PLANNING BOARD

Tuesday, February 18, 2025 at 6:00 PM

Landis Board Room

AGENDA

PLEASE SILENCE ALL CELL PHONES

1. INTRODUCTION:

1.1 Call Meeting to Order

1.2 Determination of Quorum

1.3 Pledge of Allegience

1.4 Recognitions and Acknowledgements

1.5 Adoption of Agenda

2. APPROVAL OF MINUTES FOR MEETING(S):

2.1 Consider Approval of Meeting Minutes from January 21, 2025 and January 28, 2025

3. NEW BUSINESS:

3.1 Consider Discussion of New Street Sign Logo

4. OLD BUSINESS:

4.1 Consider an Ordinance Amending the Landis Development Ordinance - Certain Uses in Main Street District

4.2 Consider Discussion of Corrections to Plans for Landis Multifamily from TRC Review

4.3 Consider Discussion of Landis Ridge Phase 2-A TRC Final Review Comments

5. REPORTS:

5.1 Planning & Zoning Reports (Included in Packet)

6. CLOSING:

6.1 Adjournment

PLANNING BOARD

Tuesday, January 21, 2025 at 6:00 PM

Landis Board Room

MINUTES

PLEASE SILENCE ALL CELL PHONES

1. INTRODUCTION:

1.1 Call Meeting to Order

Madam Chair Catherine Drumm called the meeting to order at 6:01 PM

1.2 Determination of Quorum

Members Present: Catherine Drumm, Glenn Corriher, Scott Faw came in about 6:02 PM

Staff Present: Town Manager Michael Ambrose, Planning Director Phil Collins, Deputy Clerk/ Planning Technician Angie Sands, Assistant Chief of Police Kevin Young

Others Present: Phil Conrad

It was determined that we did not have quorum. Madam Chair Catherine Drumm rescheduled the meeting to Tuesday January 28, 2025, at 6:00 PM in the Landis Board Room.

1.3 Pledge of Allegience

1.4 Recognitions and Acknowledgements

1.5 Adoption of Agenda

2. APPROVAL OF MINUTES FOR MEETING(S):

2.1 Consider Approval of December 10, 2024, Meeting Minutes

3. OLD BUSINESS:

3.1 Consider an Ordinance Amending the Landis Development Ordinance - Certain Uses in Main Street District

4. NEW BUSINESS:

4.1 Consider Zoning Map Amendment - Monroy - North Cannon Boulevard

4.2 Consider Zoning Map Amendment -Town of Landis - 0 W Taylor Street - CIV - SFR-1

4.3 Consider Zoning Map Amendment - Mount Moriah Church Road - SFR-2 - SFR-3

REPORTS:

Planning & Zoning Reports (Included in Packet)

CLOSING:

Adjournment
Madam Chair Catherine Drumm adjourned the meeting at 6:02 PM.

PLANNING BOARD

Tuesday, January 28, 2025 at 6:00 PM

Landis Board Room

MINUTES

PLEASE SILENCE ALL CELL PHONES

1. INTRODUCTION:

1.1 Call Meeting to Order

Madam Chair Catherine Drumm called the meeting to order at 6:00 PM

1.2 Determination of Quorum

Members Present: Madam Chair Catherine Drumm, Member Beryl Alston, Member Mark Bringle, Member Glenn Corriher

Members Absent: Member Deborah Cox, Member Jade Bittle, Vice-Chair Scott Faw

Staff Present: Town Manager Michael Ambrose, Planning Director Phil Collins, Planning Technician/Deputy Town Clerk Angie Sands, Police Chief Matthew Geelen.

Others Present: Phil Conrad, Nadine Cherry, Joseph Keller and son.

1.3 Pledge of Allegiance

Madam Chair Catherine Drumm led those in attendance to the Pledge of Allegiance

1.4 Recognitions and Acknowledgements

Town Manager Michael Ambrose introduced the new Planning Director Phil Collins. He is a member of the staff and has been here almost a month. Phil comes from Cabarrus County, he is AIC certified and has a lot of experience.

1.5 Adoption of Agenda

A MOTION WAS MADE BY GLENN CORRIHER TO ADOPT THE AGENDA, SECONDED BY BERYL ALSTON, MOTION PASSED UNANIMOUSLY (4-0).

2. APPROVAL OF MINUTES FOR MEETING(S):

2.1 Consider Approval of December 10, 2024, Meeting Minutes

A MOTION WAS MADE BY MARK BRINGLE, SECONDED BY GLENN CORRIHER TO APPROVE THE DECEMBER 10, 2024, MEETING MINUTES, MOTION PASSED UNANIMOUSLY (4-0).

3. OLD BUSINESS:

3.1 Consider an Ordinance Amending the Landis Development Ordinance - Certain Uses in Main Street District

Madam Chair Catherine Drumm gave a brief description of the Development Ordinance. This ordinance will prevent anyone who buys or rents in the Main Street District from using the bottom floor as residential. Town Manager Michael Ambrose added that it would be from E. Mills all the way over to E. Garden on both sides, from the main street side, from W. Garden to S. Main Street. The lower level would be commercial.

Madam Chair Catherine Drumm asked if currently we would be looking at the entire main street district.

Town Manager Michael Ambrose stated that it would just be these corridors. E. Mills Street off S. Central over to N. Central and E. Garden, from W. Garden on Main Street, all the way to W. Rice. The reason it was put on hold is because the Parkdale site had not been sold. Now that it has been sold, we've been able to talk with some developers about what's proposed at that site, we feel comfortable bringing this back to the board to hopefully move forward.

A MOTION WAS MADE TO TABLE BY MARK BRINGLE, SECONDED BY BERYL ALSTON, MOTION PASSED UNANIMOUSLY (4-0).

4. NEW BUSINESS:

4.1 Consider Zoning Map Amendment - Monroy - North Cannon Boulevard

Planning Director Phil Collins gave a brief overview of Zoning Map Amendment Monroy – North Cannon Boulevard. Mr. Monroy came in on December 18, 2024 to inquire about getting this property annexed into the town.

Town Manager Micheal Ambrose added that the applicant is a young developer who wants to develop the property for commercial use. He is asking for a C-29 zoning, which is dedicated to 29 roadway for commercial use. As a department we believe that would be the most fitting to recommend to this board. He wants to be annexed into the town and then get the C-29 zoning.

A MOTION WAS MADE TO APPROVE ZONING MAP AMENDMENT – MONROY- NORTH CANNON BOULEVARD BY GLENN CORRIHER, SECONDED BY BERYL ALSTON, MOTION PASSED UNANIMOUSLY (4-0).

4.2 Consider Zoning Map Amendment - Town of Landis - 0 W Taylor Street – CIV SFR-1

Town Manager Michael Ambrose gave a brief overview of Zoning Map Amendment – Town of Landis – 0 Taylor Street – CIV – SFR-1. This is the Linn Community, and all those properties are all SFR-1. This property is less than an acre, and will not be able to have any kind of structure on it, unless it is combined with another property.

Planning Director Phil Collins gave a brief overview of the property and the surrounding properties and zonings.

Madam Chair Catherine Drumm asked the size of the property.

Planning Director Phil Collins answered .34 acres.

Madam Chair Catherine asked what the purpose would be for the property due to the size, nothing can be built on it.

Town Manager Michael Ambrose stated it would be to secure it.

A MOTION WAS MADE BY MARK BRINGLE, SECONDED BY GLENN CORRIHER TO APPROVE ZONING MAP AMENDMENT – TOWN OF LANDIS – 0 TAYLOR STREET – CIV- SFR-1, MOTION PASSED UNANIMOUSLY (4-0).

4.3 Consider Zoning Map Amendment - Mount Moriah Church Road - SFR-2 - SFR-3

Planning Director Phil Collins gave a brief overview of the property. The property is approximately 24.22 acres. It is currently planned for neighborhood residential development.

Town Manager Michael Ambrose stated that this is the same property that was recommended for MU-1 at another time and was zoned SFR-2, and is not asking for SFR-3 zoning. The applicant is here.

Joseph Keller stated that he loves the Town of Landis and looks forward to working with us. The Town Manager and the Board are easy to work with and it's great, more developers would love the way this town works.

A MOTION WAS MADE BY GLENN CORRIHER, SECONDED BY BERYL ALSTON TO APPROVE ZONING MAP AMENDMENT – MOUNT MORIAH CHURCH ROAD – SFR-2 – SFR-. MOTION PASSED UNANIMOUSLY (4-0).

REPORTS:

Monthly Report

Town Manager Michael Ambrose stated that this would be the last time that Code Enforcement Reports would be this way. Code Enforcement has been turned over to Police Chief Geelen and his operations, so they will be changed.

CLOSING:

Adjournment

A MOTION WAS MADE TO ADJOURN AT 6:19 PM, BY GLENN CORRIHER, SECONDED BY BERYL ALSTON, MOTION PASSED UNANIMOUSLY (4-0).

Respectfully Submitted,

_____

Deputy Clerk Angie Sands


TOWN OF
LANDIS
NORTH CAROLINA
W. HOKE ST
300

AN ORDINANCE AMENDING

THE "LANDIS DEVELOPMENT ORDINANCE"

OF THE TOWN OF LANDIS, NORTH CAROLINA

Ordinance Number ZTA-2023-12-11

WHEREAS, on May 10, 2021, the Town Board of Aldermen's newly adopted Landis Development Ordinance, also known as the LDO, became fully effective; and,

WHEREAS, the amendment of the LDO to incorporate up-to-date standards and specifications is both consistent with the adopted *Town Plan 2040* by continuing to meet the adopted goals of *Town Plan 2040* emphasizing Goal 7, Objective 7.2, Strategy 1; then,

THEREFORE, BE IT ORDAINED by the Town Board of Aldermen that the Landis Development Ordinance be amended as follows:

PART 1. "Article 8, Table 8.1, Section 1 – General Uses" is hereby amended to 1) revise the Main Street (MS) District uses to add conditions noted as "A (10.1-38)" where such entries appear below and 2) delete the symbol "L" for current listed uses where the MS column is left blank for uses as indicated by a yellow highlight without any symbols appearing therein as follows:

(This space left blank intentionally)

Table 8.1 - Table of Uses L=listed use S=special use A=use listed with additional standards Section 1 - General Uses of the following:	Main Street (MS)
Bed & Breakfast (incl. Tourist Home, Boarding House except when "Residential Tourist/temporary residence")	A (10.1-8) & A(10.1-38)
Communication or Broadcasting Facility, without Tower	A(10.1-38)
Dance School	A(10.1-38)
Day Care Center for Children or Adults (6 or more)	A (10.1-14) & A(10.1-38)
Day Care Center, Home Occupation for less than 6 children	A (10.1-15) & A(10.1-38)
Event and Wedding Venue	A(10.1-38)
Funeral Home without Crematorium	A(10.1-38)
Furniture Framing	A(10.1-38)
Group Care Facility	S (10.2-8) A (10.1-38)
Home Occupation	A (10.1-21) & A(10.1-38)
Hotel or Motel	A(10.1-38)
Laboratory, Medical or Dental	A(10.1-38)
Medical, Dental or Related Office	A(10.1-38)
Nursing Home, Assisted Living	A (10.1-25) & A(10.1-38)
Office Uses	
Accounting, Auditing or Bookkeeping Services	A(10.1-38)
Administrative or Management Services	A(10.1-38)
Advertising Agency	A(10.1-38)
Architect, Engineer or Surveyor's Office	A(10.1-38)
Dental, Medical or Related Office	A(10.1-38)
Employment Agency, Personnel Agency	A(10.1-38)
Finance or Loan Office	A(10.1-38)
Home Occupation	A (10.1-21) & A(10.1-38)
Insurance Agency (w/on-site claims inspections)	A(10.1-38)
Insurance Agency (without on-site claims inspections)	A(10.1-38)
Law Office	A(10.1-38)
Medical, Dental or Related Office	A(10.1-38)
Office Uses Not Otherwise Classified	A(10.1-38)
Real Estate Office	A(10.1-38)
Stock, Security or Commodity Broker	A(10.1-38)
Travel Agency	A(10.1-38)
Residential Uses (Dwellings)	
Dwelling, Accessory Unit	A(10.1-38)
Dwelling, Attached House (incl. term "Townhouse")	A(10.1-38)
Dwelling, Multifamily 8 Units or Less	A (10.1-24) & A(10.1-38)
Dwelling, Multifamily (apartments or condominiums)	A (10.1-24) & A(10.1-38)
Dwelling, Single-Family Detached, including Duplex (2-family), may also include Modular Construction	
Temporary Family Health Care Structure (per G.S. 160D-914(a)(5)	
Retreat Center	A(10.1-38)
Vocational, Business or Secretarial School	A(10.1-38)

PART 2. "Article 10, Section 10.1-38" is hereby established to read as follows:

10.1-38 Certain Uses in Main Street (MS) District

(A.) Within the Main Street (MS) Zoning District all uses bearing the symbol "A(10.1-38)" in Table 8.1, appearing in Article 8 of this Ordinance are listed; however, all properties of the MS district located within the blocks bounded by Central Avenue and Chapel Street between East Garden Street and East Ridge Avenue shall be subject to the additional standards appearing in Sub-section 10.1-38(B) below.

(B.) Standards applicable within the MS district located within the blocks bounded by Central Avenue and Chapel Street between East Garden Street and East Ridge Avenue:

(1.) Certain uses appearing in Article 8, Table 8.1 with the symbol "A(10.1-38)" as a use listed with additional standards shall meet the following standards:

(a.) Secondary use shall be situated on second or higher floor above adjacent grade as determined by the *Planning, Zoning & Subdivision Administrator*, whose determination shall be final.

(b.) Uses occupying basement and/or floors below grade may be principal and/or accessory uses to the principal use occupying the first floor above grade.

(c.) Secondary use shall have separate access to second or higher floor and distinguishable from principal use occupying first floor, not including basements and/or floors below grade.

(d.) Secondary use may utilize first floor for access to include, but not be limited to, lobby/reception, elevator(s), stairwell(s), etc. provided only security and reception personnel only may occupy the first floor above grade, provided that no such limited occupancy of the first floor shall exceed 600 sq. ft.

(2.) Projects establishing secondary use occupancy in accordance with these standards shall provide a copy of the terms of occupancy and use when multiple tenants occupy the same building when making application for a *Zoning Compliance Permit* in accordance with Article 7 of this Ordinance.

(3.) The permitted use provisions of this Article are not eligible for variance by the Board of Adjustment in accordance with NCGS 160D-705(d).

PART 3. "Article 10, Section 10.2-8(B)" is hereby amended to add a new provision 10.2-8(B)(4) to read as follows:

(4.) Provisions of 10.1-38 shall apply to properties within the MS District.

PART 4. This Ordinance shall be effective at 12:01 AM EST on December 12, 2023.

ADOPTED on this the 11th day of December 2023.

s/ _____ **s/** _____

Meredith Bare Smith, Mayor **Madison Stegall, Town Clerk**

AN ORDINANCE AMENDING

THE "LANDIS DEVELOPMENT ORDINANCE"

OF THE TOWN OF LANDIS, NORTH CAROLINA

Ordinance Number ZTA-2023-11-13

WHEREAS, on May 10, 2021 the Town Board of Aldermen's newly adopted Landis Development Ordinance, also known as the LDO, became fully effective; and,

WHEREAS, the amendment of the LDO to incorporate up-to-date stormwater standards and specifications is both consistent with the adopted *Town Plan 2040* by continuing to meet the adopted goals of *Town Plan 2040* emphasizing management of growth and reasonable because of the Town's need to achieve compliance with applicable federal mandates; and,

THEREFORE BE IT ORDAINED by the Town Board of Aldermen that the Landis Development Ordinance be amended as follows:

PART 1. **Articles 20 is hereby amended to read as it appears on the following pages:**

PART 2. **This Ordinance shall be effective at 12:01 AM EST on November 14, 2023.**

ADOPTED on this the 13th day of November 2023.

s/ _____ s/ _____

Meredith Bare Smith, Mayor **Madison Stegall, Town Clerk**

SUTHER ENGINEERING

Landis Multifamily Review Comments & Responses

Project: Lanids Multifamily

Planning Comments:

1. Show USPS Cluster Mailbox
    a. Added to Sheet C-3.0
2. Show FDC Connections
    a. Shown from MEP drawings onto C-3.0, C-5.0
3. Change "Setback" Label to "Build-To-Line" Label
    a. Changed on C-3.0 & Set
4. Call out open space on C-3.0 per LDO 21.2-1 (D) – 7500 SF
    a. Open space called out and shown C-3.0 and C-6.0
5. Call out open space improvements per 21.2-4 & 21.2-7(C)
    a. Shown & Called out on C-3.0 & C-6.0 as follows (4) Minimum
        i. Landscaping
        ii. Walks
        iii. Fences
        iv. Playground equipment

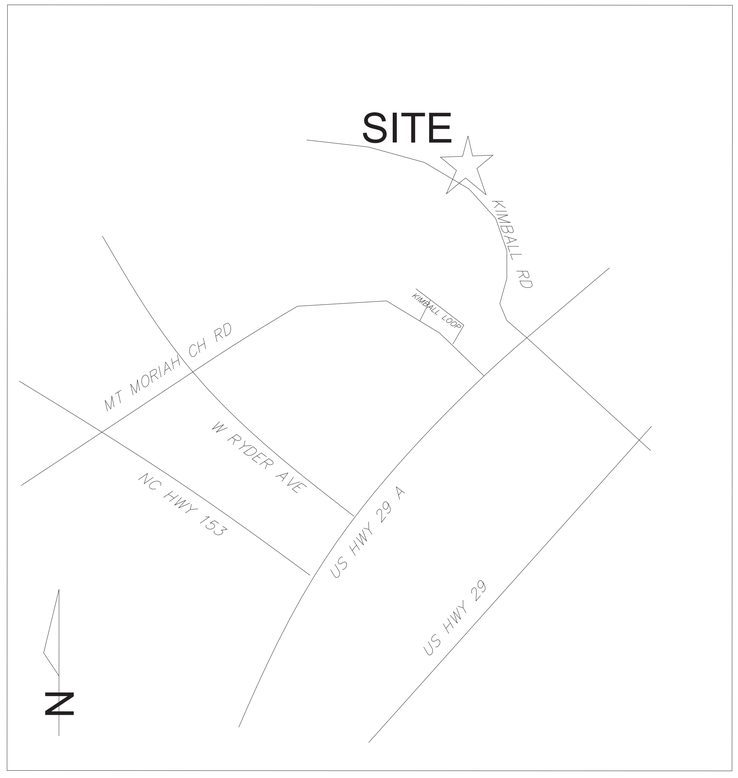
SITE DEVELOPMENT DRAWINGS

LANDIS MULTIFAMILY

COVER SHEET

ENGINEERS NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF WORK 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRICTION ACTIVITIES.
2. THE CONTRACTOR SHALL CONFIRM AT THE TIME OF NOTIFICATION TO THE ENGINEER OF THE COMMENCEMENT OF WORK THE CURRENT DRAWING REVISION AND DOCUMENTS. STATUS OF CURRENT PLANS FROM THE TOWN OF LANDIS AND RELEVANT JURISDICTIONS SHALL ALSO BE CONFIRMED PRIOR TO THE START OF CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN INTERPRETATIONS FOR ANY QUESTIONS REGARDING THESE DRAWINGS PRIOR TO COMMENCEMENT OF WORK OR ORDERING OF MATERIALS AND SHALL BEAR THE COST OF ALL REWORK IF NOT PROPERLY COORDINATED.
4. THE CONTRACTOR SHALL OBTAIN A PERMIT FOR ANY EXCAVATION PERFORMED WITHIN THE PUBLIC RIGHT OF WAY.
5. THE ENGINEER OF RECORD SHALL NOT BE RESPONSIBLE FOR THE ENFORCEMENT OF SAFETY MEASURES OR REGULATIONS. THE CONTRACTOR SHALL DESIGN, CONSTRUCT, AND MAINTAIN ALL SAFETY DEVICES AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE, AND FEDERAL SAFETY STANDARDS, LAWS AND REGULATIONS.
6. MEANS AND METHODS OF CONSTRUCTION SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ANY PROCESS, METHOD, OR ADDITIONAL DESIGN REQUIRED FOR THE INSTALLATION OF PROJECT ELEMENTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR PERFORMING THE WORK.
7. THE CONTRACTOR SHALL ADJUST ALL PROPOSED AND EXISTING FACILITIES TO FINAL DESIGN GRADE.
8. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN THE FIELD DATA AND THE INFORMATION SHOWN HEREIN. ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY WORK DONE WITHOUT PROPER NOTIFICATION AND COORDINATION.
9. THE ENGINEER PREPARING THESE PLANS SHALL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGED TO OR USES OF THESE PLANS. ALL CHANGES MUST BE IN WRITING AND MUST BE APPROVED BY THE DESIGN ENGINEER PRIOR TO IMPLEMENTATION.
10. PRIVATE WATER AND SANITARY SEWER SYSTEMS SHALL BE TESTED IN ACCORDANCE WITH N.C.D.E.N.R. REGULATIONS IN THE PRESENCE OF THE ENGINEER OR APPROPRIATE CITY INSPECTOR PRIOR TO ACTIVATION OF FACILITIES.
11. EXISTING SANITARY SEWER AND WATER SYSTEM SHOWN PER PROVIDED SURVEY AND SALISBURY REFERENCE DRAWINGS. EXISTING PUBLIC UTILITY INFORMATION IS SHOWN FOR REFERENCE ONLY AND EXISTING SIZES, INVERTS, AND LOCATIONS SHALL BE FIELD VERIFIED.
12. A LICENSED UTILITY CONTRACTOR OR APPLICABLE CITY PUBLIC WORKS WILL INSTALL THE TAPS AND METERS. THE AUTHORIZED CONTRACTOR PERFORMING THE WORK IS RESPONSIBLE FOR INSTALLING THE TAPS AND METERS TO KANNAPOLIS STANDARDS AND REGULATIONS.
13. SANITARY YARD HYDRANTS SHALL BE "STOP AND DRAIN", "STOP AND WASTE", OR "WEEP HOLE" TYPE HYDRANTS.
14. IF THE CONTRACTOR OPTS TO INSTALL PRECAST STRUCTURES, THE CONTRACTOR SHALL BE REQUIRED TO VERIFY RIM ELEVATION AND LAYOUT OF ALL PIPES , INCLUDING SIZE AND INVERTS OF EXISTING FACILITIES, PRIOR TO THE ORDERING OF MATERIALS.
15. IT SHALL BE THE RESPONSIBILITY OF THE INSTALLER TO ADJUST ALL PRECAST STRUCTURES TO FINISH GRADE IN ACCORDANCE WITH AGENCY SPECIFICATIONS AND MANUFACTURER RECOMMENDATIONS. NO ADDITIONAL PAYMENT WILL BE MADE FOR ADJUSTING FACILITIES TO FINISHED GRADES.
16. FIRE HYDRANTS SHALL BE 10' CLEAR OF ANY OBSTRUCTIONS.
17. FDC LOCATIONS SHALL BE IN ACCORDANCE WITH LANDIS FIRE DEPARTMENTS REQUIREMENTS.
18. FIRE SPRINKLER SIZING AND FDC CONNECTIONS (IF REQ) TO BE SIZED AND LOCATED PER THE RECOMMENDATION OF THE FIRE SPRINKLER CONSULTANT. ALL REFERENCE SHOWN HEREIN ARE FOR SCHEMATIC PURPOSES ONLY.
19. THE CONTRACTOR SHALL FLUSH AND CLEAN ALL ONSITE STORM DRAINAGE AND HAUL OFF ALL ACCUMULATED MATERIALS AT THE COMPLETION OF CONSTRUCTION. THE CONTRACTOR SHALL PROTECT DOWN STREAM PROPERTIES AND BMP INSTALLATIONS FROM EXCESSIVE SEDIMENT ACCUMULATION. UPOND COMPLETION OF CLEANING, CONTRACTOR SHALL PROVIDE WRITTEN CONFIRMATION TO THE OWNER AND REQUEST INSPECTION OF THE PROJECT BY THE ENGINEER FOR FINAL INSPECTIONS.



NTS VICINITY MAP

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, RULES, AND REGULATIONS.
2. NOTIFY NORTH CAROLINA 811 OR A PRIVATE UTILITY LOCATION SERVICE AT LEAST TWO FULL DAYS PRIOR TO COMMENCEMENT OF ANY EXCAVATION OR DEMOLITION ACTIVITY.
3. EXISTING UTILITY LINES AND UNDERGROUND FACILITIES, WHERE KNOWN, ARE INDICATED ON THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND IDENTIFYING IN THE FIELD ALL EXISTING UNDERGROUND UTILITIES, PIPELINES AND OTHER INSTALLATIONS PRIOR TO EXECUTING ANY EARTHWORKS OR EXCAVATIONS.
4. BOUNDARY AND TOPOGRAPHIC INFORMATION WAS OBTAINED FROM THE PLAT BOUNDARY REFERENCED AND ROWAN COUNTY DATA AVAILABLE IN THE PUBLIC DOMAIN, INTERNAL SURVEY INFORMATION, AND NORTH CAROLINA LIDAR INFORMATION AVAILABLE IN THE PUBLIC DOMAIN.
5. ARCHITECTURAL DIMENSIONS TO BE VERIFIED BY SURVEYOR. REFER TO ARCHITECTURAL PLANS FOR EXACT BUILDING DIMENSIONS.
6. THE SURVEYOR SHALL REPORT ANY ENCROACHMENTS OR DISCREPANCIES GENERATED BY THE SITE PLAN AGAINST ANY SITE DEVELOPMENT REQUIREMENTS SPECIFIED BY THE SITE PLAN TO THE OWNER, ARCHITECT, OR CIVIL ENGINEER PRIOR TO ANY ACTUAL CONSTRUCTION.
7. ALL STREET INTERSECTIONS, DRIVES, AND CURB GRADES SHALL BE COORDINATED WITH THE TOWN OF LANDIS INSPECTOR.
8. ALL ROAD IMPROVEMENTS ARE TO BE COORDINATED WITH THE TOWN OF LANDIS PLANNING / ENGINEERING DEPARTMENT AND / OR THE NCDOT PRIOR TO CONSTRUCTION.
9. IN ORDER TO ENSURE PROPER DRAINAGE, KEEP A MINIMUM OF 0.5% SLOPE ON THE CURBS.
10. CURB AND GUTTER SHOWN ON PLANS MAY BE ADJUSTED BASED UPON FIELD STAKING BY TOWN OF LANDIS ENGINEERING. ASSOCIATED STORM DRAINAGE MAY ALSO REQUIRE MODIFICATION BASED UPON FIELD CONDITIONS.
11. PE SEALED SHOP DRAWINGS FOR RETAINING WALLS MUST BE SUBMITTED TO THE TOWN PLANNER / ENGINEER AND COUNTY FOR PERMIT PRIOR TO CONSTRUCTION.
12. "AS-BUILT" DRAWINGS AND PLANS OF THE STORM DRAINAGE SYSTEM, INCLUDING DESIGNED DITCHES, MUST BE SUBMITTED PRIOR TO FINAL INSPECTION TO THE CITY/COUNTY ENGINEERING DEPARTMENT IN ACCORDANCE WITH THE TOWN OF LANDIS ORDINANCE.
13. PRIOR TO BUILDING CO, SURVEYOR SEALED "AS-BUILT" DRAWINGS OF ALL WATER QUALITY BMP'S AND DETENTION/RETENTION SYSTEMS MUST BE PROVIDED IF PRESENT IN THE DESIGN DOCS.
14. PRIOR TO PLAT RECORDATION, OFFSITE R/W AND/OR CONSTRUCTION EASEMENTS ARE REQUIRED TO BE OBTAINED.
15. ALL REQUIRED POST CONSTRICTION CONTROLS AND EASEMENTS (PCCES) MUST BE RECORDED PRIOR TO THE ISSUANCE OF THE CERTIFICATE OF OCCUPANCY.
16. ANY WORK WITHIN THE CITY OR STATE'S R/W THAT REQUIRES CLOSURE OF THE SIDEWALK OR TRAVEL LANES MUST BE APPROVED BY CONCORD OR NCDOT. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ANY CLOSURES.
17. ALL DIMENSIONS, ELEVATIONS AND COORDINATES ARE IN FEET UNLESS NOTED OTHERWISE. VERTICAL DATUM IS NAD 83.
18. CONTRACTOR SHALL FURNISH ALL EQUIPMENT AND TOOLS AND SHALL BE RESPONSIBLE FOR ACCURATELY LOCATING AND STAKING OUT THE WORK. BENCHMARKS AND REFERENCE LINES SHALL BE CAREFULLY MAINTAINED AND, IF DISTURBED OR DESTROYED, SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
19. CONTRACTOR SHALL PROVIDE ALL SURVEYING AND ENGINEERING SERVICES TO ESTABLISH REFERENCE POINTS, LINES AND GRADES TO CONTROL THE WORK, AND TO MEASURE EXCAVATION AND FILL QUANTITIES BY USE OF RECOGNIZED SURVEY PRACTICES.
20. IF NEEDED GEOTECHNICAL EXPLORATION REPORTS TO INCLUDE BORING AND SOILS DATA AND IS PROVIDED TO THE CONTRACTOR FOR USE. THE BORING LOGS AND TEST DATA SHOULD INDICATE THE CONDITIONS AT THE PARTICULAR LOCATIONS OF THE BORINGS OR TESTING LOCATIONS. IT SHALL NOT BE CONSTRUED THAT BORING LOGS AND OTHER TEST DATA INDICATE THE ACTUAL CONDITIONS THAT WILL BE ENCOUNTERED THROUGHOUT THE SITE. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY INTERPRETATION AND CONCLUSIONS, WHICH THEY MAY MAKE AS TO THE NATURE OF THE MATERIALS TO BE ENCOUNTERED AND THE DIFFICULTY OF PERFORMING THE WORK.
21. THE CONTRACTOR IS RESPONSIBLE FOR MONITORING AND TESTING THIER WORK TO ENSURE COMPLIANCE WITH THE PROJECT DOCUMENTS. ADDITIONAL TESTS AND INSPECTIONS PERFORMED BY THE OWNER/ENGINEER SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY TO CONFORM TO THE CONSTRUCTION DOCUMENTS.
22. CONTRACTOR SHALL PROVIDE ACCESS TO TESTING AGENCY TO PERFORM MATERIALS TESTING AND INSPECTIONS AND PROVIDE REASONABLE ASSISTANCE, WHEN NEEDED.
23. IF, IN THE JUDGMENT OF THE OWNER/ENGINEER, BASED ON TESTS, THE SUBGRADE OF FILL HAS BEEN PLACED BELOW THE SPECIFIED DENSITY, THE SUBCONTRACTOR WILL BE REQUIRED TO PROVIDE ADDITIONAL COMPACTION AND TESTING AT NO ADDITIONAL COSTS TO THE OWNER/ENGINEER. IN THE CASE OF THIS SITE COMPACTION REQUIREMENTS ARE TO BE SPECIFIED BY THE BUILDING DESIGNER.
24. ALL AREAS NOT SURFACED WITH ASPHALT, CONCRETE OR STONE SHALL BE COVERED WITH 4 INCHES OF COMPACTED TOPSOIL AND SHALL BE PERMANENTLY SEEDED WITHIN (7) CALENDAR DAYS OF ACHIEVING FINAL GRADE. SEE PERMANENT SEEDING NOTES FOR REQUIREMENTS.

PROJECT TEAM

OWNER/DEVELOPER:
DYNAMIC DEVELOPERS OF CAROLINAS LLC
210 OAK AVE
KANNAPOLIS, NC 28081

CIVIL ENGINEER:
SUTHER ENGINEERING PLLC
FIRM No. P-1946
1316 S. MAIN ST SUITE D
KANNAPOLIS, NC 28081

811 Know what's below. Call before you dig.

1. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR CONTACTING THE APPROPRIATE PARTIES AND ASSURING THAT EXISTING UTILITIES ARE LOCATED PRIOR TO BEGINNING CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR PLACING BARRICADES USING FLAGMEN, ETC., AS NECESSARY TO INSURE SAFETY TO THE PUBLIC.
3. ALL PAVEMENT CUTS, CONCRETE OR ASPHALT, ARE TO BE REPLACED ACCORDING TO STANDARDS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION.
4. SHORING WILL BE ACCORDING TO OSHA TRENCHING STANDARDS PART 1926 SUBPART P, OR AS AMENDED.

SHEET INDEX

SUTHER ENGINEERING
FIRM No. P-1946
1316 S. MAIN ST. STE D
KANNAPOLIS, NC 28081

John Suther 043895 ENGINEER JOHN E. SUTHER

SUBJECT PROPERTY INFO:

PARCEL ID(S):
123B119
DEED BOOK & PAGE:
DB: 1423 PG: 854
CURRENT ZONING:
MU-1 (LANDIS)
PROPERTY LOCATION:
LANDIS TOWNSHIP
ROWAN COUNTY
OWNER INFORMATION:
DYNAMIC DEVELOPERS OF THE CAROLINAS LLC
210 OAK AVE
KANNAPOLIS, NC 28081

PLAN NOTES:

1. PLAN NORTH IS BASED ON NAD83(2011)
2. GEODETIC MONUMENTS WERE SURVEYED AS SHOWN
3. ALL DISTANCES ARE GROUND HORIZONTAL UNLESS OTHERWISE NOTED
4. PROPERTY MAY BE SUBJECT TO BURDENS OR BENEFITS NOT SHOWN ON MAP.
5. NO UNDERGROUND UTILITIES WERE LOCATED WITH THIS PLAN. BEFORE DIGGING CALL NC ONE-CALL (1-800-632-4949).
6. ZONING DISTRICTS NOTED ARE PER GIS INFORMATION AVAILABLE TO THE PUBLIC
7. THE SUBJECT PARCEL(S) AND ANY ADJOINING PROPERTY OWNERS NAMES, DEEDS OF RECORD, AND TAX PARCEL IDENTIFICATIONS REFLECT THOSE AVAILABLE TO THIS ENGINEER AS OF THE DATE OF THE PLAN SHOWN
8. SURVEY INFORMATION FOR THIS PLAN SHOWN WAS PROVIDED BY: DON ALLEN & ASSOCIATES PA.

REVISION ISSUE

00	LANDIS	03.05.24
01	DEV. PLAN	05.14.24
02	SUB. PLAN	06.17.24
03	LANDIS COM	11.05.24

LANDIS MULTIFAMILY

SHEET TITLE:
COVER SHEET

SHEET NUMBER:
C-1.0

GENERAL NOTES:

1. ALL WORK TO BE DONE IN ACCORDANCE WITH TOWN OF LANDIS, LOCAL WATER AUTHORITY, NCDOT, AND NCDEQ STANDARD SPECIFICATIONS AND PROJECT SPECIFICATIONS. WHEN SPECIFICATIONS ARE IN CONFLICT THE STRICTER SHALL BE HELD.

2. THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING UTILITIES, LINES, APPURTENANCES, ETC., AND THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, PIPES, VALVES, ETC., AS SHOWN ARE IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES, LINES, PIPES, ETC., SHOWN OR NOT SHOWN ON THE PLAN, BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, PIPES AND VALVES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY CONFLICTS WITH EXISTING OR PROPOSED FACILITIES TO DETERMINE IF AN ITEM WILL NEED TO BE RELOCATED.

3. CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS PRIOR TO CONSTRUCTION. ANY SIGNIFICANT VARIATIONS SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.

4. THE CONTRACTOR SHALL PROVIDE THE APPROPRIATE BARRICADES , WARNING LIGHTS AND SIGNS TO ENSURE THE SAFETY OF THE PUBLIC AT ALL TIMES.

5. DIMENSIONS AS SHOWN, ARE TO FACE OF CURB, FACE OF BUILDING, AND EDGE OF PAVEMENT UNLESS OTHERWISE NOTES.

6. THE EXISTING UTILITIES SHALL REMAIN IN SERVICE UNTIL NEW LINES ARE IN PLACE AND ACTIVATED. THE CONTRACTOR SHALL COORDINATE REMOVAL OF SERVICES WITH THE APPROPRIATE UTILITY COMPANY AND THE OWNER.

7. THE ENGINEER HAS MADE NO EXAMINATION TO DETERMINE WHETHER ANY HAZARDOUS OR TOXIC MATERIALS ARE PRESENT OR CONTAINED IN, UNDER, OR ON THE SUBJECT PROPERTY OR ITS WATERS; OR IF ANY HAZARDOUS OR TOXIC MATERIALS HAVE CONTAMINATED THIS OR OTHER PROPERTIES OR ITS WATERS IN ANY WAY WHATSOEVER. NO SUBSURFACE EXAMINATION OF ANY TYPE HAS BEEN MADE BY THE ENGINEER AND ACCORDINGLY, NO OPINION EXPRESSED OR INFERRED ON ALL SUCH MATTERS. FURTHER, NO OPINION IS RENDERED AS TO ANY VIOLATION OF ANY ENVIRONMENTAL LAWS OR REGULATIONS, EITHER FEDERAL, STATE OR LOCAL, RELATED TO THE INFORMATION SHOWN ON THIS PLAN AND THE ENGINEER IS IN NO WAY LIABLE FOR ANY VIOLATION OF SUCH ENVIRONMENTAL LAWS SHOULD THEY EXIST.

8. THE CONTRACTOR AGREES THAT THEY SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY KIND OF LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF ANY WORK ON THIS PROJECT, EXCEPT FOR LIABILITY RISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.

9. AT ALL TIMES, THE CONTRACTOR SHALL PERFORM PROJECT DEMOLITION WITH MINIMAL DISTURBANCE TO THE ADJACENT PROPERTIES. ALL DEBRIS GENERATED DURING THE DEMOLITION PHASE OF THE PROJECT, SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

10. ALL PAVEMENT STRIPING AND MARKINGS SHALL BE THERMOPLASTIC DONE IN ACCORDANCE WITH NCDOT STD. 1205, LATEST ADDITION.

STORM DRAINAGE NOTES:

A. GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL CONFORM TO THE LATEST EDITION OF THE NCDOT STANDARD SPECIFICATIONS UNLESS OTHERWISE SPECIFIED IN THIS MANUAL. ALL CONCRETE USED FOR DRAINAGE STRUCTURES SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3600 PSI AT 28 DAYS. THIS REQUIREMENT SHALL BE PROVIDED REGARDLESS OF ANY LESSER COMPRESSIVE STRENGTH SPECIFIED IN THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
2. REINFORCED CONCRETE PIPE MAY BE USED IN ALL STORM DRAIN APPLICATIONS. HIGH DENSITY POLYETHYLENE PIPE (HDPE) MAY BE SUBSTITUTED FOR PIPE DIAMETERS OF 48 INCHES OR LESS EXCEPT FOR PIPING THROUGH EMBANKMENTS AND PIPING WITH FES AS HDPE FES IS NOT ACCEPTABLE. CULVERTS 60 INCHES IN DIAMETER OR GREATER MAY BE CORRUGATED ALUMINIZED METAL PIPE (CAMP) OR ALUMINUM WITH A MINIMUM 14 GAUGE METAL.
3. ALL PIPE SHALL BE LAID WITH THE BELL OR GROOVE UPGRADE AND THE JOINT ENTIRELY INTERLOCKING.
4. THE MINIMUM COVER FOR ALL PIPES IS TWO (2) FEET MEASURED FROM THE FINAL SURFACE. SPECIAL APPLICATIONS FOR LESS THAN TWO (2) FEET OF COVER WILL BE REVIEWED AND APPROVED BY THE ENGINEER INDIVIDUALLY. THE MAXIMUM COVER FOR STORM DRAINAGE PIPES SHALL AT A MINIMUM COMPLY WITH THE REQUIREMENTS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION HIGHWAY DESIGN BRANCH ROADWAY DESIGN MANUAL, PART I, SECTION 5, AND "DRAINAGE DESIGN". STORM PIPE DESIGN THAT EXCEEDS THESE CRITERIA MAY BE APPROVED AT THE DISCRETION OF THE COUNTY / DESIGN ENGINEER.
5. ALL PIPES IN STORM DRAIN STRUCTURES SHALL BE FLUSH WITH THE INSIDE WALL.
6. ALL STORM DRAIN STRUCTURES OVER THREE (3) FEET AND SIX (6) INCHES IN HEIGHT MUST HAVE STEPS IN ACCORDANCE WITH STANDARD DETAILS SET FORTH IN THIS MANUAL.
7. THE INTERIOR SURFACES OF ALL STORM DRAINAGE STRUCTURES SHALL BE POINTED UP AND SMOOTHED TO AN ACCEPTABLE STANDARD USING MORTAR MIXED TO MANUFACTURER'S SPECIFICATIONS.
8. STORM DRAINAGE PIPING SHALL BE PLACED IN A STRAIGHT ALIGNMENT AT UNIFORM GRADE. NO CHANGES IN ALIGNMENT SHALL BE ALLOWED EXCEPT AT CATCH BASINS, MANHOLES, OR OTHER JUNCTIONS THAT PROVIDE APPROPRIATE CLEAN OUT ACCESS. THE MAXIMUM LENGTH BETWEEN ACCESS POINTS IS 300 LINEAR FEET.
9. ALL FRAMES, GRATES, RINGS, COVERS, ETC., MUST CONFORM TO THE STANDARDS SET FORTH IN THE CURRENT EDITION OF THE ROWAN COUNTY LAND DEVELOPMENT STANDARDS MANUAL AND THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) ROADWAY STANDARD DRAWINGS, DETAILS, AND OTHER RESOURCES.
10. ALL GRADED CREEK BANKS AND SLOPES SHALL BE AT A MAXIMUM OF TWO (2) FEET HORIZONTAL TO ONE (1) FOOT VERTICAL (2:1) AND NOT TO EXCEED 10' WITHOUT TERRACING OR THE SLOPES SHALL BE DESIGNED BY A PROFESSIONAL GEOTECHNICAL ENGINEER AND APPROVED BY THE COUNTY REVIEWER ON A CASE BY CASE BASIS.

B. HIGH DENSITY POLYETHYLENE PIPE (HDPE)

1. THE PRODUCT USED SHALL BE CORRUGATED EXTERIOR/SMOOTH INTERIOR PIPE (TYPE S), CONFORMING TO THE REQUIREMENTS OF AASHTO SPECIFICATION M294 (LATEST EDITION) FOR CORRUGATED POLYETHYLENE PIPE.
2. BELL AND SPIGOT JOINTS SHALL BE REQUIRED ON ALL PIPES INSIDE THE RIGHT-OF-WAY. BELLS SHALL COVER AT LEAST TWO FULL CORRUGATIONS ON EACH SECTION OF PIPE. THE BELL AND SPIGOT JOINT SHALL HAVE AN "O" RING RUBBER GASKET MEETING ASTM F477 WITH THE GASKET FACTORY INSTALLED, PLACED ON THE SPIGOT END OF THE PIPE. PIPE JOINTS SHALL MEET ALL REQUIREMENTS OF AASHTO M294.
3. ALL HDPE PIPE INSTALLED MUST BE INSPECTED AND APPROVED BY THE COUNTY'S INSPECTOR PRIOR TO ANY BACKFILL BEING PLACED. THE COUNTY INSPECTOR MUST BE PRESENT DURING THE BACKFILLING OPERATION AS WELL.
4. BACKFILL MATERIAL USED TO INSTALL HDPE PIPE WITHIN THE STREET RIGHT-OF-WAY SHALL BE SELECT MATERIAL, CLASS II-IV, AS DEFINED BY SECTION 1016-3 OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES. UPON SUBMITTAL OF WRITTEN CERTIFICATION OF MATERIAL SUITABILITY BY A LICENSED GEOTECHNICAL ENGINEER, NCDOT CLASS I SELECT MATERIAL MAY BE USED. ALL BACKFILL MATERIAL SHALL BE APPROVED BY THE COUNTY INSPECTOR PRIOR TO PLACEMENT OF THE MATERIAL WITHIN THE STREET RIGHT-OF-WAY.
5. THE MINIMUM LENGTH OF HDPE PIPE PERMITTED FOR USE SHALL BE FOUR (4) FEET. HDPE FLARED END SECTIONS ARE NOT ALLOWED.
6. ALL HDPE PIPE INSTALLED SHALL BE THIRD PARTY CERTIFIED AND SHALL BEAR THE PLASTIC PIPE INSTITUTE'S (PPI) CERTIFICATE STICKER.

C. REINFORCED CONCRETE.

1. ALL CONCRETE SHALL BE AT LEAST 3600 PSI. PRIOR APPROVAL SHALL BE OBTAINED IN ORDER TO USE PRE-CAST STORM DRAINAGE STRUCTURES IN ANY STREET RIGHT-OF-WAY BY NCDOT ENGINEER.
2. CONCRETE PIPE USED WITHIN THE STREET RIGHT-OF-WAY SHALL BE A MINIMUM OF CLASS III REINFORCED CONCRETE PIPE, WITH A MINIMUM DIAMETER OF FIFTEEN (15) INCHES (EIGHTEEN (18) INCHES MINIMUM ON CROSS DRAIN CULVERTS WITHIN THE ETJ). INSTALLATION OF CLASS IV OR HIGHER CONCRETE PIPE SHALL BE IDENTIFIED ON THE AS-BUILT PLAN AND THE COUNTY INSPECTOR SHALL BE GIVEN DOCUMENTATION AND NOTIFICATION OF THIS INFORMATION PRIOR TO CONSTRUCTION.
3. RCP STORM DRAINAGE PIPE SHALL BE SINGLE OFFSET JOINT PIPE WITH PROFILE GASKET, IN ACCORDANCE WITH ASTM C443, UNLESS OTHERWISE SPECIFICALLY NOTED ON THE CONSTRUCTION PLANS.

D. INSTALLATION OF REINFORCED CONCRETE PIPE.

1. ALL BACKFILL SHALL BE NON-PLASTIC IN NATURE, FREE FROM ROOTS, VEGETATIVE MATTER, WASTE, CONSTRUCTION MATERIAL OR OTHER OBJECTIONABLE MATERIAL. SAID MATERIAL SHALL BE CAPABLE OF BEING COMPACTED BY MECHANICAL MEANS AND SHALL HAVE NO TENDENCY TO FLOW OR BEHAVE IN A PLASTIC MANNER UNDER THE TAMPING BLOWS OR PROOF ROLLING.
2. MATERIALS DEEMED BY THE ENGINEER AS UNSUITABLE FOR BACKFILL PURPOSES SHALL BE REMOVED AND REPLACED WITH SELECT BACKFILL MATERIAL.
3. BACKFILLING OF TRENCHES SHALL BE ACCOMPLISHED IMMEDIATELY AFTER THE PIPE IS LAID. THE FILL AROUND THE PIPE SHALL BE PLACED IN LAYERS NOT TO EXCEED EIGHT (8) INCHES, EACH LAYER SHALL BE THOROUGHLY COMPACTED TO 95% OF THE MAXIMUM DENSITY OBTAINABLE WITH THE STANDARD PROCTOR TEST (A DENSITY OF 100% STANDARD PROCTOR IS REQUIRED FOR THE TOP EIGHT (8) INCHES).
4. COMPACTION REQUIREMENTS SHALL BE ATTAINED BY THE USE OF MECHANICAL COMPACTION METHODS. EACH LAYER OF BACKFILL SHALL BE PLACED LOOSE AND THOROUGHLY COMPACTED IN PLACE.
5. UNDER NO CIRCUMSTANCES SHALL WATER BE PERMITTED TO RISE IN UN-BACKFILLED TRENCHES AFTER THE PIPE HAS BEEN PLACED

FILL / EMBANKMENT NOTES:

1. EMBANKMENT FILL MATERIALS
1.1. BORROW MATERIAL SHALL BE CLASSIFIED AS ML, MH, CL OR CH SOILS ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487) OR ANY MIXTURE OF THESE SOILS.
1.2. BORROW MATERIALS SHALL HAVE A LIQUID LIMIT (LL) BETWEEN 40 AND 60 AND A PLASTICITY INDEX (PI) BETWEEN 15 AND 30 (ASTM D4318).
1.3. MATERIAL SHALL BE FREE OF TOPSOIL, ORGANIC MATERIAL, ROOTS, STUMPS, BRUSH, ROCKS LARGER THAN 3 INCHES, SUBSOIL, DEBRIS, VEGETATION AND OTHER FOREIGN MATERIAL.
1.4. ALL MATERIAL CLODS SHALL BE BROKEN DOWN WITH TILLERS AND/OR DISCS TO PROVIDE HOMOGENEOUS SOIL THAT IS FREE OF CLAY CLODS GREATER THAN 3 INCHES IN DIAMETER.
2. SUBGRADE PREPARATION
2.1. COMPACT SUBGRADE TO DENSITY REQUIREMENTS FOR SUBSEQUENT FILL MATERIALS. REF. TO STRUCTURAL REQ. IN PROXIMITY TO BUILDING PAD. BEARING TO BE 2000 PSF MIN.
2.2. CUT OUT SOFT AREAS OF SUBGRADE NOT CAPABLE OF COMPACTION IN PLACE.
2.3. SCARIFY SUBGRADE SURFACE TO A DEPTH OF 6 INCHES.
2.4. PROOF ROLL SUBGRADE TO IDENTIFY SOFT SPOTS; FILL AND COMPACT TO DENSITY EQUAL TO OR GREATER THAN REQUIREMENTS FOR SUBSEQUENT FILL MATERIAL.
3. EMBANKMENT FILL SHALL BE CONSTRUCTED AT 3 (HORIZONTAL) TO 1 (VERTICAL) OR AS SHOWN ON THE CONSTRUCTION DRAWINGS. DEMONSTRATION OF APPROPRIATE SAFETY FACTORS AGAINST FAILURE THROUGH GEOTECHNICAL ANALYSIS SHALL BE REQUIRED FOR SLOPES STEEPER THAN 3:1.
3.1. FILL SOILS SHALL BE PLACED IN LOOSE LIFTS NOT TO EXCEED 8 INCHES IN THICKNESS AND BE COMPACTED TO A MINIMUM OF 95 PERCENT OF THE SOILS STANDARD PROCTOR (ASTM D698) MAXIMUM DRY DENSITY, OR AS SPECIFIED ON THE CONSTRUCTION DRAWINGS.
3.2. COMPACTED MOISTURE CONTENT SHALL BE BETWEEN 3 PERCENT BELOW AND 3 PERCENT ABOVE THE OPTIMUM MOISTURE CONTENT FOR ALL FILL PLACED, OR AS OTHERWISE APPROVED BY THE ENGINEER.
3.3. FILL SOILS SHOULD BE PLACED IN CONTINUOUS, HORIZONTAL LAYERS FROM ABUTMENT TO ABUTMENT.
3.4. EXISTING SLOPES GREATER THAN 4(HORIZONTAL):1(VERTICAL) SHALL BE BENCHED TO PROMOTE BONDING OF NEWLY PLACED FILL WITH EXISTING SOILS. BENCHING SHALL BE PERFORMED AT MAXIMUM OF 2 FEET VERTICAL INTERVALS AND SHALL EXTEND A MINIMUM OF 4 FET HORIZONTALLY OR AS SPECIFIED ON DRAWINGS.
3.5. WITHIN THE UPPER 12 INCHES OF EMBANKMENT, FILL SOILS SHOULD BE COMPACTED TO 100% OF ITS STANDARD PROCTOR (ASTM D698) MAXIMUM DRY DENSITY.
3.6. FILL AGAINST SUPPORTED STRUCTURES. DO NOT FILL AGAINST UNSUPPORTED STRUCTURES.
3.7. PLACE FILL SIMULTANEOUSLY ON EACH SIDE OF UNSUPPORTED STRUCTURES UNTIL SUPPORTS ARE IN PLACE.
3.8. PLACE A MINIMUM OF 6 INCHES OF TOPSOIL ACROSS DAM EMBANKMENT TO PROMOTE VEGETATIVE GROWTH.
3.9. OUTLET PIPE FILL PLACEMENT FILL OF THE CULVERTS SHALL BE PLACED AND COMPACTED IN 6-INCH THICK LOOSE LIFTS AROUND THE OUTLET STRUCTURE AND ABOVE THE CULVERTS.
3.10. COMPACTION SHALL BE PERFORMED BY HAND TAMPERS OR SMALL HAND OPERATED COMPACTORS.
3.11. COMPACTION SHALL BE AT A MINIMUM 95 PERCENT OF THE STANDARD PROCTOR (ASTM D698) MAXIMUM DRY DENSITY. COMPACTED MOISTURE CONTENT SHALL BE BETWEEN 3 PERCENT BELOW AND 3 PERCENT ABOVE THE OPTIMUM MOISTURE CONTENT FOR ALL FILL PLACED OR AS OTHERWISE APPROVED BY THE ENGINEER.
3.12. ADDITIONAL COMPACTION OF LIFTS 2 FEET OR GREATER ABOVE CULVERTS SHALL CONFORM TO THE EMBANKMENT FILL PLACEMENT SECTION OF THIS SPECIFICATION.
4. DRAINAGE AREA MUST BE STABILIZED BEFORE FILTRATION CONTROLS AND FILTER MEDIA ARE INSTALLED
4.1. FIELD QUALITY CONTROL: PERFORM LABORATORY MATERIAL TESTS IN ACCORDANCE WITH ASTM D422, ASTM D698, ASTM D2216 AND ASTM D4318.
4.2. TEST AT A FREQUENCY OF EVERY 500 CUBIC YARDS OF EMBANKMENT FILL MATERIAL PLACED, WHEN MATERIALS USED FOR EMBANKMENT FILL CHANGE, AND/OR AS DIRECTED BY THE ENGINEER.
4.3. SAMPLE SIZE SHALL BE 50 LB.
4.4. PERFORM IN PLACE COMPACTION TESTS IN ACCORDANCE WITH ASTM D1556 OR ASTM D2937 AND NATURAL MOISTURE CONTENT TEST IN ACCORDANCE WITH ASTM D2216.
4.5. FREQUENCY OF COMPACTION/NATURAL MOISTURE CONTENT TESTS:
4.5.1. EMBANKMENT FILL:
4.5.1.1. EACH LIFT SHALL BE TESTED AT A MINIMUM FREQUENCY OF 1 PER 2,500 SQ. FT.
4.5.2. PIPE INSTALLATION:
4.5.2.1. EACH LIFT SHALL BE TESTED AT A MINIMUM FREQUENCY OF 1 PER 30 LF OF PIPE
4.6. WHEN TESTS INDICATE WORK DOES NOT MEET SPECIFIED REQUIREMENTS, REMOVE WORK, REPLACE AND RETEST.

UTILITY NOTES:

General Utility Notes

1. Concrete blocking (3000 psi) to be placed at all bends or as required unless Mega Lugs or restrained joints are used.
2. Standard depth of cover to be 3 feet except at valve or hydrant locations or other special situations. Cover is based on elevation below edge or pavement or as indicated on the plans.
3. Provide poured in place concrete pads (18" x 18" x 6") (or concrete "donuts" may be used as an alternative at the discretion of the SRU Inspector) at all valve boxes.
4. Extensions for valve boxes, when required, are to be valve boxes or DIP (no PVC or C-900).
5. All pavement cuts, concrete or asphalt, are to be replaced according to The Town of Landis and Salisbury Rowan Utilities Standard Details and/or as required by the North Carolina Department of Transportation.
6. Pavement cuts are to be replaced immediately after backfilling of initial cut either with permanent replacement or a temporary replacement of 10" of base if approved by the Town (for Town maintained streets) or DOT (for state maintained streets).
7. Repairs to main breaks: (a) Solid sleeves to be used for connecting spigot ends shall be of the long body type. (b) All repairs shall be inspected by Town before backfilling.
8. In any instance where it will be necessary to have the water shut off on existing mains in order to make a tie-in, the work must be done by Town forces or a contractor working for the Town, scheduled 48 hours to 7 days in advance depending on the location and types of businesses that will be affected.
9. When a water main crosses an existing sewer main, the contractor is to replace the sewer pipe spanning the ditch with ductile pipe when the following conditions occur:
   (a) Anytime a water main is installed under a sewer main.
   (b) When a water main is over a sewer main and the vertical distance between the two mains is 18" or less (minimum 12" clearance between water and sewer lines – only allowed when other utilities prevent the 18" minimum separation).
10. Water mains shall be installed with a minimum of 10' horizontal separation or 18" vertical separation from sewer lines. Where this is not possible, both the water line and sewer line shall be ductile iron pipe.
11. Water lines shall be disinfected and hydrostatically tested in accordance with all State and SRU requirements.
12. All plans shall meet all Federal, State, Town of Landis, and Utilities owner regulations, design criteria, and construction standards.
13. Water services/meter boxes are not to be located in driveways.

SUTHER ENGINEERING
FIRM No. P-1946
1316 S. MAIN ST. STE D
KANNAPOLIS, NC 28081

043895
ENGINEER
JOHN E. SUTHER

SUBJECT PROPERTY INFO:

PARCEL ID(S):
123B119
DEED BOOK & PAGE:
DB: 1423 PG: 854
CURRENT ZONING:
MU-1 (LANDIS)
PROPERTY LOCATION:
LANDIS TOWNSHIP
ROWAN COUNTY
OWNER INFORMATION:
DYNAMIC DEVELOPERS OF THE CAROLINAS LLC
210 OAK AVE
KANNAPOLIS, NC 28081

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01	DEV. PLAN	05.14.24
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03	LANDIS COM	11.05.24

LANDIS MULTIFAMILY

SHEET TITLE:
GENERAL NOTES

SHEET NUMBER:
C-1.1

SSMH
RIM: 767.58'
INV. - 870.33'

KIMBALL ROAD
S.R. - 1211 60' PUBLIC RIGHT OF WAY

ROBERT MCGALLIARD
PID: 123B089
DB /PG: 683 / 335
ZONE: SFR-3 (LANDIS)

JOSEPH SELMA
PID: 123 090
DB /PG: 952 / 346
ZONE: RU (CHINA GROVE)

W.L. KIMBALL ESTATE
PID: 123B119
ZONE: MU-1 (LANDIS)

1.05 AC.

LARRY W PAGE FLP
PID: 123B113
DB /PG: 807 / 562
ZONE: MU-1 (LANDIS)

EXISTING 8" SS

N 39°14'21" E 212.73'

S 43°32'15" E 200.05'

N 50°26'22" W 95.68'

N 50°26'22" W 104.21'

S 38°51'56" W 186.32'

SSMH
RIM: 782.43'
INV 773.68'

24" RCP
INV. - 772.5'

MH

DI
INV. - 779.25'

12" RCP
INV. - 782.87'

DI
RIM: 785.25'
INV. - 784.16'

DI
RIM: 787.80'
INV. - 786.66'

12" RCP
INV. - 788.84'

KIMBALL ROAD

GRAPHIC SCALE
0 20 40 60
HORIZONTAL GROUND DISTANCE
1 INCH = 20 FT

NAD83(2011)

811 Know what's below. Call before you dig.

1. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR CONTACTING THE APPROPRIATE PARTIES AND ASSURING THAT EXISTING UTILITIES ARE LOCATED PRIOR TO BEGINNING CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR PLACING BARRICADES USING FLAGMEN, ETC., AS NECESSARY TO INSURE SAFETY TO THE PUBLIC.
3. ALL PAVEMENT CUTS, CONCRETE OR ASPHALT, ARE TO BE REPLACED ACCORDING TO STANDARDS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION.
4. SHORING WILL BE ACCORDING TO OSHA TRENCHING STANDARDS PART 1926 SUBPART P, OR AS AMENDED.

SUTHER ENGINEERING
FIRM No. P-1946
1316 S. MAIN ST. STE D
KANNAPOLIS, NC 28081

043895 ENGINEER JOHN E. SUTHER 05.17.24

SUBJECT PROPERTY INFO:

PARCEL ID(S):
123B119
DEED BOOK & PAGE:
DB: 1423 PG: 854
CURRENT ZONING:
MU-1 (LANDIS)
PROPERTY LOCATION:
LANDIS TOWNSHIP
ROWAN COUNTY
OWNER INFORMATION:
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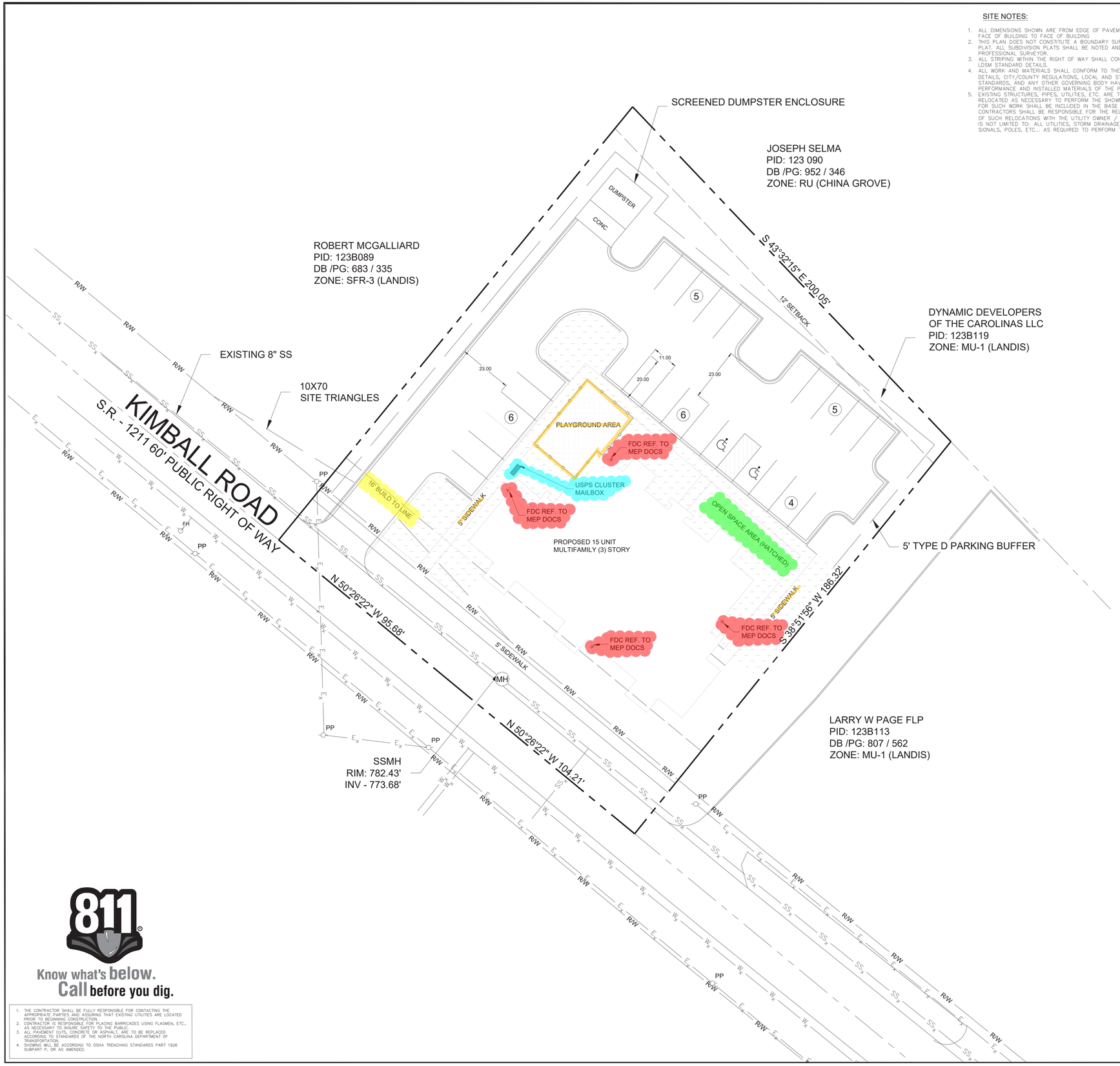
LANDIS MULTIFAMILY

SHEET TITLE:
EXISTING CONDITIONS

SHEET NUMBER:
C-2.0



SE-BOC
SE-SIDEWALK
SE-BUILDING
SE-SETBACKS
SE-LANDSCAPE BUFFERS
EX-SEWER
EX-EOP
EX-WATER-LINE
EX-OVERHEAD-PWR
EX-ROW

GRAPHIC SCALE
0 20 40 60
HORIZONTAL GROUND DISTANCE
1 INCH = 20 FT

NAD83(2011)

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SITE NOTES:

1. ALL DIMENSIONS SHOWN ARE FROM EDGE OF PAVEMENT TO EDGE OF PAVEMENT OR FACE OF BUILDING TO FACE OF BUILDING
2. THIS PLAN DOES NOT CONSTITUTE A BOUNDARY SURVEY OR SUBDIVISION SURVEY PLAT. ALL SUBDIVISION PLATS SHALL BE NOTED AND CERTIFIED BY A LICENSED PROFESSIONAL SURVEYOR.
3. ALL STRIPING WITHIN THE RIGHT OF WAY SHALL CONFORM TO THE LANDIS UDO & LDSM STANDARD DETAILS.
4. ALL WORK AND MATERIALS SHALL CONFORM TO THE LANDIS UDO & LDSM STANDARD DETAILS, CITY/COUNTY REGULATIONS, LOCAL AND STATE CODES, O.S.H.A. STANDARDS, AND ANY OTHER GOVERNING BODY HAVING JURISDICTION OVER THE PERFORMANCE AND INSTALLED MATERIALS OF THE PROJECT.
5. EXISTING STRUCTURES, PIPES, UTILITIES, ETC. ARE TO BE ABANDONED, REMOVED, OR RELOCATED AS NECESSARY TO PERFORM THE SHOWN SCOPE OF WORK. ALL COSTS FOR SUCH WORK SHALL BE INCLUDED IN THE BASE BIDS BY CONTRACTORS. THE CONTRACTORS SHALL BE RESPONSIBLE FOR THE RELOCATIONS AND COORDINATION OF SUCH RELOCATIONS WITH THE UTILITY OWNER / PROVIDERS. THIS INCLUDES BUT IS NOT LIMITED TO: ALL UTILITIES, STORM DRAINAGE, STREET SIGNS, TRAFFIC SIGNALS, POLES, ETC... AS REQUIRED TO PERFORM THE SHOWN SCOPE OF WORK.

SITE DEVELOPMENT DATA

PROPOSED AREA QUANTITIES

AREA BEING DEVELOPED: 1.05 AC.
AREA IN RIGHT OF WAY: 0.138 AC
DISTURBED AREA: 0.993 AC.
PROPOSED IMPERVIOUS: 23,067 SF , 0.53 AC.
BUILDINGS: 7,346 SF
PAVING: 14,024 SF
SIDEWALK: 1,697 SF

IMPERVIOUS % : 58.1 %
MAX IMP. % = NONE
NCDEQ DENSITY: < 1 ACRE DISTURBED (EXEMPT)
BMP CONTROLS: NO
JURISDICTION: PHASE II LOCAL – LANDIS
NCDEQ REGION: MOORESVILLE

DIMENSIONAL STANDARDS LANDIS:

MINIMUM LOT WIDTH: 24 FT
MINIMUM LOT AREA: 6000 SF
BUILD TO LINE FROM ROW MINIMUM: 16 FT
SIDE YARD SETBACK: 0 FT
REAR SETBACK MINIMUM: 12 FT
LANDSCAPE BUFFER: RESIDENTIAL TO RESIDENTIAL – NONE
RIGHT OF WAY – 60 FT

SITE MATERIALS NOTES:

PAVING
. HEAVY DUTY ASPHALT PAVING: AREAS INSIDE R/W
PROFILE:
8" AGG. BASE COURSE (ABC)
2.5" I19.0C INT. COURSE
1.5" S9.5B SURF. COURSE

LIGHT DUTY ASPHALT PAVING: DRIVE & PARKING
PROFILE:
6" AGG. BASE COURSE (ABC)
2" S9.5B SURF. COURSE

SIDEWALKS:
PROFILE:
4" 3500 PSI MIN. CONC. W/ AIR

CURB & GUTTER :
18" CURB & GUTTER – 3500 PSI CONC. W/AIR

PARKING NOTES:

REQUIRED PARKING:

BUILDING: 15 UNIT; 2 BED PER UNIT – MULTIFAMILY
PARKING REQ:
MIN: 1 PER UNIT
MAX: 2 PER UNIT

PROVIDED: 26 SPACES; 1.73 PER UNIT
BREAKDOWN: 2 HANDICAP
24 STD.

OPEN SPACE:

OPEN SPACE REQ. – LDO 21.2-1(C) TBL 21.1 – 7500 SF
OPEN SPACE PROVIDED: –
LDO 21.2-4, 21.2-7(D) PLAZA -7627 SF

SUTHER ENGINEERING
FIRM No. P-1946
1316 S. MAIN ST. STE D
KANNAPOLIS, NC 28081

043895
ENGINEER
JOHN E. SUTHER

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PARCEL ID(S):
123B119
DEED BOOK & PAGE:
DB: 1423 PG: 854
CURRENT ZONING:
MU-1 (LANDIS)
PROPERTY LOCATION:
LANDIS TOWNSHIP
ROWAN COUNTY
OWNER INFORMATION:
DYNAMIC DEVELOPERS OF THE CAROLINAS LLC
210 OAK AVE
KANNAPOLIS, NC 28081

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REVISION ISSUE

00	LANDIS	03.12.24
01	DEV. PLAN	05.14.24
02	SUB. PLAN	06.17.24
03	LANDIS COM	11.05.24

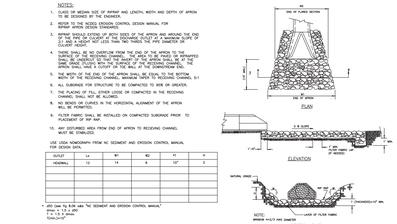
LANDIS MULTIFAMILY

SHEET TITLE:
SITE LAYOUT PLAN

SHEET NUMBER:
C-3.0

STORM PIPE TABLE							
DN STRUCTURE	UP STRUCTURE	DOWN INVERT (FT)	UP INVERT (FT)	LENGTH (FT)	SLOPE (%)	MATERIAL	SIZE (IN)
YI-2	YI-1	772.50	773.51	65.76	1.536	Concrete	15.0
YI-2	EX CULVERT	772.50	779.25	60.08	11.235	Concrete	24.0
YI-3	YI-2	771.67	772.30	49.66	1.269	Concrete	24.0
CI-1	YI-3	768.94	771.47	94.60	2.674	Concrete	24.0
DI-1	CI-1	765.14	768.74	71.92	5.005	Concrete	24.0
DI-1	CI-2	765.64	766.02	24.77	1.534	Concrete	18.0
HEADWALL OUT	DI-1	764.14	765.14	9.57	10.454	Concrete	24.0

STORM STRUCTURE TABLE					
NAME	RIM ELEV(FT)	INVERT-IN ELEV(FT) (1)	INVERT-IN ELEV(FT) (2)	INVERT-OUT ELEV(FT)	STRUCTURE ID
CI-2	771.02	N/A	N/A	766.02	DI 840.14 12"-24"
YI-1	776.51	N/A	N/A	773.51	DI 840.14 12"-24"
EX CULVERT	783.00	N/A	N/A	779.25	DI 840.14 12"-24"
YI-2	776.49	772.50	772.50	772.30	DI 840.14 12"-24"
YI-3	776.47	771.67	N/A	771.47	DI 840.14 12"-24"
CI-1	773.74	768.94	N/A	768.74	DI 840.14 12"-24"
DI-1	770.67	765.14	765.64	765.14	DI 840.14 12"-24"
HEADWALL OUT	770.75	764.14	N/A	N/A	Outfall-Wall1



RIPRAP APRON AT PIPE OUTFALLS

LEGEND

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- SE-BOC
- SE-SIDEWALK
- SE-BUILDING
- SE-SETBACKS
- SE-LANDSCAPE BUFFERS
- SS$_x$ SS$_x$ EX-SEWER
- EX-EOP
- W$_x$ W$_x$ EX-WATER-LINE
- E$_x$ E$_x$ EX-OVERHEAD-PWR
- R/W EX-ROW
- SE-WALLS
- SE- STORM PIPE
- SE-CONTOURS

GRAPHIC SCALE
0 20 40 60
HORIZONTAL GROUND DISTANCE
1 INCH = 20 FT

NAD83(2011)

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043895 ENGINEER JOHN E. SUTHER

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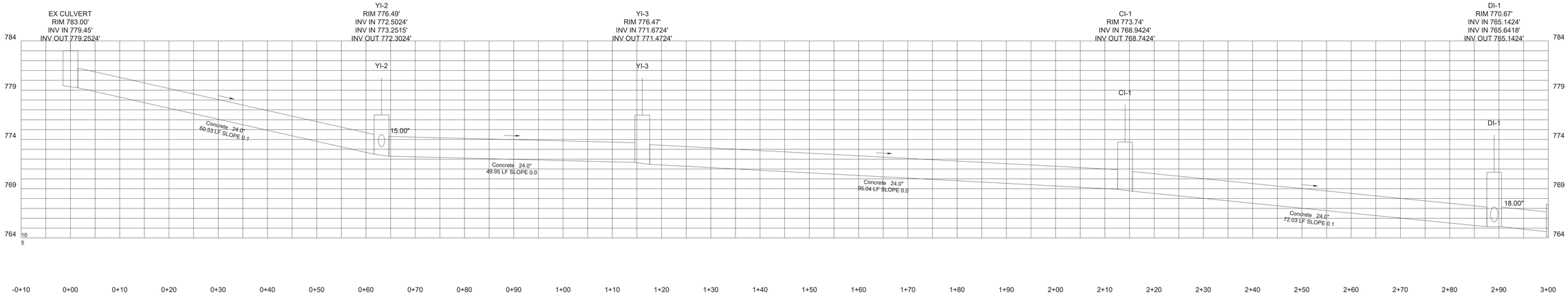
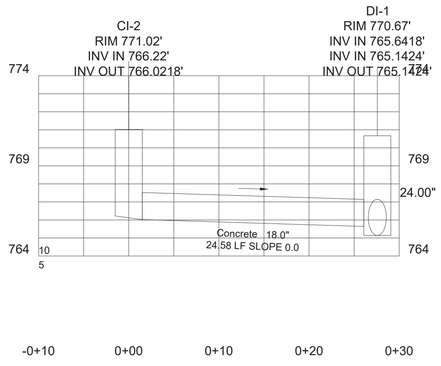
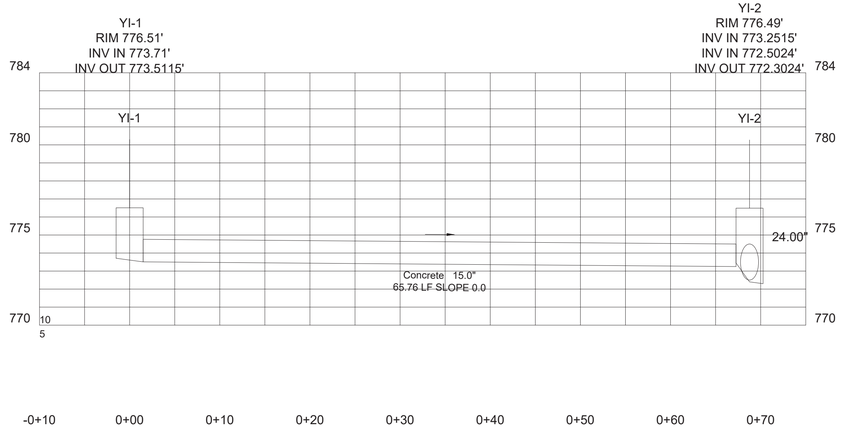
LANDIS MULTIFAMILY

SHEET TITLE:
SITE GRADING & DRAINAGE PLAN

SHEET NUMBER:
C-4.0







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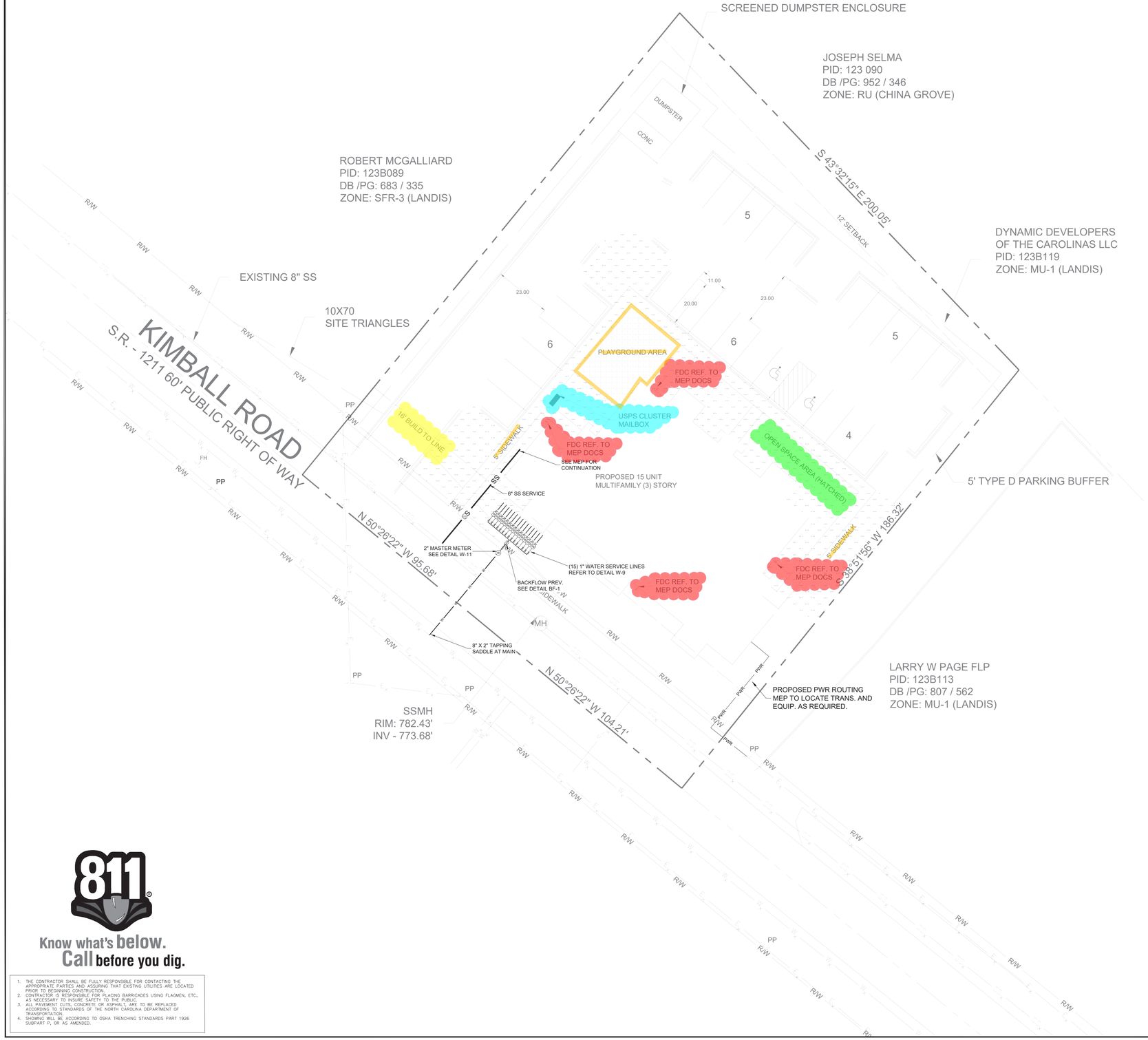
LANDIS MULTIFAMILY

SHEET TITLE:

STORM PROFILES

SHEET NUMBER:

C-4.1



GENERAL NOTES SITE UTILITIES

1. All water and sanitary sewer work shall be in accordance with the Town of Landis Land Development Standards and standard specifications for wastewater collection and distribution for the Salisbury-Rowan Utilities. Contractor shall have a copy of these specifications on-site at all times.
2. All existing water and sewer mains are owned and operated by the Town of Landis. The site inspector must be contacted at least 48 hrs prior to making any connection to the existing system.
3. Sanitary sewer laterals and water meter locations are approximate and are subject to relocation due to field locations. Under no circumstance will cleanouts and meters be located in driveways, sidewalks or under pavement of any type.
4. Water meters shall meet Town of Landis standards. Contractor is responsible for installing meter boxes and purchasing meters. Contractor shall coordinate with site inspector to have water meters delivered to the Town of Landis.
5. The developer will be responsible for paying applicable water and sewer connection fees before Zoning Clearance Permits are issued.
6. Contractor is fully responsible for contacting all appropriate parties assuring that utilities are located prior to commencement of construction. Call North Carolina 811 (1-800-632-4949) for utility locating services as required by law prior to commencement of any work. Contractor shall verify location and depth of all utilities prior to construction.
7. Contractor shall be responsible for sewer overflows that occur due to activities initiated by them and shall be responsible for, but not limited to, the costs associated with performing remedial work of/for environmental impacts and/or the paying of fines assessed by regulatory agencies and/or third-party claims.
8. Water & Sewer mains shall have a minimum cover of 36".
9. Bedding for PVC sewer mains and laterals should be NCDOT Class B Bedding.
10. Unless otherwise noted, waterlines shall be PVC C900 for 6" - 12" diameter and PVC SDR 13.5 for 2" - 4" diameter per Salisbury-Rowan Utilities standards.
11. Unless otherwise noted, Sewer mains shall be PVC SDR 35 per Salisbury-Rowan Utility standards.
12. Laterals shall have a No-Hub cap and stainless-steel No-Hub band at the clean out.
13. Ductile iron pipe shall be required for both water and sanitary sewer if the following clearances are not met:
    a. Waterline crossing under sanitary sewer (for any clearance).
    b. 18" vertical clearance for waterline installed above sewer line.
    c. 10' horizontal separation for waterline parallel to sewer line (or 18" vertical separation in separate ditches).
    d. For waterline, 18" clearance with storm drains.
    e. For waterline, 12" clearance with gas mains, telephone ducts and underground cables.
    f. For sanitary sewer, 18" clearance with storm drains.
14. Regardless of pipe material, a minimum 12" separation shall be required for water and sewer between other piping.
15. Initial connection to the existing water main shall be in accordance with the Town of Landis detail for a temporary by-pass connection for filling new water mains. The temporary jumper connection shall be removed and the waterline connected to the existing system only after the proposed system has been pressure tested, chlorinated and accepted by the Town of Landis. No other connections will be allowed to the system until the proposed system has been accepted.
16. Notify the city of any work being performed on the weekends. No work requiring testing or observation by the city will be permitted without written permission.
17. Noise Ordinance: 7:00am to 9:00pm – Weekdays, 8:00am to 9:00pm Weekends.

LEGEND

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- EX-EOP
- EX-WATER-LINE
- EX-OVERHEAD-PWR
- EX-ROW
- SE-SS
- SE-WATER
- SE-PWR

GRAPHIC SCALE
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HORIZONTAL GROUND DISTANCE
1 INCH = 100 FT

NAD83(2011)

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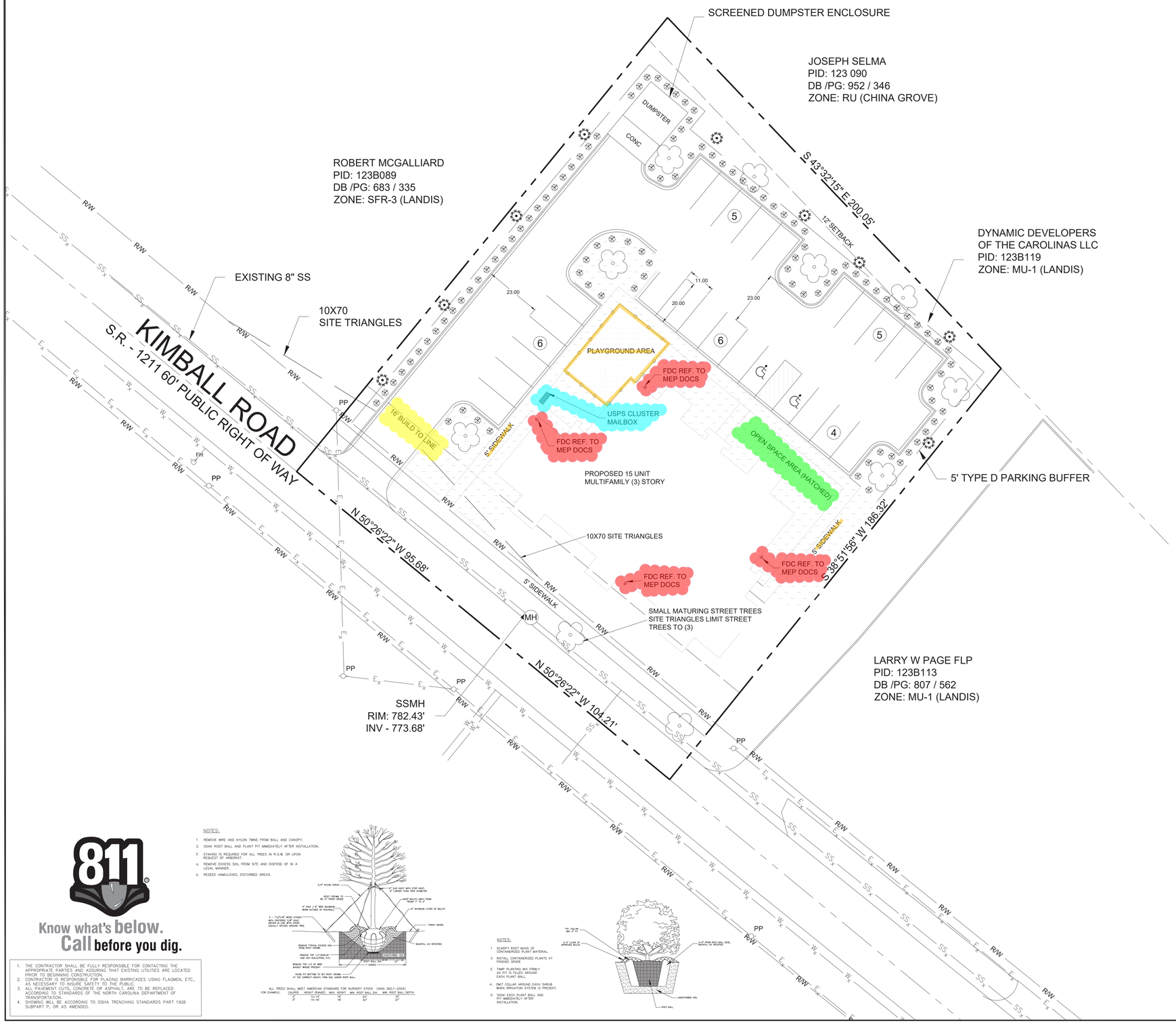
UTILITY PLAN

SHEET NUMBER:
C-5.0



PERIMETER BUFFER YARD:
PER 11.6-1 & LANDIS PRE-APP MEETING
RESIDENTIAL TO RESIDENTIAL NOT BUFFERED

STREET YARDS:
1 LARGE MATURING TREE PER 80 LF; THIS PROJECT HAS OVERHEAD POWER SO RATE WILL BE 1 SMALL MATURING TREE AT 1 PER 40 LF
95 LF @ 40 FT PER TREE = 2 TREES REQUIRED
(MEASURED OUTSIDE OF NCDOT SITE TRIANGLES)

PARKING LOT PLANTING AREAS:
(1) DECIDUOUS TREE PER 1500 SF = 9 TREES REQ.
75% LARGE MATURING TREES REQ.
(4) SHRUBS PER 1500 SF = 37 REQ.

TYPE D PARKING BUFFER:
2 UNDERSTORY TREES PER 100 LF: $\frac{360}{100}*2 = 7$ TREES
18 SHURBS PER 100 LF: $\frac{360}{100}*18 = 65$ SHRUBS

TOTAL REQUIRED:
(7) LARGE MATURING TREES
(9) DECIDUOUS UNDERSTORY TREES
(102) SHRUBS

PROVIDED:
(8) LARGE MATURING TREES
(9) DECIDUOUS UNDERSTORY TREES
(102) SHRUBS

LANDSCAPE PLANT MATERIALS AND STANDARDS.

1. PLANTINGS SHALL BE PER THE APPROVED SPECIES LIST FOR THE TOWN OF LANDIS UDO
2. ALL NEW TREES MUST HAVE, STRAIGHT TRUNKS WITH STRONG CENTRAL LEADERS INTACT TO THE TOP OF THE CROWN UNLESS MULTI-STEM TREES ARE SPECIFIED. ALL REQUIRED TREES SHALL BE TYPICAL OF THEIR SPECIES AND VARIETY, HAVE NORMAL GROTH HABITS, HAVE ELL-DEVELOPED BRANCHES, BE VIGOROUS AND HAVE FIBROUS ROOT SYSTEMS. TREES WITH CO-DOMINANT BRANCHING WILL NOT BE ACCEPTED. TREES THAT HAVE BEEN SHEARED, TOPPED OR CUT BACK TO MULTIPLY THE BRANCHING STRUCTURE WILL NOT BE ACCEPTED. TREES SHALL BE FREE OF ABRASIONS, DAMAGE, DISEASE, PESTS, AND CRACKS. ALL PRUNING CUTS ON THE TRUNK SHALL BE MORE THAN ONE HALF THE DIAMETER OF THE CENTRAL LEADER AT THE HEIGHT WHERE THE CUT WAS MADE. ROOT FLARES SHALL BE LOCATED AT GRADE. TREES WITH MORE THAN 2" OF SOIL COVERING THE ROOT BALL/ FLARE WILL NOT BE ACCEPTED.
3. THE MINIMUM TREE SIZE AT PLANTING SHALL BE PER TABLE 5.3.F(2) AS FOLLOWS:
   3.1. SHADE TREES: 2.5" CALIPER – MIN. 12' TALL
   3.2. ORNAMENTAL TREES: 1.5" CALIPER – MULTI-STEM
   3.3. ORNAMENTAL TREES: 2" CALIPER – SINGLE-STEM
   3.4. EVERGREEN TREES: N/A CALIPER – MIN. 6' TALL
   3.5. SHRUBS: 3 GALLON CONTAINER – MIN. 18" TALL
4. ALL STRAPPING AND TOP $\frac{1}{3}$ OF WIRE BASKET MUST BE CUT AWAY AND REMOVED FROM ROOT BALL PRIOR TO BACKFILLING PLANTING PIT. REMOVE TOP $\frac{1}{3}$ OF THE BURLAP FROM ROOT BALL.
5. FOR NEW PLANTING AREAS, REMOVE ALL PAVEMENT, GRAVEL SUB-BASE AND CONSTRUCTION DEBRIS; REMOVE COMPACTED SOIL AND ADD 24" NEW TOPSOIL, OR TILL AND AMEND THE TOP 24" OF EXISTING SOIL TO MET TOPSOIL/PLANTING MIX STANDARDS FOR TREES (WITHIN ENTIRE MINIMUM AREA OF 274 SQUARE FEET PER TREE.)
6. LARGE MATURING TREES MAY NOT BE PLANTED WHERE THERE ARE OVERHEAD DISTRIBUTION OR TRANSMISSION LINES. IF TREES CONFLICT WITH POWER LINES OR SIGNS, CALL URBAN FORESTER TO RESOLVE BEFORE PLANNING.
7. ADJUST TREE PLANTING LOCATIONS TO AVOID UNDERGROUND UTILITIES.
8. ATTENTION LANDSCAPER: NOTIFY URBAN FORESTER OF ANY SIGN, POWER LINE, OR OTHER CONFLICTS BEFORE PLANTING NEW TREES. LARGE MATURING TREES MUST BE A MINIMUM 25' TO 30' FEET FROM THE OVERHEAD DISTRIBUTION OR TRANSMISSION LINES. IF TREES CONFLICT WITH POWER LINES OR SIGNS, CALL URBAN FORESTER TO RESOLVE BEFORE PLANTING.
9. NO UTILITY OR LIGHT POLES TO BE INSTALLED IN TREE ISLANDS.

SOIL GUIDANCE FOR TREE PLANTING

1. SOILS FOR PLANTING SHOULD BE PREPAIRED IN ONE OF THE FOLLWING WAYS
   1.1. PREPARING THE EXISTING SOIL FOR PLANTING BY TILLING TO A DEPTH OF 18" AND ADDING SOME NEW PLANTING MIX AND/OR ORGANIC MATTER. THIS OPTION MAY ALSO REQUIRE THE REMOVAL OF SOME EXISTING SOIL ALONG WITH OTHER MITIGATION WORK AND SOIL AMENDMENTS TO IMPROVE SOIL STRUCTURE.
   1.2. REMOVING ALL EXISTING SOIL FROM A ORDINANCE REQUIRED PLANTING AREAS AND REPLACING IT WITH NEW PLANTING MIX AND OTHER SOIL AMENDMENTS.
   1.3. DETERMINATION OF SOIL REQUIREMENTS WILL BE AT THE DISCRETION OF HARRISBURG ENGINEERING STAFF OR URBAN FORESTRY STAFF AND/OR CITY ARBORIST STAFF. STAFF WILL INSPECT SOIL AT THE TIME OF PLANTING TO DETERMINE REQUIRED SOIL AMENDMENTS.
2. PLANTING MIX USED SHALL HAVE UNIFORM COMPOSITION THROUGHOUT, WITH A MIXTURE OF SUBSOIL IT SHALL BE FREE OF STONES, LUMPS, LIVE PLANTS AND THEIR ROOTS, STICKS, AND OTHER EXTRANEOUS MATTER. IT SHALL CONTAIN NO MAN-MADE MATERIALS UNLESS OTHERWISE SPECIFIED. PLANTING MIX SHALL NOT BE USED WHILE IN A FROZEN OR MUDDY CONDITION.
3. UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS, NEW/ADDED PLANTING MIX SHALL CONTAIN THE FOLLOWING SPECIFIED PERCENTAGES OF CONSTITUENTS:
   3.1. CLAY MIN. 10% MAX. 40%
   3.2. SAND MIN. 20% MAX. 50%
   3.3. SILT MIN. 20% MAX. 50%
   3.4. ORG. MAT. MIN. 5% MAX. 10%
4. ORGANIC MATTER (ORG. MAT.) IS DEFINED AS COMPOST / HUMUS SUCH AS SAWDUST OR LEAF MOLD THAT HAS COMPLETED THE DECOMPOSITION PROCESS. PERCENTAGE OF ORGANIC MATTER SHALL BE DETERMINED BY LOSS ON IGNITION OF MOISTURE FREE SAMPLED DRIED AT 65 DEGREES.
5. PLANTING SOILS SHALL HAVE AN ACIDITY RANGE OF pH 5.5 TO 7.0
6. PLANTING SOILS SHALL HAVE A CATION EXCHANGE CAPACITY (CEC) FROM 5 TO 25 CMOL +/KG(MEQ/100G)
7. PLANTING SOILS SHALL HAVE A NORMAL CONTENTS OF NITROGEN, PHOSPHOROUS, POTASSIUM, CALCIUM, MAGNESIUM, SULFUR, AND PROPER MICRO-NUTRIENT LEVELS. NUTRIENT LEVELS MUST SATISFY GROWING NEEDS (AS RECOMMENDED BY A LAB REPORT) OF THE EXISTING OR PLANNED PLANT MATERIAL.
8. LAB TESTING MAY BE REQUIRED TO VERIFY THE QUALITY OF EXISTING SOILS, PLANTING SOILS AND OTHER SOIL AMENDMENTS.

OPEN SPACE:

OPEN SPACE REQ. – LDO 21.2-1(C) TBL 21.1 – 7500 SF
OPEN SPACE PROVIDED. –
LDO 21.2-4, 21.2-7(C) FORECOURT –7627 SF

SHRUBS
UNDERSTORY TREES
MATURING TREES

GRAPHIC SCALE
0 20 40 60
HORIZONTAL GROUND DISTANCE
1 INCH = 20 FT

NAD83(2011)

Know what's below.
Call before you dig.

1. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR CONTACTING THE APPROPRIATE PARTIES AND ASSURING THAT EXISTING UTILITIES ARE LOCATED PRIOR TO BEGINNING CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR PLACING BARRICADES USING FLAGMEN, ETC., AS NECESSARY TO CORE SAFETY TO THE PUBLIC.
3. ALL PAVEMENT CUTS, CONCRETE OR ASPHALT, ARE TO BE REPLACED ACCORDING TO STANDARDS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION.
4. SHORING WILL BE ACCORDING TO OSHA TRENCHING STANDARDS PART 1926 SUBPART P, OR AS AMENDED.

NOTES:
1. REMOVE WIRE AND NYLON TWINE FROM BALL AND CANOPY.
2. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
3. STAKING IS REQUIRED FOR ALL TREES IN R.O.W. OR UPON REQUEST OF ARBORIST.
4. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
5. RESEED UNMULCHED, DISTURBED AREAS.

NOTES:
1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINISHED GRADE
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.

SUTHER ENGINEERING
FIRM No. P-1946
1316 S. MAIN ST. STE D
KANNAPOLIS, NC 28081

043895
ENGINEER LIC. SEAL
JOHN E. SUTHER

SUBJECT PROPERTY INFO:

PARCEL ID(S):
123B119
DEED BOOK & PAGE:
DB: 1423 PG: 854
CURRENT ZONING:
MU-1 (LANDIS)
PROPERTY LOCATION:
LANDIS TOWNSHIP
ROWAN COUNTY
OWNER INFORMATION:
DYNAMIC DEVELOPERS OF THE CAROLINAS LLC
210 OAK AVE
KANNAPOLIS, NC 28081

PLAN NOTES:
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8. SURVEY INFORMATION FOR THIS PLAN SHOWN WAS PROVIDED BY: HARRISBURG SURVEYING

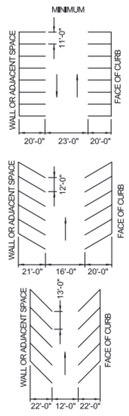
REVISION ISSUE

00	LANDIS	03.05.24
01	DEV. PLAN	05.14.24
02	SUB. PLAN	06.17.24
03	LANDIS COM	11.05.24

LANDIS MULTIFAMILY

SHEET TITLE:
LANDSCAPE PLAN

SHEET NUMBER:
C-6.0



NOTES:
1. FOR ACCESSIBLE PARKING STANDARDS/SIGNAGE SEE ADDITIONAL STANDARDS.
2. PAVEMENT MARKINGS SHALL BE 4" WHITE PAINT.
3. ALTERNATIVE PARKING ANGLES, AISLE WIDTHS, AND OPERATION (TWO-WAY ANGLED PARKING OR REVERSE-ANGLE PARKING) WILL BE CONSIDERED ON A CASE-BY-CASE BASIS.

TOWN OF LANDIS, NC	PARKING STANDARDS	STD. 2.01

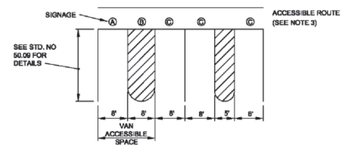
REVISIONS

NO	DATE	BY	COMMENT

ACCESSIBLE PARKING REQUIREMENTS

TOTAL PARKING SPACES PROVIDED	MINIMUM NUMBER OF ACCESSIBLE SPACES REQUIRED	MINIMUM NUMBER OF ACCESSIBLE SPACES REQUIRED TO BE VAN ACCESSIBLE
1 TO 25	1	1
26 TO 50	2	1
51 TO 75	3	1
76 TO 100	4	1
101 TO 150	5	1
151 TO 200	6	1
201 TO 300	7	1
301 TO 400	8	1
401 TO 500	9	2
501 TO 1000	2% OF TOTAL	1 IN EVERY 8 ACCESSIBLE SPACES
1001 AND OVER	20 PLUS 1 FOR EACH 100 OVER 1000	1 IN EVERY 8 ACCESSIBLE SPACES

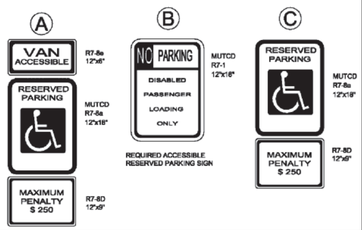
SECTION 4.1.2 (5) OF THE AMERICANS WITH DISABILITIES ACT (ADA).
SEE 4.1.2.(5) (c) FOR MEDICAL CARE FACILITIES



ONE OUT OF EVERY EIGHT (8) ACCESSIBLE SPACES, BUT NOT LESS THAN ONE, IS REQUIRED TO BE VAN ACCESSIBLE.

NOTES:
1. ALL 12"x18" ACCESSIBLE SIGNS (R7-8a & R7-1) SHALL BE MOUNTED AT 7 FEET FROM GRADE TO BOTTOM EDGE OF SIGN FACE (MUTCD). MOUNTING HEIGHT CAN BE REDUCED TO 5 FEET IF PLACED IN AN AREA BETWEEN SIDEWALK AND BUILDING FACE IN WHICH PEDESTRIANS ARE NOT EXPECTED TO USE.
2. REFER TO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (MUTCD) U.S. DEPARTMENT OF TRANSPORTATION AND NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SUPPLEMENT.
3. IF ACCESSIBLE ROUTE IS A RAISED SIDEWALK AREA, THEN RAMPS ARE REQUIRED AT LOADING ZONE AREA.

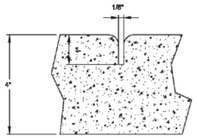
PARKING SPACE PAVEMENT MARKINGS



TOWN OF LANDIS, NC	ACCESSIBLE PARKING AND SIGNAGE	STD. 2.11

REVISIONS

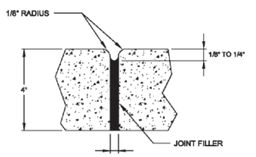
NO	DATE	BY	COMMENT



GROOVE JOINT IN SIDEWALK

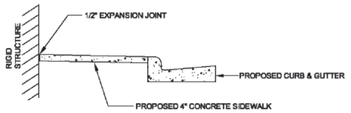
GENERAL NOTES:

1. A GROOVE JOINT 1" DEEP WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 45' INTERVALS NOT TO EXCEED 50' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
2. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6" THICK.
3. WIDTH OF SIDEWALK ON ALL STREETS SHALL BE A MINIMUM OF 5'.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI. IN 28 DAYS.
5. ZONING CONDITIONS MAY REQUIRE ADDITIONAL WIDTH SIDEWALKS WHICH SHALL SUPERSEDE THESE STANDARD DIMENSIONS SHOWN.



TRANSVERSE EXPANSION JOINT IN SIDEWALK

CONCRETE SIDEWALK WITH PLANTER STRIP

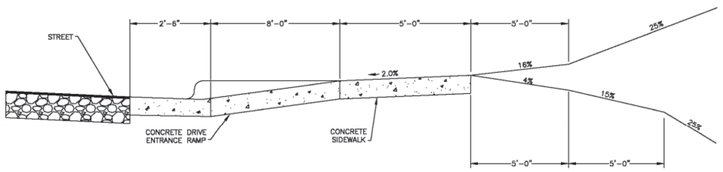


DETAILS SHOWING EXPANSION JOINTS FOR CONCRETE SIDEWALK

TOWN OF LANDIS, NC	CONCRETE SIDEWALK	STD. 3.01

REVISIONS

NO	DATE	BY	COMMENT



NOTE:

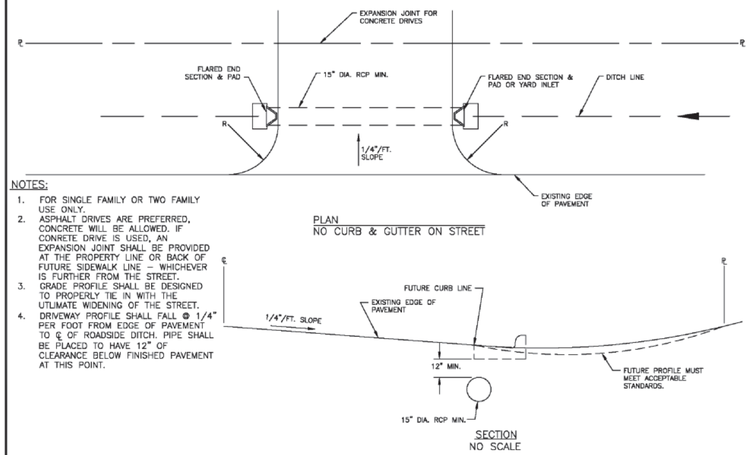
GRADES ARE SHOWN FOR SINGLE FAMILY & TWO FAMILY LOTS ONLY. COMMERCIAL TYPE USES MUST FLATTEN GRADES ACCORDINGLY FOR HIGHER VOLUMES OF TRAFFIC, ACCORDING TO THE TOWN ENGINEER'S DIRECTION.

NOT TO SCALE

TOWN OF LANDIS, NC	DRIVEWAY GRADES	STD. 4.01

REVISIONS

NO	DATE	BY	COMMENT



NOTES:
1. FOR SINGLE FAMILY OR TWO FAMILY USE ONLY.
2. ASPHALT DRIVES ARE PREFERRED, CONCRETE WILL BE ALLOWED. IF CONRETE DRIVE IS USED, AN EXPANSION JOINT SHALL BE PROVIDED AT THE PROPERTY LINE OR BACK OF FUTURE SIDEWALK LINE – WHICHEVER IS FURTHER FROM THE STREET.
3. GRADE PROFILE SHALL BE DESIGNED TO PROPERLY TIE IN WITH THE ULTIMATE WIDENING OF THE STREET.
4. DRIVEWAY PROFILE SHALL FALL @ 1/4" PER FOOT FROM EDGE OF PAVEMENT TO ℄ OF ROADSIDE DITCH. PIPE SHALL BE PLACED TO HAVE 12" OF CLEARANCE BELOW FINISHED PAVEMENT AT THIS POINT.

PLAN
NO CURB & GUTTER ON STREET

SECTION
NO SCALE

TOWN OF LANDIS, NC	DRIVEWAY DITCH SECTION STREET	STD. 4.03

REVISIONS

NO	DATE	BY	COMMENT

SUTHER ENGINEERING
FIRM No. P-1946
1316 S. MAIN ST. STE D
KANNAPOLIS, NC 28081

SUBJECT PROPERTY INFO:

PARCEL ID(S):
123B119
DEED BOOK & PAGE:
DB: 1423 PG: 854
CURRENT ZONING:
MU-1 (LANDIS)
PROPERTY LOCATION:
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ROWAN COUNTY
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DYNAMIC DEVELOPERS OF THE CAROLINAS LLC
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REVISION ISSUE

00	LANDIS	03.12.24
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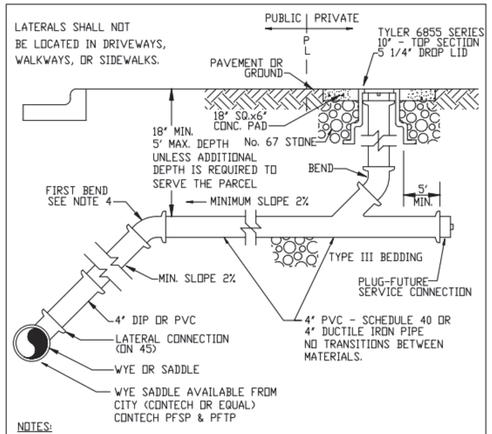
02	SUB. PLAN	06.17.24

LANDIS MULTIFAMILY

SHEET TITLE:
SITE DETAILS

SHEET NUMBER:
C-7.0

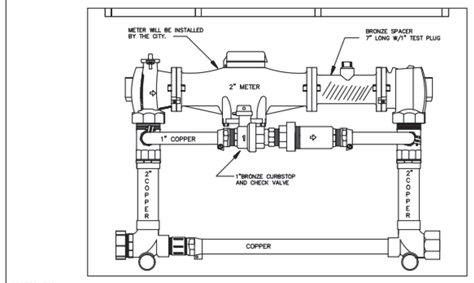


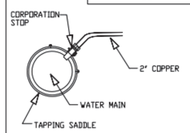
NOTES:

1. THE FULL LENGTH OF THE SERVICE DITCH SHALL BE COMPACTED IN 6' LAYERS WITH MECHANICAL TAMP, TO 95% STANDARD PROCTOR.
2. THE CITY SHALL MAKE TAPS ON EXISTING LINES
3. BENDS 1/16, 1/8, 1/4 AS REQUIRED.
4. FIRST BEND SHALL OCCUR BEHIND BACK OF CURB UNLESS SPECIFICALLY APPROVED BY THE UTILITIES ENGINEERING MANAGER.
5. ALL LATERALS 60' OR LONGER SHALL BE 6'.
6. NO MATERIAL TRANSITIONS (LATERAL & STACK MUST BE ALL PVC OR ALL DIP)
7. WYES ONLY, NO TEES. SADDLES MAY ONLY BE USED ON EXISTING SEWER LINES.

CITY OF SALISBURY, N.C. STANDARD DETAIL	DATE: MAY 19, 2009 AMENDED: JULY 19, 2022
SEWER SYSTEMS TAP & STUB-OUT	NOT TO SCALE
	STANDARD SS-5

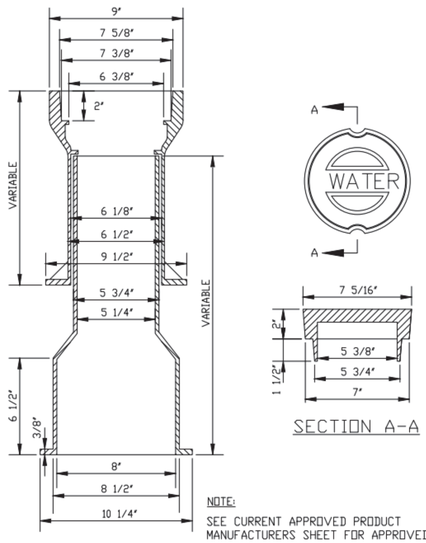
COPPERSETTER FOR 2" FLANGED METER





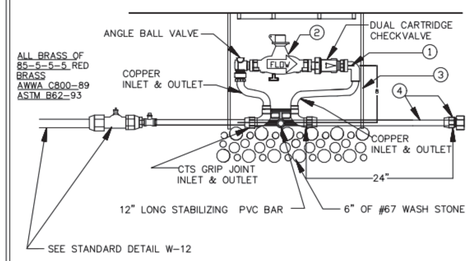
1. BY-PASS INCLUDES A BALL VALVE WITH PADLOCK WINGS.
2. BRACE PIPE EYELETS ARE STANDARD-BRACE PIPE NOT INCLUDED.
3. INLET IS COPPER TUBE PACK JOINT
4. OUTLET IS FEMALE IRON PIPE THREADS.
5. OUTLET SIDE WILL ALSO HAVE 2"X24" BRASS NIPPLE AND A 2" HAMMOND 606 GATE VALVE. METER BOX SHALL BE THE SAME AS USED FOR 1" METER.
6. SEE CURRENT APPROVED PRODUCT MANUFACTURERS SHEET FOR APPROVED TYPES. (APPENDIX "A")

CITY OF SALISBURY, N.C. STANDARD DETAIL	DATE: JANUARY1, 1991 AMENDED: MAY 19, 2009
WATER SYSTEMS 2 " METER CONNECTION	NOT TO SCALE
	STANDARD W-10



NOTE:
SEE CURRENT APPROVED PRODUCT MANUFACTURERS SHEET FOR APPROVED TYPES (APPENDIX A)

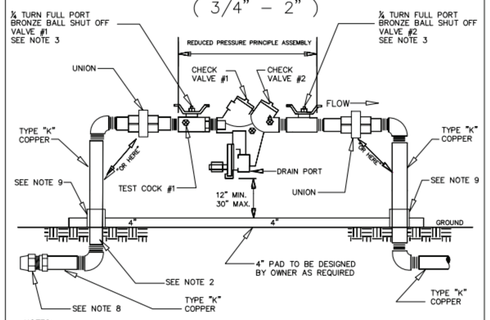
CITY OF SALISBURY, N.C. STANDARD DETAIL	DATE: OCTOBER 17, 2006
WATER SYSTEMS VALVE BOX	NOT TO SCALE
	STANDARD W-4



1. METER SETTER - INLET: COPPERTUBE PACK JOINT/OUTLET COPPERTUBE PACK JOINT - SEE CURRENT APPROVED PRODUCT MANUFACTURERS SHEET FOR APPROVED TYPES (APPENDIX A)
2. METER - TO BE INSTALLED BY THE CITY
3. METER BOX- SEE CURRENT APPROVED PRODUCT MANUFACTURERS SHEET FOR APPROVED TYPES. (APPENDIX A)
4. 24" OF COPPER W/BE USED FOR TAIL PIPE AND FIP x CTPJ W/BE PROVIDED FOR CONNECTION
5. ALL ITEMS AS SPECIFIED OR APPROVED EQUAL(DOMESTIC MANUFACTURED ONLY)
6. METER BOXES SHALL NOT BE LOCATED IN DRIVEWAYS OR DESIGNATED PARKING SPACES.
7. SEE STANDARD DETAIL W-12 FOR METER BOX LOCATION. IN AREAS WHERE SIDEWALKS ARE NOT REQUIRED THE BACK OF THE METER BOX SHALL BE LOCATED AT THE PROPERTY LINE.

CITY OF SALISBURY, N.C. STANDARD DETAIL	DATE: OCTOBER 17, 2006 AMENDED: MAY 19, 2009
WATER SYSTEMS 3/4" & 1 " METER DETAIL	NOT TO SCALE
	STANDARD W-9

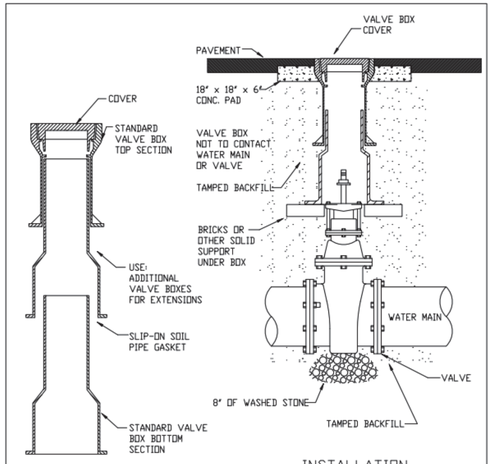
REDUCED PRESSURE PRINCIPLE ASSEMBLY (RP)
(3/4" - 2")



NOTES:

1. REDUCED PRESSURE PRINCIPLE ASSEMBLIES (RP) MUST CONFORM TO SALISBURY-ROWAN UTILITIES BACKFLOW PREVENTION REQUIREMENTS.
2. (BACKFLOW ASSEMBLY MUST BE INSTALLED BEFORE SERVICE LINE IS CONNECTED TO ANY OTHER PIPES, EXCEPT AS AUTHORIZED BY THE WATER PURVEYOR.) WATER LINE MUST BE EXPOSED FOR INSPECTION FROM METER TO BACKFLOW PREVENTER.
3. THE SALISBURY-ROWAN UTILITIES APPROVED 3/4" - 2" RP INCLUDES SHUT OFF VALVES #1 AND #2 AS PART OF THE ASSEMBLY. NO SUBSTITUTIONS SHALL BE PERMITTED.
4. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE APPROVED ASSEMBLY.
5. FIRE LINE BACKFLOW PREVENTER ASSEMBLY SHALL HAVE HEAT & TAMPER SWITCHES WITHIN THE PROTECTIVE ENCLOSURE.
6. NO STRAINER IS ALLOWED ON A BACKFLOW PREVENTION ASSEMBLY FOR A FIRE LINE SERVICE.
7. OUTDOOR INSTALLATION SHALL HAVE A PROTECTIVE COVERING (ASSE 1060) WITH DRAIN PORT AS SPECIFIED IN SALISBURY-ROWAN UTILITIES SPECIFICATIONS FOR INSTALLATION OF BACKFLOW PREVENTION ASSEMBLIES.
8. CONNECTION TO CITY'S FITTING SHALL NOT BE UNDER CONCRETE PAD.
9. APPROVED PIPE MATERIAL USED, SUBJECT TO CORROSION; SHALL BE PROTECTED ACCORDING TO NORTH CAROLINA STATE BUILDING CODE - VOLUME II PLUMBING.

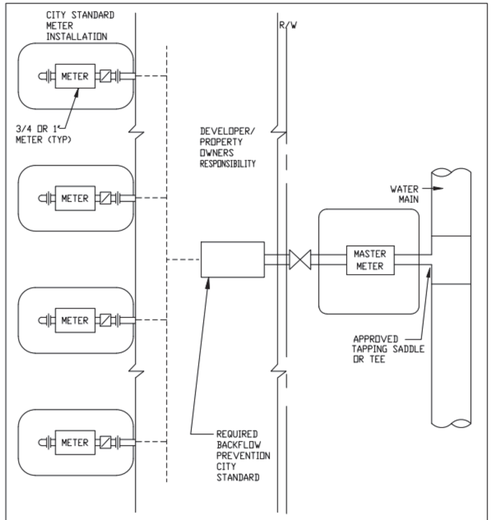
CITY OF SALISBURY, N.C. STANDARD DETAIL	DATE: OCTOBER 17, 2006 AMMENDED: JULY 19, 2022
STANDARD DETAIL BACKFLOW PREVENTION RP ¾" - 2"	NOT TO SCALE
	STANDARD BF-1



EXTENSION

INSTALLATION

CITY OF SALISBURY, N.C. STANDARD DETAIL	DATE: JANUARY 1, 1991
WATER SYSTEMS VALVE BOX INSTALLATION	NOT TO SCALE
	STANDARD W-5



1. USE OF MULTIPLE METER ASSEMBLY SHALL BE APPROVED BY UTILITIES MANAGEMENT

CITY OF SALISBURY, NC STANDARD DETAIL	DATE: JANUARY 1, 1991 AMENDED: MAY 19, 2009
WATER SYSTEMS MULTIPLE METER ASSEMBLY	NOT TO SCALE
	STANDARD W-11

SUTHER ENGINEERING
FIRM No. P-1946
1316 S. MAIN ST. STE D
KANNAPOLIS, NC 28081

043895
ENGINEER
JOHN E. SUTHER
05.17.24

SUBJECT PROPERTY INFO:

PARCEL ID(S):
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PROPERTY LOCATION:
LANDIS TOWNSHIP
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OWNER INFORMATION:
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REVISION ISSUE

00	LANDIS	03.12.24
01	DEV. PLAN	05.14.24
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LANDIS MULTIFAMILY

SHEET TITLE:
UTILITY DETAILS

SHEET NUMBER:
C-7.1

Town of Landis Technical Review Committee
312 S Main Street
Landis, NC 28088

Response to comments dated January 17th, 2025, January 22nd 2025, and January 30th 2025.

Dear Technical Review Committee,

On behalf of Suncap and ARCO Construction, Scout & Co. has prepared this letter in response to comments made by the Town Planning Director received via email dated January 17th 2025, Technical Review Committee (TRC) received via email dated January 22nd, 2025, and Stormwater review comments via email dated January 30th, 2025.

Planning Director Comments via Email:

Below are the comments that I have from review of the Landis Ridge Ph 2 A project plans (dated 11/14/24). Please provide your responses to each comment with a different colored font (ie comment addressed, see page X). Once everything has been adequately addressed, we can move towards official approval your plans and permitting. Please let me know if you have any questions.

Planning: Revisions Required

1. Please note that the property is within the Protected Area of the Coldwater Creek Watershed in the Site Data Table
    a. Please verify that the High Density option is being used (54% impervious proposed) in accordance with Section 19.1-8
    b. Has the use of the High Density option been approved by the Town (Section 19.21-8.A)
    c. Please provide a copy of the application for authorization (Section 19.1-8).

   The High Density option is being used, we have requested a copy of the High Density Application for Authorization form from the Town of Landis, and will fill this application out as soon as we receive it. Please contact Scout & Co. if this holds up approval of Construction Drawings.
2. Please provide the Parking Calculations in the Site Data Table and/or on the Overall Site Plan (Table 12-1).
   Parking Calculations have been added to the Site Data Table on the Cover sheet, C0.00.
3. Please provide renderings of the proposed Building so conformance with Section 9.8-3 can be verified.
   Section 9.8-3 refers to Highway Lot Types, which this development is not. We have provided renders for the building regardless. The renders provided are conceptual.
4. If the marked areas to the rear of the structure are being used to meet the Loading spaces requirements of Section 12.14, please provide a note and show calculations on the Overall Site Plan (Section 12.14-4).
   Loading space calculations have been added to sheet C0.00 and to Sheet C3.00.
5. Please indicate Lighting and Illumination of parking area (Section 12.11-14).
   Duke Energy is currently working on a lighting plan, and they have our most recent cad files and site plan. If a photometric lighting plan is needed before Construction drawing approval, please contact Scout & Co.
6. Please verify if there will be any bicycle parking provided (Section 12-12).
   There is no bicycle parking planned for this development
7. Please show any areas where existing vegetation is to be left undisturbed (11.6-3.E)
   There are zero areas where vegetation is left to be undisturbed within our LOD, since this area has already been cleared by the current property owner.
8. Please provide a copy of the Tree Disturbance Permit (Section 11.3-4 & 11.10).

There are zero trees to be disturbed in this area. We have interpreted that based on that fact, there is no tree disturbance permit necessary for our development. Please let us know if this is not the case.

9. Please show the location of solid waste dumpster area(s)
   Solid waste dumpster/trash compactor has been shown on sheet C3.02.
10. Please specify that the typical provided on sheet C8.00 describes the parking lot perimeter yard (Section 11.6-4)
    The typical buffer yard does describe the type d buffer around the parking lot. A label on this typical section has been provided on sheet C8.00.
    a. Please provide a typical for the interior parking lot landscaping?
       Typical section for the parking lot islands has been provided on sheet C8.00
11. Please provide a pedestrian corridor in accordance with Section 12.11-4:
    a. through the middle spaces extending to the sidewalk, and
       Sidewalk has been added to the interior of the parking lot, see sheet C3.01.
    b. around the eastern side of the parking area
       Sidewalk has been added to the east side of the parking lot, see sheet C3.01.
12. Street trees should be shown along the main road (not the interior driveway) along the northern side of the site (Section 11.6-3).
    These trees have already been permitted under the Landis Ridge Phase 1 project, they have been shown on our plan as existing, see sheets C8.00, C8.01, and C8.02
13. Please provide a legend showing the distinguishable weights for the intermittent stream along the eastern side of the site, and the corresponding buffer.
    30' intermittent stream buffer has been shown on all sheets and labeled, and legend has been added to sheet C3.00
14. Please provide another column showing the actual number of plantings provided in the Landscape Compliance Chart.
    Column has been added, and the landscape schedule has been placed next to the landscape compliance chart to confirm the number of trees provided.

TRC Comments were provided via PDF, and will be addressed via PDF, included in this package

Stormwater Comments:

An NCGO1 Construction Activities NPDES permit is required.
Project Comments
1. Coversheet: The cover sheet must be sealed by a North Carolina Professional Engineer and include the contact information (firm name, address, phone number, and NC Board of Examiners for Engineers and Surveyors license number). (21 NCAC 56.1103 (b)(5)

2. Project Narrative, Section 1.2 Existing Conditions: The narrative indicates that "one sediment basin will be used to control sedimentation in the disturbed areas for this parcel. This basin is designed and maintained by others." Additionally, this section also states the following: "The permanent pond for stormwater treatment will be a regional pond and will be designed by others under a separate cover and permit."
While we appreciate this is a phased development that I assume to be a design-build, considering the construction and associated sedimentation, erosion control, and BMP are within the WS-IV protected area, the design of these structures must be provided prior to approval of the Stormwater Permit.

This project is being designed in collaboration with the adjacent property owner, Jackson-Shaw, with the project "Landis Ridge Phase 1" or "Landis Ridge". This collaboration includes using a sediment basin, currently located on site, located to the south of this parcel for the purposes of erosion control. It also includes an agreement about maintenance. The Rowan County Erosion control reviewer and inspector has signed off on this agreement between the two owners, and the erosion control plan is approved by Rowan County.

This condition has been calculated for, the erosion control basin has been reviewed, and modeled to meet the permanent storm flows from Landis Ridge Phase 2A under it's final conditions. Once the adjacent property owner has gotten their storm pond approved, they will be responsible for the installation of new structures and an FES in the area, and permanent pipes into a new permanent SCM (see sheet C7.40). This will be submitted for approval by others. See sheets C7.00 through C7.43 for updated erosion control plan.

3. The table for line numbers 29 through 51 headings are missing. Please provide a copy of the table with the appropriate headings.

DETAILED ANALYSIS: Construction Plans
1. Cover Sheet:
a. The proposed table indicates the proposed impervious area is 399,859 SF or 54.0% of the total Limits of Disturbance (LOD). The limits of LOD are listed as 20.0 Acres or 871,200 SF. 399,859/871,200 = 45.9 %, not 54.0%, please correct.
LOD and Impervious area have been updated on sheet C0.00
b. Please indicate the Total Built Upon Area (BUA) and percentage of the parcel size. If the sediment basin and BMP are for both phases of the development there also needs the BUA percentage of the total of both parcels or additional proposed phases.
Information has been provided on the cover sheet, C0.00. Please note that the SCM will be designed by others under the current agreement, and will be designed based off of our plan and the future uses for the Phase 2B and 2C parcels.

If the BUA density exceeds 24%, the design must meet or exceed the criteria contained in 15A NCAC 2H .1008(c). Ref. Stormwater Quality Management and Discharge Control Ordinance (SQMDO) Division I. Section 1.16 Stormwater Management (c)(v).
Noted, will pass on to the Engineer designing the regional pond in the future phase.

2. Sheet C5.00 Overall Grading Plan
a. The area currently labeled as Approximate Zoning Line, Zone SFR-2, according to the most recent USGS Quad Sheet China Grove, appears to be an unnamed tributary to Beaver Creek, which is a tributary to Coldwater Creek is clearly a "blue-line stream," and therefore requires a Stream Buffer, according to the SQMDO Division I Section 1.17. Please provide the NCDEQ Division of Water Resources stream classification for this tributary as to whether it is considered Perennial, Intermittent, or Ephemeral since the buffer requirements vary, based upon SQMDO Division I Section 1.17 (c). Please delineate and label the stream buffer accordingly.
Stream has been updated to be more visible, and has been labeled as an intermittent stream, per the USGS quad map. A 30 FT buffer is required by the town of landis for intermittent streams, and this has been noted on the plans.
b. Please provide Inlet protection at all catch basins and drop inlets.
We have now provided inlet protection at all catch basins and drop inlets. Please note that the structures under the concrete dock area where the roof leaders connect are not inlets and do not collect flow.

3. Sheet C5.01 Grading Plan A
a. Same as the comment "a" on Sheet C-5.00.
b. Same as the comment "a" on Sheet C-5.00.
See responses to comments above.
4. Sheet C5.02 Grading Plan B
a. Same as the comment "a" on Sheet C-5.00.
See responses to comments above
5. Sheet C5.50 Overall Drainage Plan
a. Same as the comment "a" on Sheet C-5.00.
See responses to comments above.
6. Sheet C5.51 Drainage Plan A
a. Same as the comment "a" on Sheet C-5.00.
b. Same as the comment "b" on Sheet C-5.00.
See responses to comments above.
7. Sheet C5.51 Drainage Plan B
a. Same as the comment "b" on Sheet C-5.00.
See responses to comments above.
8. Sheet C7.10 EC Stage 1 Overall
a. Construction Sequence-Stage 1: The references to "Rowan County" shall be changed to "Town of Landis."
Note has been changed to Town of Landis.
b. Same as the comment "a" on Sheet C-5.00.
See responses to comments above.
9. Sheet C7.11 EC Stage 1A
a. Same as the comment "a" on Sheet C-5.00.
See responses to comments above.
10. Sheet C7.11 EC Stage 1A
a. No Comments
See responses to comments above.
11. Sheet C7.20 EC Stage 2 Overall
a. Same as the comment "a" on Sheet C-5.00.
See responses to comments above.
12. Sheet C7.21 EC Stage 2A
a. Same as the comment "a" on Sheet C-5.00.
See responses to comments above.
13. Sheet C7.22 EC Stage 2B
a. No Comments
14. Sheet C7.30 EC Stage 3 Overall
a. Same as the comment "a" on Sheet C-5.00.
See responses to comments above.
15. Sheet C7.31 EC Stage 3A
a. Same as the comment "a" on Sheet C-5.00.
See responses to comments above.
16. Sheet C7.32 EC Stage 3B
a. No Comments
17. Sheet C9.04 EC Details
a. Please provide an inlet protection detail

Inlet protection detail has been provided on sheet C9.05
b. The Fiber Wattle Detail is blank; please provide.
Fiber Wattle Detail has been provided on sheet C9.04

General Comments
1. Please provide the following in accordance with SQMDC Ordinance Section 1.6 Stormwater Management (c)(ii) Stormwater Management Plans shall

a. Effects on existing upstream and/or downstream drainage systems and property.
Stormwater will be conveyed to erosion control basin and treated in that basin until such time as the permanent stormwater basin is installed by others.
b. Ability of the natural drainage way to handle the additional stormwater runoff.
Noted.
c. Water quality impacts on receiving waters.
Noted

2. In accordance with the SWMDC Ordinance Section 1.6 (c) (iii), provide the following:
a. Demonstrate through accepted engineering practices described in the Stormwater Technical Standards Manual that stormwater runoff is adequately conveyed through the development of a drainage system designed to meet the criteria described in the Stormwater Technical Standards Manual. The project shall control and treat the runoff from the first one-inch of rain. Runoff volume drawdown time must be a minimum of 48 hours but not more than 120 hours. High-density projects must discharge the storage Page 9 volume at a rate equal to or less than the pre-development discharge rate for the one-year, 24-hour storm. All structural stormwater treatment systems must be designed to achieve 85% average annual removal of total suspended solids, fecal coliform, and other pollutants to levels identified in the Stormwater Technical Standards Manual. Post-development runoff rate shall not exceed the pre-development runoff rate unless a maximum discharge rate has been adopted for the applicable drainage basin and the discharge does not exceed that rate. If a maximum discharge rate has not been adopted for the applicable drainage basin, the post-development discharge rate may not exceed the pre-development discharge rate. Stormwater volumes resulting from the proposed development shall be detained within the development and released at a rate no greater than what existed prior to the development. Detention facilities shall be designed to maintain the pre-developed runoff rate from the 1-year and 10-year design storm events, and other events as specifically required by the Town's Stormwater Technical Standards Manual.
Will note this, and make sure that the permanent stormwater pond will be equipped to handle these requirements.

----------End of Comments----------

Should you have any questions or need any additional information, please contact Gary Zurawski at (919) 836.6873 or via email at gzurawski@scoutandco.com. Thank you for your review and continued assistance in permitting this project.

Sincerely,

Gary Zurawski, PE
Director of Civil Engineering
Scout & Co.
4000 Westchase Blvd, Suite 425
Raleigh, NC 27607

LANDIS RIDGE PHASE 2A

SITE DEVELOPMENT PLANS

OLD BEATTY FORD ROAD
TOWN OF LANDIS,
ROWAN COUNTY, NC

NOVEMBER 14TH, 2024
PROJECT #: TBD

SITE DATA TABLE:	
PROJECT:	LANDIS RIDGE PHASE 2A
PROPERTY OWNER:	JSC-CCI LANDIS II LLC 4890 ALPHA RD SUITE 100 DALLAS, TX 75244-4639
DEVELOPER:	SUNCAP PROPERTY GROUP
PIN:	5625-18-41-9778
DEED REFERENCE:	DB: 1438 PG:256
PROPERTY ADDRESS:	0 OLD BEATTY FORD ROAD, LANDIS, NC
JURISDICTION:	TOWN OF LANDIS
EXISTING ZONING:	IND
PARCEL ACREAGE:	15.17 ACRES
LIMITS OF DISTURBANCE:	20.00 ACRES
WETLANDS DISTURBED:	0.00 ACRES
EXISTING LAND USE:	VACANT
PROPOSED LAND USE:	INDUSTRIAL
EXISTING IMPERVIOUS:	0 SF OR 0% OF TOTAL SITE
PROPOSED IMPERVIOUS:	399,859 SF OR 54.00% OF TOTAL LOD
BUILDING COVERAGE:	26.35% OF TOTAL LOD
PARKING:	
INDUSTRIAL #1 PROPOSED PARKING:	46 SPACES - INCLUDES 2 ADA SPACES
PROPOSED PUBLIC WATER TAPS:	2 TAPS
PROPOSED PUBLIC HYDRANTS:	5 HYDRANTS
PROPOSED PUBLIC WATERLINE:	2,385 LF OF 12" LINE
PROPOSED PUBLIC SEWERLINE:	0 LF OF PUBLIC LINE

Irrigation?

WE HAVE UPDATED THIS VALUE TO 3 TAPS FOR THE IRRIGATION TAP

VICINITY MAP
SCALE 1" = 500'

Sheet List Table	
SHEET NUMBER	SHEET TITLE
C0.00	COVER SHEET
C2.01	ALTA
C2.02	ALTA
C3.00	OVERALL SITE PLAN
C3.01	SITE PLAN 'A'
C3.02	SITE PLAN 'B'
C4.00	OVERALL UTILITY PLAN
C4.01	UTILITY PLAN 'A'
C4.02	UTILITY PLAN 'B'
C4.03	SANITARY SEWER PROFILE
C4.04	PUBLIC WATER LINE PROFILE I
C4.05	PUBLIC WATER LINE PROFILE II
C5.00	OVERALL GRADING PLAN
C5.01	GRADING PLAN 'A'
C5.02	GRADING PLAN 'B'
C5.03	ADA INSET
C5.50	OVERALL DRAINAGE PLAN
C5.51	DRAINAGE PLAN 'A'
C5.52	DRAINAGE PLAN 'B'
C6.01	PUBLIC ROAD B PROFILE
C7.10	EC STAGE 1 OVERALL
C7.11	EC STAGE 1 A
C7.12	EC STAGE 1 B
C7.20	EC STAGE 2 OVERALL
C7.21	EC STAGE 2 A
C7.22	EC STAGE 2 B
C7.30	EC STAGE 3 OVERALL
C7.31	EC STAGE 3 A
C7.32	EC STAGE 3 B
C8.00	OVERALL LANDSCAPING
C8.01	LANDSCAPING A
C8.02	LANDSCAPING B
C8.03	LANDSCAPE DETAILS
C9.00	SITE DETAILS I
C9.01	SITE DETAILS II
C9.02	UTILITY DETAILS I
C9.03	UTILITY DETAILS II
C9.04	EC DETAILS
C9.05	NCG01

ARCO DESIGN/BUILD

FDC LOCATION IS NOW SHOWN ON SHEET C4.02 AFTER CONVERSATION WITH FIRE MARSHALL

Andrew King (Rowan County FMO) - 12-19-24
- FDC Location not shown
- Hydrant 100' of FDC for supply

MG (Chief of Police) - 12/20/24

KY - 12/20/24

BA (Public Works Director) - 12/20/24

Landis Fire Chief - 12-23-24

CONTACT:
AUBREE FREELY
AFREELY@ARCODB.COM

ARCO
DESIGN/BUILD
4000 WESTCHASE BLVD., SUITE 450
RALEIGH, NC 27607 P:919.573.9824

SCOUT & CO. ENGINEERING, P.C. | NCBELS: C-5153

PROJECT TITLE

LANDIS RIDGE PHASE 2A

OWNER P: 706.202.7143
JSC-CCI LANDIS II LLC
4890 ALPHA RD SUITE 100
DALLAS, TX 75244-4639

CIVIL ENGINEER P: 919.537.9824
SCOUT & CO. ENGINEERING
4000 WESTCHASE BOULEVARD, SUITE 450
RALEIGH, NC 27607

SURVEYOR P: 704.864.9007
CLONINGER BELL
107 RIVERSIDE DR.
MCADENVILLE, NC 28101

DEVELOPER P: 919.573.9824
ARCO DESIGN/BUILD
4000 WESTCHASE BOULEVARD SUITE 450
RALEIGH, NC 27607

GEOTECH P: 704.525.2003
GEOSCIENCE GROUP INC.
500 CLANTON ROAD SUITE K
CHARLOTTE, NC 28217

FOR REVIEW ONLY

ALL CONSTRUCTION TO BE PERFORMED IN ACCORDANCE WITH ALL CURRENT TOWN OF LANDIS, ROWAN COUNTY, NCDEQ, AND NCDOT STANDARDS, SPECIFICATIONS, AND DETAILS

811 Know what's below. 811 before you dig.

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034099 ENGINEER GARY J. ZURAWSKI

FIRST SUBMITTAL DATE 11/14/2024

REVISIONS

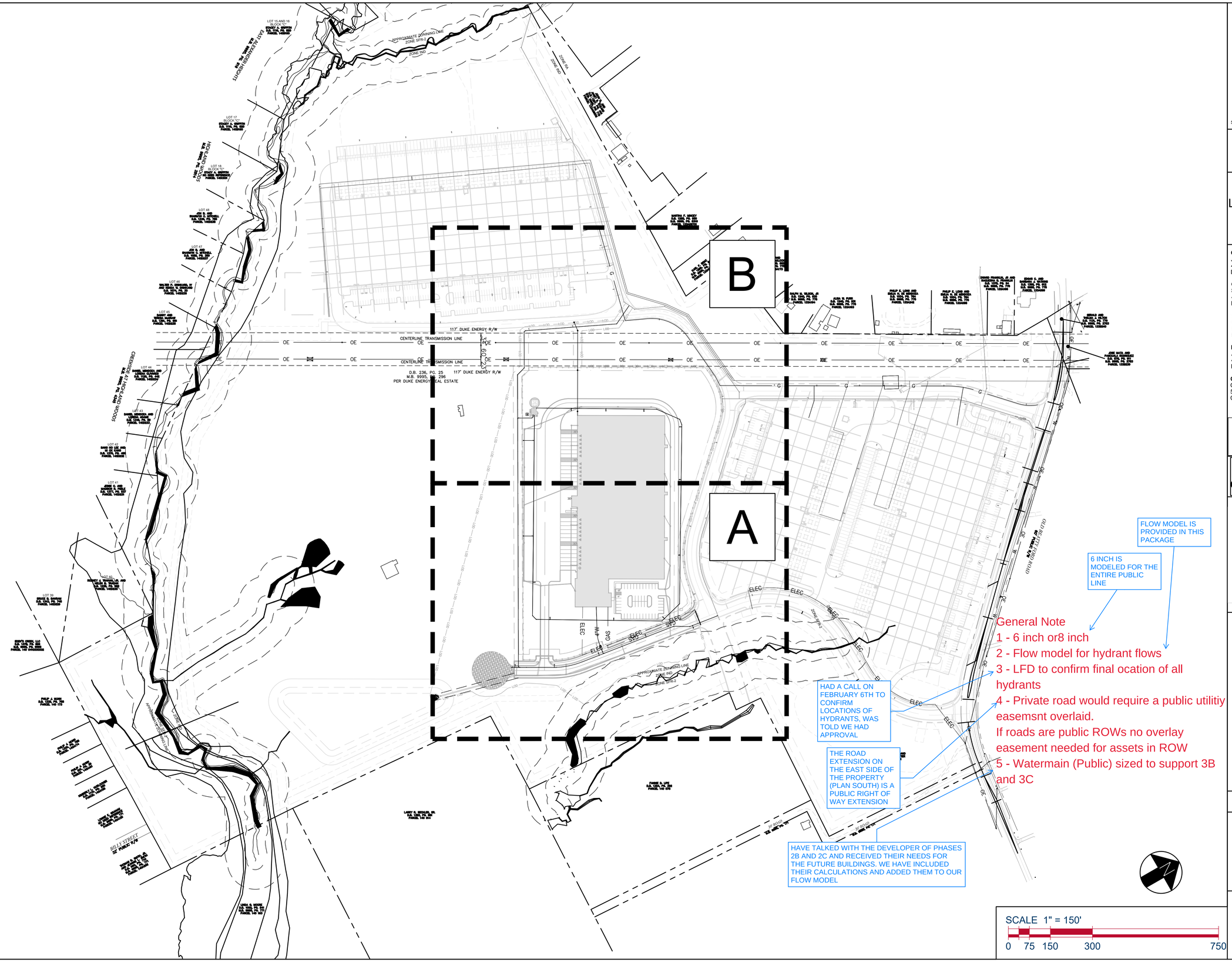
PROJECT NO.	CHECKED BY	DRAWN BY
	GJZ	LWC

SHEET TITLE

COVER SHEET

SHEET NO.

C0.00



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SCOUT & CO. ENGINEERING, P.C. | NCBELS: C-5153

PROJECT TITLE

LANDIS RIDGE PHASE 2A

OWNER P: 706.202.7143
JSC-CCI LANDIS II LLC
4890 ALPHA RD SUITE 100
DALLAS, TX 75244-4639

CIVIL ENGINEER P: 919.537.9824
SCOUT & CO. ENGINEERING
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RALEIGH, NC 27607

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MCADENVILLE, NC 28101

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SEAL

NORTH CAROLINA PROFESSIONAL SEAL 24109 ENGINEER GARY J. ZURAWSKI

FIRST SUBMITTAL DATE 11/14/2024

REVISIONS

PROJECT NO.	CHECKED BY	DRAWN BY
	GJZ	LWC

SHEET TITLE

OVERALL UTILITY PLAN

SHEET NO.

C4.00

INDUSTRIAL BUILDING
195,017 SF
FFE: 788.00'

COMPACTOR

PROP 8" DIP

PROP 6" DIP

PROP. PRIVATE FIRE HYRANT ASSEMBLY WITH 6" GV

NOTED. LABELED ON C3.01

Public Utility Easement

PROP 45.00° BEND

PROP 8" DIP (Private)

NOTED, LABELED ON SHEET C.301

PROP 8" DIP (Public)

PROP 6" DIP

Tapping method and temporary jumper

GV

PROP. PRIVATE FIRE HYRANT ASSEMBLY WITH 6" GV

PROP 22.50° BEND

TAPPING SLEEVE AND VALVE WITH JUMPER HAS BEEN ADDED TO THE PLANS, WITH DETAIL ON SHEET C9.02

NOTED, LABELED ON SHEET C.301

6 INCH DOMESTIC WATER SERVICE LINE

4" WATER METER FOR DOMESTIC WATER LINE

Backflow

BACKFLOW HAS BEEN ADDED

Meter in Public easement

Gate valve on domestic tap

Irrigation meter and backflow?

Public

NOTED, LABELED ON SHEET C3.01

2 GV @ Fit tee

PROP 11.25° BEND

PROP 6" DIP

PROP 6 IN X 6 IN X 6 IN TEE WITH (2) GV

GATE VALVE HAS BEEN ADDED ON SHEET C3.01

UPDATED ON SHEET C3.01

IRRIGATION METER AND BACKFLOW HAVE BEEN SHOWN ON SET FORSUBMITTAL 2

APPROXIMATE ZONINING LINE
ZONE IND
ZONE SFR-2

ELEC
SYD
GAS
W
LOD

SCALE 1" = 60'
0 30 60 120 300

ARCO
DESIGN/BUILD
4000 WESTCHASE BLVD., SUITE 450
RALEIGH, NC 27607 P:919.573.9824

SCOUT & CO. ENGINEERING, P.C. | NCBELS: C-5153

PROJECT TITLE

LANDIS RIDGE PHASE 2A

OWNER P: 706.202.7143
JSC-CCI LANDIS II LLC
4890 ALPHA RD SUITE 100
DALLAS, TX 75244-4639

CIVIL ENGINEER P: 919.537.9824
SCOUT & CO. ENGINEERING
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RALEIGH, NC 27607

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SEAL

NORTH CAROLINA PROFESSIONAL SEAL 34099 ENGINEER GARY J. ZURAWSKI

FIRST SUBMITTAL DATE 11/14/2024

REVISIONS

PROJECT NO.	CHECKED BY	DRAWN BY
	GJZ	LWC

SHEET TITLE

UTILITY PLAN 'A'

SHEET NO.

C4.01

this is a public sewer main with public easement across duke easement. has been updated on sheet C3.02

Tap method. Temp jumper tee w/ 2 gate valves unless installed via hot tap

Confirm this is a public or private sewer main

TAPPING SLEEVE AND VALVE WITH JUMPER HAS BEEN ADDED TO THE PLANS, WITH DETAIL ON SHEET C9.02

UPDATED ON SHEET C3.02

(Public)

PROP 6" DIP

PROP 45.00° BEND

PROP. EX-SSMH05
RIM=785.79

32' - 8" PVC @ 0.010 FT/FT

PROP 6" DIP

PROP 45.00° BEND

117' DUKE ENERGY R/W

SMISSION LINE

60'

23'

PROP 45.00° BEND

PROP 6" DIP

PROP. MH-101
RIM=791.05

142' - 8" PVC @ 0.010 FT/FT

Public utility easement for sewer

Duke requires Private if Duke allows, if private 6 inch can be conidered

LABEL HAS BEEN ADDED

NSMISSION LINE

. 25 117' DUKE ENERGY R/W

. 296

EAL ESTATE

PROP 45.00° BEND

PROP 6" DIP

Public Sewer

Private Sewer

Public

PROP. MH-102
RIM=799.33

NOTED.

THIS IS A PUBLIC EASEMENT, HAS BEEN UPDATED ON SHEET C3.02

147' - 8" PVC @ 0.010 FT/FT

PROP. MH-103
RIM=786.45

PROP. PRIVATE FIRE HYDRANT ASSEMBLY WITH 6" GV

NOTED, UPDATED ON SHEET C3.02

Private

PROP. PRIVATE FIRE HYDRANT ASSEMBLY WITH 6" GV

PROP. PRIVATE FIRE HYDRANT ASSEMBLY WITH 6" GV

LABEL HAS BEEN ADDED ON SHEET C3.02

PROP. 4'-WIDE CONC. SPLASH BLOCK

PRIVATE PUMP HOUSE FFE:788

PROP 6" DIP

PROP 8" DIP

PROP 8" DIP

PROP 45.00° BEND

PROP 6" DIP

2 GVs & tee

PROP 6" DIP

PROP 45.00° BEND

Backflow with detector check As required by state law

PROP 6" DIP

PROP 45.00° BEND

14' - 8" PVC @ 0.010 FT/FT

NOTED, UPDATED ON SHEET C3.02

PROP 22.50° BEND

PROP 6" DIP

PROP 45.00° BEND

PROP 8" DIP

PROP 22.50° BEND

PROP 8" DIP

BACKFLOW WILL BE INTERNAL TO THE BUILDING, LABEL HAS BEEN ADDED TO THAT EFFECT.

PROP 8" DIP

4.9

PROP. PRIVATE FIRE HYRANT ASSEMBLY WITH 6" GV

PROP. PRIVATE FIRE HYRANT ASSEMBLY WITH 6" GV

PROP 8" DIP

Public Utility Easement

PROP. PRIVATE FIRE HYRANT ASSEMBLY WITH 6" GV

LABEL HAS BEEN ADDED

CARL F. AND LAURA M. TADLOCK
D.B. 1378, PG. 662
M.B. 9995, PG. 775
PARCEL 133A173

KARL F. BENZ
D.B. 1289, PG. 84
M.B. 9995, PG. 775
PARCEL 133A09801

SCALE 1" = 40'

0 20 40 80 200

ARCO
DESIGN/BUILD
4000 WESTCHASE BLVD., SUITE 450
RALEIGH, NC 27607 P:919.573.9824

SCOUT & CO. ENGINEERING, P.C. | NCBELS: C-5153

PROJECT TITLE

LANDIS RIDGE PHASE 2A

OWNER P: 706.202.7143
JSC-CCI LANDIS II LLC
4890 ALPHA RD SUITE 100
DALLAS, TX 75244-4639

CIVIL ENGINEER P: 919.537.9824
SCOUT & CO. ENGINEERING
4000 WESTCHASE BOULEVARD, SUITE 450
RALEIGH, NC 27607

SURVEYOR P: 704.864.9007
CLONINGER BELL
107 RIVERSIDE DR.
MCADENVILLE, NC 28101

DEVELOPER P: 919.573.9824
ARCO DESIGN/BUILD
4000 WESTCHASE BOULEVARD SUITE 450
RALEIGH, NC 27607

GEOTECH P: 704.525.2003
GEOSCIENCE GROUP INC.
500 CLANTON ROAD SUITE K
CHARLOTTE, NC 28217

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SEAL

NORTH CAROLINA PROFESSIONAL SEAL 24359 ENGINEER GARY J. ZURAWSKI

FIRST SUBMITTAL DATE 11/14/2024

REVISIONS

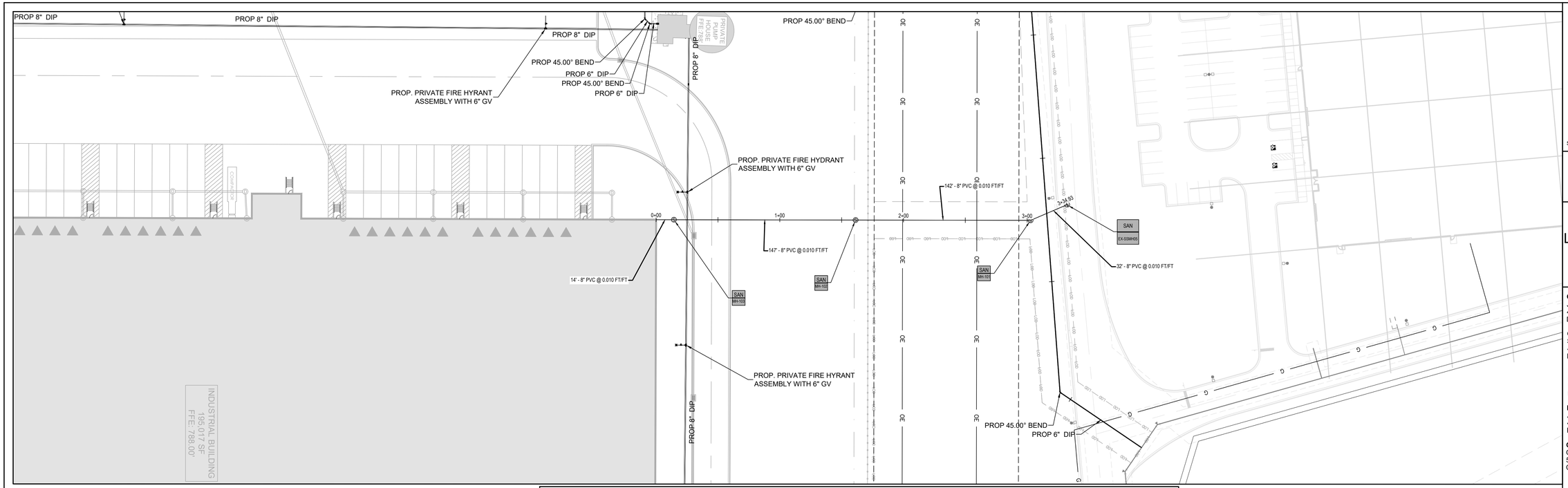
PROJECT NO.	CHECKED BY	DRAWN BY
	GJZ	LWC

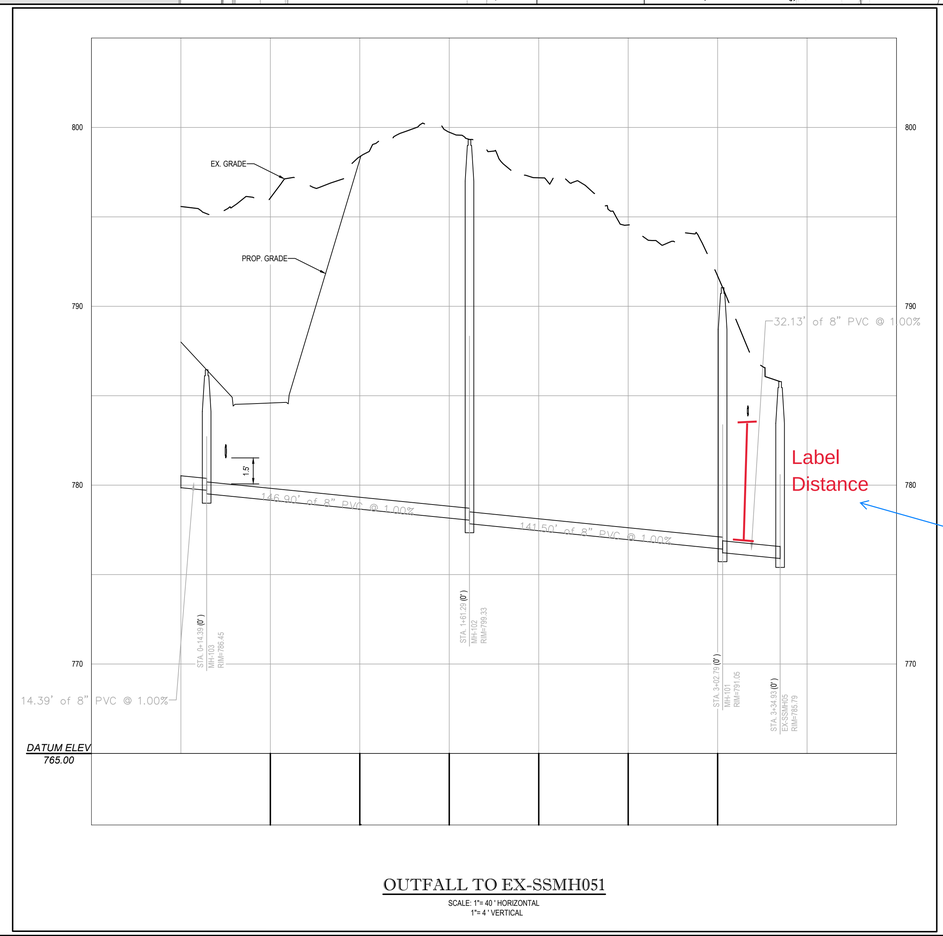
SHEET TITLE

UTILITY PLAN 'B'

SHEET NO.

C4.02





OUTFALL TO EX-SSMH051

SCALE: 1"= 40 ' HORIZONTAL
1"= 4 ' VERTICAL

Label Distance

DISTANCE HAS BEEN LABELED ON SHEET C4.03

SCALE 1" = 40'

0 20 40 80 200

ARCO
DESIGN/BUILD
4000 WESTCHASE BLVD., SUITE 450
RALEIGH, NC 27607 P:919.573.9824

SCOUT & CO. ENGINEERING, P.C. | NCBELS: C-5153

PROJECT TITLE

LANDIS RIDGE PHASE 2A

OWNER P: 706.202.7143
JSC-CCI LANDIS II LLC
4890 ALPHA RD SUITE 100
DALLAS, TX 75244-4639

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SCOUT & CO. ENGINEERING
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CHARLOTTE, NC 28217

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SEAL

NORTH CAROLINA PROFESSIONAL SEAL 041099 ENGINEER GARY J. ZURAWSKI

FIRST SUBMITTAL DATE 11/14/2024

REVISIONS

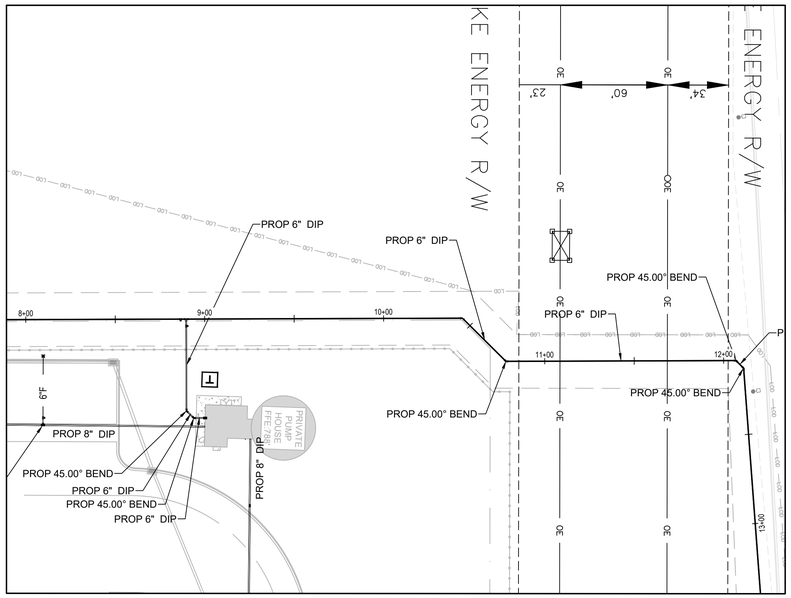
PROJECT NO.	CHECKED BY	DRAWN BY
	GJZ	LWC

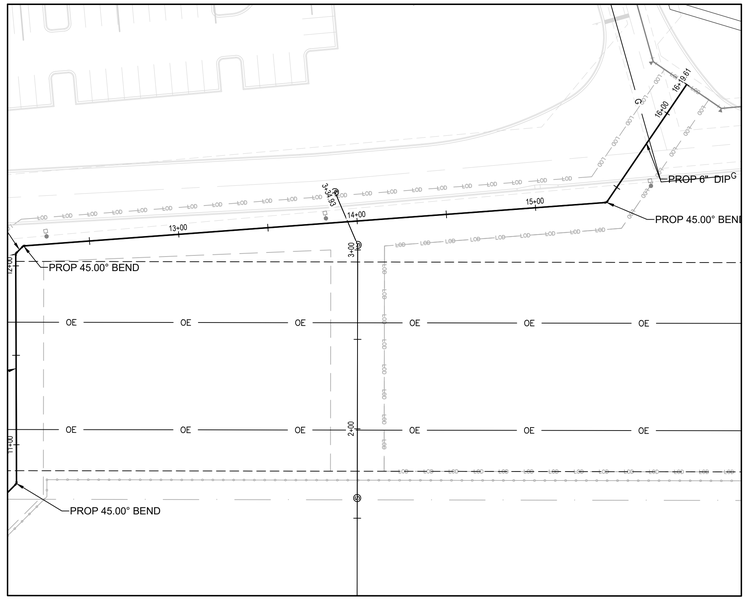
SHEET TITLE

SANITARY SEWER PROFILE

SHEET NO.

C4.03





SCALE 1" = 40'

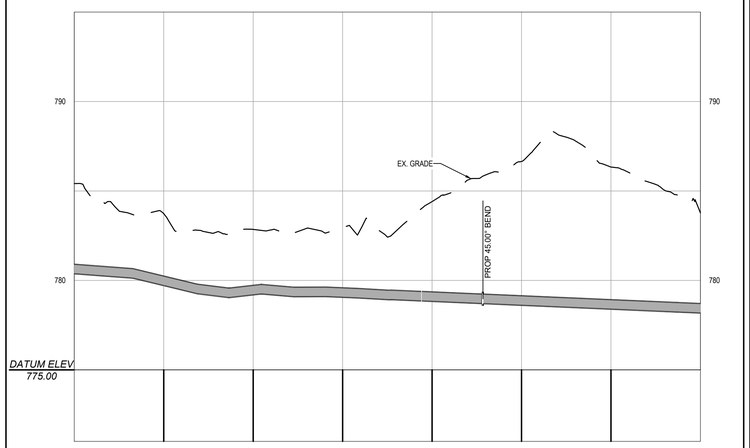
0 20 40 80 200

General Comment
Maintain Slope and cross slope grades

NOTED.

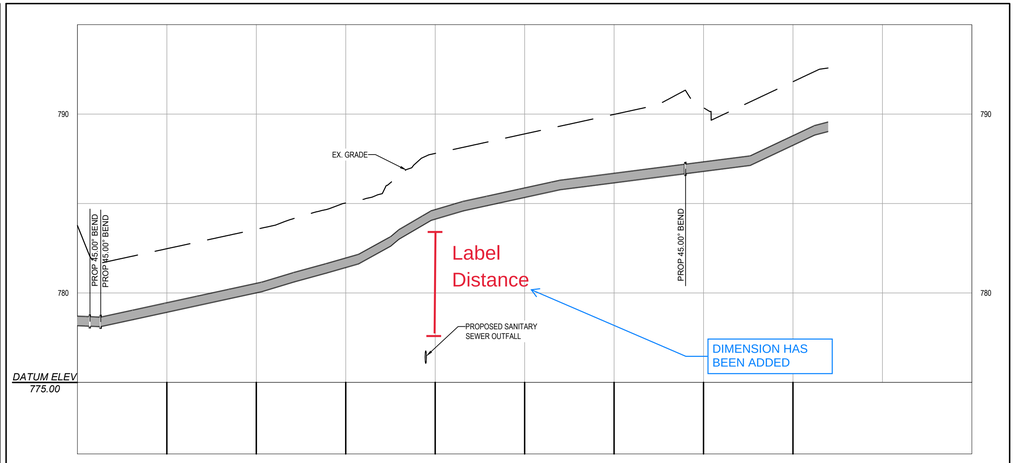
SCALE 1" = 40'

0 20 40 80 200



PUBLIC WATER LINE FROM PUBLIC ROAD B TO PRIVATE ROAD C2 (1)

SCALE: 1"= 40 ' HORIZONTAL
1"= 4 ' VERTICAL



PUBLIC WATER LINE FROM PUBLIC ROAD B TO PRIVATE ROAD C2 (1) (1)

SCALE: 1"= 40 ' HORIZONTAL
1"= 4 ' VERTICAL

ARCO
DESIGN/BUILD
4000 WESTCHASE BLVD., SUITE 450
RALEIGH, NC 27607 P:919.573.9824

SCOUT & CO. ENGINEERING, P.C. | NCBELS: C-5153

PROJECT TITLE

LANDIS RIDGE PHASE 2A

OWNER P: 706.202.7143
JSC-CCI LANDIS II LLC
4890 ALPHA RD SUITE 100
DALLAS, TX 75244-4639

CIVIL ENGINEER P: 919.537.9824
SCOUT & CO. ENGINEERING
4000 WESTCHASE BOULEVARD, SUITE 450
RALEIGH, NC 27607

SURVEYOR P: 704.864.9007
CLONINGER BELL
107 RIVERSIDE DR.
MCADENVILLE, NC 28101

DEVELOPER P: 919.573.9824
ARCO DESIGN/BUILD
4000 WESTCHASE BOULEVARD SUITE 450
RALEIGH, NC 27607

GEOTECH P: 704.525.2003
GEOSCIENCE GROUP INC.
500 CLANTON ROAD SUITE K
CHARLOTTE, NC 28217

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NORTH CAROLINA PROFESSIONAL SEAL 34099 ENGINEER GARY J. ZURAWSKI

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REVISIONS

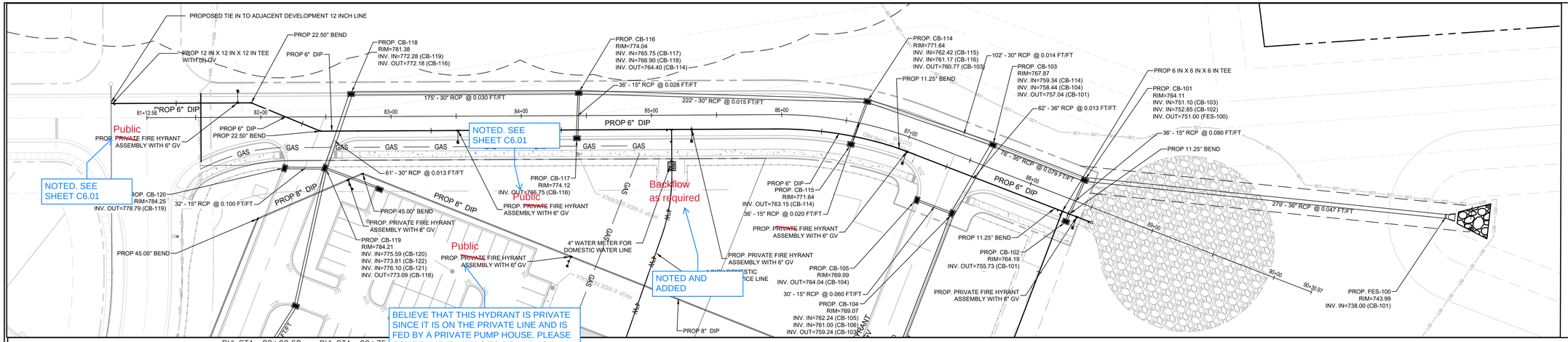
PROJECT NO. **CHECKED BY** **DRAWN BY**
GJZ LWC

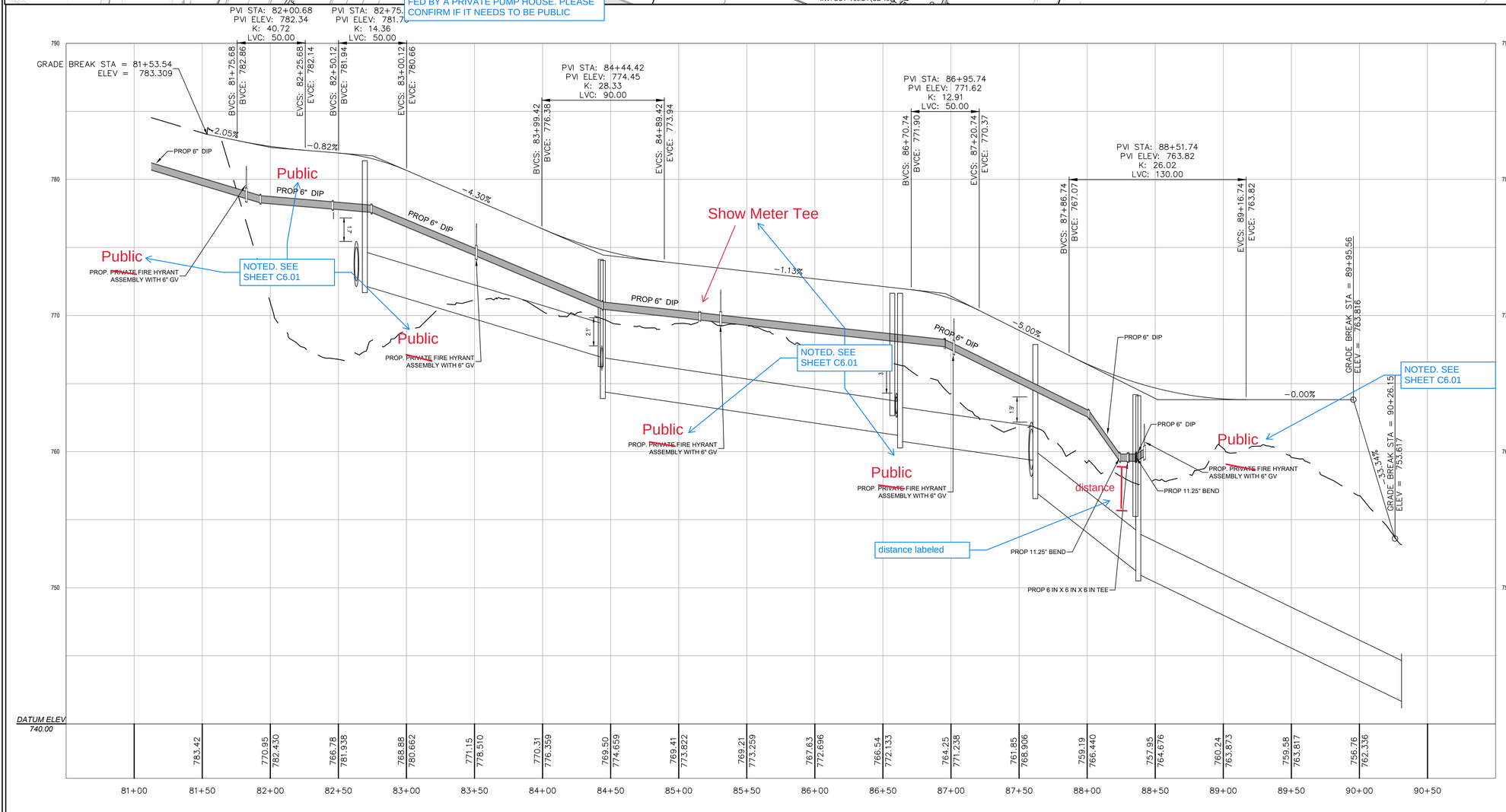
SHEET TITLE

PUBLIC WATER LINE PROFILE II

SHEET NO.

C4.05





Public Road B

SCALE: 1"= 40 ' HORIZONTAL
1"= 4 ' VERTICAL

SCALE 1" = 40'

0 20 40 80 200

ARCO
DESIGN/BUILD
4000 WESTCHASE BLVD., SUITE 450
RALEIGH, NC 27607 P:919.573.9824

SCOUT & CO. ENGINEERING, P.C. | NCBELS: C-5153

PROJECT TITLE

LANDIS RIDGE PHASE 2A

OWNER P: 706.202.7143
JSC-CCI LANDIS II LLC
4890 ALPHA RD SUITE 100
DALLAS, TX 75244-4639

CIVIL ENGINEER P: 919.537.9824
SCOUT & CO. ENGINEERING
4000 WESTCHASE BOULEVARD, SUITE 450
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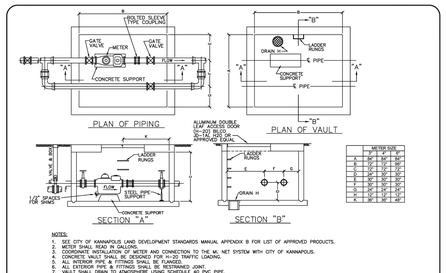
SHEET TITLE

PUBLIC ROAD B PROFILE

SHEET NO.

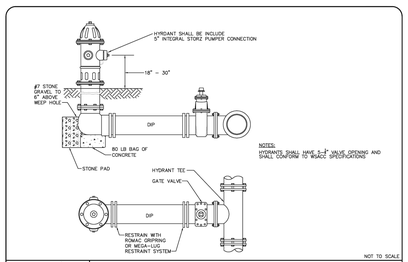
C6.01



WATER SERVICE
3", 4", & 6"
COMPOUND WATER METER & VAULT

SEPTEMBER 2022
316

METER BOXES AND VAULTS

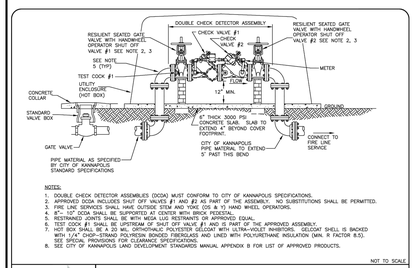


NOT TO SCALE

FIRE HYDRANT

SEPTEMBER 2022
321

FIRE HYDRANT



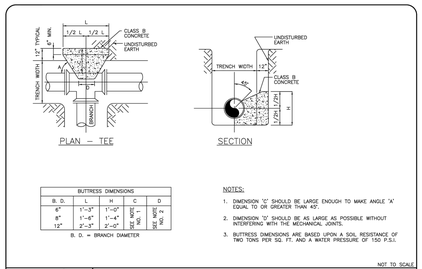
NOTES:
1. DOUBLE CHECK DETECTOR ASSEMBLIES (DCDA) MUST CONFORM TO CITY OF KANNAPOLIS SPECIFICATIONS.
2. APPROVED DCDA INCLUDES SHUT OFF VALVES #1 AND #2 AS PART OF THE ASSEMBLY. NO SUBSTITUTIONS SHALL BE PERMITTED.
3. FIRE LINE SERVICES SHALL HAVE OUTSIDE STEM AND YOKE (OS & Y) HAND WHEEL OPERATORS.
4. 8"– 10" DCDA SHALL BE SUPPORTED AT CENTER WITH BRICK PEDESTAL.
5. TEST COCKS JOINTS SHALL BE MECHANICAL JOINT OR FLANGED EQUAL.
6. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND #2 PART OF THE APPROVED ASSEMBLY.
7. HOT BOX SHALL BE A 22 MIL ORTHOPHALIC POLYESTER GELCOAT WITH ULTRA-VIOLET INHIBITORS. GELCOAT SHELL IS BACKED WITH 1/4" CHOP–STRAND POLYRESIN BONDED FIBERGLASS AND LINED WITH POLYURETHANE INSULATION (MIN. R FACTOR 8.5). SEE SPECIAL PROVISIONS FOR CLEARANCE SPECIFICATIONS.
8. SEE CITY OF KANNAPOLIS LAND DEVELOPMENT STANDARDS MANUAL APPENDIX B FOR LIST OF APPROVED PRODUCTS.

NOT TO SCALE

BACKFLOW PREVENTION
3"-10" DOUBLE CHECK DETECTOR ASSEMBLY (DCDA)

SEPTEMBER 2022
320

OUTDOOR 10" BACKFLOW PREVENTION



BUTTRESS DIMENSIONS					
B. D.	L	H	C	D	SEE NOTE NO. 2
6"	1'–3"	1'–0"			
8"	1'–6"	1'–4"			
12"	2'–3"	2'–0"			

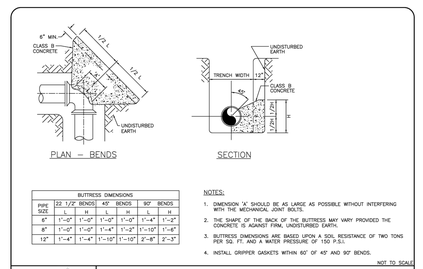
B. D. = BRANCH DIAMETER

NOTES:
1. DIMENSION 'C' SHOULD BE LARGE ENOUGH TO MAKE ANGLE 'A' EQUAL TO OR GREATER THAN 45°.
2. DIMENSION 'D' SHOULD BE AS LARGE AS POSSIBLE WITHOUT INTERFERING WITH THE MECHANICAL JOINTS.
3. BUTTRESS DIMENSIONS ARE BASED UPON A SOIL RESISTANCE OF TWO TONS PER SQ. FT. AND A WATER PRESSURE OF 150 P.S.I.

NOT TO SCALE

THRUST BLOCK - TEES

SEPTEMBER 2022
327



BUTTRESS DIMENSIONS						
PIPE SIZE	22 1/2° BENDS		45° BENDS		90° BENDS	
	L	H	L	H	L	H
6"	1'–0"	1'–0"	1'–0"	1'–0"	1'–4"	1'–3"
8"	1'–0"	1'–0"	1'–4"	1'–3"	1'–10"	1'–8"
12"	1'–4"	1'–4"	1'–10"	1'–10"	2'–8"	2'–3"

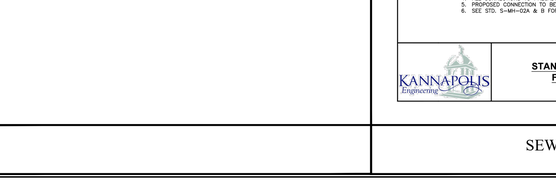
NOTES:
1. DIMENSION 'A' SHOULD BE AS LARGE AS POSSIBLE WITHOUT INTERFERING WITH THE MECHANICAL JOINT BOLTS.
2. THE SHAPE OF THE BACK OF THE BUTTRESS MAY VARY PROVIDED THE CONCRETE IS AGAINST FIRM, UNDISTURBED EARTH.
3. BUTTRESS DIMENSIONS ARE BASED UPON A SOIL RESISTANCE OF TWO TONS PER SQ. FT. AND A WATER PRESSURE OF 150 P.S.I.
4. INSTALL GRIPPER GASKETS WITHIN 60° OF 45° AND 90° BENDS.

NOT TO SCALE

THRUST BLOCK - BENDS

SEPTEMBER 2022
328

THRUST BLOCK



NOTES:
1. REFER TO KANNAPOLIS LAND DEVELOPMENT STANDARDS MANUAL (LDSM) APPENDIX B FOR APPROVED PRODUCT LIST.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. CONCRETE SHALL NOT CONTACT PVC, HDPE, OR PLASTIC PIPE MATERIAL.
4. INSTALL SLEEVE WITH PRESSURE TEST PORT FACING UP.
5. TAPPING VALVE SHALL BE FULL BODIED, EPOXY COATED, NON-RISING STEM, RESILIENT WEDGE GATE VALVE WITH ONE FLANGED END AND ONE MECHANICAL JOINT END.

NOTES (CONT'D):
6. TAP PLACEMENT SHALL BE NO CLOSER THAN 40 INCHES OR A DISTANCE EQUAL TO ONE (1) MAIN PIPE DIAMETER PLUS TWO (2) TAP PIPE DIAMETERS (WHICHEVER IS LARGER) FROM A JOINT OR FITTING.
7. BLOCKING UNDER THE VALVE AS REQUIRED BY CITY INSPECTOR.
8. PRESSURE TESTING AND BLOCKING SHALL BE WITNESSED AND APPROVED BY CITY INSPECTOR.
9. IF THE EXCAVATION EXCEEDS 6 FEET DEEP, APPROVED SHORING SHALL BE USED.
10. EXCAVATION SITE SHALL BE EASILY ACCESSIBLE BY CITY EQUIPMENT.

NOT TO SCALE

TAPPING SLEEVE AND VALVE

SEPTEMBER 2022
348

TAPPING SLEEVE

CUBIC YARDS OF CONCRETE TO ANCHOR VERTICAL BEND						
PIPE DIA.	11–1/4° BEND		22–1/2° BEND		45° BEND	
6"	812 #	1/2 CY	1653 #	1/2 CY	3247 #	1.0 CY
8"	1444 #	1/2 CY	2939 #	3/4 CY	5773 #	1.5 CY
12"	3248 #	1.0 CY	6612 #	1–3/4 CY	12988 #	3.5 CY
16"	5775 #	1–1/2 CY	11756 #	3.0 CY	23090 #	6.0 CY

NOT TO SCALE

STANDARD VERTICAL BEND ANCHORS

SEPTEMBER 2022
329

TRACER WIRE

NOT TO SCALE

SEWER TRACER WIRE

SEPTEMBER 2022
339

TRACER WIRE

NOTES
1. INSTALL 2" BLOW–OFF ON 2" THRU 8" MAINS.
2. INSTALL 2.5" BLOW–OFF ON 12" MAINS.
3. 2" & 2.5" BLOW–OFFS TO HAVE (NPT) COUPLING
4. INSTALL 4" BLOW–OFF ON 16" MAINS.
5. INSTALL 6" BLOW–OFF ON 24" MAINS.
6. THE LOCATION OF THE CHECK CONTROL VALVE AND THE BLOW–OFF DOES NOT ALLOW THE INSTALLATION OF THE CONCRETE PROTECTOR RINGS, A 24" BY 24" BY 6" THICK CONCRETE PAD SHALL BE FORMED AND POURED AROUND THE VALVE BOX. THE EDGE OF THE VALVE BOX RIM MUST BE AT LEAST 6" FROM THE EDGE OF THE CONCRETE PAD.

NOT TO SCALE

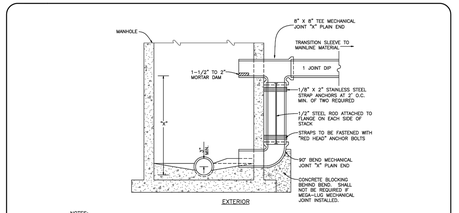
TEMPORARY BLOW-OFF ASSEMBLY

SEPTEMBER 2022
331

BLOW OFF ASSEMBLY

Temporary jumper, connecting new main

TEMPORARY JUMPER DETAIL HAS BEEN ADDED



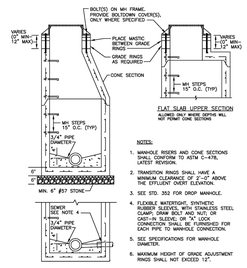
NOTES:
1. THIS DETAIL SHALL BE USED ONLY WHERE INDICATED ON PLANS.
2. ALL EXTERIOR DROP PIPE AND FITTINGS TO BE DUCTILE IRON.
3. MEGALUG MAY BE USED AS A METHOD OF RESTRAINT IN LIEU OF ¾" STEEL ROD ATTACHED TO FLANGE ON EACH SIDE OF STACK.
4. ALL MECHANICAL JOINTS ON DROP PIPE SHALL BE WATERTIGHT.
5. PROPOSED CONNECTION TO BE USED WHERE THE DROP EXCEEDS 2'–0" FROM INVERT IN TO INVERT OUT.
6. SEE STD. S–MH–02A & B FOR STANDARD MANHOLE.

NOT TO SCALE

STANDARD EXTERIOR-DROP CONNECTION FOR SANITARY SEWER MANHOLE

SEPTEMBER 2022
336

SEWER DROP MANHOLE



NOTES:
1. MANHOLE RISERS AND CONE SECTIONS SHALL CONFORM TO ASTM C–478, LATEST REVISION.
2. TRANSITION RINGS SHALL HAVE A MINIMUM CLEARANCE OF 2'–0" ABOVE THE EFFLUENT OVERT ELEVATION.
3. SEE STD. 352 FOR DROP MANHOLE.
4. FLEXIBLE WATERTIGHT, SYNTHETIC RUBBER BOOT WITH STAINLESS STEEL CLAMP, DRAW BOLT AND NUT, OR CAST–IN SLEEVE, OR "A" LOCK CONNECTION SHALL BE FURNISHED FOR EACH PIPE TO MANHOLE CONNECTION.
5. SEE SPECIFICATIONS FOR MANHOLE DIAMETER.
6. MAXIMUM HEIGHT OF GRINDE ADJUSTMENT RINGS SHALL NOT EXCEED 12".

NOT TO SCALE

STANDARD PRECAST CONCRETE MANHOLE

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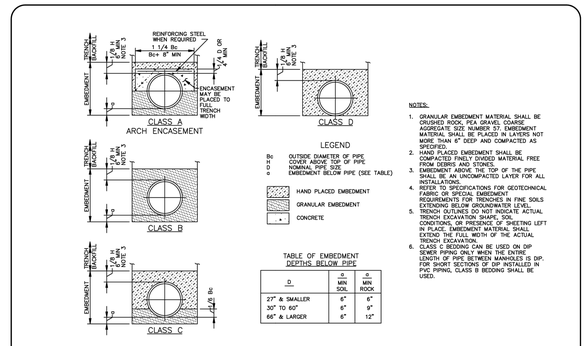
333

SEWER MANHOLE



D	e MIN SOIL	e MIN ROCK
27" & SMALLER	6"	6"
30" TO 60"	6"	9"
66" & LARGER	6"	12"

NOTES:
1. GRANULAR EMBEDMENT MATERIAL SHALL BE CRUSHED ROCK, PEA GRAVEL COARSE AGGREGATE SIZE NUMBER 57. EMBEDMENT MATERIAL SHALL BE PLACED IN LAYERS NOT MORE THAN 6" DEEP AND COMPACTED AS SPECIFIED.
2. HAND PLACED EMBEDMENT SHALL BE SELECTED SOILS OR APPROVED MATERIAL FREE FROM DEBRIS AND STONES.
3. EMBEDMENT ABOVE THE TOP OF THE PIPE SHALL BE AN UNCOMPACTED LAYER FOR ALL INSTALLATIONS.
4. SEE SPECIFICATIONS FOR GEOTECHNICAL FABRIC OR SPECIAL EMBEDMENT REQUIREMENTS FOR TRENCHES IN FINE SOILS EXTENDING BELOW GROUNDWATER LEVEL.
5. TRENCH OUTLINES DO NOT INDICATE ACTUAL TRENCH EXCAVATION SHAPE, SOIL CONDITIONS, OR PRESENCE OF SHEETING LEFT IN PLACE. EMBEDMENT SHALL BE PLACED TO EXTEND THE FULL WIDTH OF THE ACTUAL TRENCH EXCAVATION.
6. CLASS C BEDDING CAN BE USED ON DIP SEWER PIPING ONLY WHEN THE ENTIRE LENGTH OF PIPE BETWEEN MANHOLES IS DIP. FOR SHORT SECTIONS OF DIP INSTALLED IN PVC PIPING, CLASS B BEDDING SHALL BE USED.

NOT TO SCALE

EMBEDMENTS FOR MAINS

SEPTEMBER 2022
309

WATER PIPE EMBEDMENT

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DESIGN/BUILD
4000 WESTCHASE BLVD., SUITE 450
RALEIGH, NC 27607 P:919.573.9824

SCOUT & CO. ENGINEERING, P.C. | NCBELS: C-5153

PROJECT TITLE

LANDIS RIDGE PHASE 2A

OWNER P: 706.202.7143
JSC-CCI LANDIS II LLC
4890 ALPHA RD SUITE 100
DALLAS, TX 75244-4639

CIVIL ENGINEER P: 919.537.9824
SCOUT & CO. ENGINEERING
4000 WESTCHASE BOULEVARD, SUITE 450
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CHARLOTTE, NC 28217

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NORTH CAROLINA PROFESSIONAL SEAL 24089 ENGINEER GARY J. ZURAWSKI

FIRST SUBMITTAL DATE 11/14/2024

REVISIONS

PROJECT NO.	CHECKED BY	DRAWN BY
	GJZ	LWC

SHEET TITLE

UTILITY DETAILS I

SHEET NO.

C9.02

EROSION CONTROL AND STORMWATER MANAGEMENT REPORT

FOR

LANDIS RIDGE PHASE 2A

FEBRUARY 7TH, 2025

PREPARED FOR

ARCO DESIGN/BUILD

DESIGN BY: LOGAN CRISS, EIT
REVIEW BY: GARY ZURAWSKI, PE

ARCO DESIGN/BUILD

1.0 Project Narrative

This report is for the proposed industrial project located on Olde Beatty Ford Road in Landis, NC. The project contains 1 industrial building with associated parking, utilities, and erosion control. The parcel contains 15.18 acres with a stream located on the East side of the proposed project area. This parcel is a part of a larger development called Landis Ridge, which is under construction. The parcel in this proposal is a separate project with separate permit requirements, but will be called Landis Ridge Phase 2A for clarity. The proposed project has a total disturbance of 22.47 acres. The site drains to one common convergence point. The entire site drains toward the southeast corner, with an existing drainage swale from the Landis Ridge project running along the eastern edge of the site. The site falls within the Coldwater Creek (Lake Fisher) water supply Watershed, which is a Surface water classification of Water supply IV, and is a Protected area (WS-IV P). It is also in the Yadkin River Basin. The site is zoned IND and its PIN number is 140-002.

1.1 Existing Conditions

The parcel's current land cover condition is undisturbed woodlands with a stream located on the east side of the site. Wetland and stream disturbance is below half an acre. A variety of different soil types are present on site, see the web soil survey in the appendix.

1.2 Proposed Conditions

The proposed site improvements consist of 1 industrial building with associated grading, utilities, and erosion control practices. Access to the site will be on Old Beatty Ford Road, through the currently under construction Landis Ridge Project. One sediment basin will be used to control sedimentation in disturbed areas for this parcel. This basin has been designed and maintained by others under separate cover. The runoff on site will be channelized and directed to the sediment basin via lined swales. Swales were sized and lined to control the 10-year, 5 minute storm. Additional erosion control measures including rock construction entrance, silt fence with associated outlets, inlet protection, and soil stockpiles are also utilized on site. The permanent pond for stormwater treatment will be a regional pond and will be designed by others under a separate cover and permit. See sheets C7.00 through C7.43 for details and sequencing.

Bookmark Summary

APPENDIX A.
QUADRANGLE MAP

USGS science for a changing world

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

CHINA GROVE QUADRANGLE
NORTH CAROLINA
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 17S

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, July 2020 - July 2020
Roads.....U.S. Census Bureau, 2016
Names.....GNIS, 1980 - 2022
Hydrography.....National Hydrography Dataset, 2002 - 2018
Contours.....National Elevation Dataset, 2008
Boundaries.....Multiple sources; see metadata file 2019 - 2021

Wetlands.....FWS National Wetlands Inventory Not Available

MN 7°59' 142 MILS
GN 0°15' 4 MILS
UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
NV
Grid Zone Designation 17S

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

NORTH CAROLINA
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 Cleveland
2 Rowan Mills
3 Salisbury
4 Enochville
5 Rockwell
6 Kannapolis
7 Concord
8 Mount Pleasant

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

CHINA GROVE, NC
2022

MN 764301637862O
GAREF NO. USGSX24K8578

APPENDIX B.
SOIL REPORT

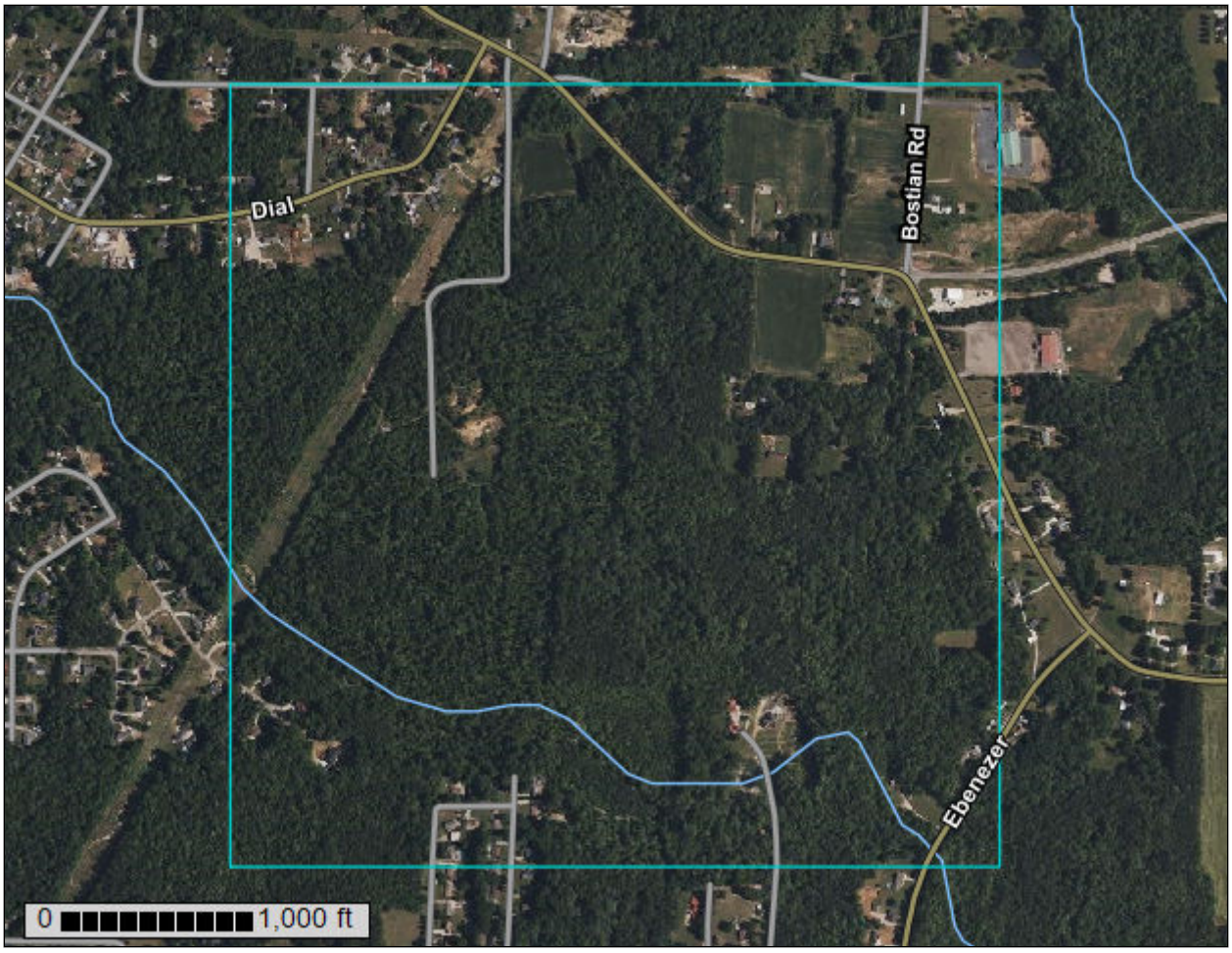
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rowan County, North Carolina



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:9,490 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:24,000.

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: Rowan County, North Carolina
Survey Area Data: Version 22, Sep 9, 2024

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

Date(s) aerial images were photographed: Mar 13, 2022—May 9, 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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ChA	Chewacla loam, 0 to 2 percent slopes, frequently flooded	22.2	5.9%
EnB	Enon fine sandy loam, 2 to 8 percent slopes	43.7	11.6%
EnC	Enon fine sandy loam, 8 to 15 percent slopes	35.0	9.3%
PaC	Pacolet sandy loam, 8 to 15 percent slopes	31.7	8.4%
PaD	Pacolet sandy loam, 15 to 25 percent slopes	0.1	0.0%
PcB2	Pacolet sandy clay loam, 2 to 8 percent slopes, moderately eroded	164.9	43.8%
PcC2	Pacolet sandy clay loam, 8 to 15 percent slopes, moderately eroded	36.9	9.8%
PxD	Poindexter-Rowan complex, 15 to 25 percent slopes	19.2	5.1%
RnB	Rion-Wedowee complex, 2 to 8 percent slopes	19.0	5.0%
SaB	Saw-Pacolet complex, 2 to 8 percent slopes	0.9	0.2%
SaC	Saw-Pacolet complex, 8 to 15 percent slopes	2.2	0.6%
ScB2	Saw-Pacolet complex, 2 to 8 percent slopes, moderately eroded	0.3	0.1%
WtB	Wynott-Enon complex, 2 to 8 percent slopes	0.7	0.2%
Totals for Area of Interest		**376.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class.

Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The

pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rowan County, North Carolina

ChA—Chewacla loam, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2vy6r
Elevation: 330 to 660 feet
Mean annual precipitation: 39 to 47 inches
Mean annual air temperature: 55 to 63 degrees F
Frost-free period: 200 to 250 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Chewacla, frequently flooded, and similar soils: 90 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chewacla, Frequently Flooded

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous and metamorphic rock

Typical profile

Ap - 0 to 6 inches: loam
Bw - 6 to 52 inches: sandy clay loam
Cg - 52 to 80 inches: stratified sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F136XY610GA - Flood plain forest, wet
Hydric soil rating: No

Minor Components

Wehadkee, frequently flooded

Percent of map unit: 5 percent
Landform: Flood plains

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

EnB—Enon fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 3vn1
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Enon and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enon

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Saprolite derived from diorite and/or gabbro and/or diabase and/or gneiss

Typical profile

Ap - 0 to 7 inches: fine sandy loam
BA - 7 to 10 inches: sandy clay loam
Bt - 10 to 27 inches: clay
BC - 27 to 33 inches: clay loam
C - 33 to 80 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F136XY720NC - Basic upland forest, moist
Hydric soil rating: No

EnC—Enon fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 3vn2
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Enon and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enon

Setting

Landform: Hillslopes on ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Saprolite derived from diorite and/or gabbro and/or diabase and/or gneiss

Typical profile

Ap - 0 to 7 inches: fine sandy loam
BA - 7 to 10 inches: sandy clay loam
Bt - 10 to 27 inches: clay
BC - 27 to 33 inches: clay loam
C - 33 to 80 inches: loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F136XY720NC - Basic upland forest, moist
Hydric soil rating: No

PaC—Pacolet sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 3vnn
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Pacolet and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pacolet

Setting

Landform: Hillslopes on ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Saprolite derived from granite and gneiss and/or schist

Typical profile

Ap - 0 to 5 inches: sandy loam
E - 5 to 8 inches: sandy loam
Bt - 8 to 29 inches: clay
BC - 29 to 38 inches: sandy clay loam
C - 38 to 80 inches: sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

PaD—Pacolet sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 3vnp
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Pacolet and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pacolet

Setting

Landform: Hillslopes on ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Saprolite derived from granite and gneiss and/or schist

Typical profile

Ap - 0 to 5 inches: sandy loam
E - 5 to 8 inches: sandy loam
Bt - 8 to 29 inches: clay
BC - 29 to 38 inches: sandy clay loam
C - 38 to 80 inches: sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B

Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

PcB2—Pacolet sandy clay loam, 2 to 8 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2m9wh
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Pacolet, moderately eroded, and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pacolet, Moderately Eroded

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Saprolite derived from granite and gneiss and/or schist

Typical profile

Ap - 0 to 7 inches: sandy clay loam
Bt - 7 to 24 inches: clay
B - 24 to 33 inches: sandy clay loam
C - 33 to 80 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

PcC2—Pacolet sandy clay loam, 8 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2m9wj
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Pacolet, moderately eroded, and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pacolet, Moderately Eroded

Setting

Landform: Hillslopes on ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Saprolite derived from granite and gneiss and/or schist

Typical profile

Ap - 0 to 7 inches: sandy clay loam
Bt - 7 to 24 inches: clay
B - 24 to 33 inches: sandy clay loam
C - 33 to 80 inches: loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

PxD—Poindexter-Rowan complex, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2md4r
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Poindexter and similar soils: 45 percent
Rowan and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poindexter

Setting

Landform: Hillslopes on ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Saprolite derived from diorite and/or gabbro and/or diabase and/or gneiss

Typical profile

A - 0 to 3 inches: loam
E - 3 to 7 inches: loam
Bt - 7 to 26 inches: sandy clay loam
C - 26 to 39 inches: loam
Cr - 39 to 43 inches: weathered bedrock
R - 43 to 80 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock; 40 to 80 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C

Ecological site: F136XY730SC - Basic upland forest, depth restriction, dry
Hydric soil rating: No

Description of Rowan

Setting

Landform: Hillslopes on ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Saprolite derived from diorite and/or gabbro and/or diabase and/or gneiss

Typical profile

A - 0 to 2 inches: loam
E - 2 to 9 inches: loam
Bt - 9 to 29 inches: sandy clay loam
C - 29 to 80 inches: loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F136XY720NC - Basic upland forest, moist
Hydric soil rating: No

RnB—Rion-Wedowee complex, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 3vp0
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Rion and similar soils: 50 percent

Wedowee and similar soils: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rion

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Saprolite derived from granite and gneiss

Typical profile

Ap - 0 to 8 inches: sandy loam
Bt - 8 to 26 inches: sandy clay loam
BC - 26 to 38 inches: sandy clay loam
C - 38 to 80 inches: sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

Description of Wedowee

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Saprolite derived from granite and gneiss and/or schist

Typical profile

Ap - 0 to 12 inches: sandy loam
BE - 12 to 15 inches: sandy clay loam
Bt - 15 to 29 inches: clay
C - 29 to 80 inches: sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

SaB—Saw-Pacolet complex, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 3vp5
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Saw and similar soils: 50 percent
Pacolet and similar soils: 45 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saw

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Saprolite derived from granite and/or gneiss

Typical profile

Ap - 0 to 8 inches: sandy loam
Bt - 8 to 20 inches: clay
BC - 20 to 26 inches: sandy clay loam
C - 26 to 29 inches: sandy loam
R - 29 to 80 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained

Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F136XY830NC - Acidic upland forest, depth restriction, dry-moist
Hydric soil rating: No

Description of Pacolet

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Saprolite derived from granite and gneiss and/or schist

Typical profile

Ap - 0 to 5 inches: sandy loam
E - 5 to 8 inches: sandy loam
Bt - 8 to 29 inches: clay
BC - 29 to 38 inches: sandy clay loam
C - 38 to 80 inches: sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

SaC—Saw-Pacolet complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 3vp6
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Saw and similar soils: 50 percent
Pacolet and similar soils: 45 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saw

Setting

Landform: Hillslopes on ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Saprolite derived from granite and/or saprolite derived from gneiss

Typical profile

Ap - 0 to 8 inches: sandy loam
Bt - 8 to 20 inches: clay
BC - 20 to 26 inches: sandy clay loam
C - 26 to 29 inches: sandy loam
R - 29 to 80 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F136XY830NC - Acidic upland forest, depth restriction, dry-moist

Hydric soil rating: No

Description of Pacolet

Setting

Landform: Hillslopes on ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Saprolite derived from granite and gneiss and/or schist

Typical profile

Ap - 0 to 5 inches: sandy loam
E - 5 to 8 inches: sandy loam
Bt - 8 to 29 inches: clay
BC - 29 to 38 inches: sandy clay loam
C - 38 to 80 inches: sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

ScB2—Saw-Pacolet complex, 2 to 8 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2m9wr
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Saw, moderately eroded, and similar soils: 50 percent
Pacolet, moderately eroded, and similar soils: 45 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saw, Moderately Eroded

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Saprolite derived from granite and/or saprolite derived from gneiss

Typical profile

Ap - 0 to 5 inches: sandy clay loam
Bt - 5 to 20 inches: clay
BC - 20 to 26 inches: sandy clay loam
C - 26 to 29 inches: sandy loam
R - 29 to 80 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F136XY830NC - Acidic upland forest, depth restriction, dry-moist
Hydric soil rating: No

Description of Pacolet, Moderately Eroded

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Saprolite derived from granite and gneiss and/or schist

Typical profile

Ap - 0 to 7 inches: sandy clay loam
Bt - 7 to 28 inches: clay
BC - 28 to 44 inches: sandy clay loam
C - 44 to 80 inches: sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

WtB—Wynott-Enon complex, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2md4m
Elevation: 200 to 1,400 feet
Mean annual precipitation: 37 to 60 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Wynott and similar soils: 60 percent
Enon and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wynott

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Saprolite derived from diorite and/or gabbro and/or diabase and/or gneiss

Typical profile

A - 0 to 4 inches: sandy loam
E - 4 to 14 inches: sandy loam
Bt - 14 to 24 inches: clay
BC - 24 to 28 inches: sandy clay loam
Cr - 28 to 80 inches: weathered bedrock

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F136XY730SC - Basic upland forest, depth restriction, dry
Hydric soil rating: No

Description of Enon

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Saprolite derived from diorite and/or gabbro and/or diabase and/or gneiss

Typical profile

Ap - 0 to 7 inches: fine sandy loam
BA - 7 to 10 inches: sandy clay loam
Bt - 10 to 27 inches: clay
BC - 27 to 33 inches: clay loam
C - 33 to 80 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F136XY720NC - Basic upland forest, moist
Hydric soil rating: No

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APPENDIX C. NOAA RAINFALL DATA

NOAA Atlas 14, Volume 2, Version 3
Location name: Landis, North Carolina, USA*
Latitude: 35.5316°, Longitude: -80.5953°
Elevation: 767 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.69** (4.33-5.10)	**5.56** (5.12-6.04)	**6.48** (5.96-7.03)	**7.13** (6.54-7.73)	**7.86** (7.18-8.51)	**8.36** (7.60-9.06)	**8.81** (7.96-9.55)	**9.20** (8.27-9.98)	**9.64** (8.57-10.5)	**9.92** (8.75-10.8)
10-min	**3.75** (3.46-4.07)	**4.44** (4.10-4.83)	**5.18** (4.78-5.63)	**5.70** (5.23-6.17)	**6.26** (5.72-6.78)	**6.66** (6.05-7.21)	**7.00** (6.32-7.58)	**7.30** (6.55-7.91)	**7.62** (6.77-8.29)	**7.82** (6.89-8.53)
15-min	**3.13** (2.88-3.39)	**3.72** (3.43-4.05)	**4.37** (4.02-4.75)	**4.81** (4.41-5.21)	**5.29** (4.83-5.73)	**5.62** (5.10-6.08)	**5.90** (5.33-6.39)	**6.14** (5.51-6.66)	**6.39** (5.68-6.96)	**6.54** (5.77-7.13)
30-min	**2.14** (1.98-2.32)	**2.57** (2.37-2.80)	**3.11** (2.86-3.38)	**3.48** (3.19-3.77)	**3.92** (3.58-4.24)	**4.23** (3.84-4.58)	**4.52** (4.08-4.89)	**4.78** (4.29-5.18)	**5.09** (4.52-5.54)	**5.30** (4.67-5.78)
60-min	**1.34** (1.23-1.45)	**1.61** (1.49-1.75)	**1.99** (1.83-2.16)	**2.27** (2.08-2.46)	**2.61** (2.38-2.82)	**2.87** (2.60-3.10)	**3.11** (2.81-3.37)	**3.35** (3.01-3.63)	**3.65** (3.24-3.97)	**3.87** (3.41-4.22)
2-hr	**0.772** (0.709-0.841)	**0.935** (0.858-1.02)	**1.16** (1.06-1.27)	**1.33** (1.22-1.45)	**1.55** (1.41-1.69)	**1.72** (1.55-1.87)	**1.88** (1.69-2.05)	**2.04** (1.82-2.23)	**2.25** (1.99-2.46)	**2.41** (2.11-2.64)
3-hr	**0.549** (0.504-0.599)	**0.663** (0.609-0.724)	**0.828** (0.759-0.904)	**0.954** (0.872-1.04)	**1.12** (1.02-1.22)	**1.25** (1.13-1.36)	**1.38** (1.24-1.50)	**1.52** (1.35-1.65)	**1.70** (1.49-1.85)	**1.83** (1.59-2.00)
6-hr	**0.334** (0.307-0.364)	**0.402** (0.370-0.440)	**0.502** (0.461-0.548)	**0.580** (0.531-0.632)	**0.685** (0.623-0.744)	**0.768** (0.694-0.834)	**0.852** (0.764-0.926)	**0.938** (0.832-1.02)	**1.06** (0.923-1.15)	**1.15** (0.989-1.25)
12-hr	**0.196** (0.181-0.214)	**0.237** (0.218-0.259)	**0.297** (0.273-0.324)	**0.345** (0.316-0.375)	**0.410** (0.373-0.445)	**0.463** (0.417-0.501)	**0.516** (0.462-0.558)	**0.572** (0.506-0.618)	**0.650** (0.565-0.701)	**0.711** (0.609-0.767)
24-hr	**0.117** (0.108-0.125)	**0.141** (0.131-0.152)	**0.177** (0.165-0.191)	**0.205** (0.191-0.221)	**0.244** (0.226-0.262)	**0.275** (0.254-0.295)	**0.306** (0.282-0.329)	**0.338** (0.311-0.364)	**0.382** (0.350-0.412)	**0.417** (0.381-0.450)
2-day	**0.068** (0.063-0.073)	**0.082** (0.076-0.088)	**0.102** (0.095-0.110)	**0.118** (0.110-0.126)	**0.139** (0.129-0.149)	**0.157** (0.145-0.168)	**0.174** (0.160-0.186)	**0.192** (0.176-0.206)	**0.216** (0.198-0.232)	**0.235** (0.215-0.253)
3-day	**0.048** (0.045-0.051)	**0.058** (0.054-0.062)	**0.072** (0.067-0.077)	**0.083** (0.077-0.088)	**0.098** (0.091-0.104)	**0.109** (0.101-0.117)	**0.121** (0.112-0.130)	**0.134** (0.123-0.143)	**0.151** (0.138-0.162)	**0.164** (0.150-0.176)
4-day	**0.038** (0.035-0.041)	**0.046** (0.043-0.049)	**0.056** (0.053-0.060)	**0.065** (0.061-0.069)	**0.077** (0.071-0.082)	**0.086** (0.079-0.092)	**0.095** (0.088-0.102)	**0.105** (0.097-0.112)	**0.118** (0.108-0.127)	**0.129** (0.118-0.138)
7-day	**0.025** (0.023-0.026)	**0.030** (0.028-0.032)	**0.036** (0.034-0.039)	**0.041** (0.039-0.044)	**0.049** (0.045-0.052)	**0.054** (0.051-0.058)	**0.060** (0.056-0.064)	**0.066** (0.061-0.070)	**0.074** (0.068-0.079)	**0.081** (0.074-0.086)
10-day	**0.020** (0.019-0.021)	**0.024** (0.022-0.025)	**0.028** (0.027-0.030)	**0.032** (0.030-0.034)	**0.037** (0.035-0.040)	**0.041** (0.039-0.044)	**0.045** (0.042-0.048)	**0.050** (0.046-0.053)	**0.055** (0.051-0.059)	**0.059** (0.055-0.063)
20-day	**0.013** (0.012-0.014)	**0.016** (0.015-0.016)	**0.018** (0.018-0.019)	**0.021** (0.020-0.022)	**0.024** (0.023-0.025)	**0.026** (0.025-0.028)	**0.029** (0.027-0.030)	**0.031** (0.029-0.033)	**0.034** (0.032-0.036)	**0.037** (0.034-0.039)
30-day	**0.011** (0.010-0.011)	**0.013** (0.012-0.013)	**0.015** (0.014-0.016)	**0.016** (0.016-0.017)	**0.019** (0.018-0.020)	**0.020** (0.019-0.021)	**0.022** (0.021-0.023)	**0.024** (0.022-0.025)	**0.026** (0.024-0.027)	**0.027** (0.026-0.029)
45-day	**0.009** (0.009-0.009)	**0.011** (0.010-0.011)	**0.012** (0.012-0.013)	**0.013** (0.013-0.014)	**0.015** (0.014-0.015)	**0.016** (0.015-0.017)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)	**0.020** (0.019-0.021)	**0.021** (0.020-0.022)
60-day	**0.008** (0.008-0.008)	**0.009** (0.009-0.010)	**0.011** (0.010-0.011)	**0.012** (0.011-0.012)	**0.013** (0.012-0.013)	**0.014** (0.013-0.014)	**0.015** (0.014-0.015)	**0.016** (0.015-0.016)	**0.017** (0.016-0.017)	**0.018** (0.017-0.018)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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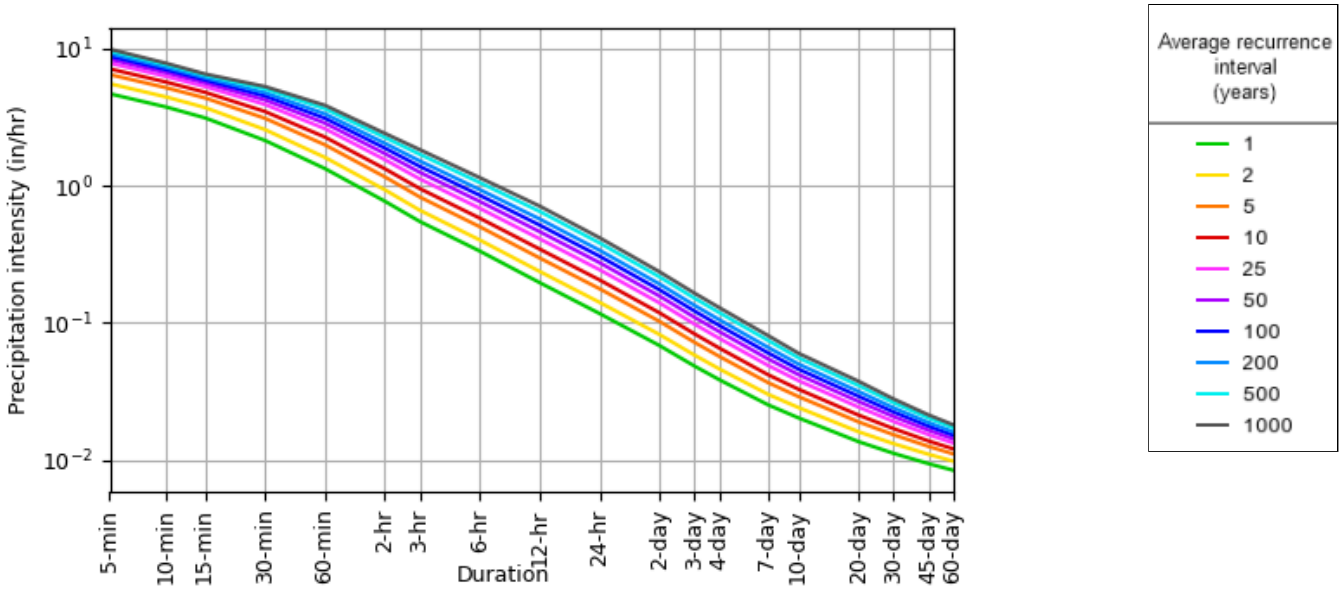
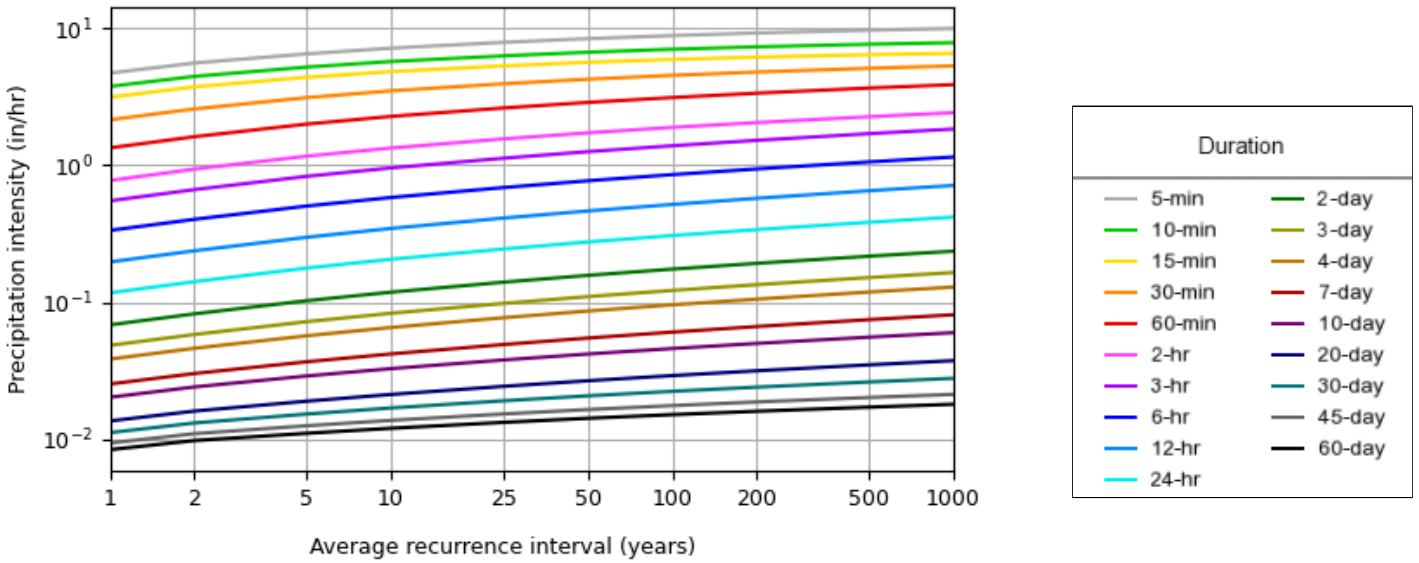
PF graphical

PDS-based intensity-duration-frequency (IDF) curves
Latitude: 35.5316°, Longitude: -80.5953°





NOAA Atlas 14, Volume 2, Version 3

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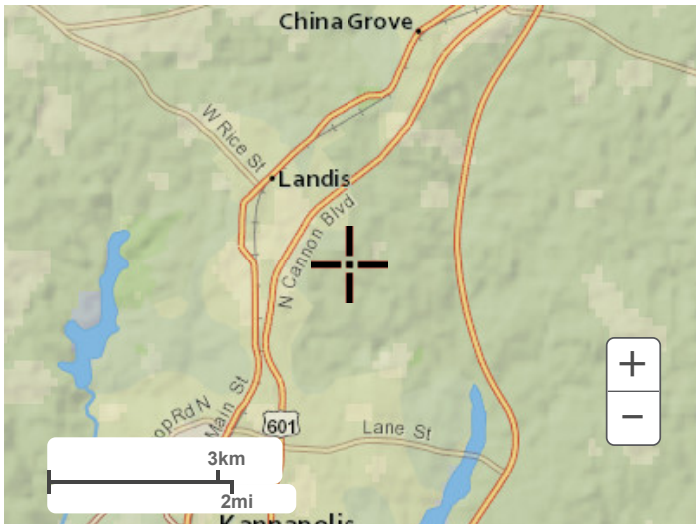
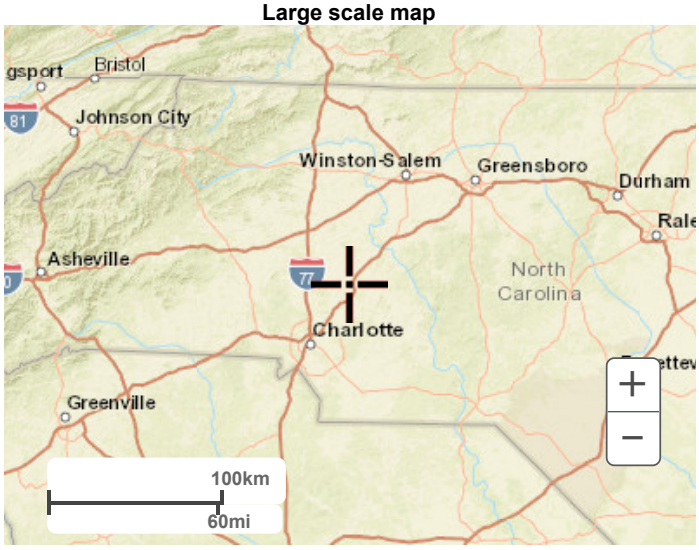
Maps & aerials

Small scale terrain

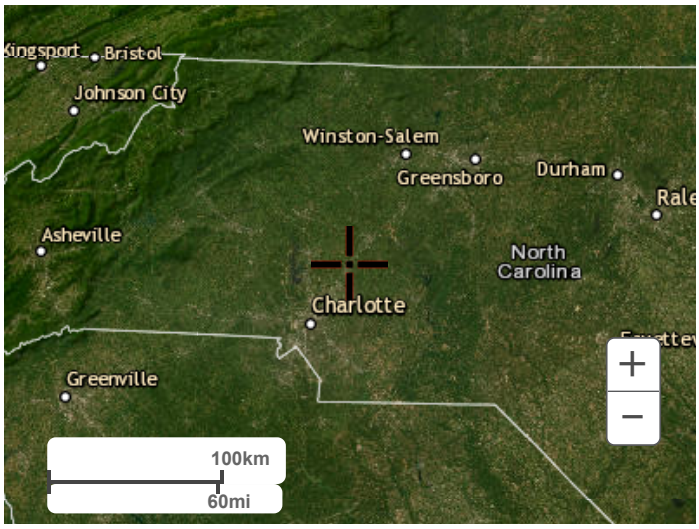


Large scale terrain

Large scale map



Large scale aerial



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Disclaimer

APPENDIX D.
STORMWATER
STUDIO PIPE MODEL

Storm Sewer Tabulation

Pro

Stormwater Studio 2024 v 3.0.0.35

02-07-2025

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
101-100	194.24	0.023	13.019	0.95	0.02	11.29	5.0	8.19	6.22	70.20	100.61	12.33	36	2.28	754.42	750.00	757.08	751.99	764.19	755.88	1
103-101	58.25	0.078	12.918	0.95	0.07	11.19	5.0	8.13	6.23	69.76	120.60	12.26	36	3.27	756.42	754.52	759.08	756.51	767.11	764.19	2
114-103	104.99	0.671	5.063	0.75	0.50	4.12	5.0	7.42	6.41	26.44	60.30	8.87	30	2.16	760.77	758.50	762.49	759.79	771.48	767.11	3
115-114	36.71	0.092	4.392	0.95	0.09	3.62	5.0	7.37	6.43	23.26	57.79	7.81	30	1.99	763.15	762.42	764.76	763.76	771.64	771.48	4
116-114	221.90	0.070	4.300	0.95	0.07	3.53	5.0	6.92	6.55	23.13	40.54	5.82	30	0.98	764.90	762.73	766.51	765.31	774.04	771.64	5
118-116	174.82	0.043	3.856	0.95	0.04	3.15	5.0	6.69	6.61	20.82	75.44	9.23	30	3.38	771.31	765.39	772.83	766.36	781.38	774.04	6
119-118	60.90	0.063	3.813	0.90	0.06	3.11	5.0	6.56	6.65	20.66	41.01	6.17	30	1.00	772.02	771.41	773.54	773.14	782.06	781.38	7
122-119	110.23	0.016	2.977	0.95	0.02	2.38	5.0	6.32	6.72	15.96	22.62	7.08	24	1.00	773.72	772.62	775.13	773.91	785.60	782.06	8
123-122	83.28	0.224	2.961	0.70	0.16	2.36	5.0	6.14	6.77	15.98	22.62	6.23	24	1.00	774.65	773.82	776.07	775.47	784.36	785.60	9
RL-10	32.82	0.347	0.347	0.95	0.33	0.33	5.0	5.00	7.13	2.35	0.56	26.95	4	7.39	784.65	782.22	825.18	782.56	786.50	784.36	10
124-123	141.30	0.762	2.389	0.65	0.50	1.87	5.0	5.82	6.87	12.87	22.62	5.18	24	1.00	776.16	774.75	777.43	776.59	784.29	784.36	11
125-124	141.13	0.103	1.272	0.80	0.08	1.04	5.0	5.45	6.98	7.27	10.50	5.94	18	1.00	778.17	776.76	779.20	777.70	784.23	784.29	12
126-125	140.53	0.506	0.816	0.65	0.33	0.62	5.0	5.03	7.12	4.43	6.46	5.30	15	1.00	779.92	778.52	780.76	779.29	784.23	784.23	13
RL-13	49.67	0.310	0.310	0.95	0.29	0.29	5.0	5.00	7.13	2.10	0.46	24.04	4	4.97	784.65	782.18	833.84	782.51	786.50	784.23	14
RL-11	40.29	0.355	0.355	0.95	0.34	0.34	5.0	5.00	7.13	2.41	0.51	27.56	4	6.09	784.65	782.20	837.28	782.53	786.50	784.29	15
RL-12	49.31	0.353	0.353	0.95	0.34	0.34	5.0	5.00	7.13	2.39	0.37	27.40	4	3.25	783.78	782.18	848.71	782.52	786.50	784.23	16
104-103	35.41	0.089	7.776	0.95	0.08	6.99	5.0	8.09	6.24	43.67	124.65	7.69	36	3.49	759.24	758.00	761.35	760.43	769.05	767.11	17
106-104	259.49	0.081	6.962	0.95	0.08	6.40	5.0	7.71	6.34	40.58	52.05	10.14	30	1.61	765.18	761.00	767.33	762.72	781.23	769.05	18
107-106	62.67	0.175	5.058	0.95	0.17	4.59	5.0	7.59	6.37	29.26	41.01	8.01	30	1.00	767.11	766.48	768.92	768.17	778.59	781.23	19
108-107	134.87	0.589	4.882	0.95	0.56	4.43	5.0	7.34	6.44	28.49	41.01	6.86	30	1.00	768.56	767.21	770.34	769.46	778.57	778.59	20
108-107 (1)	134.89	0.548	4.294	0.95	0.52	3.87	5.0	7.07	6.51	25.16	41.01	6.26	30	1.00	770.01	768.66	771.69	770.96	778.56	778.57	21
109-108	134.71	0.589	2.363	0.95	0.56	2.03	5.0	6.77	6.59	13.40	22.62	5.59	24	1.00	771.96	770.61	773.26	772.22	778.57	778.56	22

Notes: IDF File = LandisNC.idf, Return Period = 10-yrs.

Project File: 2025.02.07 STRM-100 Sub 2.

Storm Sewer Tabulation

Pro

Stormwater Studio 2024 v 3.0.0.35

02-07-2025

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
109-108 (1)	134.70	0.513	1.774	0.95	0.49	1.47	5.0	6.44	6.68	9.85	22.62	4.51	24	1.00	773.41	772.06	774.52	773.73	778.59	778.57	23
110-109	62.83	0.435	1.261	0.85	0.37	0.99	5.0	6.33	6.71	6.62	19.50	7.06	18	3.45	776.18	774.01	777.16	774.68	780.78	778.59	24
111-110	155.47	0.193	0.826	0.80	0.15	0.62	5.0	5.90	6.84	4.21	7.21	4.37	15	1.25	778.34	776.40	779.16	777.46	783.04	780.78	25
112-111	131.22	0.380	0.633	0.75	0.28	0.46	5.0	5.48	6.97	3.22	10.50	3.03	18	1.00	779.50	778.19	780.18	779.50	784.24	783.04	26
113-112	118.27	0.253	0.253	0.70	0.18	0.18	5.0	5.00	7.13	1.26	6.45	3.56	15	1.00	781.03	779.85	781.48	780.23	785.32	784.24	27
CO1-106	102.36	0.000	1.823	0.00	0.00	1.73	0.0	5.73	6.89	11.94	16.06	8.28	18	1.99	776.03	773.99	777.34	775.01	786.11	781.23	28
TEE 1-CO1	67.16	0.000	1.412	0.00	0.00	1.34	0.0	5.57	6.94	9.31	11.31	6.58	18	0.99	777.29	776.62	778.45	777.70	782.28	786.11	29
TEE 2-TEE 1	71.03	0.000	1.060	0.00	0.00	1.01	0.0	5.40	7.00	7.05	11.38	4.77	18	1.00	778.15	777.44	779.16	778.92	782.28	782.28	30
RL-3	21.64	0.347	0.347	0.95	0.33	0.33	5.0	5.00	7.13	2.35	3.61	5.55	10	2.31	780.50	780.00	781.18	780.55	782.50	782.28	31
RL-2	21.64	0.352	0.352	0.95	0.33	0.33	5.0	5.00	7.13	2.38	3.61	5.58	10	2.31	780.50	780.00	781.19	780.55	782.50	782.28	32
CO3-108	181.28	0.000	1.383	0.00	0.00	1.31	0.0	5.68	6.91	9.08	20.55	8.40	18	3.26	777.42	771.50	778.57	772.23	782.34	778.56	33
RL-6	21.64	0.344	0.344	0.95	0.33	0.33	5.0	5.00	7.13	2.33	3.89	5.68	10	2.70	780.50	779.92	781.18	780.44	782.50	782.34	34
TEE 4-CO3	64.33	0.000	1.039	0.00	0.00	0.99	0.0	5.53	6.96	6.87	12.09	4.69	18	1.13	778.25	777.52	779.25	779.03	782.28	782.34	35
RL-7	21.74	0.347	0.347	0.95	0.33	0.33	5.0	5.00	7.13	2.35	3.60	5.55	10	2.30	780.50	780.00	781.18	780.55	782.50	782.28	36
TEE 5-TEE 4	81.11	0.000	0.692	0.00	0.00	0.66	0.0	5.28	7.03	4.62	6.15	4.45	15	0.77	778.98	778.35	779.84	779.58	782.28	782.28	37
RL-8	21.64	0.347	0.347	0.95	0.33	0.33	5.0	5.00	7.13	2.35	3.61	5.55	10	2.31	780.50	780.00	781.18	780.55	782.50	782.28	38
CO4-TEE 5	71.75	0.000	0.345	0.00	0.00	0.33	0.0	5.05	7.11	2.33	3.86	3.65	12	1.00	779.92	779.20	780.56	780.31	784.05	782.28	39
RL-9	21.64	0.345	0.345	0.95	0.33	0.33	5.0	5.00	7.13	2.33	3.61	5.52	10	2.31	780.50	780.00	781.18	780.55	786.49	784.05	40
RL-1	28.45	0.411	0.411	0.95	0.39	0.39	5.0	5.00	7.13	2.78	4.82	6.71	10	4.12	780.50	779.33	781.23	779.84	786.50	786.11	41
TEE 3-TEE 2	72.30	0.000	0.713	0.00	0.00	0.68	0.0	5.20	7.06	4.78	7.00	5.54	15	1.00	779.22	778.49	780.09	779.28	782.31	782.28	42
CO2-TEE 3	59.42	0.000	0.366	0.00	0.00	0.35	0.0	5.01	7.12	2.47	6.95	4.41	15	0.99	779.90	779.31	780.53	779.86	782.39	782.31	43
RL-5	5.16	0.366	0.366	0.95	0.35	0.35	5.0	5.00	7.13	2.48	4.67	5.61	10	3.88	780.20	780.00	780.90	780.58	786.50	782.39	44

Notes: IDF File = LandisNC.idf, Return Period = 10-yrs.

Project File: 2025.02.07 STRM-100 Sub 2.

Storm Sewer Tabulation

Pro

Stormwater Studio 2024 v 3.0.0.35

02-07-2025

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
RL-4	21.64	0.347	0.347	0.95	0.33	0.33	5.0	5.00	7.13	2.35	3.61	5.55	10	2.31	780.50	780.00	781.18	780.55	782.50	782.31	45
120-119	47.90	0.109	0.109	0.70	0.08	0.08	5.0	5.00	7.13	0.54	16.69	4.05	15	6.68	778.79	775.59	779.08	775.76	783.71	782.06	46
121-119	24.55	0.665	0.665	0.90	0.60	0.60	5.0	5.00	7.13	4.27	19.32	7.36	15	8.95	776.51	774.32	777.34	774.80	783.64	782.06	47
117-116	36.03	0.374	0.374	0.85	0.32	0.32	5.0	5.00	7.13	2.27	9.00	2.89	15	1.94	766.75	766.05	767.35	767.22	774.12	774.04	48
105-104	30.00	0.726	0.726	0.70	0.51	0.51	5.0	5.00	7.13	3.62	15.82	6.53	15	6.00	764.04	762.24	764.80	762.72	769.06	769.05	49
102-101	36.01	0.079	0.079	0.95	0.08	0.08	5.0	5.00	7.13	0.53	9.41	1.33	15	2.12	758.50	757.73	758.82	758.82	764.26	764.19	50

Notes: IDF File = LandisNC.idf, Return Period = 10-yrs.

Energy Grade Line Calculations

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

Line No	Line Size	Q	Downstream							Length	Upstream							Pipe		Junction		
			Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev		Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev	n Value	Enrgy Loss	HGLa Elev	EGLa Elev	Enrgy Loss
	(in)	(cfs)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)
1	36	70.20	750.00	1.99‡	4.98	751.99	14.09	3.09	754.53	194.24	754.42	2.66²	6.64	757.08	10.58	1.74	758.83	0.013	4.291	757.08	758.83	0.00
2	36	69.76	754.52	1.99‡	4.98	756.51	14.00	3.05	759.43	58.25	756.42	2.66²	6.63	759.08	10.53	1.72	760.80	0.013	1.372	759.08	760.80	0.00
3	30	26.44	758.50	1.29‡	2.55	759.79	10.39	1.68	761.12	104.99	760.77	1.72²	3.60	762.49	7.35	0.84	763.33	0.013	2.210	762.49	763.33	0.00
4	30	23.26	762.42	1.34‡	2.69	763.76	8.66	1.17	764.78	36.71	763.15	1.61²	3.35	764.76	6.95	0.75	765.51	0.013	0.729	764.76	765.51	0.00
5	30	23.13	762.73	2.50	4.91	765.31	4.71	0.35	765.65	221.90	764.90	1.61²	3.34	766.51	6.93	0.75	767.26	0.013	1.605	766.51	767.26	0.00
6	30	20.82	765.39	0.97‡	1.76	766.36	11.82	2.17	767.61	174.82	771.31	1.52²	3.14	772.83	6.64	0.69	773.52	0.013	5.914	772.83	773.52	0.00
7	30	20.66	771.41	1.73	3.61	773.14	5.71	0.51	773.64	60.90	772.02	1.52	3.12	773.54	6.62	0.68	774.22	0.013	0.575	773.54	774.22	0.00
8	24	15.96	772.62	1.29‡	2.14	773.91	7.45	0.86	774.73	110.23	773.72	1.41²	2.38	775.13	6.72	0.70	775.84	0.013	1.102	775.13	775.84	0.00
9	24	15.98	773.82	1.66	2.78	775.47	5.75	0.51	775.99	83.28	774.65	1.42²	2.38	776.07	6.72	0.70	776.77	0.013	0.782	776.07	776.77	0.00
10	4	2.35	782.22	0.33¹	0.09	782.56	26.95	11.29	793.85	32.82	784.65	0.33²	0.09	825.18	26.95	11.29	836.47	0.012	42.626	825.18	836.47	0.00
11	24	12.87	774.75	1.84	3.02	776.59	4.26	0.28	776.87	141.30	776.16	1.27²	2.10	777.43	6.11	0.58	778.01	0.013	1.143	777.43	778.01	0.00
12	18	7.27	776.76	0.94‡	1.16	777.70	6.25	0.61	778.28	141.13	778.17	1.03²	1.29	779.20	5.62	0.49	779.69	0.013	1.412	779.20	779.69	0.00
13	15	4.43	778.52	0.77‡	0.80	779.29	5.56	0.48	779.76	140.53	779.92	0.84²	0.88	780.76	5.04	0.39	781.16	0.013	1.398	780.76	781.16	0.00
14	4	2.10	782.18	0.33¹	0.09	782.51	24.04	8.98	791.49	49.67	784.65	0.33²	0.09	833.84	24.04	8.98	842.82	0.012	51.325	833.84	842.82	0.00
15	4	2.41	782.20	0.33¹	0.09	782.53	27.56	11.81	794.34	40.29	784.65	0.33²	0.09	837.28	27.56	11.81	849.09	0.012	54.750	837.28	849.09	0.00
16	4	2.39	782.18	0.33¹	0.09	782.52	27.40	11.67	794.19	49.31	783.78	0.33²	0.09	848.71	27.40	11.67	860.38	0.012	66.195	848.71	860.38	0.00
17	36	43.67	758.00	2.42	6.12	760.43	7.14	0.79	761.22	35.41	759.24	2.11²	5.30	761.35	8.24	1.05	762.40	0.013	1.182	761.35	762.40	0.00
18	30	40.58	761.00	1.72‡	3.61	762.72	11.24	1.96	764.42	259.49	765.18	2.15	4.48	767.33	9.05	1.27	768.60	0.013	4.180	767.33	768.60	0.00
19	30	29.26	766.48	1.68‡	3.52	768.17	8.32	1.08	769.21	62.67	767.11	1.81²	3.80	768.92	7.70	0.92	769.84	0.013	0.627	768.92	769.84	0.00
20	30	28.49	767.21	2.25	4.65	769.46	6.13	0.58	770.04	134.87	768.56	1.78²	3.75	770.34	7.60	0.90	771.24	0.013	1.200	770.34	771.24	0.00
21	30	25.16	768.66	2.30	4.73	770.96	5.32	0.44	771.40	134.89	770.01	1.68²	3.50	771.69	7.19	0.80	772.49	0.013	1.088	771.69	772.49	0.00
22	24	13.40	770.61	1.61	2.70	772.22	4.96	0.38	772.60	134.71	771.96	1.30²	2.15	773.26	6.22	0.60	773.86	0.013	1.257	773.26	773.86	0.00

Notes: Return Period = 10-yrs. ¹ Critical depth. ² Critical depth. ‡ Supercritical.

Energy Grade Line Calculations

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

Line No	Line Size	Q	Downstream							Length	Upstream							Pipe		Junction		
			Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev		Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev	n Value	Enrgy Loss	HGLa Elev	EGLa Elev	Enrgy Loss
	(in)	(cfs)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)
23	24	9.85	772.06	1.67	2.80	773.73	3.52	0.19	773.92	134.70	773.41	1.11²	1.79	774.52	5.49	0.47	774.99	0.013	1.068	774.52	774.99	0.00
24	18	6.62	774.01	0.67‡	0.76	774.68	8.72	1.18	775.45	62.83	776.18	0.98²	1.23	777.16	5.40	0.45	777.62	0.013	2.166	777.16	777.62	0.00
25	15	4.21	776.40	1.06	1.11	777.46	3.80	0.22	777.68	155.47	778.34	0.82²	0.86	779.16	4.93	0.38	779.54	0.013	1.856	779.16	779.54	0.00
26	18	3.22	778.19	1.31	1.64	779.50	1.96	0.06	779.56	131.22	779.50	0.68²	0.79	780.18	4.10	0.26	780.45	0.013	0.885	780.18	780.45	0.00
27	15	1.26	779.85	0.38‡	0.32	780.23	3.95	0.24	780.46	118.27	781.03	0.45²	0.40	781.48	3.18	0.16	781.64	0.013	1.176	781.48	781.64	0.00
28	18	11.94	773.99	1.02‡	1.29	775.01	9.29	1.34	776.12	102.36	776.03	1.32²	1.64	777.34	7.27	0.82	778.16	0.012	2.040	777.34	778.16	0.00
29	18	9.31	776.62	1.08‡	1.36	777.70	6.84	0.73	778.43	67.16	777.29	1.16²	1.47	778.45	6.32	0.62	779.07	0.012	0.647	778.45	779.07	0.00
30	18	7.05	777.44	1.49	1.76	778.92	3.99	0.25	779.17	71.03	778.15	1.01²	1.27	779.16	5.55	0.48	779.64	0.012	0.467	779.16	779.64	0.00
31	10	2.35	780.00	0.55‡	0.38	780.55	6.19	0.60	781.06	21.64	780.50	0.68²	0.48	781.18	4.92	0.38	781.56	0.012	0.500	781.18	781.56	0.00
32	10	2.38	780.00	0.55‡	0.38	780.55	6.20	0.60	781.07	21.64	780.50	0.69²	0.48	781.19	4.96	0.38	781.57	0.012	0.500	781.19	781.57	0.00
33	18	9.08	771.50	0.73‡	0.86	772.23	10.55	1.73	773.26	181.28	777.42	1.15²	1.45	778.57	6.24	0.61	779.17	0.012	5.917	778.57	779.17	0.00
34	10	2.33	779.92	0.52‡	0.36	780.44	6.46	0.65	780.97	21.64	780.50	0.68²	0.48	781.18	4.90	0.37	781.55	0.012	0.583	781.18	781.55	0.00
35	18	6.87	777.52	1.50	1.77	779.03	3.89	0.23	779.27	64.33	778.25	1.00²	1.25	779.25	5.49	0.47	779.71	0.012	0.448	779.25	779.71	0.00
36	10	2.35	780.00	0.55‡	0.38	780.55	6.19	0.60	781.06	21.74	780.50	0.68²	0.48	781.18	4.92	0.38	781.56	0.012	0.500	781.18	781.56	0.00
37	15	4.62	778.35	1.23	1.22	779.58	3.78	0.22	779.80	81.11	778.98	0.86	0.90	779.84	5.11	0.41	780.25	0.012	0.446	779.98	780.39	0.14
38	10	2.35	780.00	0.55‡	0.38	780.55	6.19	0.60	781.06	21.64	780.50	0.68²	0.48	781.18	4.92	0.38	781.56	0.012	0.500	781.18	781.56	0.00
39	12	2.33	779.20	1.00	0.79	780.31	2.97	0.14	780.44	71.75	779.92	0.65²	0.54	780.56	4.33	0.29	780.86	0.012	0.413	780.56	780.86	0.00
40	10	2.33	780.00	0.55‡	0.38	780.55	6.14	0.59	781.05	21.64	780.50	0.68²	0.48	781.18	4.90	0.37	781.55	0.012	0.500	781.18	781.55	0.00
41	10	2.78	779.33	0.51‡	0.35	779.84	7.94	0.98	780.53	28.45	780.50	0.73²	0.51	781.23	5.48	0.47	781.70	0.012	1.173	781.23	781.70	0.00
42	15	4.78	778.49	0.79‡	0.82	779.28	5.87	0.53	779.81	72.30	779.22	0.88²	0.92	780.09	5.21	0.42	780.51	0.012	0.703	780.09	780.51	0.00
43	15	2.47	779.31	0.54‡	0.51	779.86	4.83	0.36	780.54	59.42	779.90	0.63²	0.62	780.53	4.00	0.25	780.78	0.012	0.239	780.53	780.78	0.00
44	10	2.48	780.00	0.58‡	0.40	780.58	6.15	0.59	781.10	5.16	780.20	0.70²	0.49	780.90	5.06	0.40	781.30	0.012	0.200	780.90	781.30	0.00

Notes: Return Period = 10-yrs. ² Critical depth. ‡ Supercritical.

Energy Grade Line Calculations

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

Line No	Line Size	Q	Downstream							Length	Upstream							Pipe		Junction		
			Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev		Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev	n Value	Enrgy Loss	HGLa Elev	EGLa Elev	Enrgy Loss
	(in)	(cfs)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)
45	10	2.35	780.00	0.55‡	0.38	780.55	6.19	0.60	781.06	21.64	780.50	0.68²	0.48	781.18	4.92	0.38	781.56	0.012	0.500	781.18	781.56	0.00
46	15	0.54	775.59	0.17‡	0.10	775.76	5.63	0.49	775.98	47.90	778.79	0.29²	0.22	779.08	2.46	0.09	779.18	0.013	3.200	779.08	779.18	0.00
47	15	4.27	774.32	0.48‡	0.44	774.80	9.77	1.48	775.52	24.55	776.51	0.83²	0.86	777.34	4.95	0.38	777.72	0.013	2.197	777.34	777.72	0.00
48	15	2.27	766.05	1.17	1.19	767.22	1.90	0.06	767.28	36.03	766.75	0.60²	0.59	767.35	3.87	0.23	767.59	0.013	0.310	767.35	767.59	0.00
49	15	3.62	762.24	0.48‡	0.43	762.72	8.44	1.11	763.33	30.00	764.04	0.76²	0.78	764.80	4.63	0.33	765.13	0.013	1.800	764.80	765.13	0.00
50	15	0.53	757.73	1.09	1.13	758.82	0.47	0.00	758.83	36.01	758.50	0.32	0.24	758.82	2.19	0.07	758.89	0.013	0.064	758.90	758.97	0.08

Notes: Return Period = 10-yrs. ² Critical depth. ‡ Supercritical.

Project File: 2025.02.07 STRM-100 Sub 2.

Inlet Report

Pro

Stormwater Studio 2024 v 3.0.0.35

02-07-2025

Line No	Inlet		Q				Curb		Grate			Gutter							Inlet			Byp Line No
	Id	Type	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Ht (in)	L (ft)	L (ft)	W (ft)	Area (sqft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CB-102	Combination	0.15	0.37	0.49	0.04	3.0	3.00	3.00	2.00	-	0.050	1.50	0.050	0.020	0.013	0.11	3.15	0.18	0.96	3.0	0
2	CB-103	Combination	0.53	0.97	1.12	0.37	3.0	4.55	4.55	2.00	-	0.050	1.50	0.050	0.020	0.013	0.15	5.25	0.15	5.25	0.0	1
3	CB-115	Combination	3.59	0.60	3.22	0.97	3.0	10.71	10.71	2.00	-	0.050	1.50	0.050	0.020	0.013	0.21	8.15	0.21	8.15	0.0	2
4	CB-114	Combination	0.62	0.03	0.56	0.08	3.0	1.53	1.53	2.00	-	0.050	1.50	0.050	0.020	0.013	0.12	3.50	0.12	3.50	0.0	50
5	CB-116	Combination	0.47	0.01	0.45	0.03	3.0	0.71	0.71	2.00	-	0.050	1.50	0.050	0.020	0.013	0.11	3.00	0.11	3.00	0.0	4
6	CB-118	Combination	0.29	0.00	0.28	0.01	3.0	1.00	1.00	2.00	-	0.030	1.50	0.050	0.020	0.013	0.10	2.55	0.10	2.55	0.0	5
7	CB-119	Combination	0.40	0.00	0.38	0.03	3.0	0.07	0.07	2.00	-	0.038	1.50	0.050	0.020	0.013	0.10	2.90	0.10	2.90	0.0	48
8	CB-122	Combination	0.11	0.00	0.11	0.00	3.0	1.00	1.00	2.00	-	0.038	1.50	0.050	0.020	0.013	0.06	1.30	0.06	1.30	0.0	7
9	CB-123	Combination	1.12	0.00	1.12	0.00	3.0	1.00	1.00	2.00	0.38	Sag	1.50	0.050	0.020	0.013	0.21	8.25	0.21	8.25	0.0	8
10	RL-10	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	CB-124	Combination	3.53	0.00	3.53	0.00	3.0	1.00	1.00	2.00	1.20	Sag	1.50	0.050	0.020	0.013	0.44	19.75	0.44	19.75	0.0	9
12	CB-125	Combination	0.59	0.00	0.59	0.00	3.0	1.00	1.00	2.00	0.20	Sag	1.50	0.050	0.020	0.013	0.18	6.75	0.18	6.75	0.0	11
13	CB-126	Combination	2.34	0.00	2.34	0.00	3.0	1.00	1.00	2.00	0.80	Sag	1.50	0.050	0.020	0.013	0.34	14.75	0.34	14.75	0.0	0
14	RL-13	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	RL-11	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	RL-12	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	CB-104	Combination	0.60	0.06	0.66	0.00	3.0	3.00	3.00	2.00	6.00	Sag	1.50	0.050	0.020	0.013	0.08	1.83	0.29	1.83	3.0	0
18	CB-106	Combination	0.55	0.00	0.49	0.06	3.0	0.93	0.93	2.00	-	0.044	1.50	0.050	0.020	0.013	0.11	3.30	0.11	3.30	0.0	17
19	CB-107	Combination	1.19	0.00	1.19	0.00	3.0	1.00	1.00	2.00	0.40	Sag	1.50	0.050	0.020	0.013	0.21	8.25	0.21	8.25	0.0	0
20	CB-107.5	Combination	3.99	0.00	3.99	0.00	3.0	1.00	1.00	2.00	1.35	Sag	1.50	0.050	0.020	0.013	0.47	21.25	0.47	21.25	0.0	0
21	CB-108	Combination	3.71	0.00	3.71	0.00	3.0	1.00	1.00	2.00	1.26	Sag	1.50	0.050	0.020	0.013	0.45	20.25	0.45	20.25	0.0	0
22	CB-108.5	Combination	3.99	0.00	3.99	0.00	3.0	1.00	1.00	2.00	1.35	Sag	1.50	0.050	0.020	0.013	0.47	21.25	0.47	21.25	0.0	0

Notes: Return Period = 10-yrs. All curb inlets are Horiz throat.,

Inlet Report

Pro

Stormwater Studio 2024 v 3.0.0.35

02-07-2025

Line No	Inlet		Q				Curb		Grate			Gutter							Inlet			Byp Line No
	Id	Type	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Ht (in)	L (ft)	L (ft)	W (ft)	Area (sqft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
23	CB-109	Combination	3.48	1.09	4.56	0.00	3.0	1.00	1.00	2.00	1.55	Sag	1.50	0.050	0.020	0.013	0.51	23.25	0.51	23.25	0.0	0
24	CB-110	Combination	2.64	0.68	2.23	1.09	3.0	5.76	5.76	2.00	-	0.015	1.50	0.050	0.020	0.013	0.23	9.45	0.23	9.45	0.0	23
25	CB-111	Combination	1.10	0.85	1.27	0.68	3.0	3.92	3.92	2.00	-	0.020	1.50	0.050	0.020	0.013	0.19	7.20	0.19	7.20	0.0	24
26	CB-112	Combination	2.03	0.54	1.71	0.85	3.0	5.14	5.14	2.00	-	0.020	1.50	0.050	0.020	0.013	0.21	8.05	0.21	8.05	0.0	25
27	CB-113	Combination	1.26	0.00	0.73	0.54	3.0	1.38	1.38	2.00	-	0.010	1.50	0.050	0.020	0.013	0.18	6.90	0.18	6.90	0.0	26
28	18INCH STORM CLEANOUT 1	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	18X15X10 TEE 1	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	15X15X10 TEE 2	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	RL-3	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	RL-2	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	18INCH STORM CLEANOUT 3	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	RL-6	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	18X15X10 TEE 4	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	RL-7	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	15X12X10 TEE 5	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	RL-8	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	18INCH STORM CLEANOUT 4	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	RL-9	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	RL-1	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	15X15X10 TEE 3	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	18INCH STORM CLEANOUT 2	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	RL-5	Grate	2.48	0.00	2.48	0.00	-	-	3.00	2.00	6.00	Sag	1.50	0.050	0.020	0.013	0.22	8.85	0.43	8.85	3.0	0

Notes: Return Period = 10-yrs. All curb inlets are Horiz throat.,

Inlet Report

Pro

Stormwater Studio 2024 v 3.0.0.35

02-07-2025

Line No	Inlet		Q				Curb		Grate			Gutter							Inlet			Byp Line No
	Id	Type	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Ht (in)	L (ft)	L (ft)	W (ft)	Area (sqft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
45	RL-4	Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	CB-120	Combination	0.54	0.00	0.54	0.00	3.0	1.00	1.00	2.00	0.18	Sag	1.50	0.050	0.020	0.013	0.18	6.75	0.18	6.75	0.0	0
47	CB-121	Combination	4.27	0.00	4.27	0.00	3.0	1.00	1.00	2.00	1.45	Sag	1.50	0.050	0.020	0.013	0.49	22.25	0.49	22.25	0.0	0
48	CB-117	Combination	2.27	0.03	1.69	0.60	3.0	6.69	6.69	2.00	-	0.050	1.50	0.050	0.020	0.013	0.17	6.35	0.17	6.35	0.0	3
49	CB-105	Combination	3.62	0.00	3.62	0.00	3.0	1.00	1.00	2.00	1.23	Sag	1.50	0.050	0.020	0.013	0.44	19.75	0.44	19.75	0.0	0
50	CB-101	Combination	0.53	0.08	0.54	0.08	3.0	1.02	1.02	2.00	-	0.050	1.50	0.050	0.020	0.013	0.11	3.40	0.11	3.40	0.0	0

Notes: Return Period = 10-yrs. All curb inlets are Horiz throat.,

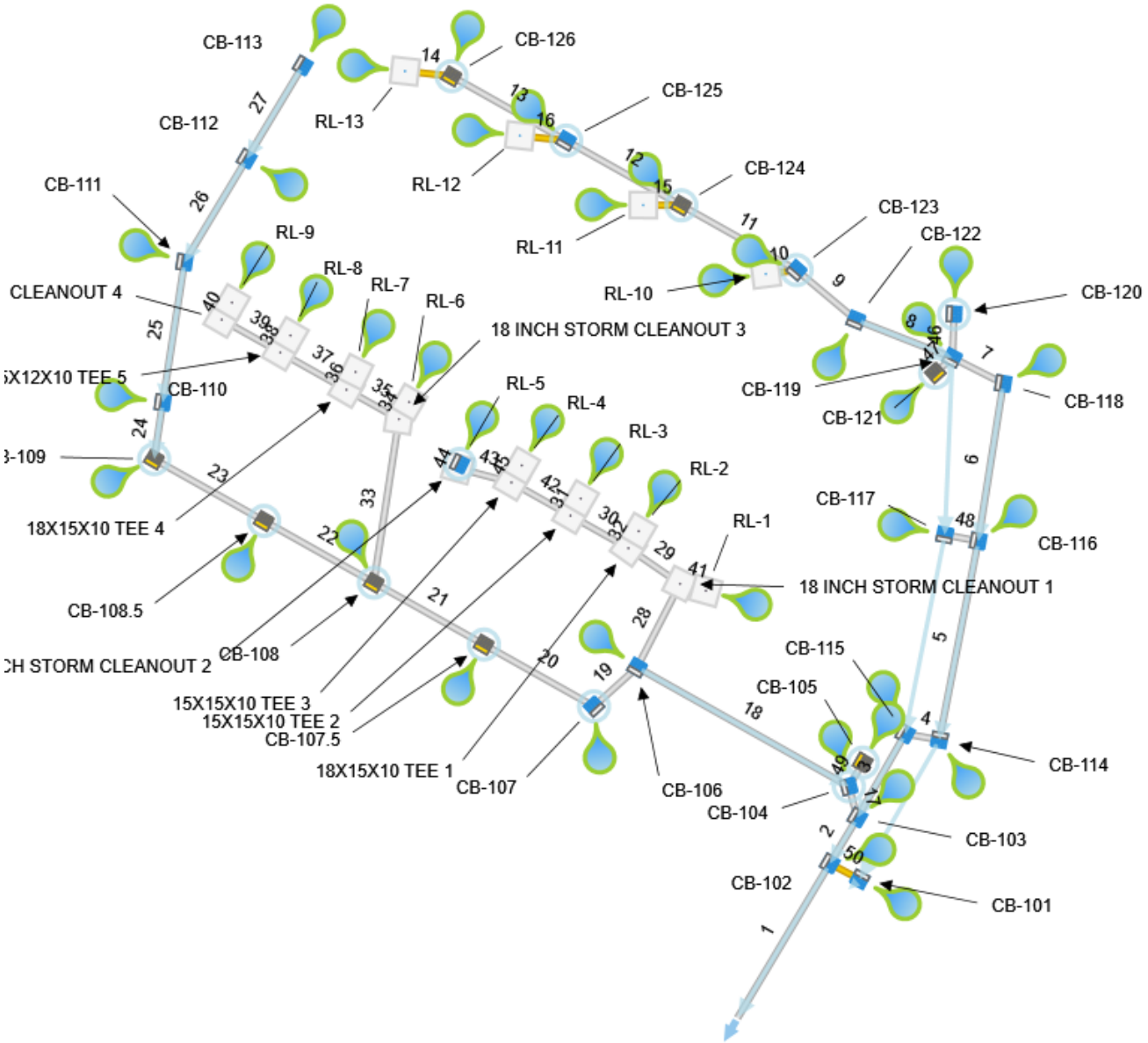
APPENDIX E. STORMWATER STUDIO PLAN AND PROFILE

Plan View

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

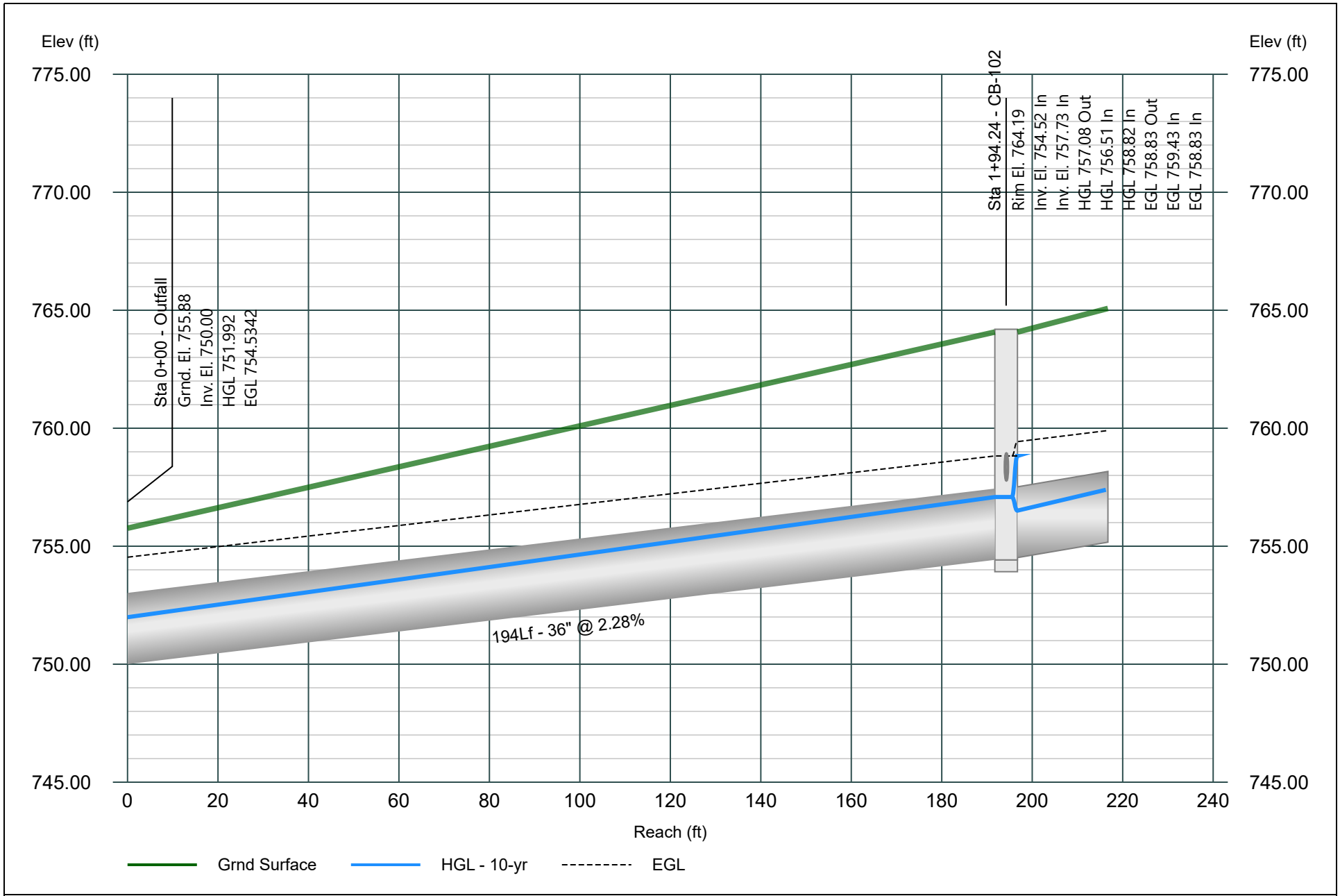


Line 1 - 101-100

Pro

Stormwater Studio 2024 v 3.0.0.35

02-07-2025

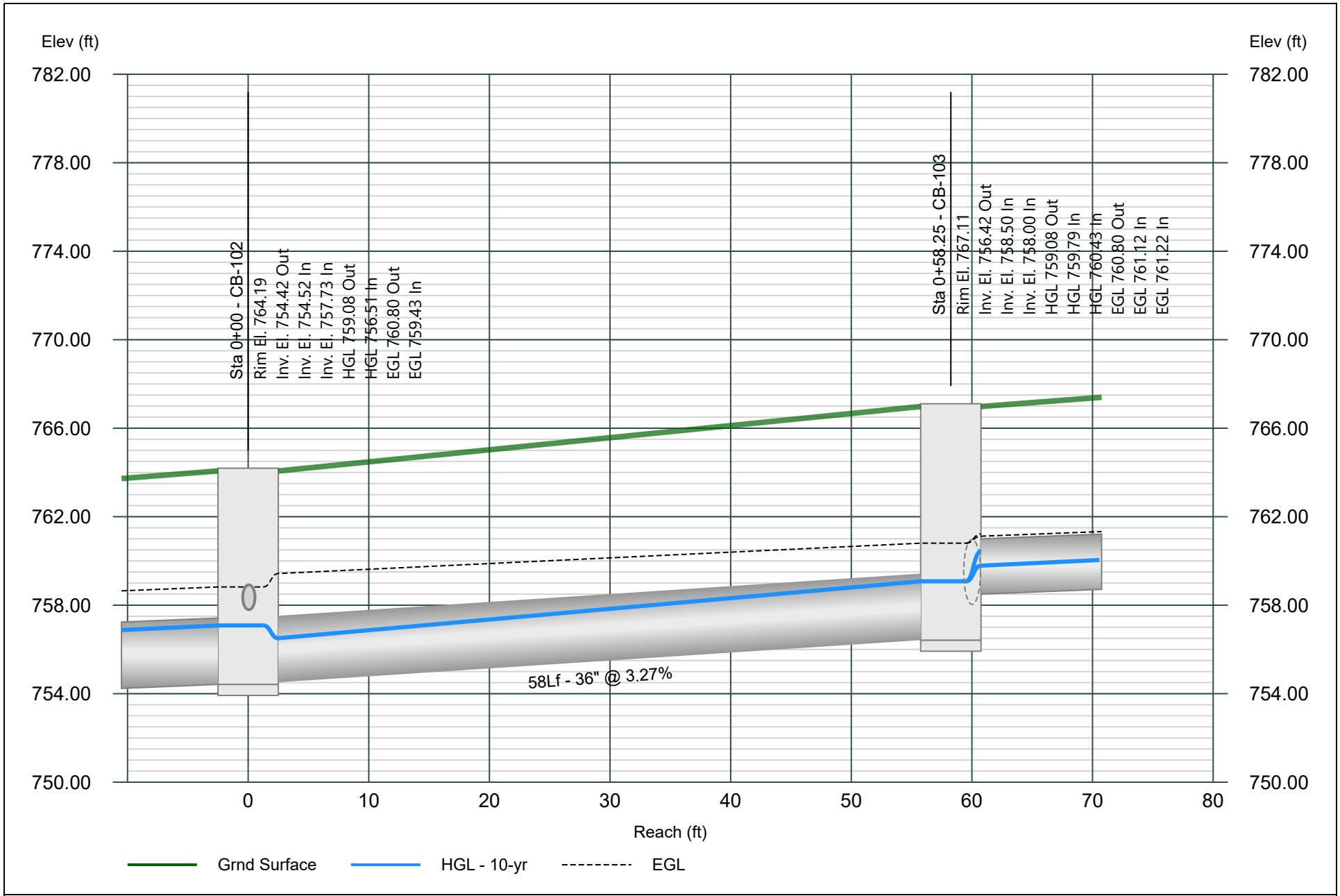


Line 2 - 103-101

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

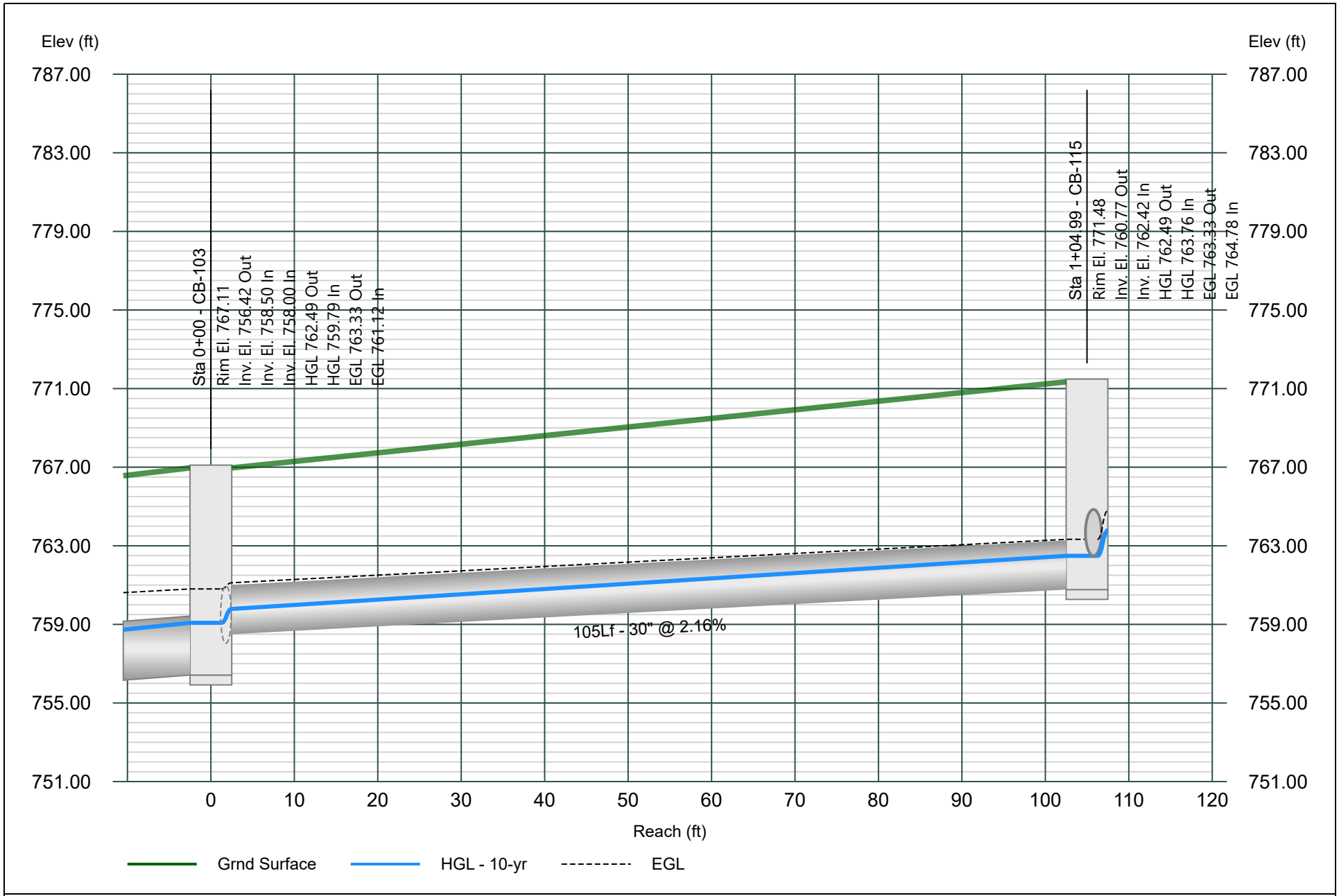


Line 3 - 114-103

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

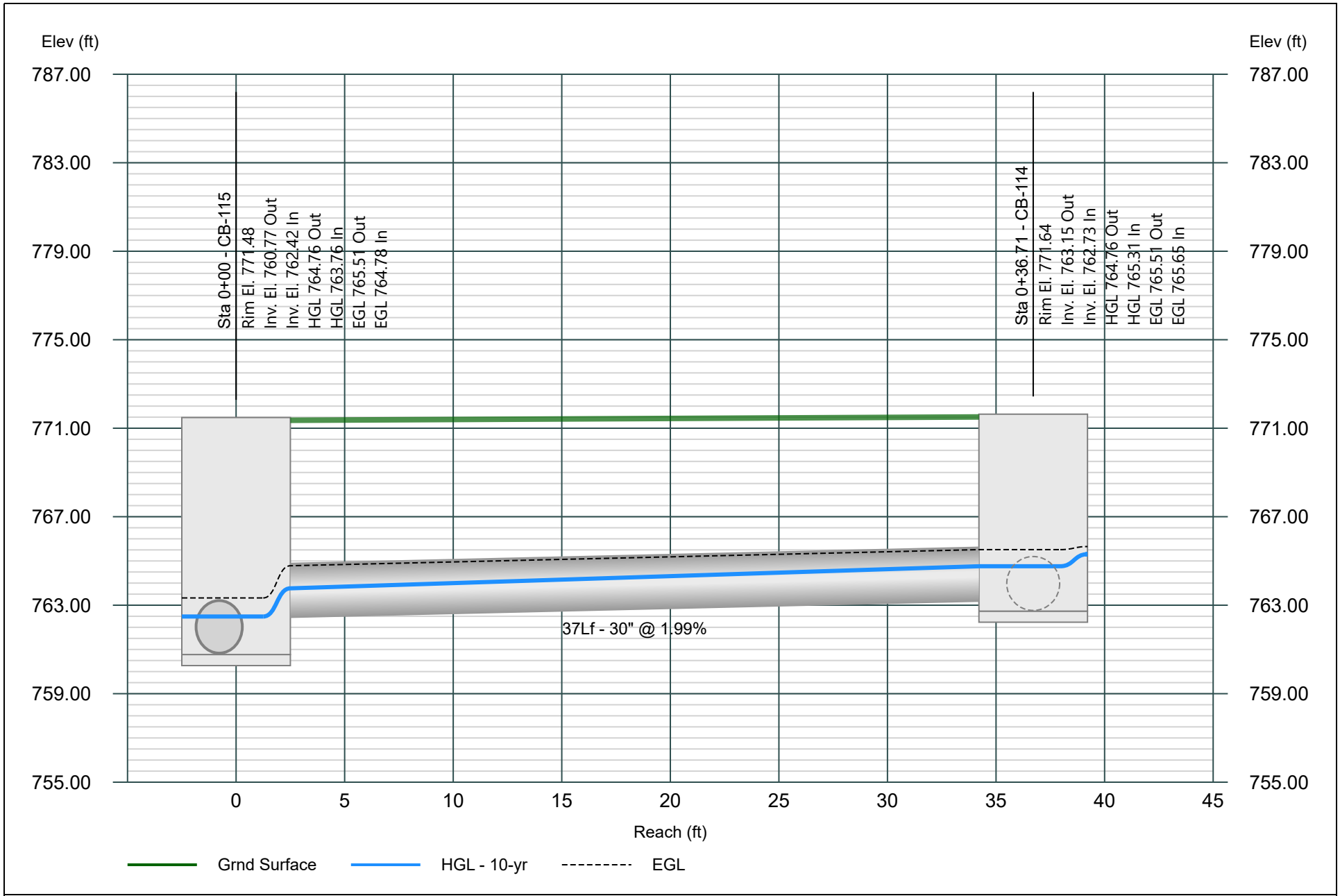


Line 4 - 115-114

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

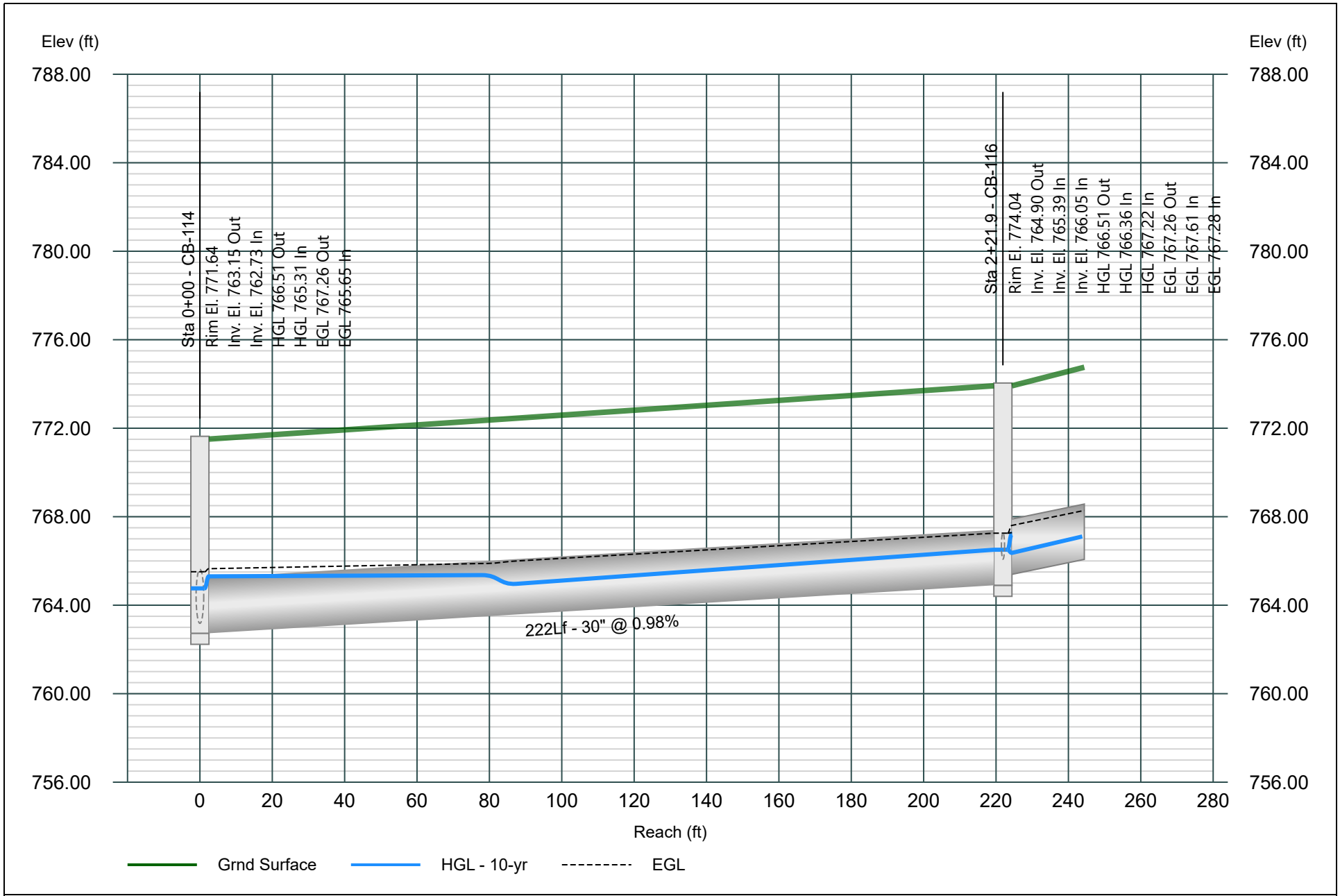


Line 5 - 116-114

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

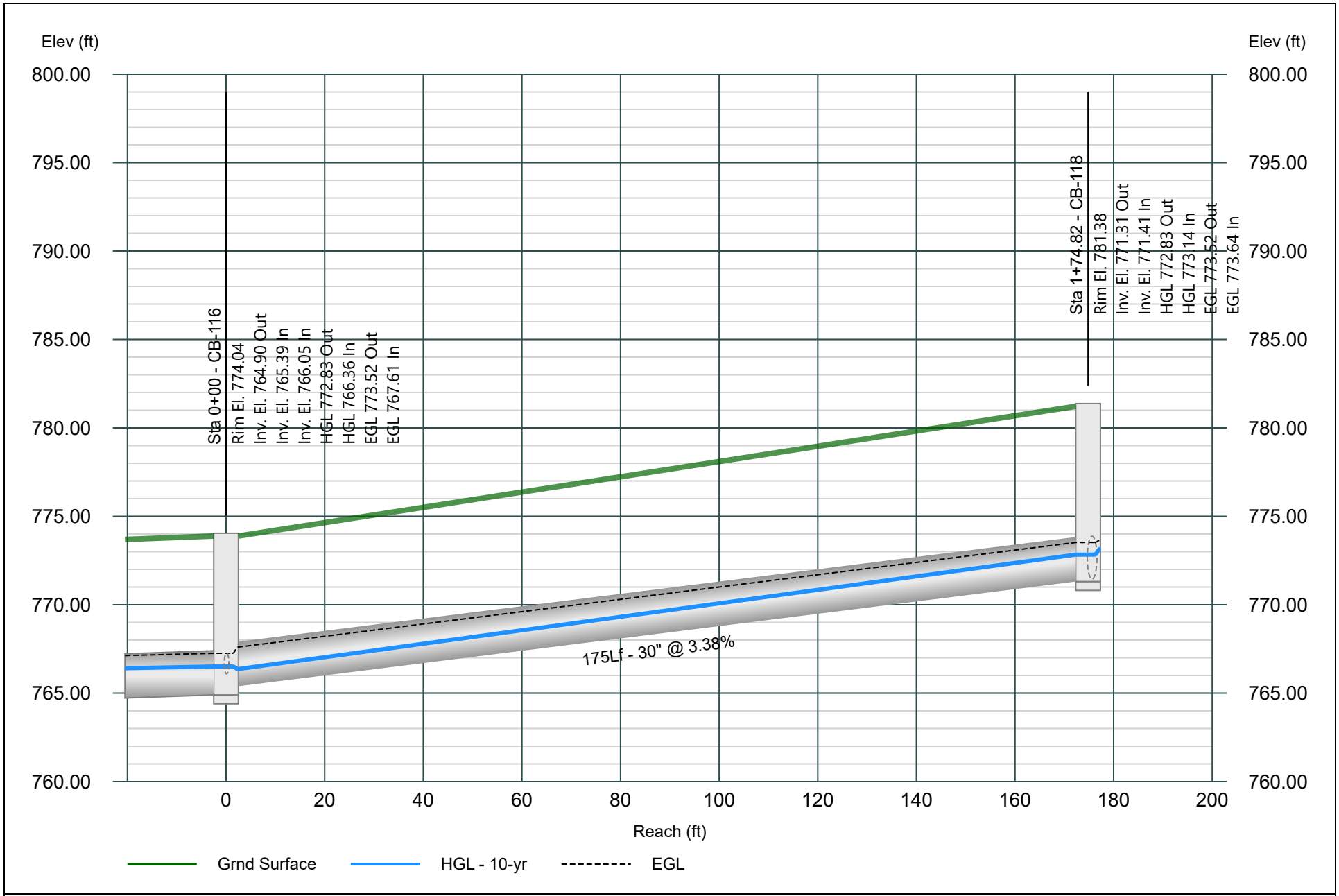


Line 6 - 118-116

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

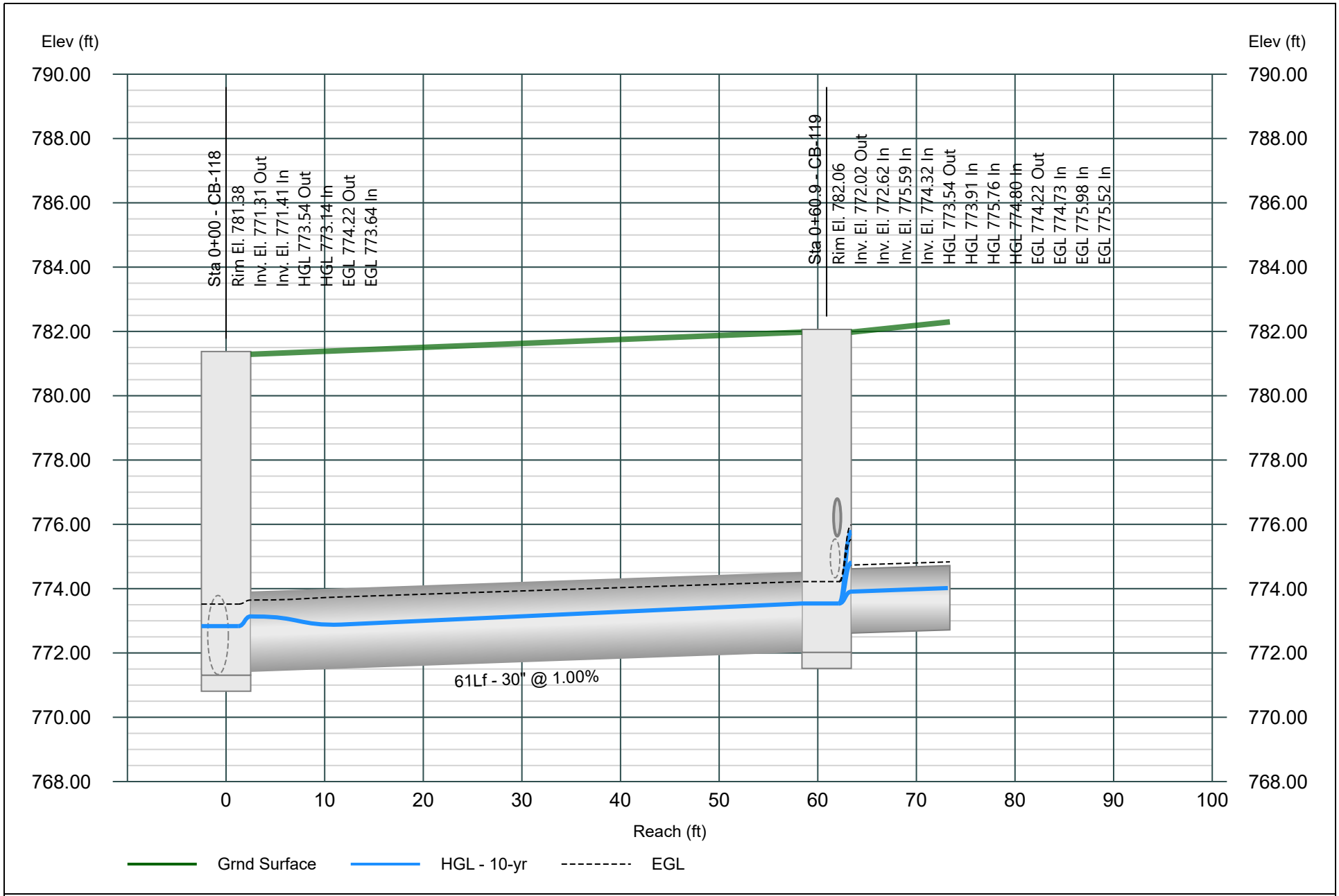


Line 7 - 119-118

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

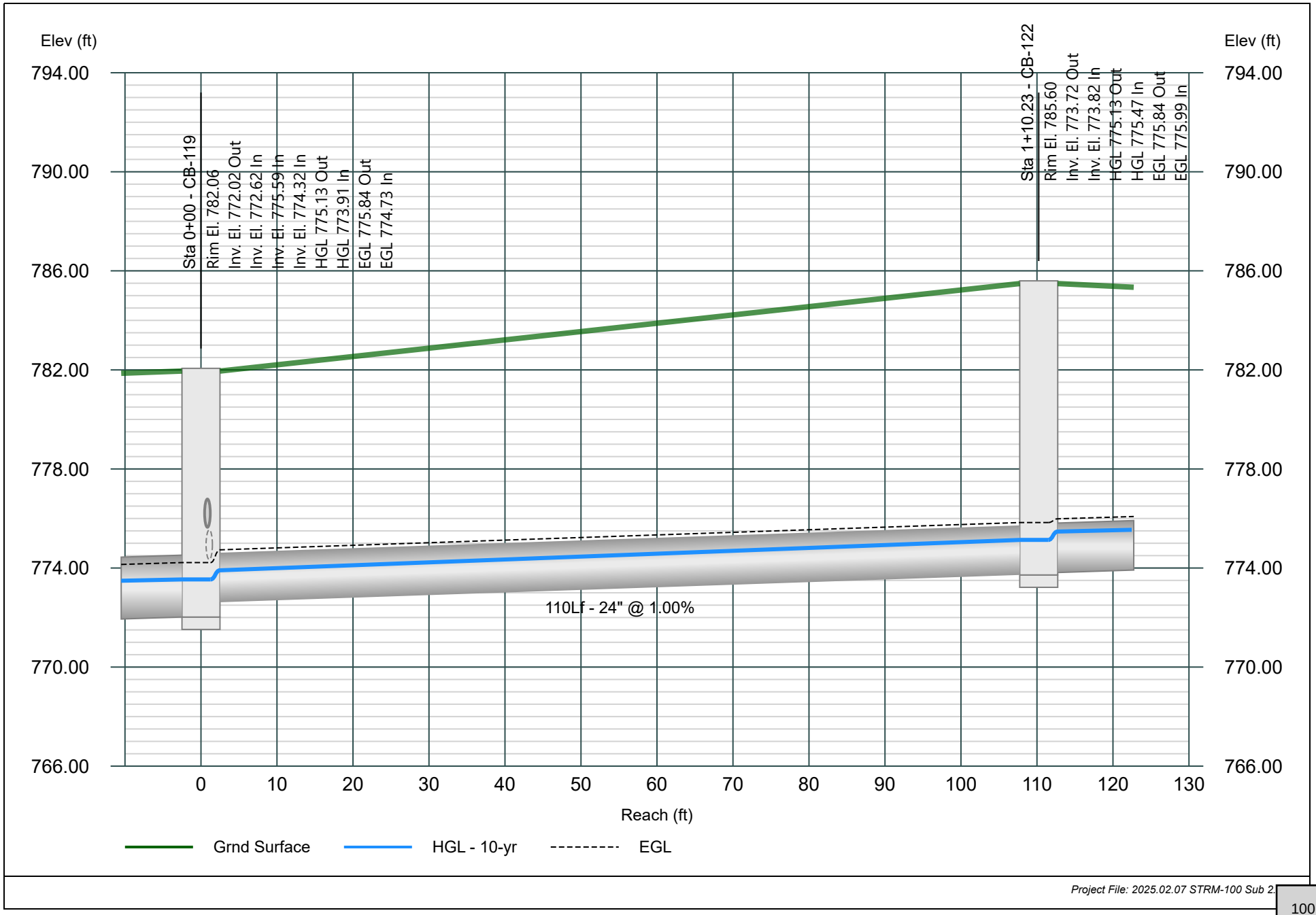


Line 8 - 122-119

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

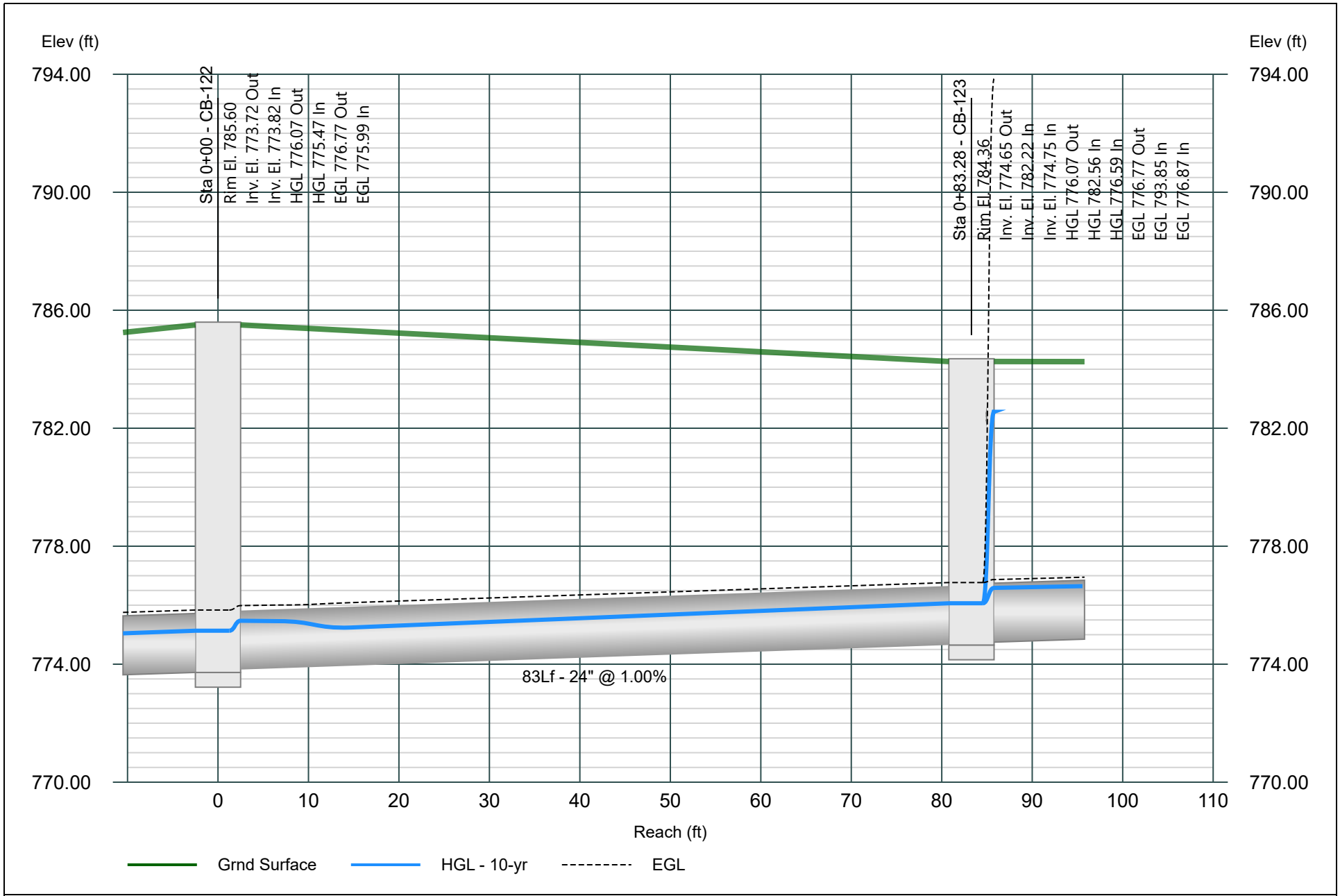


Line 9 - 123-122

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

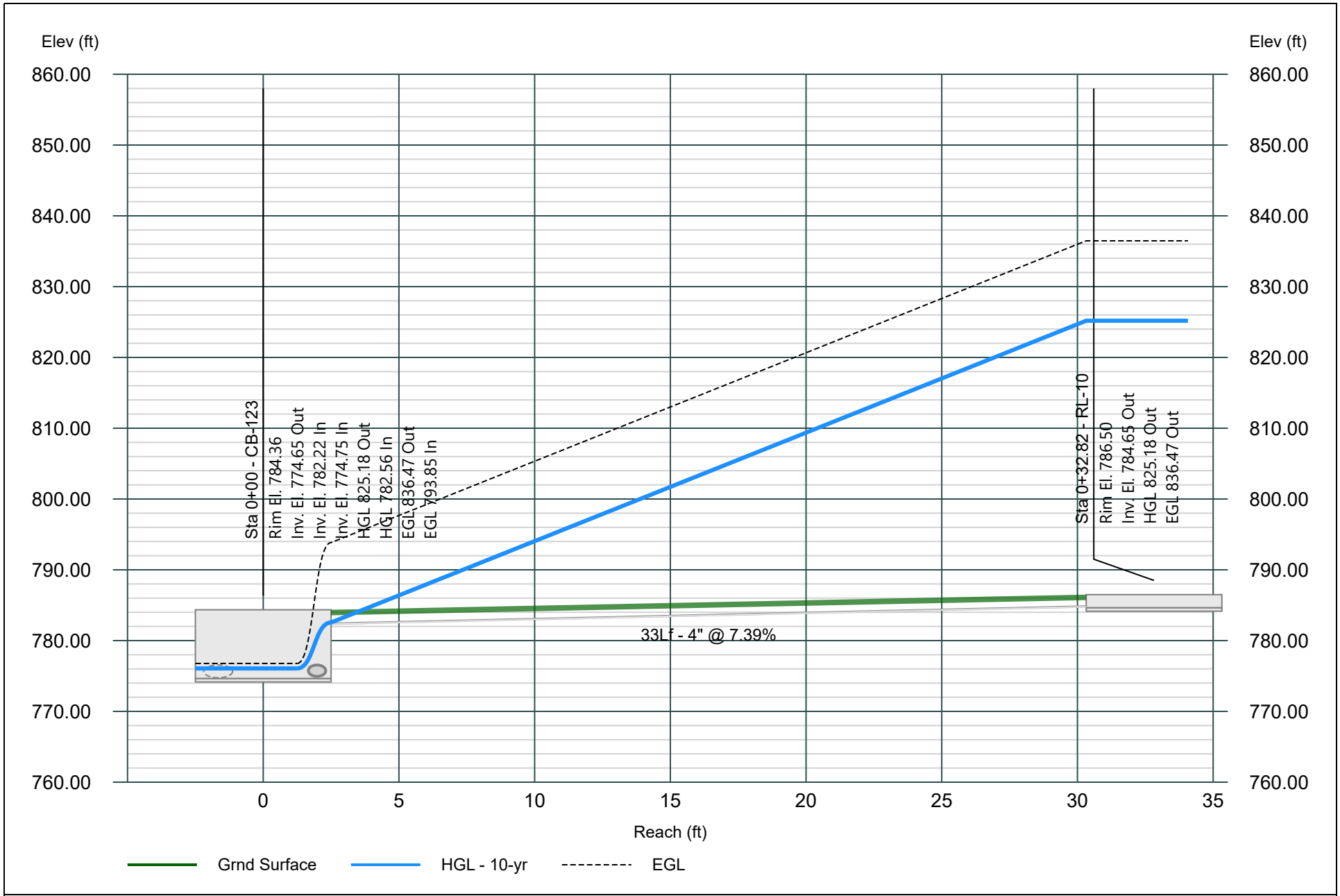


Line 10 - RL-10

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

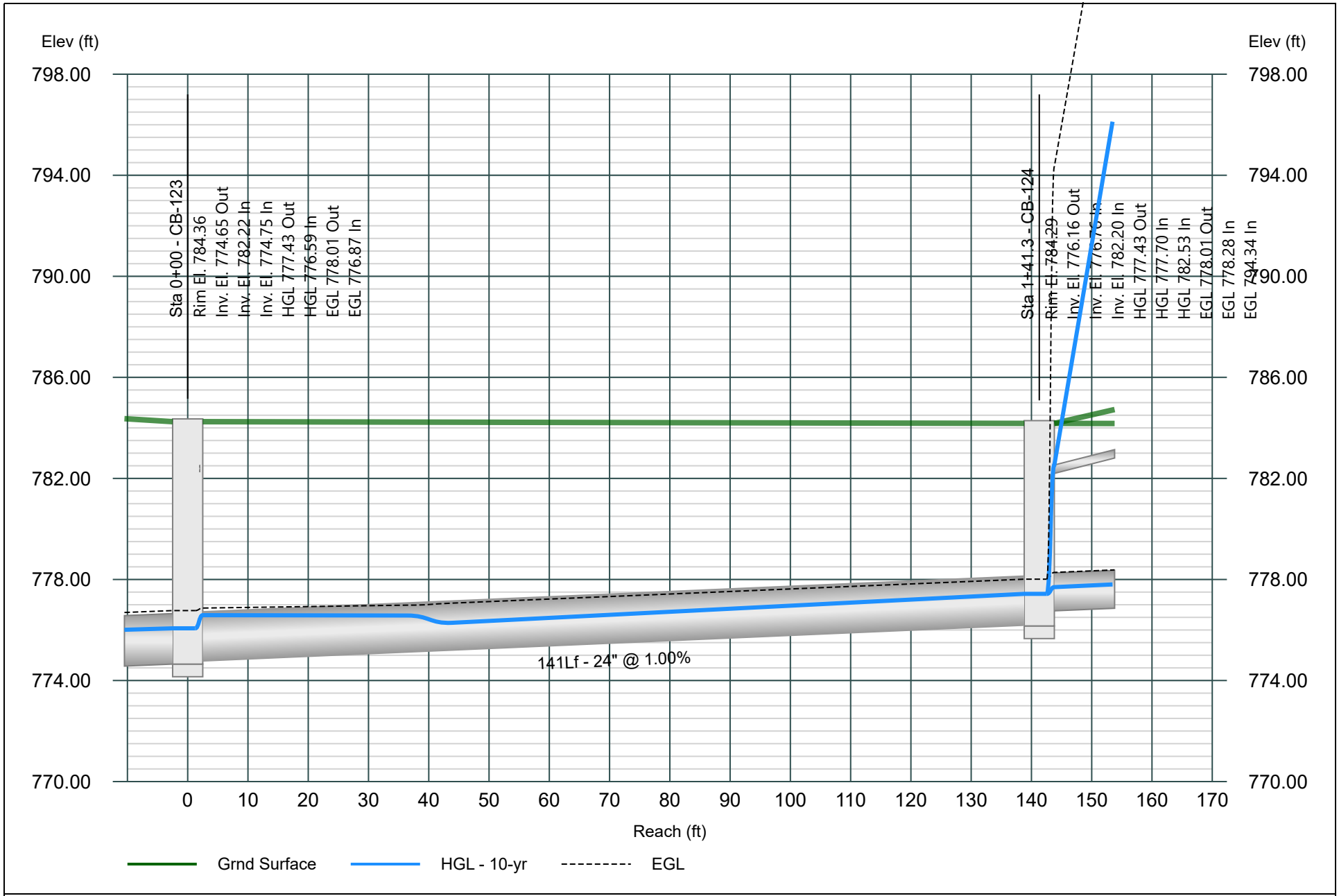


Line 11 - 124-123

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

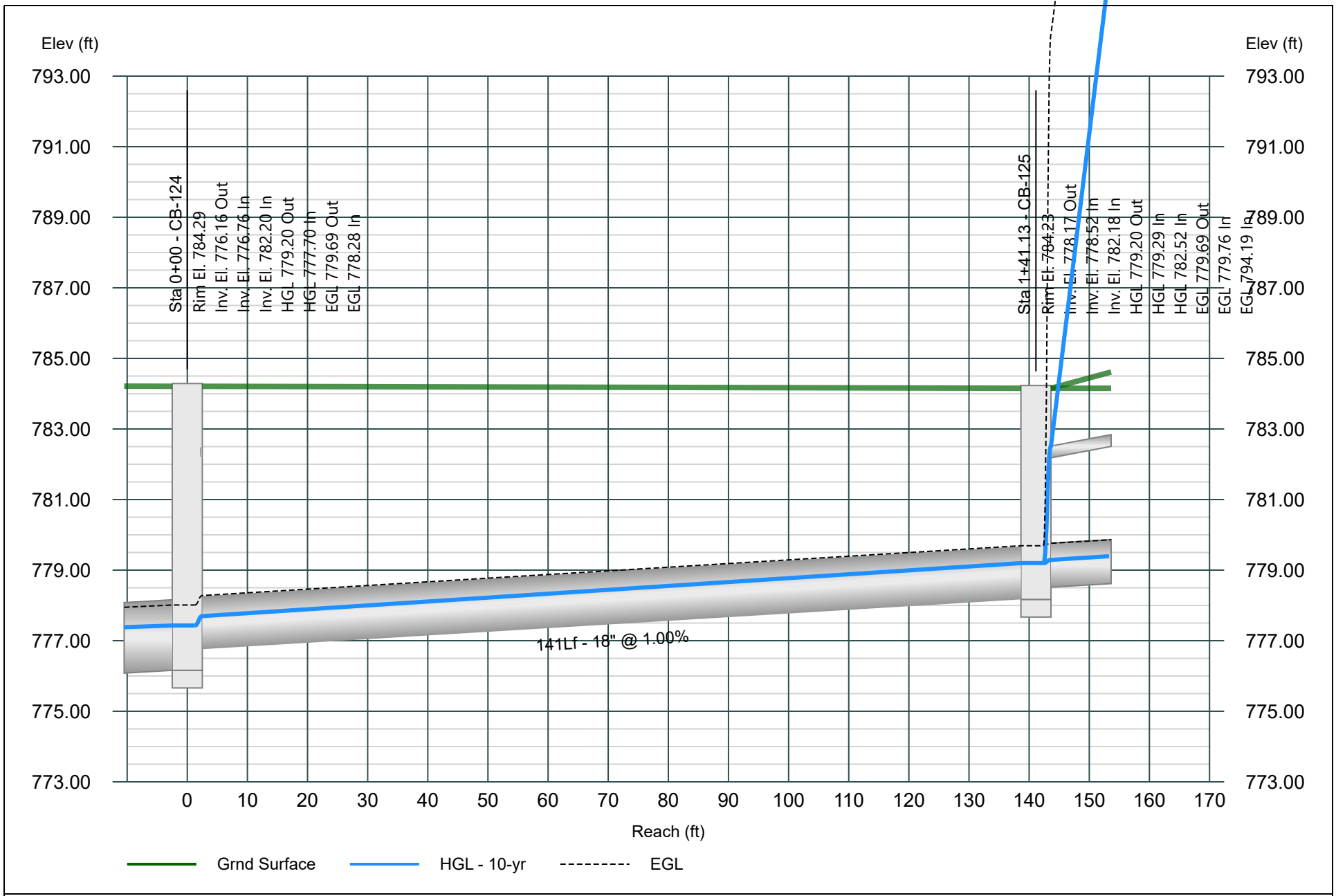


Line 12 - 125-124

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

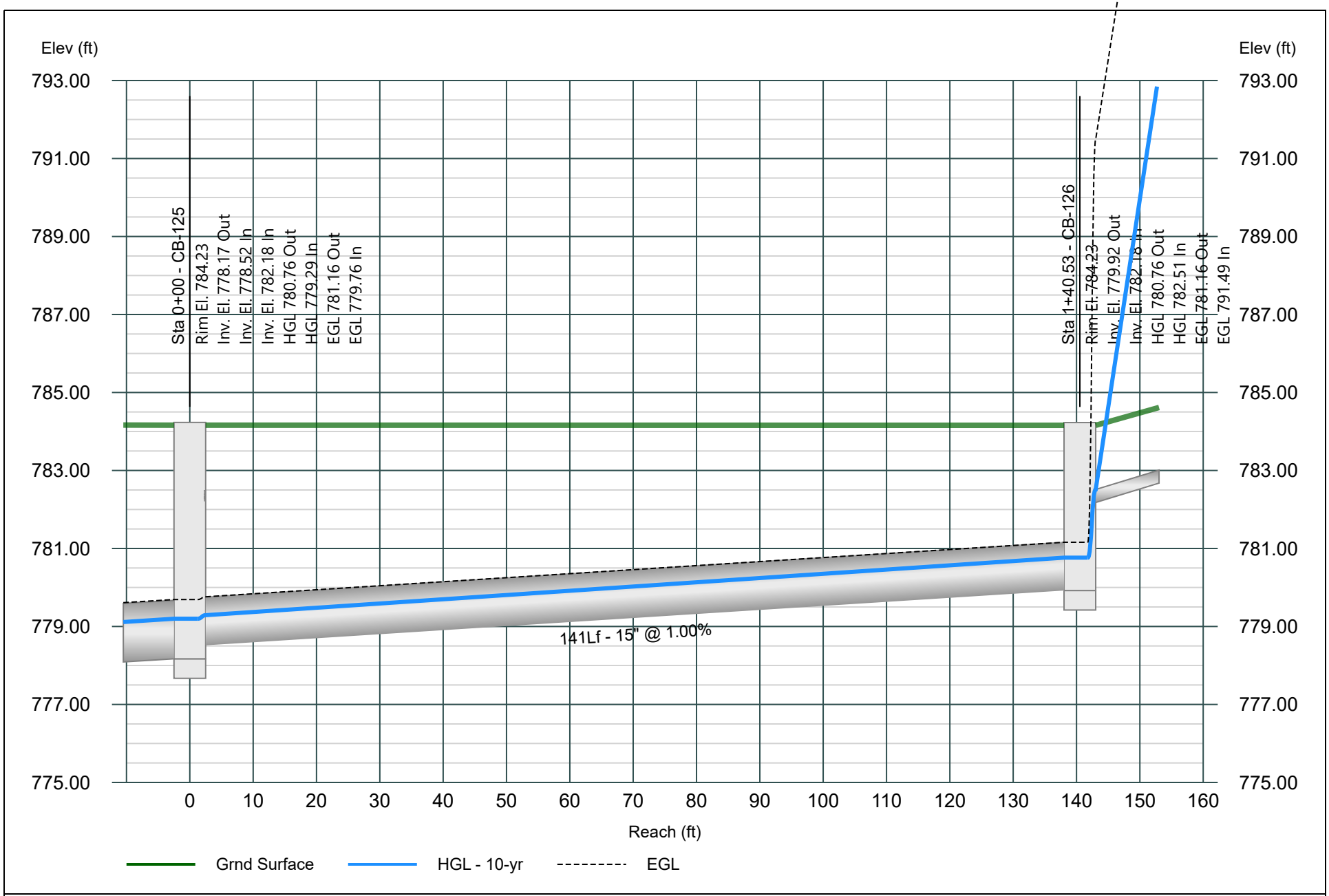


Line 13 - 126-125

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

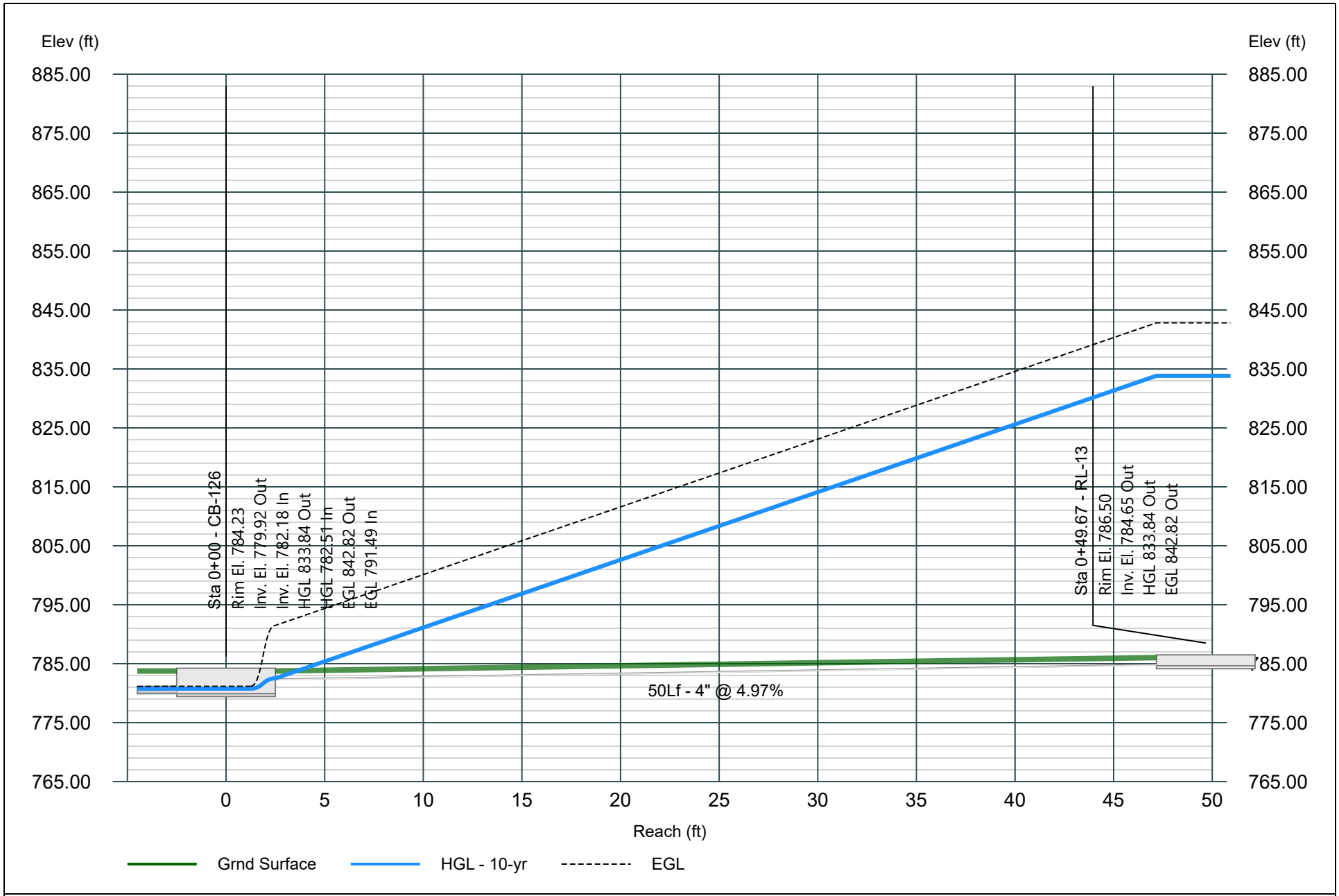


Line 14 - RL-13

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

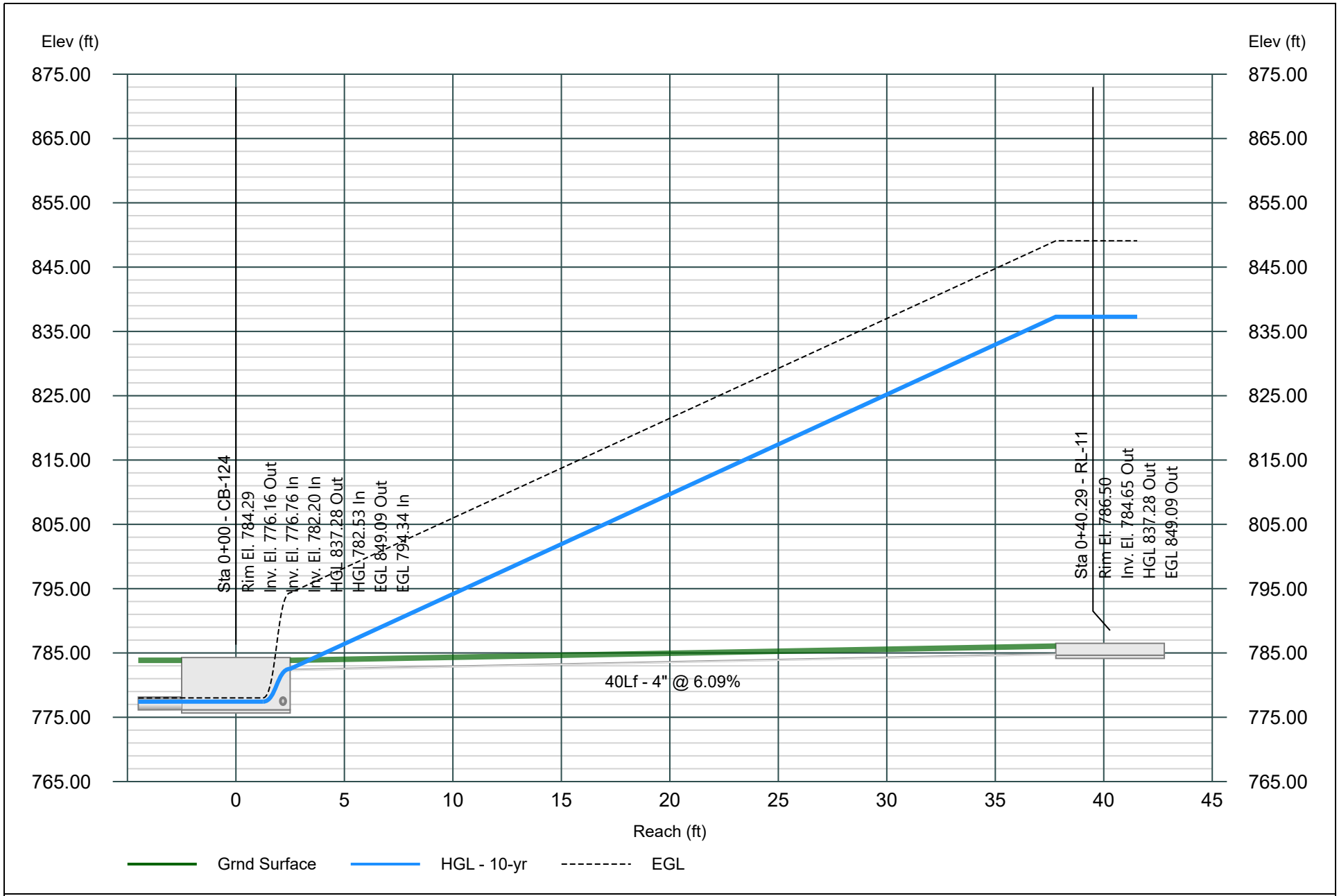


Line 15 - RL-11

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

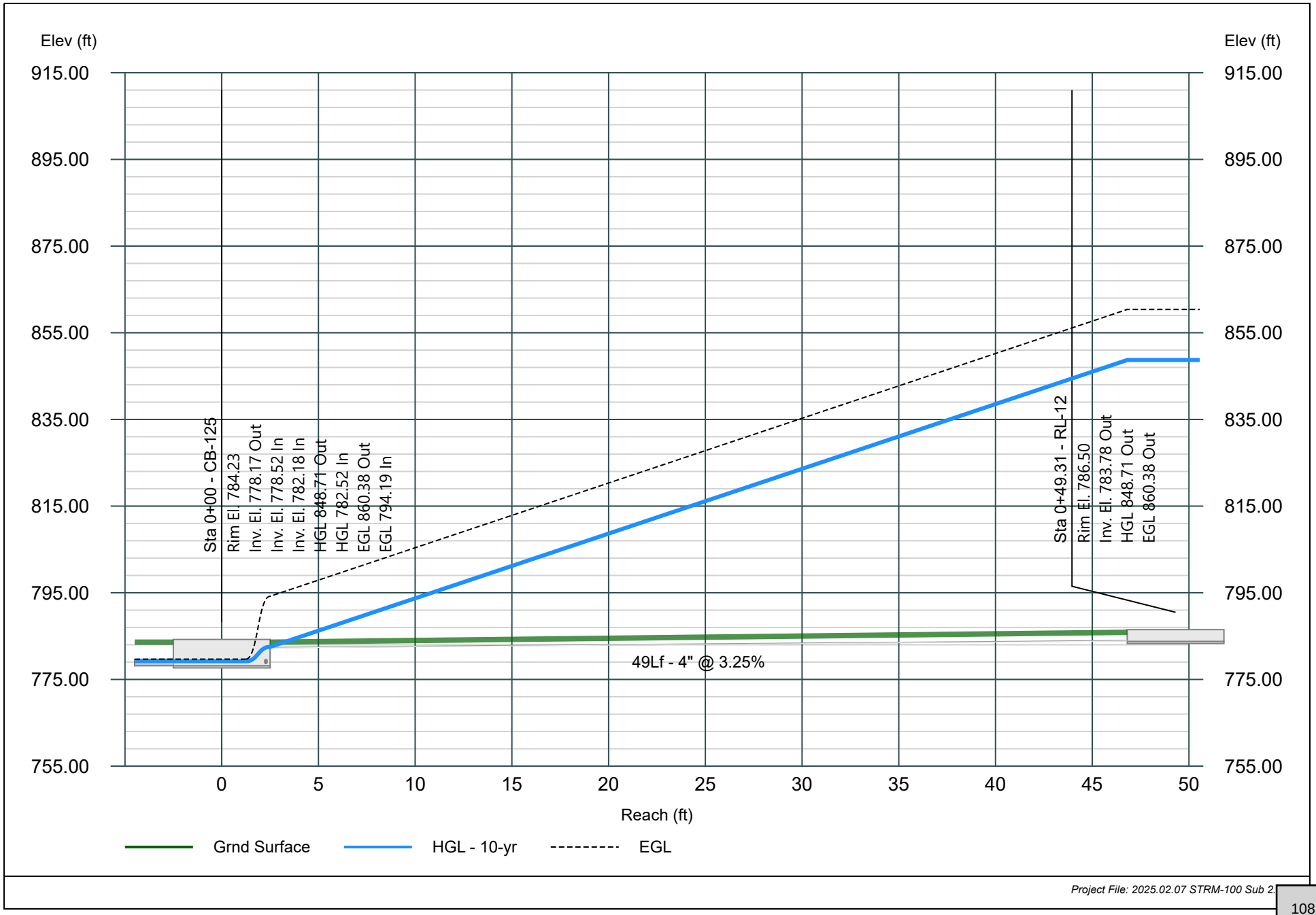


Line 16 - RL-12

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

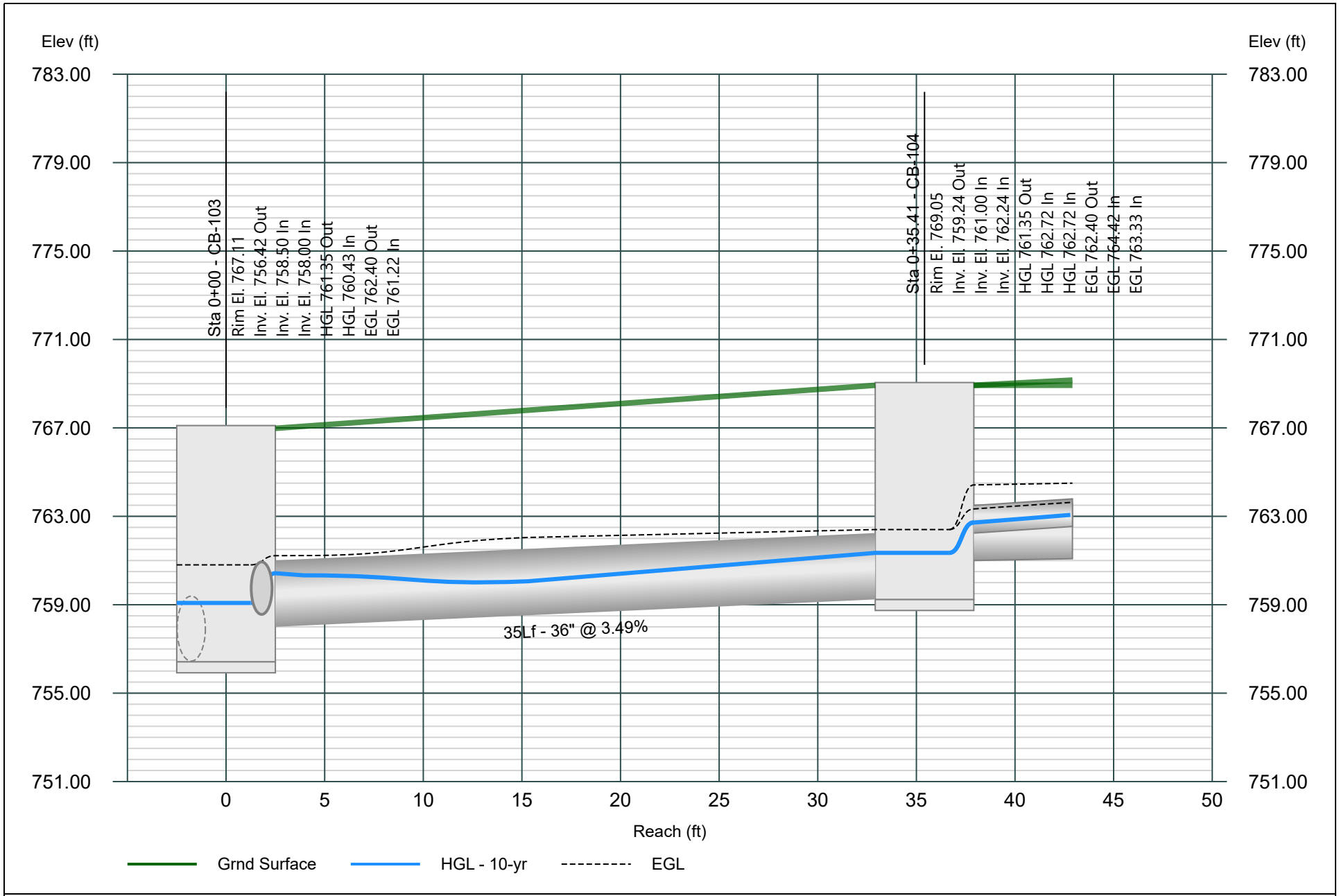


Line 17 - 104-103

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

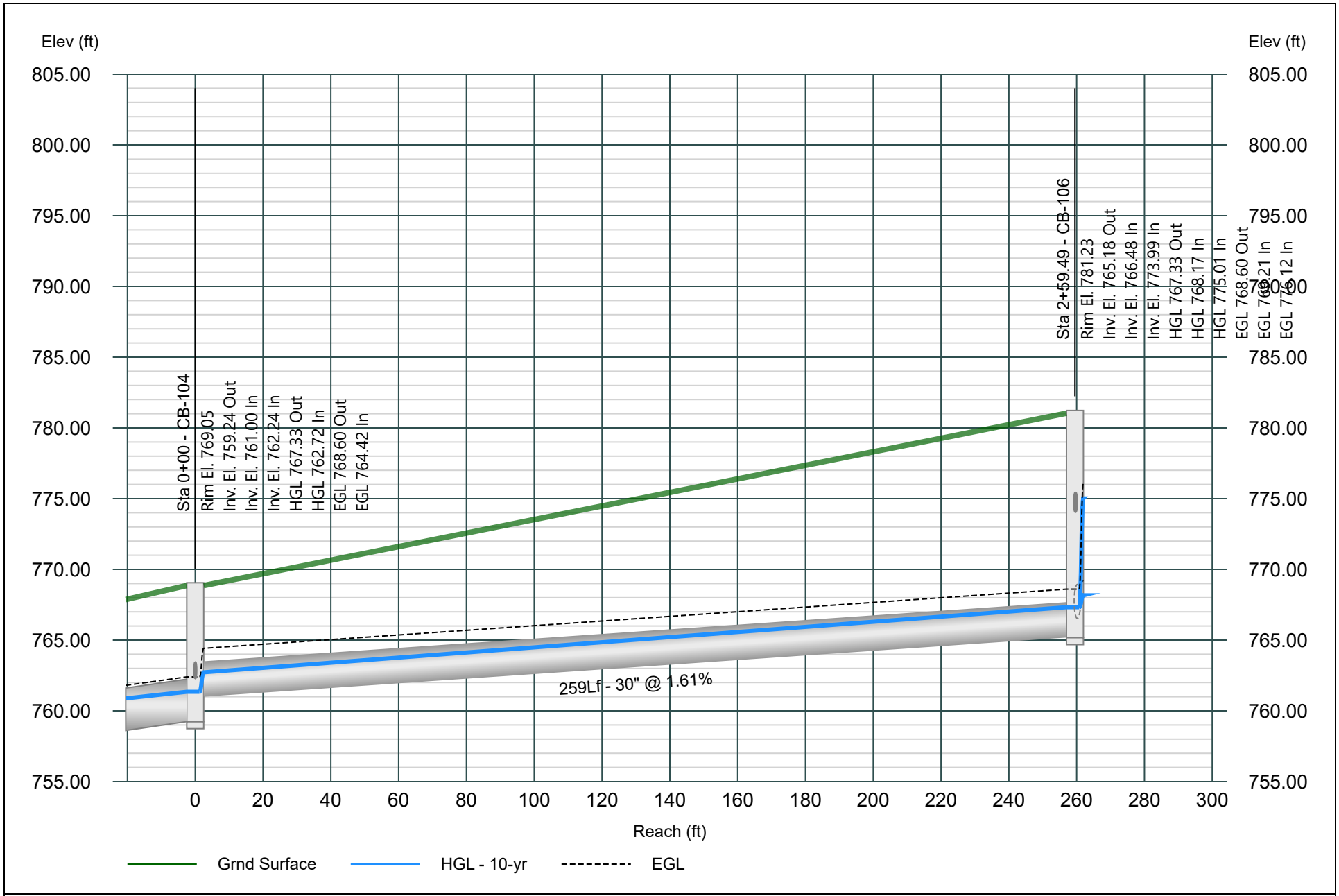


Line 18 - 106-104

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

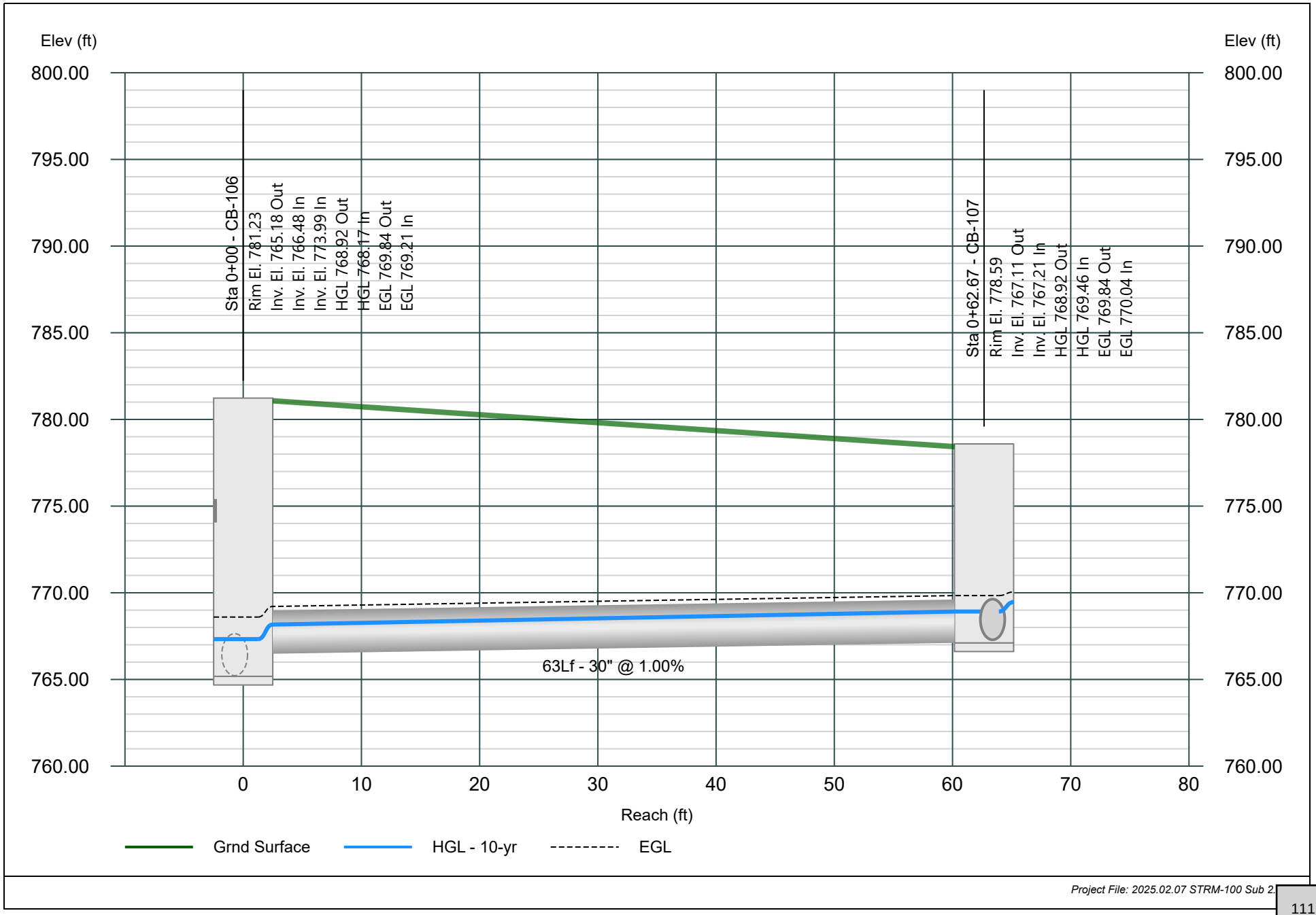


Line 19 - 107-106

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

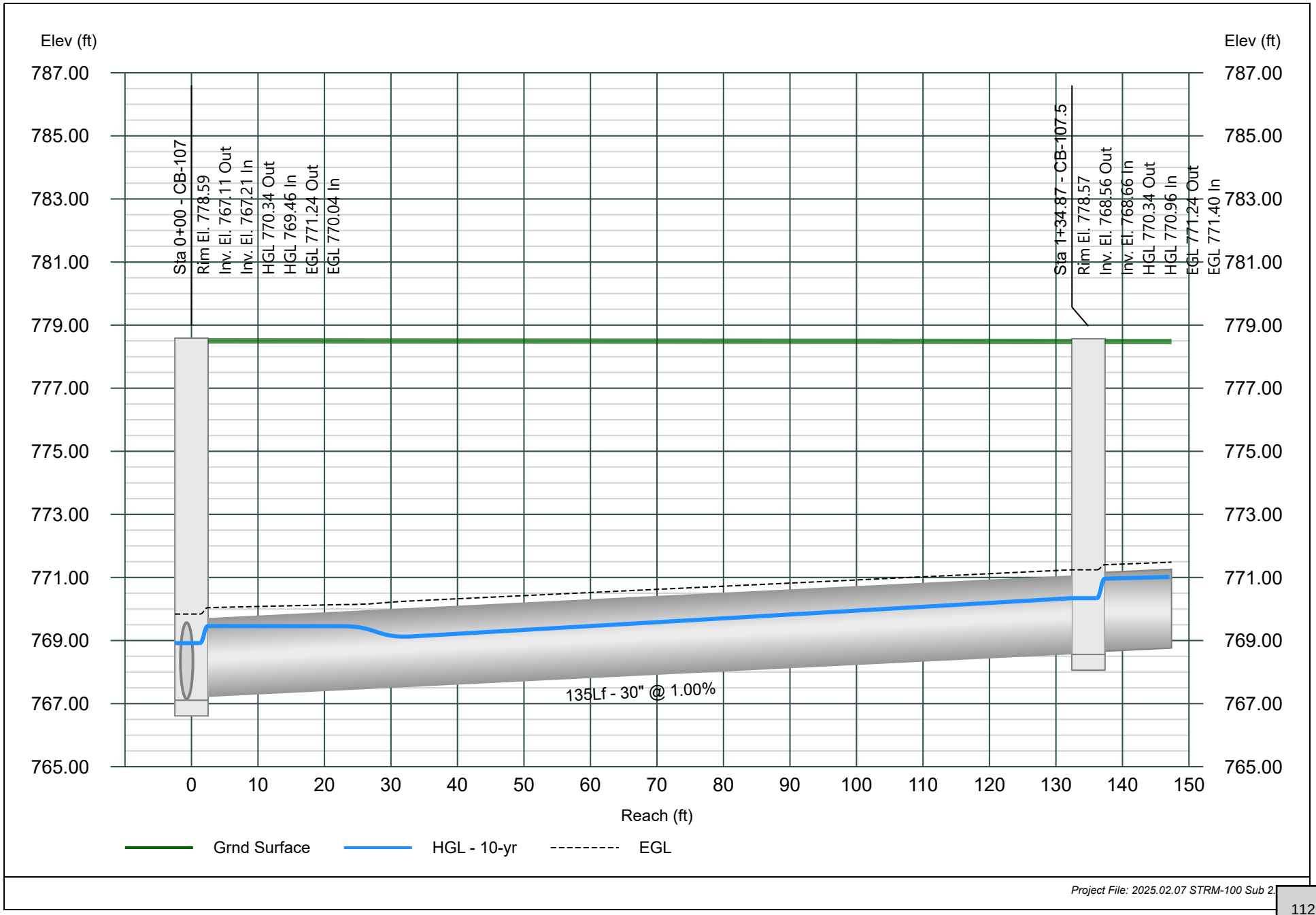


Line 20 - 108-107

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

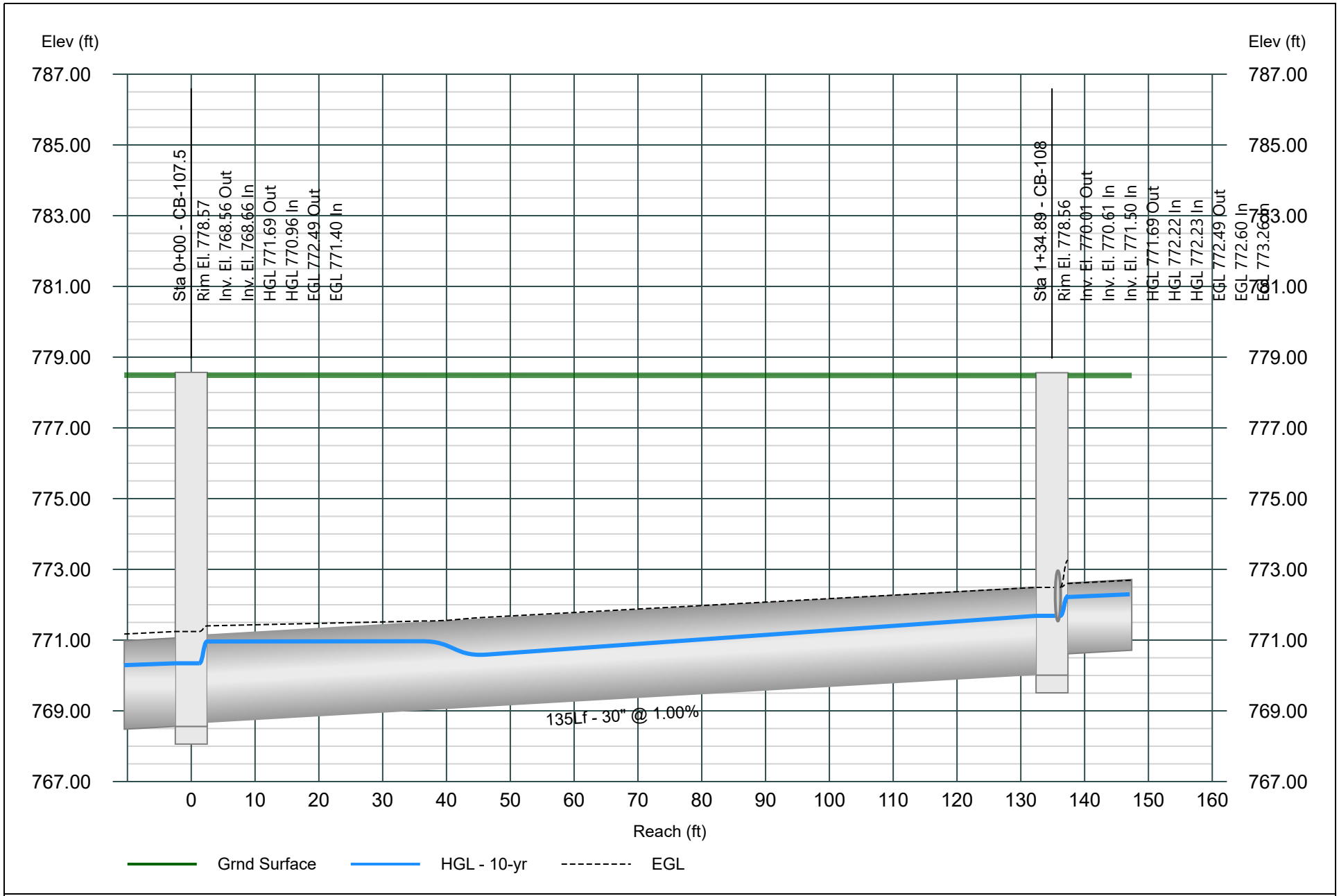


Line 21 - 108-107 (1)

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

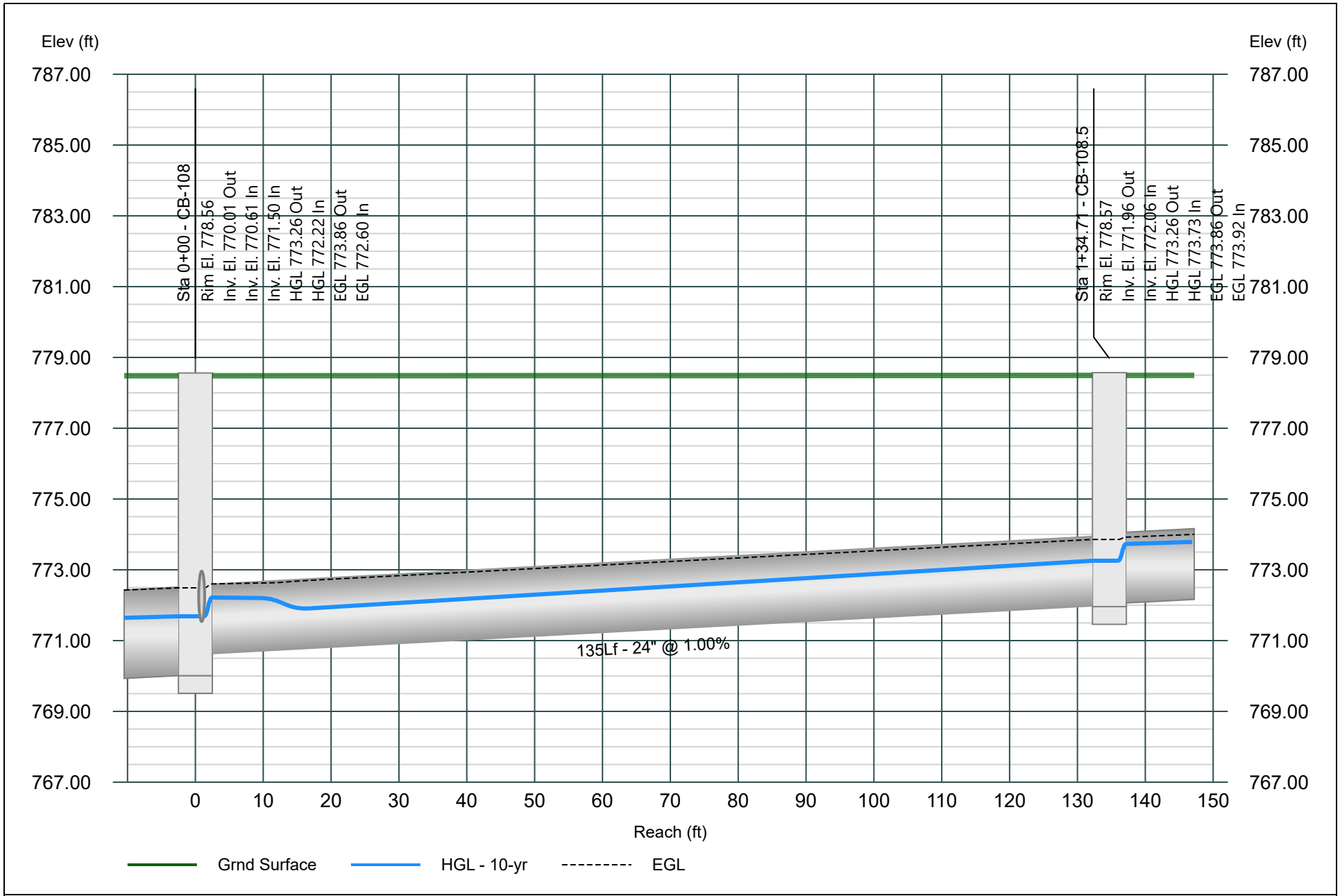


Line 22 - 109-108

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

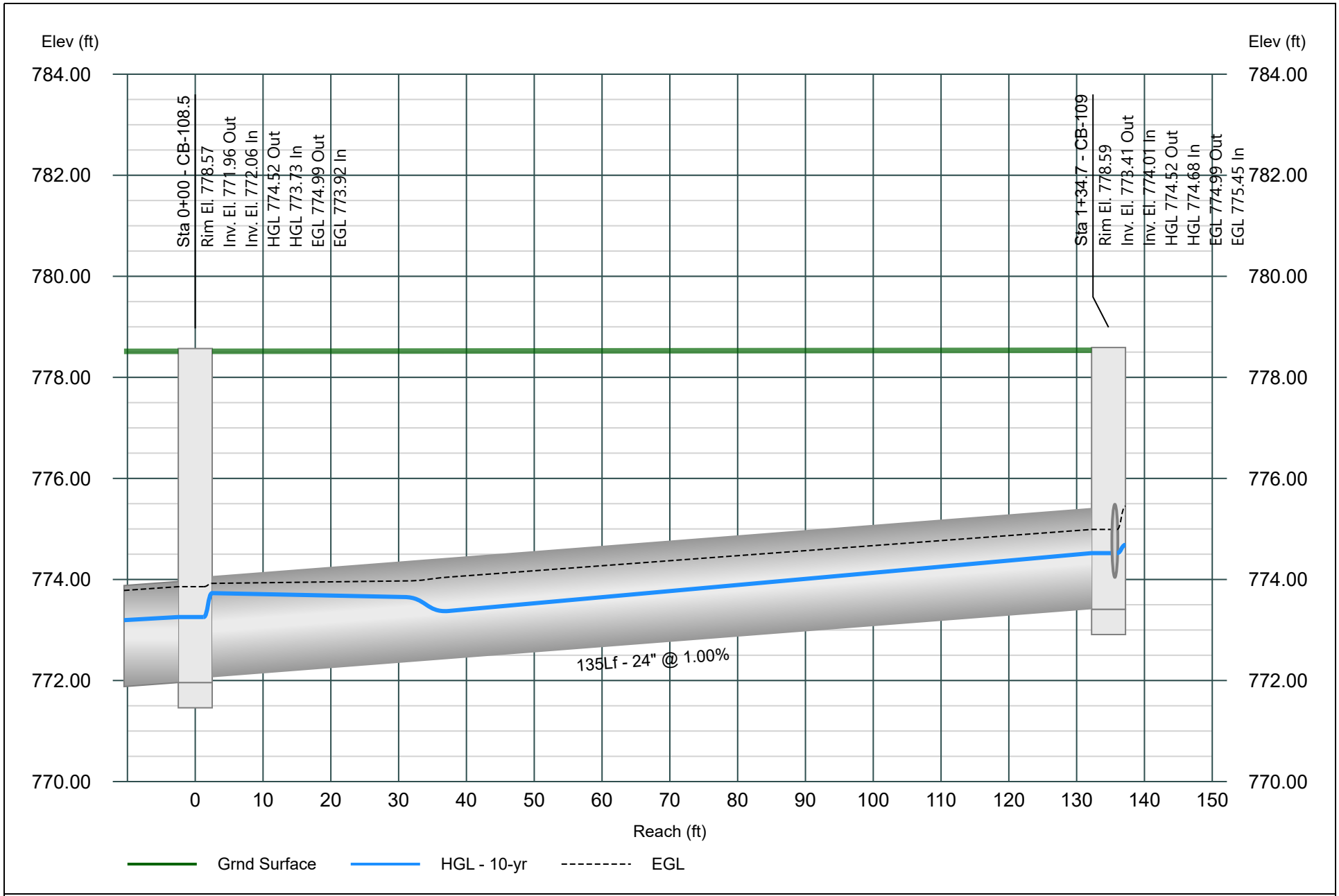


Line 23 - 109-108 (1)

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

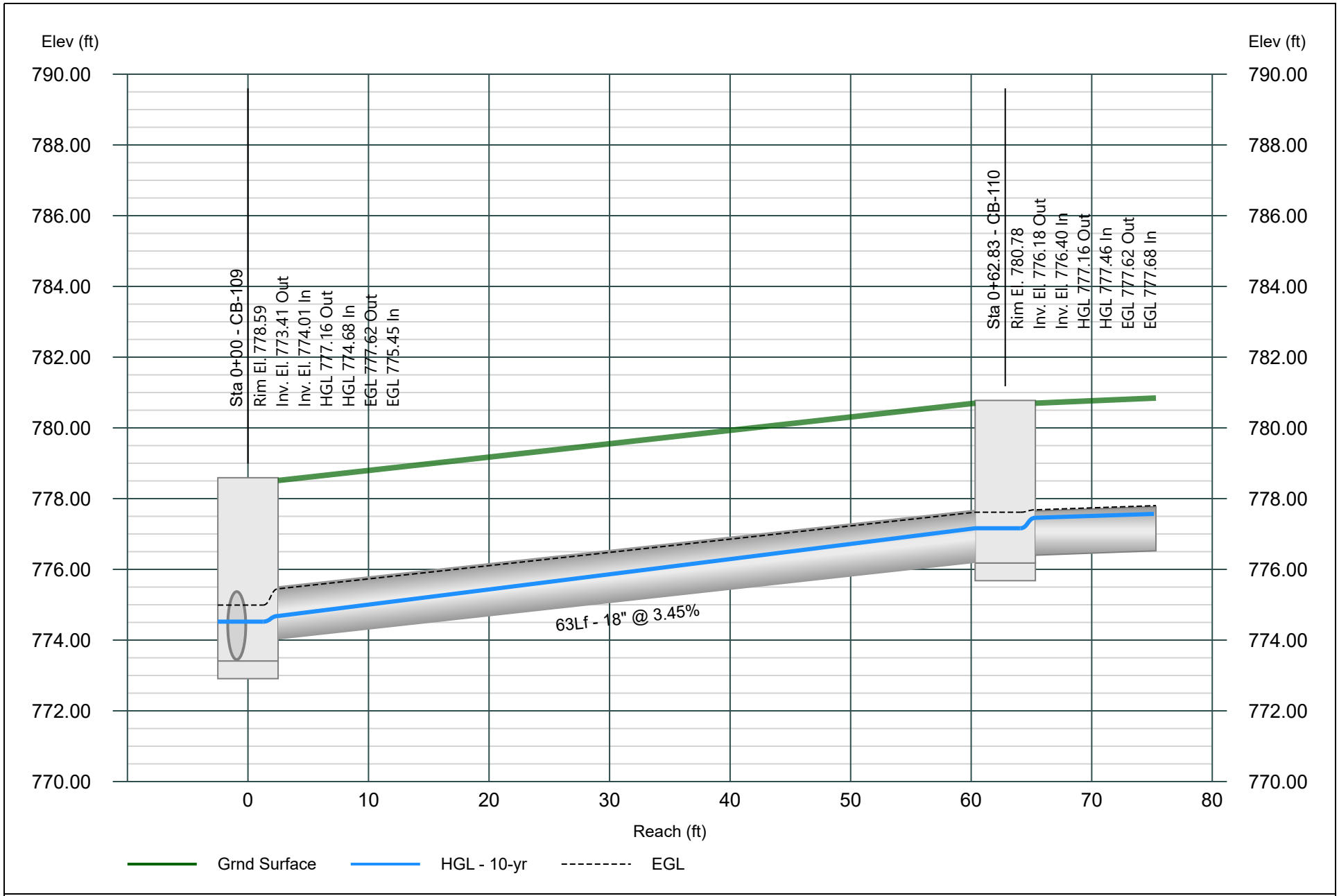


Line 24 - 110-109

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

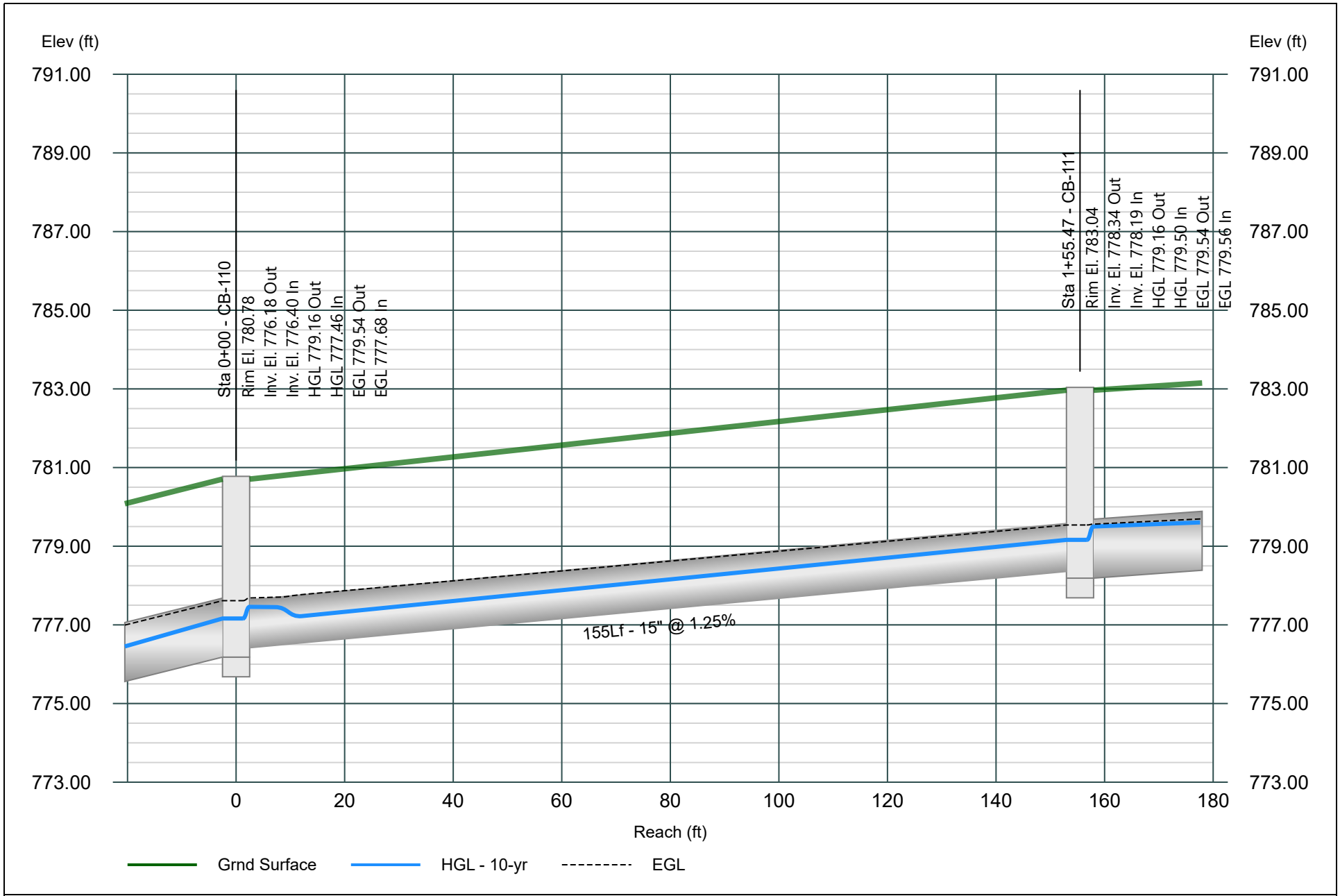


Line 25 - 111-110

Pro

Stormwater Studio 2024 v 3.0.0.35

02-07-2025

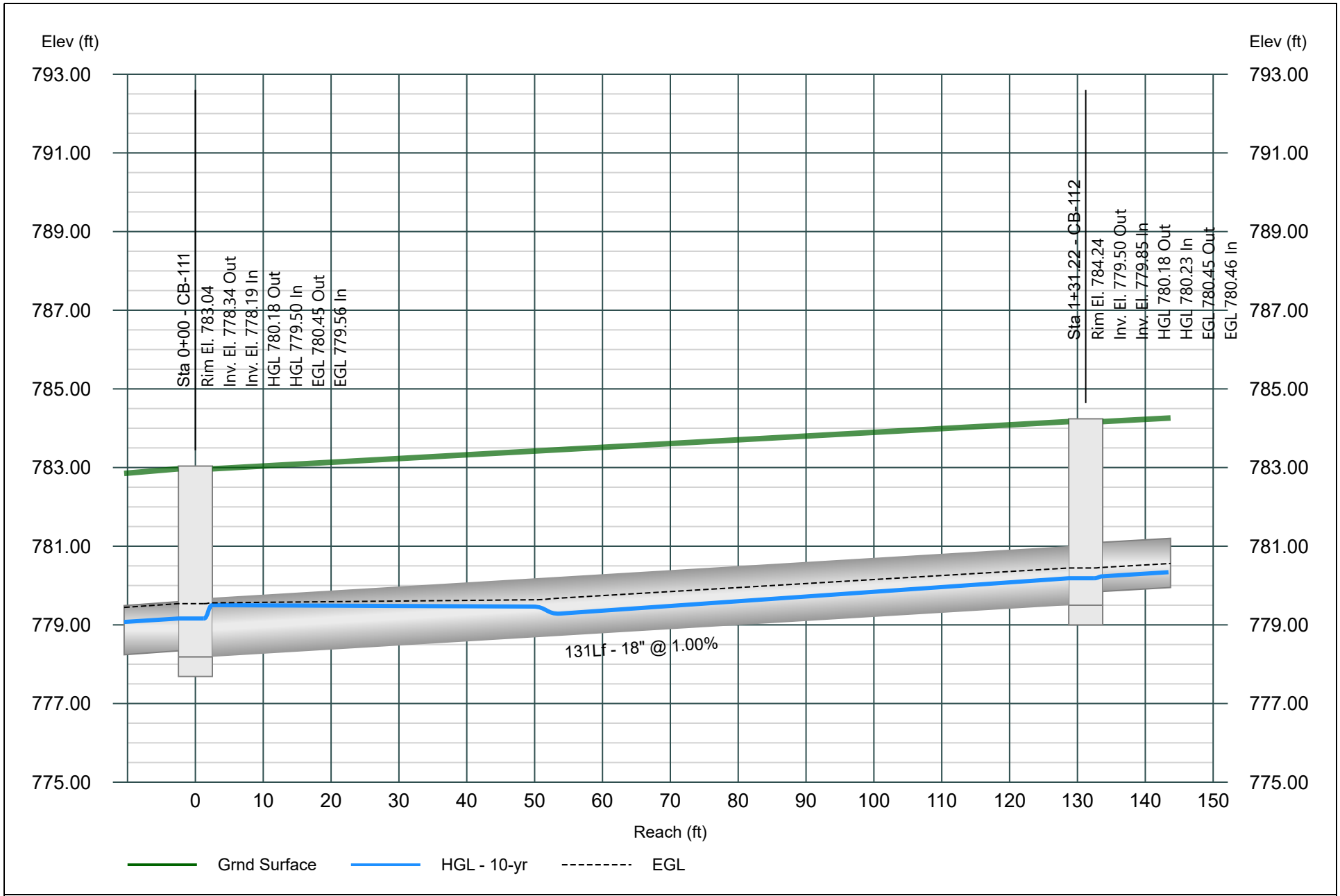


Line 26 - 112-111

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

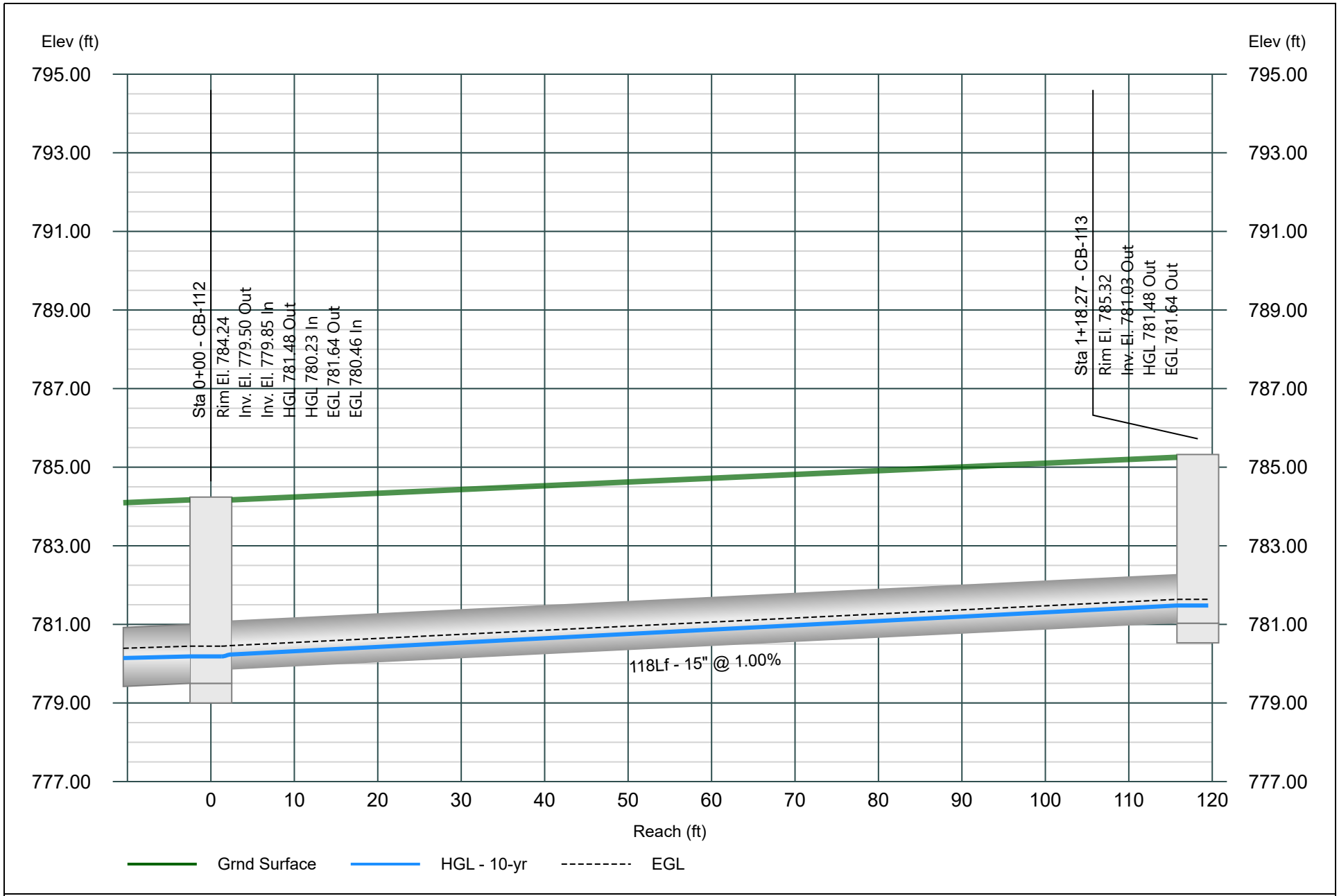


Line 27 - 113-112

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

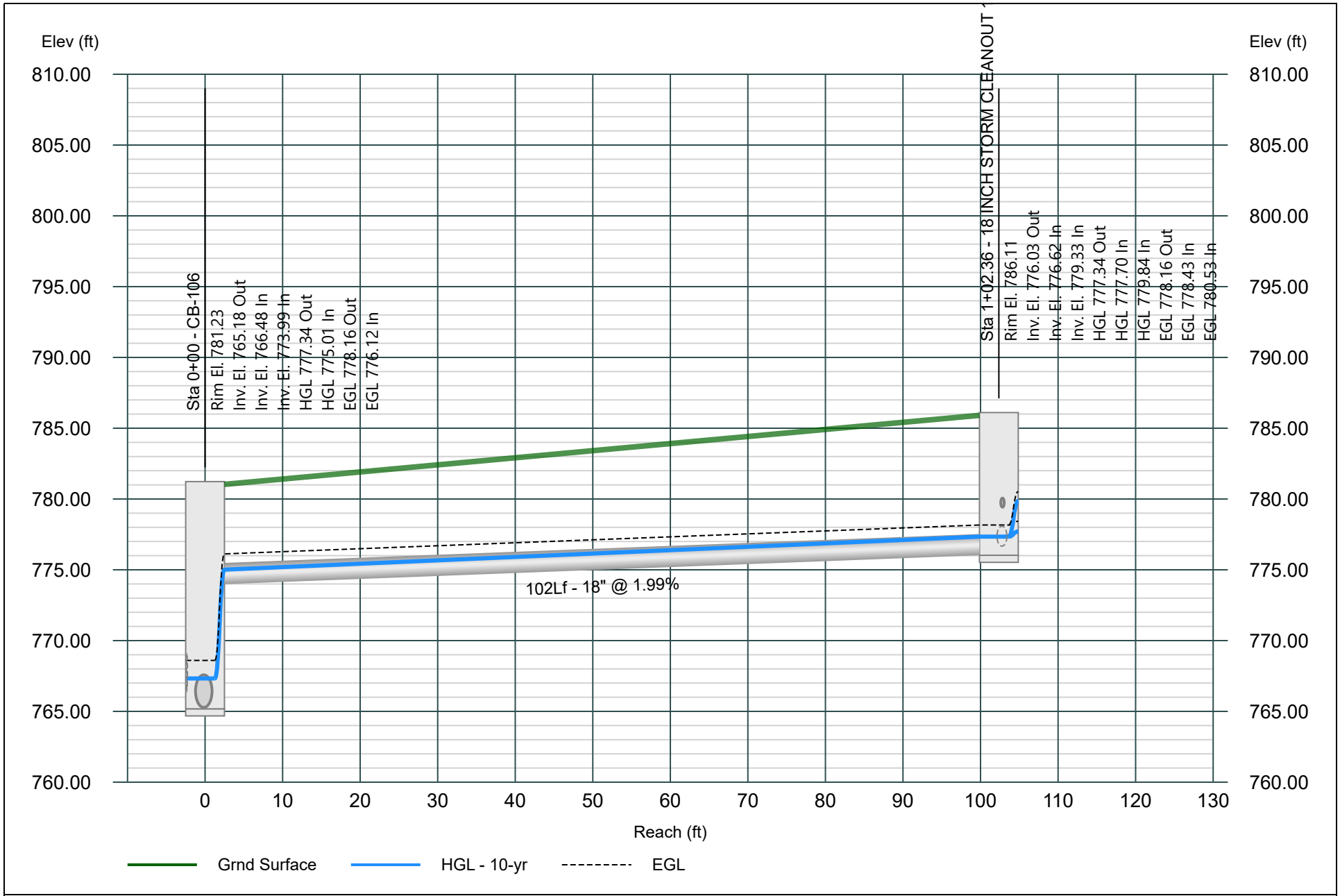


Line 28 - CO1-106

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

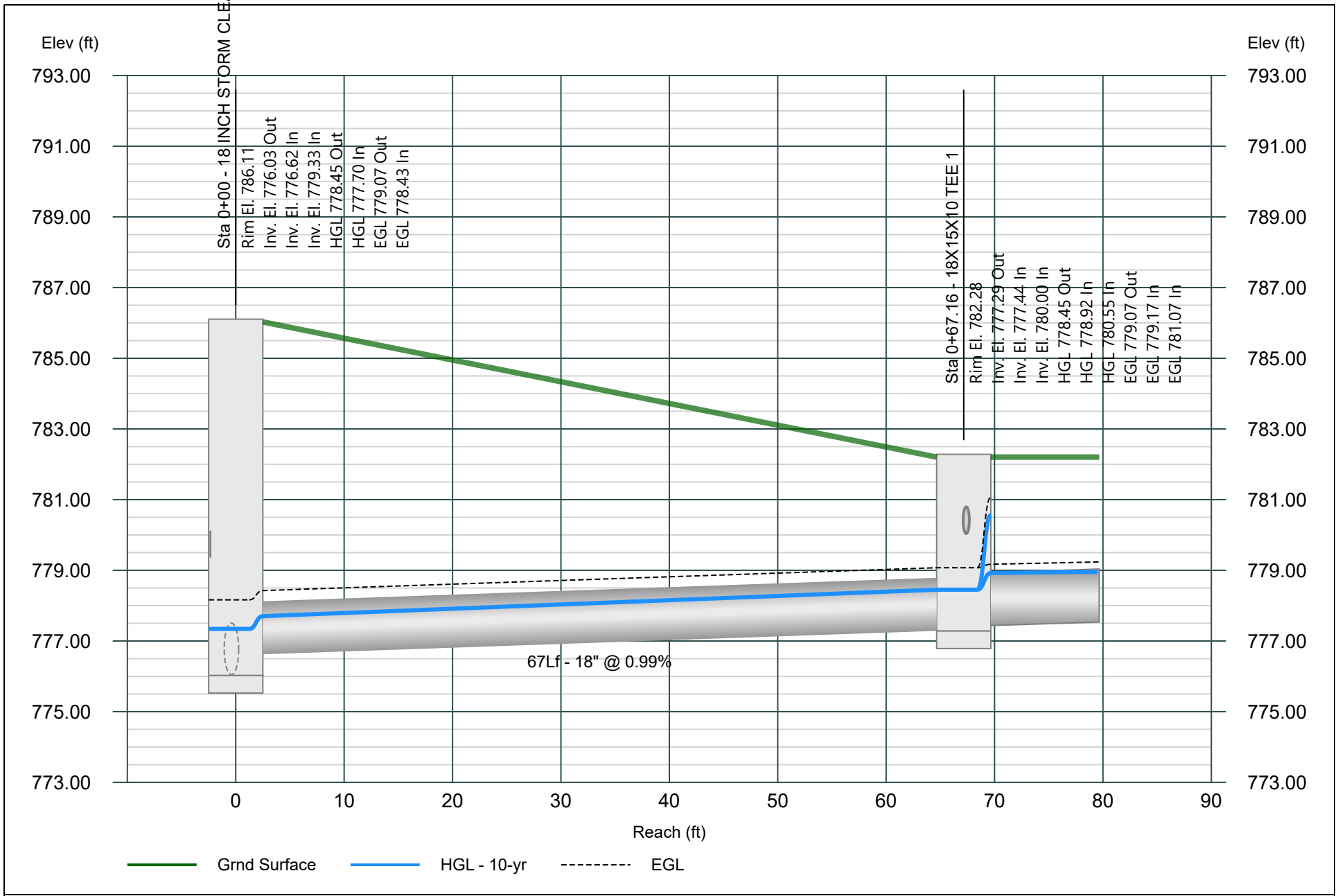


Line 29 - TEE 1-CO1

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

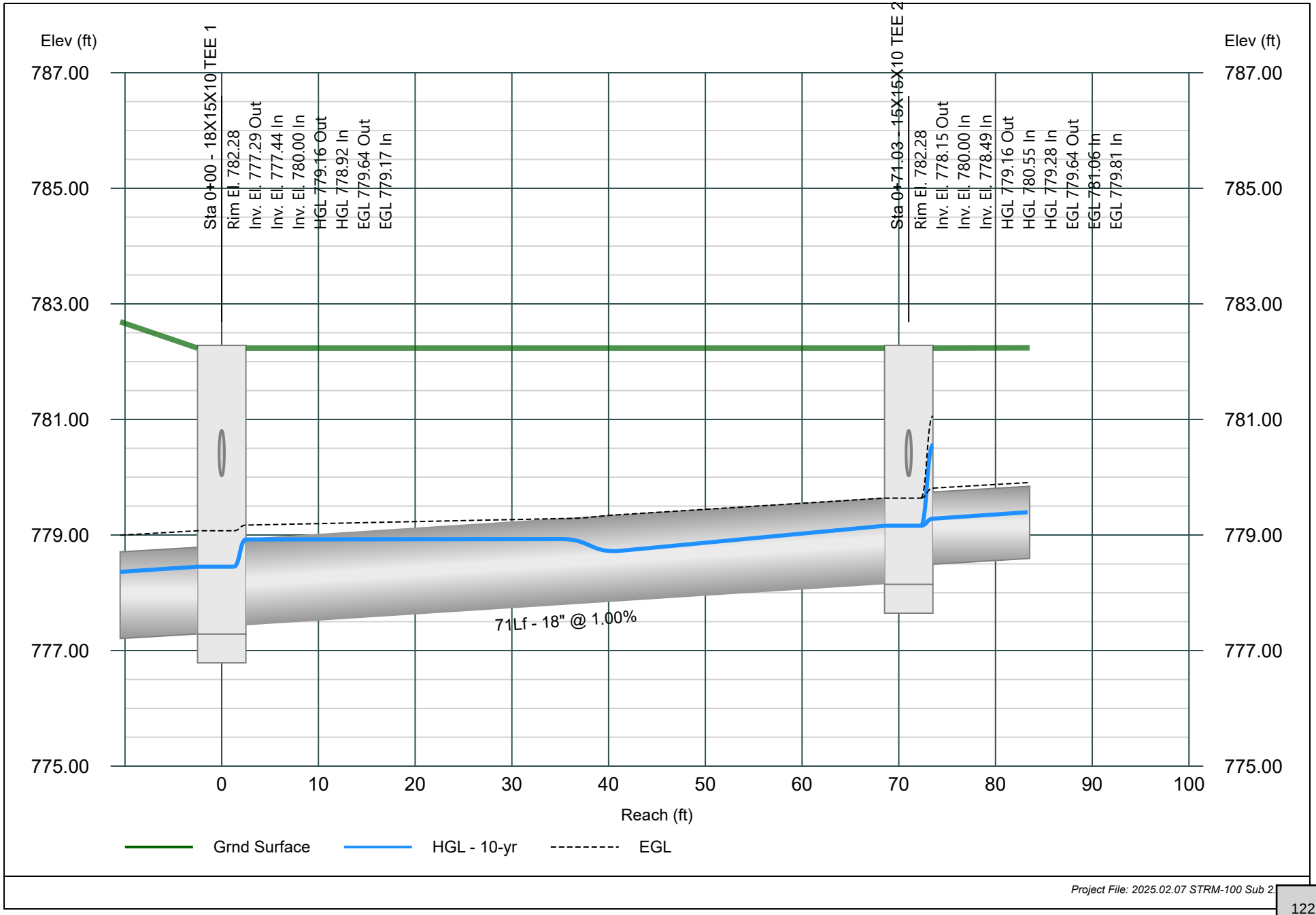


Line 30 - TEE 2-TEE 1

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

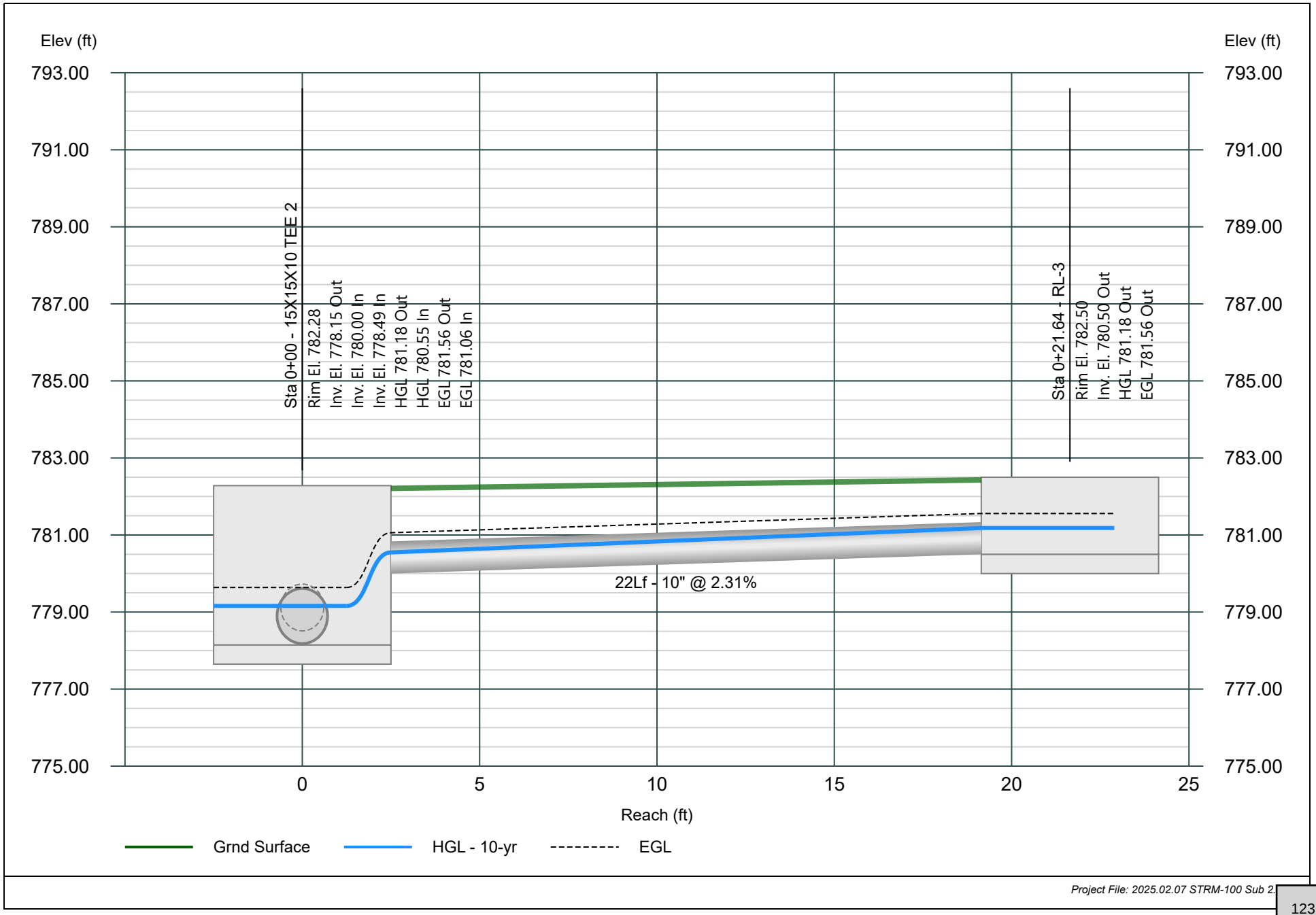


Line 31 - RL-3

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

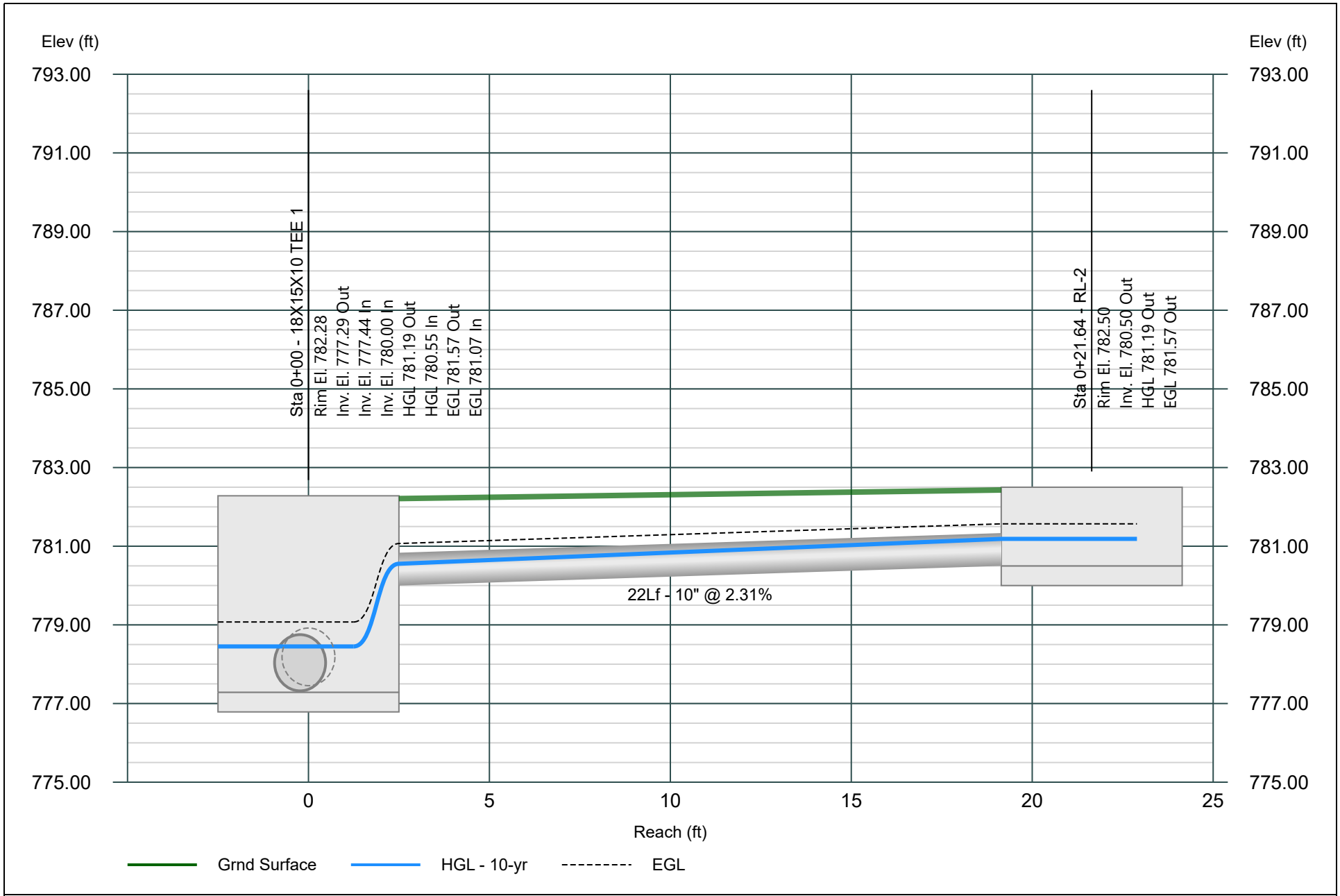


Line 32 - RL-2

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

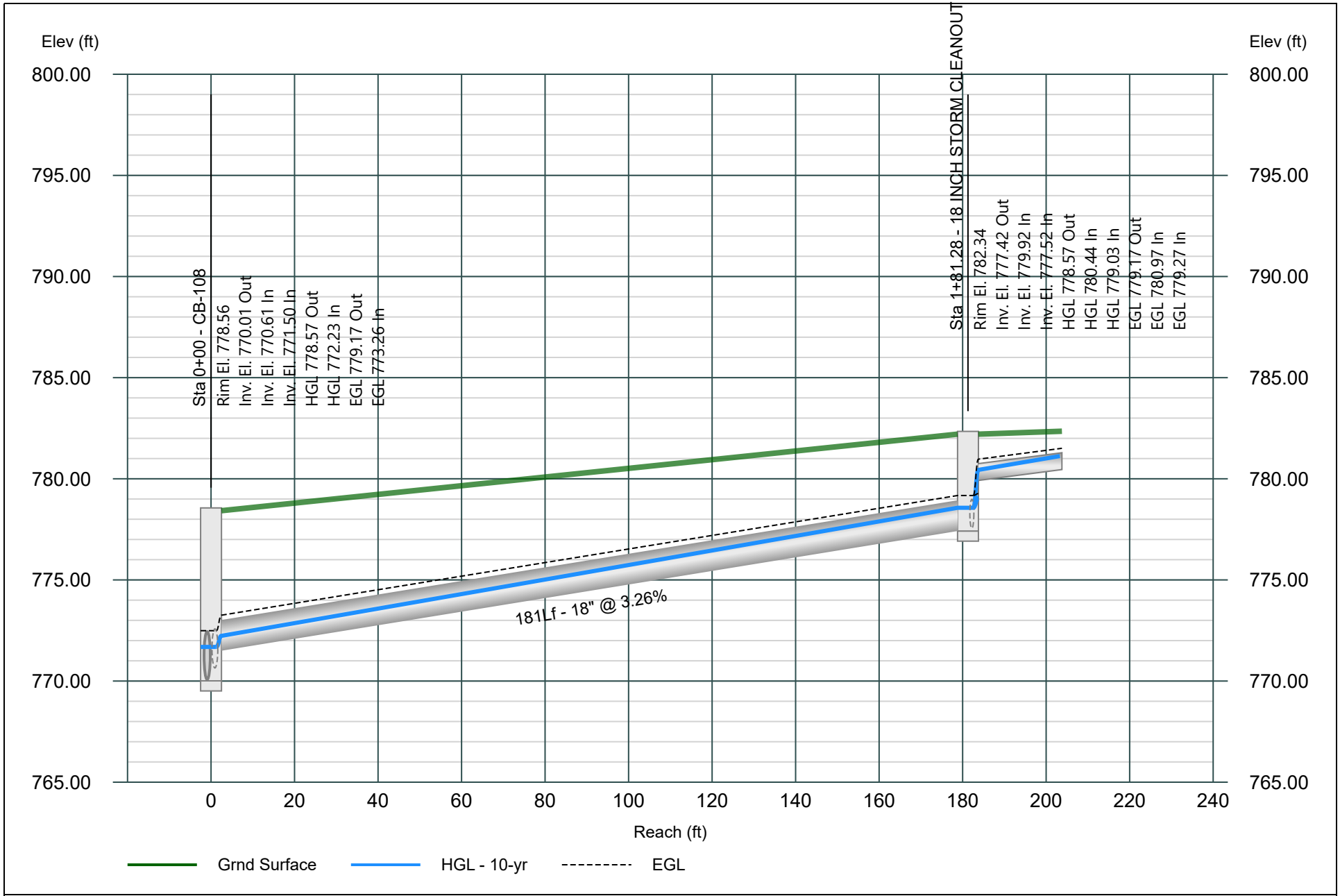


Line 33 - CO3-108

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

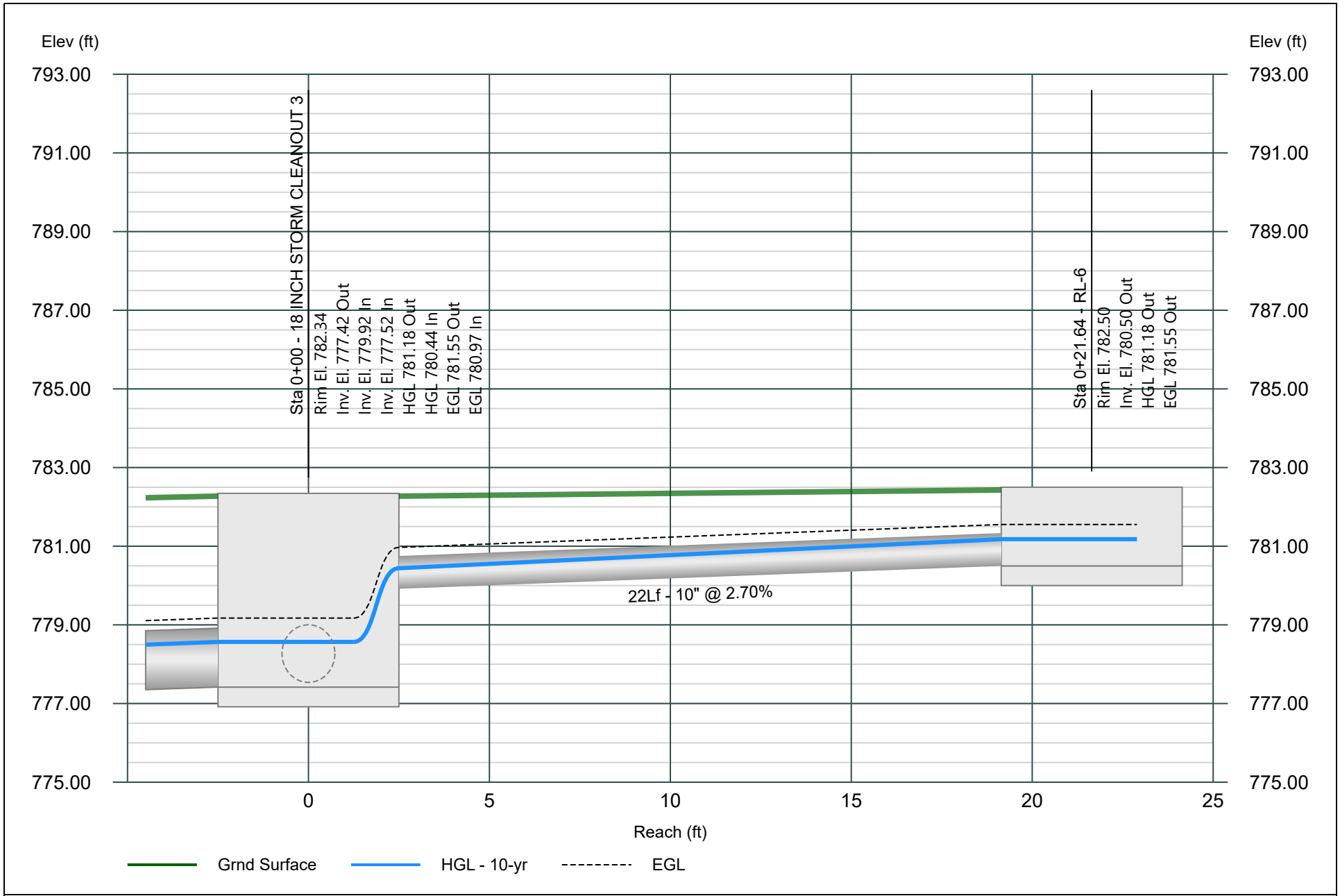


Line 34 - RL-6

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

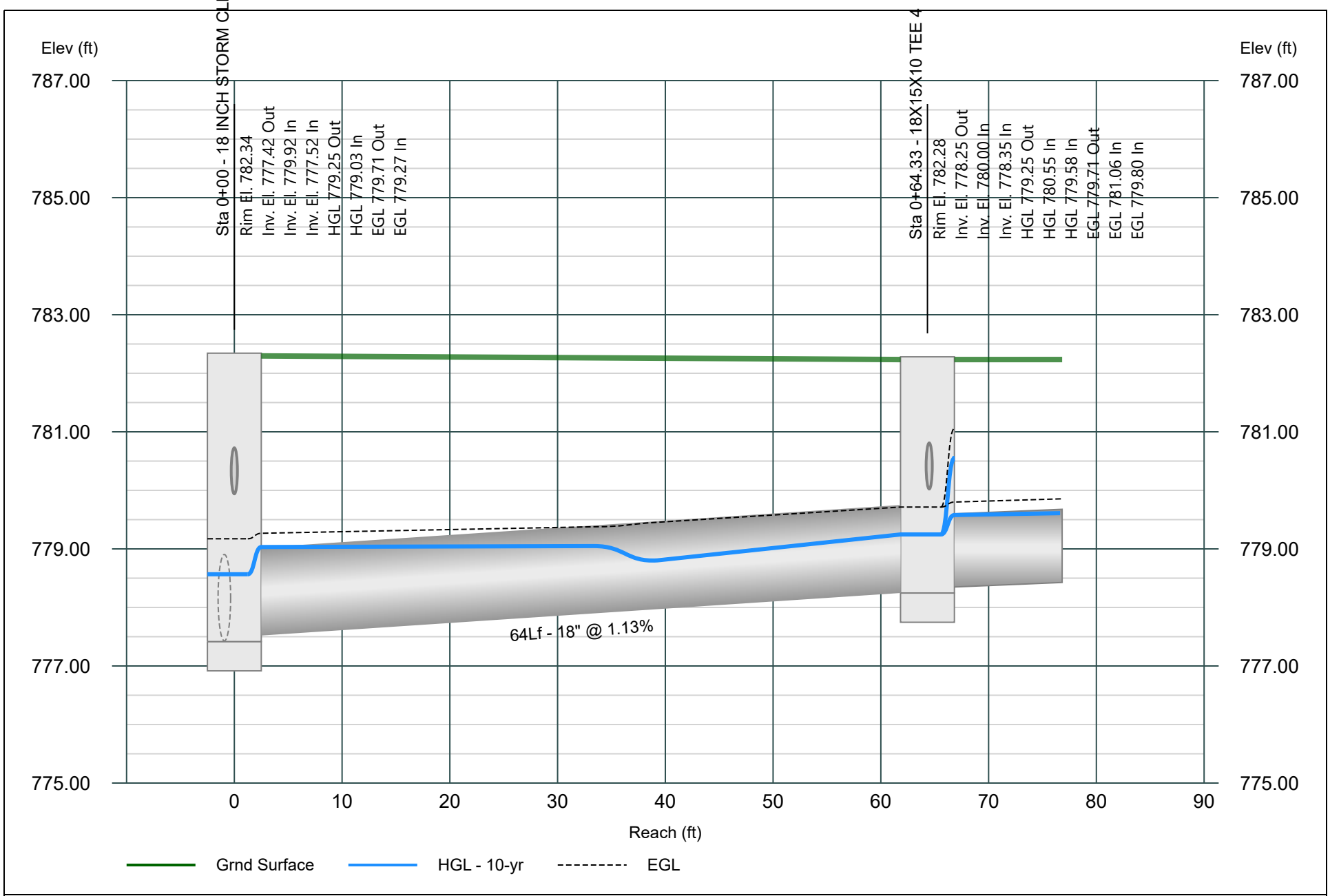


Line 35 - TEE 4-CO3

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

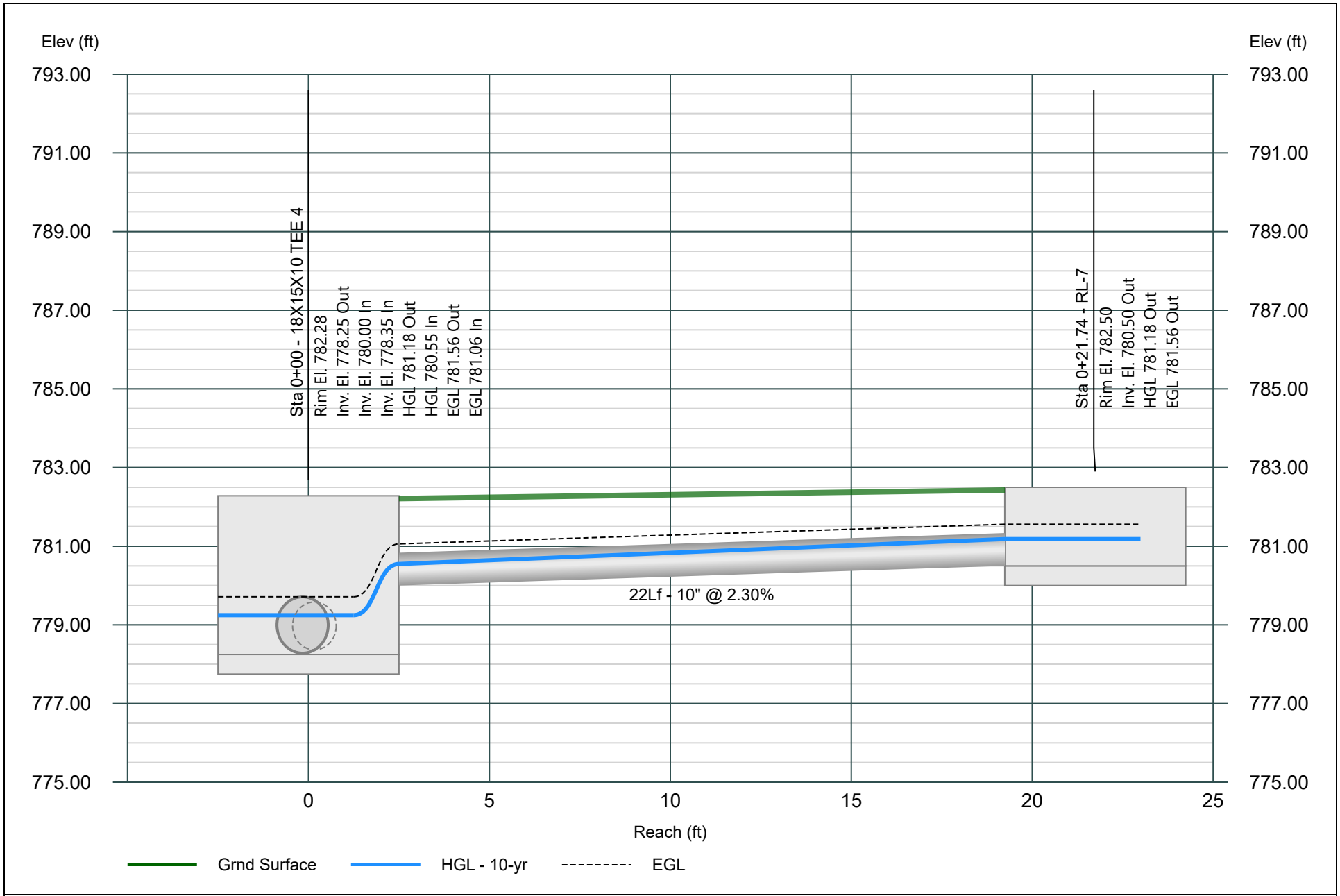


Line 36 - RL-7

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

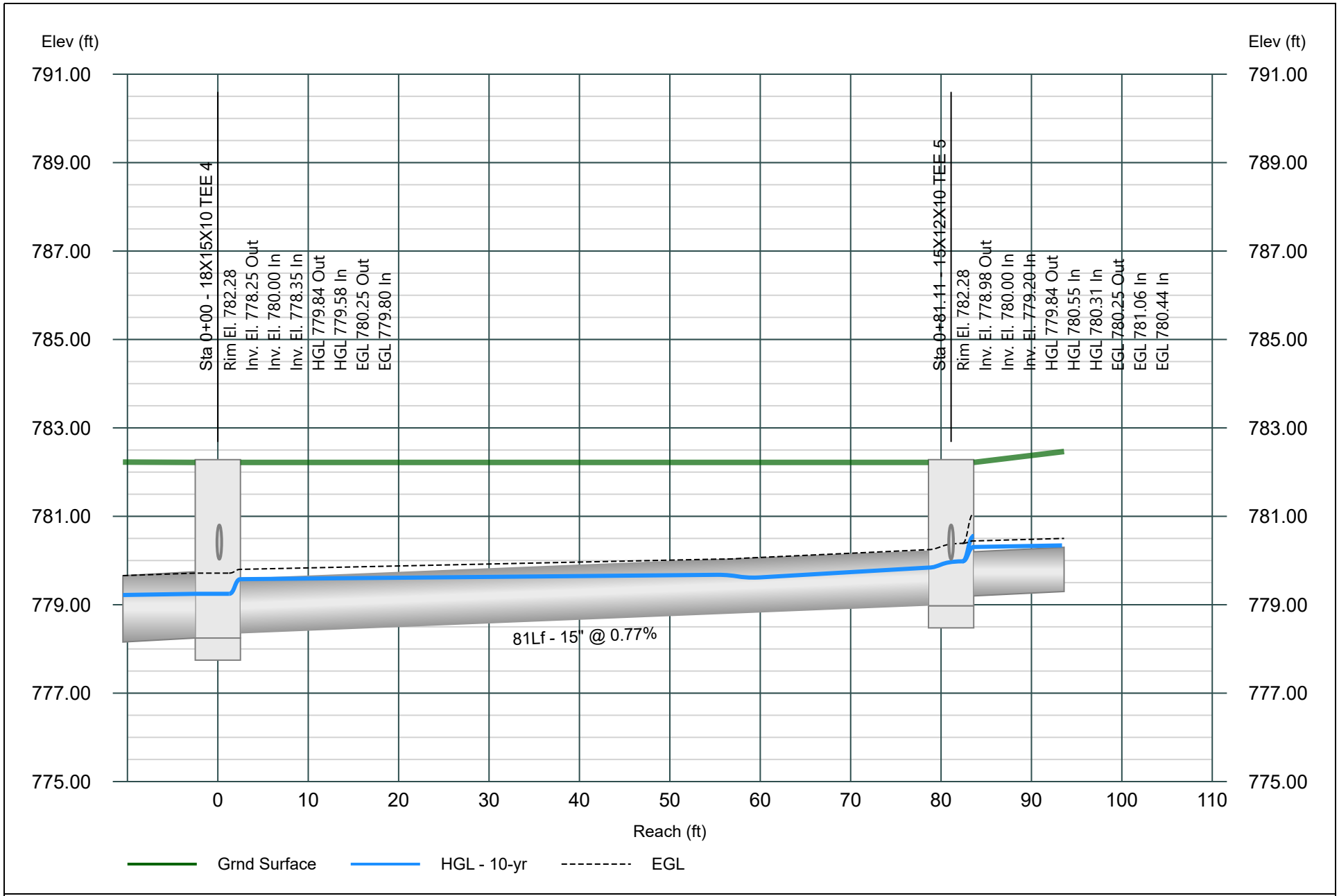


Line 37 - TEE 5-TEE 4

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

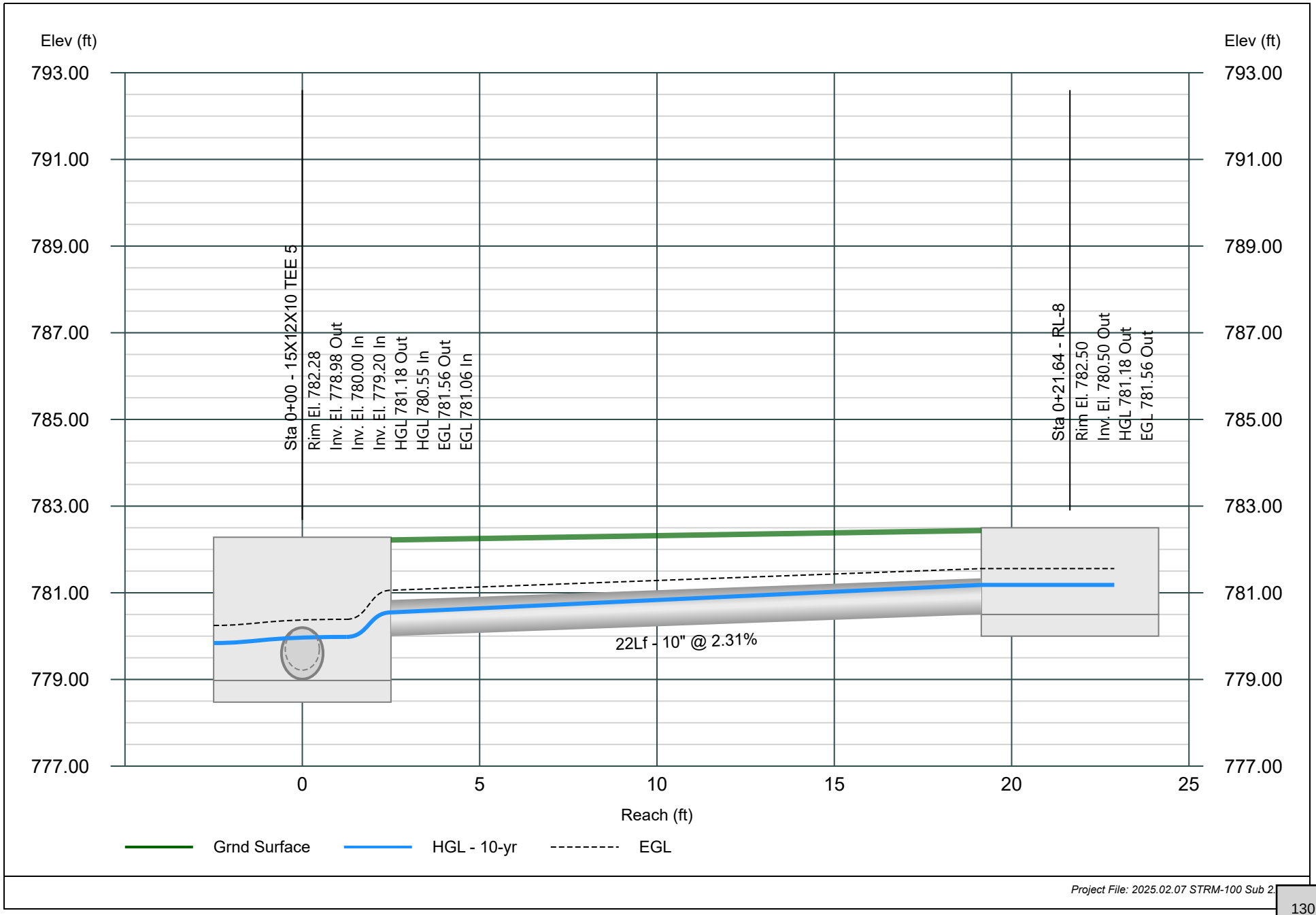


Line 38 - RL-8

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

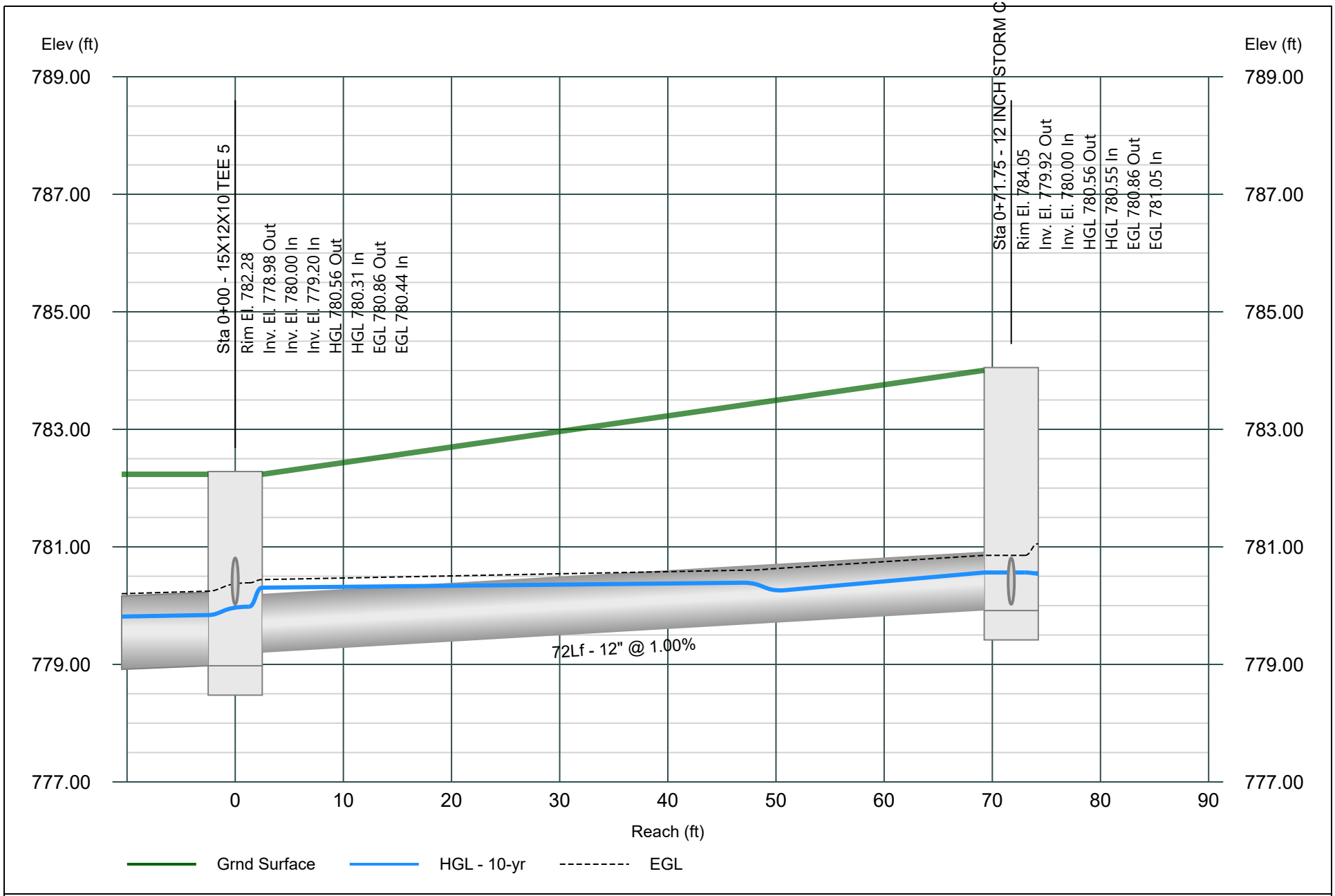


Line 39 - CO4-TEE 5

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

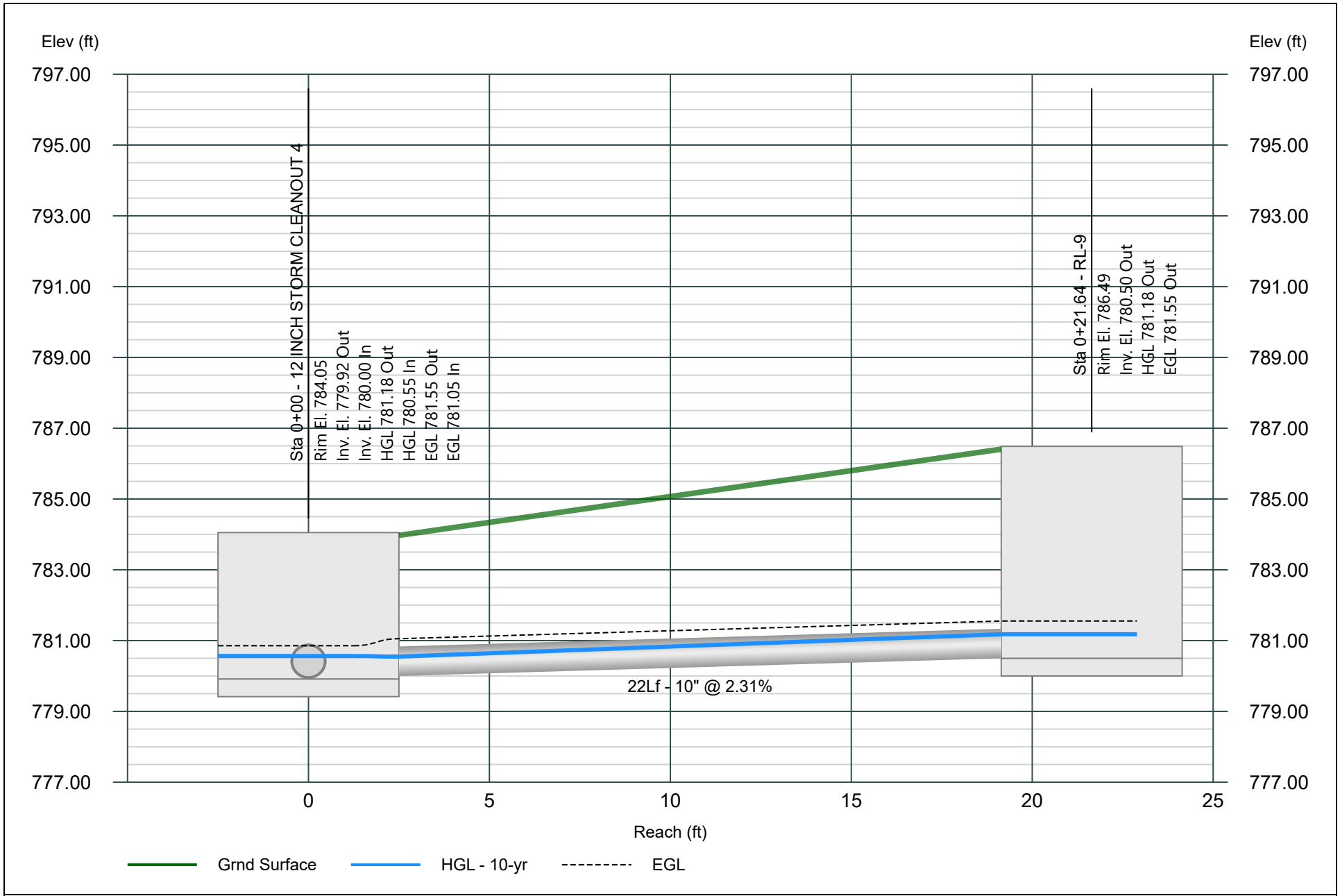


Line 40 - RL-9

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

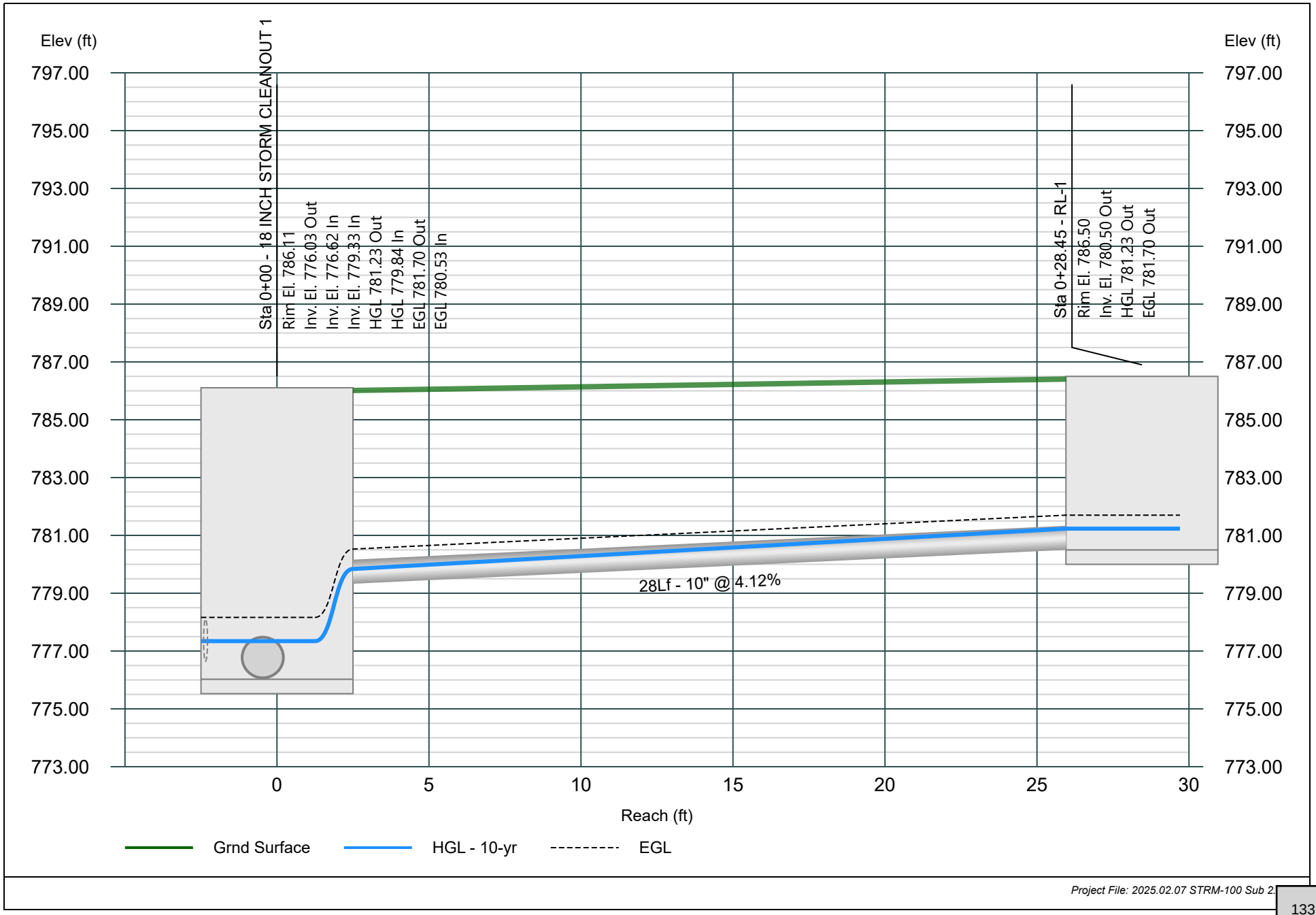


Line 41 - RL-1

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

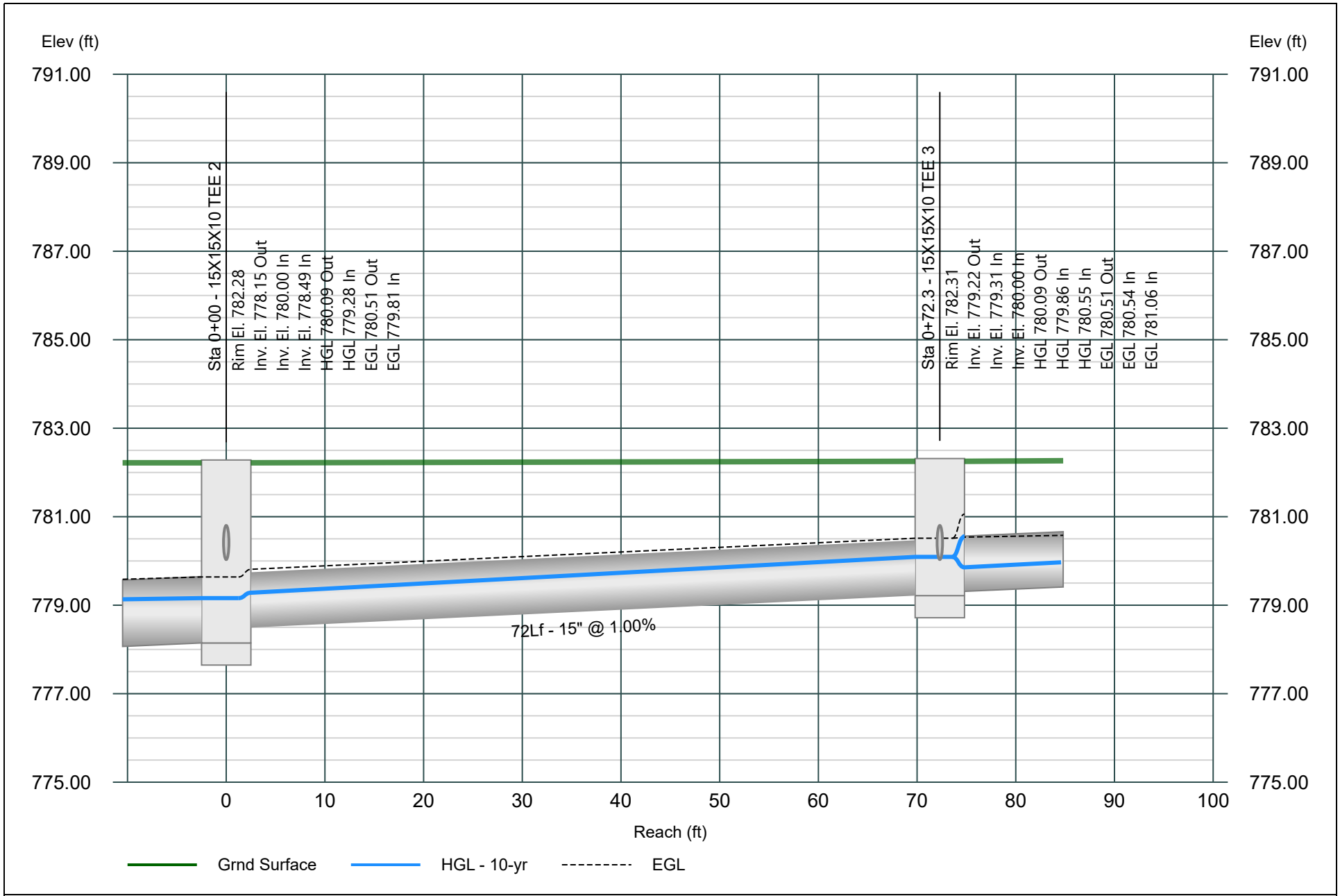


Line 42 - TEE 3-TEE 2

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

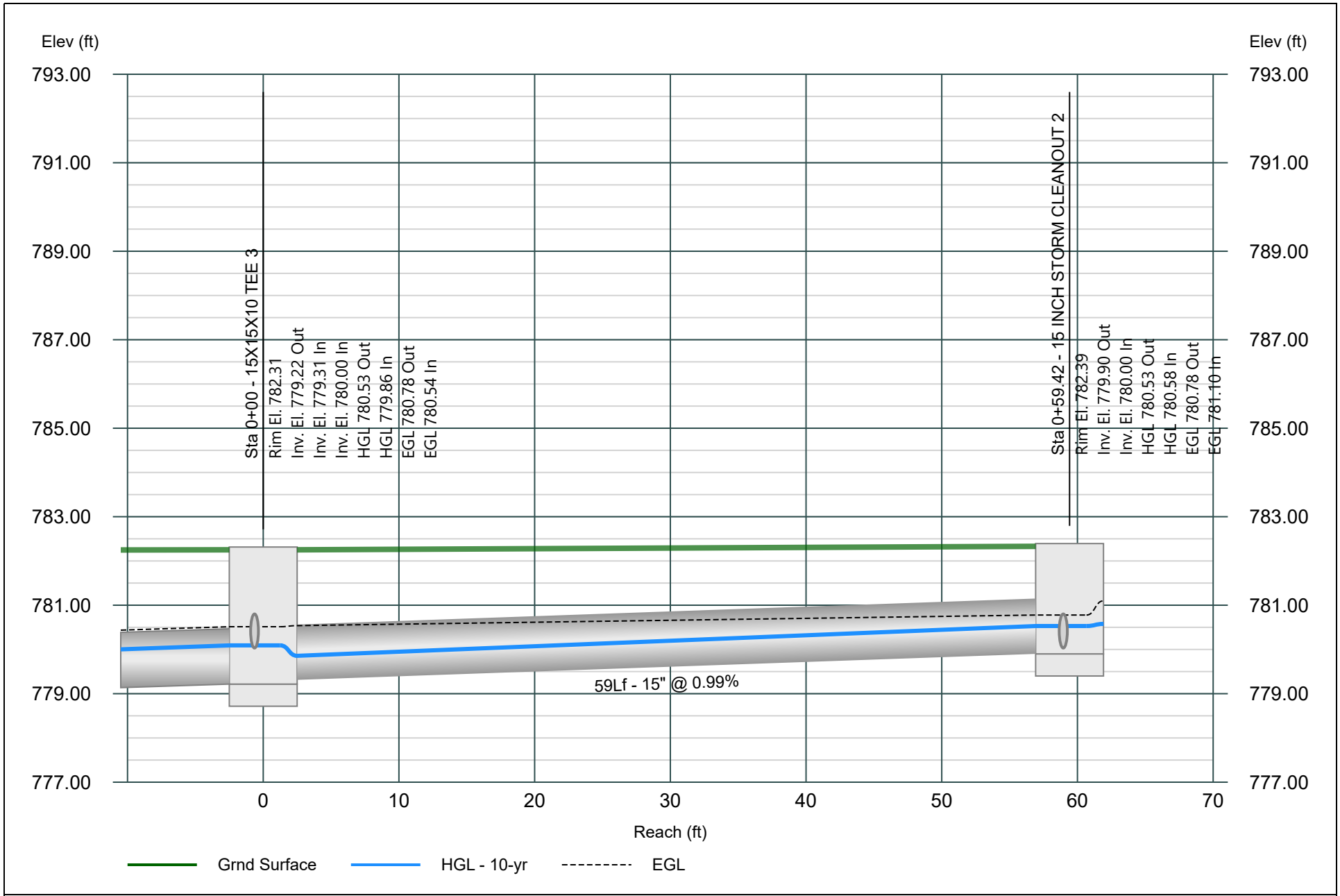


Line 43 - CO2-TEE 3

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

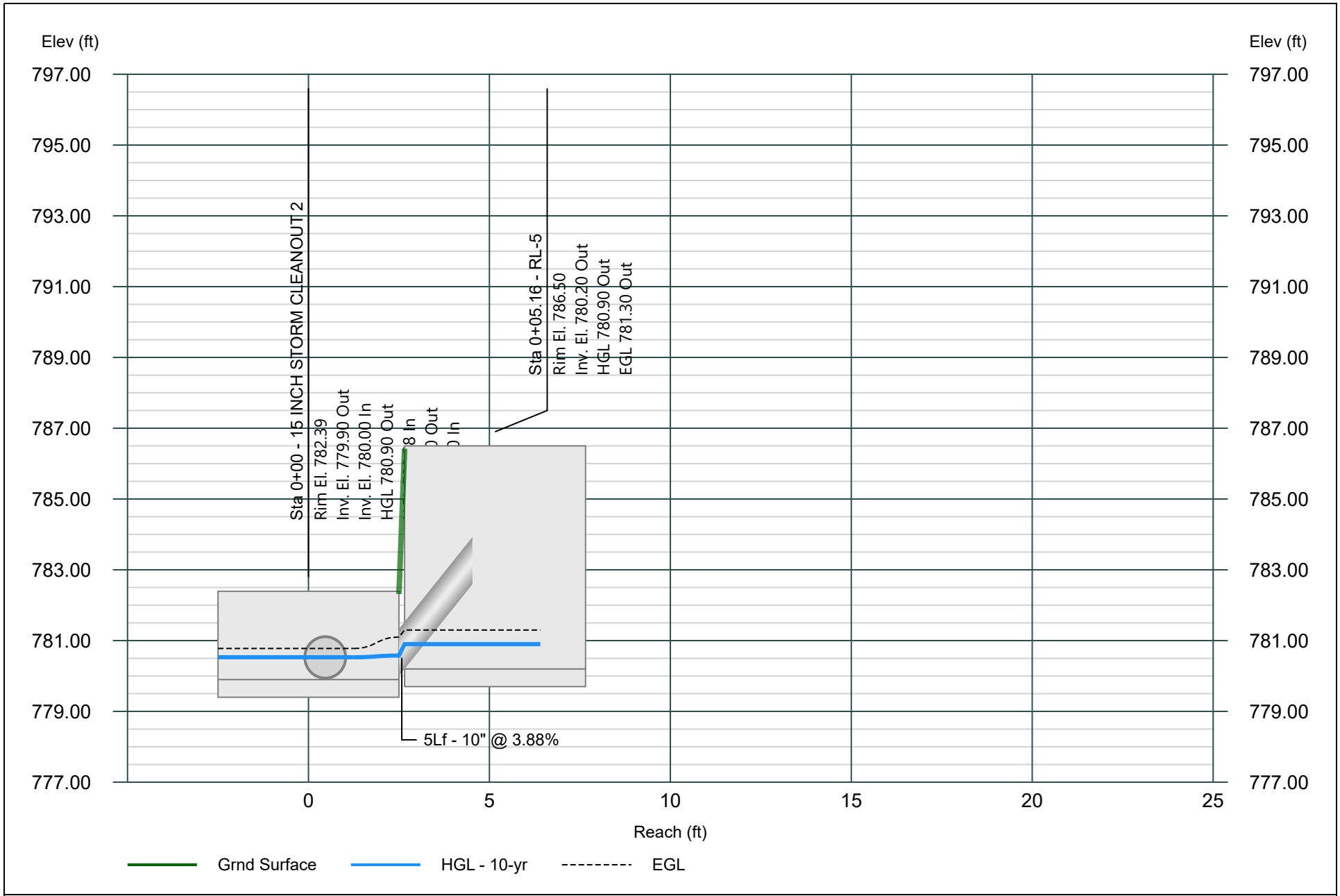


Line 44 - RL-5

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

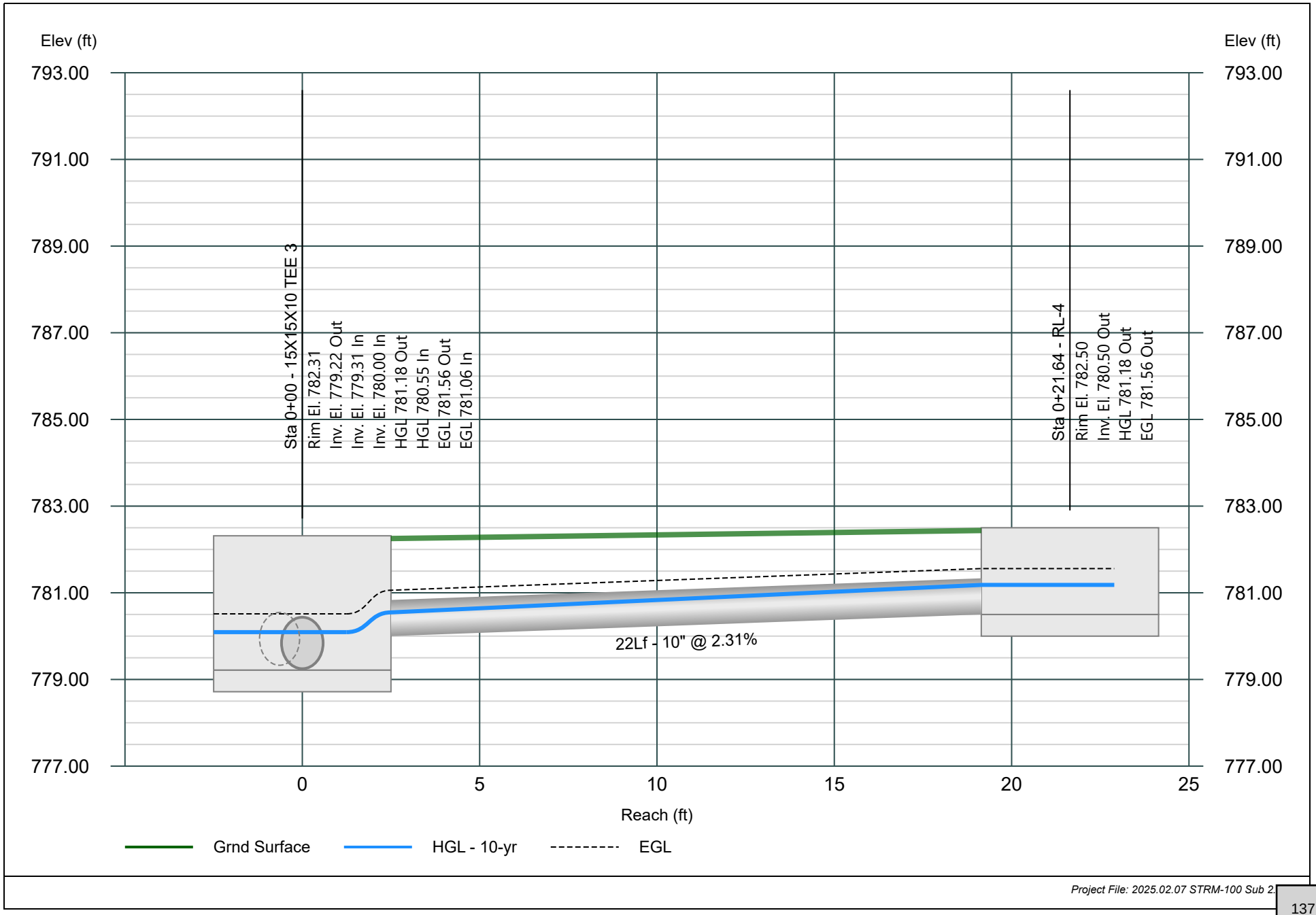


Line 45 - RL-4

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

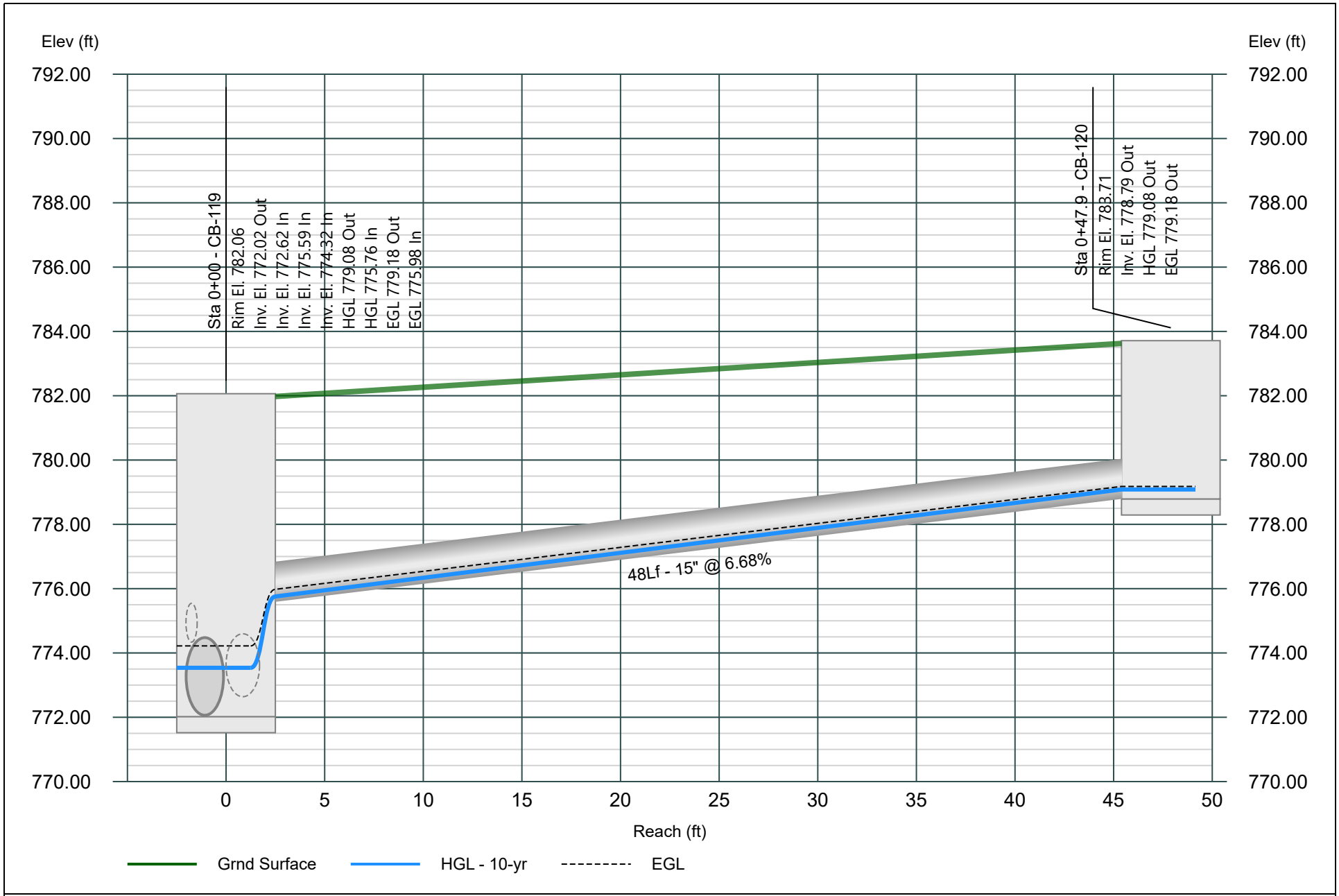


Line 46 - 120-119

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

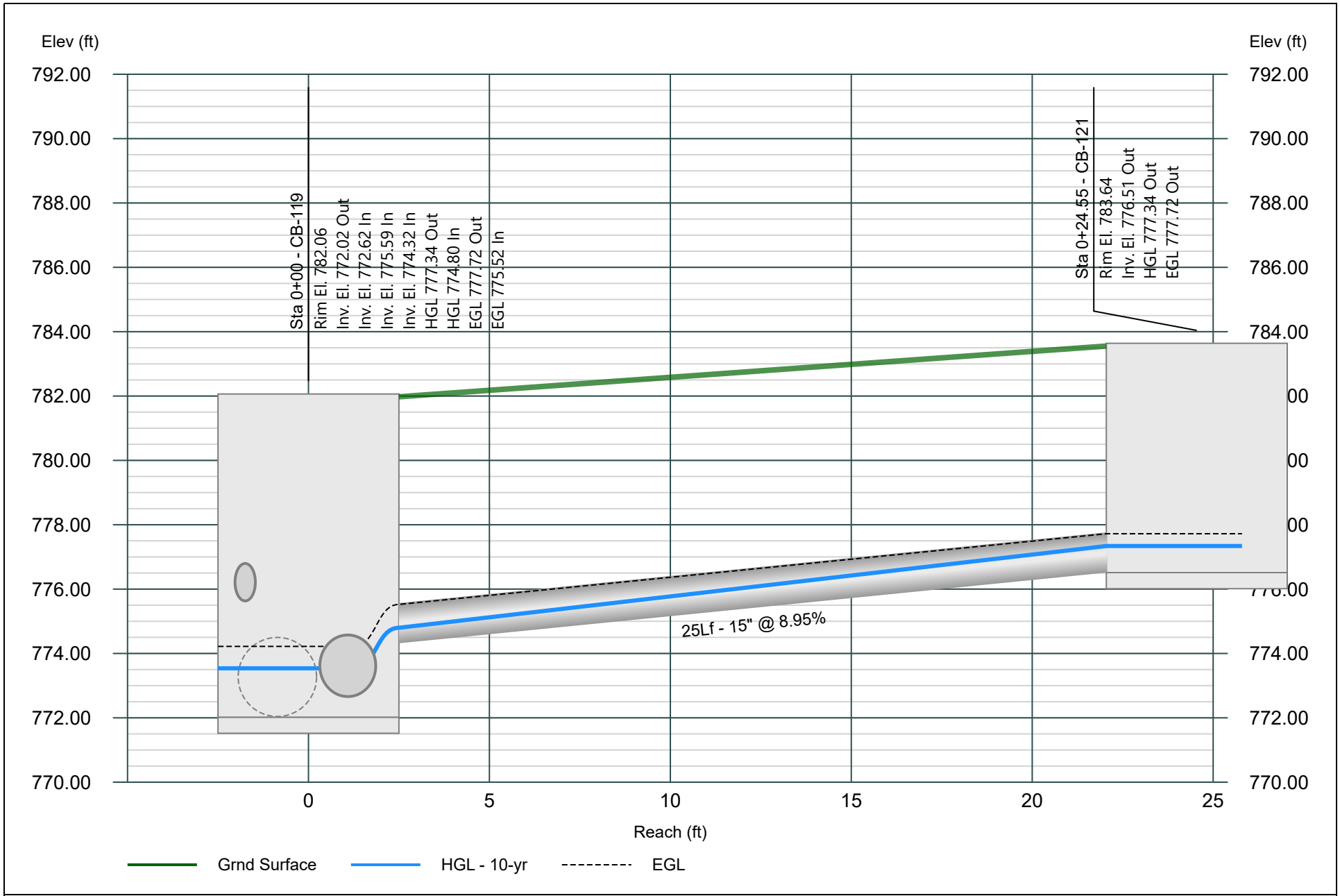


Line 47 - 121-119

Stormwater Studio 2024 v 3.0.0.35

Pro

02-07-2025

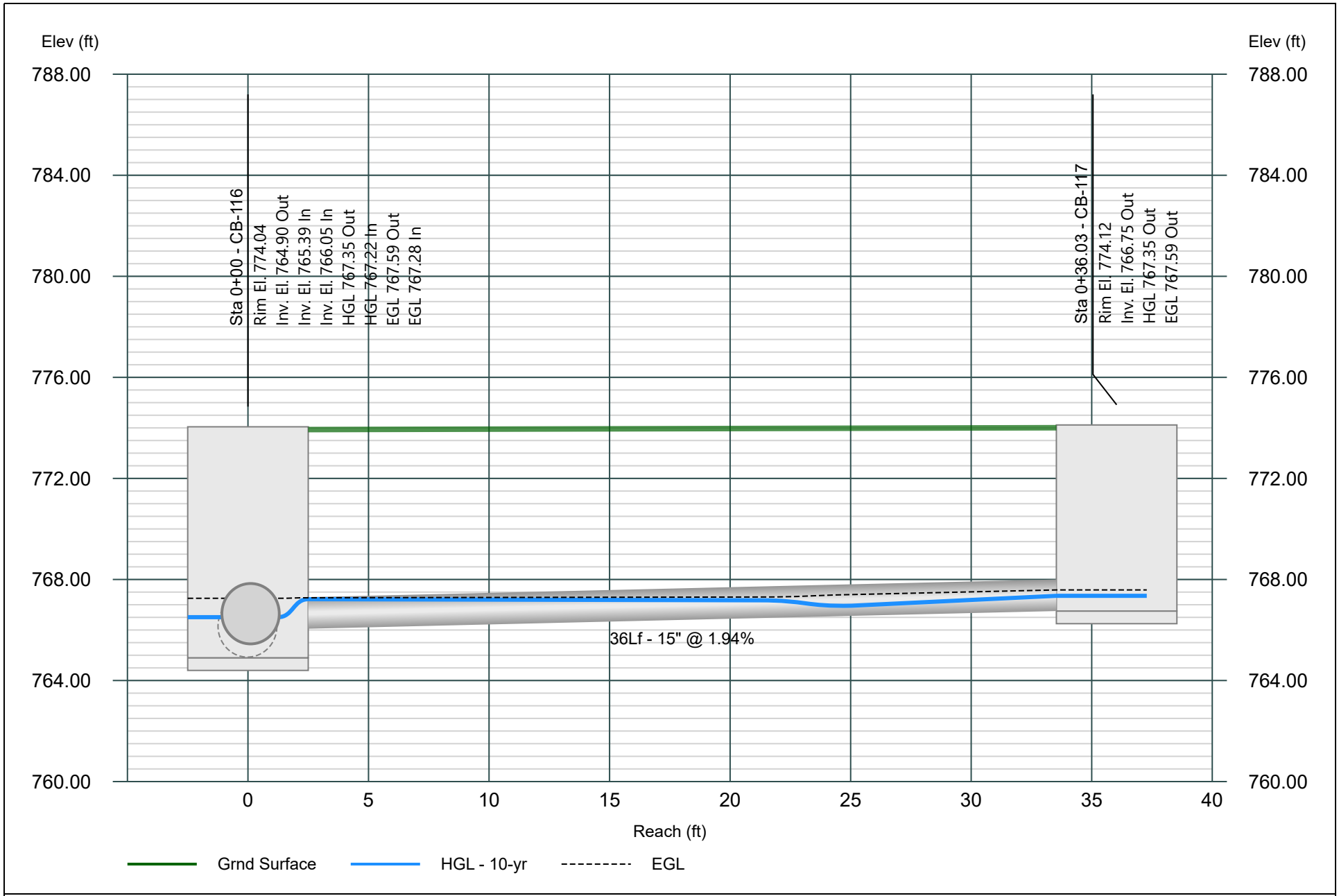


Line 48 - 117-116

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

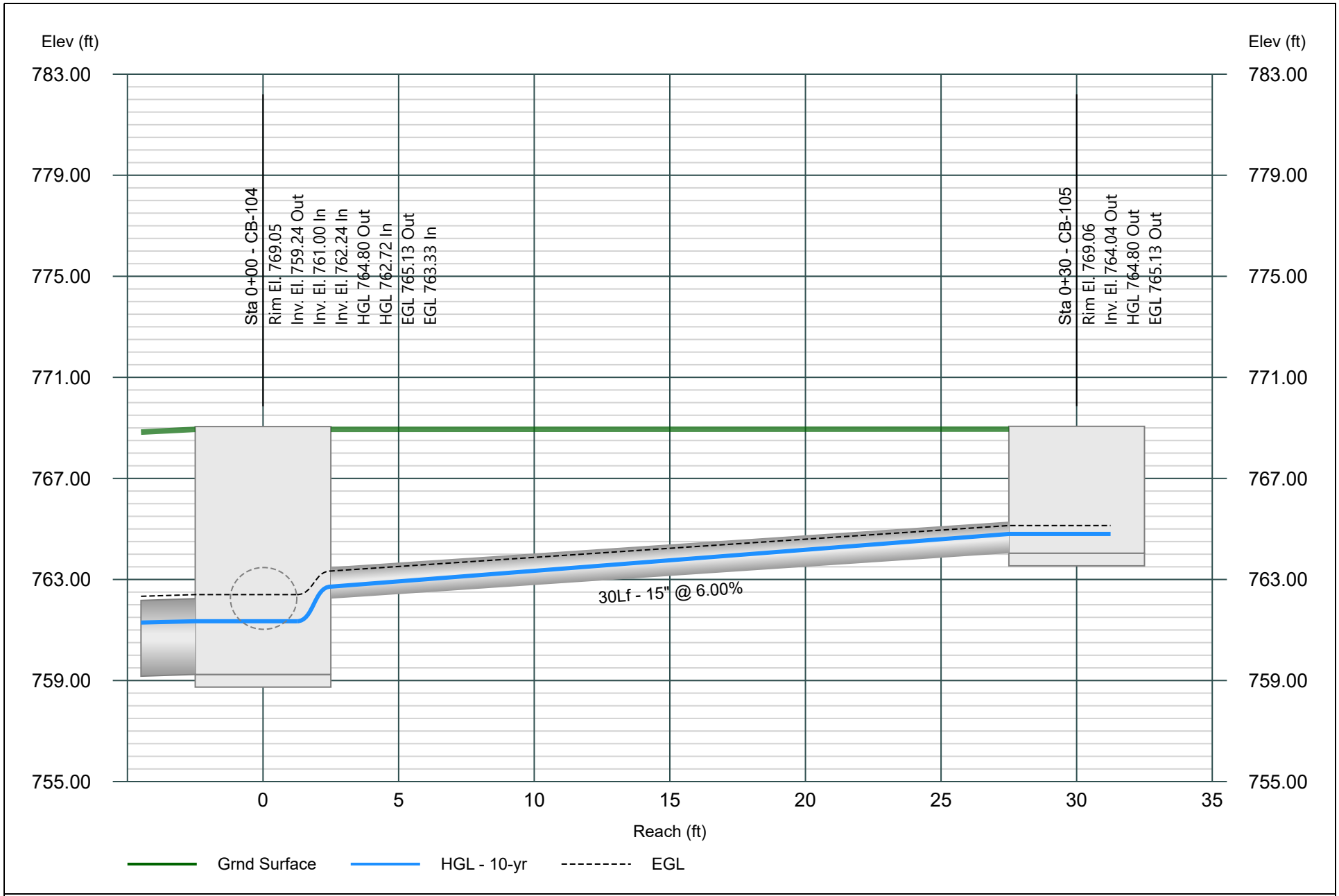


Line 49 - 105-104

Stormwater Studio 2024 v 3.0.0.35

Proj

02-07-2025

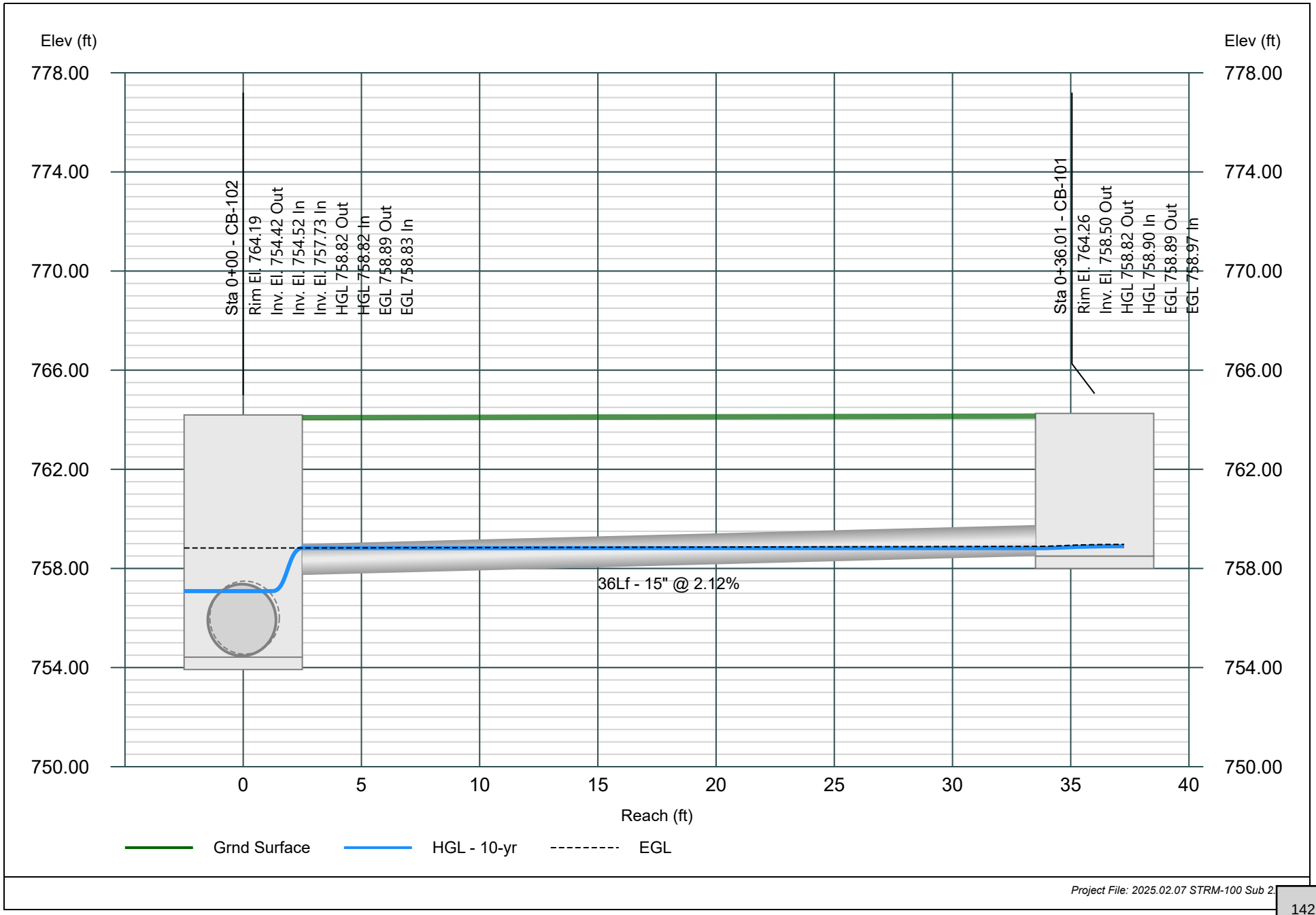


Line 50 - 102-101

Stormwater Studio 2024 v 3.0.0.35

Pro

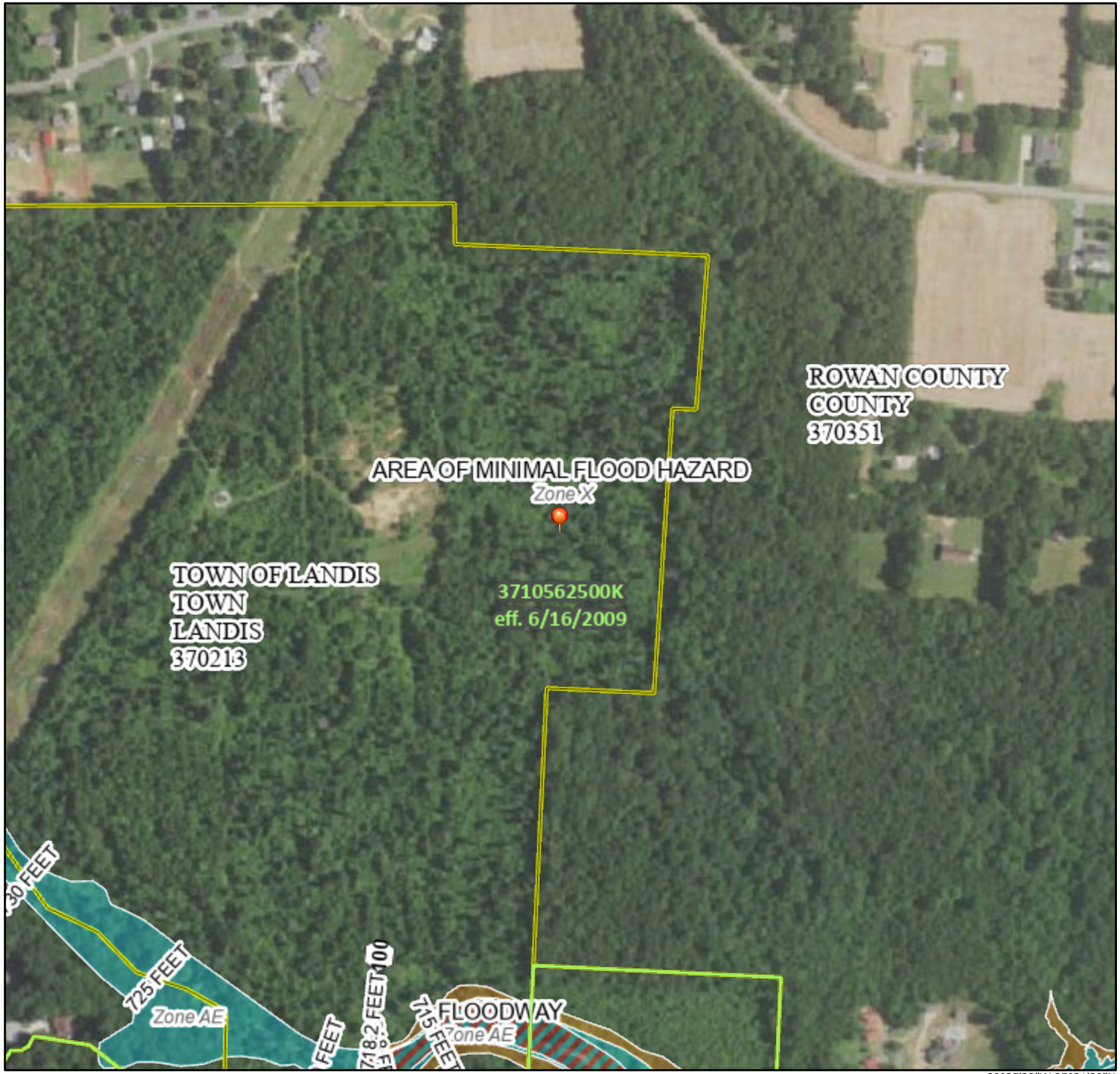
02-07-2025



APPENDIX F.
FEMA MAP

National Flood Hazard Layer FIRMette

80°35'59"W 35°32'9"N



80°35'22"W 35°31'39"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND IN UT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/14/2024 at 2:54 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community id FIRM panel number, and FIRM effective date. Map i unmapped and unmodernized areas cannot be use regulatory purposes.

APPENDIX G. EROSION CONTROL SWALE CALCULATIONS

North America
5401 St. Wendel-Cynthiana Rd.
Poseyville, Indiana 47633
Tel. 800.772.2040
>Fax 812.867.0247
www.nagreen.com
ECMDS v7.0

CHANNEL ANALYSIS

> > > Swale #1

Name	Swale #1
Discharge	20.03
Channel Slope	0.0283
Channel Bottom Width	5
Left Side Slope	3
Right Side Slope	3
Low Flow Liner	
Retardence Class	C 6-12 in
Vegetation Type	Mix (Sod and Bunch)
Vegetation Density	Fair 50-64%
Soil Type	Clay Loam (CL)

SC150

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
SC150 Unvegetated	Straight	20.03 cfs	4.35 ft/s	0.66 ft	0.036	2 lbs/ft2	1.16 lbs/ft2	1.72	STABLE	D
Underlying Substrate	Straight	20.03 cfs	4.35 ft/s	0.66 ft	0.036	2.18 lbs/ft2	0.89 lbs/ft2	2.46	STABLE	D

Unreinforced Vegetation

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Unreinforced Vegetation	Straight	20.03 cfs	3.63 ft/s	0.76 ft	0.047	4 lbs/ft2	1.34 lbs/ft2	2.99	STABLE	--
Underlying Substrate	Straight	20.03 cfs	3.63 ft/s	0.76 ft	0.047	3.45 lbs/ft2	0.99 lbs/ft2	3.47	STABLE	--

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CHANNEL ANALYSIS

> > > Swale #2

Name	Swale #2
Discharge	90.53
Channel Slope	0.0268
Channel Bottom Width	7
Left Side Slope	3
Right Side Slope	3
Low Flow Liner	
Retardence Class	C 6-12 in
Vegetation Type	Mix (Sod and Bunch)
Vegetation Density	Fair 50-64%
Soil Type	Clay Loam (CL)

SC250

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
SC250 Unvegetated	Straight	90.53 cfs	7.01 ft/s	1.21 ft	0.032	3 lbs/ft2	2.03 lbs/ft2	1.48	STABLE	E
Underlying Substrate	Straight	90.53 cfs	7.01 ft/s	1.21 ft	0.032	3.27 lbs/ft2	1.47 lbs/ft2	2.22	STABLE	E
SC250 Reinforced Vegetation	Straight	90.53 cfs	6.09 ft/s	1.35 ft	0.039	10 lbs/ft2	2.25 lbs/ft2	4.44	STABLE	E
Underlying Substrate	Straight	90.53 cfs	6.09 ft/s	1.35 ft	0.039	3.53 lbs/ft2	1.6 lbs/ft2	2.2	STABLE	E

SC150

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
SC150 Unvegetated	Straight	90.53 cfs	7.08 ft/s	1.2 ft	0.031	2 lbs/ft2	2.01 lbs/ft2	0.99	UNSTABLE	D
Underlying Substrate	Straight	90.53 cfs	7.08 ft/s	1.2 ft	0.031	2.18 lbs/ft2	1.46 lbs/ft2	1.49	STABLE	D

Unreinforced Vegetation

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Unreinforced Vegetation	Straight	90.53 cfs	6.09 ft/s	1.35 ft	0.039	4 lbs/ft2	2.25 lbs/ft2	1.78	STABLE	--
Underlying Substrate	Straight	90.53 cfs	6.09 ft/s	1.35 ft	0.039	2.35 lbs/ft2	1.6 lbs/ft2	1.47	STABLE	--

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CHANNEL ANALYSIS

> > > Swale #3

Name	Swale #3
Discharge	76.85
Channel Slope	0.0167
Channel Bottom Width	0
Left Side Slope	3
Right Side Slope	3
Low Flow Liner	
Retardence Class	C 6-12 in
Vegetation Type	Mix (Sod and Bunch)
Vegetation Density	Fair 50-64%
Soil Type	Clay Loam (CL)

SC250

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
SC250 Unvegetated	Straight	76.85 cfs	5.61 ft/s	2.14 ft	0.035	3 lbs/ft2	2.23 lbs/ft2	1.35	STABLE	E
Underlying Substrate	Straight	76.85 cfs	5.61 ft/s	2.14 ft	0.035	3.27 lbs/ft2	1.06 lbs/ft2	3.1	STABLE	E
SC250 Reinforced Vegetation	Straight	76.85 cfs	4.66 ft/s	2.34 ft	0.044	10 lbs/ft2	2.44 lbs/ft2	4.1	STABLE	E
Underlying Substrate	Straight	76.85 cfs	4.66 ft/s	2.34 ft	0.044	4.58 lbs/ft2	1.16 lbs/ft2	3.96	STABLE	E

SC150

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
SC150 Unvegetated	Straight	76.85 cfs	5.62 ft/s	2.13 ft	0.034	2 lbs/ft2	2.22 lbs/ft2	0.9	UNSTABLE	D
Underlying Substrate	Straight	76.85 cfs	5.62 ft/s	2.13 ft	0.034	2.18 lbs/ft2	1.06 lbs/ft2	2.07	STABLE	D

Unreinforced Vegetation

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Unreinforced Vegetation	Straight	76.85 cfs	4.66 ft/s	2.34 ft	0.044	4 lbs/ft2	2.44 lbs/ft2	1.64	STABLE	--
Underlying Substrate	Straight	76.85 cfs	4.66 ft/s	2.34 ft	0.044	3.05 lbs/ft2	1.16 lbs/ft2	2.64	STABLE	--

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CHANNEL ANALYSIS

> > > Swale #3B

Name	Swale #3B
Discharge	34.67
Channel Slope	0.027
Channel Bottom Width	3
Left Side Slope	3
Right Side Slope	3
Low Flow Liner	
Retardence Class	C 6-12 in
Vegetation Type	Mix (Sod and Bunch)
Vegetation Density	Fair 50-64%
Soil Type	Silt Loam (SM)

SC150

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
SC150 Unvegetated	Straight	34.67 cfs	5.47 ft/s	1.04 ft	0.034	2 lbs/ft2	1.75 lbs/ft2	1.15	STABLE	D
Underlying Substrate	Straight	34.67 cfs	5.47 ft/s	1.04 ft	0.034	1.47 lbs/ft2	1.12 lbs/ft2	1.31	STABLE	D

Unreinforced Vegetation

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Unreinforced Vegetation	Straight	34.67 cfs	4.59 ft/s	1.16 ft	0.043	4 lbs/ft2	1.96 lbs/ft2	2.04	STABLE	--
Underlying Substrate	Straight	34.67 cfs	4.59 ft/s	1.16 ft	0.043	1.7 lbs/ft2	1.23 lbs/ft2	1.38	STABLE	--

APPENDIX H.
SEDIMENT BASIN 3 CALCULATIONS

"SEDIMENT BASIN 3" IS THE NAME GIVEN BY OTHERS. THIS IS THE ONLY EROSION BASIN BEING USED FOR THIS DEVELOPMENT

ARCO DESIGN/BUILD

"SEDIMENT BASIN 3" IS THE NAME GIVEN BY OTHERS. THIS IS THE ONLY EROSION BASIN BEING USED FOR THIS DEVELOPMENT

NC SCOUT & CO US

Sediment Basin 3 Design Calcs

Project Information

Project:	Project Beacon - Landis Ridge Phase 2A
Location:	Town of Landis
Project Number:	
Date:	December 13, 2024
Designed:	LWC
Checked:	GJZ

Site Information

Sub-Area Location:	Skimmer Sediment Basin 3		
Developed Area:	22	acres @ C=	0.9
Disturbed Undeveloped Area:	25.63	acres @ C=	0.5

Required Minimum Sediment Storage:	85,734 cf

Required Minimum: 1800 cf/ac

Stage-Storage

Contour	Area (sf)	Incremental Volume (cf)	Total Volume (cf)	Stage (ft)
734.00	52,550	0	0.00	0.00
735.00	56,593	54,572	54,572	1.00
736.00	61,626	59,110	113,681	2.00
737.00	68,340	64,983	178,664	3.00
738.00	73,922	71,131	249,795	4.00
739.00	79,423	76,672	326,467	5.00
740.00	84,885	82,154	408,621	6.00

Temp. Pool Lower Elevation:	735.00	ft
Temp. Pool Upper Elevation:	736.00	ft
Temp. Pool Lower Volume:	54571.50	cf
Temp. Pool Upper Volume:	113,681	cf
Sediment Cleanout Volume:	85,734	cf
Sediment Cleanout Elevation:	735.53	ft

Pond Surface Area Check

Rainfall Intensity for 25-yr Storm:	6.26	in/hr	
Q25 Peak Inflow (Q=CIA):	204.17	cf	
Surface Area Required:	66,355	sf	
Surface Area Provided:	68,340	sf	**PASS**

Required Minimum: 325 sf/cf

Length to Width Ratio Check

Length of Flow Path at Spillway:	623	ft	
Width of Flow Path at Spillway:	109	ft	
L/W Ratio:	5.72		**PASS**

* NCDEQ Required: 2:1 to 6:1

Skimmer Sizing

Required Basin Volume:	85,734	cf	
Skimmer Size:	5	in	
Orifice Diameter:	4.50	in	
Dewatering Time:	3.5	days	**PASS**

Spillway Sizing

Rainfall Intensity for 25-yr Storm:	6.26	cfs	
Required Flow Q25:	204.17	cfs	
Spillway Elevation:	737	ft	
Top of Berm Elevation:	740	ft	
Material:	SC250	ft	
Depth:	0.55	ft	
Length:	98	ft	
Freeboard:	2.45	ft	**PASS**

SEDIMENT BASIN DESIGN SUMMARY

Basin Name:	Skimmer Sediment Basin 3	
Basin Length:	623	ft
Basin Width:	109	ft
Basin Side Slopes (X:1):	3	
Bottom of Basin Elevation:	734.00	ft
Spillway Elevation:	737.00	ft
Top of Berm Elevation:	740.00	ft
Storage Depth:	3.00	ft
Storage Required:	85,734	cf
Storage Provided:	178,664	cf
Surface Area Required:	66,355	sf
Surface Area Provided:	68,340	sf
Skimmer Main Crest Elevation:	737.00	ft
Skimmer Size:	5	in
Skimmer Orifice Diameter:	4.5	in
WSEL Across Spillway:	737.55	ft
Freeboard:	2.45	ft
Spillway Length:	98	ft

Application #	Name (surveyor & owner)	Job Address	Type/# of lots	Status FEES PD
SITE-07-21 PLANNER OFFICE (GRAY FILE DRAWER) WAS ~~JOHNSON/WOOD~~ NEW NAME: ~~VILLAS AT LANDIS~~ **RYDER PLACE** **(11-8-22)**	Yarbrough-Williams & Hoyle (Nest Communities, LLC/Johnson Wood Townhomes) FEES PD:	Corner of E. Ryder Ave & Upright Streets Map 109 149 & 133 165	Major Subdivision Duplex, Townhomes, SF	10-11-21 Application/sketch rec'd ***10/11/21 $100 SKETCH REVIEW*** 10-12-21 sketch plan reviewed by RF ***11-16-21 $100*** rec'd for review ***11-29-21 $2,092.11*** rec'd for technical review of plans. 12-8-21 TECH REV TEAM MTG 3-29-22 Zoning verification letter 4-12-22 Received updated infrastructure information- Capacity Analysis 6-2-22 PLANS REC'D 6-21-22 TRC REVIEW of PLANS 8-10-22 PL. BD REV. *SITE DEV PLAN APPROVED AS NOTED- NEXT STEP: CONSTRUCTION PLANS 8-23-22 email with St. light update to plan **9/20/22 $22,026.16 CONSTRUCTION PLANS REC'D WITH CALCULATIONS (BESIDE MAP CAGE)** **11-15-22 ENGINEER memorandum rec'd.** **11-28-22 emailed-waiting on water/sewer plans** **12-6-22 Water/sewer plans emailed, waiting on hard copies- REC'D 12-7-22** **12-8-22 NCDOT driveway permit completed and rec'd.** **12-15-22 final initial comments on w/s notified applicant to p/up their set of plans w/comments** **12-19-22 PICKED UP** **1-3-23 ACTIVE FILE** **1-5-23 REC'D NCDOT DRIVEWAY PERMIT W/CONDITIONS** **2-2-23 REC'D REQ. FOR HIGH DENSITY DEV. AGR.** **3-20-23 PUB. HEARING FOR DEV. AGREEMENT** 3-20-23 Board Approved Dev. Agreement 4-12-23 revised plans rec'd 4-26-23 RF reviewed plans, waiting on stormwater review. (Tristin is aware) 5-16-23 Stormwater review completed. NEXT STEP CONSTRUCTION CONFERENCE date: 05-24-23 @ 2pm 5-17-23 DEV. PLANS & DEV. AGR P/UP 5-23-23 1st submittal POST DEV. PLAN, NCDEQ FORM, DEEDS, USGS MAP, WETLAND DELINEATION

(CONT.) **#07-21 RYDER PLACE**				5-24-23 Pre-Construction meeting - **Constru authorized upon completion of fees and several other requirements. 5-30-23 Operation and Maintenance Agreement rec'd 6-6-23 Sent Zoning Permit Application **6-16-23 Stormwater Report From Alley William Carmen & King** **7-5-23 Rec'd water system specs.** **8-9-23 Stormwater specs reviewed ready for pickup.** **8-10-23 stormwater reviews p/up by courier.** **12-7-23 Dev. Petition to NCDEQ for w/s regulation exception** 1-25-24 issued Willingness to Serve for electricity 2-13-24 Rec'd NCDEQ Auth. For water system 2-20-24 Issued Willingness to Serve water and waste 10/16/24 Met w RF
SITE 11-21 FILE DRAWER NEW NAME: LANDIS APARTMENTS	Steve Ross – Dynamic Developers of the Carolinas, LLC Mark Siemieniec-Architect	716 W. Ryder Ave & Mt. Moriah Ch. Rd Map 130b 096	PROPOSED ~~TWNHOMES~~ APARTMENTS	***12-22-21 PAYMENT: $100 SKETCH PLAN REV.*** 12-28-21 RF to Engineer, email with comments re sketch plan layout. 2-8-22 R. Flowe mtg w/Developer Engineer 5-16-22DEV. MTG WITH R FLOWE SKTECH PLAT REV. ***7-5-22 PAYMENT $100 FOR 5-16-22 REVIEW*** 7-15-22 REC'D 2 COPIES OF PRELIMINARY SITE PLAN-*Location: floor beside map cage* ***Payment: site plan rev. $388.25*** 8-10-22 PL. BD REVWD. PLAN REJECTED. DEV WILL SUBMIT ANOTHER SITE PLAN 10-19-22 rec'd revised plan 11-8-22 OVERVIEW W/PL. BD. 11-16-22 MTG W/FLOWE &MNGR- WILL RE-SUBMIT PLANS NO TRC ON CURRENT PLANS. 12-6-22 REC'D REVISED PLANS. R FLOWE COMMENTED. EMAILED ARCHITECT W/COMMENTS **12-21-22 re-sent email of 12-6-22 to architect/confirmed recpt.** **1-3-23 ACTIVE FILE** **2-8-23 revised plan sent by email- next step is site dev. Plan rev.** **2-28-23 PLAN HARD COPIES REC'D** **2-28-23 PAYMENT: $388.25 site plan rev.** **3-2-23 REC'D REVISED SITE PLAN** **3-15-23 Revised Site Plan approved-next step-construction plans & review** **5-17-23 SC spoke w/Arch. M.** SIEMIENIEC**- Construction plans to be del ~~today.~~**

#11-21 LANDIS APTS				**5-18-23 per M.Siemieniec. plan del delay** **5-24-23 CONSTRUCTION PLANS REC'D** **5-31-23 FEES PAID FOR REVIEW. $10,266.55** ****Fees include zoning permit application when ready** ****=PLAN REVIEW(RD,PARK/LOAD/DRAINAGE,W/S LINES, STORMWATER, PERMIT APPLICATION)** **6-23 & 28th TRC REVIEW OF PLANS- NOTES ADDED- DEV. P/UP THEIR SET OF PLANS W/NOTES** **7-25-23 REC'D 2 SETS OF REVISED CONST PLANS** **7-27-23 R FLOWE REVIEWED PLANS- ISSUED EMAIL TO TECH. REV. COMM. TO REVIEW PLANS IN T.HALL** **8-3-23 Fire Marshal reviewed plans** **8-9-23 Plans ready for p/up, emailed Engineer.** ✓ **11-08-23 Rec'd Erosion & Soil Sedim. From County** **11-8-23 Pre-const. mtg set for 12-13-23 @ 9a.m.** ✓ **12-13-23 Stormwater calcs needed.** **5-21-24 Groundbreaking Ceremony on site** **5-23-24 Permit issued** **6-13-24 Requested addresses from County GIS** **6-27-24 Emailed request for Const. Admin Fees** **8-14-24 R Flowe called to request Const. Admin Fees** **8-22-24 Const Admin fees Paid $20,507.60**
YEAR 2022				
Application #	Name (surveyor &/OR owner)	Job Address	Type/# of lots	Status FEES PD
SITE DEV 09-22 **IRISH CREEK PREL. PLAT LANDIS PORTION PHASE 2&4**	LENNAR CAROLINAS – LAND DESIGN ENGINEER NOTICE OF INTENT FOR NEW DEVELOPER- SHEA HOMES Philip Smith- Land Design	CANNON FARM RD	430 LOTS- MU-1 & SFR-2 CZ **ZMA 24-04-08-1** **MU-1 TO SFR-3**	9-6-22 REC'D PLAT W/$3,000 9-13-22 REC'D MASTER PLAN PRELIMINARY PLAT W/$5,140 AND $4,580 **TOTAL $12,720** 9-13-22 PLAT OVERVIEW W/PL BD. ✓ **12-6-22 ACTIVE FILE** 3-7-23 NO ACTIVITY 7-25-23 NOTICE OF NEW DEVELOPER INTENT FROM ATLANTIC AMERICAN PROP. 9-5-2023 MTG W/PL. DIR. W/NEW DEV. 9-25-23 MTG W/PL DIR. FLOWE 9-28-23 REC'D MEETING NOTES 12-12-23 Rec'd form w/ZMA request no funds rec'd 12-19-23Rec'd partial fee for ZMA request 1-3-24 Rec'd full funds for ZMA request- March BOA mtg 2-13-24 Planning Bd did not meet- April BOA mtg 2-15-24 Utilities meeting with Dev.& Land Design

SITE DEV 09-22 **IRISH CREEK PREL. PLAT** **LANDIS PORTION PHASE 2&4**				2-26-24 Neighborhood Meeting for Phase II Site 3-6 & 3-7 Water/Sewer Plans rec'd 4-08-2024 PUB. HRNG ZMA- approved 4-16-24 Irish Crk Development Team met with P/Z 5-10-24 rec'd revised lot drawing 7-16-24 Teams meeting re phase 2 plans 8/6-24 Feed Paid 8-12-24 Phase 2 presented to Planning Board, TRC starts 8-26-24 Pub Wrks Info Reqst. 9-3-24 PP Plat Review 9-4-24 TRC 9-11-24 Met with RF and Pub Works and design team
SITE DEV #10-22- **LANDIS RIDGE** ~~**LANDIS 85**~~ ~~**OLD BEATTY FORD RD**~~ ~~**INDUSTRIAL SITE**~~ **NAME CHANGE:** **LANDIS RIDGE** ~~**LANDIS 85**~~ **DEV #10-22** **LANDIS RIDGE** ~~**OLD BEATTY FRD RD**~~ ~~**IND. SITE**~~ ~~**LANDIS 85**~~	RYAN BEADLE/JACKSON-SHAW- LIPE, MILLS, DEAL PROPERTIES	OLD BEATTY FORD RD INDUSTRIAL SITE	ANNEX & ZMA LOTS: MAP 140, PARCELS: 003,167, 138, 169 & 170 11-14-22- BD APPROVED ANNEXATION ZONING: IND 2-13-23 BD TO CONSIDER ANNEXATION WITH PUB. HEARING ON MARCH 20, 2023 -BD APPROVED	**9-13-22 REC'VD PAYMENT $600 ZMA REQ.** ANNEX W/ ZMA NOV.8 & 14 2022 MTGS 11-14-22 BD APPROVED ANNEX & IND ZONING 12-6-22 ACTIVE SITE- PLANS DEVELOPING 12-8-22 NCDOT TRAFFIC IMPACT STUDY CHECKLIST REC'D 12-20-22 2 CHECKS OF $875 REC'D = $1,750 FOR: **1)** ZMA W/ANNEX APPL. (APPL. REC'D 12-15-22) **2)** & ZTA (TEXT AMEND.) **1-3-2023 ACTIVE FILE** **1-09-23 ANNEXATION REQ. TABLED UNTIL FEB** **2-13-23 ZTA APPROVED ANNEX AND MAP AMEND SET FOR MARCH PUB HEARING.** **3-1-23 SITE PLAN REV. W/ DEV & PUB. WORKS** **3-14-23 FUNDS REC'D FOR: SITE PLAN REVIEW & PREL PLAT REVIEW: $4,801.75** **3-20-23 Pub. Hearing Annexation additional properties, req. IND zoning. BOARD APPROVED** **4-11-23 Plan revisions received.** **4-26-23 Plan review completed with comments.** **4-27-23 R Beadle picked up Dev. Copy with comments.** **5-25-23 Zoom mtg w/R Flowe** **6-13-23 NCDOT scoping documents received** **8-2-23 rec'd updated site dev. Plans from Developer** **8-2-23 rec'd NCDOT updated TIA scoping docs link** **9-19-23 REC'D REVISED SITE PLAN PGS 3,4 &5** **ON REVIEW TABLE FOR TRC- REVIEWED** **10-18-23 REC'D W/S WILLINGNESS TO SERVE REQUEST** **10-23-23 PLANNING BOARD MTG UPDATE✓** **11-14-23 Mtg req. by Developer- ZOOM W/RFLOWE** **11-21-23 FUNDS REC'D FOR SITE PLAN REVIEW**

DEV #10-22 **LANDIS RIDGE**				**11-30-23 WAITING ON CONSTRUCTION PLANS** **12-21-23 Rec'd revised Const. plans & all docume...** **12-21-23 FUNDS REC'D $36,136 FEES.** **1-2-24 DIGITAL FILES REC'D** **1-24-24 TRC mtg held – examined plans** **2-13-24 Meeting with Developer and Eng. Review of TRC** **2-14-24 Address from Rowan Cty GIS for constr.: #619** **3-12-24 REC'D REV. CONST. PLANS & CALCS** **WAITING ON ENG. REVIEW** **3-27-24PRE-CONSTRUCTION MEETING HELD** **4-24-24 PERMIT FOR TEMP CONST. OFFICE** **5-1-24 PERMIT FOR BLDGS 1A, 1B, & 2** **5-8-24 STORMWATER AUTHORIZATION TO PROCEED** **6-13-24 rec'd Eng. Water Main report & 2 complete sets of partial revisions to plans.** **6-18-24 RF accepted the partial plans** **6-20-24 Developer p/up their plan set** **6-27-24 Emailed request for Const. Admin Fees** **7-9-2024 Site inspection** **7-12-24 rec'd Construction Admin fees of $51,552.00**
2023 ALL '23	**PROJECTS NOW IN CONSTRUCTION**	**PHASE**		
2024	**2024**	**2024**	**2024**	**2024**
Application/ Site #	Name (surveyor & owner)	Job Address	Type/# of lots	Status, FEES PD
SITE 01-24	DOMINION ENERGY	MT MORIAH CH RD	Gas Line Encroachment	UTILITY – GAS LINE INSTALLATION ON TOWN EASEMENT/ FLOODWAY/FLOODPLAIN 2-7-24 PLANS REC'D 5-2-24 R.O.W PERMIT REQUESTED 5-28-24 REC'D HARD COPY OF PLANS 5-30-24 EMAILS TO INCLUDE PUB. WORKS 6-4-24 REC'D UPDATED PLANS BY EMAIL 7-10-24 Pub.Works working with Dominion Energy on encroachments 7-14-24 Teams Meeting set for 7/30/24 at 10am-canceled 8/16 Rqst for encroachments

				8/27 Site Plan Review apln submitted, wai 9/26/24 Permits issued and fees paid 10/24/24 Flood Plain Permit Issued
Rice and Valley	John Suther		Water Line ext, 2 SFH	6/24 Plans rcd. Awaiting Payment 10/8/24 Payment Rcd. 10/10/24 TRC Begins 10/30/24 Plans Approved/Emailed for Pick up
Landis Shops	John Suther		Truck Repair Facility	6/24 Plans rcd. Awaiting Payment 10/8/24 Payment Rcd. 10/10/24 TRC Begins 10/30/24 Plans Returned/ Emailed for Pick up 1/24/25 Electronic plans sent to Planning Director to go over corrections made.
Landis Multi-Family	Dynamic Developers John Suther		Multifamily-proposing 15 units	6/24 Plans rcd. Awaiting Payment 10/8/24 Payment Rcd. 10/10/24 TRC Begins 10/30/24 Plans returned to S Ross 1/24/25 Electronic plans sent to Planning Director to go over corrections made
SITE 02-24	OCAMPO	US 29		2-28-24 ELECTRONIC SITE PLAN REC'D 3-5-24 REC'D $325 SITE PLAN REV. FEE 4-3-24 Rec'd hard copies of site plan waiting on building elevations. 7-11-24 Rec'd complete site plans with building elevations 7-23-24 Site plan review by RFlowe - 07-24-24messaged Engineer with notes from RFlowe 8-14-24 Review for follow up comments with R Flowe 10/9/2024- Paid for 3rd Review 10.22.24 Sent email letting them know that they sent us the construction plans, not the plans needed. 10/28/24 Plans Received 10/30/24 Plans Approved/ Picked up
ZMA ✓	Legendre	627 S Chapel	RMST to CIV	Legislative Hearing 10/14/24 Approved 10/14/2024

Recombination plat	Piedmont Design Assoc.	2211 Tully More	2 lots into 1	Paid $100 on 7-16-24
Exemption, Recombination, annexation 7-15-24 PUB. HRNG ✓	CRETE SOLUTIONS & TWO-TEN PROPERTIES	220 OLD BEATTY FORD RD	COMBINING OF 3 SMALLER LOTS WITH 1 LARGE LOT	ANNEXATION AND RECOMBINATION
Landis Ridge Phase 2	**Ryan Beedle and Jackson Shaw**		Industrial Park	**10/22/24 SKETCH PLAT REVIEW & CONSULT, sent fee chart** **10/28/24 Sketch Plan paid $270, Received site plans emailed for fee** **10/30/24 Site Plan Review Paid $530** **11/19/24 Zoning Compliance Permit- Beacon-$125, Zoning Site Plan Review – Beacon - $1355 for a total of $1480 paid** **11/25/24 Site Development Plans Approved by Rick Flowe** **12/20/24 TRC Review Complete** **1/22/25 TRC Review Comments from Planning Director emailed**
PLANS IN CONSTRUCTION/ REVIEW				
SITE 02-23 CONCRETE PLANT- NEW OWNERSHIP/ NEW PLANS- **ZONING PERMIT ISSUED 5-17-23**	**William N. West Owner** **Crete Solutions**	220 OLD BEATTY FORD RD	CONCRETE PLANT ANNEX REQ. FOR 7-15-24 PUB. HRNG ✓	**04-11-2023 PD $6,188.83 NEW SITE PLANS, STORMWATER, CALCS.** **4-26-23 RF review & staff rev. complete comments on plans** **4-27-26 Owner/Dev. Bill West p/up set w/comments.** **5-9-23 Rec'd partial set of plans- advised need complete sets.** **5-10-23 rec'd 2 complete sets of plans w/revisions** **5-17-23 R. Flowe to Developer West, plan set – scale is off. West to deliver a new complete plan set to NFocus Office this day. Flowe to review and sign zoning permit application if plans are approved. 5-17-23 Plans rec'd. R. Flowe approved plans for site construction. Zoning Permit #ZN-23-27 issued.** **Site work active.** 3-27-24 POSSIBLE SITE REVISION 4-3-24 REVISED SITE PLAN $**525 PD** **5-10-24 Request ANNEXATION AND RECOMB. FOR 7-15-24 HRG** **6-11-24 RF conducted site inspection**

SITE 01-23 BYRNE PROP KIMBALL RD PERMIT ISSUED 11-30-23	**SHANNON SPARKS SURVEYOR BYRNE PROP. INC**	KIMBALL ROAD MAP 123B 115	TOWNHOMES 9 PROPOSED **9-11-23 BD ALD APPROVED DEV. AGREEMENT**	**2-2-23 SKETCH PLAT REVIEW & CONSULT** **2-2-23 PD $245 SKETCH PLAT REV. & CONSULT** **4-13-23 PD $1085 FOR SITE PLAN REVIEW** **4-26-23 Plans Reviewed by RF- approved.** **TRC & PL BD. (JUNE 21,2023)** **6-27-23 owner paid for all tap fees $45,000** **6-29-23 rec'd updated plans** **8-1-23 rec'd revised plan** **8-8-23 Pl. Bd to review Dev. Agreement for Kimball Landing** **9-11-23 BD ALD. Pub. Hearing for Dev. Agreement- APPROVED** **9-27-23 DEV. AGREEMENT SIGNATURE BY DEV.** **10-18-23 CONSTR. PLANS REC'D.** **10-18-23 PAYMENT OF $325PARTIAL CONSTR PLAN REVW** **10-18-23 PAYMENT OF $680 (8 TWNHMS- zoning permit)** **10-19-23 RFLOWE REVIEWED. NEED UPDATED BUILDING ELEVATIONS TO CURRENT PLAN.** **10-24-23 DEVELOPER AWARE OF PLANS NEEDED.** **10-26-23 UPDATE CONST. PLANS REC'D** **10-26-23 PAYMENT OF $627- REMAINDER OF CONST REVW FEES PD.** **11-29-23 PRE-CONST MTG** **11-29-23 PLANS APPROVED FOR CONSTRUCTION** **11-30-23 PERMIT ISSUED FOR SITE WORK** **3-13-24 BUILDING BEGINNING**

SITE DEV 04-22 **RICE RD TWNHOMES** **PERMIT ISSUED 12-28-22FOR SITE DEV.**	JOURNEY CAPITAL, LLC ANDREW WALTZ 704-453-2700 RICE RD TOWNHOMES ACTIVE FOR REVIEWS	**221 E RICE STREET**	TOWNHOMES	1-12-22 MTG R FLOWE ***PAYMENTS: 5-11-22: $325, 5-17-22: $1,812*** 6-21-22 TRC MTG TO REVIEW PLAN- ***Location: IN map cage*** 8-10-22 PL. BD REV. -DEV/ENGINEER NEED TO MEET TO DISCUSS WITH R FLOWE 9-1-22 MTG W/FLOWE NEXT STEP: SUBMITTAL OF REVISED SITE 11-3-22 REVISED PLANS REC'D 11-8-22 PL BD OVERVIEW 11-22-22 TRC COMMENTS COMPLETE 11-30-22 PLANS W/COMMENTS READY FOR P/UP **12-5-22 plans p/up by developer for review/revisions**

#04-22 RICE ST. TWNHMS CONT.				12-13-22 REC'D REVISED PLANS 12-15-22 PLANS REVIEWD BY RFLOWE APPROVED AS NOTED READY FOR PICK UP (EMAILED) 12-19-22 PICKED UP by developer 12-19-22 rec'd zoning permit appl by email. 12-28-22 rec'd address from county 12-28-22 issued zoning permit # ZN-22-81 **4-18-23 Rec'd 1 new page to plans.** **4-26-23 RF review, waiting on stormwater review, still need correct buildings sheet.** 5-2-23 STORMWATER REVIEWED 5-3-23 Emailed screenshot of comments- Waiting on corrected buildings sheet. 5-16-23 REC'D 2 COMPLETE SET OF PLANS 5-16-23 PLANS APPROVED –DEV. To p/up ***NEXT STEP:*** PRE-CONST. CONF. SET 05-24-23 @ 3:30 PM 5-19-23 PLANS P/UP 5-24-23 Pre-Construction meeting - **Construction authorized upon completion of fees and several other requirements **6-6-23 Const. Admin Fees Pd: $1,180.50** **6-30-23 UPDATED PLANS REVIEWED-APPROVED** **7-6-23 REC'D MATERIALS LIST** **SITE DEV # 04-22 RICE STREET TOWNHOMES CONT.** **REVIEW OF W/S, BLDG ELEVATION** **FEES PD:** **PREL PLAT $450, SKETCH PLAN$100, UNITS $100** **SITE WORK ACTIVE** **10-11-23 REC'D UTILITY AS BUILTS** **10-16-23 PLANS ACCEPTED BY RFLOWE** **10-17-23 EMAILED DEV. READY FOR PICK UP** **10-18-23 FINAL PLAT- MYLAR REC'D** **10-19-23 R FLOWE SIGNED PLAT** **10-25-23 ENGINEER W. WEBB REVIEWING FOR SIGNATURE** **10-31-23 MORE INFO NEEDED- EMAILED DEVELOPER–** as-built drawings, construction certifications from the design engineer, and cad files for the water, sewer, and storm drainage locations **11-8-23 Rec'd mylar** – waiting on State permits **11-16-23 mtg w/state rep re approvals** **11-20-23 application submitted with NCDEQ** **11-21-23 REC'D $350 FINAL PLAT FEE** **12-5-23 final plat rec'd**

Rice Street TWNHMS Cont.				**12-13-23 NOTICE OF VIOLATION (NCDEQ REQ.)** **12-21-23 Rec'd Subdivision Bond copy** **2-7-24 REC'D PERMIT FEES FOR 10 TWNHOMES (10X$50** **2-8-24PER UNIT FEES PD FOR 10 TWNHMS (10 X $35)** **2-8-24 PERMIT ISSUED FOR 5 TWNHMS** **2-14-24 Rec'd NCDEQ permit to construct water system.** **2-14-24 Rec'd NCDEQ water system approval** **2-21-24 NCDEQ permit to construct wastewater system.** **3-27-24 VIOLATION NOTICE TO DEVELOPER $9,654.66** **4-29-24 SEWER CERT REQUEST** **12-27-24 $4,254.66 Violation Paid** **1-6-25 Zoning Compliance Permits Paid for Lots- 7,8,9,10 and 11 $170 each**
W. Garden Race Shop				**11-19-24 Paid Sketch Plan Review $270 & Site Plan Review $530 – CESI** **12-20-24 TRC Review Complete**
ZMA	**Coldwater Street**		CIV to SFR-2	**12-9-24 Approved**

Town of Landis
Division of Land Use
Zoning Permits Issued – Year 2025

Permit #	Date	Name	Job Address	Permit Use
ZN-25-01	01/06/25	John Lambert	225 E Rice St	Townhome
ZN-25-02	01/06/25	John Lambert	229 E Rice St	Townhome
ZN-25-03	01/06/25	John Lambert	233 E Rice St	Townhome
ZN-25-04	01/06/25	John Lambert	237 E Rice St	Townhome
ZN-25-05	01/06/25	John Lambert	241 E Rice St	Townhome
ZN-25-06	01/09/25	Bernardo Huizar	215 Church St	Residential Addition
ZN-25-07	1/15/25	Sonny Woodward	2220 W A St	Accy Building/Pool House
ZN-25-08	1/27/25	John Lambert	304 Buford Dr	New SFH Duplex
ZN-25-09	1/27/25	John Lambert	306 Buford Dr	New SFH Duplex

Item Cover Page

MEETING TYPE Board of Alderman

DATE: February 10, 2025

SUBMITTED BY:

ITEM TYPE: Report

AGENDA SECTION: Departmental Reports

DETAILS: Monthly Report

VIOLATION ADDRESS	OWNER OR OCCUPANT	STATUS OR CONDITIONS
MINIMUM HOUSING		
314 TOWN STREET	RUTH C DEADMON (HEIRS	ABATMENT OF THE YARD AND THE STRUCTURE HAS BEEN BOARDED UP. A LEIN WILL BE PLACED ON THE PROPERTY ONCE AN INVOICE IS RECEIVED.
109 EVERHART AVENUE	MARY GRAY HILTON (HEIRS)	ABANDONED SUBSTANDARD HOUSING AND NUISANCE CONDITIONS. ADDITIONAL RESEARH TO BE CONDUCTED.
111 EVERHART AVENUE	MARY GRAY HILTON (HEIRS)	ABANDONED SUBSTANDARD HOUSING AND NUISANCE CONDITIONS. ADDITIONAL RESEARH TO BE CONDUCTED.
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		CONDITIONS. ADDITIONAL RESEARH TO BE CONDUCTED.
206 EVERHART AVENUE	**MARY GRAY HILTON (HEIRS)**	**ABANDONED SUBSTANDARD HOUSING AND NUISANCE CONDITIONS. ADDITIONAL RESEARH TO BE CONDUCTED.**
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807 NORTH ZION STREET	**MARY GRAY HILTON (HEIRS)**	**ABANDONED SUBSTANDARD HOUSING AND NUISANCE CONDITIONS. ADDITIONAL RESEARH TO BE CONDUCTED.**
809 NORTH ZION STREET	**MARY GRAY HILTON (HEIRS)**	**ABANDONED SUBSTANDARD HOUSING AND NUISANCE**

		CONDITIONS. ADDITIONAL RESEARH TO BE CONDUCTED.
1020 LINN STREET	JESUS DOTELO ANDRADE & SUSANA BERNAL LORENZO	HOUSING IN SUBSTANDARD CONDITION. INSPECTION WILL BE COMPLETED.
NUISANCES		
107 NORTH MERIAH STREET	JAMES A HALL JR (HEIRS)	PROGRESS IS BEING MONITORED.
805 COLDWATER STEET	IGVK PROPERTIES LLC	OVERGROWTH NEAR THE REAR OF THE STORE. PROGRESS HAS BEEN MADE WILL CONTINUE TO MONITOR. CLOSED 01/17/2025
303 BUFORD DRIVE	FON ERNEST	SCREEN ON THE SIDE OF THE PROPERTY IS THE ONLY REMAINING VIOLATION.
430 MT MORIAH CHURCH ROAD	THOMAS LINN	HIGH GRASS AND DEBRIS AROUND THE PROPERTY. SOME DEBRIS HAS BEEN CLEANED, AND THEY ARE MAKING PROGRESS ON THE GRASS.
400 EAST	MARY FRANCES AKERS (HEIRS)	FACIAL BOARD FALLING OFF OF THE ROOF. THE OWNER IS MAKING ARRANGEMENTS TO CORRECT THE ISSUE.
ABANDONED-JUNKED-NUISANCE VEHICLES		
ZONING		
305 SOUTH MAIN STREET SUITE B		VINYL SIGN COVERING THE WINDOW ON THE RIGHT SIDE OF THE BUILDING. CLOSED 1/27/2025
NON-RESIDENTIAL BUILDINGS		
2570 SOUTH US 29 HWY	JOSEPH J ROJAS	COMMERCIAL BUILDING CONVIENCE STORE. SEVER DEILIAPDIATION AND DEFECTS.