

**OPERATIONS AND MAINTENANCE MANUAL
KINGSBRIDGE SUBDIVISION
SECTION 3**



PROJECT SITE:
3800 North Morton Street
Franklin, Indiana 46131

PREPARED FOR:
Kingsbridge Developer, LLC
9757 Westpoint Drive, Suite 600
Indianapolis, IN 46256
317.818.2900

PREPARED BY:
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Introduction

Preface

This Operations and Maintenance Manual (O&M) has been prepared based on guidelines published in the City of Franklin, Indiana Stormwater Technical Standards Manual for Kingsbridge Developer, LLC (OWNER).

The Kingsbridge Subdivision Section 3 (SITE) is 7.3 acre +/- property, located at 3800 North Morton Street, Franklin, Indiana. The main purpose of the stormwater management Best Management Practices (BMPs) on the site, are to ensure water quantity and quality control by reducing peak runoff discharged from the increased impervious nature of residential development.

Before stormwater leaves the SITE, it is treated for both quality and quantity through the implementation of various BMPs discussed throughout this manual. Water quantity is managed through the use of both wet and dry detention areas. Water quality management occurs through but not limited to the aforementioned basins, grassy swales, and native wet tolerant plantings. The locations of the BMPs, cross section of BMP features, and points of discharge for stormwater treated by the BMPs can be found in the Kingsbridge plans, included as part of this manual in Appendix C.

Purpose

This Operations and Maintenance Manual (O&M) defines requirements for operating, inspecting, and maintaining the Kingsbridge Subdivision infrastructure, including all the BMPs constructed as part of the stormwater plan prepared by V3 Companies (ENGINEER) on behalf of the OWNER. The proposed BMPs intend to provide natural and sustainable water quality and quantity treatment. The OWNER will be responsible for all maintenance and costs associated with routine inspections and maintenance of the integrated stormwater management system BMPs. Brief descriptions of what each BMP is intended to accomplish and the physical processes which govern its behavior are included within the following manual. Inspection and maintenance guidelines specified in this manual should be implemented in order to ensure that BMPs achieve their full performance capabilities.



Section I: Owner Information

Contact Information for Owner

Kingsbridge Developer, LLC

9757 Westpoint Drive, Suite 600

Indianapolis, IN 46256

Office: 317.818.2900

Contact: Tim Walter

twalter@platinum-properties.com

The OWNER is responsible for all maintenance activities and costs associated with said activities within the BMPs.

Right of Access

The OWNER hereby grants right of access to the City of Franklin to inspect and maintain the BMPs and all other aspects covered within this manual.



Owner Acknowledgement Agreement (“Agreement”)

For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the undersigned owner (OWNER) hereby submits this Operation and Maintenance Manual (MANUAL) to the City of Franklin, Indiana (CITY) as written acknowledgement of Owner’s warranty and agreement to institute, maintain, and follow the water quality Best Management Practices (BMPs) as described in this manual, and to follow and abide by the inspection schedule and maintenance activities listed in this manual. The Owner also hereby agrees to provide, at Owner’s cost, all additional maintenance, repair and/or replacement services reasonably necessary to maintain the function and longevity of the BMPs from and including the date this Agreement is executed by Owner to and including the date on which a new Agreement is filed with the City by another party who assumes all of the obligations and responsibilities of Owner as set forth herein.

Owner Signature

Date

Printed Name

Company

STATE OF _____)

)

SS:

COUNTY OF _____)

BEFORE ME, the undersigned a Notary Public in and for said County and State, personally appeared _____, Owner, subscribed and sworn before this _____ day of _____, _____.

County of Residence

Commission Expiration Date

Signature

Printed Name



Section II: Site BMP Features

Introduction

This section defines responsibilities for operating, inspecting, and maintaining the integrated detention and water quality systems within the Kingsbridge Subdivision in Franklin, Indiana. The subsequent sub-sections below describe in detail what to observe and if deficiencies are found, how to maintain or remediate. This project utilizes BMPs including dry detention areas. In this instance, BMP refers to both water quality and quantity treatment. The operation, inspection, and maintenance of these BMPs are covered in this section. To ensure long-lasting performance, outside of routine landscaping operations for the project, inspections will be the responsibility of the OWNER. Sample inspection and maintenance checklists are included in Appendix A to evaluate each area of concern. Each inspection report shall be kept on file as a permanent record by the OWNER.





Dry Detention Area BMPs

Introduction

This type of BMP is considered a natural green infrastructure practice that affords benefits to the environment and receiving infrastructure through transpiration, evaporation, nutrient uptake, floatables and sediment control, as well as carbon sequestration. Strategically placed as part of this project, this type of BMP integrates stormwater runoff conveyance with quantity control and full quality control. Generally, runoff enters the BMP via stormwater infrastructure. The BMP temporarily detains the collected stormwater, where it is filtered through native vegetation. The water is released over time to reduce the total volume sent to storm sewers after a rain event, which helps to reduce flooding. Additionally, this type of BMP provides natural habitats to support wildlife and native plants.

Stormwater Infrastructure Inspection Schedule

The City of Franklin will have the right to enter the premises to perform compliance inspections and maintenance of all infrastructure associated with this type of BMP. This BMP's infrastructure components are considered to be the following:

- Inlet/Outlet Pipes & Structures
- Embankments & Spillway
- Scour Protection Material
- Native Prairie Management
- BMP Surface

Inspections & Maintenance/Remediation

The following are areas critical for inspection to ensure proper working function of the BMP as well as verify optimal treatment performance.

Inlet/Outlet Pipes & Structures (At Least Quarterly, As Needed)

Inspection

- Visually inspect pipes and structures for damage, displacement, and blockage or restricted stormwater flow by any detritus, sediment, or plant material at least four times per year and following rain events in excess of one (1) inch.

Maintenance

- Remove all debris, trash, floatables, or other material restricting stormwater flow and dispose of properly. Sediment should be removed when the basin is completely dry. Disturbed areas need to be immediately stabilized and re-vegetated with appropriate species.

Remediation

- Repair and/or replace any damaged pipes or structures to their originally designed condition and elevation.

Embankments & Spillway (At Least Biannually, As Needed)

Inspection

- Check the slopes of the BMP for erosion or scour protection displacement. Please note the location and describe the failure as specifically as possible. Inspect for evidence of burrowing or tunneling mammals at least twice during the growing season.



Maintenance

- Remove all debris and trash accumulation.

Remediation

- Areas of severe erosion or other conditions that affect the integrity of the BMP or constitute a public safety hazard should be corrected as soon as possible and prior to the next monthly inspection. Burrowing mammals should be controlled or eradicated when they endanger the integrity of the embankments or pose a public safety hazard. Damage caused by their actions must be repaired as soon as possible. Any burrowing mammal control effort will need to be carefully planned and executed to avoid negative impacts on adjacent habitats and wildlife and should be confined to the embankments.

Scour Protection Material (At Least Quarterly, As Needed)

Inspection

- Pay close attention for scour along the edges of the stone material adjacent to the stormwater structures. This indicates the stone is not acting like a channel and instead forcing runoff to the unprotected edges. This can be caused by debris accumulation, washed away stone or insufficient width to adequately convey runoff influent from the outlets to the BMP surface.

Maintenance

- Remove any debris accumulation. Restore any washed away stone from accumulated piles to areas bare from movement.

Remediation

- Should inspection warrant, remediate insufficient stone quantity with similar material to either widen or lengthen the stone section or restore bare areas where stone is missing. Should the remediation be necessary due to insufficient protection, explore options to enhance protection or lessen erosive velocities.

Native Prairie Management (As Identified Below)

All topics covered in Native Prairie Management apply to prairies within identified BMPs, as well as all other prairie areas.

Inspection (Within 1-Year Establishment Period - Monthly)

- Immediately after installation of material and for a minimum of one (1) subsequent year, visual inspection of plant establishment shall be monthly. Depending on planting type, pay close attention to bare areas where seed washed away before establishment. Seed material will take longer to establish than plugs/gallon stock material and may require a longer term of monthly inspections. Additionally, inspect plantings for signs of invasive species. Refer to the Invasive Species appendix of this Manual for common types. Refer to the Performance Standards and Vegetation Monitoring sub-sections below for more detailed information.

Maintenance (Within 1-Year Establishment Period)

- Remove all invasive species found within planted areas. As the native culture establishes over time, the introduction of invasive species will be minimized. Areas where seed has been washed away, re-seed with similar mix. Replace all plant material as needed to prevent erosion. Should inspection warrant, during drought periods, water plantings to continue full establishment and healthy growth.



Inspection (After Establishment Period - Biannually)

- Continue monitoring plant material at a minimum of two (2) times annually. Pay close attention to signs of invasive species. Refer to the Performance Standards and Vegetation Monitoring sub-sections below for more detailed information.

Maintenance (After Establishment Period)

- Remove all invasive species found within planted areas. This activity can coincide with normal landscape maintenance scope of the project. Should inspection warrant, during drought periods, water plantings to continue full establishment and healthy growth. No fertilizer is to be used on this project unless soil testing has found specific deficiencies in nutrients.

Weeding & Herbicide Guidance

- Hand removal or equipment removal of invasive species is preferable to the greatest practical extent (larger planting areas may not be practical). Care should be taken during hand removal, especially within the first year of prairie establishment. Prairie seedlings are delicate and can be pulled up with the weeds. Also, be careful not to mistake prairie plants for weeds. If maintenance staff can identify perennial weeds from annual weeds, perennial weeds should be the focus for hand removal, otherwise, follow the Mowing Guidance sub-section below.
- Within the second year of establishment, annual weeds may still be prevalent, along with common biennial weeds, such as Queen Anne's Lace, Sweet Clover, Wild Parsnip, and Burdock. The Invasive Species Appendix provides a few examples of common invasive species, as well as a link to an exhaustive list found within Indiana.
- Within the third and fourth year of prairie establishment, if perennial weeds appear, they must be controlled immediately, or they may become established and increasingly difficult to manage.
- Controlled spot herbicide applications to manage invasive species are acceptable if warranted and can be done without damaging off-target vegetation. The following provides guidance for applications.
 - Herbicide applications shall be conducted on minimally windy days to ensure chemical does not spread or volatilize. Re-seed and/or replant any die-back resulting from treatment. In all cases, herbicides must be applied using applicators approved by the State Chemist's Office. All herbicide treatment shall be approved by the City of Franklin Stormwater Department prior to application.
 - Throughout the first year of establishment, weeds, non-native, or invasive species can be treated with selective herbicide applications approved for use around water (Rodeo) by spot-spraying or other means that minimizes incidental drift. A determination regarding the type of herbicide to be used should be made when it is known which nuisance species are present on the site. Depending on the target weed species, a selective herbicide may be available. The choice of herbicide and timing of herbicide application will be made by a trained, experienced professional based on the target weed species and conditions. Care should be taken to monitor site weather conditions to limit herbicide drift, overspray, and ensure it is rainfast.
 - It is recommended that a minimum of four annual weed control application periods are conducted throughout a three-year management period. Below is a general guideline on the suggested schedule and target species for the application periods:

1. Application Period One (early spring – April/May): problematic species such as, but not limited to, reed canary grass, red/white clover, cool season adventive grasses.



2. Application Period Two (late spring to early summer – May/June): problematic species such as, but not limited to, teasel, white/yellow sweet clover, thistle.
3. Application Period Three (mid to late summer – July/August): problematic species such as, but not limited to, tall goldenrod, hairy aster, ragweed, cattails, purple loosestrife.
4. Application Period Four (late summer and fall – September/October): problematic species such as, but not limited to, reed canary grass, thistle, common reed, red/white clover, cool season grasses.

Native Prairie Mowing Guidance

- Within the first year of prairie establishment, controlling weeds is critical and should be done with care. Within this period, the prairie should be carefully mowed routinely to a height between four (4) to six (6) inches when weeds reach 12 to 18 inches tall. Do not let plant material get taller than 18 inches, as the subsequent mowing could leave enough material to suppress the growth of prairie seedlings. To greatest extent possible, wait until prairie plant material and underlying soil is dry before it is mown. Never mow wet or soggy plant material. Flail-type mowers are recommended for larger areas because they shred the herbaceous material and pose less risk of injury to the operator from flying debris. Selective weed whipping can be used instead of a mower if conditions are unfit (e.g., too wet or no access) for a tractor, or if only small, isolated areas require cutting.
- Within the second year of prairie establishment, mow the prairie down to roughly 12 inches tall when biennial weeds are in full bloom, but before they set seed, typically around mid to late June. Two mowings may be required at a height of 12 inches in year two, when weeds are in flower but have not yet seeded.
- At the beginning of the third growing season, around mid-Spring, mow the prairie close to the ground. To the greatest practical extent, mown material should be removed to expose the soil to the warming sun. This will encourage the growth of prairie plants over weeds.
- Upon successful establishment, mowing shall be completed once a year in the late spring. Mowing to occur no earlier than May 15th and no later than June 15th. The vegetation should be cut to a height of 6 to 9 inches at this time. Biennial weeds may appear in the third or fourth year, due to dormant seeds surviving in the soil. These weeds will need to be managed on a case-by-case basis, either being pulled or mowed back before they set seed.

Performance Standards

- The three-year management program with specifically identified performance standards should be conducted for the native prairie establishment so that the relative success may be evaluated. Controlling invasive species is essential to the prairie establishment and will be required to achieve the performance standards for the project. If the performance standards are not achieved by the end of the three-year management program, the OWNER is responsible for correction of any deficiencies through further management activities, which may include replanting. The performance standards are as follows.
 - Within 3 months of seed installation, at least 90% of the native prairie, as measured by aerial coverage, shall be vegetated. A minimum 90% vegetative coverage shall be maintained throughout, and at the end of, the three-year period for this area.
 - At the end of the first year of the monitoring period, all vegetated areas shall achieve a minimum 10% native vegetative coverage. None of the three most dominant species can be non-native and/or invasive.



- At the end of the second year of the monitoring period, all vegetated areas shall achieve a minimum 25% native vegetative coverage. None of the three most dominant species can be non-native and/or invasive.
- At the end of the third year of the monitoring period, all vegetated areas shall achieve a minimum 75% native vegetative coverage. None of the three most dominant species can be non-native and/or invasive.
- At the end of the third year of the monitoring period the site as a whole shall achieve a Floristic Quality Index of 20 or greater.
- Relative coverage (determined by ocular estimation) of cattails shall be less than 10% throughout, and at the end of, the three-year period.
- Relative coverage (determined by ocular estimation) of common reed, reed canary grass and purple loosestrife in aggregate shall be less than 5% throughout, and at the end of, the three-year period.
- Relative coverage (determined by ocular estimation) of thistle and teasel in aggregate shall be less than 5% throughout, and at the end of, the three-year period.

Vegetation Monitoring

- Annual vegetation monitoring in the native prairie areas will be conducted during the three-year period beginning immediately following planting. Ocular estimation will be used to collect approximate vegetative and species coverage data. The vegetation monitoring inspections will be conducted twice per year in May/June and August/September. In addition, an inventory of all plant species present in these areas should be collected and used to determine desired native species presence.

BMP Surface (At Least Quarterly, As Needed)

Inspection

- Visually inspect the surface of the BMP for indications of excessive ponding due to improper drainage or infiltration. Signs include plant die-off, pockets of shallow pooling, and/or presence of algae pockets. Any ponding at the surface of the BMP for periods longer than 48-hours is considered a failure and will require maintenance/remediation.

Maintenance

- Scarify top surface soil layers in areas with dead or missing plant material to free up surface voids and break up potential compaction. Remove any dead plant material. Replace soil to originally designed grade, then replant disturbed areas with similar species. Any mulch used to protect seeding should be finished (aged) leaf compost mulch. mulch in areas where depth is less than 2-inches using finished (aged) leaf compost mulch.

Remediation

- Should inspection warrant, BMP soil shall be removed and replaced with modified soil in conformance with design specifications. If the design specifications for the modified soil are deemed inadequate, increase the sand content to increase the permeability of the soil. Pay close attention to minimum organic and topsoil percentages as well as pH levels for plant health.



Section III: Stormwater Infrastructure

Introduction

This section defines responsibilities for operating, inspecting, and maintaining the stormwater infrastructure structures and conveyances within the Kingsbridge Subdivision in Franklin, Indiana. The subsequent sub-sections below describe in detail what to observe and if deficiencies are found, how to maintain or remediate. It is critical for the long-term success of stormwater operations to conduct thorough and regular inspections and maintenance of this infrastructure, both part of and separate from the BMPs. Maintenance responsibilities shall remain in effect for the life of the infrastructure from the date the construction is completed. Sample inspection and maintenance checklists are included in Appendix B to evaluate each area of concern, relative to stormwater infrastructure. Each inspection and maintenance checklist shall be kept on file as a permanent record by the OWNER and made available to the City of Franklin upon request. Additional inspections are recommended following a significant rainfall event.





Stormwater Structure Maintenance

Stormwater Structure Inspection Schedule

The City of Franklin personnel will have the right to enter the premises to perform compliance inspections and maintenance of all permanent stormwater infrastructure. Stormwater structures are considered inlets, outlets, curb turnouts, and all associated components which help transfer stormwater to or from conveyance pipes.

Inspections & Maintenance/Remediation

The following are areas critical for inspection to ensure proper working function of the infrastructure.

Inlet/Outlet Structures (At Least Quarterly, As Needed)

Inspection

- Visually inspect structures inside and out for damage, displacement, and blockage or restricted stormwater flow by any detritus, sediment, or plant material at least four times per year and following rain events in excess of one (1) inch. Identify any floatables or pollutants such as oily sheens, discoloration, and cloudy or muddy water. Also inspect for undercutting around the edges of the structures.

Maintenance

- Remove all debris, trash, floatables, or other material in or around the structures, especially those restricting stormwater flow. If any pipes or structures are blocked, they must be cleared as soon as possible, and the material disposed of properly. Sediment should be removed when the area is completely dry. Disturbed areas need to be immediately stabilized and re-vegetated with appropriate species.

Remediation

- Repair and/or replace any damaged structures or their components to their originally designed condition and elevation. If erosion is occurring, then additional scour protection measures will need to be employed. Areas of severe erosion or other conditions that may constitute a public hazard should be corrected as soon as possible and prior to the next inspection.

Scour Protection Material (At Least Quarterly, As Needed)

Inspection

- Pay close attention for scour along the edges of the stone material adjacent to the structures. This indicates the stone is not acting like a channel and instead forcing runoff to the unprotected edges. This can be caused by debris accumulation, washed away stone, or insufficient width to adequately convey stormwater to or from the structures.

Maintenance

- Remove any debris accumulation. Restore any washed away stone from accumulated piles to areas bare from movement.

Remediation

- Should inspection warrant, remediate insufficient stone quantity with similar material to either widen or lengthen the stone section or restore bare areas where stone is missing. Should the remediation be necessary due to insufficient protection, explore options to enhance protection or lessen erosive velocities. Areas of severe erosion or other conditions that may constitute a public hazard should be corrected as soon as possible and prior to the next inspection.



Stormwater Conveyance Maintenance

Stormwater Conveyance Inspection Schedule

The City of Franklin personnel will have the right to enter the premises to perform compliance inspections and maintenance of all permanent stormwater infrastructure. Stormwater infrastructure conveyance in this section includes stormwater pipes.

Inspections & Maintenance/Remediation

The following are areas critical for inspection to ensure proper working function of the infrastructure.

Stormwater Pipes (At Least Quarterly, As Needed)

Inspection

- To the greatest extent possible, visually inspect pipes for damage, displacement, and blockage or restricted stormwater flow by any detritus, sediment, or plant material at least four times per year and following rain events in excess of one (1) inch. Note the amount of sediment and/or debris accumulation within pipes on the inspection report. Identify any floatables or pollutants such as oily sheens, discoloration, and cloudy or muddy water.

Maintenance

- Remove all debris, trash, floatables, or other material in or around the pipes, especially those restricting stormwater flow. If any pipes or structures are blocked, they must be cleared as soon as possible, and the material disposed of properly. Sediment and any other debris should be removed from the pipe before 10% of the pipe diameter is blocked. Disturbed areas need to be immediately stabilized and re-vegetated with appropriate species.

Remediation

- Repair and/or replace any damaged structures or their components to their originally designed condition and elevation. If erosion is occurring, then additional scour protection measures will need to be employed. Areas of severe erosion or other conditions that may constitute a public hazard should be corrected as soon as possible and prior to the next inspection.



Spill Response Plan

The proposed land use will consist of single-family residential houses. The pollutants and sources of each pollutant normally expected from this type of land use are listed below:

- Pollutant Source: Passenger vehicles, delivery vehicles, and trucks
 - Type of Pollutant: Oil, gasoline, diesel fuel, any hydrocarbon associated with vehicular fuels and lubricants, grease, antifreeze, windshield cleaner solution, brake fluid, brake dust, rubber, glass, metal and plastic fragments, grit, road de-icing materials
- Pollutant Source: Residence
 - Type of Pollutant: Cleaning solutions or solvents, leaks from HVAC equipment, grit from roof drainage, aggregate or rubber fragments from roofing system
- Pollutant Source: Roadway
 - Type of Pollutant: Any pollutant associated with vehicular sources, grit from asphalt wearing surface, bituminous compounds from periodic maintenance (sealing, resurfacing, and patching), pavement de-icing materials, wind-blown litter from off-site sources, and elevated water temperatures from contact with impervious surfaces
- Pollutant Source: Lawn and landscape areas
 - Type of Pollutant: Fertilizers, herbicides, organic material (leaves, mulch, grass clippings) and pesticides.

In case of spill, contact the City of Franklin Fire Department (317-736-3650), City of Franklin Department of Public Works (888-736-3640), and the IDEM Spill Hotline (317-233-7745).

Responsible Parties

The following owner information is responsible for funding and maintenance of the BMP's listed in the manual:

Owner's Name: Kingsbridge Developer, LLC
Owner's Address: 9757 Westpoint Drive, Suite 600
Indianapolis, IN 46256



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Appendix A – Inspection & Maintenance Checklists

Introduction

This appendix contains sample checklists meant to guide the process and documentation of inspections and maintenance of the BMPs mentioned within this manual for the Kingsbridge Subdivision. The checklists help to identify areas of the BMPs that require ongoing maintenance and the minimum frequency of inspections that should be completed. It is recommended that inspections be completed by a licensed professional engineer (PE) and/or person with sufficient operational knowledge of the BMPs design and function. Refer to the latest edition of the City of Franklin, Indiana Stormwater Technical Standards Manual for additional information.

The checklists in this appendix include:

- Dry Detention BMP Inspection and Maintenance Checklist
- Wet Detention BMP Inspection and Maintenance Checklist
- Stormwater Infrastructure: Structure Inspection and Maintenance Checklist
- Stormwater Infrastructure: Conveyance Inspection and Maintenance Checklist



Dry Detention BMP Inspection and Maintenance Checklist

Checklist to be completed monthly and within 48 hours of significant rainfall events resulting in 1 or more inch of rain within a 24 hour period.

Site Name _____

BMP – ID _____

“As Built” Plans Available? _____

Inspection Date _____ Inspection Time _____

Days Since Previous Rainfall _____ Depth of Previous Rainfall _____

Inspector _____ Inspector Signature _____

Maintenance Item	Satisfactory or Unsatisfactory	Recommended Inspection Frequency	Notes
<i>Inlet/Outlet Pipes & Structures</i>			
Inspect pipes and structures for proper functioning, damage, and displacement		Quarterly, As Needed	
Inspect for blockages and sediment or debris accumulation		Quarterly, As Needed	
Remove and dispose of sediment, debris, trash, etc. appropriately		As Needed	
Other: _____			
<i>Scour Protection</i>			
Inspect stone at inlets/outlets for displacement or loss of material and for erosion around the material		Quarterly, As Needed	
Inspect for sediment and debris accumulation		Quarterly, As Needed	
Remove and dispose of sediment, debris, trash, etc. appropriately		As Needed	
Inspect for weed intrusion		Quarterly	
Other: _____			
<i>Embankments & Spillway</i>			
Inspect slopes for erosion and structural integrity		Biannually, As Needed	
Inspect slopes for burrowing or tunneling of mammals		Biannually	
Other: _____			



Prairie (Post-Establishment Period)			
Inspect for weeds and invasive species		Biannually, As Needed	
Inspect for visual signs of plant cover, die-off, and overall health		Monthly, As Needed	
Inspect plant heights to determine mowing needs		Monthly, As Needed	
Other: _____			
BMP Surface			
Inspect for ponding, algae pockets, and improper drainage		Quarterly, As Needed	
Remove trash, debris, & sediment appropriately		As Needed	
Inspect for erosion and improper grades		Quarterly, As Needed	
Other: _____			
Actions to be taken:			
To be Completed by (Date):			



Stormwater Infrastructure: Structure Inspection and Maintenance Checklist

Checklist to be completed monthly and within 48 hours of significant rainfall events resulting in 1 or more inch of rain within a 24 hour period.

Site Name _____

BMP – ID (If Applicable) _____

“As Built” Plans Available? _____

Inspection Date _____ Inspection Time _____

Days Since Previous Rainfall _____ Depth of Previous Rainfall _____

Inspector _____ Inspector Signature _____

Storm Structure #	Debris	Blocked	Condition	Notes
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	
	Y / N	Y / N	Intact / Damaged	

Actions to be Taken:

To be Completed by (Date)



Stormwater Infrastructure: Conveyance Inspection and Maintenance Checklist

Checklist to be completed monthly and within 48 hours of significant rainfall events resulting in 1 or more inch of rain within a 24 hour period.

Site Name _____

BMP – ID (If Applicable) _____

“As Built” Plans Available? _____

Inspection Date _____ Inspection Time _____

Days Since Previous Rainfall _____ Depth of Previous Rainfall _____

Inspector _____ Inspector Signature _____

Pipe #	Condition	Condition	Notes
	Blocked / Clean	Intact / Damaged	

Actions to be Taken:

To be Completed by (Date)



Appendix B – Invasive Species

Invasive Species

This appendix includes photos of invasive species and a species list that are commonly found within the vegetated areas:





Typha angustifolia
Narrowleaf Cattail



Phalaris arundinacea
Reed Canary Grass



Lythrum salicaria
Purple Loosestrife



Phragmites australis
Common Reed



Cirsium arvense
Canada Thistle



Alliaria petiolata
Garlic Mustard

Below is a list of invasive species that may be found within the vegetated areas:

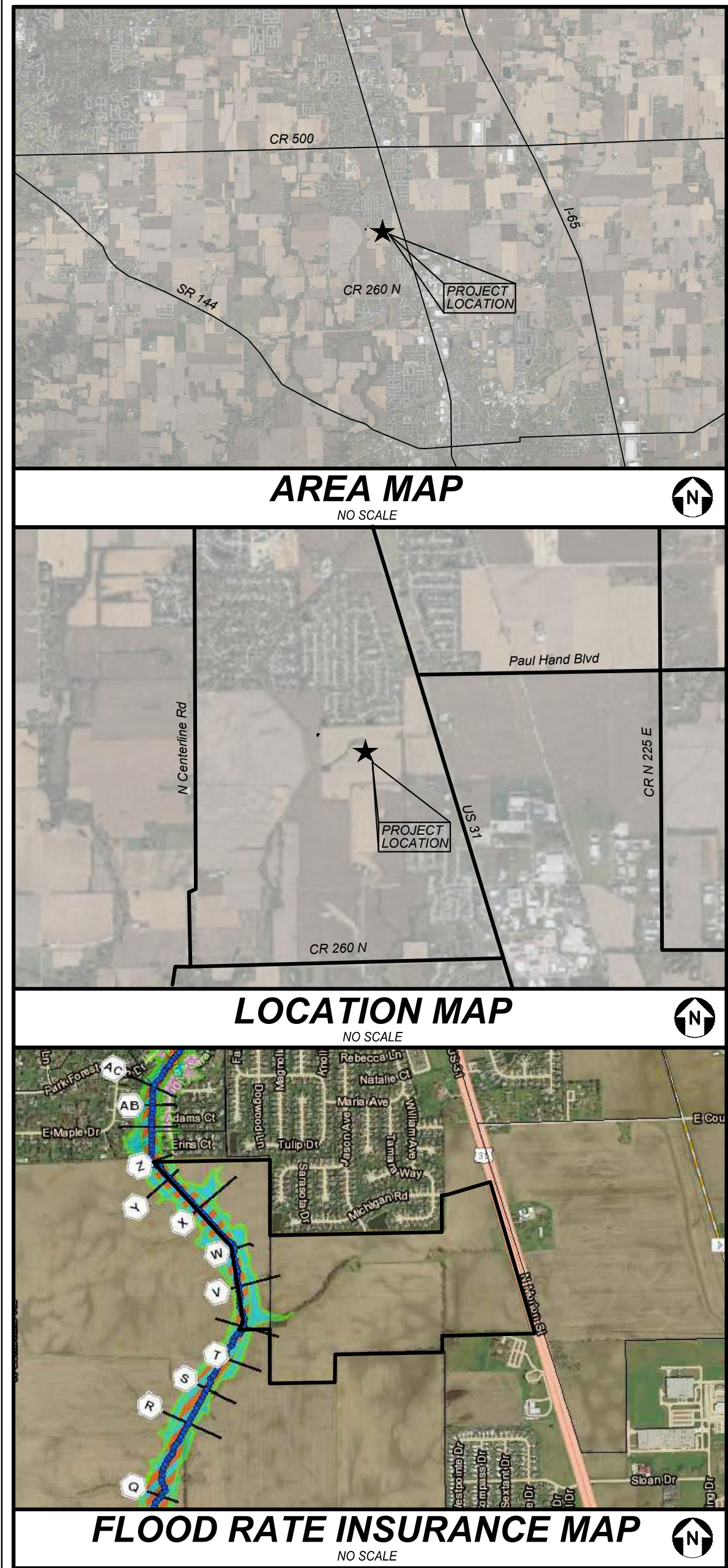
- Asian Bush Honeysuckle
- Autumn Olive
- Black Locust
- Buckthorn
- Chinese Silvergrass
- Common Reed
- Creeping Charlie
- Creeping Jenny
- Crown Vetch
- Dame's Rocket
- Japanese Hedge Parsley
- Japanese Honeysuckle
- Japanese Knotweed
- Multiflora Rose

- Norway Maple
- Periwinkle
- Privet
- Purple Loosestrife
- Purple Winter Creeper
- Reed Canary Grass
- Russian Olive
- Siberian Elm
- Smooth Brome
- Star-of-Bethlehem
- Sweet Clover
- Tall Fescue
- Tree-of-Heaven
- White Mulberry
- Winged Burning Bush

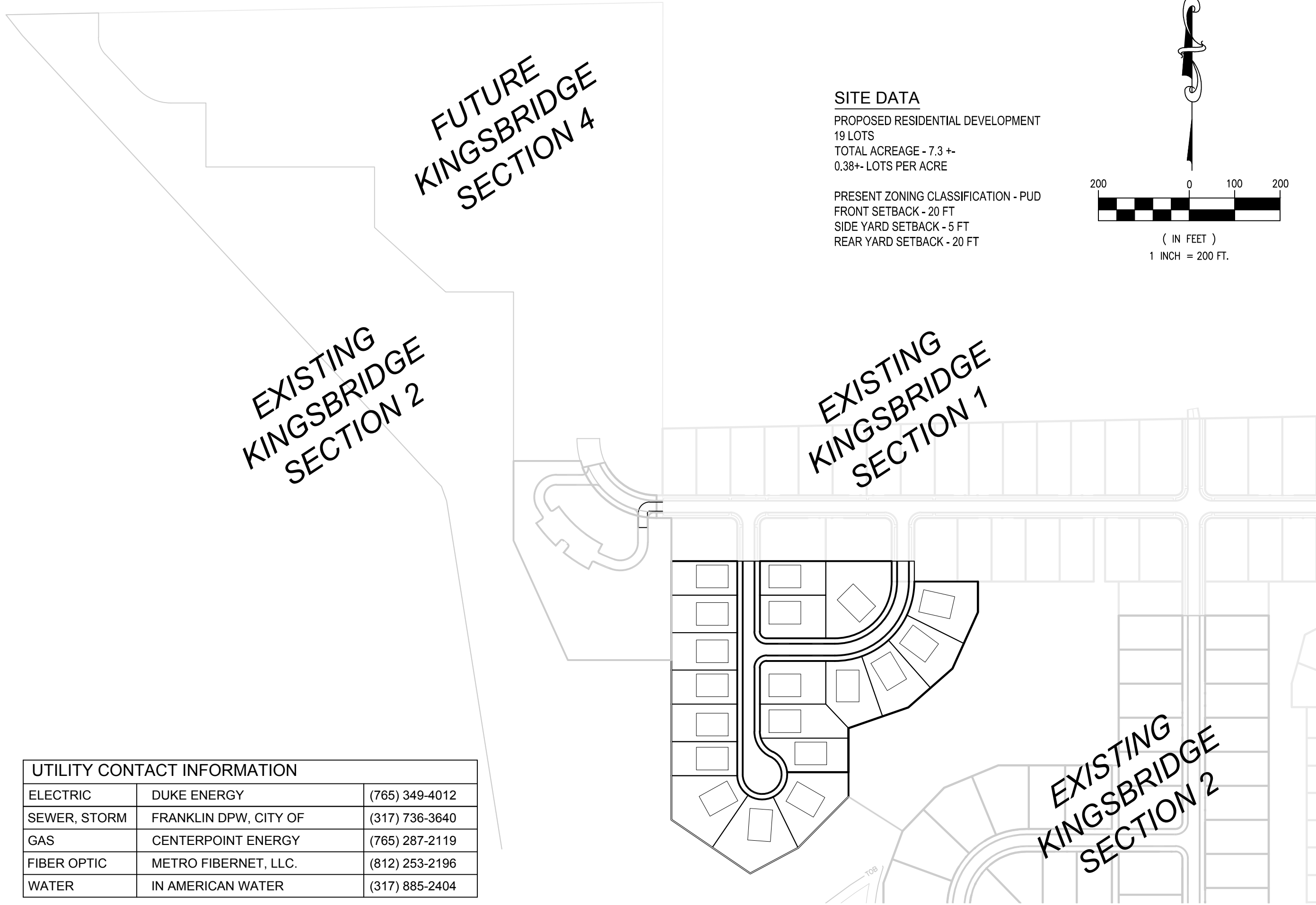
The link below is an exhaustive list of Indiana's Invasive Plants:
<http://www.in.gov/dnr/naturepreserve/4736.htm>



Appendix C – Kingsbridge Subdivision Section 3 Plans and Details



ENGINEERING PLANS
FOR
KINGSBRIDGE SECTION 3
FRANKLIN, INDIANA



UTILITY CONTACT INFORMATION		
ELECTRIC	DUKE ENERGY	(765) 349-4012
SEWER, STORM	FRANKLIN DPW, CITY OF	(317) 736-3640
GAS	CENTERPOINT ENERGY	(765) 287-2119
FIBER OPTIC	METRO FIBERNET, LLC.	(812) 253-2196
WATER	IN AMERICAN WATER	(317) 885-2404

LEGAL DESCRIPTION OF PROPERTY

PART OF SECTION 33 AND THE NORTHWEST QUARTER OF SECTION 34, ALL IN TOWNSHIP 13 NORTH, RANGE 4 EAST OF THE SECOND PRINCIPAL MERIDIAN, JOHNSON COUNTY, INDIANA, DESCRIBED AS FOLLOWS:
BEGINNING AT THE NORTHWEST CORNER OF SAID NORTHWEST QUARTER OF SECTION 34; THENCE NORTH 88 DEGREES 31 MINUTES 03 SECONDS EAST 412.25 FEET TO THE WEST LINE OF THE INDIANAPOLIS, COLUMBUS AND SOUTHERN TRACTION COMPANY; THENCE ON AND ALONG THE AFORESAID WEST LINE OF TRACTION COMPANY, SOUTH 16 DEGREES 35 MINUTES 00 SECONDS EAST 2661.91 FEET; THENCE PARALLEL TO THE SOUTH LINE OF THE SAID NORTHWEST QUARTER OF SECTION 34, SOUTH 88 DEGREES 44 MINUTES 07 SECONDS WEST 1155.28 FEET TO THE WEST LINE THEREOF; THENCE ON AND ALONG THE SAID WEST LINE, SOUTH 00 DEGREES 22 MINUTES 34 SECONDS EAST 130.06 FEET TO A STONE AT THE SOUTHWEST CORNER OF SAID NORTHWEST QUARTER OF SECTION 34; THENCE ON AND ALONG THE EAST LINE OF THE SOUTHEAST QUARTER OF THE SAID SECTION 33K SOUTH 00 DEGREES 02 MINUTES 19 SECONDS EAST 70.83 FEET; THENCE SOUTH 88 DEGREES 39 MINUTES 54 SECONDS WEST 1331.73 FEET; THENCE SOUTH 00 DEGREES 15 MINUTES 59 SECONDS WEST 345.39 FEET; THENCE SOUTH 88 DEGREES 50 MINUTES 56 SECONDS WEST 808.36 FEET; THENCE NORTH 00 DEGREES 08 MINUTES 24 SECONDS WEST 673.36 FEET; THENCE SOUTH 88 DEGREES 44 MINUTES 38 SECONDS WEST 388.37 FEET TO THE CENTERLINE OF THE BREWER DITCH (THE FOLLOWING EIGHT (8) CALLS ARE ON AND ALONG THE SAID CENTERLINE OF BREWER DITCH); 1) THENCE NORTH 28 DEGREES 30 MINUTES 51 SECONDS EAST 85.96 FEET; 2) THENCE NORTH 24 DEGREES 34 MINUTES 05 SECONDS EAST 23.96 FEET; 3) THENCE NORTH 01 DEGREE 26 MINUTES 39 SECONDS EAST 37.79 FEET; 4) THENCE NORTH 09 DEGREES 09 MINUTES 39 SECONDS WEST 889.81 FEET; 5) THENCE NORTH 19 DEGREES 56 MINUTES 33 SECONDS WEST 33.87 FEET; 6) THENCE NORTH 44 DEGREES 01 MINUTE 41 SECONDS WEST 52.90 FEET; 7) THENCE NORTH 43 DEGREES 00 MINUTES 43 SECONDS WEST 1302.03 FEET; 8) THENCE NORTH 38 DEGREES 20 MINUTES 38 SECONDS WEST 57.79 FEET; THENCE NORTH 88 DEGREES 44 MINUTES 38 SECONDS EAST 1445.55 FEET; THENCE SOUTH 00 DEGREES 08 MINUTES 24 SECONDS EAST 939.17 FEET TO THE SOUTH LINE OF KNOLLWOOD FARMS SECOND SECTION, PART "C" AND PART "B" EXTENDED, AS RECORDED IN PLAT CABINET "C", PAGE 543 AND PAGE 544, RESPECTIVELY, IN THE RECORDER'S OFFICE OF JOHNSON COUNTY, INDIANA; THENCE ON AND ALONG THE EXTENSION AND SOUTH LINE OF SAID KNOLLWOOD FARMS SECTION SECTION, PART "B" AND "C", NORTH 88 DEGREES 44 MINUTES 26 SECONDS EAST 2136.79 FEET TO THE WEST LINE OF SAID NORTHWEST QUARTER OF SECTION 34; THENCE ON AND ALONG THE SAID WEST LINE NORTH 00 DEGREES 22 MINUTES 34 SECONDS WEST 1274.45 FEET TO THE POINT OF BEGINNING. CONTAINING 159.14 ACRES, MORE OR LESS.

EXCEPT
PART OF THE NORTHWEST QUARTER OF SECTION 34, TOWNSHIP 13 NORTH, RANGE 4 EAST OF THE SECOND PRINCIPAL MERIDIAN, JOHNSON COUNTY, INDIANA, DESCRIBED AS FOLLOWS:
BEGINNING AT THE NORTHWEST CORNER OF SAID NORTHWEST QUARTER; THENCE NORTH 88 DEGREES 31 MINUTES 03 SECONDS EAST (ASSUMED BEARING) 412.25 FEET TO THE WEST LINE OF THE INDIANAPOLIS, COLUMBUS AND SOUTHERN TRACTION COMPANY; THENCE ON AND ALONG THE AFORESAID WEST LINE OF TRACTION COMPANY, SOUTH 16 DEGREES 35 MINUTES 00 SECONDS EAST 688.86 FEET; THENCE SOUTH 73 DEGREES 25 MINUTES 00 SECONDS WEST 553.94 FEET TO A CURVE CONCAVE NORTHWESTERLY, THE RADIUS OF SAID CURVE BEARS NORTH 16 DEGREES 35 MINUTES 00 SECONDS WEST 275.00 FEET; THENCE SOUTHWESTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 15 DEGREES 19 MINUTES 26 SECONDS 73.55 FEET TO THE WEST LINE OF SAID NORTHWEST QUARTER; THENCE ON AND ALONG SAID WEST LINE NORTH 00 DEGREES 22 MINUTES 34 SECONDS WEST 819.03 FEET TO THE POINT OF BEGINNING. CONTAINING 8.894 ACRES, MORE OR LESS.

PARCEL NOS: 41-05-33-014-007-000-009 AND 41-05-33-012-106-000-008

BENCHMARKS

The topographic data was gathered using standard radial surveying techniques with an Electronic total station and data collector. Elevations on hard surfaces or structures are accurate to within 0.05 feet, elevations on natural surfaces are accurate to within 0.1 feet. Contours are plotted based upon interpolation of spot elevations shown hereon and are accurate to generally within one half the contour interval. Originating benchmark established with Trimble GPS Survey grade equipment and Indiana CORS Network. <http://incors.in.gov/default.aspx> Elevations (NAVD '88 Horizontal Indiana State Plane East Zone)
TBM #1 = Point number 20778; Rebar found at Southeast corner of Knollwood Farms, SECTION 3, Part B.
Elevation = 788.34' Northing: 1560370.49 Easting: 210775.52
TBM #2 = Point number 21075' Rebar found at Northwest corner of Knollwood Farms, SECTION 3, Part C.
Elevation = 788.09' Northing: 1561269.74 Easting: 208640.79
TBM #3 = Point number 5; Rebar found near the Southwest corner of the subject deed.
Elevation = 781.76' Northing: 1558492.28 Easting: 208639.33
TBM #4 = Point number 7018; Rebar found marking the Southwest corner of the Northwest quarter of S34-T13N-R4E.
Elevation = 776.38 Northing: 1558879.21 Easting: 210782.06



V3 Companies, Ltd.

DEVELOPER

KINGSBRIDGE DEVELOPER, LLC
9757 WESTPOINT DR, SUITE 600
INDIANAPOLIS IN 46256
(317) 818-2900

PROJECT TEAM

ENGINEER & SURVEYOR

V3 COMPANIES, LTD.
619 N PENNSYLVANIA AVENUE
INDIANAPOLIS, IN 46204
(317) 423-0690
Project Manager: DAVID A. MARKS
dmarks@v3co.com
Project Engineer: DAVID A. MARKS

PROPERTY OWNERS

KINGSBRIDGE DEVELOPER, LLC
9757 WESTPOINT DR, SUITE 600
INDIANAPOLIS IN 46256
(317) 818-2900

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PROFESSIONAL ENGINEER'S CERTIFICATION

I, DAVID A. MARKS, A LICENSED PROFESSIONAL ENGINEER OF INDIANA, HEREBY CERTIFY THAT THE CIVIL ENGINEERING PLANS WERE PREPARED ON BEHALF OF **KINGSBRIDGE DEVELOPER, LLC** BY V3 COMPANIES, LTD. UNDER MY PERSONAL DIRECTION. THIS TECHNICAL SUBMISSION IS INTENDED TO BE USED AS AN INTEGRAL PART OF AND IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS.

DATED THIS 1ST OF APRIL, A.D., 2024.

INDIANA LICENSED PROFESSIONAL ENGINEER

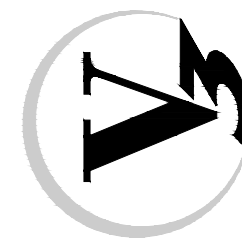
COVER SHEET

KINGSBRIDGE SECTION 3

INDIANA

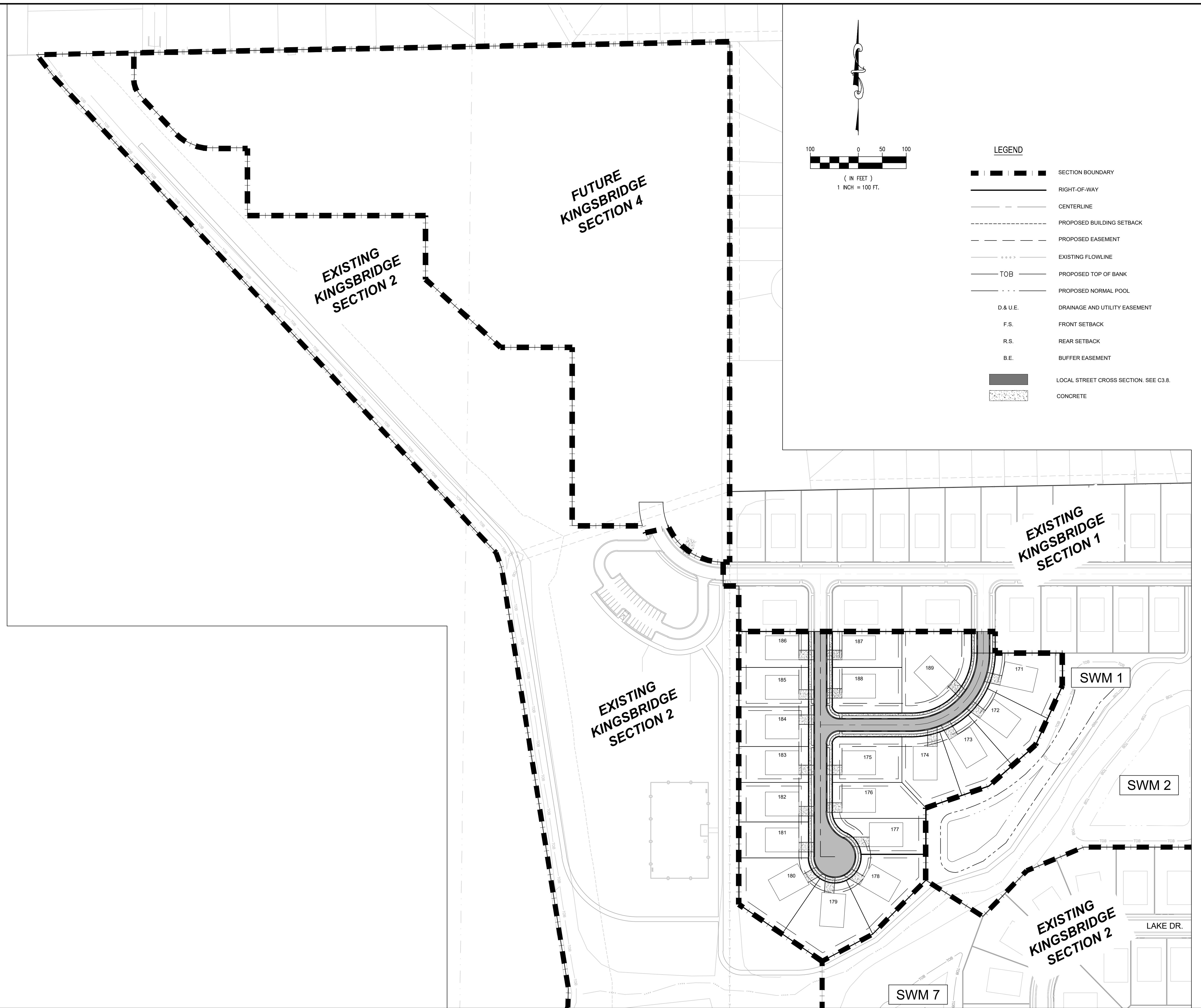
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<div></div> <div>619 N Pennsylvania Street Indianapolis, IN 46204 317.423.0690 phone www.v3co.com</div>	<div>SITE PLAN OVERALL</div> <div>KINGSBRIDGE SECTION 3</div> <div>FRANKLIN INDIANA</div>	PROJECT NO.: 211197.3	ORIGINAL ISSUE DATE: 09/04/2024				REVISIONS				
		PROJECT MANAGER: DAM	NO	DATE	DESCRIPTION	NO	DATE	DESCRIPTION			
		DESIGNED BY: DAM									
		DRAWN BY: PGS									
DRAWING NO. C2.0											



- FRONT R/W
- 20' FRONT SETBACK
- LOT XX
- MFF = XXX.X
- PAD = XXX.X
- MLAG = XXX.X
- MFPG = XXX.X
- REAR PROPERTY LINE

LOT NUMBER
MINIMUM FINISHED FLOOD
PAD ELEVATION
MINIMUM LOWEST ADJACENT GRADE

MINIMUM FLOOD PROTECTION GRADE

MINIMUM FINISH FLOOR ELEVATION IS BASED OFF OF THE BELOW CRITERIA, WHICHEVER IS HIGHER:

- ONE (1) FOOT ABOVE THE NEAREST UPSTREAM OR DOWNSTREAM SANITARY MANHOLE, WHICHEVER IS LOWEST.
- TWO (2) FEET ABOVE THE 100 YEAR FLOOD ELEVATION.
- 6" (0.5') ABOVE THE M.L.A.G.

MINIMUM FLOOD PROTECTION GRADE:

- NO LESS THAN 2 FEET ABOVE ANY ADJACENT 100-YR. LOCAL OR REGIONAL FLOOD ELEVATIONS WHICH EVER IS GREATER FOR ALL WINDOWS, DOORS, PIPE ENTRANCES, WALLS, SLOES, AND ANY OTHER STRUCTURE MEMBER WHERE FLOODWATERS CAN ENTER A BUILDING

MINIMUM FINISH FLOOR ELEVATION IS BASED OFF OF THE BELOW CRITERIA, WHICHEVER IS HIGHER:

1. 2 FEET OF FREEBOARD ABOVE THE FLOODING SOURCE'S 100-YEAR FLOOD ELEVATION UNDER PROPOSED CONDITIONS.

LOWEST ADJACENT GRADE IS THE ELEVATION OF THE LOWEST GRADE ADJACENT TO A STRUCTURE, WHERE THE SOIL MEETS THE FOUNDATION AROUND THE OUTSIDE OF THE STRUCTURE, WHERE THE SOIL MEETS THE FOUNDATION AROUND THE OUTSIDE OF THE STRUCTURE (INCLUDING STRUCTURAL MEMBERS SUCH AS BASEMENT WALKOUT, PATIOS, DECKS, PORCHES, SUPPORT POSTS OR PIERS, AND RIM OF THE WINDOW WELL.




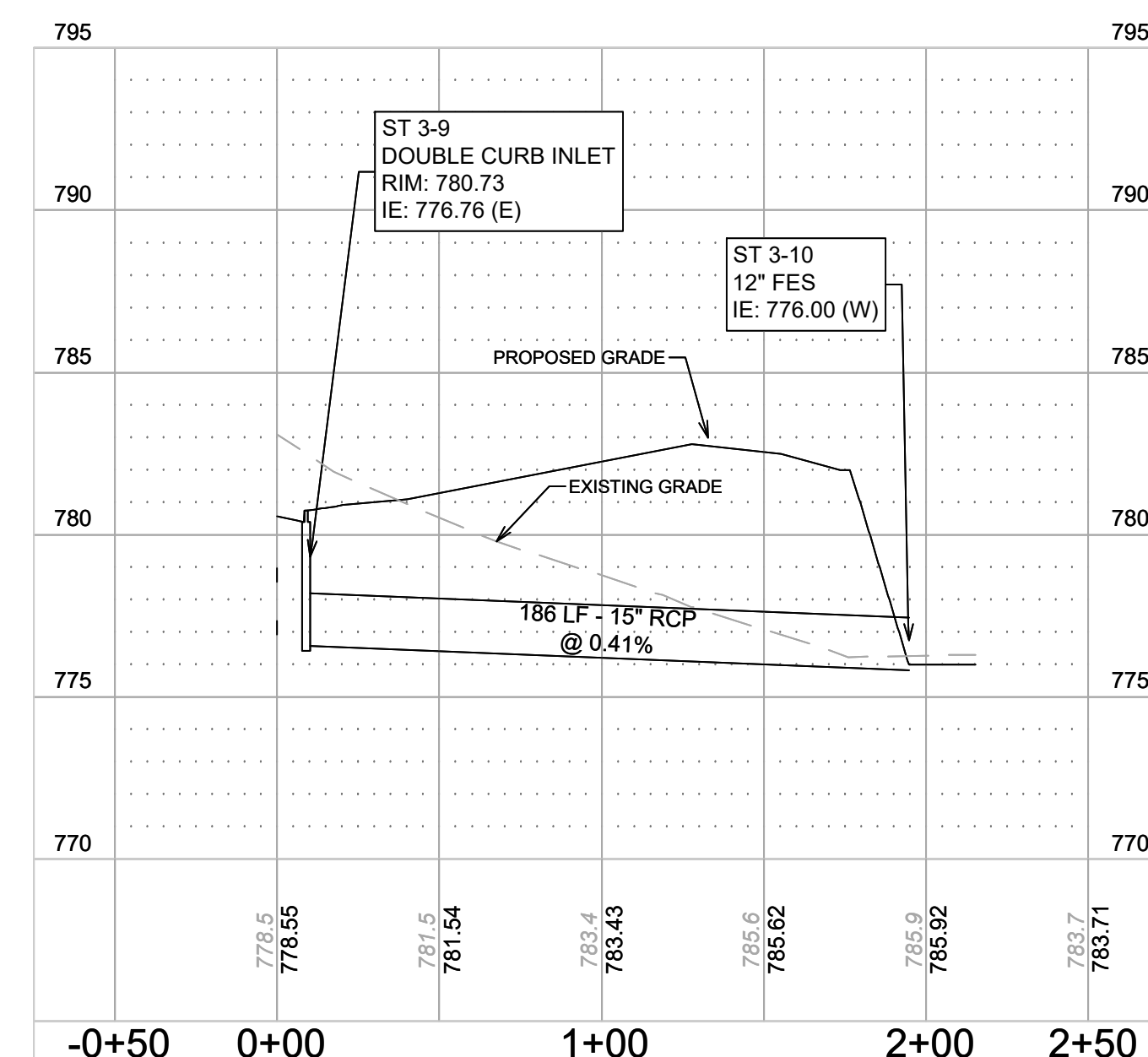
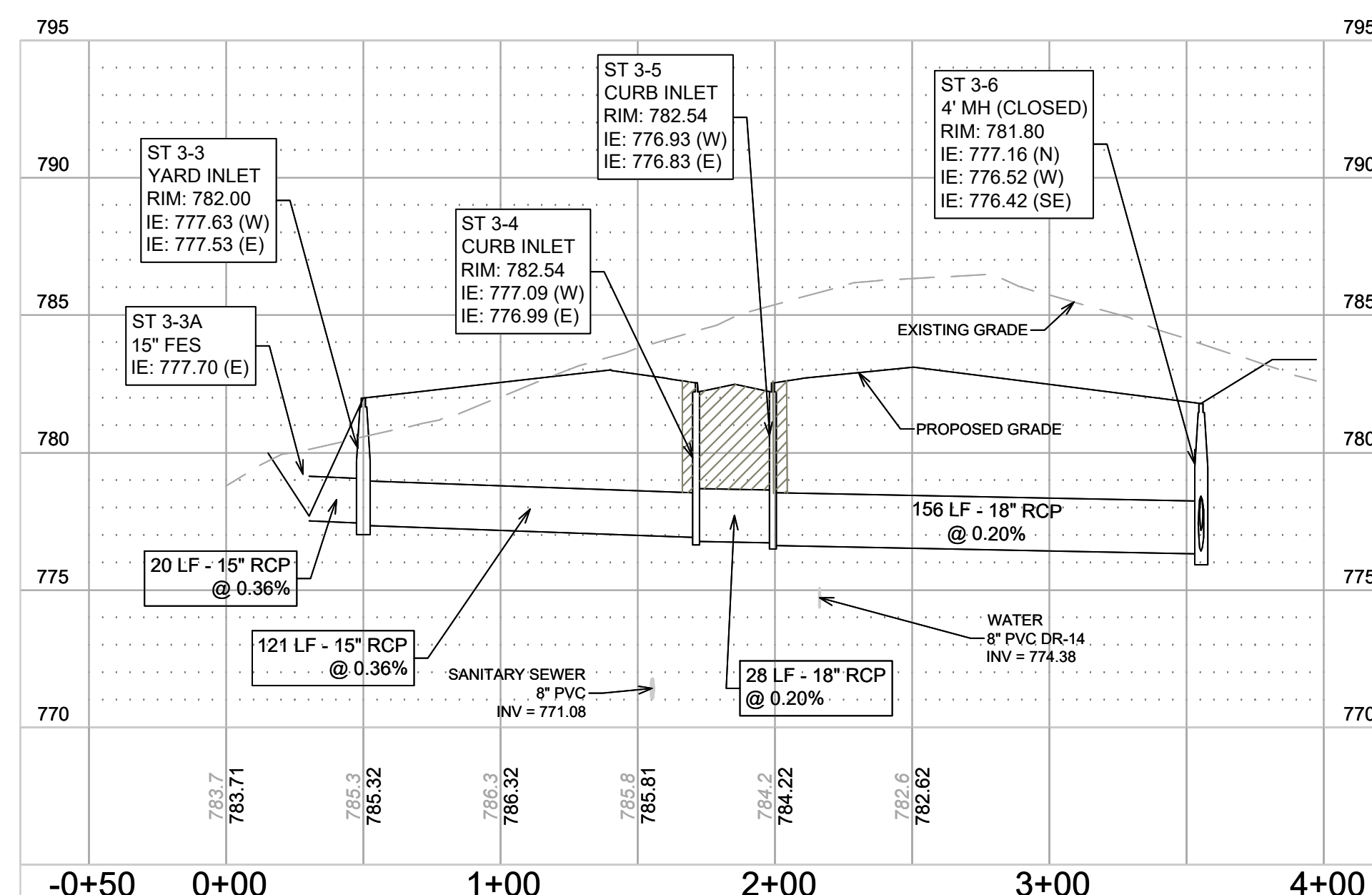
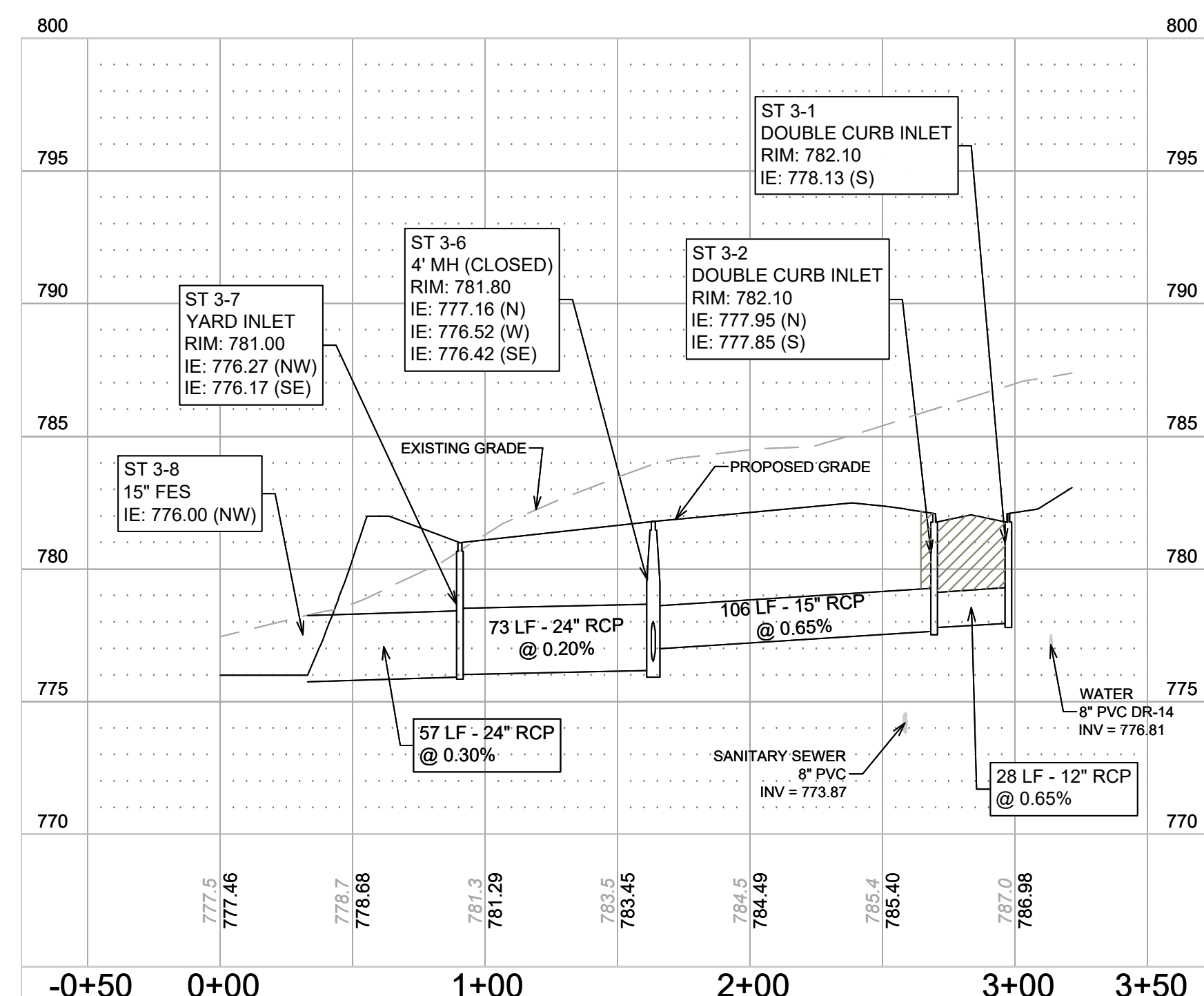
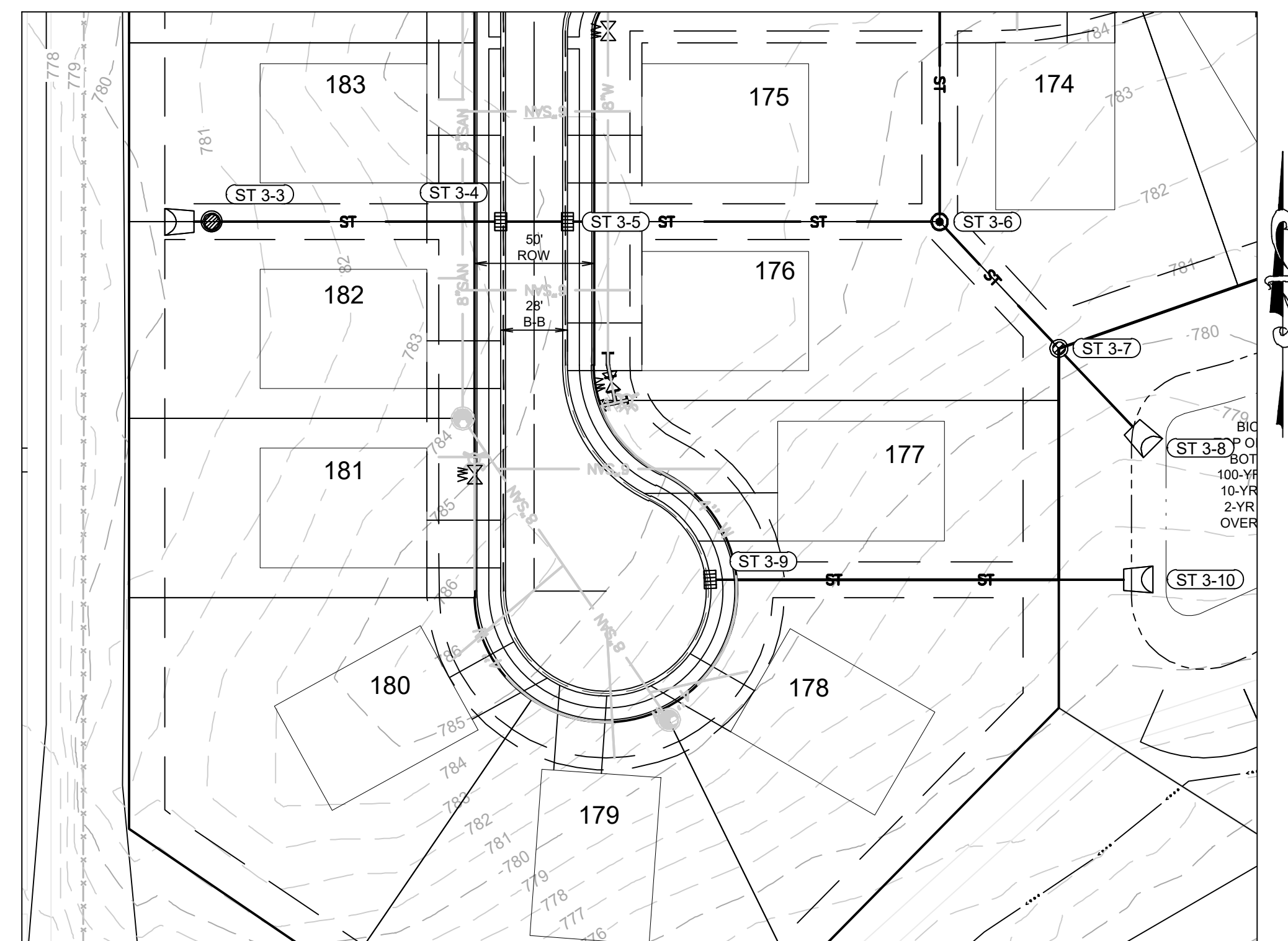
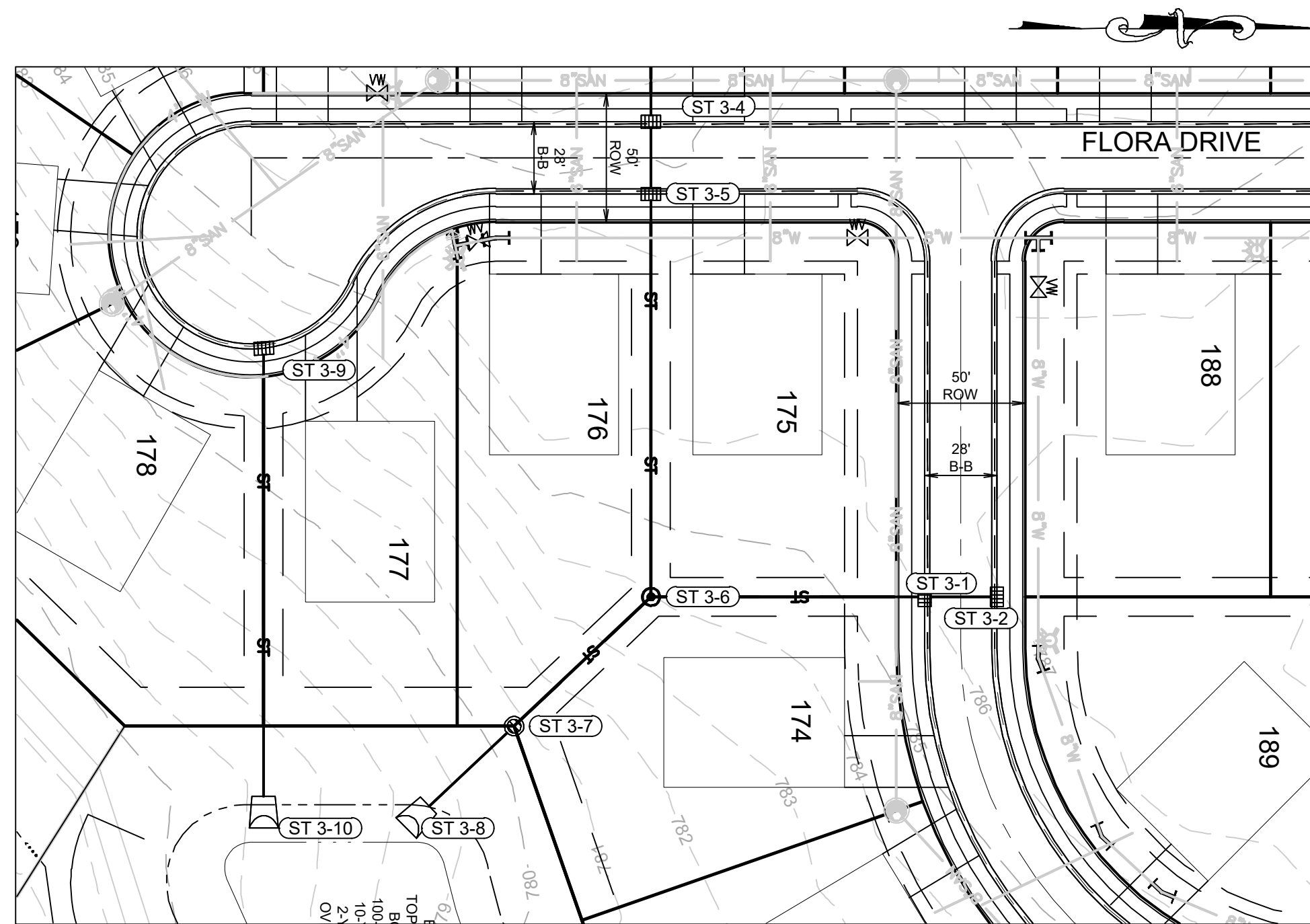
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SITE LAYOUT PLAN NOTES

1. UTILITY RELOCATIONS REQUIRED BY THE PROJECT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER. UTILITY LINE RELOCATIONS REQUIRED FOR ROAD PROJECTS THAT RESULT IN A CONFLICT WITH PROPOSED DEVELOPMENT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO RESOLVE WITH THE UTILITY. EXISTING POLE LINES REQUIRED TO BE RELOCATED SHALL BE RELOCATED TO WITHIN ONE FOOT OF THE PROPOSED RIGHT-OF-WAY LINE.
2. DEPTH OF ALL EXISTING ONSITE UTILITIES SHALL BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION TO CONFIRM THERE ARE NO CONFLICTS WITH OTHER UTILITIES, STORM SEWERS, OR STREETS. ANY CONFLICTS FOUND AFTER THE BEGINNING OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
3. ALL PAVING WITHIN THE EXISTING AND PROPOSED CITY RIGHT-OF-WAY SHALL CONFORM TO THE REQUIREMENTS OF THE DEPARTMENT OF ENGINEERING. THE CONTRACTOR SHALL CONTACT THE DEPARTMENT OF ENGINEERING TO SCHEDULE A PRE-CONSTRUCTION MEETING TO REVIEW THE DEPARTMENT CONSTRUCTION REQUIREMENTS. STAFF NOTIFICATION REQUIREMENTS AND REQUESTS FOR CERTAIN STAGES OF THE WORK AND TO REVIEW THE AUTHORITY OF THE DEPARTMENT AS IT RELATES TO WORK WITHIN THE EXISTING AND PROPOSED RIGHT-OF-WAY.
4. DAMAGE TO THE EXISTING RIGHT-OF-WAY SHALL BE RESTORED/REPAIRED TO THE SATISFACTION OF THE CITY AT THE COMPLETION OF THE PROJECT. THE CONTRACTOR IS ENCOURAGED TO INSPECT THE RIGHT-OF-WAY WITH THE CITY PRIOR TO THE START OF CONSTRUCTION TO DOCUMENT THE EXISTING CONDITION OF THE RIGHT-OF-WAY.
5. UNLESS OTHERWISE NOTED, DRIVEWAY WIDTHS ARE 20'-0".

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	<p>PROJECT MANAGER:</p>		<p>DESIGNED BY:</p>		<p>DRAWN BY:</p>		<p>PGS</p>		<p>NO</p>		<p>DATE</p>		<p>DESCRIPTION</p>	
	<p>DAM</p>		<p>DAM</p>		<p>DAM</p>		<p>DAM</p>		<p>NO</p>		<p>DATE</p>		<p>DESCRIPTION</p>	
	<p>DAM</p>		<p>DAM</p>		<p>DAM</p>		<p>DAM</p>		<p>NO</p>		<p>DATE</p>		<p>DESCRIPTION</p>	
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STORMSEWER PROFILE ST 3-1 TO ST 3-8
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

STORMSEWER PROFILE ST3-3 TO ST 3-6
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

STORMSEWER PROFILE ST 3-9 TO ST 3-10
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

NOTES

1. CONTRACTOR TO FIELD VERIFY LOCATION, INVERT, AND SIZE OF ALL EXISTING UTILITIES PRIOR TO ORDERING MATERIALS OR BEGINNING UTILITY WORK. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES IMMEDIATELY.
2. UNLESS INDICATED OTHERWISE, FRAME AND OPEN LID STORM STRUCTURES IN PAVEMENT SHALL BE NEENAH R-2502 WITH TYPE D LID OR APPROVED EQUAL, AND FRAME AND CLOSED LID STORM STRUCTURES IN PAVEMENT SHALL BE NEENAH R-1772 (OR APPROVED EQUAL). OPEN SPACE SHALL BE R-4340-B OR APPROVED EQUAL. ALL FRAME AND GRATES SHALL CONFORM TO LOCAL MUNICIPALITY REQUIREMENTS. FRAME AND CLOSED LID STORM STRUCTURES LOCATED WITHIN AN ACCESSIBLE ROUTE SHALL BE "NEENAH R-1772 WITH TYPE C LID (OR EQUIVALENT) WITH PERMA-GRIP SURFACE. DRILL 1-1" DIAMETER LIFT HOLE INSTEAD OF A STANDARD PICK HOLE.
3. THE STATIONING OF GRANULAR BACKFILL IS REPORTED AS THE DISTANCE (IN FEET) FROM THE NEAREST DOWNSTREAM STRUCTURE.

THE STORM SEWER SYSTEM SHALL BE CONSTRUCTED PER DESIGN SPECIFIED AND AS APPROVED BY THE CITY OF FRANKLIN ON THE FINAL APPROVED CONSTRUCTION PLANS. DEVIATIONS FROM THE APPROVED DESIGN SHALL ONLY BE PERMITTED DUE TO SPECIAL CIRCUMSTANCES OR DIFFICULTY DURING CONSTRUCTION AND WILL REQUIRE PRIOR FIELD APPROVAL FROM A DESIGNATED REPRESENTATIVE OF THE CITY OF FRANKLIN IN ADDITION TO SUPPLEMENTAL APPROVAL BY THE DESIGN ENGINEER. AN EXPLANATION OF ANY SUCH DEVIATION SHALL BE INCLUDED AS A REQUIREMENT ON AS-BUILT/RECORD DRAWINGS SUBMITTED FOR RELEASE OF PERFORMANCE GUARANTEES. APPROVED DESIGN SLOPES IDENTIFIED AS GENERATING VELOCITIES OF 2.5 FPS OR LESS OR 10 FPS OR GREATER (AT FULL FLOW CAPACITY) SHALL REQUIRE AS-BUILT CERTIFICATION AT THE TIME OF CONSTRUCTION, PRIOR TO BACKFILLING THE PIPE. THE CONTRACTOR IS INSTRUCTED TO AS-BUILT EACH SECTION OF STORM PIPE AS IT IS BEING INSTALLED TO ENSURE COMPLIANCE WITH THE DESIGN PLANS AND AS APPROVED BY THE CITY OF FRANKLIN.

PROJECT NO.: 21197.3		ORIGINAL ISSUE DATE: 09/04/2024				REVISIONS	
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		#	#		#	#	#
		#	#		#	#	#
DRAWN BY:		#	#		#	#	#
PGS		#	#		#	#	#


STORM PLAN AND PROFILES

KINGSBRIDGE SECTION 3

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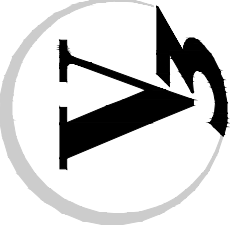
STORM STRUCTURE TABLE				
STRUCTURE	DESCRIPTION	RIM	INVERT IN	INVERT OUT
ST 3-1	DOUBLE CURB INLET	RIM: 782.10		778.13 (12° S)
ST 3-2	DOUBLE CURB INLET	RIM: 782.10	777.95 (12° N)	777.85 (15° S)
ST 3-3	YARD INLET	RIM: 782.00	777.63 (15° W)	777.53 (15° E)
ST 3-3A	15" FES	RIM: 777.70		777.70 (15° E)
ST 3-4	CURB INLET	RIM: 782.54	777.09 (15° W)	776.99 (18° E)
ST 3-5	CURB INLET	RIM: 782.54	776.93 (18° W)	776.83 (18° E)
ST 3-6	4' MH (Closed)	RIM: 781.80	777.16 (15° N) 776.52 (18° W)	776.42 (24° SE)
ST 3-7	YARD INLET	RIM: 781.00	776.27 (24° NW)	776.17 (24° SE)
ST 3-8	15" FES	RIM: 776.00	776.00 (24° NW)	
ST 3-9	DOUBLE CURB INLET			776.76 (15° E)
ST 3-10	12" FES	RIM: 776.00	776.00 (15° W)	

SANITARY STRUCTURE TABLE				
STRUCTURE	DESCRIPTION	RIM	INVERT IN	INVERT OUT
SAN 3-1	4' Sanitary MH	RIM: 783.50	770.50 (8° S) 772.97 (8° E)	770.40 (8° N)
SAN 3-2	4' Sanitary MH	RIM: 783.47	774.34 (8° NE)	774.24 (8° W)
SAN 3-3	4' Sanitary MH	RIM: 787.08		780.07 (8° SW)
SAN 3-5	4' Sanitary MH	RIM: 782.27	771.79 (8° SE)	771.59 (8° N)
SAN 3-6	4' Sanitary MH	RIM: 781.48		773.00 (8° NW)

STRUCTURE DATA TABLES

KINGSBRIDGE SECTION 3

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PROJECT NO.:
211197.3

PROJECT MANAGER:
DAM

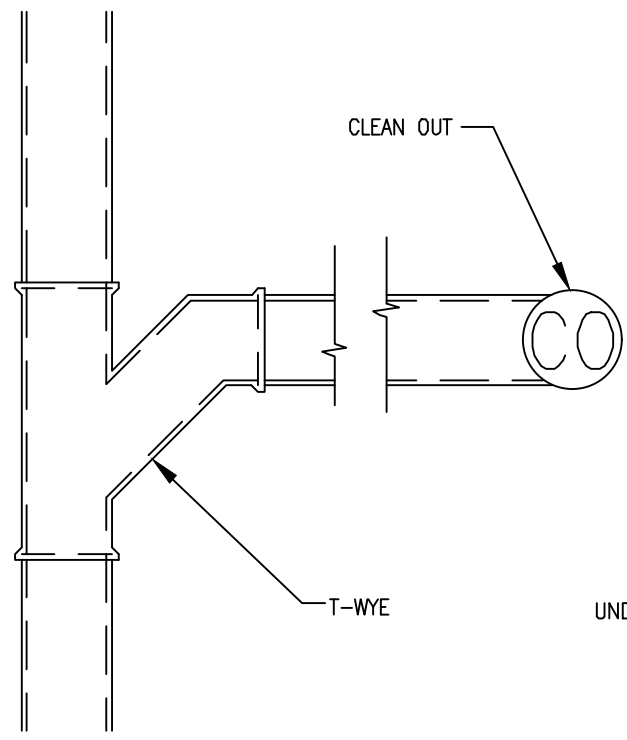
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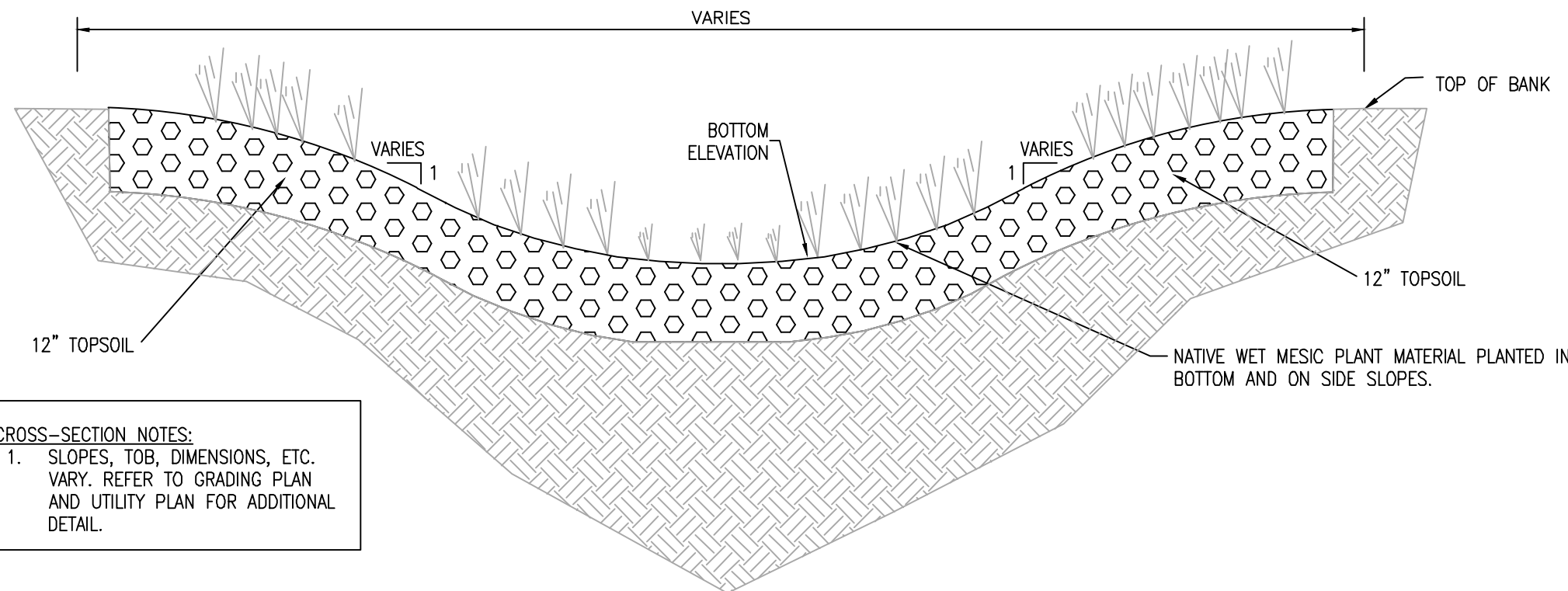
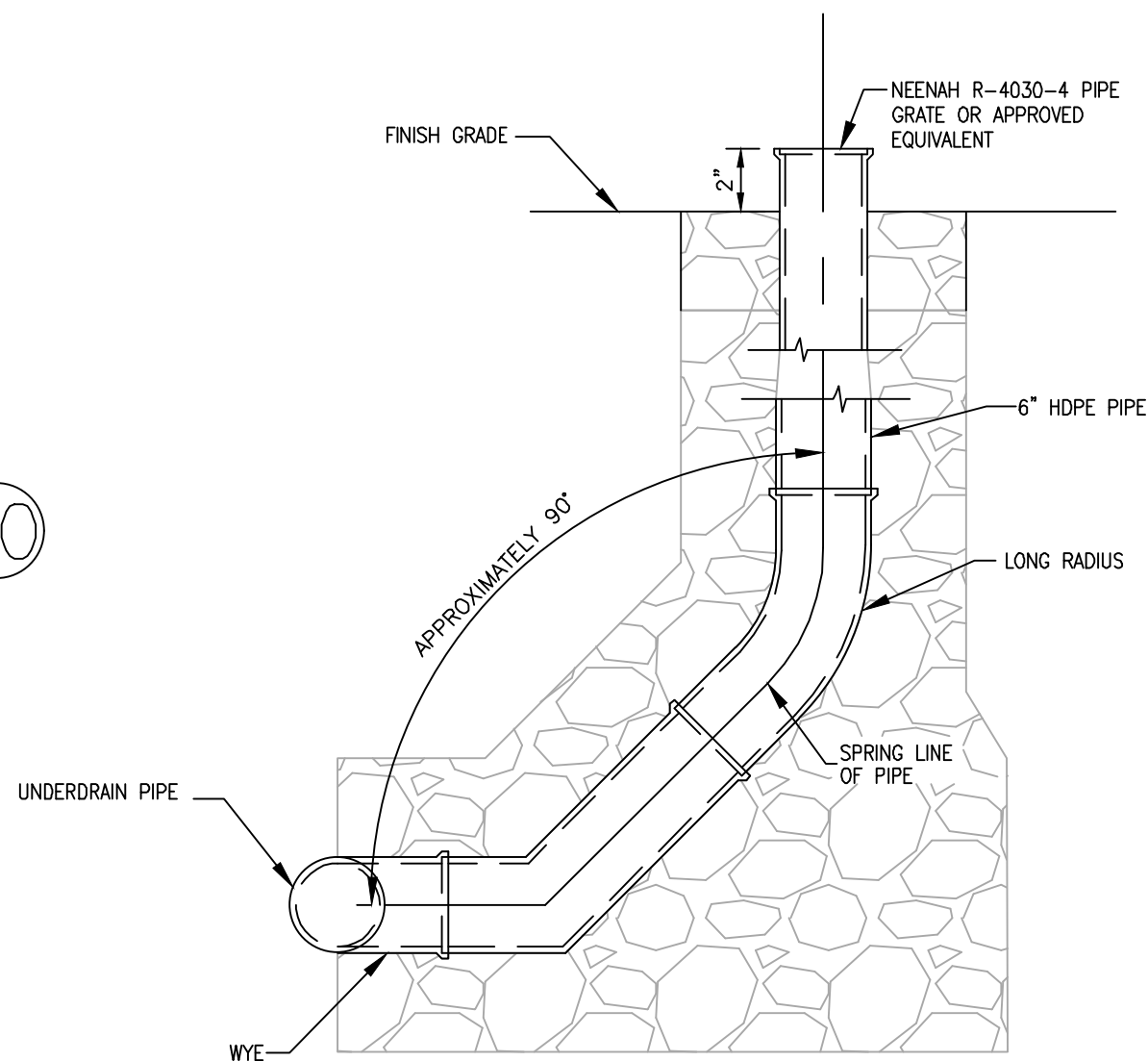
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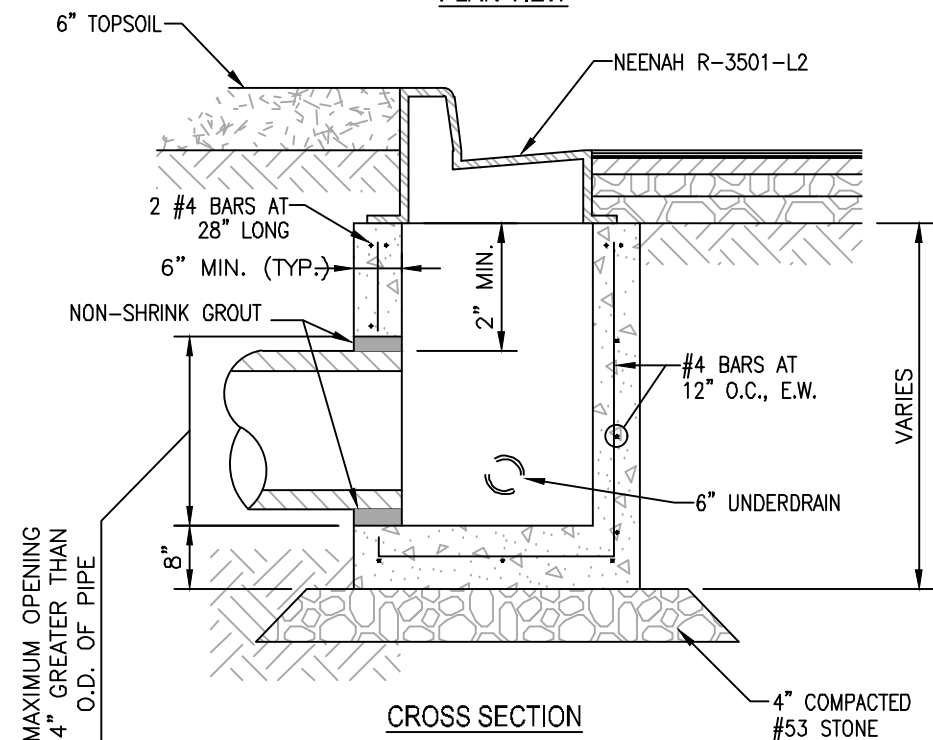
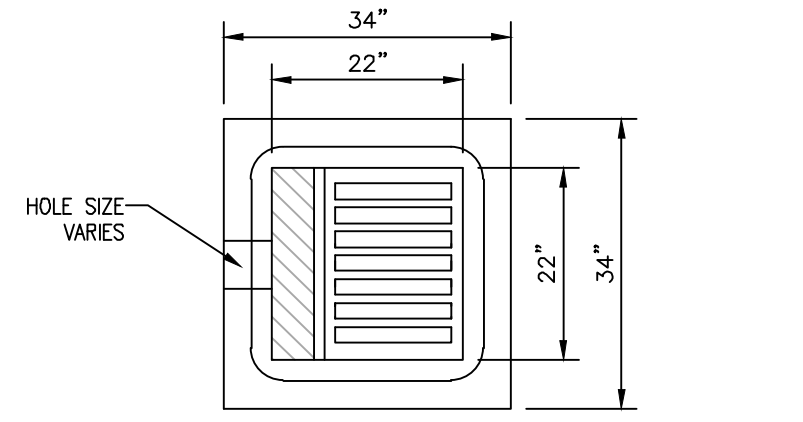
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05 UNDERDRAIN CLEANOUT DETAIL
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NOT TO SCALE



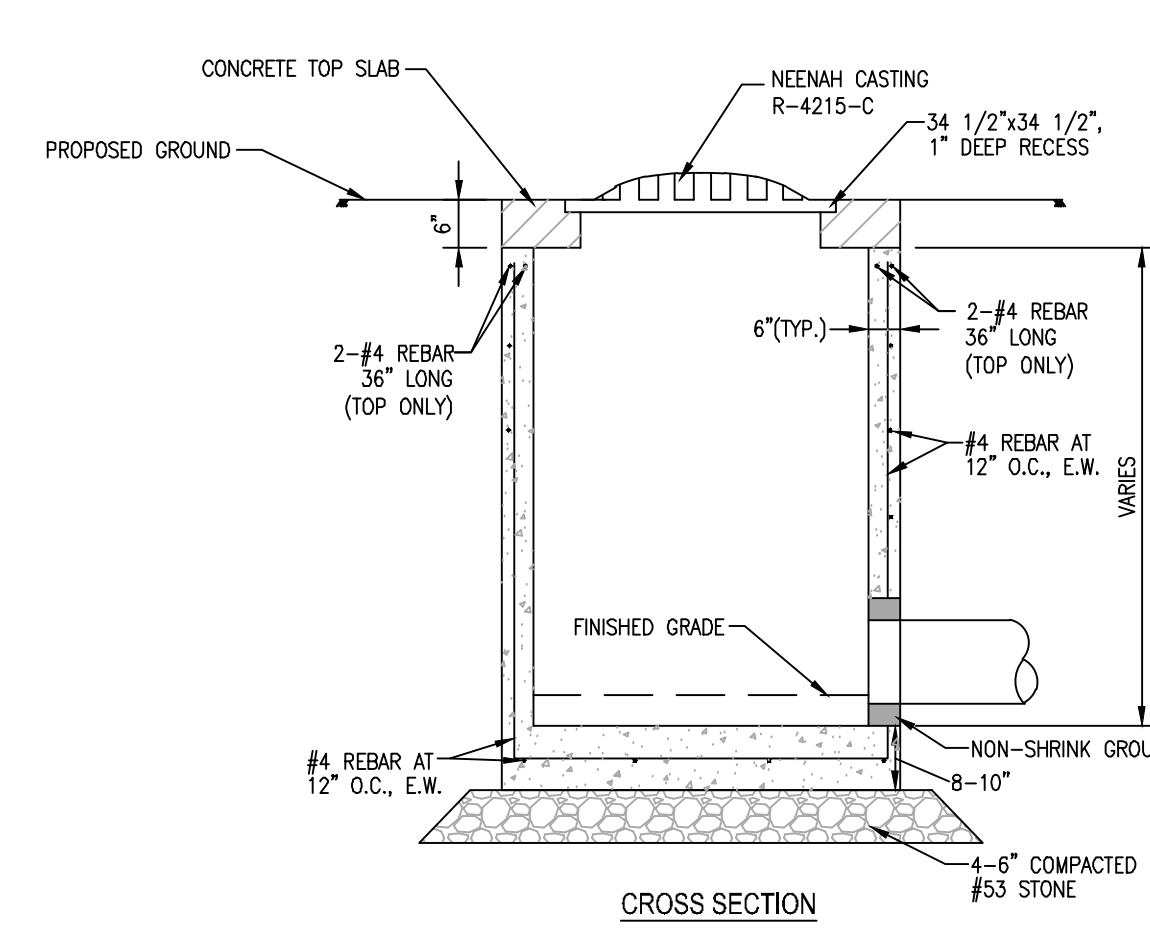
02 TYPICAL DRY DETENTION CROSS SECTION (SWM 7)
C8.1
NOT TO SCALE



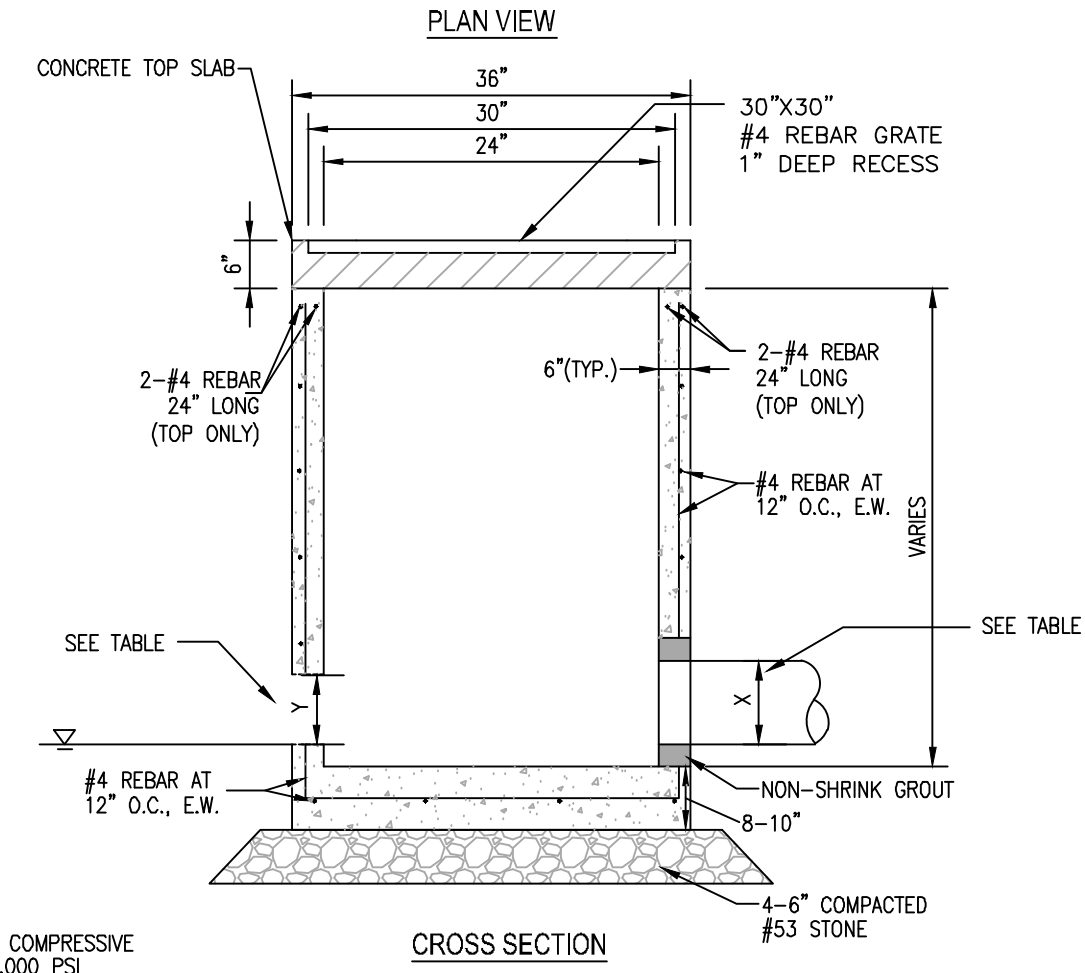
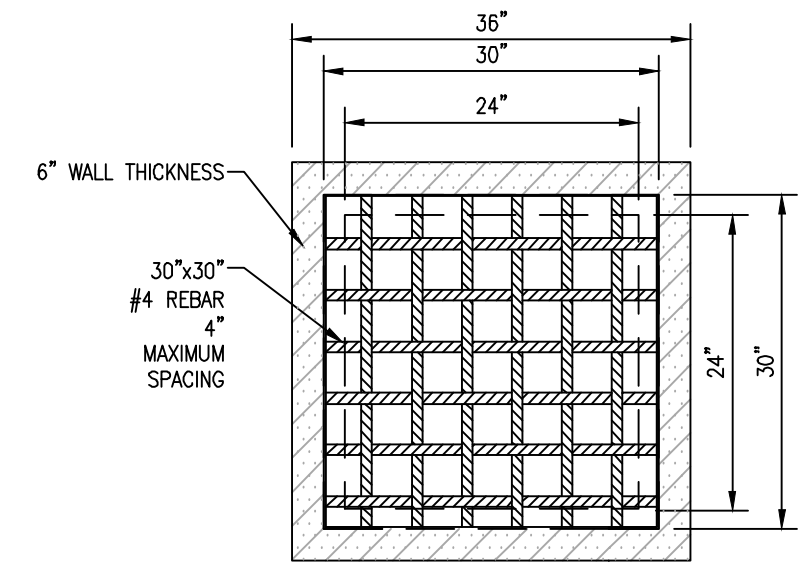
04 CURB INLET
C8.1
NOT TO SCALE

NOTES:

1. ALL STORM SEWERS SHALL BE CONSTRUCTED WITH REINFORCED CONCRETE PIPE CLASS III OR AS NOTED AND CONFORM TO A.S.T.M. C-76 OR LATEST REVISION. ALL MANHOLES SHALL BE PRECAST CONCRETE CONSTRUCTION IN ACCORDANCE WITH THE STATE OF INDIANA SPECIFICATIONS AND SHALL HAVE A TYPE "A" CAST IRON RING AND COVER.
2. ALL CASTINGS SHALL BE LABELED "DUMP NO WASTE - DRAINS TO WATERWAY" AND HAVE EMBOSSED ENVIRONMENTAL LOGO "FISH"



03 YARD INLET
C8.0
NOT TO SCALE

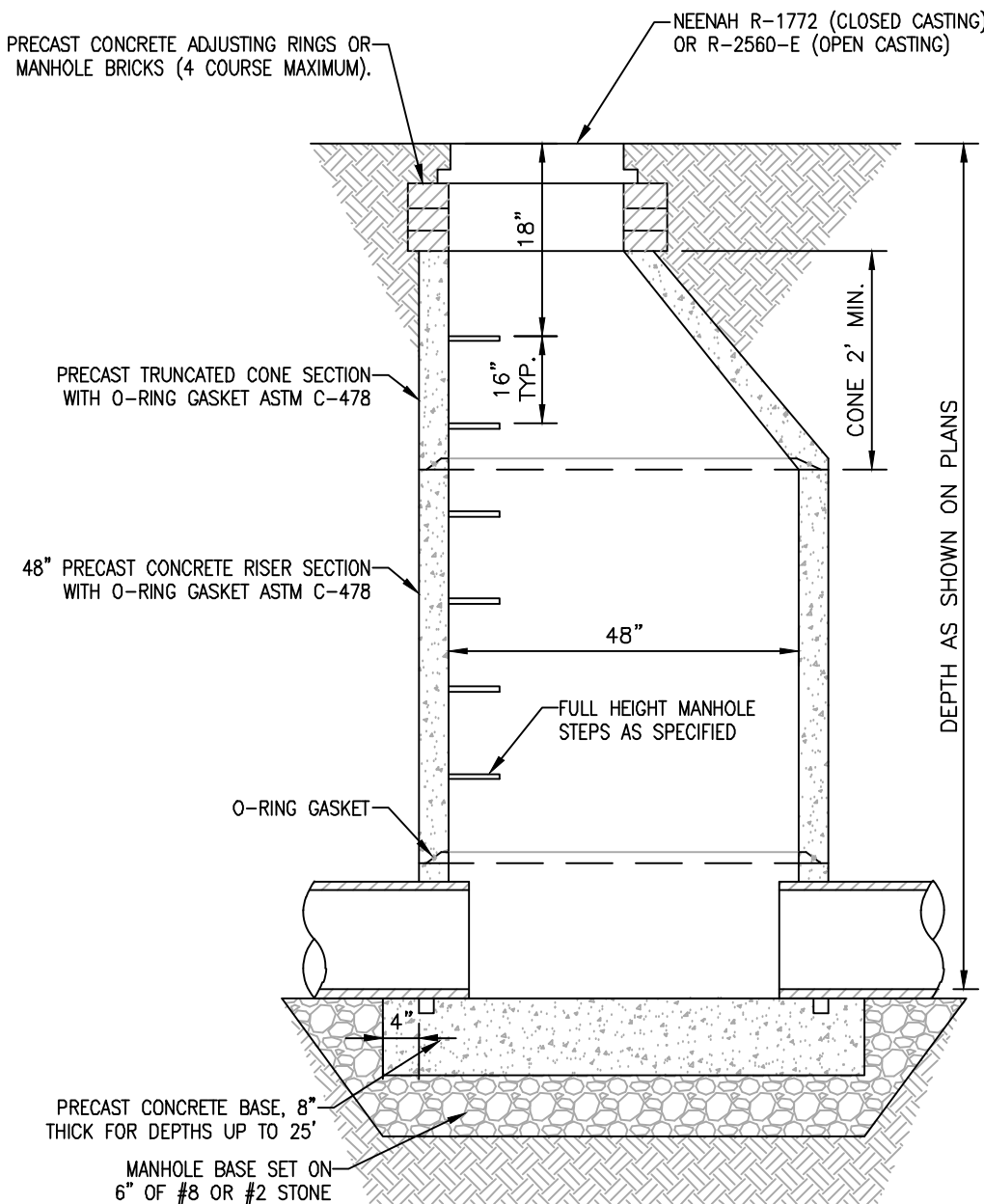


NOTES:

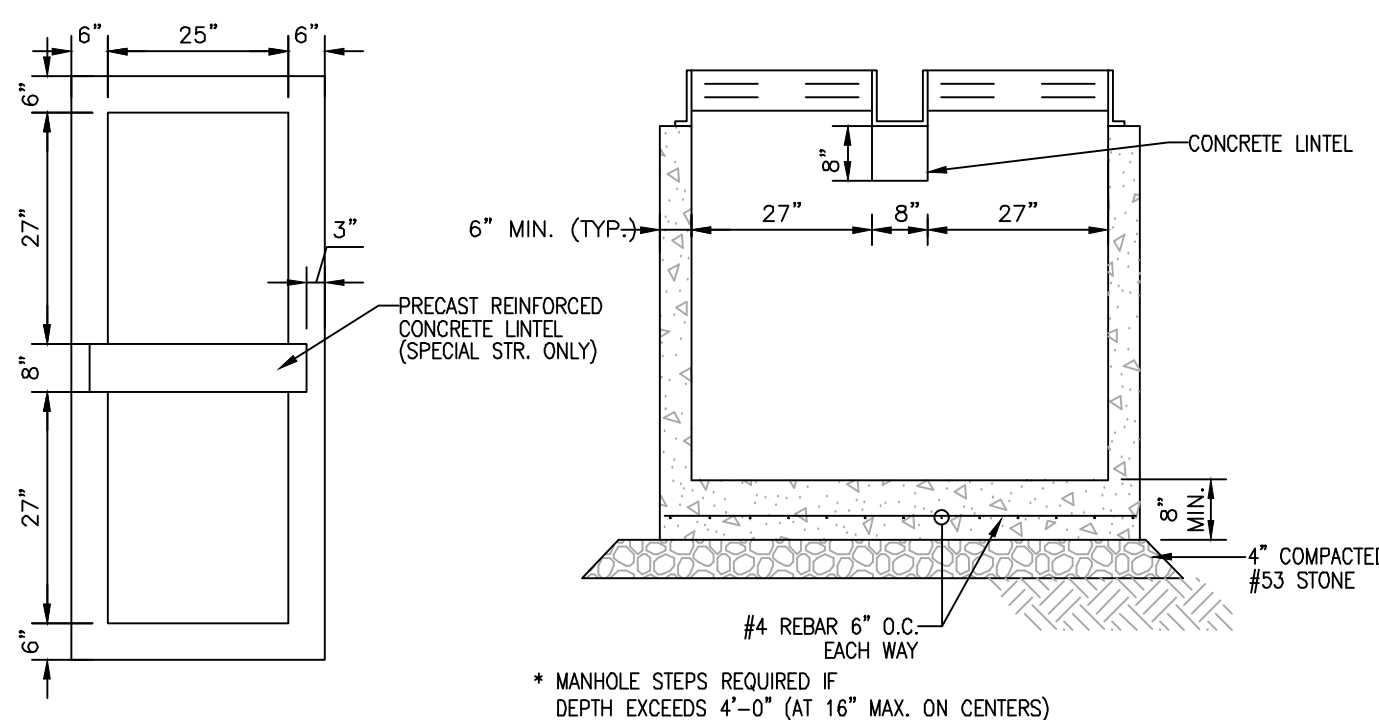
1. CONCRETE, 28 DAY COMPRESSIVE STRENGTH F'C = 5,000 PSI
2. STEEL REINFORCEMENT: ASTM A-615, GRADE 60
3. COVER TO STEEL-1" MINIMUM
4. CATCH BASINS ARE DESIGNED TO MEET ASTM C898 AND ACI 318 WITH ASHTO HS-20 LOADING
5. CONSTRUCTION JOINT SEALED WITH 1" DIA. BUTYL SEALANT
6. MAX PIPE SIZE: 18" RCP#
7. TOP SLAB (IF NEEDED), OPENING PER ENGINEERS' SPECIFICATIONS

OUTLET CONTROL STRUCTURES					
STRUCTURE NO.	OUTLET SIZE (X)	OUTLET INVERT	ORIFICE SIZE (Y)	ORIFICE ELEVATION	TOP OF CASTING ELEVATION
ST 6-1	12"	776.00	4"	776.00	779.50
ST 7-2	15"	772.60	8"	772.60	775.85

01 OUTLET CONTROL STRUCTURE (TYPICAL)
C8.0
NOT TO SCALE



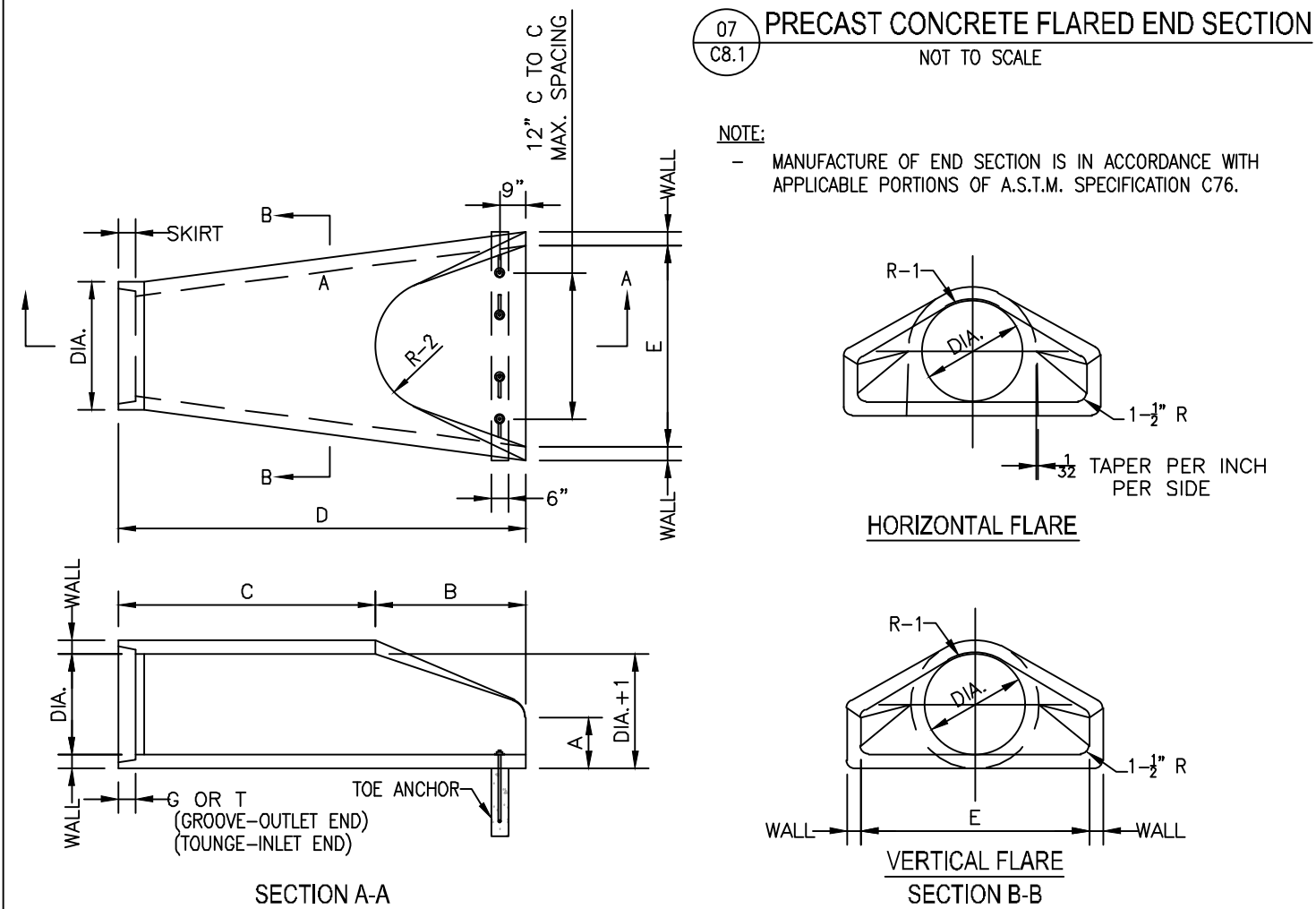
05 FOUR FOOT DIAMETER CATCH BASIN
C8.1
NOT TO SCALE



NOTES:

1. ALL STORM SEWERS SHALL BE CONSTRUCTED WITH REINFORCED CONCRETE PIPE CLASS III OR AS NOTED AND CONFORM TO A.S.T.M. C-76 OR LATEST REVISION. ALL MANHOLES SHALL BE PRECAST CONCRETE CONSTRUCTION IN ACCORDANCE WITH THE STATE OF INDIANA SPECIFICATIONS AND SHALL HAVE A TYPE "A" CAST IRON RING AND COVER.
2. ALL CASTINGS SHALL BE LABELED "DUMP NO WASTE - DRAINS TO WATERWAY"

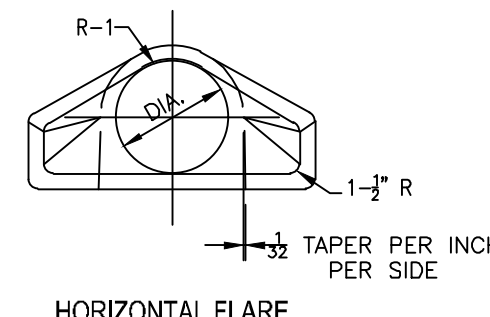
03 DOUBLE ROLL CURB INLET
C8.1
NOT TO SCALE



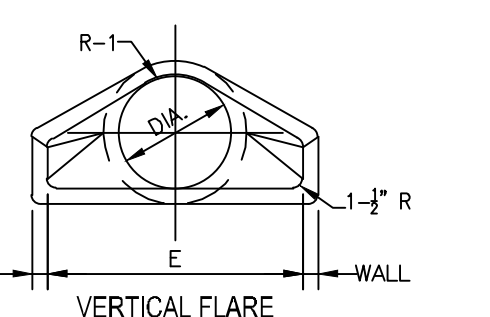
07 PRECAST CONCRETE FLARED END SECTION
C8.1
NOT TO SCALE

NOTE:

MANUFACTURE OF END SECTION IS IN ACCORDANCE WITH APPLICABLE PORTIONS OF A.S.T.M. SPECIFICATION C76.

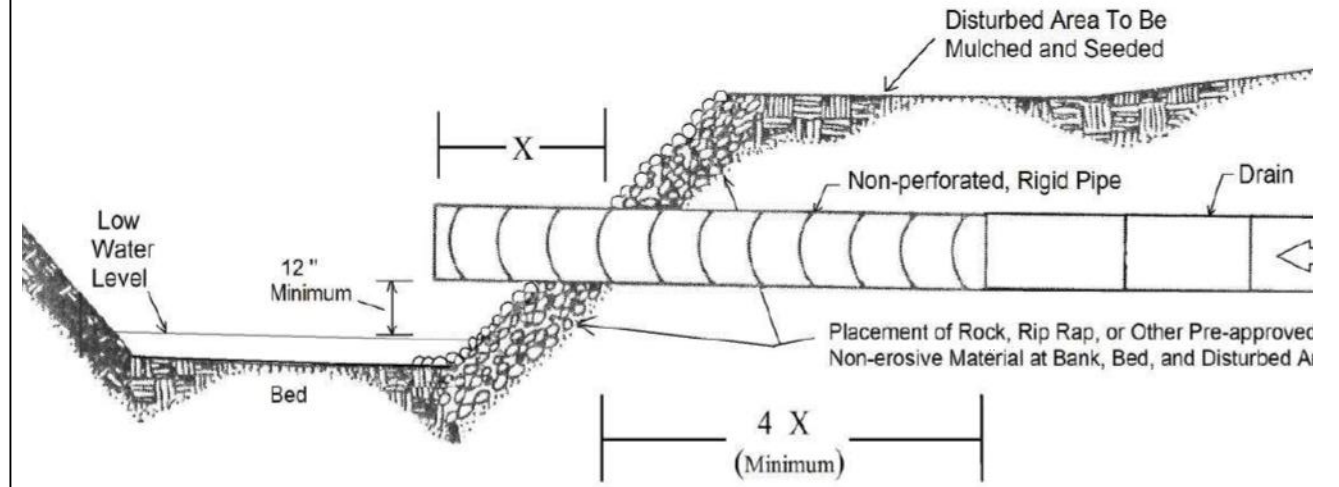


HORIZONTAL FLARE



VERTICAL FLARE

Di.	Wall	G or T	Wt. Sec.	A	B	C	D	E	Di.+1	R-1	R-2	Skirt
12	2	1/2	530	4	24	48	74	24	13	10 1/2	9	3 1/2
15	2 1/2	2	740	6	27	46	73	30	16	12	11	4
18	2 1/2	2 1/2	990	9	27	46	73	36	19	12 1/2	12	4
21	2 1/2	2 1/2	1280	9	35	38	73	42	22	14	13	4
24	3	2 1/2	1520	12	43	30	73 1/2	48	25	16 1/2	14	4 1/2
27	3 1/2	2 1/2	1930	10 1/2	48	25 1/2	73 1/2	54	28	17 1/2	14 1/2	4 1/2
30	3 1/2	3	2190	12	54	19 1/2	73 1/2	60	31	18 1/2	15	5
33	3 1/2	3 1/2	3150	13 1/2	58 1/2	34 1/2	97 1/2	66	34	23 1/2	17 1/2	5 1/2
36	4	3 1/2	4100	15	63	34 1/2	97 1/2	72	37	24 1/2	20	5 1/2



Note: Call for inspection prior to covering pipe, and at project completion.
Pipes 12 inches and Above Require Headwall

Johnson Co Surveyors Office
86 W. Court Street, Franklin, Indiana
P. 317-346-4343

Scale
ed May 10, 2021

David A. Muck



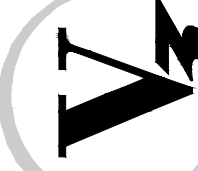
STORM DETAILS

KINGSBRIDGE SECTION 3

INDIANA

FRANKLIN

619 N Pennsylvania Street
Indianapolis, IN 46204
317.423.0680 phone
www.v3co.com



DRAWING NO.

C8.0