
DEPTH AND INTENSITY DURATION FREQUENCY TABLES

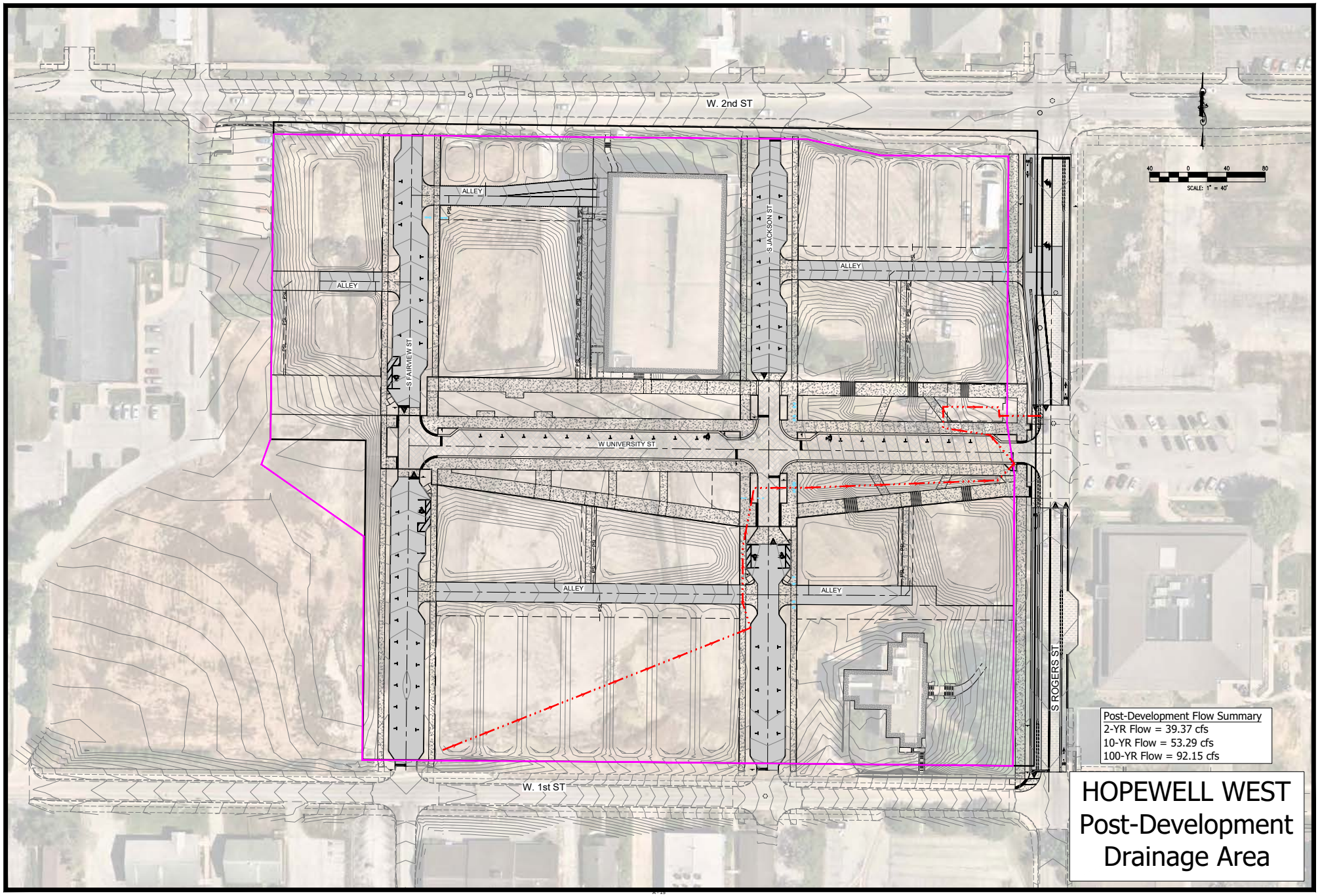
STANDARD DETAIL NUMBER 16

TABLE AG-4

Typical Values of Manning's n

Material	Manning's n	Desirable Maximum Velocities
Closed Conduits		
Concrete	0.013	15.f.p.s.
Vitrified Clay	0.013	15 f.p.s.
Brick	0.015	15 f.p.s.
Cast Iron	0.013	15 f.p.s.
Circular Corrugated Metal Pipe, Annular Corrugations, 2 2/3 x 2 in.		
Unpaved	0.024	7 f.p.s.
25% Paved	0.021	7 f.p.s.
50% Paved	0.018	7 f.p.s.
100% Paved	0.013	7 f.p.s.
Circular Metal Pipe, Helical, 2 2/3 x 2 in. Unpaved Corrugations		
12"	0.011	
18"	0.013	
24"	0.015	
36"	0.018	
48"	0.020	
60" or larger	0.021	
Corrugated Polyethylene Smooth Interior Pipe	0.012	15 f.p.s.
Concrete Culverts	0.013	
Open Channels		
Concrete Trowel Finish	0.013	
Concrete, Broom or Float Finish	0.015	
Gunite	0.018	
Riprap Placed	0.030	
Riprap Dumped	0.035	
Gabion	0.028	
New Earth (Uniform, Sodded, Clay)	0.025	
Existing Earth (Fairly Uniform With Some Weeds)		
Dense Growth of Weeds	0.030	
Dense Weeds and Brush	0.040	
Swale With Grass	0.040	
	0.035	


W. 2nd ST
W. 1st ST
S ROGERS ST
~0.93%
40 0 40 80
SCALE: 1" = 40'
Pre-Development Flow Summary
2-YR Flow = 29.67 cfs
10-YR Flow = 40.34 cfs
100-YR Flow = 70.53 cfs
HOPEWELL WEST
Pre-Development
Drainage Area


W. 2nd ST
ALLEY
ALLEY
ALLEY
ALLEY
ALLEY
S JACKSON ST
S FAIRVIEW ST
W UNIVERSITY ST
S ROGERS ST
W. 1st ST
40 0 40 80
SCALE: 1" = 40'
Post-Development Flow Summary
2-YR Flow = 39.37 cfs
10-YR Flow = 53.29 cfs
100-YR Flow = 92.15 cfs
HOPEWELL WEST
Post-Development
Drainage Area

TIME OF CONCENTRATION or TRAVEL TIME WORKSHEET

Project: Hopewell West

Designer: AJW **Date:** 2/22/2024

Str. No.: Pre-Development

Sheet Flow

1.	**Surface Description**	grass			concrete				
2.	**Manning's Roughness Coeff., (n)**	0.025			0.013				
3.	**Flow Length, (L) **total L<= 100 ft**	70.00	ft.		30.00	ft.			ft.
4.	**Two-yr 24-hr Rainfall, (P2)**	3.07	in.		3.07	in.			in.
5.	**Land Slope, (s)**	0.1020	ft./ft.		0.0200	ft./ft.			ft./ft.
6.	**Travel Time, (Tt)** **(Tt = [0.007(nL)^0.8]/[P2^0.5*s^0.4])**	0.016	hr	+	0.009	hr	+	0.000	hr

Shallow Concentrated Flow

7.	**Surface Description** **(paved or unpaved)**	**paved**			**paved**				
8.	**Flow Length, (L)**	460.00	ft.		310.00	ft.			ft.
9.	**Watercourse Slope, (s)**	0.0430	ft./ft.		0.0800	ft./ft.			ft./ft.
10.	**Average Velocity, (V)** **(Vp = 20.683(s)^0.5)** **(Vup = 16.393(s)^0.5)**	3.399	ft./s		4.637	ft./s		0.000	ft./s
11.	**Travel Time, (Tt)** **(Tt = L/3600V)**	0.038	hr	+	0.019	hr	+	0.000	hr

Watershed or Subarea Tc or Tt = **0.081 hr**

or **4.84 min**

Channel Flow (

12.	**Cross Sectional Flow Area, (a)**		ft.^2			ft.^2			ft.^2
13.	**Wetted Perimeter, Pw**		ft.			ft.			ft.
14.	**Hydraulic Radius, (r)** **(r = a/Pw)**	#DIV/0!	ft.		#DIV/0!	ft.		#DIV/0!	ft.
15.	**Channel Slope, (s)**		ft./ft.			ft./ft.			ft./ft.
16.	**Manning's Roughness Coeff., (n)**								
17.	**Velocity, (V)** **(V = [1.486*r^(2/3)*s^(1/2)]/n)**	#DIV/0!	ft./s		#DIV/0!	ft./s		#DIV/0!	ft./s
18.	**Flow Length, (L)**		ft.			ft.			ft.
19.	**Travel Time, (Tt)**	0.000	hr	+	0.000	hr	+	0.000	hr

TIME OF CONCENTRATION or TRAVEL TIME WORKSHEET

Project: Hopewell West

Designer: AJW **Date:** 2/22/2024

Str. No.: Post-Development

Sheet Flow

1.	**Surface Description**	grass			grass				
2.	**Manning's Roughness Coeff., (n)**	0.025			0.025				
3.	**Flow Length, (L) **total L<= 100 ft**	75.00	ft.		25.00	ft.			ft.
4.	**Two-yr 24-hr Rainfall, (P2)**	3.07	in.		3.07	in.			in.
5.	**Land Slope, (s)**	0.0050	ft./ft.		0.2500	ft./ft.			ft./ft.
6.	**Travel Time, (Tt)** **(Tt = [0.007(nL)^0.8]/[P2^0.5*s^0.4])**	0.055	hr	+	0.005	hr	+	0.000	hr

Shallow Concentrated Flow

7.	**Surface Description (paved or unpaved)**	**unpaved**			**unpaved**					
8.	**Flow Length, (L)**	190.00	ft.		60.00	ft.			ft.	
9.	**Watercourse Slope, (s)**	0.0050	ft./ft.		0.2500	ft./ft.			ft./ft.	
10.	**Average Velocity, (V)** **(Vp = 20.683(s)^0.5)** **(Vup = 16.393(s)^0.5)**	1.463	ft./s		10.342	ft./s		0.000	ft./s	**Watershed or Subarea Tc or Tt =** **0.118 hr**
11.	**Travel Time, (Tt)** **(Tt = L/3600V)**	0.036	hr	+	0.002	hr	+	0.000	hr	**or** **7.07 min**

Channel Flow (

		12 in Pipe		**18 in Pipe**		**24 in Pipe**	
12.	**Cross Sectional Flow Area, (a)**	0.75	ft.^2	1.68	ft.^2	2.98	ft.^2
13.	**Wetted Perimeter, Pw**	2.50	ft.	3.75	ft.	5.00	ft.
14.	**Hydraulic Radius, (r)** **(r = a/Pw)**	0.298	ft.	0.447	ft.	0.596	ft.
15.	**Channel Slope, (s)**	0.0050	ft./ft.	0.0500	ft./ft.	0.0100	ft./ft.
16.	**Manning's Roughness Coeff., (n)**	0.013		0.013		0.013	
17.	**Velocity, (V)** **(V = [1.486*r^(2/3)*s^(1/2)]/n)**	3.606	ft./s	14.941	ft./s	8.094	ft./s
18.	**Flow Length, (L)**	145.00	ft.	300.00	ft.	105.00	ft.
19.	**Travel Time, (Tt)**	0.011	hr	+ 0.006	hr	+ 0.004	hr

DETENTION STORAGE CALCULATIONS

Project: Hopewell West

Designer: AJW **Date: 02/15/24**

Release Rate Return Period	**2** yrs	**Design Return Period**	**2** yrs
Watershed Area, (AU) (Undeveloped Watershed)	10.83 acres	**Watershed Area, (AD) (Developed Watershed)**	10.83 acres
Time of Concentration (Undeveloped Watershed)	5.00 min.	**Developed Runoff Coefficient, (CD)**	0.73
Rainfall Intensity, (iU)	5.48 in./hr		
Undeveloped Runoff Coefficient, (CU)	0.50		
Undeveloped Runoff Rate, (O) (O = CU*iU*AU)	29.67 cfs		

Storm Duration	Rainfall Intensity	Inflow Rate	Outflow Rate	Storage Rate	Required Storage
td	id	I(td) = (CD*id*AD)	O = (CU*iU*AU)	I(td)-O	[I(td)-O]*td/12
(hrs)	(in./hr)	(cfs)	(cfs)	(cfs)	(acre-ft)
0.08	5.48	43.32	29.67	13.65	0.09
0.17	4.28	33.84	29.67	4.16	0.06
0.25	3.49	27.59	29.67	-2.08	-0.04
0.50	2.34	18.50	29.67	-11.17	-0.47
1.00	1.43	11.31	29.67	-18.37	-1.53
2.00	0.84	6.64	29.67	-23.03	-3.84
3.00	0.59	4.66	29.67	-25.01	-6.25
6.00	0.36	2.85	29.67	-26.83	-13.41
12.00	0.21	1.66	29.67	-28.01	-28.01
24.00	0.13	1.03	29.67	-28.65	-57.29

DETENTION STORAGE CALCULATIONS

Project: Hopewell West

Designer: AJW **Date: 06/26/23**

Release Rate Return Period	**10** yrs	**Design Return Period**	**10** yrs
Watershed Area, (AU) (Undeveloped Watershed)	10.83 acres	**Watershed Area, (AD) (Developed Watershed)**	10.83 acres
Time of Concentration (Undeveloped Watershed)	5.00 min.	**Developed Runoff Coefficient, (CD)**	0.73
Rainfall Intensity, (iU)	7.45 in./hr		
Undeveloped Runoff Coefficient, (CU)	0.50		
Undeveloped Runoff Rate, (O) (O = CU*iU*AU)	40.34 cfs		

Storm Duration	Rainfall Intensity	Inflow Rate	Outflow Rate	Storage Rate	Required Storage
td	id	I(td) = (CD*id*AD)	O = (CU*iU*AU)	I(td)-O	[I(td)-O]*td/12
(hrs)	(in./hr)	(cfs)	(cfs)	(cfs)	(acre-ft)
0.08	7.45	58.90	40.34	18.56	0.12
0.17	5.75	45.46	40.34	5.12	0.07
0.25	4.72	37.32	40.34	-3.03	-0.06
0.50	3.28	25.93	40.34	-14.41	-0.60
1.00	2.08	16.44	40.34	-23.90	-1.99
2.00	1.23	9.72	40.34	-30.62	-5.10
3.00	0.88	6.96	40.34	-33.38	-8.35
6.00	0.53	4.19	40.34	-36.15	-18.08
12.00	0.31	2.45	40.34	-37.89	-37.89
24.00	0.18	1.42	40.34	-38.92	-77.84

DETENTION STORAGE CALCULATIONS

Project: Hopewell West

Designer: AJW **Date: 06/26/23**

Release Rate Return Period	**100** yrs	**Design Return Period**	**100** yrs
Watershed Area, (AU) (Undeveloped Watershed)	10.83 acres	**Watershed Area, (AD) (Developed Watershed)**	10.83 acres
Time of Concentration (Undeveloped Watershed)	5.00 min.	**Developed Runoff Coefficient, (CD)**	0.91
Rainfall Intensity, (iU)	10.42 in./hr		
Undeveloped Runoff Coefficient, (CU)	0.63		
Undeveloped Runoff Rate, (O) (O = CU*iU*AU)	70.53 cfs		

Storm Duration	Rainfall Intensity	Inflow Rate	Outflow Rate	Storage Rate	Required Storage
td	id	I(td) = (CD*id*AD)	O = (CU*iU*AU)	I(td)-O	[I(td)-O]*td/12
(hrs)	(in./hr)	(cfs)	(cfs)	(cfs)	(acre-ft)
0.08	10.42	102.69	70.53	32.16	0.21
0.17	7.84	77.27	70.53	6.74	0.10
0.25	6.49	63.96	70.53	-6.57	-0.14
0.50	4.69	46.22	70.53	-24.31	-1.01
1.00	3.13	30.85	70.53	-39.68	-3.31
2.00	1.91	18.82	70.53	-51.71	-8.62
3.00	1.39	13.70	70.53	-56.83	-14.21
6.00	0.85	8.38	70.53	-62.15	-31.08
12.00	0.47	4.63	70.53	-65.90	-65.90
24.00	0.28	2.76	70.53	-67.77	-135.54

OUTLET PRESSURE PIPE FLOW CALCULATIONS (2-Yr)

Project: Hopewell West

Designer: DJC **Date: 2/29/2024**

Pipe Diameter, (D)	2.1	ft	
Entrance Loss Coef., (Ke)	0.50		**(square edged inlets = 0.50; rounded inlets = 0.10; grooved or socket-ended pipe = 0.15; projecting conc. pipe w/grooved or socket-ends = 0.20; projecting steel or corrugated met. pipe = 0.85)**
Outlet Loss Coef., (Ko)	1.0		**(usually taken as 1.0)**
Manning's Rough. Coef., (n)	0.013		
Acceleration of Gravity, (g)	32.20	ft/s^2	
Length of Pipe, (L)	0.33	ft	
Top of Detention Elevation	754.04	ft	
Bottom of Detention Elevation	751.36	ft	
Height of Water, (hp) (hp = height of water above center of pipe opening)	1.63	ft^2	
Area of Pipe, (Ap) (Ap = pi(D^2)/4*2)	3.46	ft^2	
Flowrate, (Q) (see equation to right)	**28.97**	cfs	**Q = Ap(hp/(((Ke+Ko)/2g)+(2.87n^2L/D^(4/3))))^.5**

OUTLET PRESSURE PIPE FLOW CALCULATIONS (10-Yr, Top Bottom Orifice)

Project: Hopewell West

Designer: DJC **Date: 2/29/2024**

Pipe Diameter, (D)	2.1	ft	
Entrance Loss Coef., (Ke)	0.50		**(square edged inlets = 0.50; rounded inlets = 0.10; grooved or socket-ended pipe = 0.15; projecting conc. pipe w/grooved or socket-ends = 0.20; projecting steel or corrugated met. pipe = 0.85)**
Outlet Loss Coef., (Ko)	1.0		**(usually taken as 1.0)**
Manning's Rough. Coef., (n)	0.013		
Acceleration of Gravity, (g)	32.20	ft/s^2	
Length of Pipe, (L)	0.33	ft	
Top of Detention Elevation	754.90	ft	
Bottom of Detention Elevation	751.36	ft	
Height of Water, (hp) (hp = height of water above center of pipe opening)	2.49	ft^2	
Area of Pipe, (Ap) (Ap = pi(D^2)/4)	3.46	ft^2	
Flowrate, (Q) (see equation to right)	**35.76**	cfs	**Q = Ap(hp/(((Ke+Ko)/2g)+(2.87n^2L/D^(4/3))))^.5**

OUTLET PRESSURE PIPE FLOW CALCULATIONS (10-Yr, Top Orifice)

Project: Hopewell West

Designer: DJC **Date: 2/29/2024**

Pipe Diameter, (D)	1.5	ft	
Entrance Loss Coef., (Ke)	0.50		**(square edged inlets = 0.50; rounded inlets = 0.10; grooved or socket-ended pipe = 0.15; projecting conc. pipe w/grooved or socket-ends = 0.20; projecting steel or corrugated met. pipe = 0.85)**
Outlet Loss Coef., (Ko)	1.0		**(usually taken as 1.0)**
Manning's Rough. Coef., (n)	0.013		
Acceleration of Gravity, (g)	32.20	ft/s^2	
Length of Pipe, (L)	0.33	ft	
Top of Detention Elevation	754.90	ft	
Bottom of Detention Elevation	754.04	ft	
Height of Water, (hp) (hp = height of water above center of pipe opening)	0.11	ft^2	
Area of Pipe, (Ap) (Ap = pi(D^2)/4)	1.77	ft^2	
Flowrate, (Q) (see equation to right)	**3.82**	cfs	**Q = Ap(hp/(((Ke+Ko)/2g)+(2.87n^2L/D^(4/3))))^.5**
Total Flowrate, (Qt)	**39.57**	cfs	

OUTLET PRESSURE PIPE FLOW CALCULATIONS (100-Yr, Top Bottom Orifice)

Project: Hopewell West

Designer: DJC **Date: 2/29/2024**

Pipe Diameter, (D)	2.1	ft	
Entrance Loss Coef., (Ke)	0.50		**(square edged inlets = 0.50; rounded inlets = 0.10; grooved or socket-ended pipe = 0.15; projecting conc. pipe w/grooved or socket-ends = 0.20; projecting steel or corrugated met. pipe = 0.85)**
Outlet Loss Coef., (Ko)	1.0		**(usually taken as 1.0)**
Manning's Rough. Coef., (n)	0.013		
Acceleration of Gravity, (g)	32.20	ft/s^2	
Length of Pipe, (L)	0.33	ft	
Top of Detention Elevation	757.54	ft	
Bottom of Detention Elevation	751.36	ft	
Height of Water, (hp) (hp = height of water above center of pipe opening)	5.13	ft^2	
Area of Pipe, (Ap) (Ap = pi(D^2)/4)	3.46	ft^2	
Flowrate, (Q) (see equation to right)	**51.35**	cfs	**Q = Ap(hp/(((Ke+Ko)/2g)+(2.87n^2L/D^(4/3))))^.5**

OUTLET PRESSURE PIPE FLOW CALCULATIONS (100-Yr, Top Orifice)

Project: Hopewell West

Designer: DJC **Date: 2/29/2024**

Pipe Diameter, (D)	1.5	ft	
Entrance Loss Coef., (Ke)	0.50		**(square edged inlets = 0.50; rounded inlets = 0.10; grooved or socket-ended pipe = 0.15; projecting conc. pipe w/grooved or socket-ends = 0.20; projecting steel or corrugated met. pipe = 0.85)**
Outlet Loss Coef., (Ko)	1.0		**(usually taken as 1.0)**
Manning's Rough. Coef., (n)	0.013		
Acceleration of Gravity, (g)	32.20	ft/s^2	
Length of Pipe, (L)	0.33	ft	
Top of Detention Elevation	757.54	ft	
Bottom of Detention Elevation	754.04	ft	
Height of Water, (hp) (hp = height of water above center of pipe opening)	2.75	ft^2	
Area of Pipe, (Ap) (Ap = pi(D^2)/4)	1.77	ft^2	
Flowrate, (Q) (see equation to right)	**19.18**	cfs	**Q = Ap(hp/(((Ke+Ko)/2g)+(2.87n^2L/D^(4/3))))^.5**
Total Flowrate, (Qt)	**70.53**	cfs	

DETENTION STORAGE CALCULATIONS (w/ OUTLET STRUCTURE)

Project: Hopewell West

Designer: AJW **Date: 02/15/24**

Release Rate Return Period	**2** yrs	**Design Return Period**	**2** yrs
Watershed Area, (AU) (Undeveloped Watershed)	10.83 acres	**Watershed Area, (AD) (Developed Watershed)**	10.83 acres
Time of Concentration (Undeveloped Watershed)	5.00 min.	**Developed Runoff Coefficient, (CD)**	0.73
Rainfall Intensity, (iU)	5.48 in./hr		
Undeveloped Runoff Coefficient, (CU)	0.50		
Undeveloped Runoff Rate (= CU*iU*AU)	29.67 cfs		
Outlet Str. Outflow Rate, (O)	28.97 cfs		

Storm Duration	Rainfall Intensity	Inflow Rate	Outflow Rate	Storage Rate	Required Storage
td	id	I(td) = (CD*id*AD)	O =	I(td)-O	[I(td)-O]*td/12
(hrs)	(in./hr)	(cfs)	(cfs)	(cfs)	(acre-ft)
0.08	5.48	43.32	28.97	14.35	0.10
0.17	4.28	33.84	28.97	4.87	0.07
0.25	3.49	27.59	28.97	-1.38	-0.03
0.50	2.34	18.50	28.97	-10.47	-0.44
1.00	1.43	11.31	28.97	-17.67	-1.47
2.00	0.84	6.64	28.97	-22.33	-3.72
3.00	0.59	4.66	28.97	-24.31	-6.08
6.00	0.36	2.85	28.97	-26.12	-13.06
12.00	0.21	1.66	28.97	-27.31	-27.31
24.00	0.13	1.03	28.97	-27.94	-55.89

DETENTION STORAGE CALCULATIONS (w/ OUTLET STRUCTURE)

Project: Hopewell West

Designer: AJW **Date: 06/26/23**

Release Rate Return Period	**10** yrs	**Design Return Period**	**10** yrs
Watershed Area, (AU) (Undeveloped Watershed)	10.83 acres	**Watershed Area, (AD) (Developed Watershed)**	10.83 acres
Time of Concentration (Undeveloped Watershed)	5.00 min.	**Developed Runoff Coefficient, (CD)**	0.73
Rainfall Intensity, (iU)	7.45 in./hr		
Undeveloped Runoff Coefficient, (CU)	0.50		
Undeveloped Runoff Rate (= CU*iU*AU)	40.34 cfs		
Outlet Str. Outflow Rate, (O)	39.57 cfs		

Storm Duration	Rainfall Intensity	Inflow Rate	Outflow Rate	Storage Rate	Required Storage
td	id	I(td) = (CD*id*AD)	O =	I(td)-O	[I(td)-O]*td/12
(hrs)	(in./hr)	(cfs)	(cfs)	(cfs)	(acre-ft)
0.08	7.45	58.90	39.57	19.33	0.13
0.17	5.75	45.46	39.57	5.89	0.08
0.25	4.72	37.32	39.57	-2.25	-0.05
0.50	3.28	25.93	39.57	-13.64	-0.57
1.00	2.08	16.44	39.57	-23.13	-1.93
2.00	1.23	9.72	39.57	-29.85	-4.97
3.00	0.88	6.96	39.57	-32.61	-8.15
6.00	0.53	4.19	39.57	-35.38	-17.69
12.00	0.31	2.45	39.57	-37.12	-37.12
24.00	0.18	1.42	39.57	-38.15	-76.29

DETENTION STORAGE CALCULATIONS (w/ OUTLET STRUCTURE)

Project: Hopewell West

Designer: AJW **Date: 06/26/23**

Release Rate Return Period	**100** yrs	**Design Return Period**	**100** yrs
Watershed Area, (AU) (Undeveloped Watershed)	10.83 acres	**Watershed Area, (AD) (Developed Watershed)**	10.83 acres
Time of Concentration (Undeveloped Watershed)	5.00 min.	**Developed Runoff Coefficient, (CD)**	0.91
Rainfall Intensity, (iU)	10.42 in./hr		
Undeveloped Runoff Coefficient, (CU)	0.63		
Undeveloped Runoff Rate, (O) (O = CU*iU*AU)	70.53 cfs		

Storm Duration	Rainfall Intensity	Inflow Rate	Outflow Rate	Storage Rate	Required Storage
td	id	I(td) = (CD*id*AD)	O = (CU*iU*AU)	I(td)-O	[I(td)-O]*td/12
(hrs)	(in./hr)	(cfs)	(cfs)	(cfs)	(acre-ft)
0.08	10.42	102.69	70.53	32.16	0.21
0.17	7.84	77.27	70.53	6.74	0.10
0.25	6.49	63.96	70.53	-6.57	-0.14
0.50	4.69	46.22	70.53	-24.31	-1.01
1.00	3.13	30.85	70.53	-39.68	-3.31
2.00	1.91	18.82	70.53	-51.71	-8.62
3.00	1.39	13.70	70.53	-56.83	-14.21
6.00	0.85	8.38	70.53	-62.15	-31.08
12.00	0.47	4.63	70.53	-65.90	-65.90
24.00	0.28	2.76	70.53	-67.77	-135.54

Aqua-Swirl™ Sizing Chart

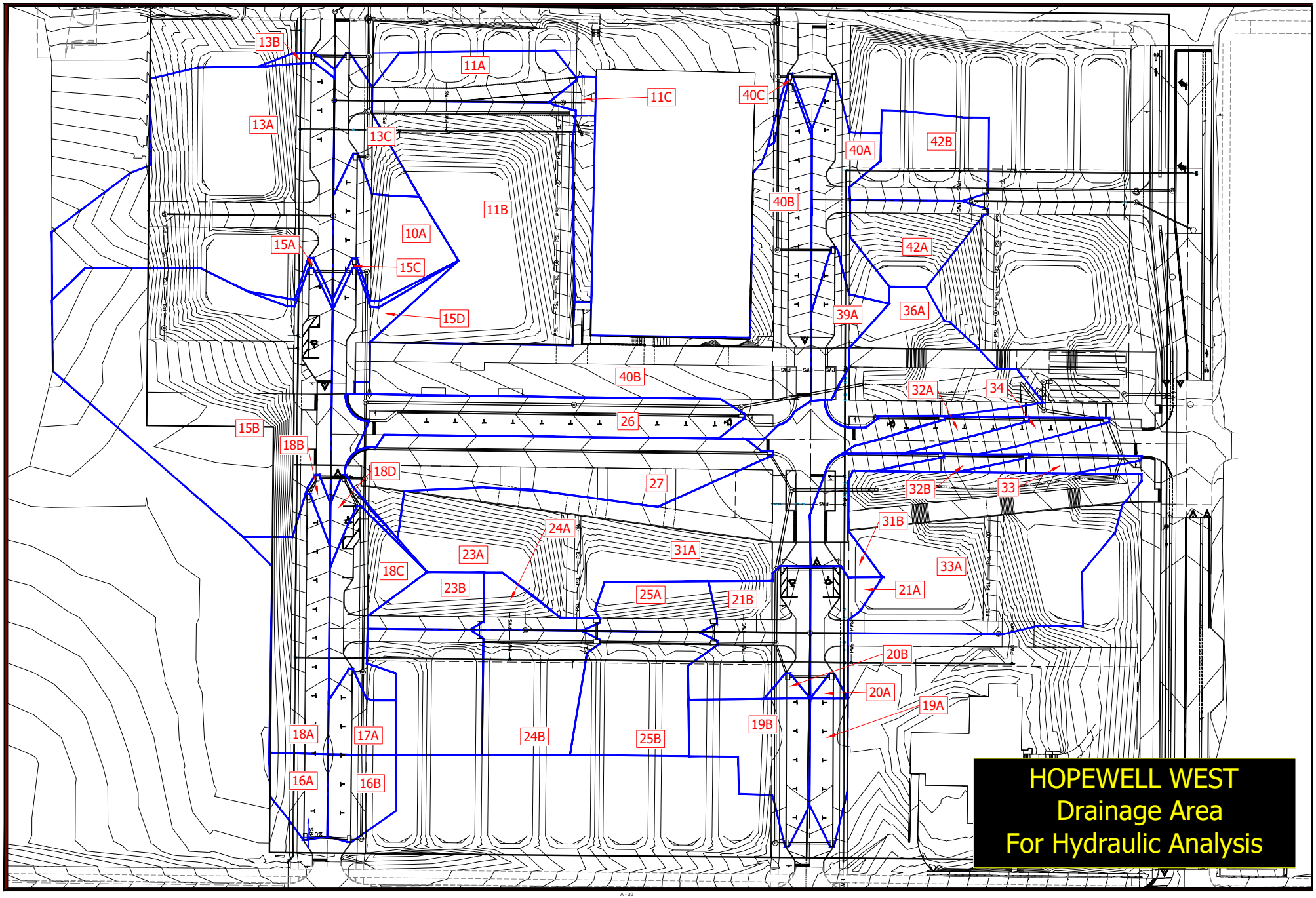
Aqua-Swirl™ Model	Swirl Chamber Diameter (ft.)	Maximum Stub-Out Pipe Outer Diameter (in.)		Water Quality Treatment Flow[2] (cfs)	Oil/Debris Storage Capacity (gal)	Sediment Storage Capacity (ft^3)
		On/Offline	BYP[1]			
AS-2	2.50	8	15	1.1	37	10
AS-3	3.25	10	21	1.8	110	20
AS-4	4.25	12	27	3.2	190	32
AS-5	5.00	12	30	4.4	270	45
AS-6	6.00	14	36	6.3	390	65
AS-7	7.00	16	42	8.6	540	90
AS-8	8.00	18	48	11.2	710	115
AS-9	9.00	20	>48 *	14.2	910	145
AS-10	10.0	22	>48 *	17.5	1130	180
AS-11	11.0	24	>48 *	21.2	1422	222
AS-12	12.0	26	>48 *	25.2	1698	270
AS-13	13.0	28	>48 *	29.6	1986	310
AS-XX	Custom	--	--	>26 **	--	--

*** See Representative for larger pipe diameters available **Higher water quality treatment flow rates can be designed with multiple swirls.**

1) *The **Aqua-Swirl™ Internal Bypass (BYP)** provides full treatment of the "first flush," while the peak design storm is diverted and channeled through the main conveyance pipe. Please refer to your local representative for more information.*

2) *Many regulatory agencies are establishing "water quality treatment flow rates" for their areas based on the initial movement of pollutants into the storm drainage system. The treatment flow rate of the Aqua-Swirl™ system is engineered to meet or exceed the local water quality treatment criteria. This **"water quality treatment flow rate"** typically represents approximately 90% to 95% of the total annual runoff volume.*

The design and orientation of the Aqua-Filter™ generally entails some degree of customization. For assistance in design and specific sizing using historical rainfall data, please refer to an AquaShield™ representative or visit our website at www.AquaShieldInc.com. CAD details and specifications are available upon request.


13B
11A
11C
40C
13A
13C
40A
42B
11B
40B
10A
15A
15C
42A
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39A
36A
40B
32A
34
15B
26
18B
18D
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31B
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33A
18C
23B
25A
21B
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18A
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24B
25B
16A
16B
HOPEWELL WEST
Drainage Area
For Hydraulic Analysis

Hopewell West - Proposed Drainage Areas for Q10									
Impervious Runoff Coefficient, "C" =				0.82					
Pervious Runoff Coefficient, "C" =				0.21					
Structure Number	Proposed Impervious Area (SFT)	Proposed Pervious Area (SFT)	Undeveloped Impervious Area (SFT)	Undeveloped Pervious Area (SFT)	Impervious Area (SFT)	Pervious Area (SFT)	Total Area (SFT)	Total Area (Acres)	Composite "C"
10A	2015	397	3294	581	5309	978	6287	0.14	0.73
11A	1906	0	3105	548	5011	548	5559	0.13	0.76
11B	2707	725	17258	3045	19965	3770	23735	0.54	0.72
11C	726	2229	0	0	726	2229	2955	0.07	0.36
13A	5163	5492	14958	2640	20121	8132	28253	0.65	0.64
13B	189	35	122	21	311	56	367	0.01	0.73
13C	1881	549	1018	180	2899	729	3628	0.08	0.70
15A	180	80	70	12	250	92	342	0.01	0.66
15B	3916	14975	12081	2132	15997	17107	33104	0.76	0.50
15C	178	58	141	25	319	83	402	0.01	0.69
15D	3204	606	674	119	3878	725	4603	0.11	0.72
16A	1603	965	0	0	1603	965	2568	0.06	0.59
16B	1617	315	1056	186	2673	501	3174	0.07	0.72
17A	1398	247	855	151	2253	398	2651	0.06	0.73
18A	4540	3891	0	0	4540	3891	8431	0.19	0.54
18B	421	46	0	0	421	46	467	0.01	0.76
18C	2619	1544	1567	277	4186	1821	6007	0.14	0.64
18D	788	79	122	22	910	101	1011	0.02	0.76
19A	2376	533	0	0	2376	533	2909	0.07	0.71
19B	2440	514	3108	548	5548	1062	6610	0.15	0.72
20A	250	71	0	0	250	71	321	0.01	0.69
20B	282	87	21	4	303	91	394	0.01	0.68
21A	2549	260	428	76	2977	336	3313	0.08	0.76
21B	2137	1632	3359	593	5496	2225	7721	0.18	0.64
23A	893	0	1963	346	2856	346	3202	0.07	0.75
23B	893	0	5424	957	6317	957	7274	0.17	0.74
24A	910	0	1100	194	2010	194	2204	0.05	0.77
24B	910	0	5594	987	6504	987	7491	0.17	0.74
25A	926	0	2163	382	3089	382	3471	0.08	0.75
25B	926	0	6406	1131	7332	1131	8463	0.19	0.74
26	8991	322	0	0	8991	322	9313	0.21	0.80
27	8184	5780	0	0	8184	5780	13964	0.32	0.57
31A	9744	2249	12742	2248	22486	4497	26983	0.62	0.72
31B	2584	163	403	71	2987	234	3221	0.07	0.78
32A	1810	0	0	0	1810	0	1810	0.04	0.82
32B	914	0	0	0	914	0	914	0.02	0.82
33A	5094	4266	12184	2150	17278	6416	23694	0.54	0.65
33	1319	0	0	0	1319	0	1319	0.03	0.82
34	1833	0	0	0	1833	0	1833	0.04	0.82
36A	3737	3457	2416	426	6153	3883	10036	0.23	0.58
39A	2406	341	571	101	2977	442	3419	0.08	0.74
40A	3196	1707	655	116	3851	1823	5674	0.13	0.62
40B	12775	12000	0	0	12775	12000	24775	0.57	0.52
40C	204	93	0	0	204	93	297	0.01	0.63
42A	1053	0	3477	613	4530	613	5143	0.12	0.75
42B	1076	0	4270	753	5346	753	6099	0.14	0.74

Hopewell West - Proposed Drainage Areas for Q100									
Impervious Runoff Coefficient, "C" =				1.03					
Pervious Runoff Coefficient, "C" =				0.26					
Structure Number	Proposed Impervious Area (SFT)	Proposed Pervious Area (SFT)	Undeveloped Impervious Area (SFT)	Undeveloped Pervious Area (SFT)	Impervious Area (SFT)	Pervious Area (SFT)	Total Area (SFT)	Total Area (Acres)	Composite "C"
10A	2015	397	3294	581	5309	978	6287	0.14	0.91
11A	1906	0	3105	548	5011	548	5559	0.13	0.95
11B	2707	725	17258	3045	19965	3770	23735	0.54	0.91
11C	726	2229	0	0	726	2229	2955	0.07	0.45
13A	5163	5492	14958	2640	20121	8132	28253	0.65	0.81
13B	189	35	122	21	311	56	367	0.01	0.91
13C	1881	549	1018	180	2899	729	3628	0.08	0.88
15A	180	80	70	12	250	92	342	0.01	0.82
15B	3916	14975	12081	2132	15997	17107	33104	0.76	0.63
15C	178	58	141	25	319	83	402	0.01	0.87
15D	3204	606	674	119	3878	725	4603	0.11	0.91
16A	1603	965	0	0	1603	965	2568	0.06	0.74
16B	1617	315	1056	186	2673	501	3174	0.07	0.91
17A	1398	247	855	151	2253	398	2651	0.06	0.91
18A	4540	3891	0	0	4540	3891	8431	0.19	0.67
18B	421	46	0	0	421	46	467	0.01	0.95
18C	2619	1544	1567	277	4186	1821	6007	0.14	0.80
18D	788	79	122	22	910	101	1011	0.02	0.95
19A	2376	533	0	0	2376	533	2909	0.07	0.89
19B	2440	514	3108	548	5548	1062	6610	0.15	0.91
20A	250	71	0	0	250	71	321	0.01	0.86
20B	282	87	21	4	303	91	394	0.01	0.85
21A	2549	260	428	76	2977	336	3313	0.08	0.95
21B	2137	1632	3359	593	5496	2225	7721	0.18	0.81
23A	893	0	1963	346	2856	346	3202	0.07	0.95
23B	893	0	5424	957	6317	957	7274	0.17	0.93
24A	910	0	1100	194	2010	194	2204	0.05	0.96
24B	910	0	5594	987	6504	987	7491	0.17	0.93
25A	926	0	2163	382	3089	382	3471	0.08	0.95
25B	926	0	6406	1131	7332	1131	8463	0.19	0.93
26	8991	322	0	0	8991	322	9313	0.21	1.00
27	8184	5780	0	0	8184	5780	13964	0.32	0.71
31A	9744	2249	12742	2248	22486	4497	26983	0.62	0.90
31B	2584	163	403	71	2987	234	3221	0.07	0.97
32A	1810	0	0	0	1810	0	1810	0.04	1.03
32B	914	0	0	0	914	0	914	0.02	1.03
33A	5094	4266	12184	2150	17278	6416	23694	0.54	0.82
33	1319	0	0	0	1319	0	1319	0.03	1.03
34	1833	0	0	0	1833	0	1833	0.04	1.03
36A	3737	3457	2416	426	6153	3883	10036	0.23	0.73
39A	2406	341	571	101	2977	442	3419	0.08	0.93
40A	3196	1707	655	116	3851	1823	5674	0.13	0.78
40B	12775	12000	0	0	12775	12000	24775	0.57	0.66
40C	204	93	0	0	204	93	297	0.01	0.79
42A	1053	0	3477	613	4530	613	5143	0.12	0.94
42B	1076	0	4270	753	5346	753	6099	0.14	0.93

TIME OF CONCENTRATION or TRAVEL TIME WORKSHEET

Project: Hopewell West

Designer: DJC **Date:** 2/26/2024

Str 22 to Str 33A

Sheet Flow

1. Surface Description								
2. Manning's Roughness Coeff., (n)								
3. Flow Length, (L) **total L<= 100 ft		ft.			ft.			ft.
4. Two-yr 24-hr Rainfall, (P2)		in.			in.			in.
5. Land Slope, (s)		ft./ft.			ft./ft.			ft./ft.
6. Travel Time, (Tt) (Tt = [0.007(nL)^0.8]/[P2^0.5*s^0.4])	0.000	hr	+	0.000	hr	+	0.000	hr

Shallow Concentrated Flow

7. Surface Description (paved or unpaved)								
8. Flow Length, (L)		ft.			ft.			ft.
9. Watercourse Slope, (s)		ft./ft.			ft./ft.			ft./ft.
10. Average Velocity, (V) (Vp = 20.683(s)^0.5) (Vup = 16.393(s)^0.5)	0.000	ft./s		0.000	ft./s		0.000	ft./s
11. Travel Time, (Tt) (Tt = L/3600V)	0.000	hr	+	0.000	hr	+	0.000	hr

Watershed or Subarea Tc or Tt = **0.016 hr**

or **0.95 min**

Channel Flow

	Existing Earth		Pipe		Rock Channel	
12. Cross Sectional Flow Area, (a)		ft.^2		ft.^2	78.00	ft.^2
13. Wetted Perimeter, Pw		ft.		ft.	31.80	ft.
14. Hydraulic Radius, (r) (r = a/Pw)	#DIV/0!	ft.	#DIV/0!	ft.	2.453	ft.
15. Channel Slope, (s)		ft./ft.		ft./ft.	0.0020	ft./ft.
16. Manning's Roughness Coeff., (n)					0.035	
17. Velocity, (V) (V = [1.486*r^(2/3)*s^(1/2)]/n)	#DIV/0!	ft./s	#DIV/0!	ft./s	3.453	ft./s
18. Flow Length, (L)		ft.		ft.	196.80	ft.
19. Travel Time, (Tt) (Tt = L/3600V)	0.000	hr +	0.000	hr +	0.016	hr

P2 is from NOAA Precipitation Depths Table in Appendices
Manning's n from IDM Figures

TIME OF CONCENTRATION or TRAVEL TIME WORKSHEET

Project: Hopewell West

Designer: DJC **Date:** 2/26/2024

Str 30 to Str 36A

Sheet Flow

1. Surface Description								
2. Manning's Roughness Coeff., (n)								
3. Flow Length, (L) **total L<= 100 ft		ft.			ft.			ft.
4. Two-yr 24-hr Rainfall, (P2)		in.			in.			in.
5. Land Slope, (s)		ft./ft.			ft./ft.			ft./ft.
6. Travel Time, (Tt) (Tt = [0.007(nL)^0.8]/[P2^0.5*s^0.4])	0.000	hr	+	0.000	hr	+	0.000	hr

Shallow Concentrated Flow

7. Surface Description (paved or unpaved)									
8. Flow Length, (L)		ft.			ft.			ft.	
9. Watercourse Slope, (s)		ft./ft.			ft./ft.			ft./ft.	
10. Average Velocity, (V) (Vp = 20.683(s)^0.5) (Vup = 16.393(s)^0.5)	0.000	ft./s		0.000	ft./s		0.000	ft./s	Watershed or Subarea Tc or Tt = 0.010 hr
11. Travel Time, (Tt) (Tt = L/3600V)	0.000	hr	+	0.000	hr	+	0.000	hr	or 0.60 min

Channel Flow

	Existing Earth			Pipe			Rock Channel	
12. Cross Sectional Flow Area, (a)		ft.^2			ft.^2		78.00	ft.^2
13. Wetted Perimeter, Pw		ft.			ft.		31.80	ft.
14. Hydraulic Radius, (r) (r = a/Pw)	#DIV/0!	ft.		#DIV/0!	ft.		2.453	ft.
15. Channel Slope, (s)		ft./ft.			ft./ft.		0.0020	ft./ft.
16. Manning's Roughness Coeff., (n)							0.035	
17. Velocity, (V) (V = [1.486*r^(2/3)*s^(1/2)]/n)	#DIV/0!	ft./s		#DIV/0!	ft./s		3.453	ft./s
18. Flow Length, (L)		ft.			ft.		123.90	ft.
19. Travel Time, (Tt) (Tt = L/3600V)	0.000	hr	+	0.000	hr	+	0.010	hr

P2 is from NOAA Precipitation Depths Table in Appendices
Manning's n from IDM Figures

Inlet Comp Worksheet **Project** **Hopewell West** **Computed By:** **DJC** **Date** **2/21/2023**

Pavement Roughness Coefficient - n = 0.013 Adjacent Lane Width = Varies Gutter width = 0 ft d-cf = depth at curb face d-ce = depth at casting edge

Inlet Intake Formulas: for slopes equal or greater than 1% the Neenah method is used; for slopes less than 1% the Weir equation method is used FA = Area of Flow over Casting's width

Turnout Intake Formulas: taken from HERPICC Stormwater Drainage Manual - Chapter 5 Section 3.2 (Curb Inlets)

Inlet Casting Information			
Type	Width (ft)	Length (ft)	P (ft)
15	1.83	3.48	7.14

Depressed Curb Inlet Weir Coefficient (Cw) = 2.3

Location		Gutter Discharge Design Frequency = 10 yr.									Gutter Discharge Allowable Spread = Varies (see plans)									Grate/Combination Inlets Only														Curb Turnouts Only				
																				Inlet Information			Weir Condition, SL <1%				SL>1%	On Grade		Sag		Intake	Runby				
Inlet no	Station	DA - Imper (sqft)	C pave	DA - grass (sqft)	C grass	Area (Ac)	Comp Coeff (C)	Tc (min)	Intensity (i) in/hr	Q=CiA (cfs)	SL (%)	ST (S) (%)	Prev. Runby (cfs)	Tot. Gutter Flow (cfs)	Spread (T)	Depth (d) d-cf (ft)	Depth (d) d-ce (ft)	Flow Area (sqft)	V (ft/s)	Inlet Casting	Width of Opening (ft)	Length of Opening (ft)	FA (sqft)	Qi (cfs) Cast Width	Qi (cfs) Cast Length	Qwi (cfs) Total		Qni (cfs) Total	Qi (cfs)	Qr (cfs)	P (ft)	Qi (cfs)	Qi (cfs)	Qr (cfs)	Inlet No.	Allowable Spread (ft)	Notes
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Fairview W Curb																																					
16A		1603	0.82	965	0.21	0.06	0.59	5.00	7.45	0.26	1.00%	2.00%	0.00	0.26	4.0	0.08	0.04	0.16	1.60	15	1.83	3.48						0.23	0.23	0.03					16A	16.5	
18A		4540	0.82	3891	0.21	0.19	0.54	5.00	7.45	0.78	5.00%	2.00%	0.00	0.78	4.5	0.09	0.05	0.20	3.85	15	1.83	3.48						0.61	0.61	0.16					18A	16.5	
18B		421	0.82	46	0.21	0.01	0.76	5.00	7.45	0.06	5.00%	2.00%	0.16	0.22	2.8	0.06	0.02	0.08	2.82	15	1.83	3.48						0.21	0.21	0.02					18B	7	
15B		15997	0.82	17107	0.21	0.76	0.50	5.00	7.45	2.86	4.31%	2.00%	0.02	2.87	7.5	0.15	0.11	0.57	5.05	15	1.83	3.48						1.65	1.65	1.23					15B	16.5	
15A		250	0.82	92	0.21	0.01	0.66	5.00	7.45	0.04	4.31%	2.00%	1.23	1.26	5.5	0.11	0.07	0.31	4.12	15	1.83	3.48						0.89	0.89	0.38					15A	16.5	
13A		20121	0.82	8132	0.21	0.65	0.64	5.00	7.45	3.11	2.57%	2.00%	0.38	3.49	8.9	0.18	0.14	0.80	4.37	15	1.83	3.48						1.86	1.86	1.63					13A	10.5	
13B		311	0.82	56	0.21	0.01	0.73	5.00	7.45	0.05	2.57%	2.00%	1.63	1.68	6.8	0.14	0.10	0.46	3.64	15	1.83	3.48						1.17	1.17	0.51					13B	10.5	
Fairview E Curb																																					
16B		2673	0.82	501	0.21	0.07	0.72	5.00	7.45	0.39	1.00%	2.00%	0.00	0.39	4.7	0.09	0.06	0.22	1.78	15	1.83	3.48						0.33	0.33	0.06					16B	16.5	
17A		2253	0.82	398	0.21	0.06	0.73	5.00	7.45	0.33	5.00%	2.00%	0.00	0.33	3.3	0.07	0.03	0.11	3.11	15	1.83	3.48						0.30	0.30	0.03					17A	16.5	
18C		4186	0.82	1821	0.21	0.14	0.64	5.00	7.45	0.65	5.00%	2.00%	0.03	0.68	4.3	0.09	0.05	0.18	3.73	15	1.83	3.48						0.55	0.55	0.14					18C	16.5	
18D		910	0.82	101	0.21	0.02	0.76	5.00	7.45	0.13	5.00%	2.00%	0.14	0.27	3.0	0.06	0.02	0.09	2.95	15	1.83	3.48						0.25	0.25	0.02					18D	7	
15D		3878	0.82	725	0.21	0.11	0.72	5.00	7.45	0.57	4.31%	2.00%	0.02	0.59	4.2	0.08	0.05	0.17	3.40	15	1.83	3.48						0.82	0.82	0.00					15D	16.5	
15C		319	0.82	83	0.21	0.01	0.69	5.00	7.45	0.05	4.31%	2.00%	0.00	0.05	1.6	0.03	0.00	0.03	1.81	15	1.83	3.48						0.32	0.32	0.00					15C	16.5	
10A		5309	0.82	978	0.21	0.14	0.73	5.00	7.45	0.78	2.57%	2.00%	0.00	0.78	5.1	0.10	0.07	0.26	3.01	15	1.83	3.48						0.62	0.62	0.16					10A	16.5	
13C		2899	0.82	729	0.21	0.08	0.70	5.00	7.45	0.43	2.57%	2.00%	0.16	0.59	4.6	0.09	0.06	0.21	2.81	15	1.83	3.48						0.51	0.51	0.08					13C	10.5	
S Jackson E Curb																																					
19A		2376	0.82	533	0.21	0.07	0.71	5.00	7.45	0.35	4.39%	2.00%	0.00	0.35	3.4	0.07	0.03	0.12	3.01	15	1.83	3.48						0.31	0.31	0.04					19A	16.5	
20A		250	0.82	71	0.21	0.01	0.69	5.00	7.45	0.04	1.08%	2.00%	0.00	0.04	1.9	0.04	0.00	0.04	1.02	15	1.83	3.48						0.04	0.04	0.00					20A	16.5	
21A		2977	0.82	336	0.21	0.08	0.76	5.00	7.45	0.43	1.53%	2.00%	0.00	0.43	4.5	0.09	0.05	0.20	2.13	15	1.83	3.48						0.37	0.37	0.06					21A	16.5	
S Jackson W Curb																																					
19B		5548	0.82	1062	0.21	0.15	0.72	5.00	7.45	0.82	4.39%	2.00%	0.00	0.82	4.7	0.09	0.06	0.22	3.72	15	1.83	3.48						0.63	0.63	0.18					19B	16.5	
20B		303	0.82	91	0.21	0.01	0.68	5.00	7.45	0.05	1.08%	2.00%	0.00	0.05	2.1	0.04	0.00	0.04	1.07	15	1.83	3.48						0.05	0.05	0.00					20B	16.5	
21B		5496	0.82	2225	0.21	0.18	0.64	5.00	7.45	0.85	1.53%	2.00%	0.00	0.85	5.8	0.12	0.08	0.34	2.53	15	1.83	3.48						0.63	0.63	0.22					21B	16.5	
N Jackson W Curb																																					
40B		12775	0.82	12000	0.21	0.57	0.52	5.00	7.45	2.22	6.44%	2.00%	0.00	2.22	6.4	0.13	0.09	0.40	5.51	15	1.83	3.48						1.40	1.40	0.82					40B	16.5	
40A		204	0.82	93	0.21	0.01	0.63	5.00	7.45	0.03	6.44%	2.00%	0.82	0.85	4.4	0.09	0.05	0.20	4.34	15	1.83	3.48						0.67	0.67	0.18					40A	16.5	
N Jackson E Curb																																					
39A		2977	0.82	442	0.21	0.08	0.74	5.00	7.45	0.43	6.44%	2.00%	0.00	0.43	3.4	0.07	0.03	0.12	3.66	15	1.83	3.48						0.38	0.38	0.05					39A	16.5	
40C		3851	0.82	1823	0.21	0.13	0.62	5.00	7.45	0.61	6.44%	2.00%	0.05	0.66	4.0	0.08	0.04	0.16	4.07	15	1.83	3.48						0.54	0.54	0.12					40C	16.5	
Univerity N Curb																																					
26		8991	0.82	322	0.21	0.21	0.80	5.00	7.45	1.27	2.53%	1.33%		1.27	7.9	0.11	0.08	0.42	3.05	15	1.83	3.48						0.52	0.52	0.75					26	9.5	
31A		22486	0.82	4497	0.21	0.62	0.72	5.00	7.45	3.32	8.50%	2.00%	0.75	4.07	7.6	0.15	0.11	0.57	7.11	15	1.83	3.48						1.96	1.96	2.10					31A	9.5	
32A		1810	0.82	0	0.21	0.04	0.82	5.00	7.45	0.25	8.50%	2.00%	2.10	2.36	6.2	0.12	0.09	0.38	6.21	15	1.83	3.48						1.33	1.33	1.03					32A	9.5	
34		1833	0.82	0	0.21	0.04	0.82	5.00	7.45	0.26	8.50%	2.00%	1.03	1.28	4.9	0.10	0.06	0.24	5.33	15	1.83	3.48						0.76	0.76	0.52					34	9.5	
Univerity S Curb																																					
27		8184	0.82	5780	0.21	0.32	0.57	5.00	7.45	1.36	2.53%	1.33%		1.36	8.1	0.11	0.08	0.44	3.10	15	1.83	3.48						0.63	0.63	0.73					27	9.5	
31B		2987	0.82	234	0.21	0.07	0.78	5.00	7.45	0.43	8.50%	2.00%	0.73	1.15	4.7	0.09	0.06	0.22	5.19	15	1.83	3.48						0.38	0.38	0.78					31B	9.5	
32B		914	0.82	0	0.21	0.02	0.82	5.00	7.45	0.13	8.50%	2.00%	0.78	0.91	4.3	0.09	0.05	0.19	4.89	15	1.83	3.48						0.07	0.07	0.84					32B	9.5	
33		1319	0.82	0	0.21	0.03	0.82	5.00	7.45	0.18	8.50%	2.00%	0.84	1.02	4.5	0.09	0.05	0.20	5.04	15	1.83	3.48						0.03	0.03	0.99					33	9.5	
NE Alley																																					
42B		5346	0.82	753	0.21	0.14	0.74	5.00	7.45	0.78	6.68%	2.00%	0.00	0.78	4.3	0.09	0.05	0.18	4.30	15	1.83	3.48						0.62	0.62	0.15					42B	6	
42A		4530	0.82	613	0.21	0.12	0.75	5.00	7.45	0.66	6.68%	2.00%	0.00	0.66	4.0	0.08	0.04	0.16	4.12	15	1.83	3.48						0.55	0.55	0.11					42A	6	
SW Alley																																					
23A		2856	0.82	346	0.21	0.07	0.75	5.00	7.45	0.41	3.25%	2.00%	0.00	0.41	3.8	0.08	0.04	0.15	2.80	15	1.83	3.48						0.35	0.35	0.06					23A	6	
24A		2010	0.82	194	0.21	0.05	0.77	5.00	7.45	0.29	3.25%	2.00%	0.06	0.35	3.6	0.07	0.04	0.13	2.68	15	1.83	3.48						0.31	0.31	0.04					24A	6	
25A		3089	0.82	382	0.21	0.08	0.75	5.00	7.45	0.45	3.25%	2.00%	0.04	0.49	4.1	0.08	0.05	0.17	2.92	15	1.83	3.48						0.41	0.41	0.07					25A	6	
23B		6317	0.82	957	0.21	0.17	0.74	5.00	7.45	0.92	3.25%	2.00%	0.00	0.92	5.2	0.10	0.07	0.27	3.42	15	1.83	3.48						0.69	0.69	0.24					23B	6	
24B		6504	0.82	987	0.21	0.17	0.74	5.00	7.45	0.95	3.25%	2.00%	0.24	1.18	5.7	0.11	0.08	0.32	3.64	15	1.83	3.48						0.83	0.83	0.35					24B	6	
25B		7332	0.82	1131	0.21	0.19	0.74	5.00	7.45	1.07	3.25%	2.00%	0.35	1.42	6.1	0.12	0.09	0.37	3.81	15	1.83	3.48						0.96	0.96	0.46					25B	6	2
NW Alley																																					
11B		19965	0.82	3770	0.21	0.54	0.72	5.00	7.45	2.94	4.08%	2.00%	0.00	2.94	7.7	0.15	0.12	0.59	4.98	15	1.83	3.48						1.42	1.42	1.51					11B	10.5	
11A		2899	0.82	729	0.21	0.08	0.70	5.00	7.45	0.43	4.08%	2.00%	0.00	0.43	3.7	0.07	0.04	0.14	3.08	15	1.83	3.48						0.37	0.37	0.06					11A	10.5	

NOTES:

1 **Local street spread limit requires 8.0' travel lane (width/2-4)**
Structure X = 41/2 - 4 = 16ft.
Structure X = 29/2 - 4 = 10.5ft.
Structure X = 27/2 - 4 = 9.5ft.
Structure X = 22/2 - 4 = 7ft.
Structure X = 20/2 - 4 = 6ft.

2 **Spread exeeds calculated limit for Structure 25B. However, Spread from 25A is less than the limit allowing a travel lane of 8ft between the inlets.**

Route: Hopewell West | Conc. Pipe Manning's n = 0.013 | Project: Hopewell West | Computed By: DJC | Date: 4/19/2024

Location		Proposed Pipe Hydraulics																						Contributes to Structure
Str. No.	Station	Structure Type	Pipe Diameter (in.)	Pipe Length (ft)	Weighted C	A (ac.)	CA	CA Previous	CA Total	Time in Pipe (min.)	Time of Concentration, Tc (min.)	Rain Intensity, I10 (in./h)	Q10 = CIA (cfs)	Rain Intensity, I100 (in./h)	Q100 = CIA (cfs)	Pipe Slope (%)	Vmax (fps)	Qmax (cfs)	Q10 Eff. (%)	Q100 Eff. (%)	Upstream Elev.	Downstream Elev.	Rim Elev.	
1	2	3	4	5.0	6a	6b	6	7	8	9a	9b	10	11	12	13	14	15	16	17	17a	18	19	20	21
11A		Inlet	12	25.6	0.7599	0.1276	0.097		0.097	0.13	5.00	7.45	0.72	10.42	1.26	0.50%	3.22	2.53	29%	50%	767.12	767.00	770.12	11B
11C		Inlet	12	19.4	0.3599	0.0678	0.024		0.024	0.03	5.00	7.45	0.18	10.42	0.32	4.50%	9.65	7.58	2%	4%	769.30	768.43	771.95	11B
11B		Inlet	15	159.3	0.7231	0.5449	0.394	0.121	0.515	0.71	5.13	7.40	3.82	10.35	6.67	0.50%	3.73	4.58	83%	146%	767.00	766.20	770.31	12
10A		Inlet	12	9.4	0.7251	0.1443	0.105		0.105	0.05	5.00	7.45	0.78	10.42	1.36	0.50%	3.22	2.53	31%	54%	774.61	774.57	777.61	10
10		Manhole	12	35.0			0.000	0.105	0.105	0.09	5.05	7.43	0.78	10.39	1.36	2.00%	6.43	5.05	15%	27%	774.57	773.87	778.21	12
12		Manhole	15	43.3			0.000	0.620	0.620	0.19	5.84	7.16	4.44	9.98	7.74	0.50%	3.73	4.58	97%	169%	765.20	764.33	777.09	13
13A		Inlet	15	8.0	0.6444	0.6486	0.418		0.418	0.04	5.00	7.45	3.11	10.42	5.44	0.50%	3.73	4.58	68%	119%	772.04	772.00	775.19	13B
13B		Inlet	15	27.7	0.7269	0.0084	0.006	0.418	0.424	0.09	5.04	7.44	3.15	10.40	5.51	1.00%	5.28	6.48	49%	85%	771.90	771.62	775.00	13C
13C		Inlet	15	16.1	0.6974	0.0833	0.058	0.424	0.482	0.05	5.12	7.41	3.57	10.36	6.24	1.00%	5.28	6.48	55%	96%	771.52	771.36	775.14	13
13		Manhole	15	29.6			0.000	1.102	1.102	0.07	6.04	7.10	7.82	9.88	13.62	2.00%	7.46	9.16	85%	149%	764.33	763.74	775.85	WQU1
WQU1		Manhole	18	26.4			0.000	1.102	1.102	0.07	6.10	7.07	7.80	9.85	13.57	1.00%	5.96	10.53	74%	129%	763.74	763.48	772.87	14
15A		Inlet	12	8.0	0.6559	0.0079	0.005		0.005	0.04	5.00	7.45	0.04	10.42	0.07	0.50%	3.22	2.53	2%	3%	778.17	778.13	781.07	15B
15B		Inlet	15	34.2	0.5048	0.7600	0.384	0.005	0.389	0.15	5.04	7.44	2.89	10.40	5.05	0.50%	3.73	4.58	63%	110%	778.13	777.96	781.41	15D
15C		Inlet	12	8.0	0.6941	0.0092	0.006		0.006	0.03	5.00	7.45	0.05	10.42	0.08	1.00%	4.55	3.57	1%	2%	778.17	778.09	781.07	15D
15D		Inlet	15	9.4	0.7239	0.1057	0.076	0.395	0.472	0.04	5.19	7.38	3.48	10.32	6.08	0.50%	3.73	4.58	76%	133%	777.96	777.91	781.41	15
15		Manhole	15	101.9			0.000	0.472	0.472	0.46	5.24	7.37	3.48	10.30	6.07	0.50%	3.73	4.58	76%	133%	777.91	777.40	782.01	28
16A		Inlet	12	34.6	0.5908	0.0590	0.035		0.035	0.18	5.00	7.45	0.26	10.42	0.45	0.50%	3.22	2.53	10%	18%	791.15	790.97	794.15	16B
16B		Inlet	12	9.3	0.7237	0.0729	0.053	0.035	0.088	0.05	5.18	7.39	0.65	10.33	1.13	0.50%	3.22	2.53	26%	45%	790.97	790.93	794.13	16
16		Manhole	12	130.0			0.000	0.088	0.088	0.67	5.23	7.37	0.65	10.30	1.13	0.50%	3.22	2.53	26%	45%	790.93	790.28	794.74	17
17A		Inlet	12	9.3	0.7284	0.0609	0.044		0.044	0.05	5.00	7.45	0.33	10.42	0.58	0.50%	3.22	2.53	13%	23%	790.48	790.44	793.48	17
17		Manhole	12	151.2			0.000	0.132	0.132	0.26	5.90	7.14	0.94	9.96	1.64	4.50%	9.65	7.58	12%	22%	789.98	783.17	794.09	18
18A		Inlet	12	16.3	0.5385	0.1935	0.104		0.104	0.04	5.00	7.45	0.78	10.42	1.36	2.00%	6.43	5.05	15%	27%	783.68	783.36	786.76	18B
18B		Inlet	12	21.0	0.7599	0.0107	0.008	0.104	0.112	0.11	5.04	7.44	0.84	10.40	1.46	0.50%	3.22	2.53	33%	58%	783.36	783.25	786.41	18D
18C		Inlet	12	27.0	0.6351	0.1379	0.088		0.088	0.06	5.00	7.45	0.65	10.42	1.14	3.00%	7.88	6.19	11%	18%	784.06	783.25	787.14	18D
18D		Inlet	12	16.0	0.7591	0.0232	0.018	0.200	0.218	0.08	5.15	7.40	1.61	10.34	2.81	0.50%	3.22	2.53	64%	111%	783.25	783.17	786.31	18
18		Manhole	12	59.3			0.000	0.349	0.349	0.28	6.16	7.05	2.47	9.82	4.29	0.60%	3.52	2.77	89%	155%	782.17	781.82	786.19	28
28		Manhole	18	162.7			0.000	0.821	0.821	0.64	6.44	6.96	5.71	9.68	9.93	0.50%	4.21	7.45	77%	133%	777.40	776.59	785.89	29
29		Manhole	18	130.5			0.000	0.821	0.821	0.36	7.09	6.74	5.53	9.34	9.59	1.00%	5.96	10.53	53%	91%	776.59	775.28	782.12	30
26		Inlet	12	7.1	0.7989	0.2138	0.171		0.171	0.03	5.00	7.45	1.27	10.42	2.22	1.00%	4.55	3.57	36%	62%	776.10	776.03	779.10	30
30		Manhole	18	96.7			0.000	0.992	0.992	0.19	7.45	6.62	6.56	9.16	11.35	2.05%	8.53	15.08	44%	75%	775.28	773.30	779.21	Out
19A		Inlet	12	35.3	0.7082	0.0668	0.047		0.047	0.18	5.00	7.45	0.35	10.42	0.62	0.50%	3.22	2.53	14%	24%	774.07	773.89	777.07	19B
19B		Inlet	12	9.1	0.7220	0.1517	0.110	0.047	0.157	0.05	5.18	7.39	1.16	10.33	2.02	0.50%	3.22	2.53	46%	80%	773.89	773.85	777.07	19
19		Manhole	12	155.7			0.000	0.157	0.157	0.81	5.23	7.37	1.16	10.30	2.02	0.50%	3.22	2.53	46%	80%	773.85	773.07	777.69	20
20A		Inlet	12	34.6	0.6851	0.0074	0.005		0.005	0.13	5.00	7.45	0.04	10.42	0.07	1.00%	4.55	3.57	1%	2%	777.35	777.01	780.35	20B
20B		Inlet	12	27.4	0.6791	0.0090	0.006	0.005	0.011	0.10	5.13	7.41	0.08	10.35	0.14	1.00%	4.55	3.57	2%	4%	777.01	776.73	780.18	20
23A		Inlet	12	16.7	0.7541	0.0735	0.055		0.055	0.09	5.00	7.45	0.41	10.42	0.72	0.50%	3.22	2.53	16%	29%	786.74	786.66	789.74	23B
23B		Inlet	12	90.9	0.7397	0.1670	0.124	0.212	0.336	0.18	5.09	7.42	2.49	10.38	4.36	3.30%	8.26	6.49	38%	67%	786.66	783.66	789.73	24B
24A		Inlet	12	16.7	0.7663	0.0506	0.039		0.039	0.06	5.00	7.45	0.29	10.42	0.51	1.00%	4.55	3.57	8%	14%	783.79	783.66	786.79	24B
24B		Inlet	12	91.4	0.7396	0.1720	0.127	0.375	0.502	0.16	5.27	7.36	3.69	10.28	6.45	4.30%	9.43	7.41	50%	87%	783.66	779.73	786.78	25B
25A		Inlet	12	16.7	0.7529	0.0797	0.060		0.060	0.06	5.00	7.45	0.45	10.42	0.78	1.00%	4.55	3.57	13%	22%	779.82	779.73	782.82	25B
25B		Inlet	12	48.2	0.7385	0.1943	0.143	0.562	0.705	0.09	5.43	7.30	5.15	10.20	8.99	4.30%	9.43	7.41	70%	121%	779.73	777.66	782.81	20
20		Manhole	18	57.9			0.000	0.716	0.716	0.23	5.52	7.27	5.21	10.15	9.09	0.50%	4.21	7.45	70%	122%	773.07	772.78	780.96	21
21A		Inlet	12	44.6	0.7581	0.0761	0.058		0.058	0.16	5.00	7.45	0.43	10.42	0.75	1.00%	4.55	3.57	12%	21%	775.76	775.31	778.76	21B
21B		Inlet	12	4.3	0.6442	0.1772	0.114	0.058	0.172	0.02	5.16	7.39	1.27	10.34	2.22	1.00%	4.55	3.57	36%	62%	775.31	775.27	778.76	21
21		Manhole	18	62.9			0.000	0.888	0.888	0.25	5.75	7.20	6.39	10.04	11.14	0.50%	4.21	7.45	86%	150%	772.78	772.47	779.30	22
27		Inlet	12	33.3	0.5675	0.3206	0.182		0.182	0.12	5.00	7.45	1.36	10.42	2.37	1.00%	4.55	3.57	38%	66%	775.74	775.41	778.74	22
22		Manhole	21	67.5			0.000	1.070	1.070	0.24	5.99	7.11	7.61	9.91	13.25	0.50%	4.67	11.23	68%	118%	772.47	772.13	779.26	Out
39A		Inlet	12	43.7	0.7411	0.0785	0.058		0.058	0.23	5.00	7.45	0.43	10.42	0.76	0.50%	3.22	2.53	17%	30%	768.10	767.88	771.10	39
39		Manhole	12	135.1			0.000	0.058	0.058	0.23	5.23	7.37	0.43	10.30	0.75	4.50%	9.65	7.58	6%	10%	764.78	758.70	771.71	40
40A		Inlet	12	34.6	0.6240	0.1303	0.081		0.081	0.13	5.00	7.45	0.61	10.42	1.06	1.00%	4.55	3.57	17%	30%	758.11	757.77	761.11	40C
40B		Inlet	12	8.0	0.5245	0.5688	0.298		0.298	0.03	5.00	7.45	2.22	10.42	3.89	1.00%	4.55	3.57	62%	109%	757.85	757.77	761.70	40C
40B		Inlet	12	9.2	0.6290	0.0068	0.004	0.380	0.384	0.03	5.03	7.44	2.86	10.40	4.99	1.00%	4.55	3.57	80%	140%	757.77	757.68	761.11	40
40		Manhole	12	43.3			0.000	0.442	0.442	0.07	5.46	7.29	3.22	10.18	5.63	4.50%	9.65	7.58	43%	74%	756.90	754.96	761.71	WQU2
WQU2		Manhole	12	26.0			0.000	0.442	0.442	0.10	5.53	7.27	3.21	10.14	5.61	1.00%	4.55	3.57	90%	157%	754.96	754.70	758.96	41
42A		Inlet	12	16.4	0.7473	0.1181	0.088		0.088	0.06	5.00	7.45	0.66	10.42	1.15	1.00%	4.55	3.57	18%	32%	757.94	757.77	760.94	42B
42B		Inlet	12	117.8	0.7447	0.1400	0.104	0.088	0.192	0.20	5.06	7.43	1.43	10.39	2.50	4.50%	9.65	7.58	19%	33%	754.97	749.67	760.94	WQU3
WQU3		Manhole	12	28.0			0.000	0.192	0.192	0.10	5.26	7.36	1.42	10.28	2.47	1.00%	4.55	3.57	40%	69%	749.67	749.39	752.68	43
33A		Inlet	18	18.0	0.6548	0.5439	0.356	1.070	1.426	0.05	7.19	6.71	9.57	9.29	16.57	1.00%	5.96	10.53	91%	157%	757.08	756.84	-	33
31B		Inlet	12	66.4	0.7757	0.0739	0.057		0.057	0.08	5.00	7.45	0.43	10.42	0.75	8.49%	13.25	10.41	4%	7%	769.09	763.45	772.09	32B
32B		Inlet	12	74.3	0.8200	0.0210	0.017	0.057	0.075	0.09	5.08	7.42	0.55	10.38	0.97	8.83%	13.52	10.62	5%	9%	765.90	759.34	766.45	33
33		Inlet	21	31.4	0.8200	0.0303	0.025	1.501	1.526	0.08	7.24	6.69	10.21	9.27	17.67	1.00%	6.61	15.89	64%	111%	756.84	756.45	760.13	34
31A		Inlet	12	66.0	0.7183	0.6194	0.445		0.445	0.08	5.00	7.45	3.32	10.42	5.80	8.49%	13.25	10.41	32%	56%	768.51	762.91	771.51	31A
32A		Inlet	12	62.6	0.8200	0.0416	0.034	0.445	0.479	0.08	5.08	7.42	3.56	10.38	6.21	7.32%	12.31	9.66	37%	64%	765.36	760.78	765.91	34
34		Inlet	21	49.4	0.8200	0.0421	0.035	2.005	2.039	0.12	7.31	6.66	13.59	9.23	23.52	1.00%	6.61	15.89	86%	148%	756.45	755.95	760.58	35
36A		Inlet	18	27.8	0.5840	0.2304	0.135	0.992	1.126	0.08	8.24	6.35	7.15	8.75	12.32	1.00%	5.96	10.53	68%	117%	761.50	761.22	-	35
36		Manhole	24	13.2			0.000	3.166	3.166	0.03	8.32	6.32	20.01	8.71	34.46	1.00%	7.22	22.68	88%	152%	755.95	755.82	765.39	WQU4
WQU4		Manhole	24	8.8			0.000	3.166	3.166	0.02	8.35	6.31	19.98	8.69	34.40	1.00%	7.22	22.68	88%	152%	755.82	755.73	764.57	36

Erosion-Protection Method	Velocity, v (ft/s)
Revetment Riprap	≤ 6.5
Class 1 Riprap	$6.5 < v < 10$
Class 2 Riprap	$10 \leq v \leq 13$
Energy Dissipator	> 13

Note: If clear-zone or other issues prohibit the use of the required erosion-protection method, the Office of Hydraulics should be contacted for additional instructions.

STREAM VELOCITY FOR EROSION PROTECTION

Figure 203-2D