# CITY OF CHARLES TOWN
## PLANNING COMMISSION
## AGENDA • APRIL 22, 2024

**Commission/Board Meeting** **CITY HALL** **7:00 PM**

**101 E Washington Street, Charles Town, WV 25414**

**1. CALL TO ORDER**

**2. WORK SESSION**

: TXA2024-04: Preliminary Plan Public Participation
1. Report.pdf

: TXA2023-09 Neighborhood Residential Uses
1. Report.pdf

**3. CALL TO ORDER**

**4. APPROVAL OF MINUTES**

21. : February 26, 2024 DRAFT Minutes
2.26.24 PC MINUTES_DRAFT.pdf

**5. UNFINISHED BUSINESS**

**6. NEW BUSINESS**

: *Commission Review*: **SLD2022-04**: *Hillside* Preliminary Plans
1. Staff Report.pdf
2. Plan Application.pdf
3. Revised Plans.pdf
4. KH Comments.pdf

: *Commission Review*: **SLD2024-01**: *University Healthcare* Sketch Plan
Note: Applicant will have a sketch plan public hearing next month
1. Staff Report.pdf
2. Application.pdf
3. Plans.pdf
4. KH Comments.pdf

: *Commission Review*: **BR2024-05** - Huntfield Bond Extension Request
1. Staff Report.pdf
2. Application.pdf
3. Bond Letter of Credit (United Bank).pdf
4. Surety bond.pdf

**7. ADJOURNMENT**

**8. NOTICE: The Public May View the Meeting Live by Clicking on the Event Link at:**

**https://www.charlestownwv.us/government/agendas-and-minutes/**

**Planning Commission**
101 East Washington Street
Charles Town, WV 25414

**SCHEDULED**

Meeting: 04/22/24
Department: Planning Commission
Category: Report
Initiator:

**AGENDA ITEM (ID # )**

## TXA2024-04: Preliminary Plan Public Participation

**ATTACHMENTS:**

- 1. Report.pdf

*TXA2024-04*

*Preliminary Plan Public Participation*

**Date**: For the April 22, 2024 Planning Commission work session
**Report by**: James Newman, City Planner, Zoning/Subdivision Administrator.

## ISSUE

There are three phases a major subdivision/land development must go through. The first is a sketch plan, which is open to public comment at the Planning Commission. The second phase, a preliminary plan, is much more detailed, but not subject to public comment at the Planning Commission. The final phase is the final plan, which is reviewed and approved/denied administratively.

As the City continues to see large scale development, especially residential, it is imperative that the public be able to provide participate in the planning process. The purpose of this text amendment is to open the preliminary plan phase of development to public comment. Generally the level of detail the public is interested in is not available at the sketch plan phase; once provided at the preliminary plan phase the public has no means to provide comment in an open forum.

## PRELIMINARY PLAN

Per Subdivision Ordinance Section 1332.03.C.3.A, "*The Preliminary Plan and Plat is a site plan, including supporting data, indicating a proposed site layout design or subdivision design, prepared by, as necessary, a West Virginia registered civil engineer, land surveyor, landscape architect, architect, or land planner.*"

Per Subdivision Ordinance Section 1332.03.C.3.E.2. "*The Preliminary Plan and Plat Application shall be scheduled before the Planning Commission for a workshop approval. No notice requirements shall apply, other than standard agenda notice period. Approval by the Planning Commission is not a Public Hearing and is for the benefit of the Planning Commission to ensure the Preliminary Plat and Plan is in substantial compliance with the Sketch Plan.*"

## STATE CODE REQUIREMENTS

State Code Section 8A-5-8 governs the procedures for a hearing on a major subdivisions/land development. It lays out the requirements for a determination of completeness followed by a public hearing, which the City does through the sketch plan public hearing process. It makes no reference to preliminary plans.

**EXISTING LANGUAGE**

**Table 1332.03 – Application and Review Procedures**

| Stage | Minor Subdivisions/ Land Developments | Major Subdivisions/ Land Developments | Party Authorized To Approve | Public Hearing? |
|---|---|---|---|---|
| Pre-submission Consultation Meeting | Required | Required | Not Applicable | No |
| Sketch Plan Submission | Not Applicable | Required | Planning Commission | Yes |
| Preliminary Plan & Plat Approval | Not Applicable | Required[1] | Planning Commission | NO. PC Workshop |
| Final Plan & Plat Approval | Required | Required | Staff | No |
| Guarantee of Surety | Not Applicable | Required | Planning Commission | Yes |

[1] Preliminary Plan & Plat approval may be combined with Final Plan & Plat approval as specified in Section 1332.01(A)(3)(a) and (3)(c).

…

Section 1332.03.C.3.E.2. "At the next available Planning Commission agenda for the Planning Commission, the Preliminary Plan and Plat Application shall be scheduled before the Planning Commission for a workshop approval. No notice requirements shall apply, other than standard agenda notice period. Approval by the Planning Commission is not a Public Hearing and is for the benefit of the Planning Commission to ensure the Preliminary Plat and Plan is in substantial compliance with the Sketch Plan."

**PROPOSED LANGUAGE**

The proposed text amendment is in red below:

**Table 1332.03 – Application and Review Procedures**

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| Preliminary Plan & Plat Approval | Not Applicable | Required[1] | Planning Commission | Yes |
| Final Plan & Plat Approval | Required | Required | Staff | No |
| Guarantee of Surety | Not Applicable | Required | Planning Commission | Yes |

[1] Preliminary Plan & Plat approval may be combined with Final Plan & Plat approval as specified in Section 1332.01(A)(3)(a) and (3)(c).

…
(Proposed Redlined text)

Section 1332.03.C.3.E.2. "At the next available Planning Commission agenda for the Planning Commission, the Preliminary Plan and Plat Application shall be scheduled before the Planning Commission ~~for a workshop~~ to vote on the subject application. ~~No notice requirements shall apply, other than standard agenda notice period~~. Approval by the Planning Commission is ~~not a Public Hearing and is for the benefit of the Planning Commission~~ to ensure the Preliminary Plat and Plan is in substantial compliance with the Sketch Plan."

(a) The Planning Commission must publish a public notice of the public hearing and meeting in a local newspaper of general circulation in the City of Charles Town at least 14 calendar days prior to the scheduled public hearing, a notice posted on the property (by the applicant), and letters sent to the adjacent property owners. Adjacent Property owners are identified as properties within 100 feet of the proposed development. Adjacent Property owners include properties across a right-of-way or easement.

(Proposed Clean text version, with additions in red only)

Section 1332.03.C.3.E.2. "At the next available Planning Commission agenda for the Planning Commission, the Preliminary Plan and Plat Application shall be scheduled before the Planning Commission to vote on the subject application. Approval by the Planning Commission is to ensure the Preliminary Plat and Plan is in substantial compliance with the Sketch Plan."

(a) The Planning Commission must publish a public notice of the public hearing and meeting in a local newspaper of general circulation in the City of Charles Town at least 14 calendar days prior to the scheduled public hearing, a notice posted on the property (by the applicant), and letters sent to the adjacent property owners. Adjacent Property owners are identified as properties within 100 feet of the proposed development. Adjacent Property owners include properties across a right-of-way or easement.

**Planning Commission**
101 East Washington Street
Charles Town, WV 25414

**SCHEDULED**

Meeting: 04/22/24
Department: Planning Commission
Category: Report
Initiator:

**AGENDA ITEM (ID # )**

## TXA2023-09 Neighborhood Residential Uses

**ATTACHMENTS:**

- 1. Report.pdf

*Neighborhood Residential Use Mix Review*

**Date**: For the April 22, 2024 Planning Commission Special Work Session
**Report by**: James Newman, City Planner, Zoning/Subdivision Administrator.

## ISSUE

While the NR zoning district allows for some recreational uses by-right (such as parks, tennis courts, gym), the only retail use permitted is a convenience store open 15-16 hours/day. That is the sole commercial use allowed at all, either by-right or with a special exception. Additionally, the only office use allowed at all is a government office building. The requirement for Neighborhood Commercial (NC) uses does not specify that such uses must be commercial in nature, and must be corrected.

## PURPOSE

The purpose of the NR District is to provide for a mix of housing types and related services and Uses, including Commercial Uses and office services. It is the intent of the zoning classification to allow mixed development on undeveloped land and, where applicable as may be further described in this Ordinance, the Redevelopment of specific parcels within the City.

The NR District applies to parcels or tracts larger than five (5) acres. The intent is to create a cohesive pattern of primarily residential development that allows a mix of Uses, including neighborhood servicing Commercial and office Uses and/or Commercial and office Uses that complement the primarily residential character of the neighborhood.

## CITY COUNCIL

On September 5, 2023, City Council unanimously voted to refer this item to the Planning Commission for discussion and eventual public hearing.

## PLANNING COMMISSION

The Commission reviewed this item at their October 23, 203 work session. The Commission requested staff modify the language about NC Use requirements in NR zoning, and requested some modifications to permitted uses.

The Commission reviewed this item at their November 27, 2023 meeting. The Commission discussed removal of reference to Neighborhood Commercial, and to simplify by stating that the required 10% to be *non-residential* uses. They asked staff to provide a comparison of the R15, NR, NC Districts.

The Commission reviewed this item at their January 30, 2024 meeting. The Commission asked staff to prepare a matrix of uses with definitions and status in the NR district.

The Commission reviewed this item at their March 25, 2024 meeting. The Commission reviewed the staff-proposed changes and made suggestions.

**NEIGHBORHOOD RESIDENTIAL**

*Purpose*: The purpose of the NR District is to provide for a mix of housing types and related services and Uses, including Commercial Uses and office services. It is the intent of the zoning classification to allow mixed development on undeveloped land and, where applicable as may be further described in this Ordinance, the Redevelopment of specific parcels within the City. The NR District applies to parcels or tracts larger than five (5) acres. The intent is to create a cohesive pattern of primarily residential development that allows a mix of Uses, including neighborhood servicing Commercial and office Uses and/or Commercial and office Uses that complement the primarily residential character of the neighborhood.

**POTENTIAL USES**

Proposed use changes are based on the intent of the district.

**NOTE**: Uses not defined in our Code take their definitions from the Institute of Transportation Engineers manual (per City Code regulations) **unless otherwise specified**.

Red Text in the *NR* column is the staff proposed use permission level: P = permitted by-right, S= Special Use Permit required, blank = not permitted at all.

**TABLE 1322.04, Zoning District Use Table**

| ITE CODE | USE | NR |
|---|---|---|
| 090 | Park-and-Ride Lot<br><br>Not defined. Proposed definition:<br>PARK AND RIDE LOT – Park and ride lots, with bus or other public or shared transportation service areas used for the transfer of people between private vehicles and buses or other public or shared transportation. They usually contain a bus shelter, a parking lot and circulation area for buses or other public or shared transportation, as well as circulation areas for private motor vehicles. In addition to park and ride, passengers may also be dropped off.<br><br>Note: Definition slightly modified from the ITE definition, to include passenger/shared transportation, to broaden the category beyond just buses and private cars. | |
| 210 | Single-Family Detached Housing<br><br>DWELLING, SINGLE-FAMILY DETACHED – A Building containing only a Dwelling Unit surrounded by Yards or other open area on the same Lot and not occupied by more than one single Family. | P |
| * | Duplex<br><br>DWELLING, DUPLEX – A Building located on two Lots and containing two individual Dwelling Units that are attached, but on separate Lots. | P |
| | *Go to next page* | |

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| * | Dwelling, Two Family<br>DWELLING, TWO-FAMILY – A Building located on one Lot containing not more than two Dwelling Units, arranged one above the other or side-by-side. | P |
| 220 | ~~Apartment~~ Multi-Family Dwelling<br>DWELLING, MULTI-FAMILY – A Building containing three or more Dwelling Units.<br><br>Note: Apartment not defined. Propose replacing with Multi-family. | P |
| 230 | Residential Condominium/Townhouse<br>DWELLING, TOWNHOUSE – One of a series of three or more attached Dwelling Units separated from one another by continuous vertical party walls without openings from Basement floor to roof, with each Dwelling Unit occupied by only one single Family. | P |
| 240 | Mobile Home Park<br><br>MOBILE HOME PARK – A Lot or tract of land used or intended to accommodate Mobile Homes for residential purposes with adequate public or community water and sewerage service meeting Health Department standards. A Mobile Home Park does not include Mobile Home sales lots, on which unoccupied Mobile Homes are parked for inspection or sale, and does not include parks for the temporary parking for camping or recreational purposes of Travel Trailers or Motor Homes or sales lots for the same. See the Charles Town Subdivision and Land Development Ordinance for additional information and requirements regarding Mobile Home Parks. | |
| 251 | Senior Adult Housing – Detached<br>Not defined in our Code:<br>SENIOR ADULT HOUSING, DETACHED – Senior adult detached housing consists of detached independent living developments, including retirement communities, age-restricted housing, and active adult communities. These developments may include amenities such as gold courses, swimming pools, security, | P |
| 252 | Senior Adult Housing – Attached<br>Not defined in our Code:<br>SENIOR ADULT HOUSING, ATTACHED – Senior adult housing consists of attached independent living developments, including retirement communities, age-restricted housing, and active adult communities. These developments may include limited social or recreational services. However, they generally lack centralized dining and on-site medical care facilities. Residents in these communities live independently, are typically active (requiring little to no medical supervision) and may or may not be retired. | P |
| 253 | Congregate Care Facility<br>Not defined in our Code:<br>CONGREGATE CARE FACILITY – Independent living developments that provide centralized amenities such as dining, housekeeping, transportation, and organized social/recreational activities. Limited medical services (such as nursing and dental care) may or may not be provided. The residents may contract additional medical or personal services. | S |

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| 254 | Assisted Living<br>Not defined in our Code:<br>ASSISTED LIVING – These complexes are residential settings that provide either routine general protective oversight or assistance with activities necessary for independent living to mentally or physically limited persons. They commonly have separate living quarters for residents, and services include dining, housekeeping, social and physical activities, medication administration, and transportation. | S |
| 255 | Continuing Care Retirement Community<br>Not defined in our Code:<br>CONTINUING CARE RETIREMENT COMMUNITY – A complex that provides multiple elements of senior adult living. These combine aspects of independent living with increased care, as lifestyle needs change with time. Housing options may include various combinations of senor adult housing-detached and senior adult housing-attached, congregate care, assisted living and skilled nursing care – aimed at allowing the residents to live in one community as their medical needs change. The communities may also contain special services such as medical, dining, recreational, and some limited supporting retail facilities. These communities are usually self-contained villages. | S |
| * | Adult Day Care Center<br>ADULT DAY CARE CENTER – A facility that provides non-medical care for seven (7) or more adult persons on a less than 24-hour basis and that is duly licensed by the State of West Virginia and approved to operate as an adult day care center by all appropriate authorities. | S |
| * | Child Care Center<br>CHILD CARE CENTER – A private home-based establishment enrolling six (6) or fewer children where tuition, fees, or other forms of compensation for the care of the children is charged, and which is licensed by the State of West Virginia and approved to operate as such an establishment. | S |
| * | Detached Garage or carport, provided it does not exceed 500 sq. feet. | PA |
| | Guest Quarters<br>Not defined in our Code. Proposed definition is from Fredericksburg VA<br>GUEST QUARTERS -A secondary dwelling unit established in conjunction with and clearly subordinate to a principal dwelling unit, whether part of the same structure as the principal dwelling unit, or as a detached structure on the same lot | PA |
| | Group Home<br>GROUP HOME – A facility that:<br>1. Provides residential services and supervision for individuals who are developmentally disabled or behaviorally disabled;<br>2. Is occupied as a residence by not more than eight (8) individuals who are developmentally disabled and not more than three (3) supervisors, or is occupied as a residence by not more than twelve (12) individuals who are behaviorally disabled and not more than three (3) supervisors; | |

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| | 3. Is licensed by the West Virginia Department of Health and Human Resources;<br>4. Complies with the State Fire Code for residential facilities. | |
| * | Home Occupation, Minor<br>HOME OCCUPATION – A business, profession, occupation, or trade conducted for financial gain or profit and located entirely within a residential Dwelling, or within a detached Residential Garage. Such Use is accessory, incidental, and secondary to the Use of the Dwelling for residential purposes and does not change the residential purposes and does not change the residential character or appearance of the Dwelling or detached Residential Garage. | PA |
| * | Home Occupation, Major<br>HOME OCCUPATION – A business, profession, occupation, or trade conducted for financial gain or profit and located entirely within a residential Dwelling, or within a detached Residential Garage. Such Use is accessory, incidental, and secondary to the Use of the Dwelling for residential purposes and does not change the residential purposes and does not change the residential character or appearance of the Dwelling or detached Residential Garage. | SA |
| * | Swimming Pool (Private)<br>SWIMMING POOL – Any Structure intended for swimming or recreational bathing that contains water over 24 inches deep. This includes in-ground, aboveground, and on-ground Swimming Pools, hot tubs, and spas. | PA |
| 310 | Hotel<br>Not defined in our Code:<br>HOTEL- A place of lodging that provides sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room), and/or other retail and service shops. | |
| 311 | All Suites Hotel<br>Not defined in our Code:<br>HOTEL, ALL SUITES – A place of lodging that provides sleeping accommodations, a small restaurant and lounge, and small amounts of meeting space. Each suite includes a sitting room and separate bedroom; limited kitchen facilities are provided within the suite. | |
| 312 | Business Hotel<br>Not defined in our Code:<br>HOTEL, BUSINESS – A place of lodging aimed towards business travelers. These hotels provide sleeping accommodations and other limited facilities, such as a breakfast buffet bar and afternoon beverage bar (no lunch or dinner is served and no meeting facilities are provided). Each unit is a single large room. Business hotels provide very few or none of the supporting facilities provided at a hotel or all suite hotel, and are usually smaller in size. Generally located in a suburban area. | |

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| 320 | Motel<br>Not defined in our Code:<br>MOTEL – A place of lodging that provides sleeping accommodations and often a restaurant. Motels generally offer free on-site parking and provide little or no meeting space and few (if any) supporting facilities | |
| * | Bed and Breakfast Inns<br>BED AND BREAKFAST INN – Any Owner-occupied residential Dwelling, or Accessory Structure which is part of the owner occupied property, in which rooms are rented to paying guests on an overnight basis with not more than one (1) meal served daily, the entire service to be included in one (1) stated price. Such facility is not a Home Occupation for purposes of this Ordinance. | SA |

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| 411 | City Park<br>Not defined in our Code. Staff drafted:<br>CITY PARK: Parkland owned and operated by the City. | P |
| 412 | County Park<br>Not defined in our Code. Staff drafted:<br>COUNTY PARK – Parkland owned and operated by Jefferson County, West Virginia. | P |
| 413 | State Park<br>Not defined in our Code. Staff drafted:<br>STATE PARK – Parkland owned and operated by the State of West Virginia. | P |
| 416 | Campground/Recreational Vehicle Park<br>Not defined in our Code:<br>CAMPGROUND/RECREATIONAL VEHICLE PARK - Recreational sites that accommodate campers, trailers, tents, and recreational vehicles on a transient basis. They provide a variety of facilities, often including restrooms with showers, recreational facilities (such as a swimming pool), laundromat facilities, and a convenience store. | |
| 430 | Golf Course<br>Not defined in our Code:<br>GOLF COURSE – A recreational location offering 9, 18, 27, and 36 hole courses, or a similar configuration. Some sites may also have driving ranges, and clubhouses with a pro shop, restaurant, lounge, and banquet facilities. Includes municipal golf courses. Does not include miniature golf. | S |
| 431 | Miniature Golf Course<br>Not defined in our Code:<br>MINIATURE GOLF COURSE – Consists of one or more individual putting courses. They may include limited game rooms or refreshment services. This is a stand-alone facility and not part of a larger recreational facility | S |
| 432 | Golf Driving Range<br>Not defined in our Code:<br>GOLF DRIVING RANGE – Outdoor facilities containing driving tees for golfers to practice. These facilities may also provide individual or group lessons. May include a pro-shop and/or refreshment facilities. | S |

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| 433 | Batting Cages<br>Not defined in our Code:<br>BATTING CAGES – Recreational facilities which consist of one or more individual batting cages. They may contain game rooms and/or refreshment services. | S |
| 438 | Billiard Hall<br>Not defined in our Code. Definition taken from Merriam-Webster and modified:<br><br>BILLIARD HALL – A facility used to play billiards, also known as a poolhall. Generally provides dining or refreshment facilities | S |
| 435 | Multipurpose Recreational Facility<br>Not defined in our Code:<br><br>MULTIPURPOSE RECREATIONAL FACILITY – A facility containing two or more of the following uses combined at one site: miniature golf, batting cages, video arcades, bumper cars/vehicles, go-carts, golf driving ranges, and similar recreational facilities. Refreshment areas may also be provided | S |
| 437 | Bowling Alley<br>Not defined in our Code:<br><br>BOWLING ALLEY – A recreational facility that includes bowling lanes. A small lounge, restaurant and/or snack bar, video games, and billiards table may also be available. | S |
| 440 | Adult Cabaret (Adult Uses)<br><br>ADULT ENTERTAINMENT CABARET – A public or private establishment that is licensed to serve food and/or alcoholic beverages, which features topless dancers, strippers, male or female impersonators, or similar entertainers. | |
| 441 | Live Theater<br>Modified from existing *Theater* definition.<br>THEATER, LIVE – A Building or part of a Building devoted to showing live dramatic, musical, or other performances. | |
| 443/444 | Movie Theater<br>Not defined in our Code:<br>THEATER, MOVIE – A facility with a screen or multiple screens up to a maximum of nine (9), audience seating, a lobby, and refreshment stand. Not used for live performances. | |
| 445 | Multiplex Movie Theater<br>Not defined in our Code:<br>THEATER, MULTIPLEX MOVIE- A facility with a minimum of ten (10) screens, audience seating, a lobby, and a refreshment stand. Generally has one or more of the following amenities: digital sound, tiered stadium seating, moveable/expandable walls. | |
| 460 | Arena<br>Not defined in our Code:<br>ARENA – Large indoor structures in which spectator events are held. These events vary from professional sports to events such as concerts, shows, or religious services. | |

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| 464 | Roller Skating Rink<br>Not defined in our Code. Definition taken from Merriam-Webster and modified:<br>RINK, ROLLER SKATING – An enclosure for roller skating. May feature a refreshment area. | |
| 465 | Ice Skating Rink<br>Not defined in our Code:<br>RINK, ICE SKATING – Standalone facilities use for ice-skating oriented sports and entertainment. May contain spectator areas, refreshments areas, locker rooms, and arcades. | |
| 473 | Casino/Video Lottery Establishment<br>Not defined in our Code. This definition is from ITE and modified to include dining facilities. The ITE definition did not cover full-service casinos.<br>CASINO/VIDEO LOTTERY ESTABLISHMENT – Establishment that provides electronic or manually-controlled slot machines, games of chance, and/or games of skill. These facilities exist for the primary purpose of deriving revenue from gaming operations. May include dinning and refreshment facilities, as well as lodging, and conference spaces. | |
| 480 | Amusement Park<br>Not defined in our Code:<br>AMUSEMENT PARK – A recreational facility that contains rides, entertainment, and refreshment stands. | |
| 488 | Soccer Complex<br>Not defined in our Code:<br>SOCCER COMPLEX – Outdoor facility used for non-professional soccer games. They may consist of multiple fields. Ancillary amenities include stadium seating, and other recreational activities, such as a fitness trail, ball court, and playground. | S |
| 490 | Tennis Courts<br>Not defined in our Code:<br>TENNIS COURT – Indoor or outdoor facilities specifically designed for playing tennis. May be public or private. Generally does not include ancillary uses besides seating. | P |
| 491 | Racquet/Tennis Club<br>Not defined in our Code:<br>RACQUET/TENNIS CLUB – Privately owned facilities that primarily cater to racquet sports (tennis, racquetball, or squash – indoor or outdoor). The land use may also provide ancillary facilities, such as swimming pools, saunas, weight rooms, snack bars, retail stores, and/or a clubhouse. These facilities are membership clubs that allow access to the general public for a fee. | S |
| 492 | Health/Fitness Club<br>Not defined in our Code:<br>HEALTH/FITNESS CLUB – A privately owned facility that primarily focuses on individual fitness or training. Typically they provide exercise classes; weightlifting, fitness, and gymnastics equipment, spas, locker rooms, and refreshment areas. Ancillary features may include saunas, swimming pools, racquet sport facilities, handball courts, and limited retail. These facilities are membership clubs that may allow access to the general public for a fee. | P |

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| 493 | Athletic Club<br>Not defined in our Code:<br>ATHLETIC CLUB – Privately owned facilities that offer comprehensive athletic facilities. These clubs typically have one or more of the following: tennis, racquetball, squash, handball, basketball, and volleyball courts; swimming pools, whirlpools, saunas, spas, exercise rooms, and/or weight rooms. They may offer a diversity of competitive team sports activities, as well as social facilities. They facilities are membership facilities that may allow access to the general public for a fee. | P |
| 495 | Recreational Community Center<br>Not defined in our Code:<br>RECREATIONAL COMMUNITY CENTER – Stand-alone public facilities similar to an athletic club. These facilities often include classes and clubs for adults and children; a daycare/nursery school; meeting rooms; swimming pools, whirlpools, saunas; tennis racquetballs, handball, basketball, and/or volleyball courts; outdoor and indoor recreation areas; athletic fields; weightlifting and gymnastics equipment; and a refreshment area. A fee may be charged. | S |
| * | Swimming Pool Facility<br>Not defined in our Code or in ITE. Staff crafted proposed definition:<br>SWIMMING POOL FACILITY – A swimming pool open to the public for free, a fee, or to a fee paying membership. May contain refreshment facilities. | S |
| 520 | Elementary School<br>Not defined in our Code:<br>SCHOOL, ELEMENTARY – Educational facility typically serving students from kindergarten through to fifth or sixth grade. Generally includes bus parking, as well as outdoor recreational fields and play areas. Include both private and public facilities. | |
| 522 | Middle School/Junior High School<br>Not defined in our Code:<br>SCHOOL, MIDDLE/JUNIOR HIGH – Educational facility serving students who have graduated from elementary school but not yet in high school. Generally includes bus parking, as well as outdoor recreational fields and play areas. Include both private and public facilities. | |

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| 530 | High School<br>Not defined in our Code:<br>SCHOOL, HIGH – Educational facility serving students who have graduated from middle/junior high school. Generally includes bus parking, as well as outdoor recreational fields and play areas. Include both private and public facilities. | |
| 534/536 | Private School (K-12)<br>Not defined in our Code:<br>SCHOOL, PRIVATE – Educational facility that primarily educates kindergarten through eighth grade. They may offer pre-kindergarten classes, as well as extended daycare. Generally includes bus parking, as well as outdoor recreational fields and play areas. | |

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| 540 | Junior/Community College<br>Not defined in our Code:<br>COLLEGE, JUNIOR/COMMUNITY – Educational facility which offers two-year junior, community, or some technical colleges. Educational programs may exceed two years for certain programs. | |
| 550 | University/College<br>Not defined in our Code:<br>COLLEGE/UNIVERSITY – Educational facility offering four-year educational programs. Generally offers a variety of undergraduate, graduate, and postgraduate educational programs. | |
| * | Technical and Vocational School<br>Not defined in our Code or ITE. Definition from Fredericksburg VA:<br><br>SCHOOL, TRADE/TECHINCIAL/VOCATIONAL- A facility primarily teaching a usable skill that prepares a person for a job in a trade and meeting any licensing requirements of the State, including barber, cosmetology, mechanical, plumbing, electrical, carpentry, and auto-mechanic trades. | |
| * | Professional and Management Development Training Center<br>Not defined in our Code or ITE. Definition from N. American Industry Classification System:<br><br>PROFESSIONAL AND MANAGEMENT DEVELOPMENT TRAINING CENTER - Establishments primarily engaged in offering an array of short duration courses and seminars for management and professional development. Training for career development may be provided directly to individuals through employers' training programs and courses that are customized or modified to meet the special needs of their customers. Common types of services within this sector include: continuing Education (classes, seminars, and conferences), professional development training, quality assurance training, and management development training. | |
| 560/561 | Church/Synagogue<br>CHURCH – A Religious Institution. | S |
| 565 | Day Care Center<br>DAY CARE CENTER – A private establishment enrolling more than six (6) children where tuition, fees, or other forms of compensation for the care of the children is charged, and which is licensed by the State of West Virginia and approved to operate as such an establishment. | ~~SA~~ P |
| 566 | Cemetery<br>CEMETERY -A place used for the permanent internment of dead human bodies or the cremated remains thereof. A Cemetery may be a burial park for earth internments, a mausoleum for vault or crypt internments, a columbarium for cinerary internments, or a combination of one or more thereof. | |
| 571 | Prison Not defined in our Code:<br>PRISON – A building or buildings where persons convicted of a crime or who are awaiting trial are confined. May include limited recreational facilities, as well as work areas, dining areas, and office spaces. | |
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| 580 | Museum<br>Not defined in our Code<br>MUSEUM – A facility offering exhibitions, displays, shows, and/or demonstrations of historical, scientific, artistic, or other cultural significance. | P |
| * | Cultural Center<br>CULTURAL CENTER – A use providing for display, performance, or enjoyment of heritage, history, or the arts. This use allows for the combination of the uses as follows, but is not limited to: museums, art performances, corporate retreats, art galleries, historic interpretation/reenactment, cultural activities, weddings, or interpretive sites, but does not include commercially-operated businesses. | ~~S~~ P |
| 590 | Library<br>Not defined in our Code<br>LIBRARY – Either a public or private facility with shelved books, reading rooms, and sometimes meeting rooms. | P |
| 591 | Lodge/Fraternal Organization<br>LODGE/FRATERNAL ORGANIZATION: A private clubhouse with dining and drinking facilities, recreational and entertainment areas, and meeting rooms. | S |
| 610 | Hospital<br>HOSPITAL – A licensed and West Virginia accredited institution rendering medical, surgical or convalescent care at least partially on an inpatient basis, including Nursing Homes, homes for the aged and sanatoriums, and treatment centers that serve human patients at least partially on an inpatient basis and partially by outpatient services, particularly emergency care. | |
| 612 | (Outpatient) Surgery Center<br>OUTPATIENT SURGEY CENTER – A healthcare facility that provides surgical care without providing overnight accommodations. | |
| 620 | Nursing Home<br>NURSING HOME – This item includes rest homes, nursing homes, convalescent homes for children and homes providing chronic and convalescent care; a place that has obtained the necessary licensing requirements in West Virginia which is devoted primarily to the maintenance and operation of facilities for the treatment and care of four (4) or more persons suffering from illness, diseases, deformities or injuries not requiring extensive and/or intensive care that is normally provided in a general Hospital or other specialized Hospital. | |
| 630 | Clinic<br>CLINIC – An establishment where patients are admitted for examination and treatment by one or more physicians, dentists, psychologists, social workers, or veterinarians and where patients are not usually lodged overnight. | |

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| 640 | Animal Hospital/Veterinary Clinic<br>ANIMAL HOSPITAL – A place where animals or pets are given medical or surgical treatment and the boarding of animals is limited to short-term care incidental to the hospital use. | S |
| * | Medical / Dental Lab<br>Not defined in our Code or ITE. Definition from Fredericksburg VA:<br>MEDICAL/DENTAL LAB - A room or group of rooms used for conducting the affairs of a businesses engaged in offering or providing medical, dental, or other health-related diagnostic services to clients both on-site and in separate locations. | S |
| * | Heliport<br>Not defined in our Code or ITE. Definition from Fredericksburg VA:<br>HELIPORT - An area, either on ground level or elevated on a structure, licensed or approved for repetitive helicopter landings and takeoffs on the same parcel of land. The term heliport includes accessory uses and structures such as parking, waiting room, fueling, and maintenance equipment | |
| 710 | General Office Building<br>Not defined in our Code<br>OFFICE BUILDING, GENERAL – A building generally housing multiple tenants. It is a location where affairs of businesses, commercial, or industrial organizations, or professional persons or firms are conducted. May include ancillary businesses such as dining or retail. | |
| 714 | Corporate Headquarters Building<br>Not defined in our Code, and such a use seems like it can be subsumed into another Office category use. | |
| 715 | Single Tenant Building<br>Not defined in our Code<br>OFFICE BUILDING, SINGLE-TENANT – A building containing the offices of a single business or company. Generally contains offices, meeting rooms, and storage facilities. May have ancillary support services such as a cafeteria, gym facilities, and/or a daycare. | P |
| 720 | Medical-Dental Office Building Not defined in our Code, and this use seems like it can be subsumed into the *Medical/Dental Lab* use. | P |
| 730 | Government Office Building<br>Not defined in our Code<br>OFFICE BUILDING, GOVERNMENT – A individual building containing government offices. May be local, state, or federal offices. | P |
| 732 | United States Post Office<br>Not defined in our Code<br>UNITED STATES POST OFFICE – A federal post office building. Generally contains service windows, post office boxes, and sorting and distribution facilities. | P |

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| 733 | Government Office Complex<br>Not defined in our Code<br>OFFICE COMPLEX, GOVERNMENT – A series of government office buildings connected by pedestrian walkways. May be local, state, or federal offices. | |
| 735 | Judicial Complex<br>Not defined in our Code or ITE. Staff crafted definition:<br>JUDICIAL COMPLEX – An office building or series of office buildings used for judicial proceedings. May include offices, meeting rooms, trial hearing rooms, and detention facilities. | |
| 750 | Office Park<br>Not defined in our Code<br>OFFICE PARK – Usually a planned development featuring general office buildings and support services, such as banks, restaurants, and service stations, arranged in a campus-like atmosphere. The development is focused on offices and ancillary service industry businesses. | |
| 760 | Research and Development Center<br>RESEARCH AND DEVELOPMENT CENTER – A Building or Buildings, for which an overall Schematic Plan has been approved by the Planning Commission, designed with Open Space and compatible with the adjacent community, to be used for the inquiry and investigation of sources and limited to the basic and applied research phase of the inquiry; not including however, any manufacturing, industrial operations or pilot plant involving machines or operations normally associated with production or assembly lines or the production of goods in quantity above that needed for product testing and evaluation. | |
| 770 | Business Park<br>Not defined in our Code<br>BUSINESS PARK – Consists of a group of buildings used for flex-type or incubator businesses. Generally one or two story buildings served by a common roadway system. The tenant space is flexible and may be used for a variety of uses. The rear of the building is usually used as a service entrance. May include office space, retail and wholesale stores, warehousing, restaurants, light-industrial, and scientific research businesses. Average mixture of uses is 30% commercial/office, and 70% industrial/warehouse. | |
| 812 | Building Materials and Lumber Store<br>Not defined in our Code<br>BUILDING MATERIALS AND LUMBER STORE – A free-standing building that sells hardware, building materials, and lumber. Generally less than 30,000 sq. ft. May feature an outdoor storage yard. | |
| 813 | Free-Standing Discount Superstore<br>Not defined in our Code<br>DISCOUNT SUPERSTORE, FREE-STANDING – This type of store offer a wide arrange of products and services, and has centralized cashiering. It also has a full-service grocery department. May have ancillary support operations, such as gasoline sales, a garden center, and automotive services. Generally open every day, with long operating hours. May be part of a larger retail complex. | |

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| 814 | Specialty Retail Center<br>Not defined in our Code. Proposed definition taken from Wikipedia:<br><br>RETAIL CENTER, SPECIALTY - A specialty store is a shop/store that carries a deep assortment of brands, styles, or models within a relatively narrow category of goods. Furniture stores, florists, sporting goods stores, and bookstores are all specialty | P |
| 815 | Free-Standing Discount Store<br>Not defined in our Code<br>DISCOUNT STORE, FREE-STANDING – This type of store offer a wide arrange of products and services, and has centralized cashiering. It does not have a full-service grocery department. May have ancillary support operations, such as gasoline sales, a garden center, and automotive services. Generally open every day, with long operating hours. May be part of a larger retail complex. | P |
| 816 | Hardware/Paint Store<br>Not defined in our Code. ITE definition is simply "Generally a free-standing store". This proposed definition is Staff created:<br><br>HARDWARE/PAINT STORE – A store offering hardware, paint, and other home improvement goods. Generally has a more limited selection of good compared to a building materials and lumber | P |
| 817 | Nursery/Garden Center<br>Not defined in our Code.<br>NURSERY/GARDEN CENTER – A free standing building with an outside storage area for planting or landscaping stock. Primarily serves the general public. May have a greenhouse on-site, offices, storage, shipping facilities, and may offer landscaping services. | S |
| 818 | Nursery (Wholesale)<br>Not defined in our Code.<br>NURSERY (WHOLESALE) - A free standing building with an outside storage area for planting or landscaping stock. Primarily serves contractors and suppliers. May have a greenhouse on-site, offices, storage, shipping facilities, and may offer landscaping services. | |
| 820 | Shopping Center<br>Not defined in our Code.<br>SHOPPING CENTER – An integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. Generally provides on-site parking. | |
| 823 | Factory Outlet Center<br>Not defined in our Code.<br>FACTORY OUTLET CENTER – A shopping center that primarily houses factory outlet stores. | |
| 841 | Automobile Sales<br>Not defined in our Code.<br>AUTOMOBILE SALES – A dealership, typically located along major arterial streets characterized by abundant commercial development. Leasing and used car sales may also be areas of focus. May offer services and sale of parts. | |

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| 843 | Automobile Parts Sales<br>Not defined in our Code.<br>AUTOMOBILE PARTS SALES – Facility focused on the sale of automobile parts for maintenance and repair. Material sold may include oil and batteries, and a wide array of automobile parts. | |
| 848 | Tire Store<br>Not defined in our Code.<br>TIRE STORE – A business focused on the sale of automobile tires. May offer services such as tire installation and repair. May offer automotive maintenance and repair services. Generally does not have large storage or warehouse areas. | |
| 849 | Tire Superstore<br>Not defined in our Code.<br>TIRE SUPERSTORE – Warehouse-style facility focused on selling and installing automobile tires. May offer automotive maintenance and repair services, such as wheel alignment and shock and brake service. Generally has a significant storage area. General bodywork and mechanical repairs are not performed. | |
| 850 | Supermarket<br>Not defined in our Code.<br>SUPERMARKET – Free-standing retail store selling an assortment of food, food preparation and wrapping materials, and household goods. They may contain a deli, a bakery, a pharmacy, and other customary services. May be open 24 hours. | S |
| 851 | Convenience Market (Open 24 Hours)<br>Not defined in our Code.<br>CONVENIENCE MARKET (24 HOURS) – A market which sells convivence goods, magazines, and often prepared food. May sell alcohol. Does not sell or dispense gasoline. Open 24 hours. | |
| 852 | Convenience Market (Open 15 – 16 Hours)<br>Not defined in our Code.<br>CONVENIENCE MARKET (15-16 HOURS) – A market which sells convivence goods, magazines, and often prepared food. May sell alcohol. Does not sell or dispense gasoline. Generally open no more than 16 hours a day. | P |
| 853 | Convenience Market with Gasoline Pumps<br>Not defined in our Code.<br>CONVENIENCE MARKET (WITH GASOLINE SALES) – A market which sells convivence goods, magazines, and often prepared food. May sell alcohol. May be open 24 hours. Has gasoline and other automotive fuel dispensers. | |
| 854 | Discount Supermarket<br>Not defined in our Code.<br>SUPERMARKET, DISCOUNT – A free-standing retail store selling an assortment of food (often in bulk), food preparation and wrapping materials, and household goods, at discounted prices. | P |
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| 857 | Discount Club<br>Not defined in our Code.<br>DISCOUNT CLUB - A discount store or warehouse where shoppers pay a membership fee in order to take advantage of discounted prices on a wide variety of items such as food, clothing, tires and appliances; many items are sold in large quantities or bulk. Some site include on-site fueling pumps. | |
| 859 | Liquor Store (including Beer Distributor)<br>Not defined in our Code. Definition taken from Martinsburg:<br>LIQUOR STORE (Including Beer Distributor): Any established licensed and permitted under the West Virginia Alcohol and Beverage Control Administration to sell alcoholic beverages, including beer, wine, and liquor | S |
| 860 | Wholesale Market<br>Not defined in our Code.<br>WHOLESALE MARKET –Use with large storage and distribution areas for receiving goods and shipping these goods to places such as grocery stores and restaurants. Generally, these markets are characterized by little drive-in business; truck deliveries and pick-up take place at all hours of the day | |
| 861 | Sporting Goods Superstore<br>Not defined in our Code.<br>SUPERSTORE, SPORTING GOODS – Free-standing facility which generally offer a variety of customer services and centralized cashiering, and which specialize in the sale of athletic and out-door oriented merchandise. These stores typically maintain long store hours, and are generally open every day of the week | |
| 862 | Home Improvement Superstore<br>Not defined in our Code.<br>SUPERSTORE, HOME IMPROVEMENT – Free-standing facility that specializes in the sale of home improvement merchandise. Generally offer a variety of customer services and centralized cashiering. These stores typically maintain long store hours, and are generally open every day of the week. May have a garden center | |
| 863 | Electronics Superstore<br>Not defined in our Code.<br>SUPERSTORE, ELECTRONICS - Free-standing facility that specializes in the sale of electronics merchandise, and may also offer major home appliances. Generally offer a variety of customer services and centralized cashiering. These stores typically maintain long store hours, and are generally open every day of the week. | |
| 864 | Toy/Children's Superstore<br>Not defined in our Code.<br>SUPERSTORE, CHILDRENS GOODS/TOYS - Free-standing facility that specializes in the sale of toys and other child-oriented merchandise. Generally offer a variety of customer services and centralized cashiering. These stores typically maintain long store hours, and are generally open every day of the week. | |
| 865 | Baby Superstore<br>Not defined in our Code.<br>SUPERSTORE, BABY GOODS - Free-standing facility that specializes in the sale of toys and other baby-oriented merchandise. Generally offer a variety of customer services and centralized cashiering. These stores typically maintain long store hours, and are generally open every day of the week. | |

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| 866 | Pet Supply Superstore<br>Not defined in our Code.<br>SUPERSTORE, PET SUPPLY – Free-standing facility which generally offer a variety of customer services and centralized cashiering, and which specialize in the sale of pets and pet oriented merchandise. These stores typically maintain long store hours, and are generally open every day of the week. May have a shelter, and may offer training classes. | |
| 867 | Office Supply Superstore<br>Not defined in our Code.<br>SUPERSTORE, OFFICE SUPPLY – Free-standing facility which generally offer a variety of customer services and centralized cashiering, and which specialize in the sale of office merchandise, such as desks, paper, ink, and printers. These stores typically maintain long store hours, and are generally open every day of the week. They may offer services such as labeling, shipping, administrative support, and internet based services. | |
| 868 | Book Superstore<br>Not defined in our Code.<br>SUPERSTORE, BOOK – Free-standing facility which generally offer a variety of customer services and centralized cashiering, and which specialize in the sale of books, magazines, periodicals, and other printed goods. These stores typically maintain long store hours, and are generally open every day of the week. They may also have sale of audio/visual goods and toys. They may also have a café. | |
| 869 | Discount Home Furnishings Superstore<br>Not defined in our Code.<br>SUPERSTORE, DISCOUNT HOME FURNISHING – Free-standing facility which generally offer a variety of customer services and centralized cashiering. These stores typically maintain long store hours, and are generally open every day of the week. They typically exceed 100,000 sq. ft. in area, and offer an extensive variety of home furnishings and accessories. They may offer ancillary services such as dining facilities or children play area. | |
| 870 | Apparel Store<br>Not defined in our Code or in ITE. Definition crafted by staff.<br>APPAREL STORE – A facility specializing in textile sales. May offer a wide range of clothing, or specialize in certain items, such as outdoor apparel. | P |
| 879 | Arts and Crafts Store<br>Not defined in our Code.<br>ARTS AND CRAFTS STORE – A facility that sells art, art supplies, hobby supplies, framing, décor, and seasonal merchandise. May also offer art and craft classes. | |
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| 880 | Pharmacy/Drugstore without Drive-Through Window<br>Not defined in our Code.<br>PHARMACY/DRUGSTORE – Retail facility that primarily sells prescription and non-prescription drugs. They may also sell cosmetics, stationary, personal care products, a limited food selection, and general merchandise. They may offer some medical services. | P |
| 881 | Pharmacy/Drugstore with Drive- Through Window<br>Not defined in our Code.<br>PHARMACY/DRUGSTORE – Retail facility that primarily sells prescription and non-prescription drugs. They may also sell cosmetics, stationary, personal care products, a limited food selection, and general merchandise. They may offer some medical services. | S |
| 890 | Furniture Store<br>Not defined in our Code.<br>FURNITURE STORE – A full-service retail store that specializes in the sale of furniture, and often also carpeting. May include a large storage facility. | |
| 892 | Carpet Store<br>Not defined in our Code or in ITE. Definition crafted by staff.<br>CARPET STORE – A retail store specializing in the sale of carpeting, rugs, and other flooring material. May have a large storage | |
| 896 | Video Rental Store<br>Not defined in our Code.<br>VIDEO RENTAL STORE – A retail store specializing in the sale or rental of motion-picture goods (such as DVD, Blu-ray, and other home video goods). May also offer video games for rental or sale. | |
| * | Art Gallery<br>ART GALLERY – A Structure, or part thereof, devoted to the exhibition of visual works of fine art. Art galleries generally include accessory services, such as sale or purchase of displayed works, custom framing or encasement of art works and services related to art appraisal, display, preservation or restoration. | P |
| * | Gift shops and Boutiques<br>Not defined in our Code or in ITE. Definition crafted by staff.<br>BOUTIQUE/GIFT SHOP – A retail shop specializing in a limited and specialized line of goods. Has a small building footprint. May be a free-standing use or located within a larger commercial use/structure. | P |
| * | Farmers Market<br>Not defined in our Code.<br>FARMERS MARKET – A market held in an open area or structure where individual sellers offer goods for sale to the public. Such sellers may set up temporary stalls or tables for the sale of their products. Such sales may involve new and/or used items and may include the sale of fruits, vegetables, and other edible items. | |
| * | Florist<br>Not defined in our Code or in ITE. Definition crafted by staff.<br>FLORIST – A facility that specializes in selling flowers, and may create arrangements of flowers. May also sell gardening supplies. | P |
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| * | Photo / Camera Store<br>Not defined in our Code or in ITE. Definition crafted by staff.<br>PHOTO/CAMERA STORE – A facility specializing in the sale of cameras and camera equipment. May offer picture and portraiture services, and offer classes. | |
| 911 | Walk-in Bank<br>Not defined in our Code.<br>BANK, WALK-IN – Generally a free-standing structure that provides financial services and products. These facilities generally have a parking lot, and do not have drive-through teller services, though they may contain a non-drive-through automatic teller machine. | P |
| 912 | Drive-in Bank<br>Not defined in our Code.<br>BANK, DRIVE-IN – Generally a free-standing structure that provides financial services and products. These facilities generally have a parking lot, and do offer drive-through teller services, including automated teller machines. | S |
| 918 | Hair Salon<br>Not defined in our Code.<br>HAIR SALON – Facility offering cosmetic and beauty services, such as hair cutting and styling, skin and nail care, and massage therapy. May also contain spa facilities. | P |
| 931 | Quality Restaurant<br>Not defined in our Code.<br>RESTAURANT, QUALITY – Full-service eating establishment, with typical customer duration stay of an hour or more. Generally does not offer breakfast service, and may not offer lunch service. Does offer dinner service. Reservations are generally required. May have lounge or bar facilities. | P |
| 932 | High-Turnover (Sit-Down) Restaurant<br>Not defined in our Code.<br>RESTAURANT, HIGH-TURNOVER/SIT DOWN – Full service eating establishments, with typical customer duration stay of an hour. Generally offers lunch and dinner service, may also offer breakfast service. May be open 24 hours a day. Typically reservations are not required. | |
| 933 | Fast-Food Restaurant w/o Drive-Through Window<br>RESTAURANT, FAST-FOOD – An establishment whose principal business is the sale of pre-prepared or rapidly prepared food directly to the customer in a ready-to- consume state for consumption either within the Restaurant Building or off premises. | |
| 934 | Fast-Food Restaurant with Drive-Through Window<br>RESTAURANT, FAST-FOOD – An establishment whose principal business is the sale of pre-prepared or rapidly prepared food directly to the customer in a ready-to- consume state for consumption either within the Restaurant Building or off premises. | |

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| 935 | Fast-Food Restaurant with Drive-Through Window and No Indoor Seating<br>RESTAURANT, FAST-FOOD – An establishment whose principal business is the sale of pre-prepared or rapidly prepared food directly to the customer in a ready-to- consume state for consumption either within the Restaurant Building or off premises. | |
| 936 | Coffee/Donut Shop w/o Drive- Through Window<br>Not defined in our Code.<br>COFFEE/DOUGHNUT SHOP – Restaurant that focuses on providing coffee and breakfast foods. May also sell newspapers, books, and music CDs. May offer indoor seating but no indoor table service. | P |
| 937 | Coffee/Donut Shop with Drive- Through Window<br>Not defined in our Code.<br>COFFEE/DOUGHNUT SHOP – Restaurant that focuses on providing coffee and breakfast foods. May also sell newspapers, books, and music CDs. May offer indoor seating but no indoor table service. | P |
| 938 | Coffee/Donut Shop with Drive- Through Window and No Indoor Seating<br>Not defined in our Code.<br>COFFEE/DOUGHNUT SHOP – Restaurant that focuses on providing coffee and breakfast foods. May also sell newspapers, books, and music CDs. May offer indoor seating but no indoor table service. | P |
| 939 | Bread/Donut/Bagel Shop w/o Drive-Through Window<br>Not defined in our Code.<br>BREAD/DOUGHNUT/BAGEL SHOP – Facility specialized in the sale of breads, doughnuts, and bagels as primary products. May offer beverages and limited sale of other foods. Indoor seating may be available, and table service may be provided. | P |
| 940 | Bread/Donut/Bagel Shop with Drive-Through Window<br>Not defined in our Code.<br>BREAD/DOUGHNUT/BAGEL SHOP – Facility specialized in the sale of breads, doughnuts, and bagels as primary products. May offer beverages and limited sale of other foods. Indoor seating may be available, and table service may be provided. | P |
| 941 | Quick Lube Vehicle Shop<br>Not defined in our Code.<br>QUICK LUBE VEHICLE SHOP – A business where the primary activity is to perform oil change services for vehicles. May also offer ancillary services such as preventative maintenance. Vehicle repair is generally not performed. | |
| 942 | Automobile Care Center<br>Not defined in our Code.<br>AUTOMOBILE CARE CENTER – A center which houses numerous businesses that provided automobile-related services. These service may include repair and servicing, upholstering, and stereo installation. | |
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| 943 | Automobile Parts and Service Center<br>Not defined in our Code.<br>AUTOMOBILE PARTS AND SERVICE CENTER - Facility focused on the sale of automobile parts for maintenance and repair, and also provide a full array of auto repair services. Material sold may include oil and batteries, and a wide array of automobile parts. | |
| 944 | Gasoline/Service Station<br>Not defined in our Code.<br>GASOLINE/SERVICE STATION – Business with a primary focus on fueling vehicles. May offer some ancillary repair services. Sale of goods is limited or non-existent. Does not have a car wash facility. | |
| 945 | Gasoline/Service Station with Convenience Market<br>Not defined in our Code.<br>GASOLINE/SERVICE STATION WITH CONVENIENCE MARKET – Business with a primary focus on fueling vehicles. May offer some ancillary repair services. May sell a limited selection of food, beverages, and consumer goods. Does not have a car wash facility. | P |
| 946 | Gasoline/Service Station with Convenience Market and Car Wash<br>Not defined in our Code.<br>GASOLINE/SERVICE STATION WITH CONVENIENCE MARKET AND CAR WASH – Business with a primary focus on fueling vehicles. May offer some ancillary repair services. May sell a limited selection of food, beverages, and consumer goods. Does have a car wash facility. | |
| 947 | Self-Service Car Wash<br>CAR WASH – A Structure containing facilities for both hand and automatic washing of automobiles, which facilities may include the use of a chain conveyor or other method of moving the cars along, and automatic or semiautomatic application of cleaner, brushes, rinse water and heat for drying. | |
| 948 | Automated Car Wash<br>CAR WASH – A Structure containing facilities for both hand and automatic washing of automobiles, which facilities may include the use of a chain conveyor or other method of moving the cars along, and automatic or semiautomatic application of cleaner, brushes, rinse water and heat for drying. | |
| 960 | DRY CLEANERS<br>Not defined in our Code or ITE. Definition from Fredericksburg VA:<br>DRY CLEANERS– A facility used for cleaning fabrics, textiles, wearing apparel, or articles of any sort by immersion and agitation, or by immersions only, in water or volatile solvents | S |
| * | Funeral Home/Crematory<br>FUNERAL HOME – A Building used for the preparation of the deceased for burial and the display of the deceased and ceremonies connected therewith before burial or cremation. | |
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| * | Kennel<br>KENNEL – Any Building or Structure and/or land used, designed, or arranged for housing, boarding, breeding, or care of more than three adult dogs or cats kept or bred for hunting, sale, exhibition, or domestic use or other domestic animals for profit, but not including those animals raised for agricultural purposes. | |
| * | Tattoo Parlor<br>Not defined in our Code or ITE. Definition from Martinsburg<br>TATTOO PARLOR- Establishments primarily in the business of applying lettering, art, and other images with permanent and semi-permanent inks, paints, pigments, or piercings to the body of patrons | P |
| * | Self-Storage Facility<br>Not defined in our Code or ITE. Definition from Martinsburg<br>SELF-STORAGE FACILITY - Any real property designed and used for the purpose of renting or leasing individual storage space to occupants who are to have access to such facility for the purpose of storing and removing personal property | |
| * | Outdoor Café<br>Not defined in our Code or ITE. Definition from NACTO:<br><br>OUTDOOR CAFÉ - An open-air seating area on a public sidewalk provided by a restaurant located on the adjoining property, where restaurant patrons can eat or drink | |
| * | Parking Facility<br>Not defined in our Code or in ITE. Definition crafted by staff.<br>PARKING FACILITY – A facility where vehicles are kept for storage. Available for the public for free or for a fee | PA |
| * | Wireless Telecommunication Facilities<br>Not defined in our Code or ITE. Definition from Fredericksburg VA:<br>WIRELESS TELECOMMUNICATION FACILITIES - Equipment at a fixed location that enables wireless communications between user equipment and a communications network, including but not limited to equipment associated with wireless services such as private, broadcast and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul; and radio transceivers, antennas, coaxial or fiber-optic cable, regular and backup power supplies, and comparable equipment, regardless of technological configuration | S |
| * | Essential Utilities and Equipment<br>ESSENTIAL UTILITIES AND EQUIPMENT – This term comprises underground or overhead electrical, gas, communications not regulated by the Federal Communications Commission, water and sewage systems, including poles, towers or pole structures, wires, lines, mains, drains, pumping stations, sewers, conduits, cables, fire alarm boxes, public telephone structures, police call boxes, traffic signals, hydrants, regulating and measuring devices and the structures in which they are housed, and other similar equipment accessories in connections therewith. It does not include Buildings, yards, stations used for storage, repair or processing of equipment or material, and does not include Buildings, yards, stations, or substations for transforming, boosting or switching purposes, where such facilities are constructed on the ground. | P |

**Planning Commission**
101 East Washington Street
Charles Town, WV 25414

Meeting: 04/22/24
Department: Planning Commission
Category: Report
Initiator:

**SCHEDULED**

**AGENDA ITEM (ID # )**

## February 26, 2024 DRAFT Minutes

**ATTACHMENTS:**

- 2.26.24 PC MINUTES_DRAFT.pdf

# CITY OF CHARLES TOWN
## PLANNING COMMISSION
## AGENDA • FEBRUARY 26, 2024

**Committee Meeting** **CITY HALL** **6:00 PM**

**101 E Washington Street, Charles Town, WV 25414**

**1. CALL TO ORDER SPECIAL WORK SESSION AT 6:00 PM**

Present: Ann Paonessa, Chair
Jeff Hynes
Kevin Long
Zakhary Dunning – Arrived at 6:05
Jessica Derr - Absent

James Newman, City Staff: Zoning Administrator
Kim Crosson, City Staff: Permit Tech
Mark Phillips, Kimley-Horn

**2. SPECIAL WORK SESSION**

**2.1: TXA2024-03 - Text Amendment on Residential Improvement**

Staff gave presentation.

SUMMARY OF DISCUSSION: Staff clarified this would only apply to residential infill and would remove the responsibility to develop land that developers do not own. Discussion indicated the need to avoid conflict with existing language. Commission asked staff to further revise text to avoid possible future conflicts regarding proposed changes to Table 1333.09 and proposed text changes.

**2.2: TXA2024-01 - Update on Bond Estimates by Kimley-Horn**

Mark Phillips of Kimley-Horn gave presentation

SUMMARY OF DISCUSSION: Commission sought clarification regarding how often amounts should be updated. Mr. Phillips confirmed every 4 years or depending on the rate of inflation. Commission asked if we can set a benchmark that is tied to inflation. Mr. Phillips was unsure, indicated that he'd research if other localities have done that. Commission stated the need to have a mechanism to keep track of the bonds. Commission is in favor of the possibility of a construction cost increase index.

DRAFT

## 3. CALL TO ORDER REGULAR MEETING AT 7:00 PM

Present: Ann Paonessa, Chair
Jessica Derr
Zakhary Dunning
Jeff Hynes
Kevin Long

James Newman, City Staff: Zoning Administrator
Kim Crosson, City Staff: Permit Tech

## 4. APPROVAL OF MINUTES

### 4.1: January 18, 2024 Minutes – Special Meeting

Motion to approve

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| **RESULT:** | **Approved** |
| **MOVER:** | Derr |
| **SECONDER:** | Hynes |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

### 4.2: TXA2024-03 – January 22, 2024 Minutes – Regular Meeting

Motion to approve

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| **RESULT:** | **Approved** |
| **MOVER:** | Hynes |
| **SECONDER:** | Derr |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

### 4.3: TXA2024-03 – January 30, 2024 Minutes – Special Work Session

Motion to approve subject to the following: Change required on page 1, section 3.1. Language must be modified to be grammatically correct. Need to correct spelling of 'Ordinance'.

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Dunning |
| **SECONDER:** | Long |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

## 5. UNFINISHED BUSINESS

None

## 6. NEW BUSINESS

### 6.1: SLD2023-04 Fairview Major Subdivision

Staff gave presentation

DRAFT

Derr: How is the commercial acreage calculated, as there is conflict with numbers in staff report compared to number sin the plan set?

Staff: There is a credit for land they dedicated for the water treatment plant.

Hynes: How are the traffic amounts calculated since the self-storage use is not permitted?

Mark Phillips, Kimley-Horn: Unsure, but traffic study is based on current proposal and traffic study will need to be updated according to any revision. Typically, it would be based on the highest possible use it could be utilized under current approved zoning if no specific use is declared.

Hynes: How are passive fields, multipurpose playing fields and recreational fields defined and how do they differ?

Staff: A passive field of grass is with an open field of space and a multipurpose play field would be more like soccer or baseball fields.

Jason Gerhardt, Applicant's Engineer: Commercial land total includes land designated for water treatment. Traffic study can be updated as actual commercial uses get purposed. You want to provide a study based on what is known and updated to account for future impacts.

Hynes: Why self-storage?

Jason Gerhardt, Applicant's Engineer: There are few things allowed, and the most likely use would be self-storage.

Hynes: Why passive field as opposed to multi-purpose fields?

Jason Gerhardt, Applicant's Engineer: Our intent is to provide a multi-purpose field, graded for active use. It will be a large flat field and no equipment details have been identified yet as to what will be provided.

Motion to open public hearing

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Derr |
| **SECONDER:** | Long |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

Lynn Widmyer: Opposed. Not in conformance with the Comprehensive Plan. Stated concerns that the sketch plan is a backdoor to changing the Comp Plan. Worry about lack of public input for preliminary plan. Stormwater impact and analysis not included with sketch plan, though Applicant stated they willing to work with us.

PC Discussion about public hearing rules.

Ron Widmyer: This is not an urban style development, and there is no surrounding development for it to connect to. Additional housing will burden the school system. Not enough recreation space or trails available on site. Concern about impact to City and County services.

DRAFT

Motion to close public hearing

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Long |
| **SECONDER:** | Hynes |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

Jason Gerhardt, Applicant's Engineer: Application complies with zoning and conditions of annexation. Project to be phased. Committed to working with the Widmyer family.

Abe Ashton, Applicant's Attorney: According to the requirements of a sketch plan, it does not require much detail. We will keep stormwater on site.

Derr: Why are only certain traffic impacts required to be mitigated?

Mark Phillips, Kimley-Horn: Intersections 4 and 5 on table 4, page 34, are the ones most closely correlated with the impact of this site's development.

Paonessa: Commercial pad sites to be prepped?

Hynes: Yes. Required by COA. They are already complying with that and this was the inspiration for a recent text amendment.

Paonessa: Not in conformance with comprehensive plan.

Staff: Updated conditions of Annexation accepted by Council, knowing it was predominantly residential even though the Comprehensive Plan calls for Office/Professional uses.

Long: Any special stormwater management requirements regarding runoff and being adjacent to agricultural use?

Mark Phillips, Kimley-Horn: At the level of a sketch plan there are limits to what can be shown. At the next stage of the preliminary plan, they will be required to show and reduce their ten-year runoff. Stormwater regulations are not affected by adjacent land use.

Motion to approve Motion to approve SLD2023-04 Fairview Major Subdivision subject to the following: Include conditions recommended by staff

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Derr |
| **SECONDER:** | Dunning |

Hynes: Spoke about unit fees and impact fees

Amended Motion to approve SLD2023-04 Fairview Major Subdivision subject to the following: At the preliminary plan stage, the traffic study needs to provide what the LOS level would be for intersections 4 and 5 and include staff recommendations.

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Derr |
| **SECONDER:** | Dunning |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |
| **NAYES:** | Long |

DRAFT

### 6.2: TXA2024-Neighborhood Residential Update

Staff gave presentation

Motion to open public hearing

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Hynes |
| **SECONDER:** | Derr |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

No comment

Motion to close public hearing

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Long |
| **SECONDER:** | Derr |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

Motion to approve TXA2024-Neighborhood Residential Update

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Long |
| **SECONDER:** | Derr |

Hynes: Asked for clarification to be made regarding neighborhood commercial language

Amended Motion to approve TXA2024-Neighborhood Residential Update subject to the following: Keep "Neighborhood Commercial" language

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Long |
| **SECONDER:** | Derr |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

### 6.3: BR2024-04 – Tate Manor Bond

Staff presentation

PC Discussion

Dan Ebersole, Applicant: This is a routine request. All lots are finally built out, ready to do the required work once the weather warms.

Motion to approve BR2024-04 – Tate Manor Bond subject to the following: Approval is extended to June 30, 2024

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Hynes |
| **SECONDER:** | Derr |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

DRAFT

### 6.4: BR2023-12 – Norborne Glebe Phase 15 Bond Reduction

Staff presentation

Long: Estimate based on current or future proposed bond estimate forms?

Staff: Current

Motion to approve BR2023-12 – Norborne Glebe Phase 15 Bond Reduction – PERFORMANCE BOND

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Hynes |
| **SECONDER:** | Derr |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

Motion to approve BR2023-12 – Norborne Glebe Phase 15 Bond Reduction – LAND DISTURBANCE BOND

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Hynes |
| **SECONDER:** | Long |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

### 6.5: BR2024-01 – Westover Dental Bond Establishment

Staff presentation

Motion to approve BR2024-01 – Westover Dental Bond Establishment

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Long |
| **SECONDER:** | Hynes |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

### 6.6: BR2024-01 – SLD2022-04 – Hillside Preliminary Plan

Staff presentation

Motion to table until March 25, 2024 per applicant's request

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Hynes |
| **SECONDER:** | Long |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

### 6.7: SLD2022-06 – Norborne Glebe Phases 10B, 11, 12, 13

Staff presentation

Derr: Asked clarifying question regarding lighting, acorn verses colonial.

Staff: They are of similar design

DRAFT

Motion to approve SLD2022-06 – Norborne Glebe Phases 10B, 11, 12, 13

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Long |
| **SECONDER:** | Derr |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

### 6.8: SLD2024-01 – WVU Healthcare Foundation Sketch Plan

Staff presentation

Hynes: Asked for clarification regarding rezoning.

Staff: They are going to submit a rezoning, boundary line adjustment, and a sketch plan.

Hynes: Does this sketch plan impact multiple properties?

Rob Whitson, Applicant's Engineer: Includes approximately 9.4 acres of neighboring residential property to the north

Long: Does your sketch plan assumes a successful rezoning of that other parcel to general commercial?

Rob Whitson, Applicant's Engineer: Yes

Thomas Moats, Applicant's Attorney: The amendment application has been filed and is on the agenda for March.

PC discussion regarding process

Motion to table SLD2024-01 – WVU Healthcare Foundation Sketch Plan,

| | |
|---|---|
| **RESULT:** | **Failed** |
| **MOVER:** | Long |
| **SECONDER:** | Paonessa |
| **AYES:** | Paonessa, Long |
| **NAYES:** | Derr, Dunning, Hynes |

Motion to table SLD2024-01 – WVU Healthcare Foundation Sketch Plan

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Hynes |
| **SECONDER:** | Derr |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

The Items were tabled to allow the rezoning process to play out first.

## 7. ADJOURNMENT

Motion to adjourn

| | |
|---|---|
| **RESULT:** | **Approved** |
| **MOVER:** | Hynes |
| **SECONDER:** | Long |
| **AYES:** | Paonessa, Derr, Dunning, Hynes, Long |

Meeting adjourned at 8:18 pm.

DRAFT

**Planning Commission**
101 East Washington Street
Charles Town, WV 25414

Meeting: 04/22/24
Department: Planning Commission
Category: Report
Initiator:

**SCHEDULED**

**AGENDA ITEM (ID # )**

## *Commission Review*: SLD2022-04: *Hillside* Preliminary Plans

**ATTACHMENTS:**

- 1. Staff Report.pdf
- 2. Plan Application.pdf
- 3. Revised Plans.pdf
- 4. KH Comments.pdf

Preliminary Plan Report

**SLD2022-04**

**Date:** For the April 22, 2024 Planning Commission meeting

**Applicant**: Christopher Consultants Ltd.

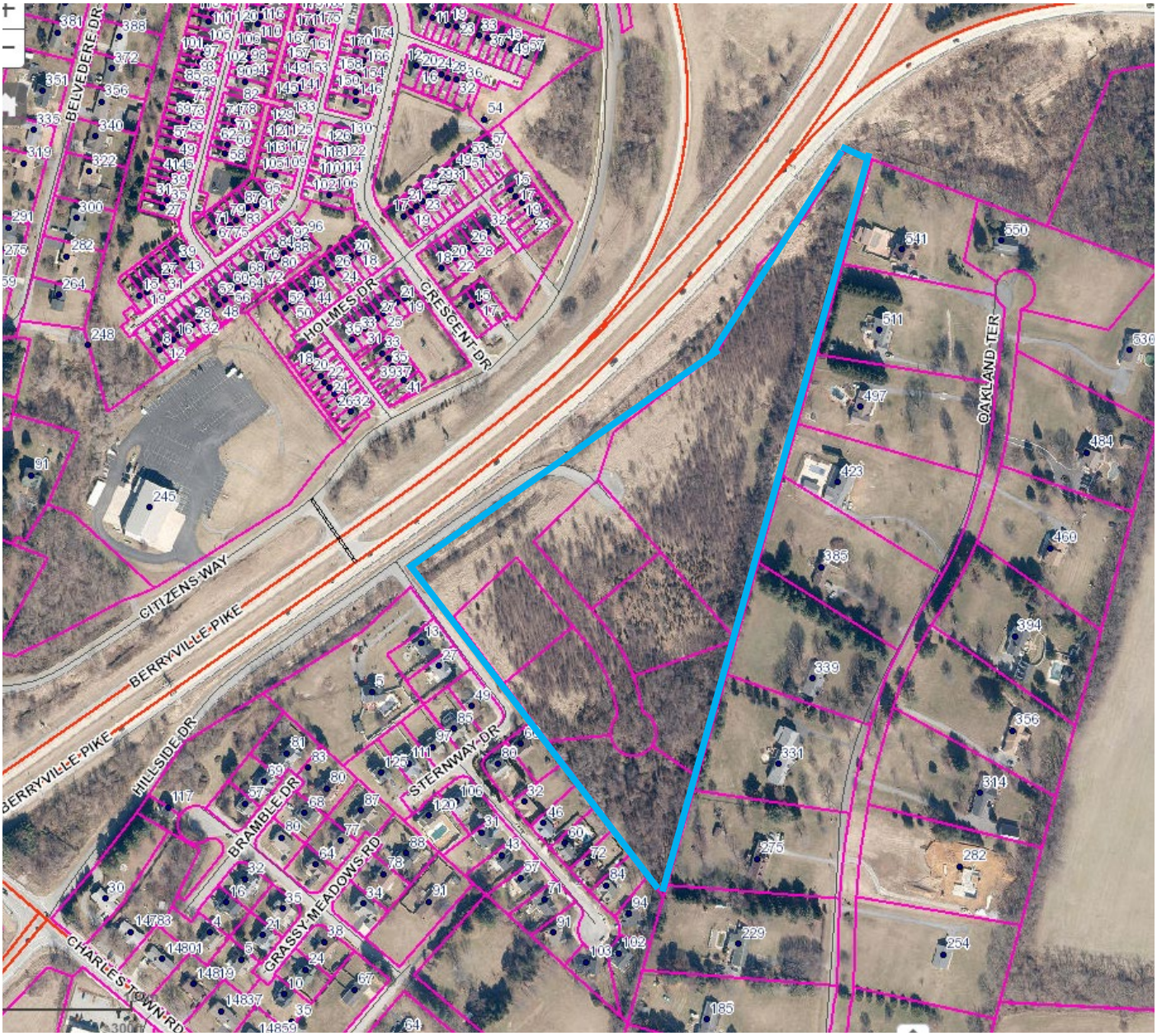
**Property Owner:** Hillside Investments LLC.

**Report by**: James Newman, City Planner, Zoning/Subdivision Administrator.

**Proposal:** Major Subdivision and Land Development, waiver for electric meter location.

**Property Location:** Located on Hillside Drive. Property roughly outlined in **blue** below.

**Current Zoning:** Residential Medium-High Density (R-15).



**PROJECT OVERVIEW**
The development of 14 acres into 121 townhouses.

**SKETCH PLAN**
The sketch plan was deemed complete by the Planning Commission on February 27th, 2023.

The sketch plan was approved by the Planning Commission on April 24, 2023, subject to conditions:

1. The plans must meet the 30% open space requirement of townhome developments.
2. Respectfully, that Council reach out to the WV Division of Highways about traffic mitigation possibilities, including a right turn only lane, at the intersection of Hillside Drive and Charles Town Road.

Approval of a sketch plan is valid for one year.

**WAIVER**
The Planning Commission approved a waiver from townhome electric meter locations on March 27, 2023.

**ZONING REVIEW**
The properties are zoned residential Medium-High Density (R-15).

*Density*
Maximum density is 15 units per acre. Density is calculated on net buildable land area. Out of a 14 acre site, net buildable land area is 9.75 acres/424,732 sq. ft. Applicant proposes 121 townhomes. 121 units / 9.75 acres = 12.4 units per acre, which is within the density limit of the zoning district.

*Open Space*
30% of the property must be open space. Open Space is partly defined in Code as land "*intended for the use and enjoyment of the residents living within the development*." Open space does not include land dedicated to buffer areas, streets, parking, stormwater management ponds, or other areas not practically useable by residents.

Proposed active open space includes a playground. Overall open space occupied 32%/3.14 acres of the site.

Additionally, Subdivision Ordinance Section 1333.17 requires that some open space be dedicated to the City as parkland, or a fee-in-lieu-of $500 per unit be paid. The applicant has informed staff that they will pay a fee-in-lieu-of.

*Parking*

Required off-street parking for townhomes is 1.8 spaces per unit, which would total 218 spaces. Applicant is proposing 263 spaces.

*Street Connections*

The City's Engineering firm, Kimley-Horn, had no comments about street connections or road design. Both Hillside and Sternway Drives are shown as local roads on the *2040 Comprehensive Plan*.

Proposed sidewalks within the development would connect to existing sidewalks on Sternway Drive. There is no existing sidewalk along Hillside Drive, and no sidewalks are proposed there.

*Landscaping*

Street trees are required for every 50 feet of street frontage. Up to 10 % of these trees may be planted in open space rather than along the street.

*Buffers*

Opaque screening of at least 6 ft. in height is required between townhomes and single family detached dwelling units. Opaque screening shall consist of a wall, fence, landscaped earth berm, planted vegetation, existing vegetation, or a combination thereof and shall be intended to prevent visibility and reduce noise.

A fence will be placed between the townhomes and the existing residences along Edaw Drive and half of Sternway Drive. A vegetated buffer will be used for the other units adjacent to Sternway.

Fencing will be used as a buffer between the townhomes and the existing homes along Oakland Terrace, with some vegetated landscaping included as well. There is no proposed buffer between open space and exiting homes.

*Stormwater*

The City's Engineering firm, Kimley-Horn, had no comments about stormwater control facilities. Those facilities are located at the northernmost point of the property, and along the western property line as well.

*Utilities*

A waiver was approved for the location of electric meters. The applicant does not yet have a letter confirming availability of water and sewage utilities from the Charels Town Utility Board.

*Lighting*

The applicant has provided photometric data which complies with Code requirements. The proposed lighting will be acorn style, as required.

## TRAFFIC IMPACT STUDY

The following analysis was prepared by the City's 3rd party engineering firm Kimley-Horn:

The Hillside Residential TIS is predicated and built upon three prior approved traffic studies and one study pending approval for. These developments and their proposed mitigation measures are included in the forecasts as background developments that will be fully or partially complete by the Build Year of 2029. These developments are the Tate Manor, Magnolia Springs, Kings Crossing, and Fairview Farms developments. The Tate Manor and Magnolia Springs developments are located north of Crescent Drive/High Street and east of Jefferson Avenue in Charles Town and are anticipated to be completed by the year 2024. The Kings Crossing development is located along the south side of WV 115 between Crosswinds Drive and Kabletown Road and is anticipated to be complete by 2025. The pending Fairview Farms development is located along the north side of WV 115 opposite Kings Crossing and is anticipated to be complete by 2030 (assumed 90% complete by 2029).

The developments previously mentioned include the following improvements which are considered a background condition of the study:

- Tate Manor TIS:
  - Installation of a Traffic Signal at WV 115 and Jefferson Avenue
  - Construction of an exclusive left-turn lane on WV 115 EB at Jefferson Avenue
  - Installation of a single lane roundabout at WV 115 and US 340 NB Ramp/Hillside Drive
- Kings Crossing TIS:
  - Construction of a right-turn slip lane on the US 340 SB Ramp approach at WV 115 eastbound
- Magnolia Springs TIS:
  - Proceed with the Single Lane Roundabout at WV 115 and US 340 NB Ramp/Hillside Drive (Planned by WVDOH to be installed in 2025)
- Fairview Farms TIS:
  - Construction of an exclusive right-turn slip lane on the WV 115 eastbound approach to US 340 Northbound Ramps/Hillside Drive

Should these background improvements not be implemented prior to the Hillside Residential Development Intersections #2 (Charles Town Road at US 340/Citizens Way) and #3 (Charles Town Road at US 340/Hillside Drive) will be operating under failing levels of service without the implementation of the slip lanes and single lane roundabout respectively.

The Hillside Residential Development proposes 128 new Townhouse Units which will add 896 average daily trips, 63 AM Peak Hour Trips and 76 PM Peak Hour Trips.

The Hillside Residential Development TIS recommends the following additional mitigation measures to provide adequate levels of service in the future build condition with the assumption the aforementioned improvements would be in place:

- Construction of an exclusive full movement approach along Hillside Drive to Site Drive #1,
- Construction of an exclusive full movement approach on Sternway Drive to Site Drive #2.

With the proposed mitigation measures in place by 2029 and the two additional site entrance improvements proposed by the Hillside Residential Development all study intersections are forecast to operate with acceptable levels of service (LOS D or better) in the 2029 Future Build Improved Scenario.

**TOWNHOUSE DEVELOPMENT STANDARDS**

Section 1333.20 of the Subdivision and Land Development Ordinance lays out use standards which apply to townhome developments:

*(A)* ***Density****. The overall density in a townhouse project shall not exceed the Maximum Density specified in the Charles Town Zoning Ordinance for the Zoning District in which it is located except when designed and developed as a Planned Unit Development under provisions set forth in the Charles Town Zoning Ordinance. Density shall be calculated using the Net Buildable Land Area (as such term is defined in the Zoning Ordinance) of the Lot.*

Maximum density in R-15 is 15 units per acre. Proposed density is12.4 units per acre. This criterion is **met**.

*(B)* ***Land Area****. The Net Buildable Land Area (as such term is defined in the Zoning Ordinance) of a townhouse Development shall equal at least 3,500 square feet for each dwelling unit. Each dwelling unit shall have a minimum lot size of 2,000 square feet. The difference between the Net Buildable Land Area and the total area of the dwelling unit Lots shall be allocated to open space common area*.

This criterion is **met**. The net buildable land area is calculated by subtracting areas where building is prohibited or subject to significant restrictions from the gross lot area. The calculation is based on subtracting the land devoted to sensitive areas such as wetland, sinkholes, and floodplains, public rights-of-way, and stormwater management areas. Setback requirements are <u>not</u> part of this calculation.

Per the applicant, the overall size of the site is 14.47 acres/630,313 sq. ft. Following the removal of public and private rights-of-way dedication, the net buildable area is 9.75 acres/424,732 sq. ft. As there are 121 proposed townhomes, the total land area for each dwelling unit is 3,510sq. ft. per dwelling unit, which meets the 3,500 sq. ft. threshold requirement.

*(C)* ***Tract Frontage****. Each townhouse development shall have at least 50 foot of street frontage. This does not apply to single or multiple contiguous townhouses on an existing platted street. For a townhouse development on a pipestem lot, the minimum pipestem width shall be the right-of-way width as required per Table 1333.02.*

This criterion is **met**. Each section of townhomes meets this requirement.

*(D) **Townhouse Lot Width**. The minimum townhouse lot width shall be in accordance with the minimum lot with specified in the Charles Town Zoning Ordinance for the Zoning District in which the townhouse is located. Each Lot on the end of a row of townhouses shall have an additional width necessary to accommodate the required side yard.*

This criterion is **met**. The minimum lot width requirement in R-15 zoning is 18 ft.

*(E) **Length of Townhouse Row**. There shall be not be more than ten (10) nor less than three (3) contiguously connected townhouse units.*

This criterion is **met**.

*(F) **Yards**. The following minimum Setback requirements shall apply:*

*1. **Front Yard**. Each townhouse shall have a minimum front yard Setback that is in accordance with the minimum front yard setback specified in the Charles Town Zoning Ordinance for the Zoning District in which the townhouse is located. Townhouses, however, may be arranged to face onto a common open space. In such instances, such a space shall not be less than fifty (50) feet in width and shall be arranged to permit access for emergency vehicles.*

*With such an arrangement, the front yard requirement may be reduced by ten (10) feet. If the townhouses have rear loaded garages or parking, the setback can be reduced from the required setback distance to zero (0) feet, or any distance in between, provided that no steps or stoops shall be allowed within the right of way or upon sidewalk, unless the sidewalk has a clear walking path of five (5) feet from the closest edge of the steps or stoop to the edge of curb. This reduced setback shall supersede the Zoning Ordinance requirements.*

*2. **Side Yard**. Each townhouse shall have a minimum side yard Setback that is in accordance with the minimum side yard setback specified in the Charles Town Zoning Ordinance for the Zoning District in which the townhouse is located. When the yard adjoining the corner Lot along the rear lot line fronts the side Street of the corner Lot, the width of the corner Lot shall be increased to provide a minimum side yard Setback equal to the adjoining front yards.*

*3. **Rear Yard**. Each townhouse shall have a minimum rear yard Setback that is in accordance with the minimum rear yard setback specified in the Charles Town Zoning Ordinance for the Zoning District in which the townhouse is located. However, access to the rear yard for purposes of maintenance and fire protection shall be accommodated by a private access drive or a minimum ten (10) foot property service easement, which shall be perpetually recorded with each dwelling unit property.*

*An accessory Building shall be located only in a rear yard and shall occupy not over twenty-five (25) percent of the rear yard area and shall be located not less than five (5) from any Alley or rear service Street Line. Enclosing of the rear yard space is permitted pursuant to the fencing requirements specified under Article 1323 (H) of the Charles Town Zoning Ordinance.*

These setback criteria are **met**. The proposed development meets the setback requirements, which are:
Front: 25 ft.
Sides: 10 ft., or 0 ft. for a shared party-wall.
Rear: 20 ft.

*(G) **Access Drives and Off-Street Parking**. Off-street parking space shall be provided at the rate of 1.8 spaces per dwelling unit. In a Subdivision/Land Development of townhouse Lots, it will not be necessary that off-street parking be provided on a specific Lot so long as the required number of parking spaces are provided in the Subdivision/Land Development for the number of Lots to be served; provided that, no parking area shall be more than 200 feet from the dwelling unit it serves.*

This criterion is **met**. Each unit features a driveway, and parking is available on-street.

*(H) **Townhouse garages** may be attached to or detached from the townhouse unit and may be accessed from either the front or rear yard. When detached the garage structure must be consistent and compatible with the architecture and materials of the respective townhouse unit.*

This criterion is **met**.

*(I) Townhouses abutting each other shall have complimentary but not identical **facades**.*

This criterion will be enforced during the building permit process. No architectural plans have been provided for staff review yet.

*(J) No more than two abutting townhouses shall have a **common roof line**.*

This criterion will be enforced during the building permit process. No architectural plans have been provided for staff review yet.

*(K) When townhouse Lots do not front on a Public Street, they shall front on private roads, parking lots or access Easements. The length and extent of private roads, parking lots or access Easements providing access to Lots shall be minimized, and Public Streets shall be provided in larger Subdivisions/Land Developments when substantial distances are involved.*

*Private roads, parking lots, and access Easements shall be no more than 500 feet from a Public Street, as measured along the centerline of the access Road. Private roads, parking lots, and access Easements may be located up to 800 feet from a public Road where enhanced circulation is provided with two connection points to the Public Street. The average daily trip for private roads, parking lots, or access Easements shall not exceed 250 VPD. Townhouse Developments that include the use of private roads, parking lots and access Easements shall conform to the West Virginia Code Chapter 36B, Uniform Common Interest Ownership Act, as specified under Section 1333.21 of this Ordinance.*

The applicant completed a traffic impact study. The average daily trips and peak hour trips to be generated are:

-896 average daily trips
-63 AM Peak Hour Trips
-76 PM Peak Hour Trips.

*(L)* ***Site Coverage****. The minimum townhouse lot width shall be in accordance with the minimum lot with specified in the Charles Town Zoning Ordinance for the Zoning District in which the townhouse is located.*

This criterion is **met**. Minimum lot size is 2,000 sq. ft.

*(M) Adequate provision shall be made for* ***storage of collection and refuse*** *where applicants desire a centralized collection point(s) in lieu of curb-side trash pick-up. This area shall be screened and the dumpsters placed on a concrete pad pursuant to Article 1333.23(L) of this Ordinance.*

The plan does not show any centralized dumpster or waste collection facilities or pads. This criteria would only apply if such facilities were proposed.

*(N)* ***Permeable areas*** *of the site shall be planted with ground cover, shrubs, and trees as required by this Ordinance.*

Ground cover in the form of grass and other landscaping will be used on permeable areas.

*(O)* ***Required Open Space****.*

*1. The difference between the Net Buildable Land Area of a townhouse Development and the total area of the dwelling unit Lots shall be allocated to open space common area as specified in Section 1333.20(B) above.*

*2. In the event that the Planning Commission, by waiver, permits dwelling unit Lots of less than the 2,000 square foot minimum specified in Section 1333.20(B), compensating open space must be established and provided within the project site equal to the aggregate area by which such Lots are under the 2,000 square foot minimum.*

*3. In a townhouse Development, open space for the Subdivision/Land Development must at least equal 30 percent of the Net Buildable Land Area of the Subdivision/Land Development.*

Open space is provided at 33% of the site.

*(P)* ***Maintenance of Common Areas****. All common areas and facilities including, but not limited to, recreational facilities, off-street parking and common open space shall be maintained in a satisfactory manner without expense to the general taxpayers of the City. In order to insure the maintenance of and the payment of taxes on the commonly held non-public property, a mandatory homeowners association shall be created and a declaration regarding the same shall be recorded to the satisfaction of the Planning Commission in the Office of the Clerk of Jefferson County.*

A homeowner's association must be established to care for common areas. The applicant has stated they will establish an association.

**RECOMMENDATION**

The site layout is generally in conformance with the approved sketch plan. The applicant has revised their plan to meet City requirements, and the number of unit (121) is less than originally planned (128). The Commission should vote to **approve** the plans.

**Sketch Plan Application No.**_____

# SKETCH PLAN APPLICATION

## SUBDIVISION AND LAND DEVELOPMENT ORDINANCE
## ARTICLE 1332, SUBDIVISION AND LAND DEVELOPMENT APPLICATION & APPROVAL REQUIREMENTS

**To assist the Subdivision Administrator in the review of a Sketch Plan Application, the Applicant must utilize this form to supply the City with the information prescribed under Section 1332.03 of the Charles Town S/LD Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as the Applicant's Sketch Plan Application as required by Ordinance Section 1332.03. Applicant is responsible to ensure the standards of Ordinance Section 1332.04, Sketch Plan Requirements, are met and provided herein is a checklist of the Sketch Plan requirements.**

1. DATE _____ 5/26, 2022

2. APPLICATION TYPE*

☐ Zoning Use Permit, Special Exception Use and Sketch Plan requirements found in the Supplemental Regulations of the Zoning Ordinance
- Submit Three (3) 11" x 17" copies of the Sketch Plan shall be submitted and in Adobe PDF format

☑ Major S/LD Development
- Submit Three (3) 18" x 24" copies of the Sketch Plan shall be submitted and in Adobe PDF format

*There are two types of Sketch Plan submissions:

1. For Zoning Use Permit, Special Exception Use and Sketch Plan requirements found in the Supplemental Regulations of the Zoning Ordinance. Submission standards are found in Section 1332.04(D).
2. For a Sketch Plan for a Major S/LD application, submission standards are found in Section 1332.04(E)

3. APPLICANT'S NAME* Christopher Consultants Ltd - Attn. Sylke Knuppel

Address: 4601 Forbes Boulevard # 140, Lanham, MD 20706

Telephone Number (240) 296-1574 Fax Number ( )

Email Address sylkeknuppel@ccl-eng.com

4. PROPERTY OWNER'S NAME Hillside Investment LLC

Address: 175 John J Thomas Way, Charles Town, WV 25414

Telephone Number (304)283-2601 Fax Number ( )

Email Address

5. LEGAL DESCRIPTION OF THE SUBJECT PROPERTY (list all parcels that apply)

Property Address:

Tax Map # and Parcel: Tax Map#: 9 Parcel#: 67

Deed Book and Page #: Deed Book: 691 Page#: 432

Property Area in Square Feet or Acres: 13.71 Acres

6. DESCRIPTION OF PROJECT AND PROPOSED USE(S) OF THE PROPERTY:

The project proposes a Subdivision, Parcel 67, Lots 2A and 2B, and consists of 126 Townhouse lots. The acreage to be developed is approximately 13.71 acres. Each townhouse unit is three(3) stories, 20' x 40', and 2,400 SF.

7. DESCRIPTION OF THE EXISTING (OR FORMER) USE(S) OF THE PROPERTY AND CURRENT ZONING:

The property is located south of Berryville Pike and is accessible from Hillside Drive. They are currently vacant and are designated as General Commercial in the City of Charles Town Zoning Map. The property is in Neighborhood Residential (NR) Zone.

*Applicants Include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

8. ARE THERE ANY ANTICIPATED WAIVERS OR VARIANCES? IF YES, PROVIDE DETAILS.

n/a

9. HAS THE PROPERTY BEEN THE SUBJECT OF ANY COURT ACTION?

☐ Yes (Please specify nature of all proceedings and current status and attach any documents showing court decisions, etc.)

☑ No

10. PARCEL HISTORY (List all pending or previously approved applications on the subject parcels inventoried above, including previous site plan applications if this application is a site plan amendment)

| Application No. | Project Name and Phase | Status | Approval Date |
|---|---|---|---|

11. INTERESTED PARTY ADDRESSES, FOR PUBLIC NOTICE (including across street)
(Interested parties are defined as adjacent properties within 100 feet).

| Owner | # and Street | City, State, Zip |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Section 1332.02 of the Charles Town S/LD Ordinance and relevant provisions of the Charles Town City Code.

Signature of Applicant

_____ Date 6-2-22

Signature of Property Owner (If different than Applicant)

_____ Date _____

Please submit an original completed Application and specified number of Site Plan copies to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

---

***FOR CITY USE ONLY***

Application Number:_____ Date Application Received:_____

Fee: $_____ Paid:$_____ Check No._____

Receipt No._____

Subdivision Administrator Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

Comments:_____

_____

_____

_____

_____

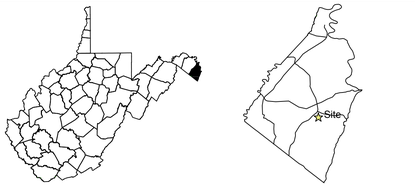
_____

# HILLSIDE

## PRELIMINARY SUBDIVISION/LAND DEVELOPMENT PLAT
## MAJOR SLD 2022-TBD

*CHARLES TOWN CORP. DISTRICT (3) - MAP 9 - PARCEL 67, LOTS 2A & 2B*
*DEED BOOK 691 - PAGE 432*
*CITY OF CHARLES TOWN, WEST VIRGINIA*
ZONED RESIDENTIAL MEDIUM-HIGH DENSITY (R-15)

**GENERAL LOCATION**




## LEGEND

- PROPOSED INDEX CONTOUR MAJOR (260)
- PROPOSED INT. CONTOUR MINOR (258)
- PROPOSED PROPERTY LINE
- PROPOSED PROPERTY SETBACK
- PROPOSED RIGHT-OF-WAY BOUNDARY
- PROPOSED BUILDING OUTLINE
- PROPOSED UTILITY EASEMENT
- PROPOSED STORM PIPE
- PROPOSED WATERLINE
- PROPOSED SANITARY SEWER
- PROPOSED 6' FENCE (X — X)
- PROP. SIDEWALK
- PROP. ASPHALT
- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. PROPERTY SETBACK
- EX. BUILDING OUTLINE
- EX. CURB AND GUTTER
- EX. STORM PIPE
- EX. WATERLINE
- EX. SANITARY SEWER
- EX. SIDEWALK
- EX. UTILITY EASEMENT
- ACCESSIBLE CURB RAMP
- ACCESSIBLE PARKING SPACE
- •0.00 PROPOSED SPOT ELEVATION
- PROPOSED PARKING COUNT
- PROPOSED STORM MANHOLE
- PROPOSED STORM INLET STRUCTURE
- WATER METER
- SANITARY SEWER CLEANOUT
- PROP. STREET LIGHT (TYP.)
- UTILITY POLE
- 8" PVC SDR-26 PROPOSED SANITARY SEWER LABEL
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED WATER VALVE
- PROPOSED WATER FITTINGS
- EX. ACCESSIBLE CURB RAMP
- EX. POST
- EX. STORM GRATE INLET
- EX. TRAFFIC CONTROL SIGNALS
- EX. TRAFFIC SIGNAL POLE
- EX. STORM MANHOLE
- EX. SANITARY MANHOLE
- EX. UTILITY POLE
- EX. PEDESTAL
- EX. VAULT
- EX. FIRE HYDRANT




**VICINITY MAP**

600 300 0 600 1200
GRAPHIC SCALE
1" = 600'

### CALL "MISS UTILITY"

MISS UTILITY OF WEST VIRGINIA (MUWV) AT 811 OR 1-800-245-4848, 48 HOURS PRIOR TO THE START OF WORK. EXCAVATORS MUST NOTIFY ALL PUBLIC UTILITY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATING OR BLASTING AND HAVE THOSE FACILITIES LOCATED BY THE UTILITY COMPANIES PRIOR TO COMMENCING EXCAVATION. THE EXCAVATOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL COUNTY REQUIREMENTS, WEST VIRGINIA CODE AND REGULATIONS.

### UTILITY NOTICE (AS NEEDED)

Contractors shall notify all public utility operators who maintain underground utility lines in the area of proposed excavating or blasting at least two (2) working days, but not more than ten (10) working days, prior to commencement of excavation or demolition. Names and telephone numbers of the operators of underground utility lines appear below. These numbers shall also be used to serve in an emergency condition.

| | |
|---|---|
| Water: | Charles Town Utility Board<br>832 S. George Street<br>Charles Town, WV 25414<br>(304) 725-2316 |
| Sewer: | Charles Town Utility Board<br>832 S. George Street<br>Charles Town, WV 25414<br>(304) 725-2316 |
| Power: | Potomac Edison<br>P.O.Box 3615<br>Akron, OH 44309<br>(800) 686-0011 |
| Phone: | Frontier Communications<br>1108 N. Mildred Street<br>Ranson, WV 25438<br>(304) 728-8500 |
| Soil Conservation: | Eastern Panhandle Conservation District<br>151 Aikens Center, Suite 2<br>Martinsburg, WV 25404<br>(304) 263-4376 |

### STATE & LOCAL PERMITS

| AGENCY | PERMIT #/APPROVAL DATE |
|---|---|
| | |
| | |
| | |
| | |


*CIVIL ENGINEER*
*IMEG*
*SYLKE KNUPPEL, P.E.*
*4601 FORBES BOULEVARD*
*SUITE 140*
*LANHAM, MARYLAND 20706*
*(240) 296-1568*

*DEVELOPER*
*APPLICANT/OWNER*
*HILLSIDE INVESTMENT LLC*
*175 JOHN J THOMAS WAY*
*CHARLES TOWN, WEST VIRGINIA 25414*
*(304) 283-2601*


### Sheet List Table


| SHEET NUMBER | SHEET TITLE |
|---|---|
| C000 | Cover Sheet |
| C100 | General Notes |
| C101 | Adjoining Owner Information and Phasing Key |
| C200 | Exisiting Conditions and Demo Plan |
| C201 | Exisiting Conditions and Demo Plan |
| C300 | Grading and SD Plan |
| C301 | Grading and SD Plan |
| C301A | Grading and SD Plan |
| C301B | Sidewalk Ramp Insets |
| C302 | Storm Profiles |
| C303 | Storm Profiles |
| C304 | Storm Profiles |
| C305 | Storm Sewer Computations |
| C306 | Storm Sewer Computations |
| C307 | Storm Sewer Computations |
| C308 | Storm Drain Drainage Area Map |
| C309 | Storm Sewer Details |
| C400 | Site Plan |
| C401 | Site Plan |
| C402 | Road Profiles |
| C403 | Road Profiles |
| C404 | Road Profiles |
| C405 | Road Profiles |
| C406 | Sight Distance Profiles |
| C407 | Sight Distance Profiles |
| C408 | Sight Distance Profiles |
| C409 | Site Details |
| C410 | Site Details |
| C411 | Site Details |
| C412 | Site Details |
| C500 | Utilities Plan |
| C501 | Utilities Plan |
| C502 | Sanitary Sewer Profiles |
| C503 | Sanitary Sewer Profiles |
| C504 | Sanitary Sewer Profiles |
| C505 | Sanitary Sewer Profiles |
| C506 | Sanitary Lateral Computations |
| C507 | Waterline Profiles |
| C508 | Waterline Profiles |
| C509 | Waterline Profiles |
| C510 | Utility Details |
| C511 | Utility Details |
| C600 | SWM NARRATIVE |
| C601 | SWM PRE-DEVELOPED DRAINAGE AREA MAP |
| C602 | SWM POST-DEVELOPED DRAINAGE AREA MAP |
| C610 | SWM PRE-DEVELOPED HYDROGRAPHS |
| C620 | SWM POST-DEVELOPED HYDROGRAPHS AREA A |
| C621 | SWM POST-DEVELOPED HYDROGRAPHS AREA B |
| C630 | SWM BMP MAP |
| C640 | SWM BMP COMPUTATIONS |
| C641 | SWM BMP COMPUTATIONS |
| C650 | SWM POND A |
| C651 | SWM POND A PROFILES |
| C652 | SWM POND A INFLOW COMPUTATIONS |
| C653 | SWM POND A OUTLET COMPUTATIONS |
| C654 | SWM POND A DETAILS |
| C655 | SWM POND A CONSTRUCTION INSPECTION CHECKLIST |
| C660 | SWM BIORETENTION B |
| C661 | SWM BIORETENTION B PROFILE |
| C662 | SWM BIORETENTION B INFLOW COMPUTATIONS |
| C663 | SWM BIORETENTION B OUTLET COMPUTATIONS |
| C664 | SWM BIORETENTION B DETAILS |
| C665 | SWM BIORETENTION B CONSTRUCTION INSPECTION CHECKLIST |
| C670 | SWM ADDITIONAL POND DETAILS |
| C700 | Erosion & Sediment Control Plan Phase 1 |
| C701 | Erosion & Sediment Control Plan Phase 1 |
| C702 | Erosion & Sediment Control Plan Phase 2 |
| C703 | Erosion & Sediment Control Plan Phase 2 |
| C704 | Erosion & Sediment Control Plan Narrative |
| C705 | Erosion & Sediment Control Plan Details |
| C800 | Fire Signage and Lighting Plan |
| C801 | Lighting Details |
| C802 | Photometric Plan |
| C900 | Preliminary Plat |
| L100 | LANDSCAPE PLAN |
| L101 | LANDSCAPE PLAN |
| L102 | LANDSCAPE PLAN |
| L200 | LANDSCAPE NOTES AND DETAILS |


*PRELIMINARY PLAN AND PLAT APPROVAL*

"This Preliminary Plan was approved by the City of Charles Town, on the _____ day of _____ , 20_____ , subject to any conditions specified hereon.

This plan is vested and valid for one (1) year with the possibility of a one (1) year extension per Section 1332.03(C)(2)(F)(5) of the City of Charles Town Subdivision and Land development Ordinance.

All expenses incurred with respect to improvements for all utility services, paving, grading, landscaping, curbs, gutters, sidewalks, road lighting, road signs, flood protection devices, drainage structures and all other improvements that may be required shall be the responsibility of the subdivider and not the City.

_____ _____
Secretary of the Planning Commision Date

*STATEMENT OF ACCEPTANCE*

"The developer, in signing this plat/plan, agrees to abide by all conditions, terms and specifications provided heron; and to complete all the improvements required by the Preliminary Plat and Plan or site plan."

_____ _____
HILLSIDE INVESTMENT LLC Date
175 JOHN J THOMAS WAY
CHARLES TOWN, WEST VIRGINIA 25414

*ENGINEER/SURVEYOR'S CERTIFICATION*

"The plat represents a survey made by him/her; all Monuments and improvements indicated thereon actually exist, and that their location, size and material are correctly shown; his/her best knowledge and belief, all requirements of the Ordinance have been fully complied therewith."

_____ _____
CHRIS LEMON Date
IMEG

*STATEMENT OF ACCURACE*

"The Engineer and/or Surveyor, in signing this plat/plan, attests to the best of his or her knowledge, is plan is complete and accurate."

_____ _____
CHRIS LEMON Date
IMEG


IMEG
50 Catoctin Circle NE, Suite 210
Leesburg, VA 20176 P: 703.777.2755
engineering • surveying • land planning


PRELIM PLAN - COVER SHEET
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
COVER SHEET

SHEET No.
C000


P:\Projects\22063\001\01\112742 Prelim Subdivision - Land Development Plan\C000 Cover Sheet.dwg, 4/8/2024 11:43:03 AM, Andrew H. Fraser,

# GENERAL NOTES

1. Methods and materials used in the construction of the improvements herein shall conform to current Jefferson County Construction Standards and Specifications and/or current WVDOH Standards and Specifications.
2. The Engineer shall not have control over or charge of and shall not be responsible for construction means, methods, techniques, sequences or procedures nor for safety precautions and programs in connection with work shown on these plans. The Engineer is not responsible for the contractor's schedules or failure to carry out the work. The Engineer is not responsible for acts or omissions of the contractor, subcontractor, or their agents or employees, or any other person performing portions of the work.
3. The Contractor, Owner or Developer shall be responsible for securing any third party inspection/testing service to insure construction compliance with these plans and specifications. It is IMEG Engineering's recommendation that a third party inspection/testing service be employed to ensure that project is completed and materials installed meet the details and specifications in these plans.
4. The location of existing utilities shown in these plans are taken from existing records and available asbuilt data. It shall be the contractors responsibility to verify the exact horizontal and vertical location of all existing utilities as needed prior to construction. The contractor shall be responsible for the digging of all test holes that may be required, whether recommended or not by these plans, to determine the exact location and elevation of existing utilities. If any conflicts arising from this existing utility work or verification or if during the course of construction, any object of an unusual nature is encountered, the contractor shall cease work in that area and immediately notify IMEG Engineering at (240) 296-1569 and/or the proper authority. IMEG Engineering or any engineer associated with these plans shall not be responsible or liable for any construction cost that may be associated with the installation or reinstallation any utility or other improvements if not notified of any discrepancies between actual field conditions and the approved plan.
5. The approval of these plans in no way relieve the developer, the contractor, or their agents of any legal responsibility which may be required by the code of West Virginia or any other ordinance enacted by Jefferson County nor does it guarantee the issuance of any required permit by Jefferson County, WVDOH or any other Agency.
6. An approved set of plans and all applicable permits must be available at the construction site at all times during construction. A representative of the developer must be available at all times.
7. The contractor shall provide adequate means of cleaning mud from trucks and/or other equipment prior to entering public streets, and it is the contractors responsibility to clean streets, allay dust, and to take whatever measures are necessary to insure that public streets are maintained in a clean, mud and dust free condition at all times.
8. The developer will be responsible for any damage to the existing streets and utilities which occurs as a result of his construction project within or contiguous to the existing right-of-way.
9. Warning signs, markers, barricades or flagmen should be in accordance with the State and Federal Manual on Uniform Traffic Control Devices (MUTCD).
10. All unsuitable material shall be removed from the construction limits of the site plan before placing embankment.
11. All pavement sections shown on these approved plans are based on a minimum CBR value of 6 and are for preliminary design only. Final pavement design shall be based upon actual field tested CBR values. The Contractor or Developer shall be responsible for field tests per WVDOH standards to obtain actual CBR values for final design. Final pavement designs will be approved by WVDOH and/or the Owner/Developer, which ever applicable, prior to installation.
12. All springs shall be capped and piped to the nearest storm sewer manholes or curb inlet. The pipe shall be minimum 6" diameter.
13. When grading is proposed within easements of utilities, letters of permission from all involved companies must be provided to Jefferson County & Charles Town Utility Board (CTUB) prior to issuance of grading and/or site development permits.
14. a. Notification shall be given to the Charles Town Utility Board two weeks prior to construction so they can arrange to have a project representative during construction. The District would like to be in the pre-construction project meetings with the contractor.

    b. Notification shall be given to the Charles Town Utility Board prior to construction of water lines. Information should also be obtained from the appropriate authority concerning permits, cut sheets, and connections to existing lines.
15. The Developer and/or Contractor shall be responsible to supply all utility companies with copies of the approved plans and advise them that all grading shall conform to the approved plans, and further that the utility companies shall be responsible for honoring these plans and the finished grades in the installation of their utility lines.
16. All utilities to be located underground.
17. Contractors shall notify operators who maintain underground utility lines in the area of proposed excavating or blasting at least two (2) working days, but not more than ten (10) working days, prior to commencement of excavation or demolition.
18. The developer will be responsible for the relocation of any utilities which is required as a result of his project. The relocation should be done prior to construction.
19. All dry utility design shall be performed and provided separately by others. All dry utility information shown hereon is as specified by others and is included for informational purposes only, as directed by the Owner, Developer and/or public agency requirements. The lighting photometric design has been performed by WLS Lighting to comply with Charles Town specifications. IMEG Engineering has not performed the lighting and/or dry utility design and does not warrant and is not responsible for the degree and/or adequacy of illumination on this project or the adequacy of the dry utility to service the site.
20. All sanitary sewers, water mains and appurtenances shall be constructed in accordance with the current standards and specifications of the Charles Town Utility Board.
21. All stormwater piping and structures shown on these plans are only accurate to the inlet or manhole locations as shown hereon. Detail design of stormwater structures were not provided to Greenway Engineering. Actual pipe alignments will be based upon developed structural shop drawings as provided by the manufacturer. Contractor shall make adjustments to pipe alignments base on provided shop drawings. Greenway Engineering will not be held responsible or liable for any discrepancies or changes caused by the structural design. Contractor may submit shop drawings to Greenway Engineering for review and approval at contractor's expense. Shop drawings will be reviewed for compliance with design plans. The Owner or Developer will be responsible for any redesign as a result of structural shop drawing design.
22. Controlled fills shall be compacted to 95% of maximum density as determined by method "A" per standard proctor AASHTO-T99, ASTM-D698, or VTM-1 as applicable. Density shall be certified by a registered professional engineer and results submitted to Jefferson County, prior to pavement construction. If a geotechnical report has been prepared, it should supersede the requirements in this note.
23. Refer to Geotechnical Engineer for methods, materials and details for construction of all earthwork activities.
24. Any retaining wall 2 ft, or greater in height shall require the issuance of a separate building permit.
25. Construction debris shall be containerized. No less than one liter receptacle shall be provided at the construction site.
26. IMEG Engineering, Inc. (IE) issued this plan set based on project criteria dictated by the client and municipal codes. This plan set is not considered complete or appropriate for construction until ALL necessary agencies have given approval AND this plan set is signed and sealed by a licensed professional. Any work, planning, scheduling, material purchases and/or construction prior to approvals and licensed/professional sealing will be performed at the risk of the personnel authorizing work. IE shall be held harmless from any costs, time delay and/or material changes incurred on work started before this plan set receives approvals and seals.
27. There are no known FEMA 100-year floodplains Floodplains on the subject property, per FEMA Map Number 54037C0139E, Effective December, 18 2009.
28. No known wetlands have been identified on the subject property.
29. The HOA or Individual lot owners shall be responsible for trash pick up service to the u nits. No dumpsters are proposed for this section.

# WATER AND SEWER NOTES

1. Easements shall be given to the Jefferson County Public Service District for the construction and maintenance of sewer facilities, as depicted herein.
2. Installation and maintenance of water and sewer lines shall be in accordance with the WV Department of Health, Jefferson County Public Sewer District, the City of Charles Town and the Charles Town Utility Board requirements.
3. Complete water lateral prior to final paving.
4. Water lines to have a minimum of forty-two inches (42") of cover to crown of pipe. Water lines to have seal of the National Sanitation Foundation. Mechanical joints or slip-on joints with rubber gaskets are preferred by the Health Department.
5. Provide concrete thrust blocking at all water line intersections and direction changes.
6. All water mains must be AWWA C900, CL235 PVC. All sanitary sewer to be PVC ASTM 3034 SDR-35 unless otherwise specified.
7. Water easements are to be dedicated to the Charles Town Utility Board.
8. Storm drain easements are to be dedicated to the City of Charles Town.
9. Sanitary sewer and force main easements are to be dedicated to the Jefferson County Public Sewer District.
10. A horizontal separation of at least 10 foot must be maintained between sanitary sewer and potable water lines except when they are crossing. When water and sewer lines cross, the water line shall be at least 18 inches above the sewer line.

Summary of Water Requirements - Charles Town Utility Board, Charles Town, WV

1. All water mains must be AWWA C900, CL235 PVC. Line extensions must have permitted approval prior to installation.
2. All service lines to be minimum 200 PSI PVC or copper. Final Line size will depend on the type of service. The City will not allow any galvanized lines or fittings. A standard shut off valve must be installed on the property side of the meter for the owner's use; the meter valve is for the city use only,
3. All meters, vaults, and crooks will be set at the property line; the CTUB will install the meters.
4. All service lines will be no deeper than 36" at the meter location to allow access to the setter by the meter installers. Deeper service lines may be acceptable if a crossing conflict is encountered or site conditions dictate.
5. The CTUB will supply the meters, setter and boxes. All non-metallic lines will be installed with tracer ribbon. (Located 6" above the newly installed service line with 3" wide detectable tape.)
6. All multi-meter installations, such as a business or apartment complex are to be set in an outside vault, or an accessible mechanical room, and are to be supplied by the owner. These areas are to be inspected prior to the availability of water service.
7. Fire Hydrants must be American Darling Mark B62B 5-1/4" valve opening with 6" base or equal,
8. Valves are to be AWWA C515 gate valves resilient seated opening left. Valve boxes must be screw type Tyler #562S or equal. All valve riser sleeves are to be cast iron with cap. PVC risers to be approved on a use basis by the CTUB Water Representatives.
9. All valves, bends (45's, 22's and 90's), tees and elbows shall have mechanical restraints (such as mega lugs) and thrust blocks.
10. The CTUB must inspect all work. The contractor must give 24-hour notice to the CTUB for an inspection request. The CTUB may request as-built sketches, photos etc. (as back up)
11. All West Virginia Public Service Commission and WV Health Department, rules and regulations, applying to water and sewer must be followed, and all local state and federal permits and approvals must be obtained prior to performing any water or sewer extensions or upgraded work.

Submittals

1. Prior to the installation of any material or equipment on the project supplied by the Contractor, the Contractor shall submit to the City, three (3) copies of all shop drawings, laying schedules, manufacturer specifications, certification and drawings in accordance with the General Conditions. (Water/Sewer) One copy is for the application file, One copy is for the final inspection compliance, One copy is for inspection review or comments to be completed prior to beginning work. A copy of a current WV Contractors License and proof of Liability Insurance must accompany the submittal.
2. City will require as-built drawings and a copy of submittals for all pipe and and appurtenances used on the project. As-builts shall be furnished in both PDF and AutoCAD formats. An O&M Manual containing, at a minimum, all submittals is to be furnished.

Field Copies of Construction Information
The Contractor shall keep a minimum of one (1) complete copy of the Contract construction plans and specifications (including all revisions and addendums), and all shop drawings issued at the project site. All information shall be kept in a neat and good order and shall be made available for the City's Representative to use at his request.

Open Excavation

1. The depth of trenches shall be such that the location of the proposed pipes will conform with the lines and grades shown on the plans. The shape of all trenches above and within the pipe zone, the construction methods employed, the general protections requirements, the general excavation requirements, the general trenching requirements, and the minimum regulations for trench shoring, shall conform with the regulations set forth under OSHA Regulations 29CFR part 1926 650, 651 & 652. No trenching excavation work shall be performed which is not in accordance with those regulations.
2. The shape of the trenches in the "pipe zone" (which shall be construed to be that portion of the trench between the trench bottom and an elevation 1 foot above the top of the pipe) shall conform to the configuration identified as "Typical Bedding" on Pipe Bedding Drawing #1. The contractor is herein advised that if trench widths in the pipe zone exceed the outside diameter of the pipe plus two feet, and if the City determines that such excessive widths will result in a structural loading for which the pipe is not designed, he shall be required to bed the pipe on a concrete cradle at no additional cost.
3. The Contractor shall shape trenches which are located adjacent to existing above ground or underground structures and/or facilities or in other confined areas, so that such structures and facilities are properly protected against damage or disturbance from settlement or displacement. Adequate sheeting, shoring and/or bracing shall be installed and maintained to provide such protection and the Contractor shall be responsible for all damages resulting to such proposed and existing structures, pipelines, and/or facilities as the result of his failure to use and maintain adequate trench wall support, as well as a result of any other construction activities. The bottoms of all trenches shall be excavated to a depth of 6 inches below the bottom of the proposed lines to accommodate the bedding hereinafter specified.

Pipe Installation

1. Before any pipe is installed in trenches, it shall be inspected for damage and the inside of the pipe shall be swabbed to remove loose dirt and foreign objects, No damaged pipe will be permitted to be installed.
2. All pipes shall be installed to the lines and grades shown on the drawings. No pipes shall be constructed in trenches in which water flows or is pooled and, all pipes shall be carefully handled in the ditch to keep the jointing ends and materials free from dirt during installation. During shut down periods and at the end of each day, all open ends of pipe shall be suitably plugged to prevent the inflow of water, dirt, foreign objects, etc.

Pipe Bedding and Pipe Zone Backfill Material
All proposed pipelines shall be supported on stone dust or #10's small diameter stone. The material shall be placed to a minimum depth of 6 inches below the bottom of the pipe and 6 inches above of the top of the pipe. The material shall be placed in the pipe zone in such a manner as to not disturb, displace, or otherwise misalign the installed pipelines.

Backfill Material Above the Pipe Zone
The material used above the pipe zone shall be such that a satisfactory compaction can be made. At no time shall material bigger than 2 inches in diameter be used. But any material used must be approved by the City before hand. After approval, the entire depth within the backfilled area shall be compacted to provide the minimum percentage of density specified for each area of classification.

Special Backfill Material Below the Pipe Zone
Where muck, quicksand, soft clay, swampy or other material is encountered in the trench bottom, which in the opinion of the City is unsuitable for pipe foundation subgrade or backfill, such material shall be removed to a depth satisfactory to the City. The trench shall then be backfilled to grade with acceptable City approved material, mechanically compacted in successive layers.

Ductile Iron Pipe and Fittings
Ductile iron pipe and fittings under this Contract shall be furnished by the Contractor. All pipes will be slip type joint unless otherwise noted and all fittings will be mechanical joint.

PVC Pipe and Fittings
No glue joints are to be used within the CTUB water or JCPSD right of way. Onsite sewer laterals are to be schedule 40 PVC Pipe or equivalent.

Fire Hydrants
Hydrants shall be furnished and installed complete where shown on the drawings and as approved by the CTUB. This installation shall be adapted to the location of the hydrant so as to make the best installation possible. (note: hydrants no-more than 500 ft apart)

Service Connections for Water Lines

1. Service connections shall be made as indicated on the Contract Drawings.
2. The Contractor shall furnish all fittings required to make the necessary connections. All service line connections shall be made in the presence of the CTUB representative.

Valves and Boxes
Each valve installed underground shall be equipped with a valve box furnished by the Contractor and installed by the Contractor.

Anchoring and Blocking

1. All bends in excess of 10 deg, plugs, caps, tees, and wyes branches along pipelines shall be adequately blocked or anchored to prevent the lines from pulling apart under pressure (see typical concrete blocking).
2. Lugged fitting and tie rods, clamps collars, restrained joints, and anchoring fittings may be substituted in lieu of blocking after having received the approval of the CTUB. Concrete used for blocking and anchoring pipelines in trenches shall consist of concrete as specified elsewhere in these specifications.

Pressure and Leakage Tests
All pipeline shall be tested by the Contractor according with AWWA and witnessed by the CTUB Representative. The Contractor shall furnish all equipment, apparatus, temporary blocking, pumps, taps and gauges to conduct the tests.

Blow Off
Blow off valves shall not be installed.

Minimum Pipe Size and System Design

1. The minimum size of water pipe shall be six-inch diameter. This may be increased at the discretion of the City if hydraulic modeling indicates that a larger size is needed to provide pressure and/or fireflow in the area.
2. Dead ends shall be minimized by looping of all mains.
3. Where dead-end mains occur they should be provided with a fire hydrant, for flushing purposes.
4. No flushing device shall be directly connected to any sewer.

Separation of Water Services & Mains from Other Utilities
5 foot horizontal separation from all non-sewer utility lines - electric, phone etc.

Parallel Installation

1. Normal conditions - Water mains shall be laid at least ten feet horizontally from any sanitary sewer, storm sewer or sewer manhole, whenever possible; the distance shall be measured edge-to-edge.
2. Unusual conditions - When local conditions prevent a horizontal separation of 10 feet, a water main may be laid closer to a storm sewer provided that:

A. The bottom of the water main is at least 18 inches above the top of the sewer
B. Where this vertical separation cannot be obtained, the water main will be sleeved and all voids will be filled.

Crossings

1. Normal conditions - Water mains crossing house sewers, storm sewers or sanitary sewer shall be laid to provide a separation of at least 18 inches between the bottom of the water main and the top of the sewer, whenever possible.
2. Unusual conditions - When local conditions prevent a vertical separation as described, Charles Town Utility Board shall be contacted for direction.
3. Water mains passing under sewer shall be protected by providing:

A. A vertical separation of at least 18 inches between the bottom of the sewer and the top of the water main.
B. Adequate structural support for the sewers to prevent excessive deflection of the joints and settling on and breaking the water mains;
C. That the length of the water pipe be centered at the point of crossing so that the joints will be equidistant and as far as possible from the sewer.
D. Water line shall be sleeved and the void area filled.

4. Sewer manholes - No water pipe shall pass through or come within 5 feet of any part of a sewer manhole.

Private Fire Protection Service
No pipe or fixtures connected with a private fire service served by the CTUB shall be connected with pipes or fixtures supplied with water from any other source.

# WVDOH NOTES

WV1. All work, construction methods and materials shall conform with the West Virginia Division of Highways "STANDARD SPECIFICATIONS ROADS AND BRIDGES Adopted January 1, 2017" and Supplemental Specifications dated January 1, 2020. All work on this project shall also conform with The Soil Conservation Service Erosion and Sediment Control Regulations and any other state, federal, or local regulations applicable. In the event of conflict between any of these standards, specifications, or plans, the most stringent shall govern.

WV2. All construction shall comply with the latest U.S. Department of Labor Occupational Safety & Health Administration.

WV3. When working on WVDOH right-of-way, all traffic control, whether permanent or temporary, shall be in accordance with "Manual on Temporary Traffic Control for Streets and highways" 2006 Edition as published by WVDOH.

WV4. Design features relating to construction or to regulation, control, and safety of traffic maybe subject to change as deemed necessary by WVDOH.

WV 5. Prior to initiation of work, Contractor shall be responsible for acquiring all necessary WVDOH land use permits for any work on WVDOH right-of-way.

WV 6. If required by the local WVDOH Residency Office, a preconstruction conference must be arranged and held by the engineer and/or developer with the attendance of the contractor, various County agencies, utility companies and WVDOH prior to initiation of work.

WV 7. Contractor shall notify the local WVDOH Residency Office when work is to begin or cease for any undetermined length of time. WVDOH will also require 48 hours notice for any inspection. Please contact the Burlington, WV field office at 304-289-3521.

WV 8. The Contractor will be responsible for maintaining adequate access to the project from the adjacent public roadway through construction and maintenance of a construction entrance in accordance with the Soil Conservation Service Erosion & Sediment Control Handbook. Furthermore, access to other properties affected by this project shall be maintained through construction.

WV 9. Contractor shall ensure adequate drainage is achieved and maintained on the site during and at the end of construction.

WV 10. All water and sewer lines within existing or proposed WVDOH right-of-way are to have minimum 36" cover and, when possible, to be installed under roadway drainage facilities.

WV 11. Any unusual subsurface conditions encountered during the course of construction shall be immediately brought to the attention of the engineer and WVDOH. Work shall cease in that vicinity until an adequate design can be determined by the engineer and approved by WVDOH.

WV 12. All undercut areas and borrow material shall be inspected and approved by WVDOH Inspector prior to placement of fill.

WV 13. All roadway fill, base, subsurface material and backfill of utility/storm sewer trenches shall be compacted in 6" lifts to 98% of theoretical maximum density as determined by AASHTO T-99 Method A, within plus or minus 2% of optimum moisture for the full width of any dedicated street right-of-way. At the direction of WVDOH Inspector density tests performed by a qualified independent agency shall be conducted as required in the WVDOH Road and Bridge Specifications. A copy of all tests shall be submitted to WVDOH prior to final WVDOH approval.

WV 14. WVDOH Standard CD and UD underdrains shall be installed where indicated on these plans and further where determined necessary by WVDOH Inspector.

WV 15. The installation of any entrances and mailboxes within any dedicated street right-of-wayshall meet WVDOH minimum design standards and is the developer's responsibility.

WV 16. If required by the local WVDOH Residency Office, copies of all invoices for materials within any dedicated street right-of-way must be provided to the WVDOH Inspector prior to acceptance of work. Unit and total prices may be obscured.

WV 17. Prior to acceptance by WVDOH of any streets, any required street signage and/or pavement markings must be installed by the developer.

# GENERAL CTUB SEWER NOTES

- Refer to the Charles Town Utility Board (CTUB) sewer system specifications dated May 2016, and the latest modifications or revisions thereto, for sanitary system construction methods, materials, field quality control, and for all details and specifications for all sanitary sewer systems to be served by the Charles Town Utility Board.
- No gravity sewer shall be less than 8" diameter
- A minimum of 3 feet of earth covering is required on all sewer lines.
- Sewers shall be laid in straight line with uniform slope between manholes. Sewers on 20% slope or greater shall be anchored securely with concrete anchors, or approved equal.
- Bedding - No. 8 or No. 10 limestone shall be used for bedding unless otherwise approved by CTUB.
- There shall be no physical connection between a drinking water supply system and a sewer system
- Horizontal Separation - A minimum of 10 feet separation between sewer lines and water lines must be maintained. In cases where the 10 feet minimum cannot be maintained, the sewer line shall be 18" lower than the water line and constructed of a pressure type pipe. When the lines are placed within 5 feet of each other, permanent identification tape must be buried directly above the lines denoting "Sewer Line" or "Potable Water Line".
- Vertical Separation - A minimum of 18" of separation between the top of the sewer lines and the bottom of the water lines must be maintained. In case where the 18" cannot be maintained, the sewer line shall cross at midpoint of a 20' long joint of the water line and be constructed of pressure type pipe. A sewer line shall not be constructed over top of a water line. If the standard vertical installation requirements cannot be maintained the sewer line shall be encased so that the casing extends at least 15 feet each side of the crossing with a minimum of 18" of vertical separation.
- Manholes - Shall be pre-cast concrete meeting requirement of American Society for Testing and Materials (ASTM). The minimum base diameter shall be 48" (Minimum opening 24"). The inside base of the manhole shall be filled with concrete to form a bench sloping toward the flow channel. Watertight manhole covers are to be used wherever the manhole covers may be flooded by street runoff or high water. Pipe connections to manholes and joints on manholes shall be watertight. Concrete manholes shall be waterproofed on the exterior where groundwater conditions are unfavorable.
- Gravity sewers shall be PVC pipe, schedule SDR-35. All pipes and fittings shall meet or exceed all requirements of ASTM specifications D-3034 and /or other requirements of UNI-BELL UNI B4. Joints shall be either O-ring type "or" mechanical seal joint meeting material requirements of ASTM 1784 and joint requirements of ASTM 3212. No solvent cement joints will be permitted in field construction, except as specifically authorized by CTUB.
- Lateral piping and fittings sizes 4" through 6" for use in lateral piping shall meet the requirements of schedule 40.
- Refer to CTUB Sewer System Specifications and the latest modifications or revisions thereto, for:
  - Gravity sewer construction methods and pipeline testing.
  - Manholes submittals, delivery, storage and handling, inspection, preparation, construction methods and vacuum testing.
  - Cast in-place concrete specifications and requirements.
- The developer shall furnish and install the wye branches, riser pipe, service laterals, transition fittings, and incidentals where shown on the plans or where directed by CTUB.
- Home owner installed service laterals - pipe shall be 4" minimum SDR-35 or schedule 40 installed at 2% minimum slope. Lateral should be placed with 3 feet minimum cover unless otherwise approved by CTUB. Laterals shall be installed with minimum 6" bedding below pipe and 12" over pipe. Connection of home owner lateral to existing lateral shall be fitting of same type of pipe. Bedding shall be No. 8 or No. 10 limestone or other material as approved by CTUB. The lateral and connections shall be inspected and approved by a representative of CTUB prior to covering with bedding.
- Contractor shall contact CTUB at least 48 hours before connecting to the lateral system to allow for CTUB representatives to perform the onsite inspection of the connection.
- Contractor shall notify CTUB prior to installation of any improvements within the water and sewer easements to ensure that no fence posts or other improvements are placed on top of the utilities.
- Charles Town Utility Board
  661 S. George Street
  Charles Town, WV 25414
  (304) 725-2316

# PROJECT NOTES

| | |
|---|---|
| PARCEL IDENTIFICATION NO. | 19-03-009B-0001-0000, 19-03-009B-0002-0000, 19-03-009B-0003-0000, 19-03-009B-0004-0000, 19-03-009B-0005-0000, 19-03-009B-0006-0000, 19-03-0009-0067-0000 |
| STREET ADDRESS: | HILLSIDE DR. |
| PROJECT SITE AREA: | 14.47 ACRES |
| CURRENT ZONING: | RESIDENTIAL MEDIUM-HIGH DENSITY (R-15) |
| CURRENT USE: | NEIGHBORHOOD RESIDENTIAL VACANT |
| PROPOSED USE: | RESIDENTIAL SUBDIVISION |
| BUILDING SETBACKS | |
| FRONT: | 25' |
| REAR: | 20' |
| SIDE: | 10' |
| MAX BUILDING HEIGHT: | (MAX. 3 STORIES) |
| MAX. DENSITY ALLOWED: | 15 UNITS PER ACRE (NBLA AC X 15 UNITS) |
| MAX. DENSITY PROVIDED: | 9.75 AC X 15 = 146 DUs (121 SHOWN) |
| MIN. LOT AREA: | 2,000 SF END UNITS |
| LOT AREA PROVIDED: | 2,000 SF INTERIOR UNITS |
| | 28' END UNITS |
| MIN. LOT WIDTH: | 18' INTERIOR UNITS |
| | 30' END UNITS |
| LOT WIDTH PROVIDED: | 20' INTERIOR UNITS |
| OFF STREET PARKING REQUIRED: | 1.8 SPACES /DU = 1.8x121= 218 SPACES |
| OFF STREET PARKING PROVIDED: | 2.0 SPACES /DU = 2X121 = 242 SPACES |
| ADDITIONAL SPACES PROVIDED: | 21 SPACES |
| TOTAL PARKING PROVIDED: | 263 TOTAL SPACES (OFF STREET PARKING SHALL BE NO MORE THAN 200' FROM UNIT BEING SERVED) |

NOTE: SEC 1322.08(C)2
a. STATES, UNENCLOSED EXTERIOR STAIRWAYS MAY PROJECT INTO A REQUIRED SIDE OR REAR YARD NOT MORE THAN 4', AND
b. NO FRONT PORCH OR DECK SHALL EXTEND INTO THE REQUIRED FRONT YARD UNLESS DEVELOPMENT PATTERNS WITHIN THE BLOCK ARE SUCH THAT A PORCH WOULD BE APPROPRIATE. IN NO CASE, SHALL A FRONT PORCH EXTEND MORE THAN 8' INTO A REQUIRED FRONT YARD.

# AREA TABULATIONS

| | |
|---|---|
| PROPOSED LOTS: | 121 TOTAL LOTS |
| TOTAL PROPERTY AREA: | 14.47 ACRES |
| PROPOSED IMPERVIOUS LOT AREA: | 4.97 ACRES |
| PROPOSED PERVIOUS LOT AREA: | 3.36 ACRES |
| PROPOSED PAVED/GRAVEL AREA: | 1.59 ACRES |
| PROPOSED SIDEWALK AREA: | 0.43 ACRES |
| PROPOSED TOTAL IMPERVIOUS AREA: | 4.97 ACRES |
| PROPOSED LOT AREA: | 285,944 S.F. OR 6.56 ACRES |
| RIGHT OF WAY: | 135,601 S.F. OR 3.11 ACRES |
| SWM FACILITIES & PUBLIC UTILITY EASEMENTS: | 70,137 S.F. OR 1.61 ACRES |
| OPEN SPACE AREA: | 138,788 S.F. OR 3.19 ACRES |
| NET BUILDABLE LAND AREA: | 424,732 S.F. OR 9.75 ACRES |
| 30% MIN. OPEN SPACE : | 127,420 S.F. OR 2.93 ACRES |
| 33% OPEN SPACE AREA PROVIDED: | 138,788 S.F. OR 3.19 ACRES |

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PRELIM PLAN - GENERAL NOTES
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
GENERAL NOTES

SHEET No.
C100

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C100 General Notes.dwg, 4/10/2024 4:46:40 PM, Matthew Pohlhaus,

U.S. ROUTE 340 BYPASS
(VARIABLE WIDTH RIGHT-OF-WAY)

HILLSIDE DRIVE

E:2437521
N:2286981

E:2438162
N:2287521

WEST VIRGINIA STATE GRID NORTH
WV83-NF

PUBLIC ROAD 'A'

PUBLIC ROAD 'B'

PUBLIC ROAD 'C'

PUBLIC ROAD 'D'

HILLSIDE DRIVE

STERNWAY DRIVE
(40' ROW)

HILL SIDE
(40' ROW)

OAKLAND HEIGHTS
SECTION 1

OAKLAND HEIGHTS
SECTION 2

LOT 1
CTC M9A P1
MOWERY
D.B. 953 PG. 201

LOT 2
CTC M9A P2
GLENN
D.B. 951 PG. 238

LOT 3
CTC M9A P3
OWEN
D.B. 1205 PG. 38

LOT 4
CTC M9A P4
OWEN
D.B. 1016 PG. 25

LOT 5
CTC M9A P5
SULLIVAN
D.B. 1230 PG. 202

LOT 18
CTC M9A P18
TROXEL
D.B. 1079 PG. 418

LOT 19
CTC M9A P19
CLARK
D.B. 949 PG. 451

LOT 20
CTC M9A P20
OWEN
D.B. 1260 PG. 9

LOT 21
CTC M9A P21
UBERT
D.B. 1134 PG. 446

LOT 22
CTC M9A P22
DELANEY
D.B. 1952 PG. 486

LOT 23
CTC M9A P23
POTTER
D.B. 1206 PG. 494

LOT 24
CTC M9A P24
DOUGHERTY
D.B. 1181 PG. 746

LOT 25
CTC M9A P25
POTTER
D.B. 996 PG. 683

LOT 5
CTD M18 P6.6
WALTERS
D.B. 678 PG. 304

LOT 6
CTD M18 P6.7
HIPSLEY
D.B. 1011 PG. 394

LOT 7
CTD M18 P6.8
MCMILLAN
D.B. 1120 PG. 393

LOT 8
CTD M18 P6.9
MATTHEWS
D.B. 949 PG. 112

LOT 9
CTD M18 P6.10
SPITZER
D.B. 865 PG. 647

LOT 10
CTD M18 P6.11
GRENIER
D.B. 1087 PG. 213

LOT 11
CTD M18 P6.12
CENATE
D.B. 1034 PG. 356

LOT 12
CTD M18 P6.13
CENATE
D.B. 609 PG. 195

LOT 13
CTD M18 P6.14
GRIMES
D.B. 1183 PG. 253

E:2438411
N:2286599

60 30 0 60 120
GRAPHIC SCALE
1" = 60'

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PRELIM PLAN - ADJOINING OWNER INFORMATION AND PHASING KEY

691/432 MAP 9 PARCEL 67

LOTS 2A (RESIDUE) & 2B

DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 60'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

ADJOINING OWNER INFORMATION AND PHASING KEY

SHEET No.

C101

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C101 Adjoining Owner Information and Phasing Key.dwg, 4/7/2024 9:09:58 PM, Matthew Polkhaus,

SEE SHEET C201

SEE SHEET C201

STERNWAY DRIVE (40' ROW)

EDAW DRIVE (40' ROW)

HILL SIDE

WEST VIRGINIA STATE GRID NORTH
UTM83-18F

LOT 3 CTC M9A P3 OWEN D.B. 1205 PG. 38

LOT 5 CTC M9A P5 SULLIVAN D.B. 1230 PG. 202

LOT 4 CTC M9A P4 OWEN D.B. 1016 PG. 25

LOT 24 CTC M9A P24 DOUGHERTY D.B. 1181 PG. 748

LOT 25 CTC M9A P25 POTTER D.B. 996 PG. 683

LOT 23 CTC M9A P23 POTTER D.B. 1206 PG. 494

LOT 22 CTC M9A P22 DELANEY D.B. 1952 PG. 486

LOT 21 CTC M9A P21 UBERT D.B. 1134 PG. 446

LOT 20 CTC M9A P20 OWEN D.B. 1260 PG. 9

LOT 19 CTC M9A P19 ARK PG. 451

TOP=475.07
INV IN=467.67
INV IN=467.57
INV OUT=467.47

TOP=473.25
INV IN=468.15
INV OUT=468.05

EX. CURB & GUTTER TO BE REMOVED

EX 15' TEMP. CONSTRUCTION ESMT P.B.17, PG. 67

EX 5' PERM. STORM DRAIN ESMT P.B.17, PG. 67

CONCRETE DITCH

10.5' x 4' BOX CULVERT INV = 454.48'

LANDSCAPE BUFFER P.B.10, PG. 27

EX. PAVEMENT TO BE REMOVED

EX. GRAVEL TO BE REMOVED

EX. WV DEPT. HWY ESMT. P.B. 10, PG. 27

EX. 60' ACCESS ESMT P.B. 18, PG. 29

E:2437646
N:286725

E:2437958
N:286334

E:2438099
N:286859

N45°22'59"E 171.36'
N49°10'29"E 12.49'
R=25.00'
L=39.27'
N49°10'29"E 183.50'
N49°10'29"E 218.74'
N38°24'48"W 845.32'
N83°00'29"E 155.85'
S40°49'31"E 280.00'
S40°49'31"E 200.00'
N49°10'29"E 215.49'
S42°24'55"E 528.61'
S08°46'29"W 261.75'
S10°54'09"E 6.10'
R=20.00'
L=16.82'
L=42.50'
R=344.21' L=179.77'
R=404.21' L=211.10'
L=136.28'
L=72.82'
R=55.00' L=265.20'
L=88.57'
N55°49'50"W 131.38'
299.81'
344.00'
173.10'
243.87'
229.99'
226.99'
252.69'
276.52'

GRAPHIC SCALE
30 15 0 30 60
1" = 30'

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PRELIM PLAN - EXISITING CONDITIONS AND DEMO PLAN
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 05/22/2023
SCALE: 1" = 30'
DESIGN: AF
DRAWN: PS
CHECKED: SK

SHEET TITLE:
EXISITING CONDITIONS AND DEMO PLAN

SHEET No.
C200

P:\Projects\22063\001001\112742 Prelim Subdivision - Land Development Plan\C201 Existing Conditions and Demolition Plan.dwg, 4/7/2024 9:10:37 PM, Matthew Pohlhaus,

SEE SHEET C200

U.S. ROUTE 340 BYPASS
(VARIABLE WIDTH RIGHT-OF-WAY)

WEST VIRGINIA STATE GRID NORTH
ZONE
UTM83-18F

10.5' x 4' BOX CULVERT
INV = 454.10'

460

N18°38'15"E 118.06'

EX. PAVEMENT
TO BE
REMOVED

460

460

CONCRETE DITCH

N49°10'29"E 383.99'

EX. WV DEPT HWY ESMT
P.B. 10, PG. 27

EX. GRAVEL
TO BE
REMOVED

LANDSCAPE
BUFFER
P.B.10, PG. 27

E:2437996
N:2871499

FRONTAGE ROAD
P.B.10, PG. 27

460

E:2438126
N:2871186

450

450

N36°53'32"E 545.28'

460

450

440

4' WIRE
FENCE

E:2438375
N:2871889

4' WIRE
FENCE

4' WIRE
FENCE

470

1208.00'

470

SEE SHEET C200

| CURVE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| CURVE | DELTA | RADIUS | ARC | TANGENT | CHORD | CH. BEARING |
| C1 | 90°00'00" | 25.00' | 39.27' | 25.00' | 35.36' | S4°10'29"W |
| C2 | 29°55'23" | 404.21' | 211.10' | 108.02' | 208.71' | N25°51'50"W |
| C3 | 48°11'24" | 20.00' | 16.82' | 8.94' | 16.33' | S34°59'51"E |
| C4 | 276°22'34" | 55.00' | 265.30' | -49.20' | 73.34' | N79°05'59"E |
| C5 | 48°11'24" | 20.00' | 16.82' | 8.94' | 16.33' | N13°11'32"E |
| C6 | 29°55'23" | 344.21' | 179.77' | 91.98' | 177.73' | N25°51'50"W |
| C7 | 90°00'00" | 25.00' | 39.27' | 25.00' | 35.36' | N85°49'31"W |

30 15 0 30 60
GRAPHIC SCALE
1" = 30'

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PRELIM PLAN - EXISITING CONDITIONS AND DEMO PLAN
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

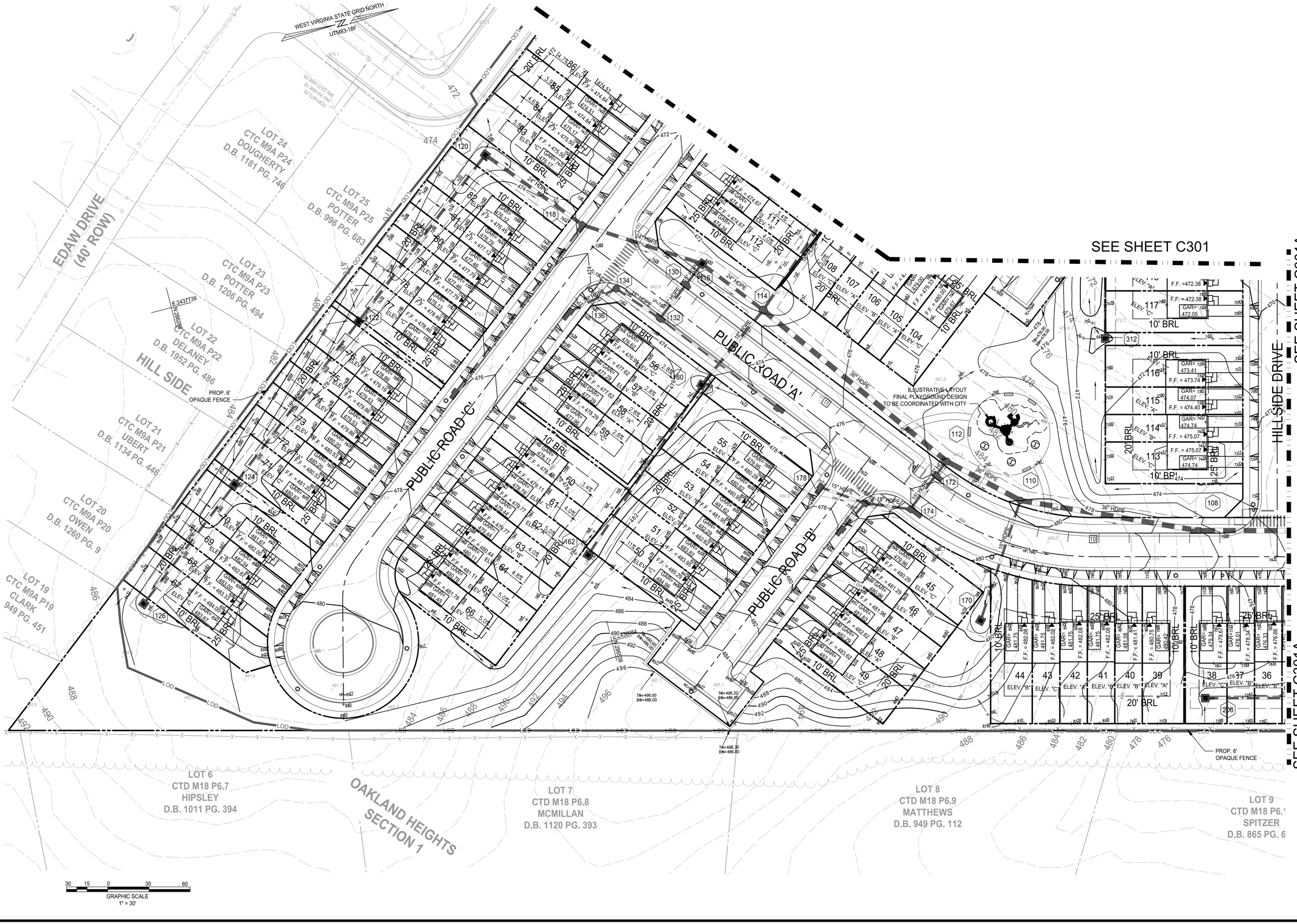
SHEET TITLE:

EXISITING CONDITIONS AND DEMO PLAN

SHEET No.

C201

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C201 Exisiting Conditions and Demolition Plan.dwg, 4/7/2024 9:10:53 PM, Matthew Pohlhaus,

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PRELIM PLAN - GRADING AND SD
PLAN HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 05/22/2023
SCALE: 1" = 30'
DESIGN: AF
DRAWN: PS
CHECKED: SK

SHEET TITLE:

GRADING AND SD PLAN

SHEET No.

C300

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C3018 Sidewalk Ramp Insets.dwg, 4/9/2024 9:12:55 AM, Matthew Polhaus,

WEST VIRGINIA STATE GRID NORTH
UTM83-18F

LOT 1
CTC M9A P1
MOWERY
D.B. 953 PG. 201

LOT 2
CTC M9A P2
GLENN
D.B. 951 PG. 238

LOT 3
CTC M9A P3
OWEN
D.B. 1205 PG. 38

LOT 4
CTC M9A P4
OWEN
D.B. 1016 PG. 25

LOT 5
CTC M9A P5
SULLIVAN
.B. 1230 PG. 202

D.B. 2437546
PLAT 298517

STERNWAY DRIVE
(40' ROW)

HILLSIDE DRIVE

PUBLIC ROAD 'D'

SEE SHEET C300

SEE SHEET C301A

SEE SHEET C300

SEE SHEET C301A

GRAPHIC SCALE
1" = 30'


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# PRELIM PLAN - GRADING AND SD PLAN HILLSIDE

691/432 MAP 9 PARCEL 67

LOTS 2A (RESIDUE) & 2B

DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 05/22/2023
SCALE: 1" = 30'
DESIGN: AF
DRAWN: PS
CHECKED: SK

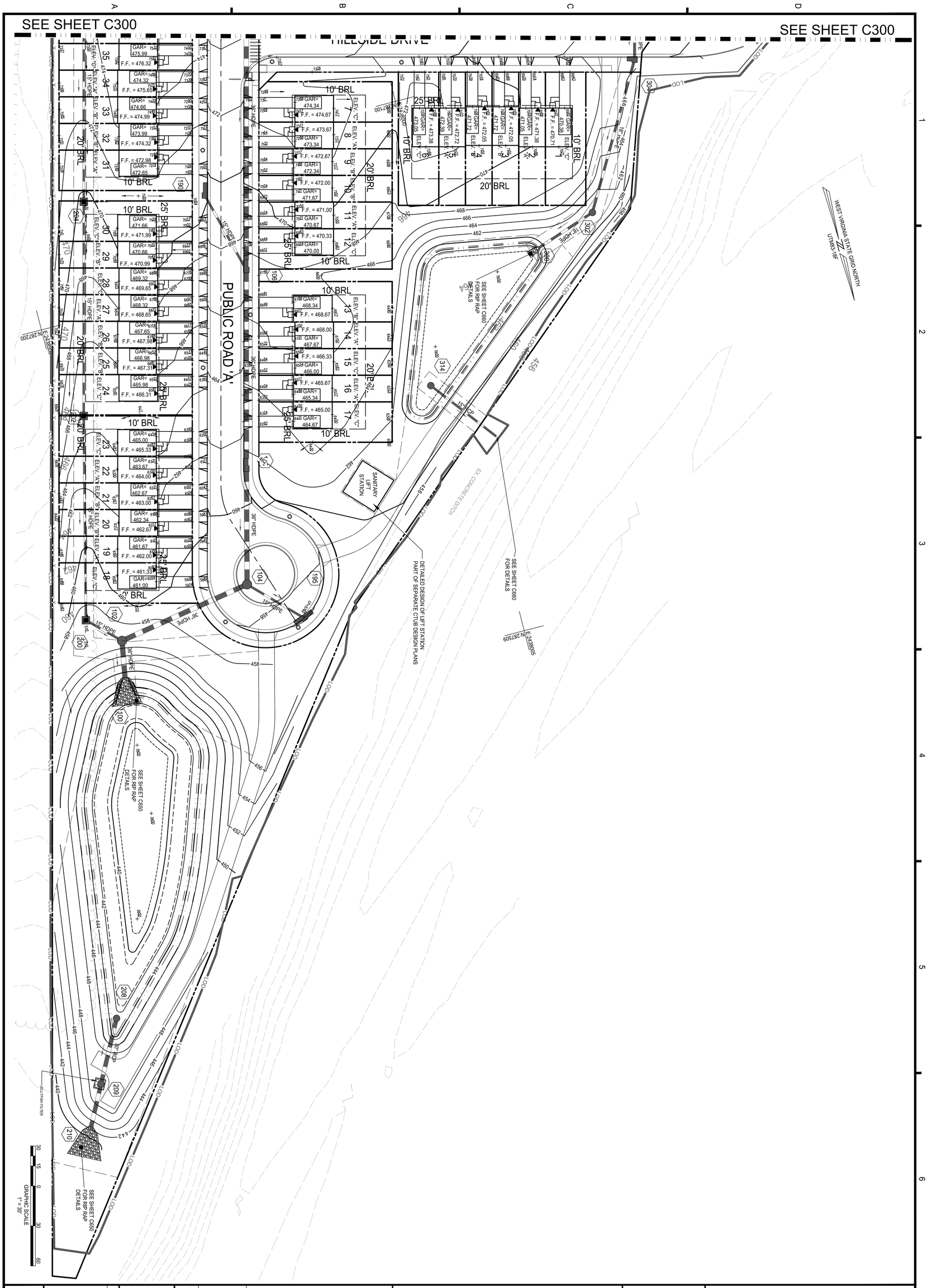
SHEET TITLE:

GRADING AND SD PLAN

SHEET No.

C301

P:\Projects\22063\00100\112742 Prelim Subdivision - Land Development Plan\C3018 Sidewalk Ramp Inserts.dwg, 4/7/2024 9:13:23 PM, Matthew Polihuis,




| SHEET No. | SHEET TITLE |
|---|---|
| C301A | GRADING AND SD PLAN |

PROJECT No: 220631.001.00
DRAWING No: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: RMS
CHECKED: SK

| MARK | DATE | DESCRIPTION |
|---|---|---|

# PRELIM PLAN - GRADING AND SD PLAN HILLSIDE

691/432 MAP 9 PARCEL 67

LOTS 2A (RESIDUE) & 2B

DISTRICT 3, JEFFERSON COUNTY, WV

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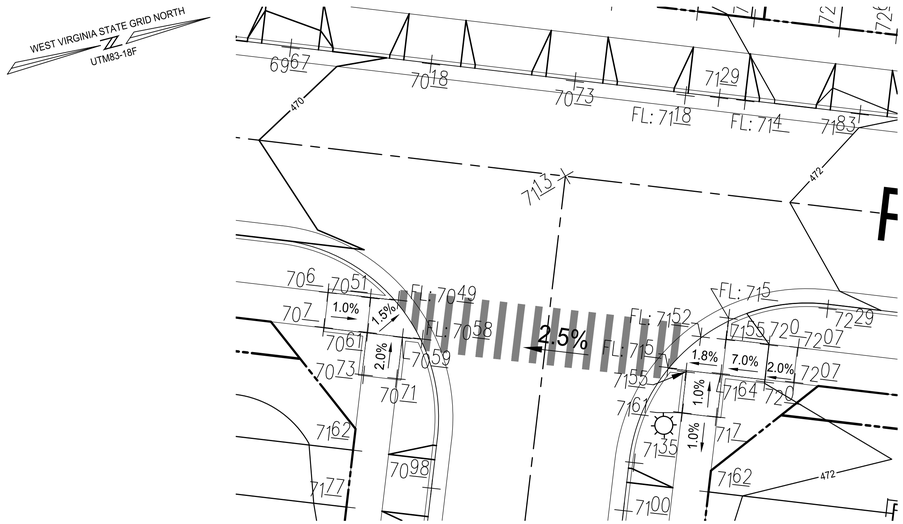
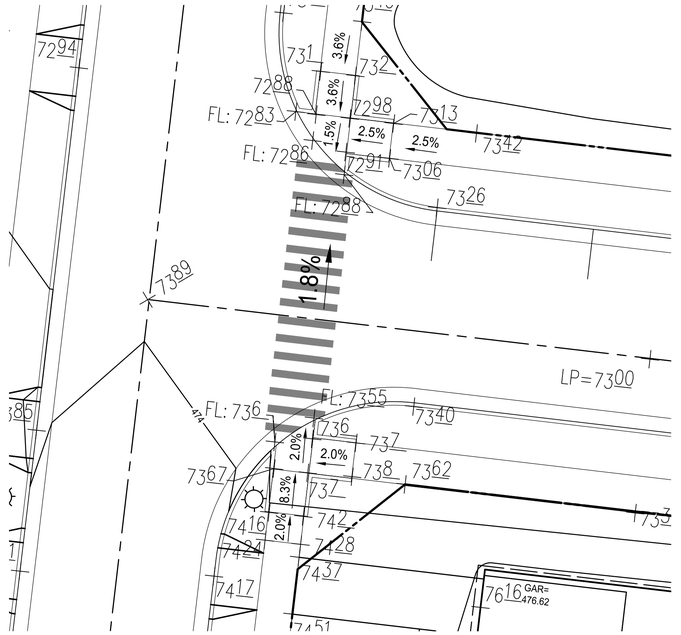


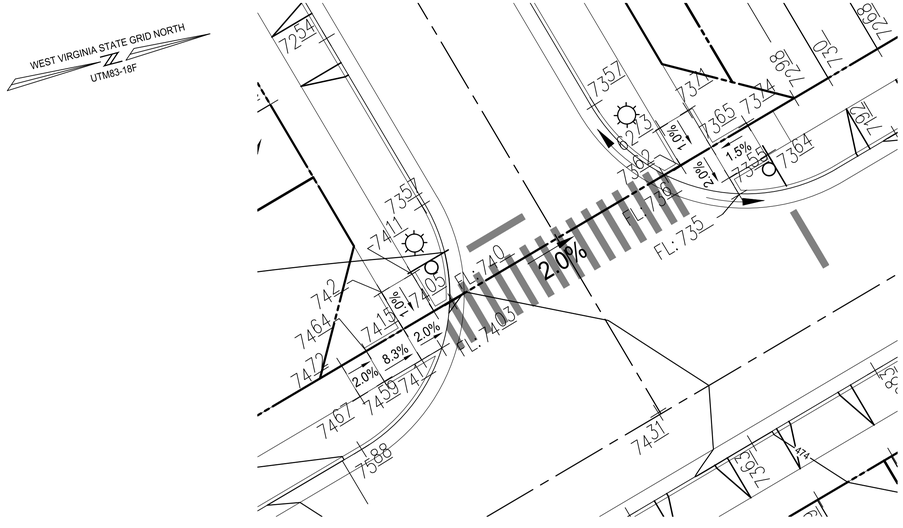

PUBLIC ROADS 'C' AND
'D' INTERSECTION

SCALE: 1"=10'



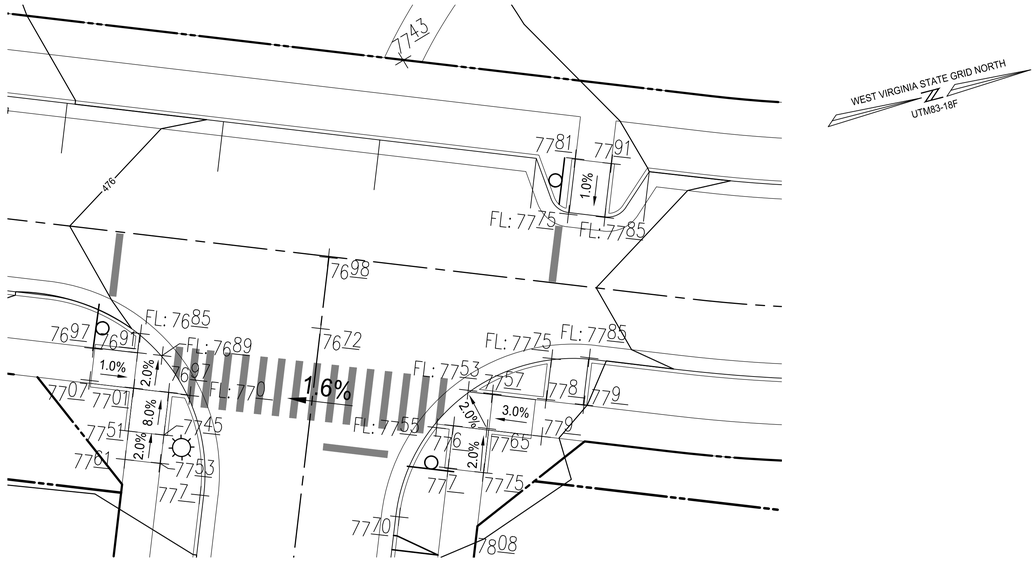

PUBLIC ROADS 'A' AND
'C' INTERSECTION

SCALE: 1"=10'




HILLSIDE DRIVE AND PUBLIC
ROAD 'A' INTERSECTION

SCALE: 1"=10'




PUBLIC ROADS 'A' AND
'B' INTERSECTION

SCALE: 1"=10'

10 5 0 10 20
GRAPHIC SCALE
1" = 10'

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PRELIM PLAN - SIDEWALK RAMP
INSETS HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 10'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

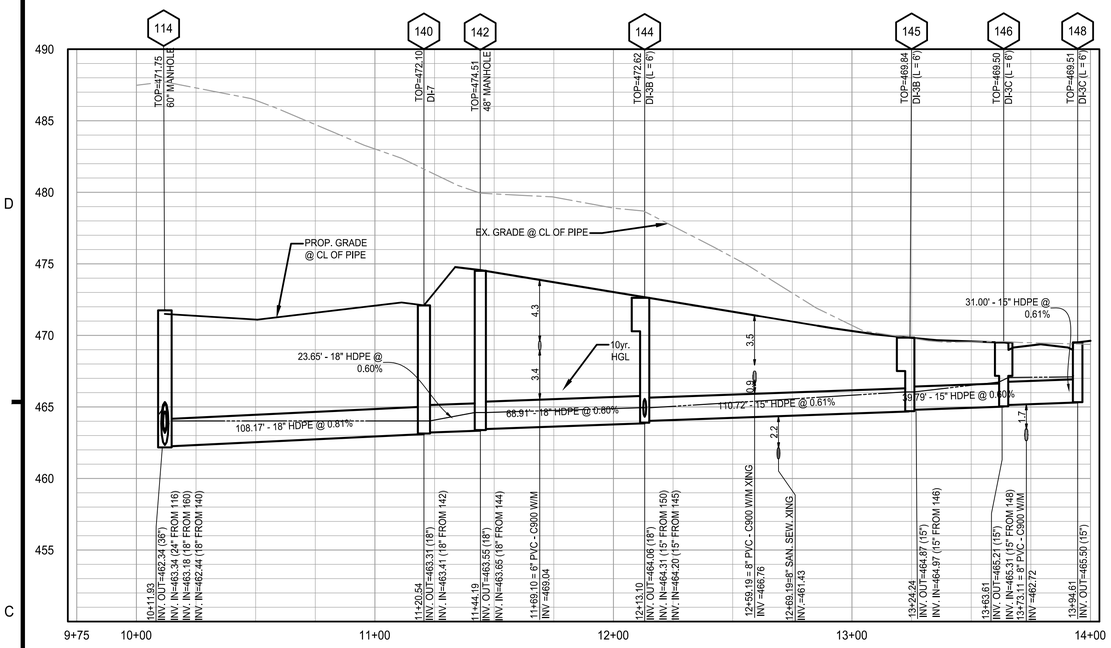
SHEET TITLE:

SIDEWALK
RAMP INSETS

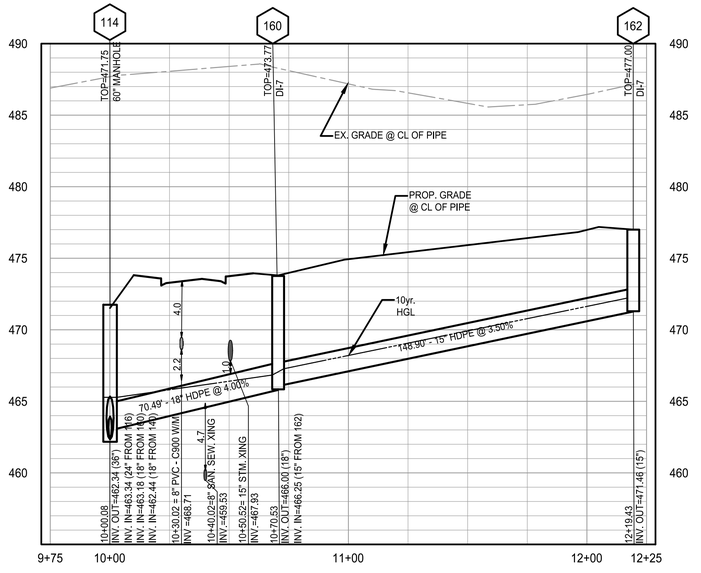
SHEET No.

C301B

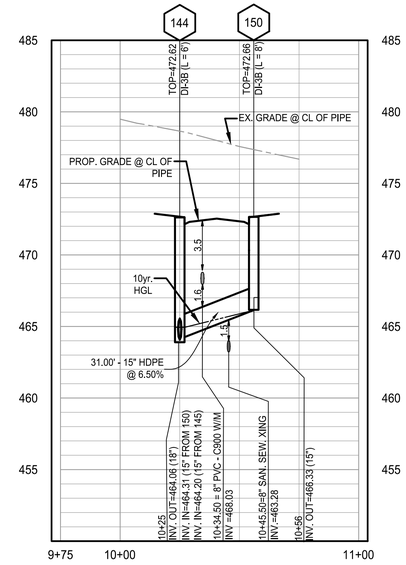
P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C301B Sidewalk Ramp Insets.dwg, 4/7/2024 9:14:21 PM, Matthew Polthaus,



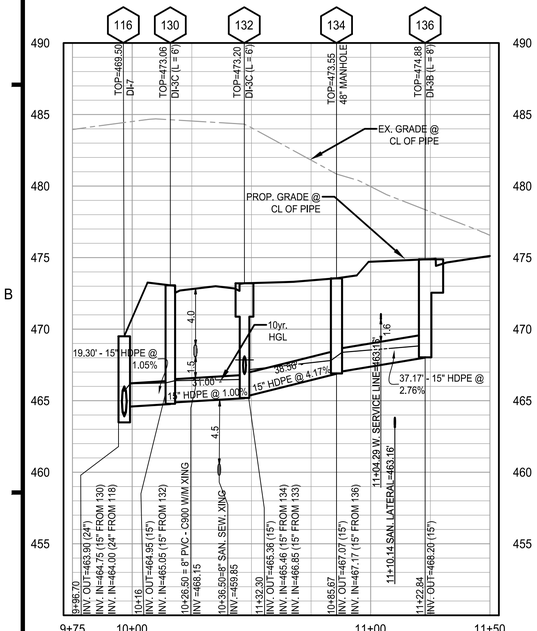

STRM STR 148 TO STR 114 PROFILE



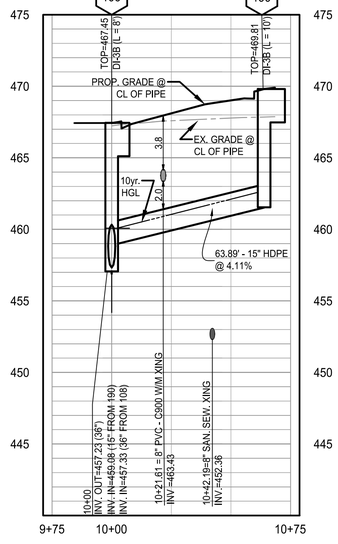

STRM STR 114 TO STR 162 PROFILE



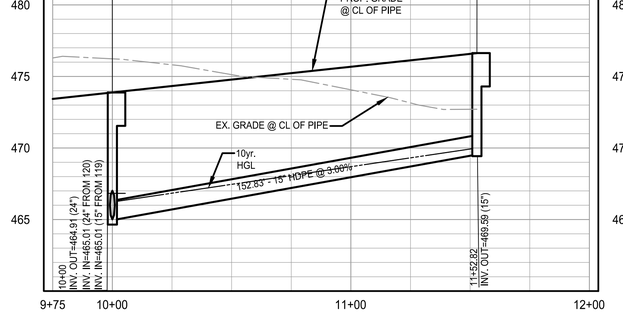

STRM STR 144 TO STR 150 PROFILE



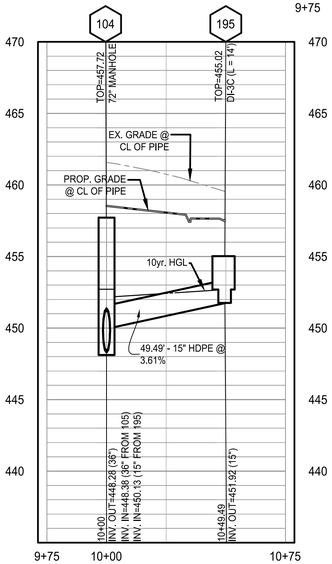

STRM STR 116 TO STR 136 PROFILE



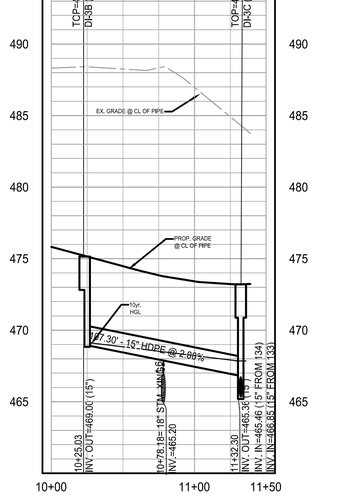

STRM STR 106 TO STR 190 PROFILE




STRM STR 118 TO STR 119 PROFILE




STRM STR 195 TO STR 104 PROFILE




STRM STR 132 TO STR 133 PROFILE

NOTE:

CONTRACTOR SHALL TEST PIT AND LOCATE ALL EXISTING UNDERGROUND UTILITIES AT ALL PROPOSED UTILITY CROSSINGS AND CONNECTIONS TO OBTAIN ACTUAL VERTICAL AND HORIZONTAL LOCATIONS AND VERIFY THAT NO CONFLICTS EXIST WITH NEW UTILITIES WELL IN ADVANCE OF CONSTRUCTION START. REPORT ANY CONFLICTS TO ENGINEER SO ANY DESIGN ADJUSTMENTS CAN BE MADE PRIOR TO CONSTRUCTION.

NOTES

1. ALL STORM DRAIN STRUCTURES ARE WVDOH STANDARDS. ALL SEWER STRUCTURES ARE CHARLES TOWN UTILITY BOARD STANDARDS. CONTRACTOR MAY USE PRECAST STRUCTURE WHERE AVAILABLE TO MEET THE STANDARD STRUCTURE SPECIFIED.
2. ELEVATIONS ARE GIVEN TO TOP OF LID FOR MANHOLES. CONTRACTOR TO ADJUST ELEVATIONS PROVIDED TO MATCH EXISTING PAVEMENT ELEVATIONS AND FIELD CONDITIONS WHERE APPROPRIATE.

GRAPHIC SCALE
VERTICAL: 1" = 5'
5 2.5 0 5 10

GRAPHIC SCALE
HORIZONTAL: 1" = 30'
30 15 0 30 60

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PRELIM PLAN - STORM PROFILES
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

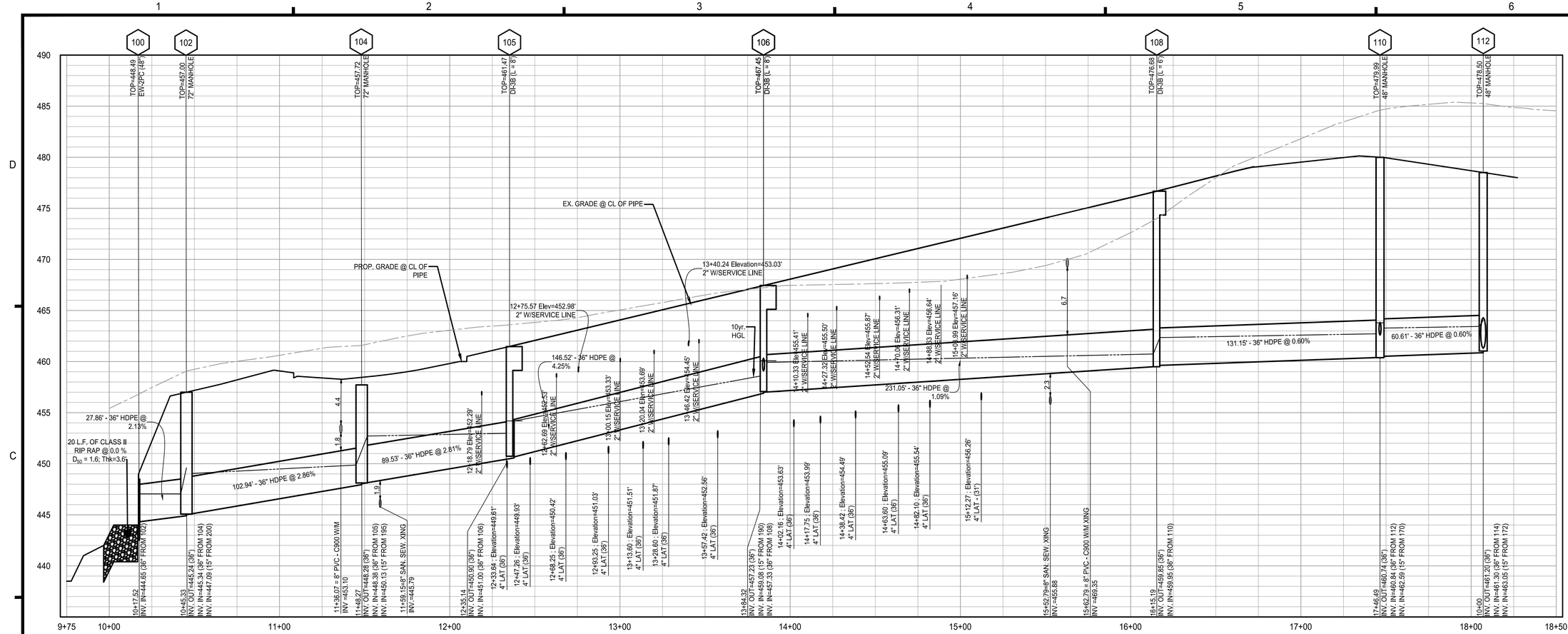
SHEET TITLE:

STORM PROFILES

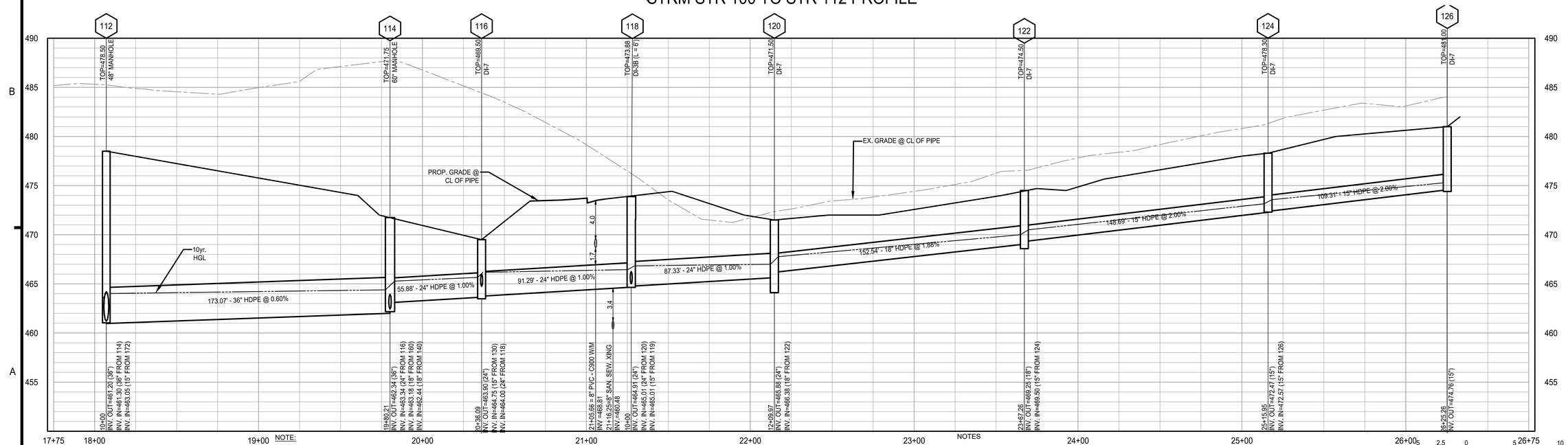
SHEET No.

C302

P:\Projects\22063\003\001\112742 Prelim Subdivision - Land Development Plan\C304 Storm Profiles.dwg, 4/8/2024 12:28:20 PM, Miranda Tison,




STRM STR 100 TO STR 112 PROFILE




STRM STR 112 TO STR 126 PROFILE

NOTE:

CONTRACTOR SHALL TEST PIT AND LOCATE ALL EXISTING UNDERGROUND UTILITIES AT ALL PROPOSED UTILITY CROSSINGS AND CONNECTIONS TO OBTAIN ACTUAL VERTICAL AND HORIZONTAL LOCATIONS AND VERIFY THAT NO CONFLICTS EXIST WITH NEW UTILITIES WELL IN ADVANCE OF CONSTRUCTION START. REPORT ANY CONFLICTS TO ENGINEER SO ANY DESIGN ADJUSTMENTS CAN BE MADE PRIOR TO CONSTRUCTION.

NOTES

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GRAPHIC SCALE
VERTICAL: 1" = 5'
5 2.5 0 5 10

GRAPHIC SCALE
HORIZONTAL: 1" = 30'
30 15 0 30 60

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PRELIM PLAN - STORM PROFILES
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

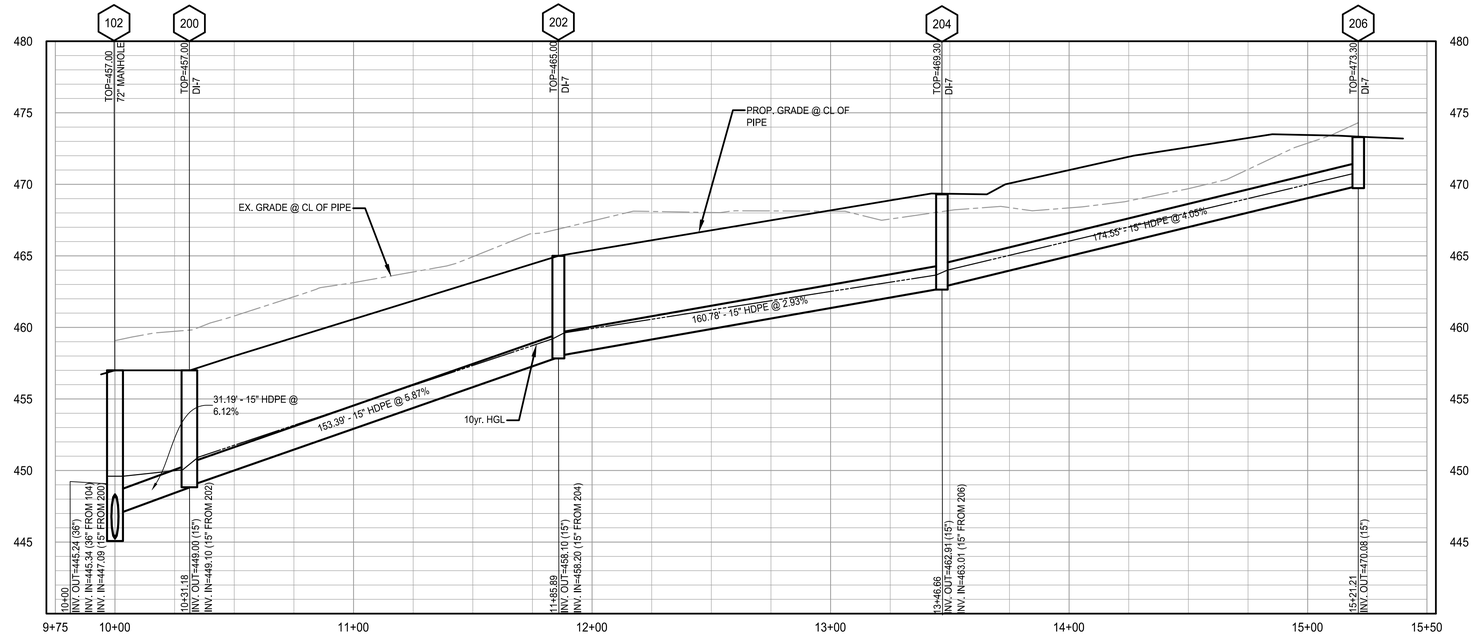
SHEET TITLE:

STORM PROFILES

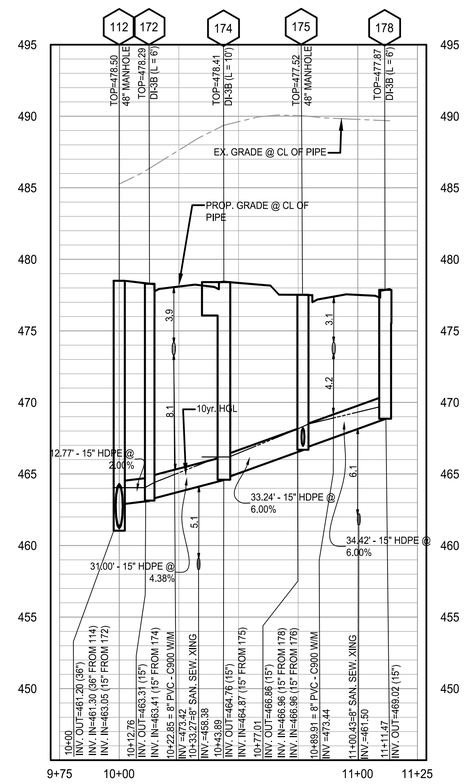
SHEET No.

C303

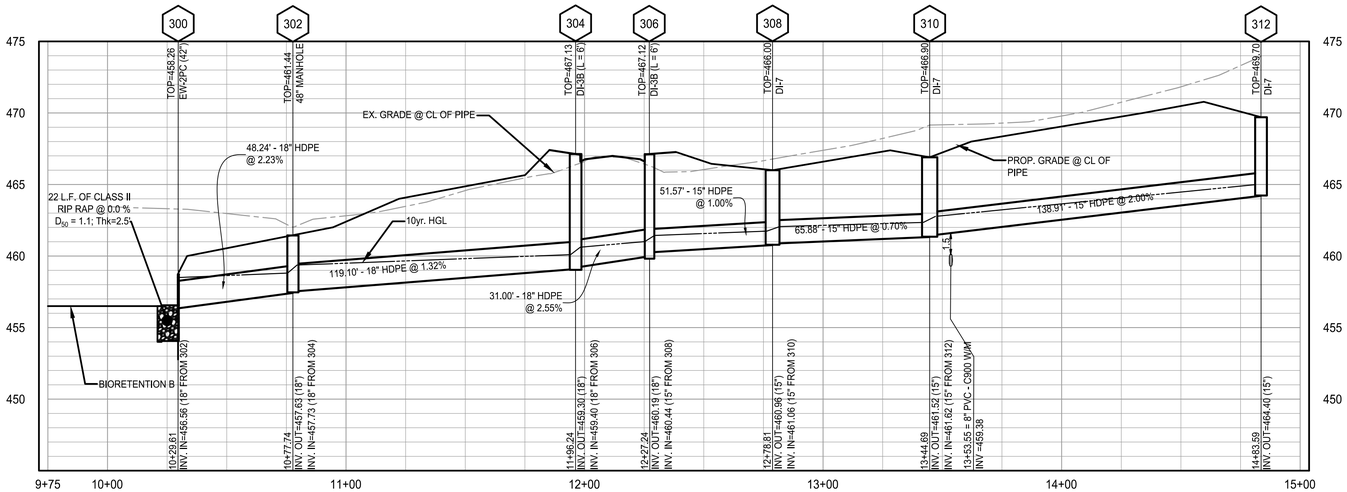
P:\Projects\22063\001000\112742 Prelim Subdivision - Land Development Plan\C304 Storm Profiles.dwg, 4/8/2024 12:54:46 PM, Miranda Tison,



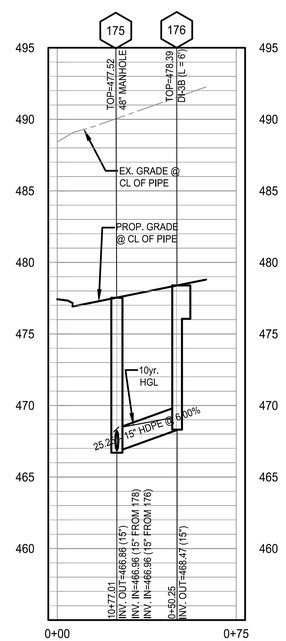

STRM STR 200 TO STR 206 PROFILE



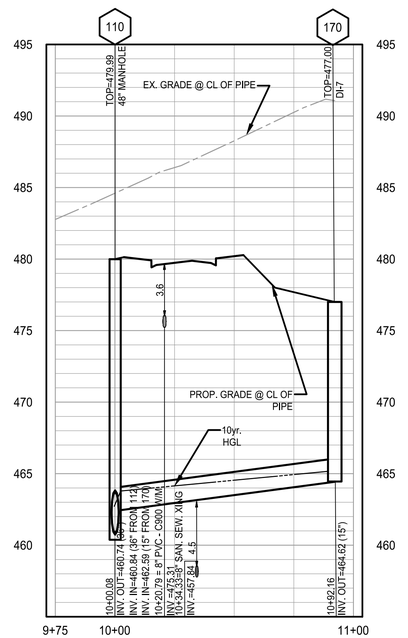

STRM STR 112 TO STR 178 PROFILE




STRM STR 300 TO STR 312 PROFILE




STRM STR 175 TO STR 176 PROFILE




STRM STR 110 TO STR 170 PROFILE

GRAPHIC SCALE
VERTICAL: 1" = 5'
5 2.5 0 5 10

GRAPHIC SCALE
HORIZONTAL: 1" = 30'
30 15 0 30 60

NOTES

1. ALL STORM DRAIN STRUCTURES ARE WVDOH STANDARDS. ALL SEWER STRUCTURES ARE CHARLES TOWN UTILITY BOARD STANDARDS. CONTRACTOR MAY USE PRECAST STRUCTURE WHERE AVAILABLE TO MEET THE STANDARD STRUCTURE SPECIFIED.
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PRELIM PLAN - STORM PROFILES
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
STORM PROFILES

SHEET No.
C304

P:\Projects\22063\001001\112742 Prelim Subdivision - Land Development Plan\C304 Storm Profiles.dwg, 6/8/2024 12:28:47 PM, Miranda Tison,

| FROM | TO | TYPE OF STR. | DRAIN. AREA (AC.) | RUNOFF COEF. C | CxA | | TIME OF CONCENTRATION | | | | TOTAL FLOW (CFS) | PIPE RUN | | | | | | | CAPACITY OF PIPE | | | ACTUAL VELOCITY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | INCR. | ACCUM. | TC TO PIPE | TIME IN PIPE | ACCUM. TIME | I (IN/HRS) | | TYPE PIPE | MANNINGS N | LENGTH (FT) | DIA (IN) | UPPER INVERT | LOWER INVERT | SLOPE (%) | CAPACITY (CFS) | CAPACITY % | VELOCITY (FPS) | |
| 126 | 124 | DI-7 | 0.32 | 0.89 | 0.29 | 0.29 | 5.00 | 0.29 | 5.29 | 6.75 | 1.93 | HDPE | 0.012 | 109.31 | 15 | 474.76 | 472.57 | 2.00 | 9.91 | 20% | 8.07 | 6.27 |
| 124 | 122 | DI-7 | 0.53 | 0.87 | 0.46 | 0.75 | 5.29 | 0.30 | 5.60 | 6.75 | 5.04 | HDPE | 0.012 | 148.69 | 15 | 472.47 | 469.50 | 2.00 | 9.89 | 51% | 8.06 | 8.13 |
| 122 | 120 | DI-7 | 0.56 | 0.86 | 0.49 | 1.23 | 5.60 | 0.28 | 5.88 | 6.75 | 8.32 | HDPE | 0.012 | 152.54 | 18 | 469.25 | 466.38 | 1.88 | 15.60 | 53% | 8.83 | 8.99 |
| 120 | 118 | DI-7 | 0.46 | 0.85 | 0.39 | 1.62 | 5.88 | 0.19 | 6.07 | 6.75 | 10.94 | HDPE | 0.012 | 87.33 | 24 | 465.88 | 465.01 | 1.00 | 24.50 | 45% | 7.80 | 7.60 |
| 118 | 116 | DI-3B | 0.23 | 0.71 | 0.16 | 2.11 | 6.07 | 0.19 | 6.26 | 6.41 | 13.51 | HDPE | 0.012 | 91.29 | 24 | 464.91 | 464.00 | 1.00 | 24.51 | 55% | 7.80 | 8.12 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 119 | 118 | DI-3B | 0.48 | 0.68 | 0.32 | 0.32 | 5.00 | 0.66 | 5.66 | 6.75 | 2.18 | HDPE | 0.012 | 152.83 | 15 | 469.60 | 465.01 | 3.00 | 12.13 | 18% | 9.88 | 3.85 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 133 | 132 | DI-3B | 0.13 | 0.77 | 0.10 | 0.10 | 5.00 | 1.23 | 6.23 | 6.75 | 0.69 | HDPE | 0.012 | 107.30 | 15 | 469.00 | 466.85 | 2.00 | 9.91 | 7% | 8.07 | 1.45 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 136 | 134 | DI-3B | 0.46 | 0.83 | 0.38 | 0.38 | 5.00 | 0.08 | 5.08 | 6.75 | 2.58 | HDPE | 0.012 | 37.17 | 15 | 468.20 | 467.17 | 2.76 | 11.63 | 22% | 9.48 | 7.67 |
| 134 | 132 | MH-2 | 0.00 | 0.90 | 0.00 | 0.38 | 5.08 | 0.10 | 5.18 | 6.75 | 2.58 | HDPE | 0.012 | 38.56 | 15 | 467.07 | 465.46 | 4.17 | 14.29 | 18% | 11.64 | 6.64 |
| 132 | 130 | DI-3C | 0.14 | 0.69 | 0.10 | 0.58 | 6.23 | 0.08 | 6.32 | 6.41 | 3.72 | HDPE | 0.012 | 31.00 | 15 | 465.36 | 465.05 | 1.00 | 7.00 | 53% | 5.70 | 6.24 |
| 130 | 116 | DI-3C | 0.13 | 0.81 | 0.11 | 0.69 | 6.32 | 0.05 | 6.37 | 6.41 | 4.41 | HDPE | 0.012 | 19.30 | 15 | 464.95 | 464.75 | 1.05 | 7.16 | 62% | 5.83 | 6.48 |
| 116 | 114 | DI-7 | 0.56 | 0.87 | 0.48 | 3.28 | 6.37 | 0.10 | 6.47 | 6.41 | 21.02 | HDPE | 0.012 | 55.88 | 24 | 463.90 | 463.34 | 1.00 | 24.51 | 86% | 7.80 | 9.06 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 148 | 146 | DI-3C | 0.28 | 0.78 | 0.22 | 0.22 | 5.00 | 0.13 | 5.13 | 6.75 | 1.45 | HDPE | 0.012 | 31.00 | 15 | 465.50 | 465.31 | 0.60 | 5.42 | 27% | 4.42 | 4.05 |
| 146 | 145 | DI-3C | 0.30 | 0.46 | 0.14 | 0.35 | 5.13 | 0.08 | 5.21 | 6.75 | 2.38 | HDPE | 0.012 | 39.79 | 15 | 465.21 | 464.97 | 0.60 | 5.43 | 44% | 4.43 | 8.21 |
| 145 | 144 | DI-3B | 0.26 | 0.73 | 0.19 | 0.55 | 5.21 | 0.18 | 5.39 | 6.75 | 3.68 | HDPE | 0.012 | 110.72 | 15 | 464.87 | 464.20 | 0.61 | 5.44 | 68% | 4.44 | 10.35 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 150 | 144 | DI-3B | 0.31 | 0.83 | 0.26 | 0.26 | 5.00 | 0.05 | 5.05 | 6.75 | 1.74 | HDPE | 0.012 | 31.00 | 15 | 466.33 | 464.31 | 6.50 | 17.84 | 10% | 14.54 | 9.93 |
| 144 | 142 | DI-3B | 0.21 | 0.84 | 0.18 | 0.98 | 5.39 | 0.23 | 5.62 | 6.75 | 6.62 | HDPE | 0.012 | 68.91 | 18 | 464.06 | 463.65 | 0.60 | 8.82 | 75% | 4.99 | 4.99 |
| 142 | 140 | MH-2 | 0.00 | 0.90 | 0.00 | 0.98 | 5.62 | 0.08 | 5.70 | 6.75 | 6.62 | HDPE | 0.012 | 23.65 | 18 | 463.55 | 463.41 | 0.60 | 8.82 | 75% | 4.99 | 4.99 |
| 140 | 114 | DI-7 | 0.07 | 0.35 | 0.03 | 1.01 | 5.70 | 0.32 | 6.01 | 6.75 | 6.79 | HDPE | 0.012 | 108.17 | 18 | 463.31 | 462.44 | 0.81 | 10.21 | 67% | 5.78 | 5.67 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 162 | 160 | DI-7 | 0.59 | 0.90 | 0.53 | 0.53 | 5.00 | 0.27 | 5.27 | 6.75 | 3.55 | HDPE | 0.012 | 148.81 | 15 | 471.46 | 466.25 | 3.50 | 13.09 | 27% | 10.67 | 9.12 |
| 160 | 114 | DI-7 | 0.46 | 0.89 | 0.41 | 0.93 | 5.27 | 0.12 | 5.39 | 6.75 | 6.30 | HDPE | 0.012 | 70.49 | 18 | 466.00 | 463.84 | 3.07 | 19.94 | 32% | 11.29 | 10.03 |
| 114 | 112 | MH-2 | 0.00 | 0.90 | 0.00 | 5.22 | 6.47 | 0.35 | 6.82 | 6.41 | 33.44 | HDPE | 0.012 | 173.07 | 36 | 462.34 | 461.30 | 0.60 | 55.96 | 60% | 7.92 | 8.28 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 178 | 175 | DI-3B | 0.21 | 0.82 | 0.17 | 0.17 | 5.00 | 0.07 | 5.07 | 6.75 | 1.14 | HDPE | 0.012 | 34.42 | 15 | 469.03 | 466.96 | 6.00 | 17.14 | 7% | 13.97 | 8.06 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 176 | 175 | DI-3B | 0.24 | 0.74 | 0.18 | 0.18 | 5.00 | 0.05 | 5.05 | 6.75 | 1.19 | HDPE | 0.012 | 25.25 | 15 | 468.48 | 466.96 | 6.00 | 17.14 | 7% | 13.97 | 7.95 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 175 | 174 | MH-2 | 0.00 | 0.90 | 0.00 | 0.34 | 5.07 | 0.07 | 5.14 | 6.75 | 2.33 | HDPE | 0.012 | 40.91 | 15 | 467.32 | 464.87 | 6.00 | 17.14 | 14% | 13.97 | 9.79 |
| 174 | 172 | DI-3B | 0.07 | 0.81 | 0.06 | 0.40 | 5.14 | 0.06 | 5.20 | 6.75 | 2.71 | HDPE | 0.012 | 31.00 | 15 | 464.77 | 463.41 | 4.38 | 14.65 | 18% | 11.94 | 9.15 |
| 172 | 112 | DI-3B | 0.05 | 0.79 | 0.04 | 0.44 | 5.20 | 0.03 | 5.23 | 6.75 | 2.98 | HDPE | 0.012 | 12.77 | 15 | 463.31 | 463.05 | 2.00 | 9.89 | 30% | 8.06 | 7.07 |
| 112 | 110 | MH-2 | 0.00 | 0.90 | 0.00 | 5.66 | 6.82 | 0.12 | 6.94 | 6.41 | 36.27 | HDPE | 0.012 | 60.61 | 36 | 461.20 | 460.84 | 0.60 | 56.00 | 65% | 7.92 | 8.44 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 170 | 110 | DI-7 | 0.39 | 0.86 | 0.33 | 0.33 | 5.00 | 0.23 | 5.23 | 6.75 | 2.25 | HDPE | 0.012 | 92.07 | 18 | 464.62 | 462.59 | 2.21 | 16.91 | 13% | 9.57 | 6.64 |
| 110 | 108 | MH-2 | 0.00 | 0.90 | 0.00 | 6.00 | 6.94 | 0.26 | 7.19 | 6.41 | 38.41 | HDPE | 0.012 | 131.16 | 36 | 460.74 | 459.95 | 0.60 | 55.97 | 69% | 7.92 | 8.54 |
| 108 | 106 | DI-3B | 0.07 | 0.81 | 0.06 | 6.05 | 7.19 | 0.36 | 7.56 | 6.10 | 36.94 | HDPE | 0.012 | 231.05 | 36 | 459.85 | 457.33 | 1.09 | 75.45 | 49% | 10.67 | 10.63 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 190 | 106 | DI-3B | 0.44 | 0.80 | 0.35 | 0.35 | 5.00 | 0.10 | 5.10 | 6.75 | 2.39 | HDPE | 0.012 | 63.90 | 15 | 461.71 | 459.08 | 4.11 | 14.19 | 17% | 11.57 | 10.78 |
| 106 | 105 | DI-3B | 0.18 | 0.81 | 0.15 | 6.55 | 7.56 | 0.15 | 7.70 | 6.10 | 40.00 | HDPE | 0.012 | 146.52 | 36 | 457.23 | 451.00 | 4.25 | 149.01 | 27% | 21.08 | 16.57 |
| 105 | 104 | DI-3B | 0.21 | 0.82 | 0.17 | 6.73 | 7.70 | 0.10 | 7.80 | 6.10 | 41.04 | HDPE | 0.012 | 89.53 | 36 | 450.90 | 448.38 | 2.81 | 121.15 | 34% | 17.14 | 15.64 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 195 | 104 | DI-3C | 0.70 | 0.70 | 0.49 | 0.49 | 5.00 | 0.09 | 5.09 | 6.75 | 3.30 | HDPE | 0.012 | 46.78 | 15 | 451.92 | 450.13 | 3.82 | 13.68 | 24% | 11.15 | 8.61 |
| 104 | 102 | MH-2 | 0.00 | 0.90 | 0.00 | 7.21 | 7.80 | 0.10 | 7.90 | 6.10 | 44.02 | HDPE | 0.012 | 102.94 | 36 | 448.28 | 445.34 | 2.86 | 122.17 | 36% | 17.28 | 16.34 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 206 | 204 | DI-7 | 0.27 | 0.45 | 0.12 | 0.12 | 5.00 | 0.90 | 5.90 | 6.75 | 0.83 | HDPE | 0.012 | 185.06 | 15 | 470.08 | 463.01 | 3.82 | 13.68 | 6% | 11.15 | 3.43 |
| 204 | 202 | DI-7 | 0.31 | 0.90 | 0.28 | 0.40 | 5.90 | 0.42 | 6.32 | 6.75 | 2.69 | HDPE | 0.012 | 160.80 | 15 | 462.91 | 458.20 | 2.93 | 11.98 | 22% | 9.76 | 6.44 |
| 202 | 200 | DI-7 | 0.23 | 0.90 | 0.20 | 0.60 | 6.32 | 0.28 | 6.60 | 6.41 | 3.85 | HDPE | 0.012 | 153.26 | 15 | 458.10 | 449.10 | 5.87 | 16.96 | 23% | 13.82 | 9.14 |
| 200 | 102 | DI-7 | 0.23 | 0.90 | 0.21 | 0.81 | 6.60 | 0.05 | 6.65 | 6.41 | 5.18 | HDPE | 0.012 | 32.50 | 15 | 449.00 | 447.09 | 5.88 | 16.97 | 31% | 13.82 | 10.71 |
| 102 | 100 | MH-2 | 0.00 | 0.90 | 0.00 | 8.02 | 7.90 | 0.03 | 7.93 | 6.10 | 48.96 | HDPE | 0.012 | 27.86 | 36 | 445.24 | 444.65 | 2.13 | 105.42 | 46% | 14.91 | 16.32 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 312 | 310 | DI-7 | 0.51 | 0.90 | 0.46 | 0.46 | 5.00 | 0.32 | 5.32 | 6.75 | 3.09 | HDPE | 0.012 | 138.91 | 15 | 464.40 | 461.62 | 2.00 | 9.90 | 31% | 8.06 | 7.12 |
| 310 | 308 | DI-7 | 0.26 | 0.90 | 0.23 | 0.69 | 5.32 | 0.21 | 5.53 | 6.75 | 4.67 | HDPE | 0.012 | 65.88 | 15 | 461.52 | 461.06 | 0.70 | 5.85 | 80% | 4.77 | 5.31 |
| 308 | 306 | DI-7 | 0.11 | 0.90 | 0.10 | 0.79 | 5.53 | 0.14 | 5.67 | 6.75 | 5.34 | HDPE | 0.012 | 51.57 | 15 | 460.96 | 460.44 | 1.00 | 7.00 | 76% | 5.70 | 6.29 |
| 306 | 304 | DI-3B | 0.34 | 0.90 | 0.31 | 1.10 | 5.67 | 0.05 | 5.72 | 6.75 | 7.42 | HDPE | 0.012 | 31.00 | 18 | 460.19 | 459.40 | 2.55 | 18.18 | 41% | 10.29 | 9.78 |
| 304 | 302 | DI-3B | 0.27 | 0.81 | 0.22 | 1.32 | 5.72 | 0.25 | 5.97 | 6.75 | 8.91 | HDPE | 0.012 | 119.10 | 18 | 459.30 | 457.73 | 1.32 | 13.07 | 68% | 7.39 | 7.96 |
| 302 | 300 | MH-2 | 0.00 | 0.35 | 0.00 | 1.32 | 5.97 | 0.08 | 6.05 | 6.75 | 8.91 | HDPE | 0.012 | 48.24 | 18 | 457.63 | 456.56 | 2.23 | 16.99 | 52% | 9.61 | 9.76 |

## RIP RAP COMPUTATIONS

| OUTLET NO. | TAILWATER CONDITION | Do (PIPE SIZE) | FLOW (cfs) | W1 (ft) | W2 (ft) | La (ft) | VDOT CLASS | $D_{50}$ (ft.) | $D_{MAX}$ (ft.) | Depth (ft.) | VELOCITY (fps) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | Tw < 0.5 D | 36 | 50.89 | 9 | 17 | 20 | II | 1.60 | 2.40 | 3.6 | 16.97 |
| POND A OUTFALL | Tw < 0.5 D | 30 | 12.00 | 7.5 | 16.3 | 22 | II | 1.60 | 2.40 | 3.6 | 8.47 |
| 300 | Tw < 0.5 D | 18 | 8.50 | 4.5 | 8.1 | 9 | I | 1.10 | 1.65 | 2.5 | 6.64 |
| | | | | | | | | | | | |

(1) LENGTH OF RIP RAP WAS OBTAINED FROM PLATE 3.18-3 OR 4 (AS APPLICABLE) OF THE VESCH MANUAL
(2) RIP RAP CLASS WAS DETERMINED FROM TABLE 3 OF SECTION 5.220 OF THE LOUDOUN COUNTY FSM

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PRELIM PLAN - STORM SEWER COMPUTATIONS HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
STORM SEWER COMPUTATIONS

SHEET No.
C305

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C305 storm Sewer Computations.dwg, 4/7/2024 9:17:10 PM, Matthew Pohlhaus,

## GRATE INLET COMPUTATIONS

| INLET NO. | C | I | AREA | INLET | INLET TYPE | Q10 TO INLET | PONDED DEPTH | % INTER-CEPTION | PICKUP Q | GRATE CAPACITY | BYPASS Q | TOP ELEV | 50% BLOCKED ELEV (10 YR) | OVERFLOW ELEV | FREEBOARD | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | 0.90 | 6.75 | 0.23 AC. | DI-7 | A-I | 1.40 CFS | 0.17 FT. | 100 | 1.40 CFS | 5.60 CFS | 0.00 CFS | 457.00 | 457.17 | 457.50 | 0.33 ft. | |
| 202 | 0.90 | 6.75 | 0.23 AC. | DI-7 | A-I | 1.37 CFS | 0.17 FT. | 100 | 1.37 CFS | 5.47 CFS | 0.00 CFS | 464.75 | 464.92 | 466.00 | 1.08 ft. | |
| 204 | 0.90 | 6.75 | 0.31 AC. | DI-7 | A-I | 1.87 CFS | 0.21 FT. | 100 | 1.87 CFS | 7.46 CFS | 0.00 CFS | 469.30 | 469.51 | 470.00 | 0.49 ft. | |
| 206 | 0.45 | 6.75 | 0.27 AC. | DI-7 | A-I | 0.83 CFS | 0.12 FT. | 100 | 0.83 CFS | 3.30 CFS | 0.00 CFS | 473.40 | 473.52 | 474.00 | 0.48 ft. | |
| 170 | 0.86 | 6.75 | 0.39 AC. | DI-7 | A-I | 2.25 CFS | 0.24 FT. | 100 | 2.25 CFS | 9.00 CFS | 0.00 CFS | 477.00 | 477.24 | 478.30 | 1.06 ft. | |
| 160 | 0.89 | 6.75 | 0.46 AC. | DI-7 | A-I | 2.75 CFS | 0.27 FT. | 100 | 2.75 CFS | 11.00 CFS | 0.00 CFS | 473.80 | 474.08 | 474.73 | 0.65 ft. | |
| 162 | 0.90 | 6.75 | 0.59 AC. | DI-7 | A-I | 3.55 CFS | 0.32 FT. | 100 | 3.55 CFS | 14.19 CFS | 0.00 CFS | 477.00 | 477.32 | 477.80 | 0.48 ft. | |
| 120 | 0.85 | 6.75 | 0.46 AC. | DI-7 | A-I | 2.62 CFS | 0.26 FT. | 100 | 2.62 CFS | 10.50 CFS | 0.00 CFS | 473.11 | 473.37 | 473.80 | 0.43 ft. | |
| 122 | 0.86 | 6.75 | 0.56 AC. | DI-7 | A-I | 3.28 CFS | 0.31 FT. | 100 | 3.28 CFS | 13.11 CFS | 0.00 CFS | 475.00 | 475.31 | 476.50 | 1.19 ft. | |
| 124 | 0.87 | 6.75 | 0.53 AC. | DI-7 | A-I | 3.11 CFS | 0.30 FT. | 100 | 3.11 CFS | 12.43 CFS | 0.00 CFS | 478.30 | 478.60 | 479.00 | 0.40 ft. | |
| 126 | 0.89 | 6.75 | 0.32 AC. | DI-7 | A-I | 1.94 CFS | 0.22 FT. | 100 | 1.94 CFS | 7.74 CFS | 0.00 CFS | 480.00 | 480.22 | 480.60 | 0.38 ft. | |
| 140 | 0.35 | 6.75 | 0.07 AC. | DI-7 | A-I | 0.17 CFS | 0.04 FT. | 101 | 0.18 CFS | 0.69 CFS | 0.00 CFS | 472.10 | 472.14 | 472.30 | 0.16 ft. | |
| 116 | 0.87 | 6.75 | 0.56 AC. | DI-7 | A-I | 3.27 CFS | 0.31 FT. | 100 | 3.27 CFS | 13.08 CFS | 0.00 CFS | 469.50 | 469.81 | 473.90 | 4.09 ft. | |
| 308 | 0.90 | 6.75 | 0.11 AC. | DI-7 | A-I | 0.67 CFS | 0.11 FT. | 100 | 0.67 CFS | 2.67 CFS | 0.00 CFS | 466.00 | 466.11 | 466.50 | 0.39 ft. | |
| 310 | 0.90 | 6.75 | 0.26 AC. | DI-7 | A-I | 1.58 CFS | 0.19 FT. | 100 | 1.58 CFS | 6.34 CFS | 0.00 CFS | 467.32 | 467.51 | 467.65 | 0.14 ft. | |
| 312 | 0.90 | 6.75 | 0.51 AC. | DI-7 | A-I | 3.09 CFS | 0.30 FT. | 100 | 3.09 CFS | 12.36 CFS | 0.00 CFS | 469.72 | 470.01 | 470.50 | 0.49 ft. | |

## ULTIMATE ON GRADE CURB INLET COMPUTATIONS

| STR NO. | TYPE | CAT | AREA | C | I | Q | CARRY | Q TOT | S % | SX % | SX % CALC | T FT | W/T | SWSX | Eo | a | S'W | Se | LT | L | E | Q INT | BY-PASS | DPTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 118 | DI-3B | N/A | 0.23 | 0.71 | 4.00 IN/HR | 0.66 CFS | 0.36 | 1.02 CFS | 2.00% | 2.08% | 2.08% | 4.0 | 0.50 | 4.01 | 0.95 | 3.5 | 0.146 | 0.159 | 7.0 | 6 | 0.86 | 0.87 | 0.15 | - |
| 144 | DI-3B | N/A | 0.21 | 0.84 | 4.00 IN/HR | 0.71 CFS | 0.00 | 0.71 CFS | 2.50% | 2.08% | 2.08% | 2.6 | 0.77 | 4.01 | 1.00 | 3.5 | 0.146 | 0.166 | 6.3 | 6 | 0.96 | 0.68 | 0.03 | - |
| 145 | DI-3C | N/A | 0.26 | 0.73 | 5.00 IN/HR | 0.96 CFS | 0.00 | 0.96 CFS | 2.75% | 2.08% | 2.08% | 3.3 | 0.61 | 4.01 | 0.98 | 3.5 | 0.146 | 0.164 | 7.4 | 6 | 0.81 | 0.78 | 0.18 | - |
| 150 | DI-3B | N/A | 0.31 | 0.83 | 4.00 IN/HR | 1.03 CFS | 0.00 | 1.03 CFS | 3.00% | 2.08% | 2.08% | 3.4 | 0.59 | 4.01 | 0.98 | 3.5 | 0.146 | 0.163 | 7.8 | 8 | 1.00 | 1.03 | 0.00 | - |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| 133 | DI-3B | N/A | 0.13 | 0.77 | 6.00 IN/HR | 0.61 CFS | 0.17 | 0.78 CFS | 2.70% | 2.08% | 2.08% | 2.7 | 0.74 | 4.01 | 1.00 | 3.5 | 0.146 | 0.166 | 6.7 | 6 | 0.90 | 0.70 | 0.08 | |
| 136 | DI-3B | N/A | 0.46 | 0.83 | 4.00 IN/HR | 1.53 CFS | 0.00 | 1.53 CFS | 2.00% | 2.08% | 2.08% | 5.4 | 0.37 | 4.01 | 0.86 | 3.5 | 0.146 | 0.146 | 8.8 | 8 | 0.91 | 1.40 | 0.13 | - |
| 174 | DI-3B | N/A | 0.07 | 0.81 | 4.00 IN/HR | 0.23 CFS | 0.00 | 0.23 CFS | 2.50% | 2.08% | 8.33% | 1.4 | 1.43 | 1.00 | 1.00 | 2.0 | 0.083 | 0.167 | 3.9 | 8 | 1.00 | 0.23 | 0.00 | |
| 176 | DI-3B | N/A | 0.24 | 0.74 | 4.00 IN/HR | 0.70 CFS | 0.00 | 0.70 CFS | 3.50% | 2.08% | 8.33% | 2.0 | 1.00 | 1.00 | 1.00 | 2.0 | 0.083 | 0.167 | 6.9 | 6 | 0.87 | 0.61 | 0.09 | - |
| 178 | DI-3B | N/A | 0.21 | 0.82 | 4.00 IN/HR | 0.68 CFS | 0.00 | 0.68 CFS | 3.50% | 2.08% | 8.33% | 2.0 | 1.00 | 1.00 | 1.00 | 2.0 | 0.083 | 0.167 | 6.8 | 6 | 0.89 | 0.60 | 0.08 | |
| | | | | | | | 0.00 | | | | | | | | | | | | | | | | | |
| 172 | DI-3B | N/A | 0.05 | 0.79 | 4.00 IN/HR | 0.16 CFS | 0.00 | 0.16 CFS | 3.00% | 2.08% | 8.33% | 1.2 | 1.67 | 1.00 | 1.00 | 2.0 | 0.083 | 0.167 | 3.5 | 6 | 1.00 | 0.16 | 0.00 | - |
| | | | | | | | | | | | | | | | | | | | | | | | | - |
| 108 | DI-3B | N/A | 0.07 | 0.81 | 4.00 IN/HR | 0.23 CFS | 0.00 | 0.23 CFS | 4.20% | 2.08% | 8.33% | 1.3 | 1.54 | 1.00 | 1.00 | 2.0 | 0.083 | 0.167 | 4.6 | 6 | 1.00 | 0.23 | 0.00 | - |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| 190 | DI-3C | N/A | 0.44 | 0.80 | 4.00 IN/HR | 1.42 CFS | 0.00 | 1.42 CFS | 4.00% | 2.08% | 2.08% | 4.0 | 0.50 | 4.01 | 0.95 | 3.5 | 0.146 | 0.159 | 9.9 | 10 | 1.00 | 1.42 | 0.00 | - |
| 106 | DI-3B | N/A | 0.18 | 0.81 | 4.00 IN/HR | 0.59 CFS | 0.00 | 0.59 CFS | 4.00% | 2.08% | 8.33% | 1.8 | 1.11 | 1.00 | 1.00 | 2.0 | 0.083 | 0.167 | 6.6 | 6 | 0.90 | 0.53 | 0.06 | - |
| 105 | DI-3B | N/A | 0.21 | 0.82 | 4.00 IN/HR | 0.68 CFS | 0.06 | 0.74 CFS | 4.00% | 2.08% | 8.33% | 2.0 | 1.00 | 1.00 | 1.00 | 2.0 | 0.083 | 0.167 | 7.3 | 8 | 1.00 | 0.74 | 0.00 | - |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| 304 | DI-3B | N/A | 0.27 | 0.81 | 4.00 IN/HR | 0.88 CFS | 0.00 | 0.88 CFS | 2.50% | 2.08% | 2.08% | 3.2 | 0.63 | 4.01 | 0.98 | 3.5 | 0.146 | 0.164 | 6.9 | 8 | 1.00 | 0.88 | 0.00 | - |
| 306 | DI-3B | N/A | 0.34 | 0.90 | 4.00 IN/HR | 1.23 CFS | 0.00 | 1.23 CFS | 2.40% | 2.08% | 2.08% | 4.4 | 0.45 | 4.01 | 0.92 | 3.5 | 0.146 | 0.156 | 8.1 | 10 | 1.00 | 1.23 | 0.00 | - |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| 119 | DI-3B | N/A | 0.48 | 0.68 | 4.00 IN/HR | 1.29 CFS | 0.00 | 1.29 CFS | 2.40% | 2.08% | 2.08% | 4.5 | 0.44 | 4.01 | 0.92 | 3.5 | 0.146 | 0.155 | 8.3 | 6 | 0.72 | 0.93 | 0.36 | |

## ULTIMATE SAG CURB INLET COMPUTATIONS

| | TYPE | CAT | AREA | C | I | Q | CARRY | Q TOT | S % | SX % | SX % CALC | T FT | W/T | SWSX | Eo | a | S'W | Se | LT | L | E | Q INT | BY-PASS | DPTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 146 | DI-3C | N/A | 0.30 | 0.46 | 4.00 IN/HR | 0.55 CFS | 0.33 | 0.88 | 0.00% | 2.08% | - | 5.6 | - | - | - | - | - | - | - | 6 | - | - | - | 0.12 |
| | RIGHT | | 0.04 | 0.46 | 4.00 IN/HR | 0.08 CFS | 0 | 0.08 | 0.30% | 2.08% | 8.33% | 1.4 | 1.43 | 1.00 | 1.00 | 2.0 | 0.083 | 0.167 | 1.3 | | 1.00 | 0.08 | - | - |
| | LEFT | | 0.10 | 0.46 | 4.00 IN/HR | 0.18 CFS | 0.33 | 0.51 | 0.30% | 2.08% | 2.08% | 4.9 | 0.41 | 4.01 | 0.89 | 3.5 | 0.146 | 0.151 | 3.1 | | 1.00 | 0.51 | - | - |
| 148 | DI-3C | N/A | 0.28 | 0.78 | 4.00 IN/HR | 0.86 CFS | 0.00 | 0.86 | 0.00% | 2.08% | - | 5.5 | - | - | - | - | - | - | - | 6 | - | - | - | 0.12 |
| | RIGHT | | 0.22 | 0.78 | 4.00 IN/HR | 0.69 CFS | 0.00 | 0.69 | 0.30% | 2.08% | 2.08% | 5.9 | 0.34 | 4.01 | 0.82 | 3.5 | 0.146 | 0.141 | 3.6 | | 1.00 | 0.69 | - | - |
| | LEFT | | 0.06 | 0.78 | 4.00 IN/HR | 0.17 CFS | 0.00 | 0.17 | 0.30% | 2.08% | 8.33% | 1.9 | 1.05 | 1.00 | 1.00 | 2.0 | 0.083 | 0.167 | 1.8 | | 1.00 | 0.17 | - | - |
| 132 | DI-3C | N/A | 0.14 | 0.69 | 4.00 IN/HR | 0.39 CFS | 0.21 | 0.60 | 0.00% | 2.08% | - | 4.3 | - | - | - | - | - | - | - | 6 | - | - | - | 0.09 |
| | RIGHT | | 0.07 | 0.69 | 4.00 IN/HR | 0.18 CFS | 0.13 | 0.32 | 0.14% | 2.08% | 2.08% | 4.6 | 0.43 | 4.01 | 0.91 | 3.5 | 0.146 | 0.154 | 2.0 | | 1.00 | 0.32 | - | - |
| | LEFT | | 0.07 | 0.69 | 4.00 IN/HR | 0.20 CFS | 0.08 | 0.28 | 0.40% | 2.08% | 2.08% | 2.5 | 0.80 | 4.01 | 1.00 | 3.5 | 0.146 | 0.166 | 2.4 | | 1.00 | 0.28 | - | - |
| 130 | DI-3C | N/A | 0.13 | 0.81 | 4.00 IN/HR | 0.43 CFS | 0.00 | 0.43 | 0.00% | 2.08% | - | 3.5 | - | - | - | - | - | - | - | 6 | - | - | - | 0.07 |
| | RIGHT | | 0.03 | 0.81 | 4.00 IN/HR | 0.08 CFS | 0 | 0.08 | 0.80% | 2.08% | 8.33% | 1.2 | 1.67 | 1.00 | 1.00 | 2.0 | 0.083 | 0.167 | 1.8 | | 1.00 | 0.08 | - | - |
| | LEFT | | 0.10 | 0.81 | 4.00 IN/HR | 0.33 CFS | 0 | 0.33 | 0.30% | 2.08% | 2.08% | 3.5 | 0.57 | 4.01 | 0.97 | 3.5 | 0.146 | 0.163 | 2.5 | | 1.00 | 0.33 | - | - |
| 195 | DI-3C | N/A | 0.70 | 0.70 | 4.00 IN/HR | 1.96 CFS | 0.00 | 1.96 | 0.67% | 2.08% | - | 6.4 | - | - | - | - | - | - | - | 14 | - | - | - | 0.13 |
| | RIGHT | | 0.38 | 0.70 | 4.00 IN/HR | 1.05 CFS | 0.00 | 1.05 | 0.82% | 2.08% | 2.08% | 5.7 | 0.35 | 4.01 | 0.84 | 3.5 | 0.146 | 0.143 | 5.8 | | 1.00 | 1.05 | - | - |
| | LEFT | | 0.18 | 0.70 | 4.00 IN/HR | 0.51 CFS | 0.00 | 0.51 | 0.97% | 2.08% | 2.08% | 3.0 | 0.67 | 4.01 | 0.99 | 3.5 | 0.146 | 0.165 | 4.1 | | 1.00 | 0.51 | - | - |

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PRELIM PLAN - STORM SEWER
COMPUTATIONS HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

STORM SEWER COMPUTATIONS

SHEET No.

C306

P:\Projects\22063\001000\112742 Prelim Subdivision - Land Development Plan\C306 Storm Sewer Computations.dwg, 4/7/2024 9:17:52 PM, Matthew Polihaus,

# HYDRAULIC GRADE LINE - TO POND A AND BIORETENTION

| INLET STATION | OUTLET WATER SURFACE ELEVATION | Do | Qo | Lo | n | Sfo% | Hf | JUNCTION LOSSES | | | | | | | | | | | | | | FINAL H | INLET WATER SURFACE ELEVATION | RIM ELEVATION | REMARKS | FREE-BOARD (FT) | HOW OUTLET WSE DETERMINED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Vo | Ho | Qi | Vi | QiVi | Vi2/2g | Hi | ANGLE | H Δ | Ht | 1.3 Ht | 0.5 Ht | 0.65 Ht | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | Downstream WSE= | | 444.65 | | | | |
| 102 | 447.05 | 36 | 48.96 | 27.86 | 0.012 | 0.46% | 0.13 | 16.32 | 1.03 | 44.02 | 16.34 | 719.42 | 4.15 | 1.45 | 90 | 2.90 | 5.39 | 7.01 | 2.69 | 3.50 | 2.82 | 449.87 | 457.00 | OK | 7.13 | 0.8D |
| 104 | 449.87 | 36 | 44.02 | 102.94 | 0.012 | 0.37% | 0.38 | 16.34 | 1.04 | 41.04 | 15.64 | 641.81 | 3.80 | 1.33 | 86 | 2.60 | 4.96 | 6.45 | 2.48 | 3.23 | 2.86 | 452.73 | 457.72 | OK | 4.99 | IWE |
| 105 | 452.73 | 36 | 41.04 | 89.53 | 0.012 | 0.32% | 0.29 | 15.64 | 0.95 | 40.00 | 16.57 | 662.77 | 4.26 | 1.49 | 1 | 0.05 | 2.49 | 3.24 | 1.25 | 1.62 | 1.54 | 454.27 | 461.47 | OK | 7.20 | IWE |
| 106 | 454.27 | 36 | 40.00 | 146.52 | 0.012 | 0.31% | 0.45 | 16.57 | 1.07 | 36.94 | 10.63 | 392.81 | 1.76 | 0.61 | 63 | 1.04 | 2.72 | 3.53 | 1.36 | 1.77 | 1.81 | 459.97 | 467.45 | OK | 7.48 | IWE |
| 108 | 459.97 | 36 | 36.94 | 231.05 | 0.012 | 0.26% | 0.60 | 10.63 | 0.44 | 38.41 | 8.54 | 328.19 | 1.13 | 0.40 | 10 | 0.15 | 0.98 | 1.28 | 0.49 | 0.64 | 1.10 | 461.23 | 476.68 | OK | 15.45 | IWE |
| 110 | 462.35 | 36 | 38.41 | 131.16 | 0.012 | 0.28% | 0.37 | 8.54 | 0.28 | 36.27 | 8.44 | 306.17 | 1.11 | 0.39 | 81 | 0.45 | 1.13 | 1.46 | 0.56 | 0.73 | 0.93 | 463.28 | 479.37 | OK | 16.09 | 0.8D |
| 112 | 463.28 | 36 | 36.27 | 60.61 | 0.012 | 0.25% | 0.15 | 8.44 | 0.28 | 33.44 | 8.28 | 276.91 | 1.06 | 0.37 | 80 | 0.51 | 1.16 | 1.51 | 0.58 | 0.75 | 0.73 | 464.02 | 478.34 | OK | 14.32 | IWE |
| 114 | 464.02 | 36 | 33.44 | 173.07 | 0.012 | 0.21% | 0.37 | 8.28 | 0.27 | 21.02 | 9.06 | 190.48 | 1.28 | 0.45 | 90 | 1.09 | 1.81 | 2.35 | 0.90 | 1.17 | 1.27 | 465.29 | 471.00 | OK | 5.71 | IWE |
| 116 | 465.29 | 24 | 21.02 | 55.88 | 0.012 | 0.74% | 0.41 | 9.06 | 0.32 | 13.51 | 8.12 | 109.64 | 1.02 | 0.36 | 90 | 0.46 | 1.13 | 1.47 | 0.57 | 0.74 | 0.98 | 466.27 | 469.50 | OK | 3.23 | IWE |
| 118 | 466.27 | 24 | 13.51 | 91.29 | 0.012 | 0.30% | 0.28 | 8.12 | 0.26 | 10.94 | 7.60 | 83.10 | 0.90 | 0.31 | 18 | 0.20 | 0.77 | 1.00 | 0.39 | 0.50 | 0.66 | 466.93 | 474.02 | OK | 7.09 | IWE |
| 120 | 466.93 | 24 | 10.94 | 87.33 | 0.012 | 0.20% | 0.17 | 7.60 | 0.22 | 8.32 | 8.99 | 74.80 | 1.26 | 0.44 | 89 | 0.87 | 1.54 | 2.00 | 0.77 | 1.00 | 0.94 | 467.87 | 473.11 | OK | 5.24 | IWE |
| 122 | 467.87 | 18 | 8.32 | 152.54 | 0.012 | 0.53% | 0.81 | 8.99 | 0.31 | 5.04 | 8.13 | 41.00 | 1.03 | 0.36 | 0 | 0.00 | 0.67 | 0.88 | 0.34 | 0.44 | 1.15 | 470.34 | 475.00 | OK | 4.66 | IWE |
| 124 | 470.50 | 15 | 5.04 | 148.69 | 0.012 | 0.52% | 0.77 | 8.13 | 0.26 | 1.93 | 6.27 | 12.12 | 0.61 | 0.21 | 0 | 0.00 | 0.47 | 0.61 | 0.24 | 0.31 | 1.01 | 473.38 | 478.30 | OK | 4.92 | 0.8D |
| 126 | 473.57 | 15 | 1.93 | 109.31 | 0.012 | 0.08% | 0.08 | 6.27 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.15 | 0.20 | 0.08 | 0.10 | 0.16 | 475.36 | 480.00 | OK | 4.64 | 0.8D |
| | | | | | | | | | | | | | | | | | | | | | | 466.93 | | | | |
| 119 | 466.93 | 15 | 2.18 | 152.83 | 0.012 | 0.10% | 0.15 | 3.85 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.06 | 0.07 | 0.03 | 0.04 | 0.18 | 469.95 | 476.63 | OK | 6.68 | IWE |
| | | | | | | | | | | | | | | | | | | | | | | 449.87 | | | | |
| 200 | 449.87 | 15 | 5.18 | 32.50 | 0.012 | 0.55% | 0.18 | 10.71 | 0.44 | 3.85 | 9.14 | 35.21 | 1.30 | 0.45 | 82 | 0.87 | 1.76 | 2.29 | 0.88 | 1.15 | 1.06 | 450.93 | 457.00 | OK | 6.07 | IWE |
| 202 | 450.93 | 15 | 3.85 | 153.26 | 0.012 | 0.30% | 0.46 | 9.14 | 0.32 | 2.69 | 6.44 | 17.32 | 0.64 | 0.23 | 0 | 0.00 | 0.55 | 0.71 | 0.27 | 0.36 | 0.74 | 459.14 | 464.75 | OK | 5.61 | IWE |
| 204 | 459.20 | 15 | 2.69 | 160.80 | 0.012 | 0.15% | 0.24 | 6.44 | 0.16 | 0.83 | 3.43 | 2.83 | 0.18 | 0.06 | 0 | 0.00 | 0.22 | 0.29 | 0.11 | 0.15 | 0.35 | 463.56 | 469.30 | OK | 5.74 | 0.8D |
| 206 | 464.01 | 15 | 0.83 | 185.06 | 0.012 | 0.01% | 0.03 | 3.43 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.05 | 0.06 | 0.02 | 0.03 | 0.05 | 470.39 | 473.40 | OK | 3.01 | 0.8D |
| | | | | | | | | | | | | | | | | | | | | | | 449.87 | | | | |
| 195 | 451.13 | 15 | 3.30 | 46.78 | 0.012 | 0.22% | 0.10 | 8.61 | 0.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.29 | 0.37 | 0.14 | 0.19 | 0.25 | 452.78 | 457.65 | OK | 4.87 | 0.8D |
| | | | | | | | | | | | | | | | | | | | | | | 459.97 | | | | |
| 190 | 460.08 | 15 | 2.39 | 63.90 | 0.012 | 0.12% | 0.07 | 10.78 | 0.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.45 | 0.59 | 0.23 | 0.29 | 0.30 | 462.83 | 468.21 | OK | 5.37 | 0.8D |
| | | | | | | | | | | | | | | | | | | | | | | 463.28 | | | | |
| 170 | 463.79 | 18 | 2.25 | 92.07 | 0.012 | 0.04% | 0.04 | 6.64 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.17 | 0.22 | 0.09 | 0.11 | 0.12 | 465.26 | 477.00 | OK | 11.74 | 0.8D |
| | | | | | | | | | | | | | | | | | | | | | | 464.02 | | | | |
| 172 | 464.05 | 15 | 2.98 | 12.77 | 0.012 | 0.18% | 0.02 | 7.07 | 0.19 | 2.71 | 9.15 | 24.78 | 1.30 | 0.45 | 0 | 0.00 | 0.65 | 0.84 | 0.32 | 0.42 | 0.35 | 464.40 | 478.29 | OK | 13.90 | 0.8D |
| 174 | 464.41 | 15 | 2.71 | 31.00 | 0.012 | 0.15% | 0.05 | 9.15 | 0.32 | 2.33 | 9.79 | 22.78 | 1.49 | 0.52 | 49 | 0.48 | 1.33 | 1.73 | 0.66 | 0.86 | 0.71 | 466.19 | 478.41 | OK | 12.22 | 0.8D |
| 175 | 466.19 | 15 | 2.33 | 40.91 | 0.012 | 0.11% | 0.05 | 9.79 | 0.37 | 1.19 | 7.95 | 9.44 | 0.98 | 0.34 | #N/A | 0.00 | 0.72 | 0.93 | 0.36 | 0.47 | 0.40 | 468.49 | 477.88 | OK | 9.39 | IWE |
| 178 | 468.49 | 15 | 1.14 | 34.42 | 0.012 | 0.03% | 0.01 | 8.06 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.25 | 0.33 | 0.13 | 0.16 | 0.14 | 469.82 | 477.87 | OK | 8.05 | IWE |
| | | | | | | | | | | | | | | | | | | | | | | 468.49 | | | | |
| 176 | 468.49 | 15 | 1.19 | 25.25 | 0.012 | 0.03% | 0.01 | 7.95 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 42 | 0.45 | 0.69 | 0.90 | 0.35 | 0.45 | 0.35 | 469.48 | 479.87 | OK | 10.39 | Norm. Depth |
| | | | | | | | | | | | | | | | | | | | | | | 464.02 | | | | |
| 140 | 464.02 | 18 | 6.79 | 108.17 | 0.012 | 0.36% | 0.39 | 5.67 | 0.12 | 6.62 | 4.99 | 33.04 | 0.39 | 0.14 | 4 | 0.02 | 0.28 | 0.36 | 0.14 | 0.18 | 0.52 | 464.54 | 472.10 | OK | 7.56 | Norm. Depth |
| 142 | 464.61 | 18 | 6.62 | 23.65 | 0.012 | 0.34% | 0.08 | 4.99 | 0.10 | 6.62 | 4.99 | 33.03 | 0.39 | 0.14 | 90 | 0.27 | 0.50 | 0.65 | 0.25 | 0.33 | 0.33 | 464.94 | 474.51 | OK | 9.57 | 0.8D |
| 144 | 464.94 | 18 | 6.62 | 68.91 | 0.012 | 0.34% | 0.23 | 4.99 | 0.10 | 3.68 | 10.35 | 38.07 | 1.66 | 0.58 | 90 | 1.07 | 1.75 | 2.28 | 0.88 | 1.14 | 1.11 | 466.05 | 472.62 | OK | 6.58 | IWE |
| 145 | 466.05 | 15 | 3.68 | 110.72 | 0.012 | 0.28% | 0.31 | 10.35 | 0.42 | 2.38 | 8.21 | 19.53 | 1.05 | 0.37 | 0 | 0.00 | 0.78 | 1.02 | 0.39 | 0.51 | 0.70 | 466.74 | 469.84 | OK | 3.10 | IWE |
| 146 | 466.74 | 15 | 2.38 | 39.79 | 0.012 | 0.12% | 0.05 | 8.21 | 0.26 | 1.45 | 4.05 | 5.89 | 0.25 | 0.09 | 90 | 0.18 | 0.53 | 0.69 | 0.26 | 0.34 | 0.31 | 467.06 | 469.50 | OK | 2.44 | Norm. Depth |
| 148 | 467.06 | 15 | 1.45 | 31.00 | 0.012 | 0.04% | 0.01 | 4.05 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.06 | 0.08 | 0.03 | 0.04 | 0.05 | 467.10 | 469.51 | OK | 2.41 | IWE |
| | | | | | | | | | | | | | | | | | | | | | | 466.05 | | | | |
| 150 | 466.05 | 15 | 1.74 | 31.00 | 0.012 | 0.06% | 0.02 | 9.93 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.38 | 0.50 | 0.19 | 0.25 | 0.21 | 467.35 | 472.66 | OK | 5.31 | IWE |
| | | | | | | | | | | | | | | | | | | | | | | 465.29 | | | | |
| 160 | 465.29 | 18 | 6.30 | 70.49 | 0.012 | 0.31% | 0.22 | 10.03 | 0.39 | 3.55 | 9.12 | 32.35 | 1.29 | 0.45 | 3 | 0.05 | 0.89 | 1.16 | 0.44 | 0.58 | 0.66 | 467.28 | 473.80 | OK | 6.52 | IWE |
| 162 | 467.28 | 15 | 3.55 | 148.81 | 0.012 | 0.26% | 0.38 | 9.12 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.32 | 0.42 | 0.16 | 0.21 | 0.54 | 472.38 | 477.00 | OK | 4.62 | IWE |
| | | | | | | | | | | | | | | | | | | | | | | 466.27 | | | | |
| 130 | 466.27 | 15 | 4.41 | 19.30 | 0.012 | 0.40% | 0.08 | 6.48 | 0.16 | 3.72 | 6.24 | 23.23 | 0.60 | 0.21 | 0 | 0.00 | 0.37 | 0.49 | 0.19 | 0.24 | 0.26 | 466.53 | 473.06 | OK | 6.53 | IWE |
| 132 | 466.53 | 15 | 3.72 | 31.00 | 0.012 | 0.28% | 0.09 | 6.24 | 0.15 | 2.58 | 6.64 | 17.17 | 0.69 | 0.24 | 87 | 0.47 | 0.86 | 1.12 | 0.43 | 0.56 | 0.52 | 467.05 | 473.20 | OK | 6.15 | IWE |
| 133 | 467.85 | 15 | 0.69 | 107.30 | 0.012 | 0.01% | 0.01 | 1.45 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 469.12 | 475.15 | OK | 6.02 | 0.8D |
| 134 | 467.05 | 15 | 2.58 | 38.56 | 0.012 | 0.14% | 0.05 | 6.64 | 0.17 | 2.58 | 7.67 | 19.83 | 0.91 | 0.32 | 61 | 0.52 | 1.01 | 1.31 | 0.50 | 0.66 | 0.56 | 468.13 | 474.55 | OK | 6.42 | IWE |
| 136 | 468.17 | 15 | 2.58 | 37.17 | 0.012 | 0.14% | 0.05 | 7.67 | 0.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.23 | 0.30 | 0.11 | 0.15 | 0.16 | 468.95 | 474.88 | OK | 5.93 | 0.8D |
| | | | | | | | | | | | | | | | | | | | | | | 458.50 | | | | |
| 302 | 458.50 | 18 | 8.91 | 48.24 | 0.012 | 0.61% | 0.30 | 9.76 | 0.37 | 8.91 | 7.96 | 70.93 | 0.98 | 0.34 | 41 | 0.43 | 1.14 | 1.49 | 0.57 | 0.74 | 0.87 | 459.37 | 461.44 | OK | 2.07 | IWE |
| 304 | 459.37 | 18 | 8.91 | 119.10 | 0.012 | 0.61% | 0.73 | 7.96 | 0.25 | 7.42 | 9.78 | 72.54 | 1.49 | 0.52 | 15 | 0.28 | 1.05 | 1.36 | 0.52 | 0.68 | 1.25 | 460.62 | 467.13 | OK | 6.51 | IWE |
| 306 | 460.62 | 18 | 7.42 | 31.00 | 0.012 | 0.42% | 0.13 | 9.78 | 0.37 | 5.34 | 6.29 | 33.59 | 0.61 | 0.22 | 16 | 0.12 | 0.71 | 0.92 | 0.36 | 0.46 | 0.49 | 461.36 | 467.12 | OK | 5.76 | IWE |
| 308 | 461.44 | 15 | 5.34 | 51.57 | 0.012 | 0.58% | 0.30 | 6.29 | 0.15 | 4.67 | 5.31 | 24.79 | 0.44 | 0.15 | 41 | 0.19 | 0.49 | 0.64 | 0.25 | 0.32 | 0.55 | 461.99 | 466.00 | OK | 4.01 | 0.8D |
| 310 | 462.06 | 15 | 4.67 | 65.88 | 0.012 | 0.45% | 0.29 | 5.31 | 0.11 | 3.09 | 7.12 | 22.00 | 0.79 | 0.28 | 66 | 0.46 | 0.85 | 1.10 | 0.42 | 0.55 | 0.72 | 462.77 | 467.32 | OK | 4.54 | 0.8D |
| 312 | 462.77 | 15 | 3.09 | 138.91 | 0.012 | 0.19% | 0.27 | 7.12 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | #N/A | 0.00 | 0.20 | 0.26 | 0.10 | 0.13 | 0.37 | 465.09 | 469.72 | OK | 4.63 | IWE |

IMEG
50 Catoctin Circle NE, Suite 210
Leesburg, VA 20176 P: 703.777.2755
engineering • surveying • land planning

PRELIM PLAN - STORM SEWER
COMPUTATIONS HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

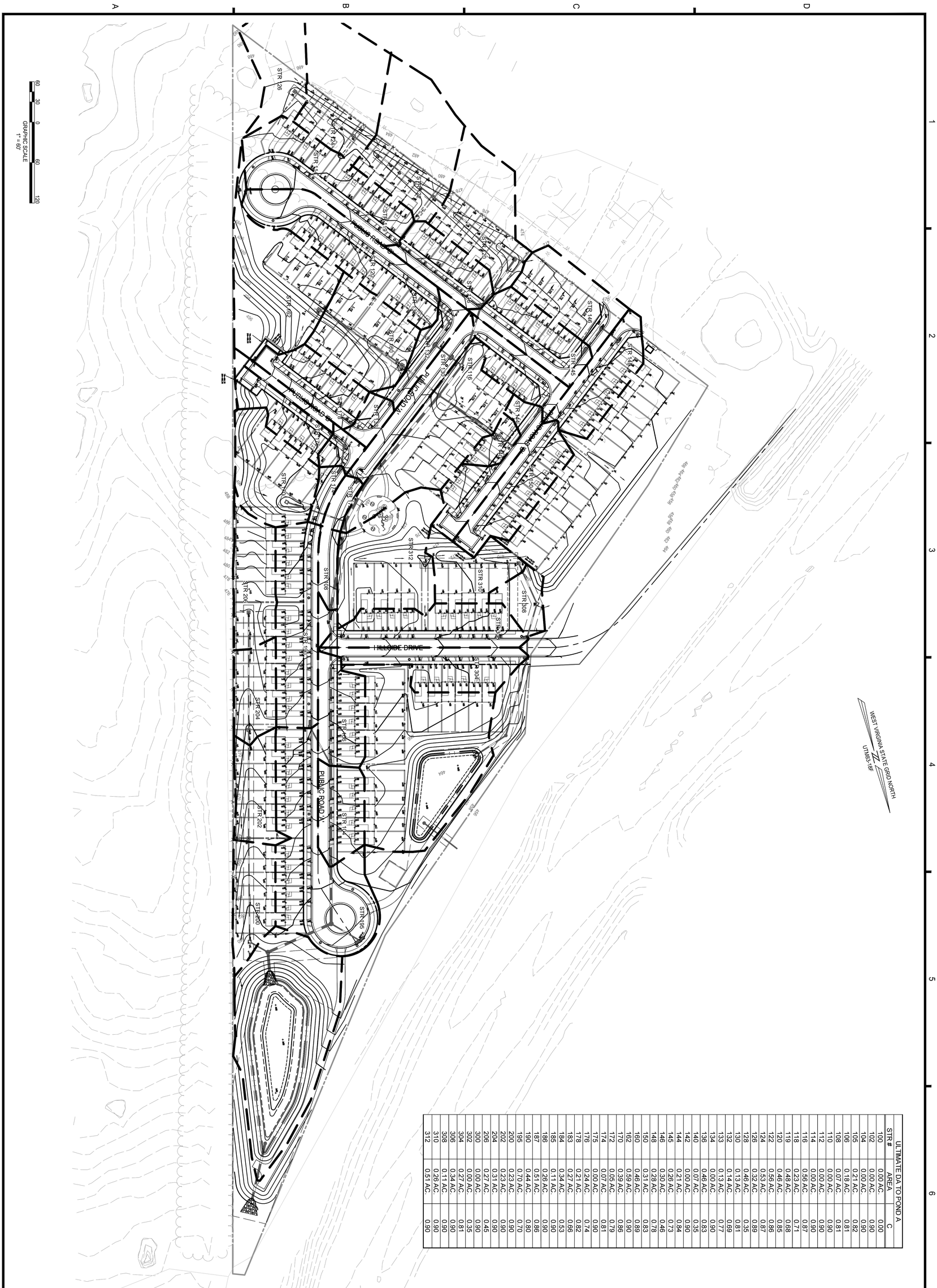
PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
STORM SEWER COMPUTATIONS

SHEET No.
C307

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C307 Storm Sewer Computations .dwg, 4/8/2024 11:30:41 AM, Miranda Tison,

P:\Projects\220631\00100\112742 Prelim Subdivision - Land Development Plan\C308 Storm Drain Drainage Area Map.dwg, 4/8/2024 1:15:01 PM, Miranda Tison,




| STR # | ULTIMATE DA TO POND A AREA | C |
|---|---|---|
| 100 | 0.00 AC. | 0.00 |
| 102 | 0.00 AC. | 0.90 |
| 104 | 0.00 AC. | 0.90 |
| 105 | 0.21 AC. | 0.82 |
| 106 | 0.18 AC. | 0.81 |
| 108 | 0.07 AC. | 0.81 |
| 110 | 0.00 AC. | 0.90 |
| 112 | 0.00 AC. | 0.90 |
| 114 | 0.00 AC. | 0.90 |
| 116 | 0.56 AC. | 0.87 |
| 118 | 0.23 AC. | 0.71 |
| 119 | 0.48 AC. | 0.68 |
| 120 | 0.46 AC. | 0.85 |
| 122 | 0.58 AC. | 0.86 |
| 124 | 0.53 AC. | 0.87 |
| 126 | 0.32 AC. | 0.89 |
| 128 | 0.46 AC. | 0.35 |
| 130 | 0.13 AC. | 0.81 |
| 132 | 0.14 AC. | 0.77 |
| 133 | 0.13 AC. | 0.77 |
| 134 | 0.00 AC. | 0.90 |
| 136 | 0.48 AC. | 0.83 |
| 140 | 0.07 AC. | 0.35 |
| 142 | 0.00 AC. | 0.90 |
| 144 | 0.21 AC. | 0.84 |
| 145 | 0.26 AC. | 0.73 |
| 146 | 0.30 AC. | 0.46 |
| 148 | 0.28 AC. | 0.78 |
| 150 | 0.31 AC. | 0.83 |
| 160 | 0.46 AC. | 0.89 |
| 162 | 0.59 AC. | 0.90 |
| 170 | 0.39 AC. | 0.86 |
| 172 | 0.05 AC. | 0.79 |
| 174 | 0.07 AC. | 0.81 |
| 175 | 0.00 AC. | 0.90 |
| 176 | 0.24 AC. | 0.74 |
| 178 | 0.21 AC. | 0.82 |
| 183 | 0.27 AC. | 0.66 |
| 184 | 0.34 AC. | 0.53 |
| 185 | 0.11 AC. | 0.90 |
| 186 | 0.26 AC. | 0.90 |
| 187 | 0.51 AC. | 0.86 |
| 190 | 0.44 AC. | 0.80 |
| 195 | 0.70 AC. | 0.70 |
| 200 | 0.23 AC. | 0.90 |
| 202 | 0.23 AC. | 0.90 |
| 204 | 0.37 AC. | 0.90 |
| 300 | 0.07 AC. | 0.45 |
| 302 | 0.00 AC. | 0.35 |
| 304 | 0.27 AC. | 0.81 |
| 306 | 0.34 AC. | 0.90 |
| 308 | 0.11 AC. | 0.90 |
| 310 | 0.26 AC. | 0.90 |
| 312 | 0.51 AC. | 0.90 |

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 220631.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 60'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
STORM DRAIN DRAINAGE AREA MAP

SHEET No.
C308

# PRELIM PLAN - STORM DRAIN DRAINAGE AREA MAP HILLSIDE

691/432 MAP 9 PARCEL 67

LOTS 2A (RESIDUE) & 2B

DISTRICT 3, JEFFERSON COUNTY, WV

IMEG
50 Catoctin Circle NE, Suite 210
Leesburg, VA 20176 P 703.777.2755
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| INLET MOUNDING TABLE | | | |
|---|---|---|---|
| DITCH GRADE | VERTICAL LENGTH | HORIZONTAL LENGTH | VERTICAL LENGTH |
| FROM TO | (FT.) | (FT.) | (FT.) |
| 0 3 | 3 | 10 | 10 |
| 3 7.5 | 4 | 15 | 15 |
| 7.5 UP | SPECIAL DESIGN | SPECIAL DESIGN | |

MOUNDING DETAIL
Median and Side Ditches

SECTION A-A
(Type 2 Grate Shown)

SECTION B-B

PLAN VIEW-TYPE 2 GRATE

PLAN

SECTION THROUGH TYPE 1 GRATE

SECTION THROUGH TYPE 2 GRATE

EXPLODED DETAIL

CONSTRUCTION JOINT DETAILS

| DIMENSIONS | | | | | | | TYPE 2 GRATE | | FRAME | TYPE 1 GRATE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Inside Dia. | A | B | C | D | Inside | F | Bars | WT | WT | F | Bars | WT |
| 18" | 2'-0" | 2'-0" | 2'-3 3/4" | 2'-3 3/4" | 2'-0" | 2'-3" | 7 | 233 | 82 | 2'-3" | 7 | 233 |
| 24" | 2'-0" | 2'-0" | 2'-3 3/4" | 2'-3 3/4" | 2'-0" | 2'-3" | 7 | 233 | 82 | 2'-3" | 7 | 233 |
| 30" | 2'-0" | 2'-0" | 2'-3 3/4" | 2'-3 3/4" | 2'-0" | 2'-3" | 7 | 233 | 82 | 2'-3" | 7 | 233 |
| 36" | 2'-0" | 2'-0" | 2'-3 3/4" | 2'-3 3/4" | 2'-0" | 2'-3" | 8 | 278 | 88 | 2'-3" | 10 | 346 |
| 30" | 3'-0" | 4'-0" | 3'-3 3/4" | 3'-3 3/4" | 3'-0" | 3'-3" | 8 | 357 | 80 | 3'-3" | 21 | 787 |
| 33" | 3'-0" | 4'-0" | 3'-3 3/4" | 3'-3 3/4" | 3'-0" | 3'-3" | 10 | 418 | 85 | 3'-3" | 21 | 841 |
| 36" | 4'-0" | 4'-0" | 3'-3 3/4" | 4'-3 3/4" | 3'-0" | 3'-3" | 11 | 486 | 90 | 3'-3" | 23 | 887 |
| 42" | 4'-0" | 5'-0" | 4'-3 3/4" | 4'-3 3/4" | 3'-0" | 3'-3" | 13 | 582 | 102 | 3'-3" | 25 | 1007 |
| 48" | 5'-0" | 5'-0" | 4'-3 3/4" | 5'-3 3/4" | 3'-0" | 3'-3" | 15 | 744 | 112 | 3'-3" | 28 | 1507 |

Table Note: Grate and frame weights are for information only and will increase if larger straps and bars are used. The following substitutions in dimensions are acceptable for fabricating the grate and frame:
Strap Thickness: 1/2" Strap Depth: 3" Bar Depth: 3"

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DETAIL

APPROVED 7-11-95
REVISED 5-21-96

TYPE G INLET

STANDARD SHEET DRG-G

NOTES

The final installed top surface of inlet and grate shall be flush with adjacent finished surfaces such as pavement, gutters, curbs, and sidewalks. Top of grate elevation, if shown on the plans, is for information only.

Construction may be cast-in place, precast in one or multiple sections, or any combination of cast-in-place and precast.

Type 2 Grate shall be used at all locations unless otherwise specified on the Plans. Type 1 Urban Grates shall be used only at specially designated locations as shown on the plans.

The Contractor, at his option, may omit use of the frame by forming a ledge in the concrete.

2" sloped concrete shall be excised in forming the ledge for supporting the frame. If the shallow frame is not used, no projections shall exist on the bearing surfaces of the ledge or the grates, and the grates shall seat on the ledge without rocking.

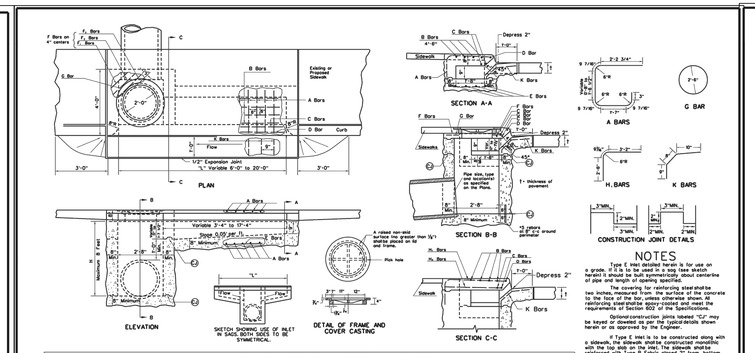
The Mounding Detail as shown is not required when an inlet is placed in a sag.

Optional construction joints labeled "CJ" may be roughened concrete, keyed or doweled as per the typical details shown herein or as approved by the Engineer. Non shrink grout meeting the requirements of subsection 710.5 of the specifications may be used to a depth of 7/2" for leveling between precast sections. Thicker depths will be allowed as per the manufacturer's recommendations.

This inlet is to be installed in roadside or median ditches only. It is not to be placed adjacent to pavement or in the gutter pan of combination curb and gutter.

The minimum distance from the top of any pipe opening to any construction joint above the opening shall be four (4) inches.

The number and location of pipe openings shall be as shown in the plans. Cutting of openings at no additional cost, shall be responsible for any temporary bracing required to transport precast inlet sections due to multiple openings.


PLAN
SECTION A-A
SECTION B-B
SECTION C-C
ELEVATION
SECTION THROUGH CURB
SKETCH SHOWING USE OF INLET IN SAGS, BOTH SIDES TO BE SYMMETRICAL.
DETAIL OF FRAME AND COVER CASTING
CONCRETE AND REINFORCING STEEL QUANTITIES
Variable 3'-4" to 17'-4"
Variable 8'-0" to 20'-0"
1/2" Expansion Joint
Flow
Curb
Sidewalk
Pipe size, type, and location as specified on the Plans.
Existing or Proposed Sidewalk
Optional construction joint
A raised non-skid surface not more than 1/4" shall be placed on all end frame.
Pick hole
Depress 2"
Depress 4"
Depress 6"
Depress 8"
Minimum 8" Fill
Slope 0.05" per ft.
Flow
Curb
Grate
Frame
Concrete Gutter
Sidewalk
Top of Curb
Flow Line
Top of Grate
Top of Frame
Flow Line
Top of Curb
Top of Sidewalk

WEST VIRGINIA STATE GRID NORTH
UTM83-18F

SEE SHEET C401

SEE SHEET C401

PROP. BUS STOP
VARYING WIDTH SIGHT DISTANCE ESMT.
TRANSITION TO EX. CURB
TYPE IIIB RAMPS (TYP.)
TYPE IIB RAMPS (TYP.)
TYPE IV RAMP
TRANSITION TO EXISTING
EX. CONCRETE CHANNEL
15' SD ESMT.
15' W/M ESMT.
VARYING WIDTH SD ESMT.
6' CONC. S/W
CG-1 (TYP.)
22' TYP.
E: 2437651
N: 286870
E: 2438021
N: 286897
E: 2437990
N: 286954

STERNWAY DRIVE (40' ROW)
HILLSIDE DRIVE
PUBLIC ROAD 'A'
PUBLIC ROAD 'B'
PUBLIC ROAD 'C'
PUBLIC ROAD 'D'

OPEN SPACE A
OPEN SPACE D
OPEN SPACE E
OPEN SPACE F
OPEN SPACE G
OPEN SPACE H
OPEN SPACE I
OPEN SPACE J
OPEN SPACE K

LOT 3 CTC M9A P3 OWEN D.B. 1205 PG. 38
LOT 5 CTC M9A P5 SULLIVAN D.B. 1230 PG. 202
LOT 4 CTC M9A P4 OWEN D.B. 1016 PG. 25
LOT 24 CTC M9A P24 DOUGHERTY D.B. 1181 PG. 746
LOT 25 CTC M9A P25 POTTER D.B. 996 PG. 683
LOT 23 CTC M9A P23 POTTER D.B. 1206 PG. 494
LOT 22 CTC M9A P22 DELANEY D.B. 1952 PG. 486
HILL SIDE
LOT 21 CTC M9A P21 UBERT D.B. 1134 PG. 446
LOT 20 C M9A P20 OWEN 260 PG. 9

89 90 91 92 93 94 95 96 97 98 99 100 101 102 103
88 87 86 85 84 83 82 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67
109 110 111 112 108 107 106 105 104
121 120 119 118 117 116 115 114 113
56 57 58 59 60 61 62 63 64 65 66
55 54 53 52 51 50
45 46 47 48 49
44 43 42 41 40 39 38 37 36

GRAPHIC SCALE
1" = 30'

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PRELIM PLAN - SITE PLAN HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
SITE PLAN

SHEET No.
C400

P:\Projects\22063\000\000\112742 Prelim Subdivision - Land Development Plan\C400 Site Plan.dwg, 4/8/2024 9:28:35 AM, Matthew Pohlhaus,

WEST VIRGINIA STATE GRID NORTH
UTM83-18F

SEE SHEET C400

EX. CONCRETE CHANNEL

100'

1 2 3 4 5 6

30' 20' 20' 30'

15' SD ESMT.

VARYING WIDTH SWM ESMT.

E:2438000
N:287200

OPEN SPACE B

PUMP STATION

30' SAN. SEWER ESMT.

7 8 9 10 11 12 13 14 15 16 17

30' 20' 20' 30' 30' 20' 30'

6' CONC. S/W

CG-1 (TYP.)

R25'

TYPE IIIB RAMPS (TYP.)

PUBLIC ROAD 'A'

R55'
R43.5'
R22'
R25'
R36.5'

27'
22'

CG-1 (TYP.)

6' CONC. S/W

12' TYP.

E:2438197
N:287097

35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18

20' 30' 20'

SEE SHEET C400

VARYING WIDTH SWM ESMT.

E:2438300
N:287000

15' SD ESMT.

OPEN SPACE C

30 15 0 30 60
GRAPHIC SCALE
1" = 30'

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# PRELIM PLAN - SITE PLAN HILLSIDE

691/432 MAP 9 PARCEL 67

LOTS 2A (RESIDUE) & 2B

DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SITE PLAN

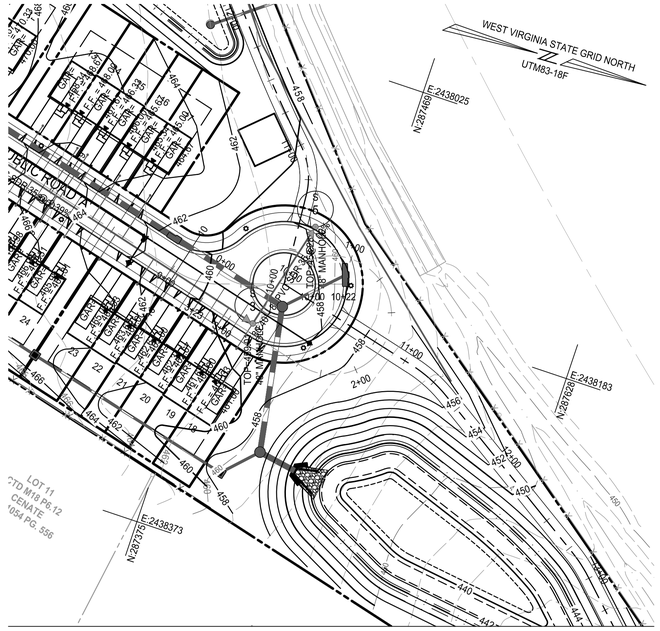
SHEET No.

C401

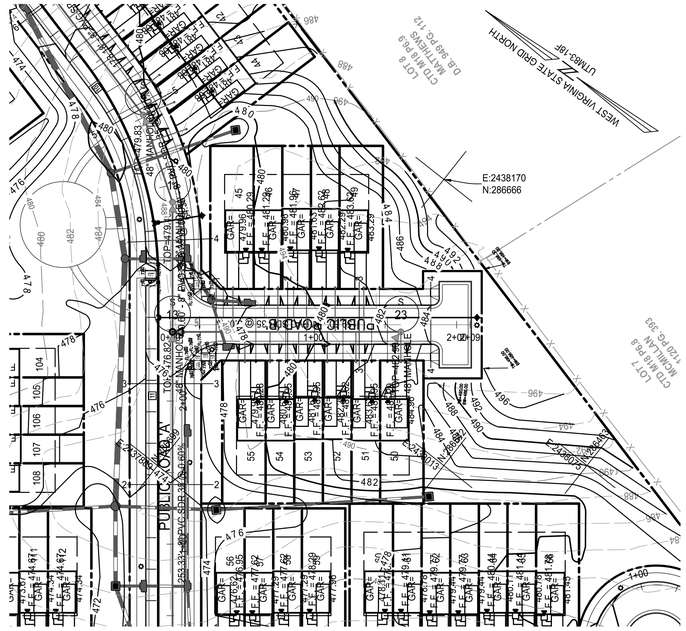
P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\[C400 Site Plan.dwg, 4/8/2024 9:34:39 AM, Matthew Pohlhaus,



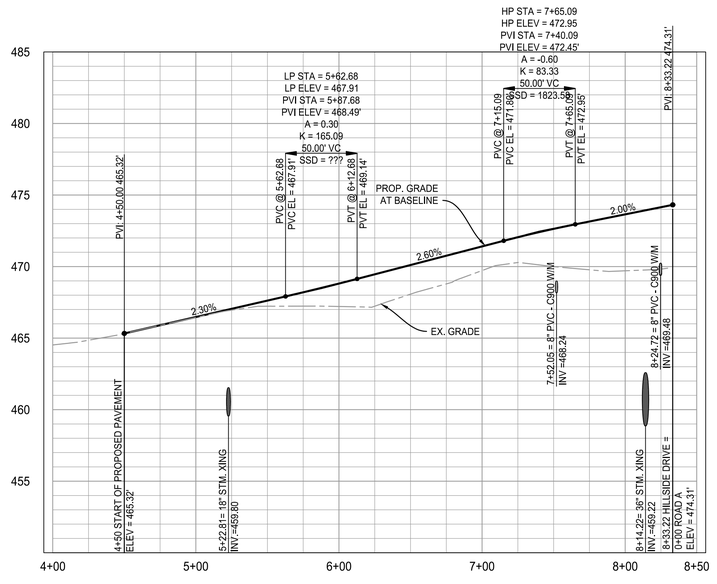

HILLSIDE DRIVE EXTENSION PLAN VIEW
SCALE: 1" = 50'



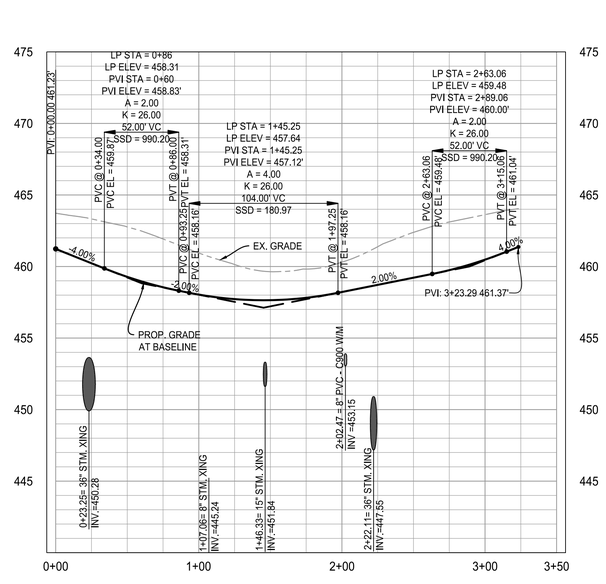

ROAD A COURT UNWRAP PLAN VIEW
SCALE: 1" = 50'



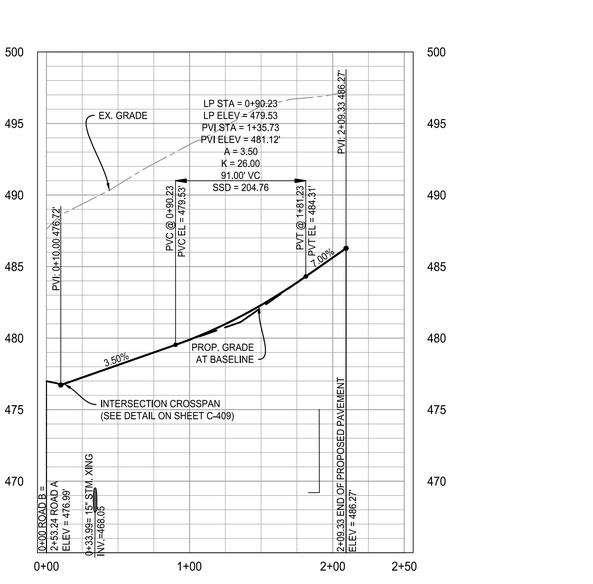

ROAD B PLAN VIEW
SCALE: 1" = 50'




HILLSIDE DRIVE EXTENSION PROFILE




ROAD A COURT UNWRAP PROFILE




ROAD B PROFILE

5 2.5 0 5 10
GRAPHIC SCALE
VERTICAL: 1" = 5'

50 25 0 50 100
GRAPHIC SCALE
HORIZONTAL: 1" = 50'

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PRELIM PLAN - ROAD PROFILES
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

ROAD PROFILES

SHEET No.
C402

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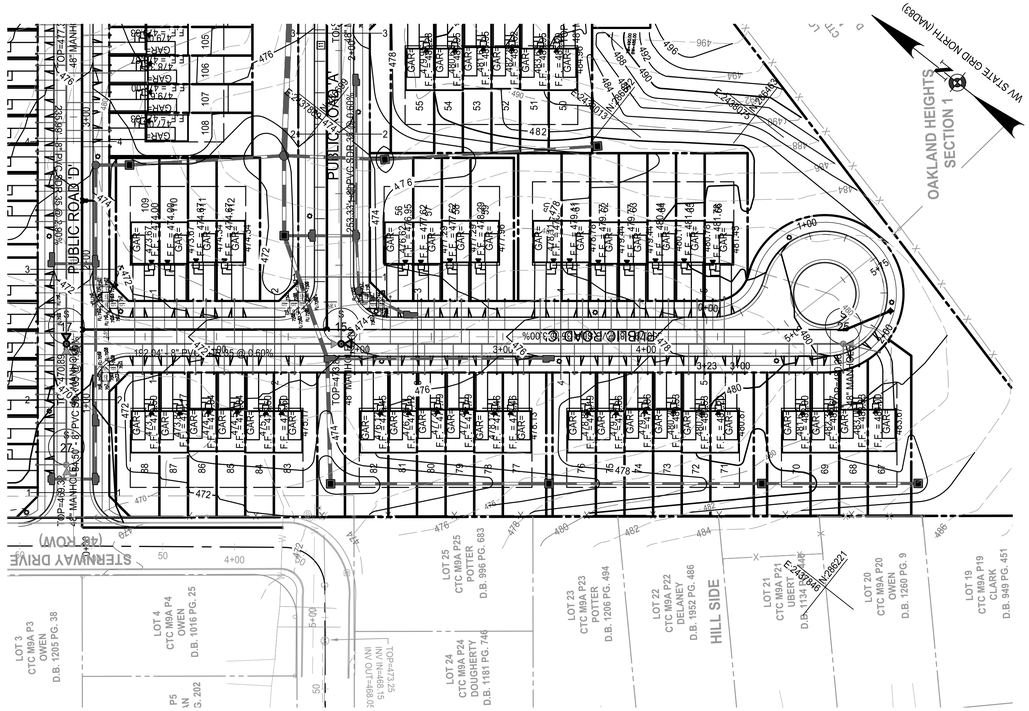
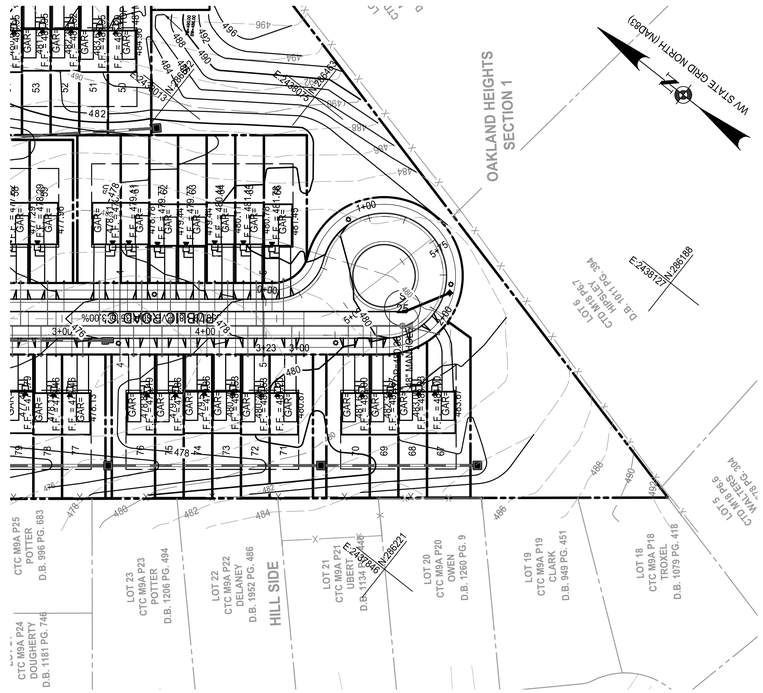
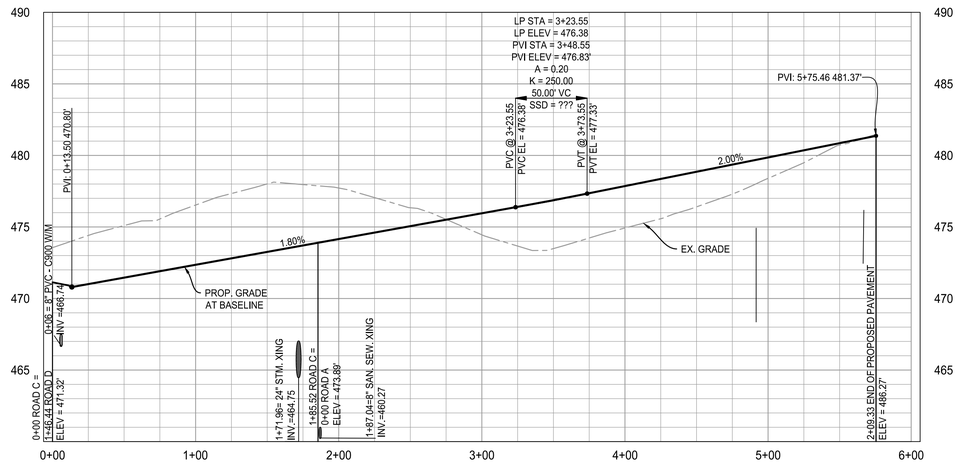


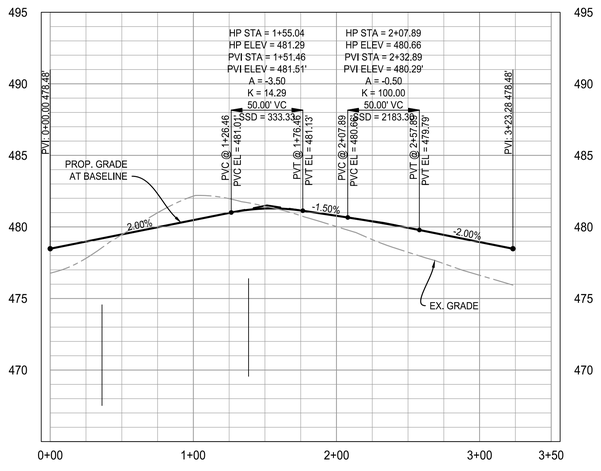

ROAD C PLAN VIEW
SCALE: 1" = 50'




ROAD C COURT UNWRAP PLAN VIEW
SCALE: 1" = 50'




ROAD C PROFILE




ROAD C COURT UNWRAP PROFILE

GRAPHIC SCALE
VERTICAL: 1" = 5'

GRAPHIC SCALE
HORIZONTAL: 1" = 50'

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PRELIM PLAN - ROAD PROFILES
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

ROAD PROFILES

SHEET No.
C403

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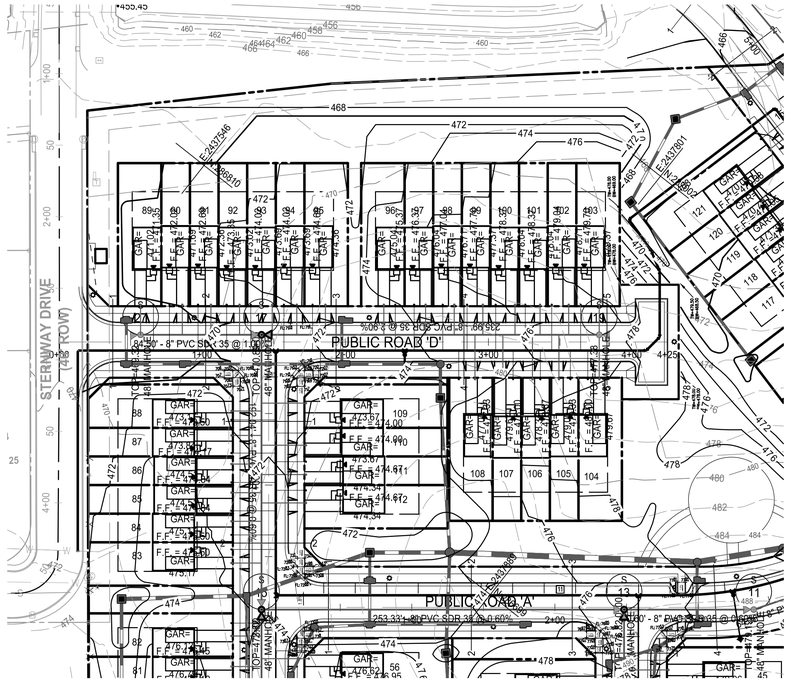
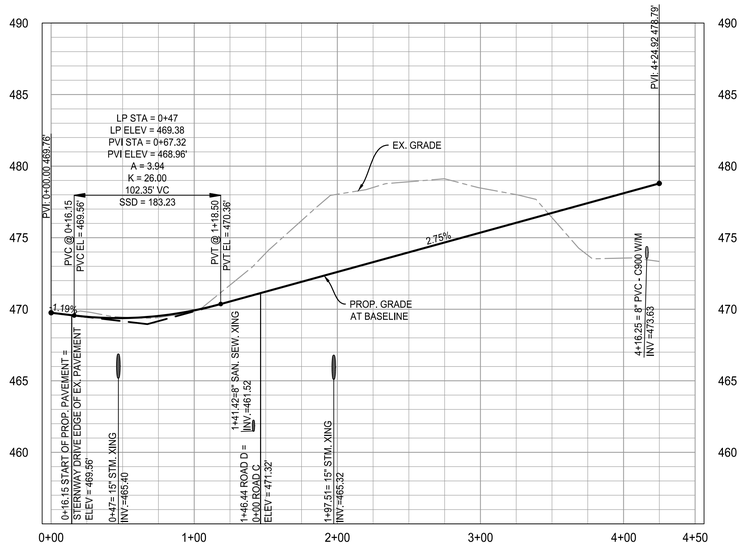



ROAD D PLAN VIEW
SCALE: 1" = 50'




ROAD D PROFILE

GRAPHIC SCALE
VERTICAL: 1" = 5'

GRAPHIC SCALE
HORIZONTAL: 1" = 50'

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PRELIM PLAN - ROAD PROFILES
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

ROAD PROFILES

SHEET No.

C404

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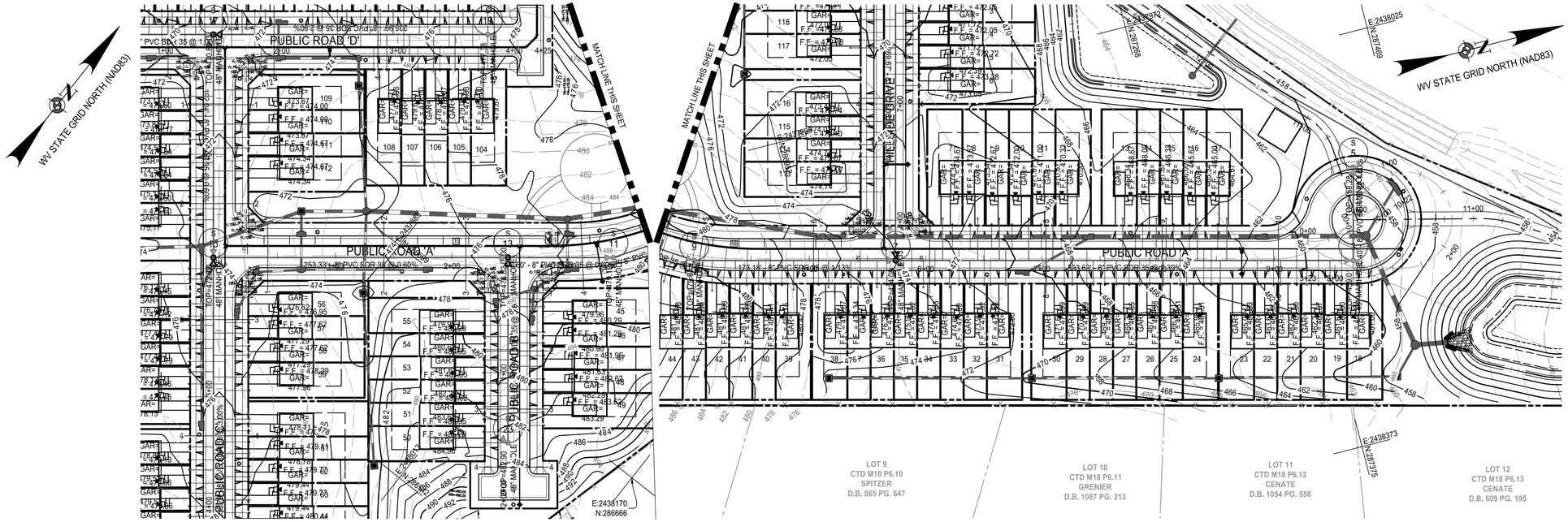
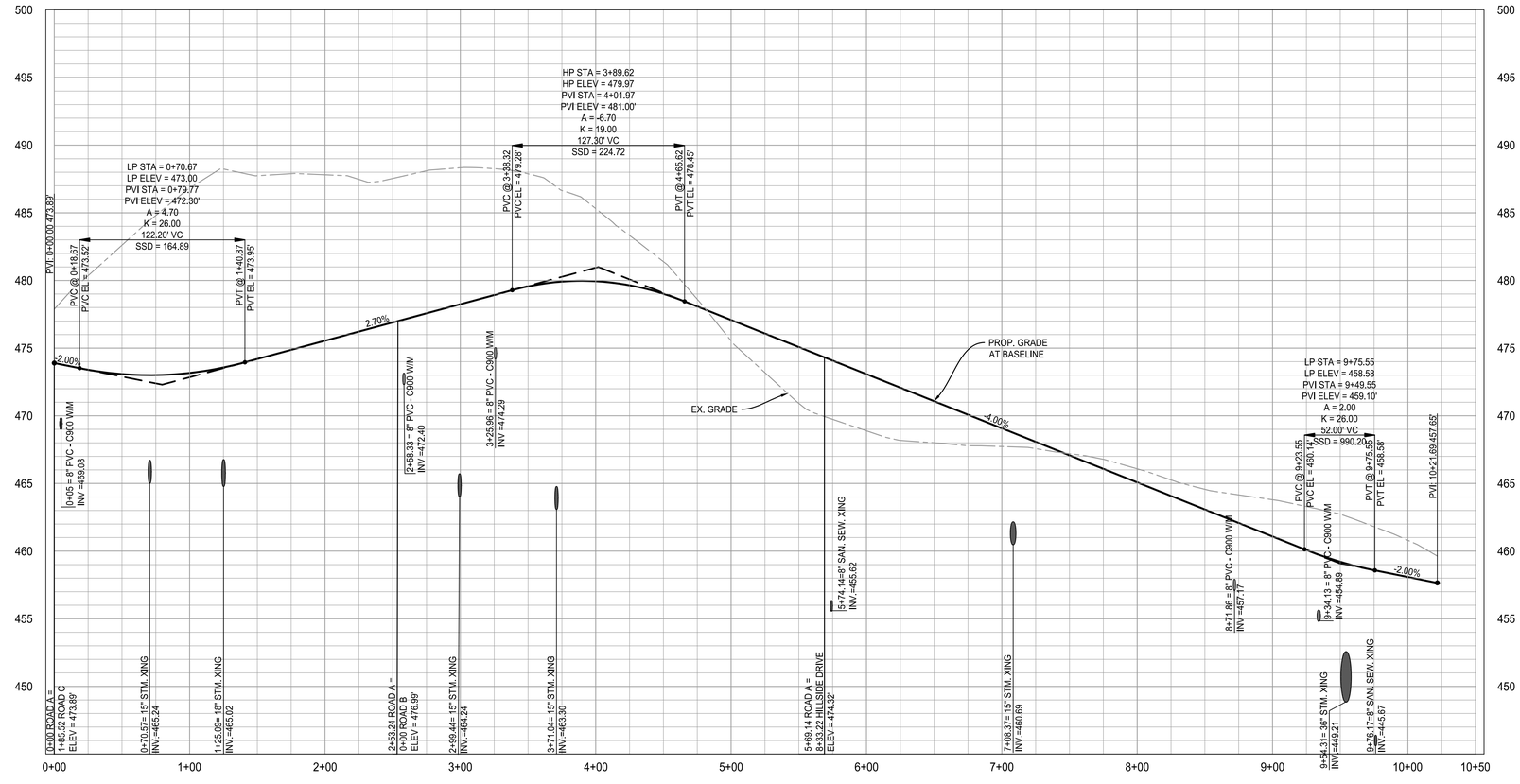



ROAD A PLAN VIEW
SCALE: 1" = 50'




ROAD A PROFILE

GRAPHIC SCALE
VERTICAL: 1" = 5'

GRAPHIC SCALE
HORIZONTAL: 1" = 50'

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PRELIM PLAN - ROAD PROFILES
HILLSIDE

691/432 MAP 9 PARCEL 67

LOTS 2A (RESIDUE) & 2B

DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

ROAD PROFILES

SHEET No.

C405

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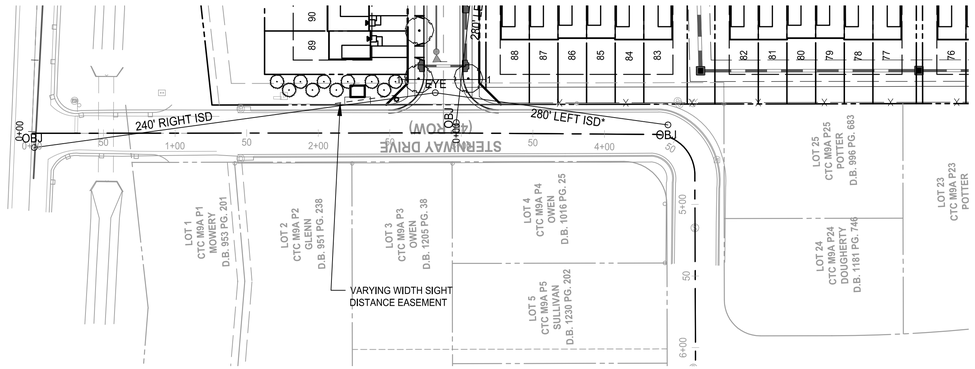
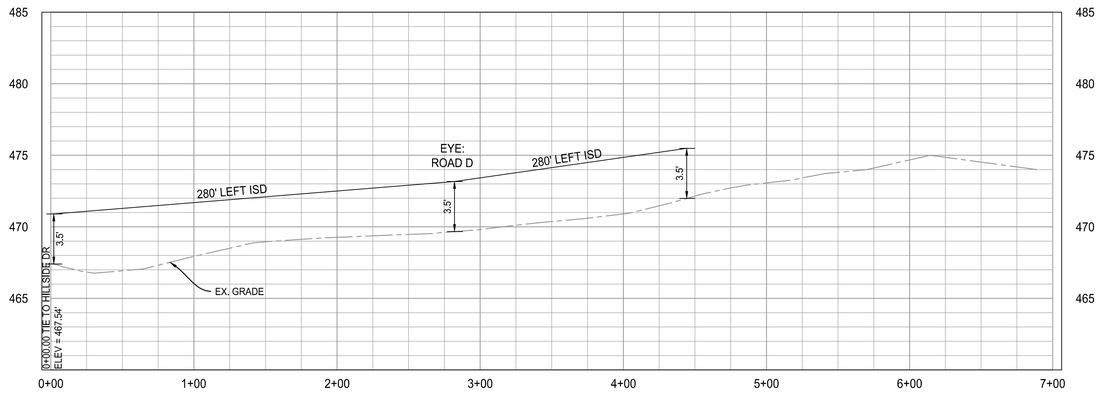



ROAD D SIGHT DISTANCES
SCALE: 1" = 50'




NOTE:
ALL STREET TREES WITHIN THE SIGHT DISTANCE SHALL BE PRUNED 7' FROM GROUND LEVEL.

*ASSUMES SIGHT DISTANCE IS REQUIRED TO THE 90° TURN OF STERNWAY DRIVE.




ROAD D SIGHT DISTANCE PROFILE
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

5 2.5 0 5 10
GRAPHIC SCALE
VERTICAL: 1" = 5'

50 25 0 50 100
GRAPHIC SCALE
HORIZONTAL: 1" = 50'

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PRELIM PLAN - SIGHT DISTANCE PROFILES HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SIGHT DISTANCE PROFILES

SHEET No.
C406

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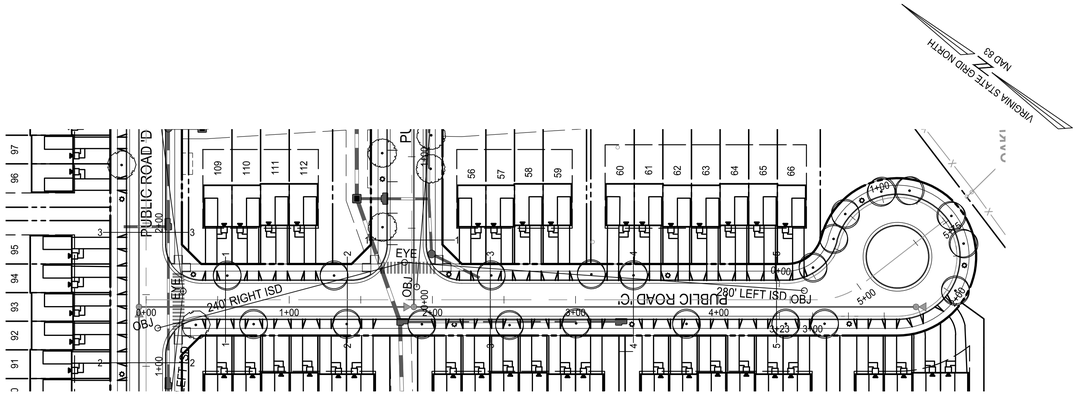
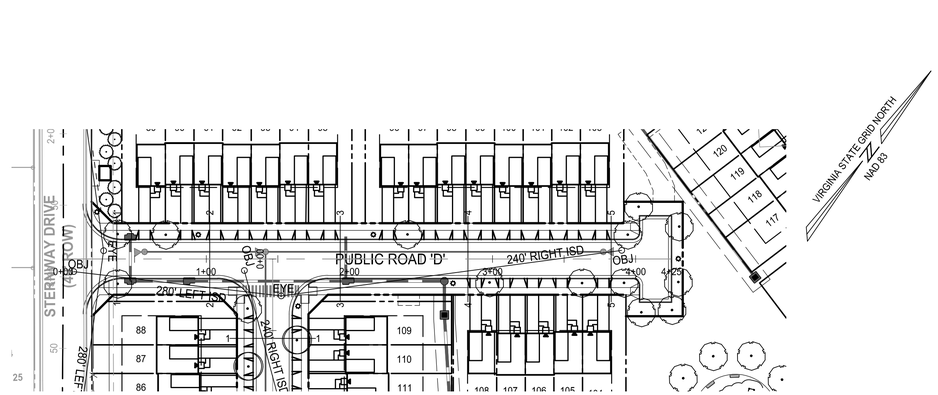
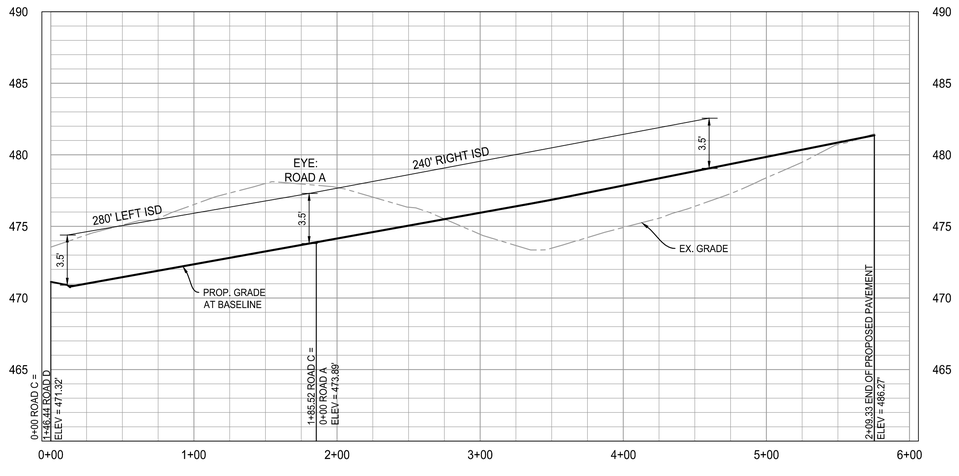



ROAD A SIGHT DISTANCES
SCALE: 1" = 50'

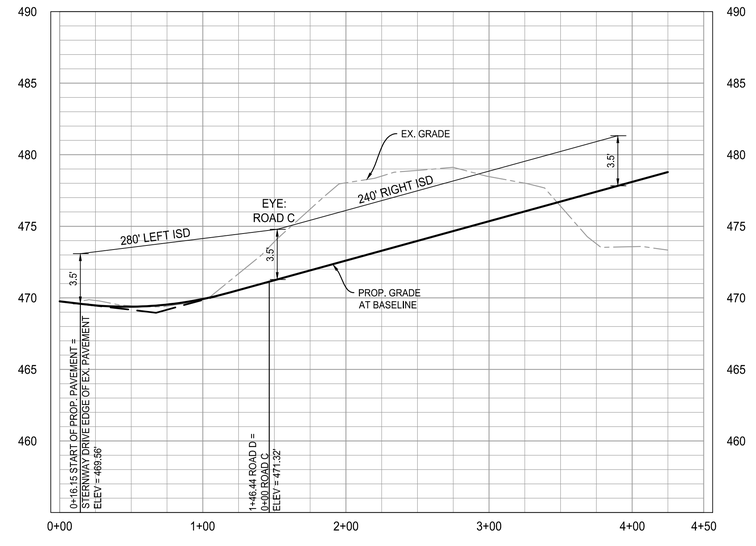



ROAD C SIGHT DISTANCES
SCALE: 1" = 50'

NOTE:
ALL STREET TREES WITHIN THE SIGHT DISTANCE SHALL BE PRUNED 7' FROM GROUND LEVEL.




ROAD A SIGHT DISTANCE PROFILE
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'




ROAD C SIGHT DISTANCE PROFILE
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

5 2.5 0 5 10
GRAPHIC SCALE
VERTICAL: 1" = 5'

50 25 0 50 100
GRAPHIC SCALE
HORIZONTAL: 1" = 50'

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PRELIM PLAN - SIGHT DISTANCE PROFILES HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

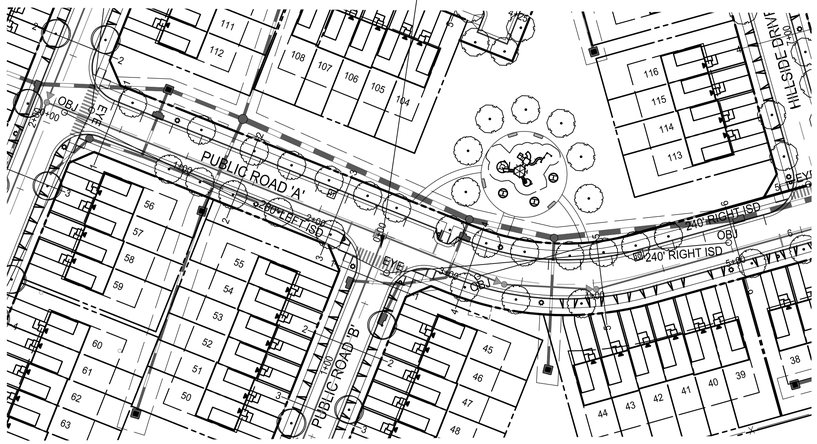
| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

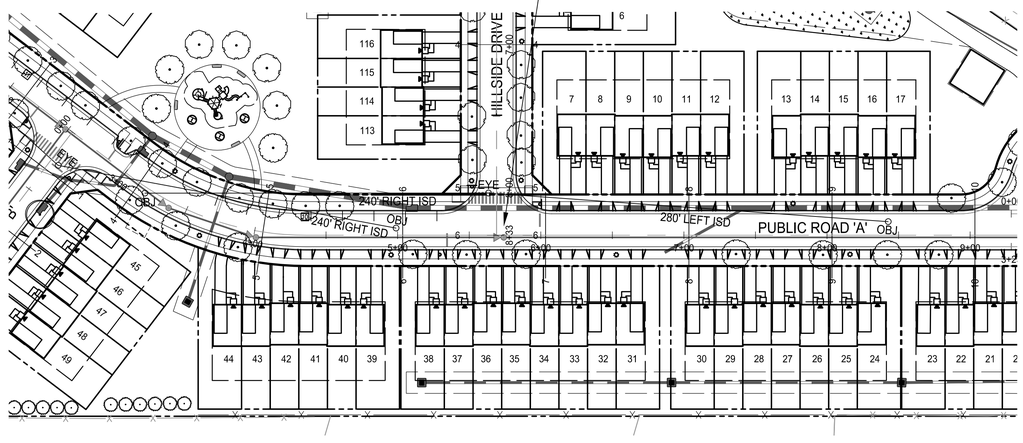
SHEET TITLE:
SIGHT DISTANCE PROFILES

SHEET No.
C407

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C408 Sight Distance Profiles.dwg, 4/8/2024 11:19:03 AM, Matthew Pohlhaus,

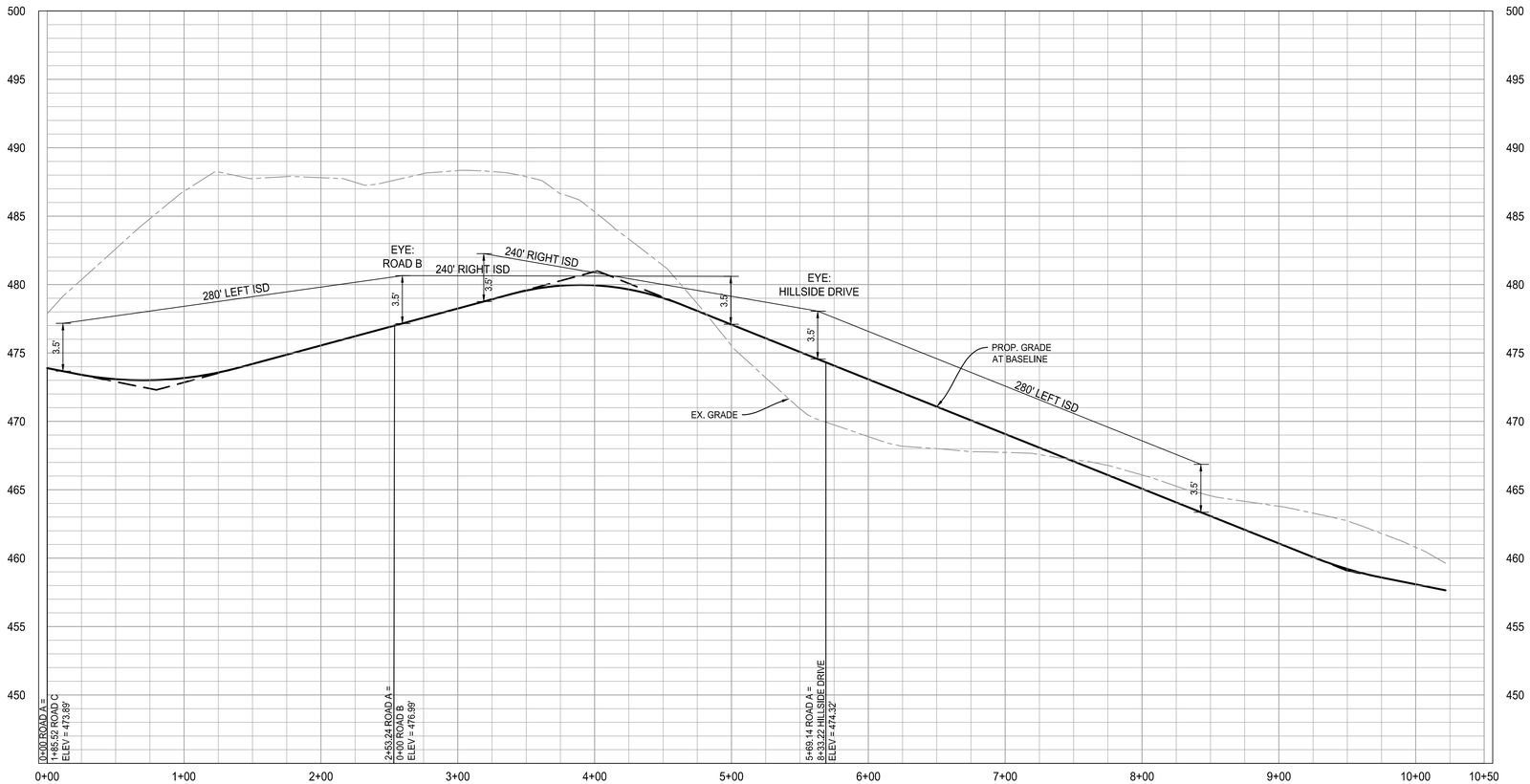



ROAD B SIGHT DISTANCES
SCALE: 1" = 50'




HILLSIDE DRIVE SIGHT DISTANCES
SCALE: 1" = 50'

NOTE:
ALL STREET TREES WITHIN THE SIGHT DISTANCE
SHALL BE PRUNED 7' FROM GROUND LEVEL.




ROAD B AND HILLSIDE DRIVE
SIGHT DISTANCE PROFILE
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

5 2.5 0 5 10
GRAPHIC SCALE
VERTICAL: 1" = 5'

50 25 0 50 100
GRAPHIC SCALE
HORIZONTAL: 1" = 50'

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PRELIM PLAN - SIGHT DISTANCE PROFILES HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
SIGHT DISTANCE PROFILES

SHEET No.
C408

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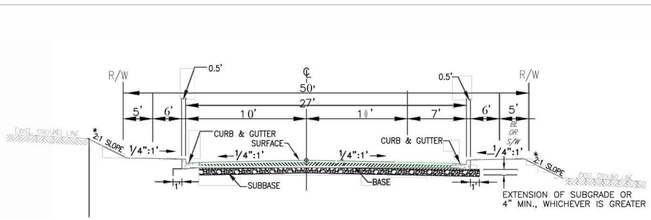
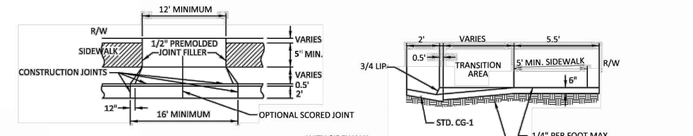
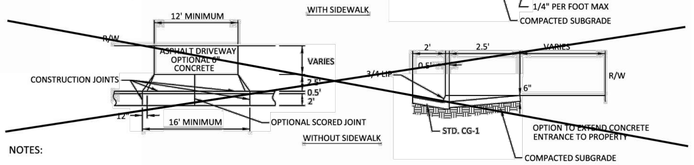



TYPICAL ROADWAY SECTION WITH CURB AND GUTTER

* ALL SLOPES ARE TO BE 2:1 OR FLATTER UNLESS SPECIFICALLY APPROVED BY THE DIRECTOR OF PUBLIC WORKS.

# TYPICAL SECTION - NEIGHBORHOOD STREET
(0-500 VPD)
City of Charles Town



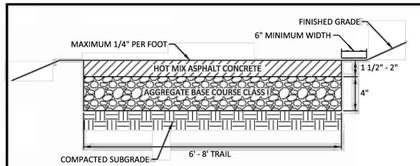

NOTES:

1. GRADING PLANS MUST PROVIDE FOR ADEQUATE VEHICULAR CLEARANCE FOR DRIVEWAY APPROACH, DEPARTURE, AND BREAKOVER TRANSITIONS.

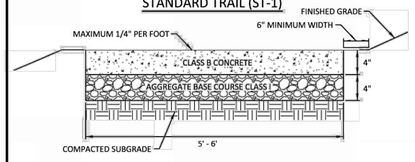
NOT TO SCALE

# DRIVEWAY ENTRACE WITH CURB AND GUTTER
City of Charles Town

DE-2




STANDARD TRAIL (ST-1)




STANDARD SIDEWALK (SW-1)

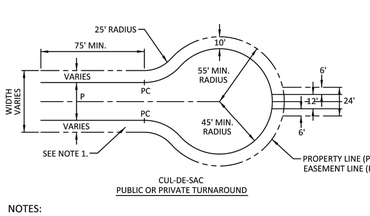
NOTES:

1. ALL PEDESTRIAN AND BIKE TRAILS LOCATED OUTSIDE OF CITY OF CHARLESTOWN RIGHT OF WAY SHALL BE A MINIMUM OF 5' IN WIDTH FOR SIDEWALKS, 6' FOR ALL PEDESTRIAN TRAILS, AND 8' FOR ALL BIKE TRAILS.
2. A PRIVATE ACCESS EASEMENT SHALL BE PROVIDED FOR ALL SIDEWALKS AND TRAILS OUTSIDE OF CITY OF CHARLES TOWN RIGHT OF WAY AND SHALL INCLUDE A MINIMUM OF 3' OF WIDTH ON BOTH SIDES OF THE TRAIL OR SIDEWALK.
3. THE MAXIMUM GRADE FOR ALL PEDESTRIAN TRAILS SHALL BE 10%.
4. THE MAXIMUM GRADE FOR ALL BIKE TRAILS SHALL BE 8%, EXCEPT UP TO 15% IS ALLOWED FOR DISTANCES OF LESS THAN 150 FEET.
5. APPROPRIATE LIGHTING AND SIGNAGE, LANDSCAPING, BUFFERING AND DRAINAGE MEASURES, ALONG WITH CONSIDERATIONS FOR SECURITY SHALL BE INCORPORATED IN THE DESIGN OF THESE FACILITIES.

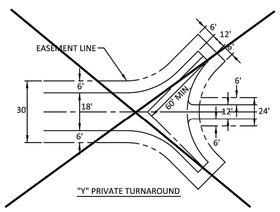
NOT TO SCALE

# TRAIL AND TYPICAL SIDEWALK
City of Charles Town

ST-1
SW-1




CUL-DE-SAC
PUBLIC OR PRIVATE TURNAROUND



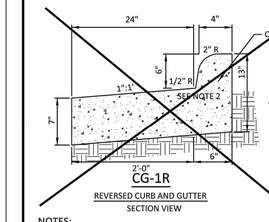

"Y" PRIVATE TURNAROUND

NOTES:

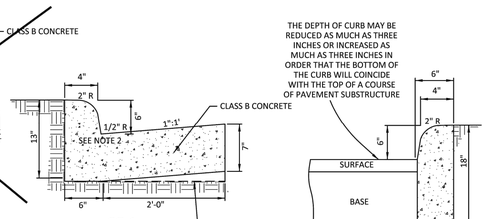
1. SIDEWALKS ON PUBLIC CUL-DE-SAC STREETS SHALL BE PROVIDED WITHIN THE RIGHT-OF-WAY.
2. A MAXIMUM GRADE OF 3% IN ALL DIRECTIONS SHALL BE MAINTAINED ACROSS THE CUL-DE-SAC.
3. THE 45' MINIMUM RADIUS MAY BE REDUCED TO AN ABSOLUTE MINIMUM RADUIS OF 30' ON SHORT LOW VOLUME CUL-DE-SAC'S, WHICH WILL REQUIRE THE APPROVAL OF THE PLANNING COMMISSION.

NOT TO SCALE

# TYPICAL CUL-DE-SAC AND "Y" TURNAROUND
City of Charles Town




CG-1R
REVERSED CURB AND GUTTER
SECTION VIEW



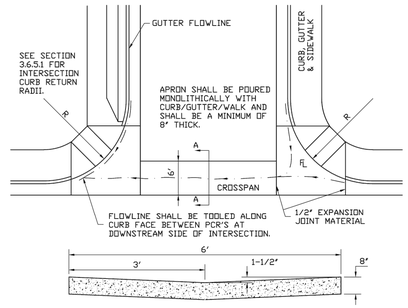

NOTES:

1. THE USE OF CG-1R SHALL NOT BE UTILIZED WITHIN THE LIMITS OF PUBLIC RIGHT OF WAY.
2. A MAXIMUM OF A 2" RADIUS IS ACCEPTABLE WITH CURB AND GUTTER.
3. SUBGRADE FOR ALL CURB AND GUTTER SHALL BE COMPACTED TO 95 PERCENT DENSITY AT OPTIMUM MOISTURE TO THE FULL WIDTH OF RIGHT OF WAY IN ACCORDANCE WITH AASHTO, T99.

NOT TO SCALE

# TYPICAL COMBINATION CURB AND GUTTER
City of Charles Town

CG-1
CG-1R
CG-2




SECTION A – A
6 FOOT CROSSPAN

NOTE:

- SEE STANDARD NO. 10 FOR CONCRETE JOINT DETAILS.
- EXPANSION JOINTS ARE REQUIRED AT P.C.R.'S.
- CROSSPANS ARE NOT PERMITTED ACROSS ARTERIAL/COLLECTOR STREETS.

*File: Stand-5*
**Typical Intersection Crosspan**



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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

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SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SITE DETAILS

SHEET No.

C409

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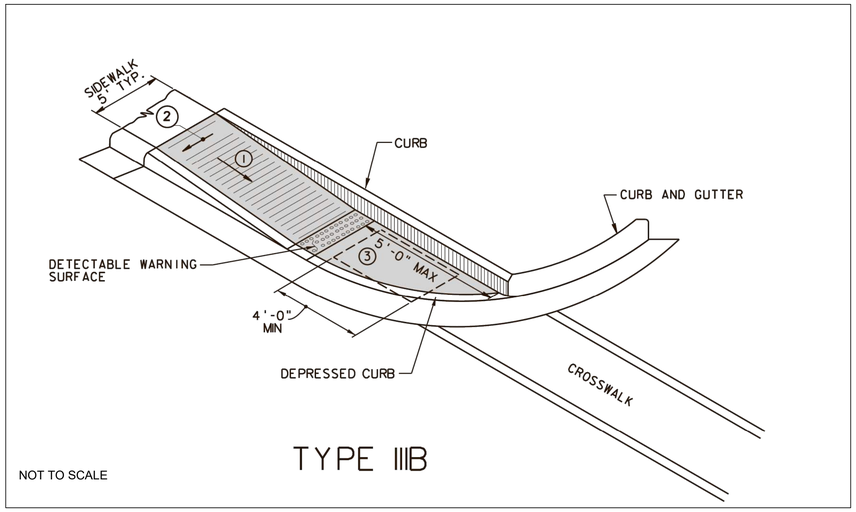
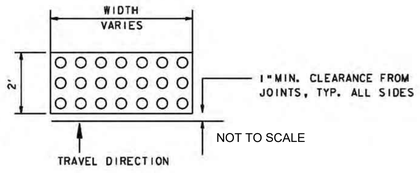
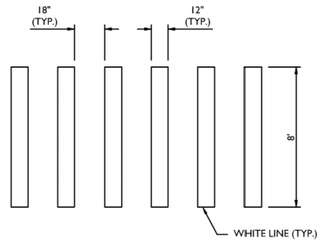



TYPE IIIB

NOT TO SCALE




DETECTABLE WARNING SURFACE




NOTE:

1. ALL STOP LINE USED FOR CROSSWALK SHALL BE WVDOH TYPE V (SECTION 715.40.2)

1 CROSSWALK DETAIL

NOT TO SCALE

## NOTES

RAMP CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 609 OF THE SPECIFICATIONS. RAMP SURFACE SHALL INCLUDE A "DETECTABLE WARNING SURFACE" (SEE PVT7 SHT. 3 OF 3) AS SHOWN FOR EACH RAMP TYPE. A COARSE BROOM FINISH, TRANVERSE TO FLARE SLOPES, OR EQUAL NON-SKID FINISH SHALL BE PROVIDED ON CONCRETE SURFACES.

NORMAL GUTTER FLOW LINE AND PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA, UNLESS OTHERWISE SHOWN OR SPECIFIED.

¼" PREFORMED EXPANSION JOINT FILLER, MEETING THE REQUIREMENTS OF SECTION 609 OF THE SPECIFICATIONS, SHALL BE PLACED AT ALL LOCATIONS WHERE RAMP CONTACTS CURB, GUTTER, OR CONCRETE PAVEMENT. WHEN THE RAMP IS POURED SEPARATELY FROM THE SIDE WALK, THE EXPANSION MATERIAL SHALL BE PLACED AT ALL LOCATIONS WHERE THE NORMAL SIDEWALK AND THE RAMP ABUT.

DRAINAGE STRUCTURES SHALL NOT BE PLACED IN LINE WITH RAMPS. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF THE DRAINAGE STRUCTURE, EXCEPT WHERE EXISTING STRUCTURES ARE BEING UTILIZED FOR CONSTRUCTION OF NEW RAMPS.

ANY GRATE IN PEDESTRIAN AREAS SHALL HAVE OPENINGS NOT GREATER THAN 1/2" AND SHALL BE PLACED WITH LONG DIMENSION OF OPENING PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.

IF THE 8.33% (12:1) SLOPE CANNOT BE OBTAINED DUE TO GRADE OF THE ADJACENT ROADWAY, THE SLOPED PORTION OF THE RAMP SHALL BE EXTENDED TO A MAXIMUM LENGTH OF 15'-0".

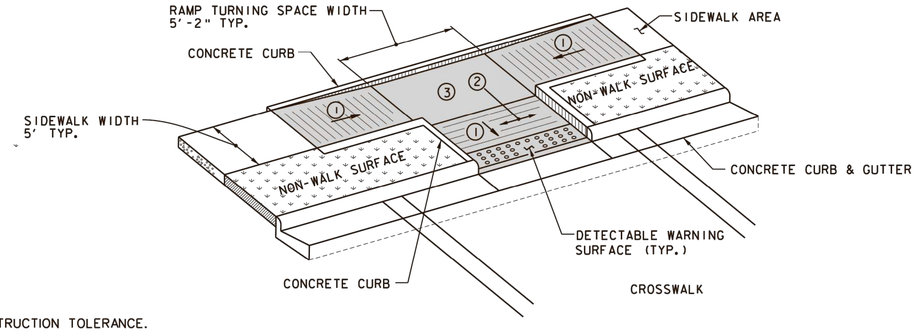
A TURNING SPACE AS DEPICTED IN THE DETAILS SHALL BE PROVIDED AT THE TOP OF APPROPRIATE CURB RAMPS. THE TURNING SPACE SHALL HAVE A MINIMUM WIDTH OF 4 FT. WHEN NO OBSTRUCTIONS EXIST AT THE BACKSIDE OF THE LANDING. WHEN AN OBSTRUCTION EXISTS SUCH AS A BUILDING, LIGHT POLE, ETC. THE MINIMUM DIMENSION OF THE LANDING SHALL BE 5 FEET.

CURB RAMP WIDTH SHALL MATCH SIDEWALK WIDTH PLUS CLEARANCE. TYPICAL SIDEWALK WIDTH IS 5'. MINIMUM WIDTH IS 4'.

THE TYPE OF RAMP TO BE USED SHALL BE AS SPECIFIED ON THE PLANS. THE FOLLOWING CAN BE CONSIDERED GUIDELINES IN SELECTING RAMP TYPES, BUT ARE INCLUDED HERE FOR INFORMATION ONLY.

RAMP TYPES

| | |
|---|---|
| TYPE I (SHT. 1) | FOR USE WHERE SIDEWALK EXTENDS TO STREET AND WHERE SIDEWALK WIDTH IS ADEQUATE FOR RAMP AND TURNING SPACE. |
| TYPE II (SHT. 1) | RAMP SHALL ONLY BE USED ON ALTERATION PROJECTS WHERE TWO SEPARATE CURB RAMPS CANNOT BE PROVIDED. THE TYPE II CURB IS NOT SUITABLE FOR NEW CONSTRUCTION. |
| TYPE III (SHT. 2) | PARALLEL RAMPS ARE FOR USE WHEN ADEQUATE SIDEWALK WIDTH FOR BOTH RAMPS AND TURNING SPACE CANNOT BE PROVIDED. |
| TYPE IV (SHT. 3) | COMBINES ASPECTS OF TYPE I AND TYPE III RAMPS AS NECESSARY. USE WHERE SIDEWALK IS SET BACK FROM STREET AND A GRASS OR LANDSCAPED STRIP IS PROVIDED BETWEEN SIDEWALK AND STREET. |




TYPE IV RAMP

1. 8.33% (12:1) MAX. RAMP SLOPE, INCLUDING CONSTRUCTION TOLERANCE.
2. CROSS SLOPE: 2.00% MAX. INCLUDING CONSTRUCTION TOLERANCE.
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM TURNING SPACE WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SEE NOTE REGARDING OBSTRUCTIONS ON SHEET 1 OF 3. SLOPE TO DRAIN TO CURB.

PAY LIMITS FOR CURB RAMPS

NOT TO SCALE

SELECT ROAD PAVEMENT SECTIONS FROM DETAIL R-05B AS FOLLOWS:

1. Check Soils Survey to determine soils series of soil to be used in the subgrade.
2. Determine the Subgrade Support Class of the soils series from the table below.

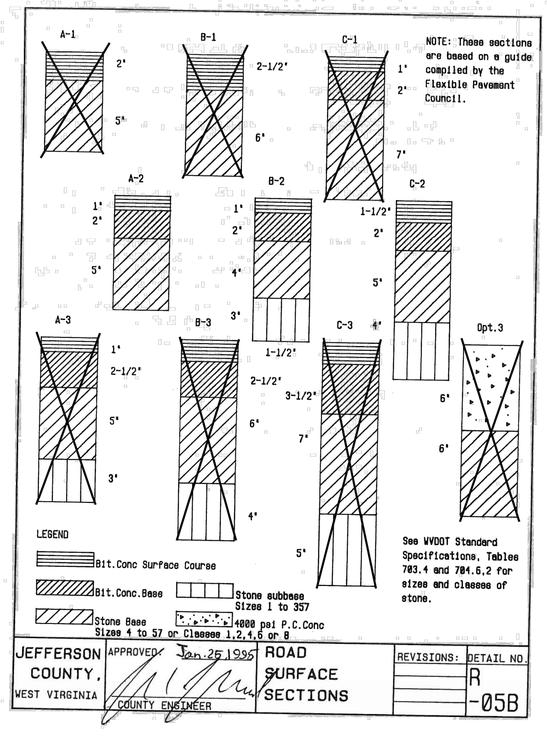
| SUBGRADE SUPPORT CLASS | SOILS SERIES |
|---|---|
| A (good - excellent) | Berks and rock land and Weikert when Weikert when shale content is high (40% or greater retained on the No.4 screen). |
| B (medium) | Ashton,Berks,Blairton,Braddock,Dekalb, Edgemont,Huntington,Laidig,Landes,Lindeide, Melvin.Monongahela,and Weikert, and Frakstown when shale content is medium to high. |
| C (poor) | Benevola,Chilhowie,Clifton,Duffield,Frankstown, Fedwick,Hagerstown,Opequon |

3. Select the appropriate road section based on the proposed use of the pavement and the Subgrade Support Class.

| USE | ROAD SECTION |
|---|---|
| Residential driveways and small parking lots with 50 stalls or less and no trucks | A-1,B-1,C-1 |
| Subdivision roads and large parking lots | A-2,B-2,C-2 |
| State road widening,industrial parking lots, and truck driveways | A-3,B-3,C-3 |

Final selection of road surface section to be based on subgrade support class. See Geotechnical Report for existing soil series.

| | | | | |
|---|---|---|---|---|
| JEFFERSON COUNTY, WEST VIRGINIA | APPROVED: Jan. 25, 1995 COUNTY ENGINEER | SURFACE SECTION SELECTION | REVISIONS: | DETAIL NO. R -05A |




| | | | | |
|---|---|---|---|---|
| JEFFERSON COUNTY, WEST VIRGINIA | APPROVED: Jan. 25 1995 COUNTY ENGINEER | ROAD SURFACE SECTIONS | REVISIONS: | DETAIL NO. R -05B |

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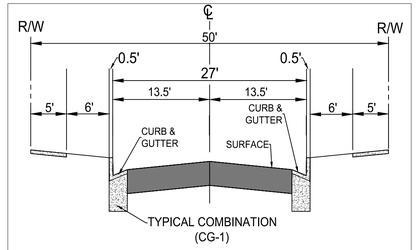


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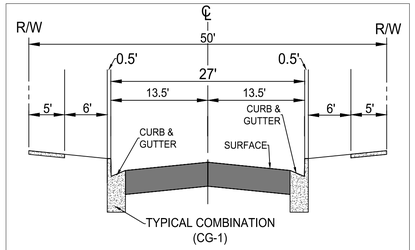
NOT TO SCALE

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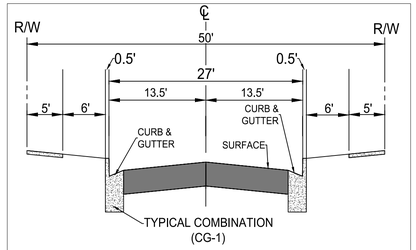


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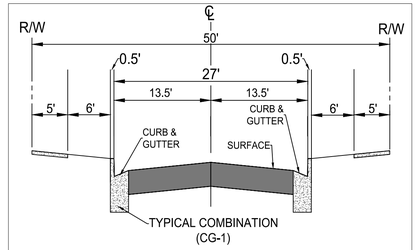


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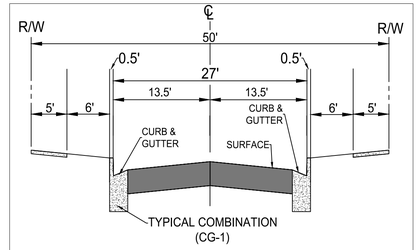


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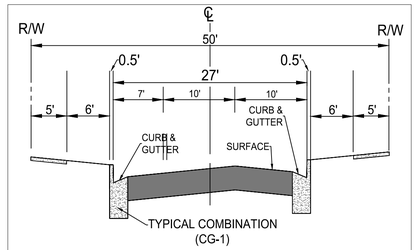


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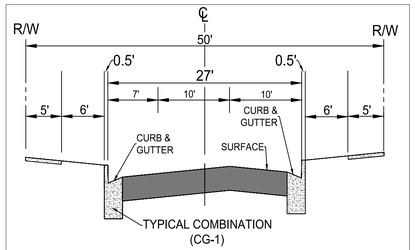


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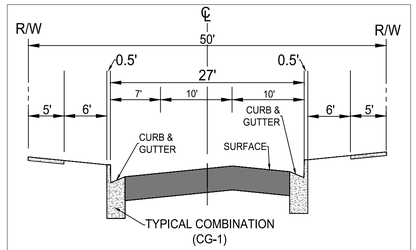


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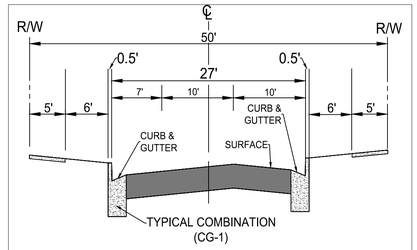


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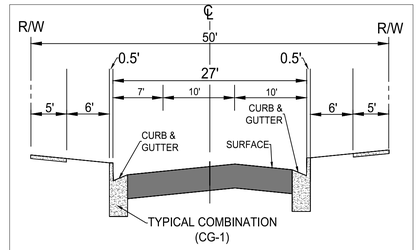


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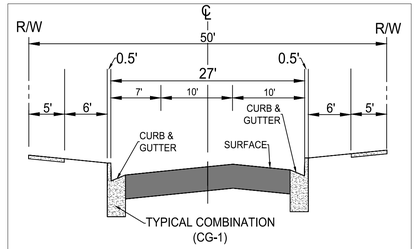


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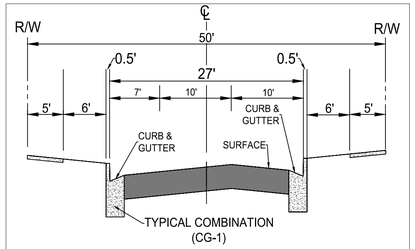


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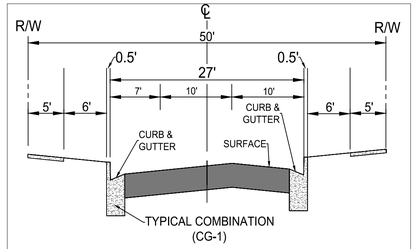


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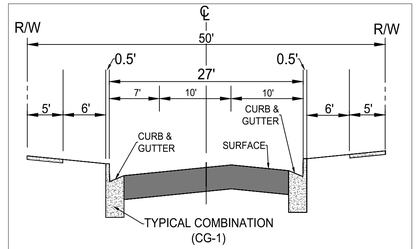


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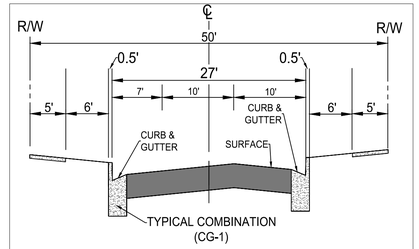


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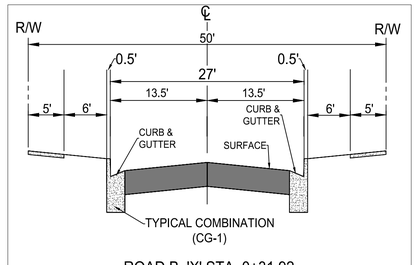


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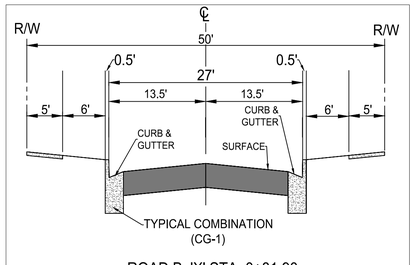


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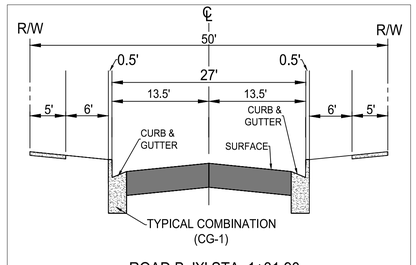


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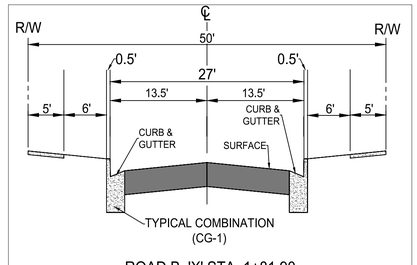


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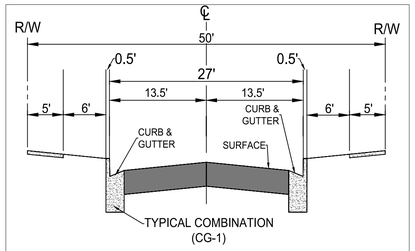


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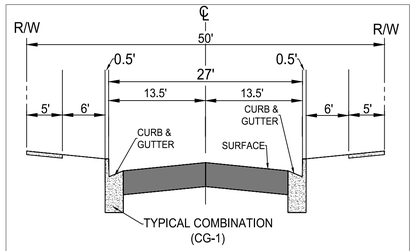


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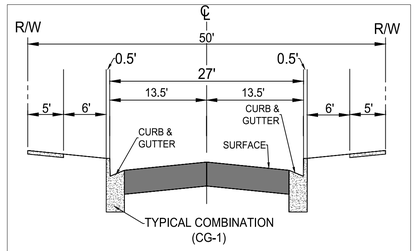


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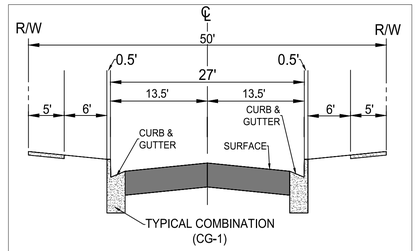


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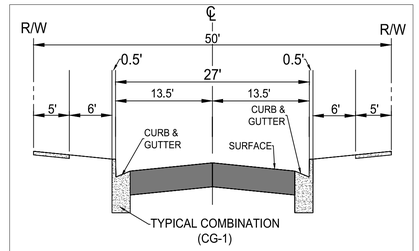


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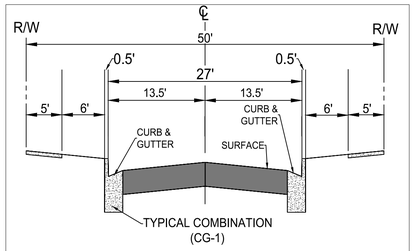


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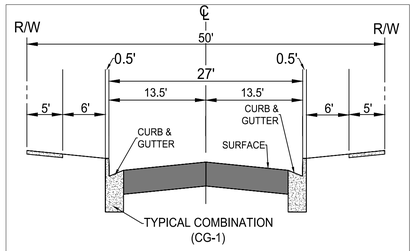


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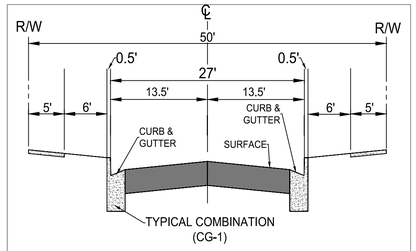


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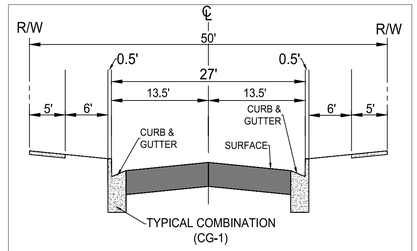


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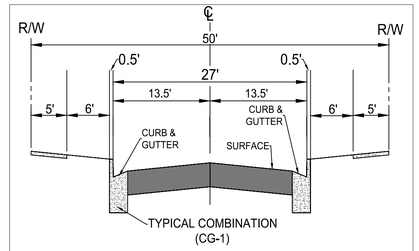


ROAD D 'X' STA. 3+82.86
NOT TO SCALE

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PRELIM PLAN - SITE DETAILS
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS-NOTED
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SITE DETAILS

SHEET No.

C412

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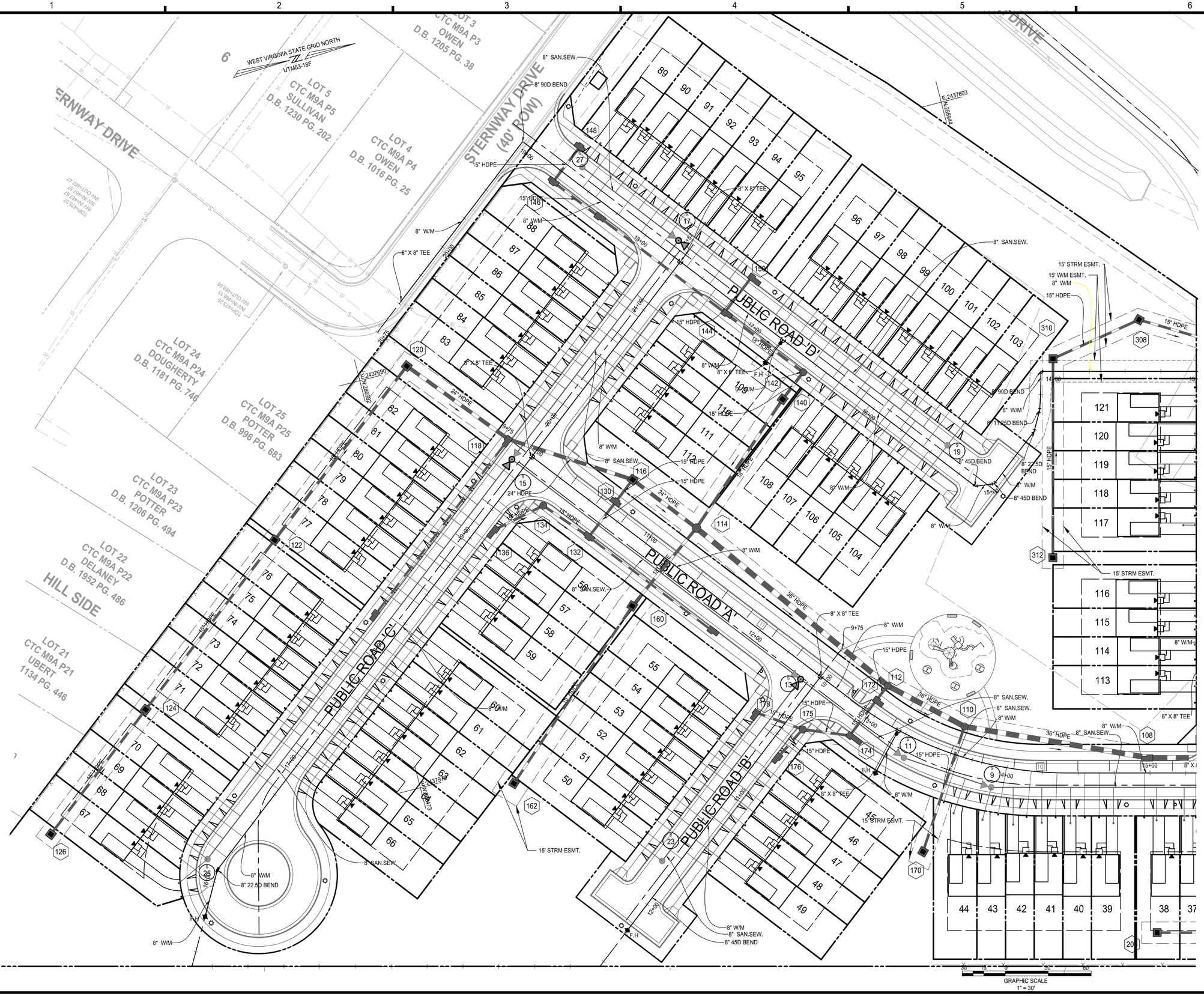


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PRELIM PLAN - UTILITIES PLAN
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

UTILITIES PLAN

SHEET No.

C500

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| SHEET No. C501 | UTILITIES PLAN | SHEET TITLE: | PROJECT No.: 220631.00100<br>DRAWING No.: 112742<br>DATE: 04/5/2024<br>SCALE: 1" = 40'<br>DESIGN: AF<br>DRAWN: KMS<br>CHECKED: SK |

| MARK | DATE | DESCRIPTION |
|---|---|---|
| | | |

PRELIM PLAN - UTILITIES PLAN
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

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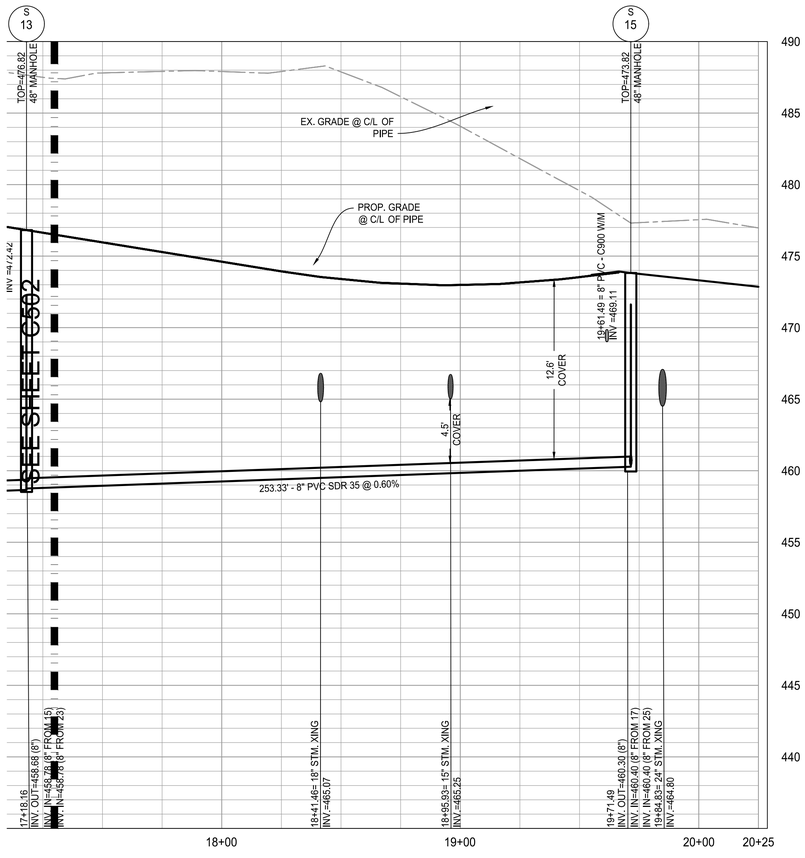
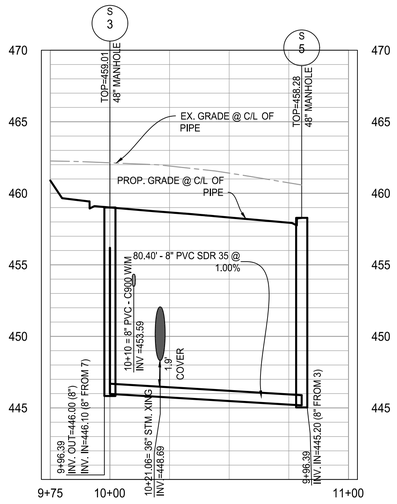



SAN SEW MH1 - MH15 PROFILE CONT.




SAN SEW MH3 - MH5 PROFILE

NOTES

1. ALL STORM DRAIN STRUCTURES ARE WVDOH STANDARDS. ALL SEWER STRUCTURES ARE CHARLES TOWN UTILITY BOARD STANDARDS. CONTRACTOR MAY USE PRECAST STRUCTURE WHERE AVAILABLE TO MEET THE STANDARD STRUCTURE SPECIFIED.
2. ELEVATIONS ARE GIVEN TO TOP OF LID FOR MANHOLES. CONTRACTOR TO ADJUST ELEVATIONS PROVIDED TO MATCH EXISTING PAVEMENT ELEVATIONS AND FIELD CONDITIONS WHERE APPROPRIATE.

NOTE:

CONTRACTOR SHALL TEST PIT AND LOCATE ALL EXISTING UNDERGROUND UTILITIES AT ALL PROPOSED UTILITY CROSSINGS AND CONNECTIONS TO OBTAIN ACTUAL VERTICAL AND HORIZONTAL LOCATIONS AND VERIFY THAT NO CONFLICTS EXIST WITH NEW UTILITIES WELL IN ADVANCE OF CONSTRUCTION START. REPORT ANY CONFLICTS TO ENGINEER SO ANY DESIGN ADJUSTMENTS CAN BE MADE PRIOR TO CONSTRUCTION.

5 2.5 0 5 10
GRAPHIC SCALE
VERTICAL: 1" = 5'

30 15 0 30 60
GRAPHIC SCALE
HORIZONTAL: 1" = 30'

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PRELIM PLAN - SANITARY SEWER
PROFILES HILLSIDE
LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SANITARY SEWER PROFILES

SHEET No.

C503

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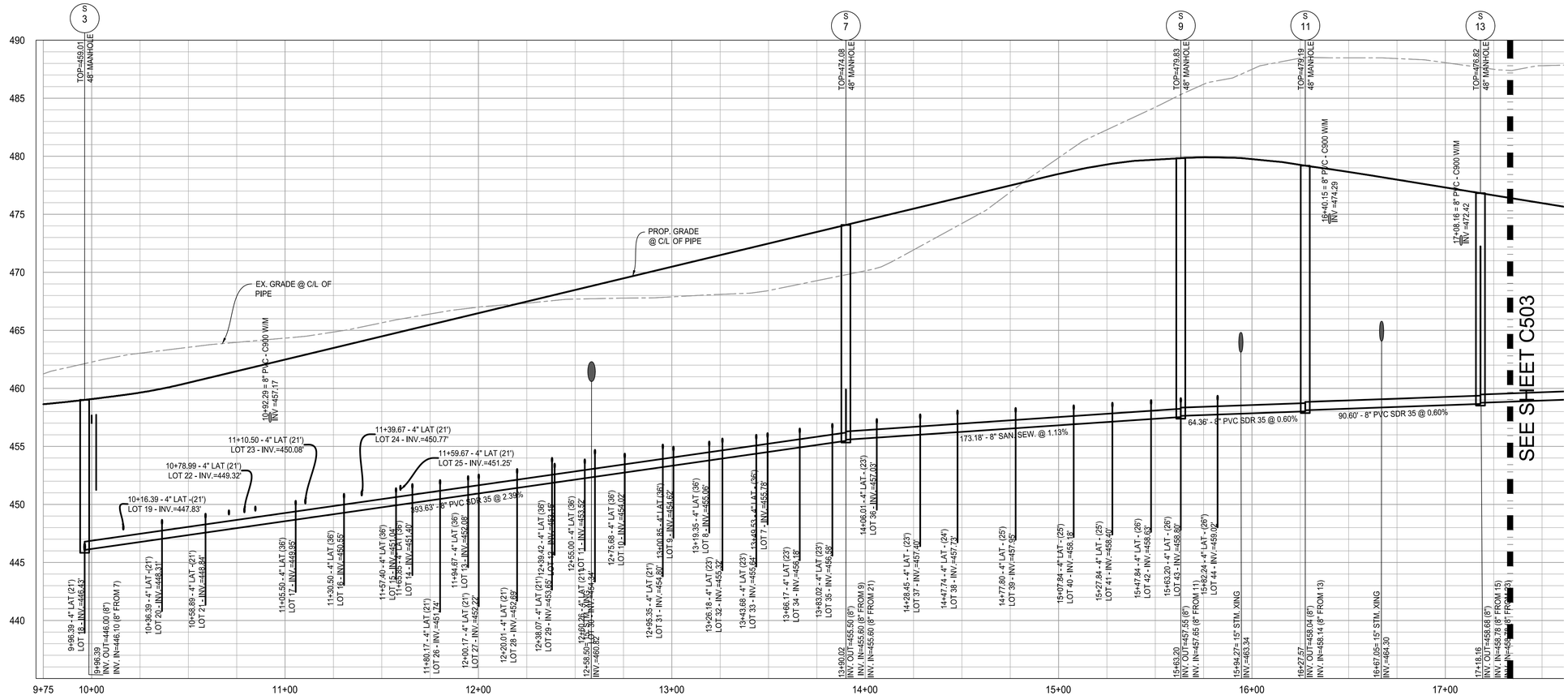


SAN SEW MH1- MH15 PROFILE

NOTES

1. ALL STORM DRAIN STRUCTURES ARE WVDOH STANDARDS. ALL SEWER STRUCTURES ARE CHARLES TOWN UTILITY BOARD STANDARDS. CONTRACTOR MAY USE PRECAST STRUCTURE WHERE AVAILABLE TO MEET THE STANDARD STRUCTURE SPECIFIED.
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5 2.5 0 5 10
GRAPHIC SCALE
VERTICAL: 1" = 5'

30 15 0 30 60
GRAPHIC SCALE
HORIZONTAL: 1" = 30'

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PRELIM PLAN - SANITARY SEWER
PROFILES HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SANITARY SEWER PROFILES

SHEET No.

C502

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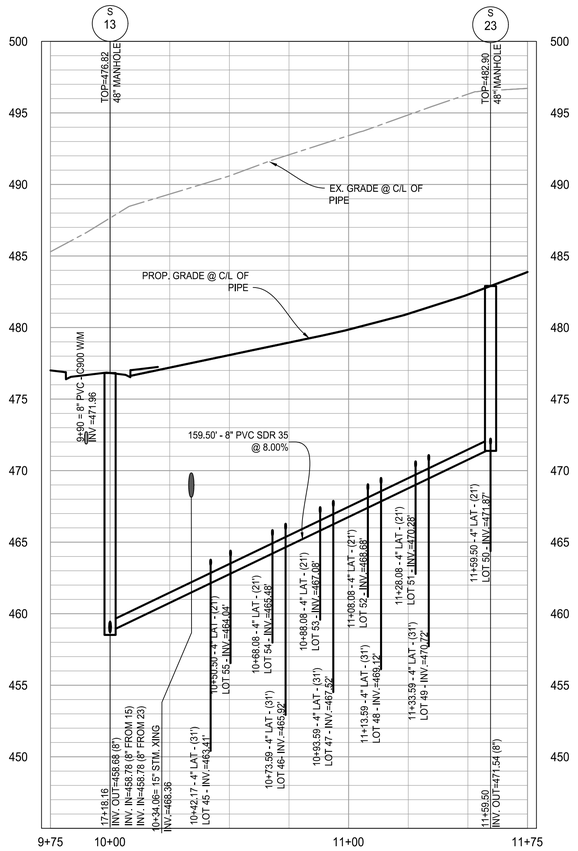


SAN SEW MH13 - MH23 PROFILE




SAN SEW MH7 - MH21 PROFILE

NOTES

1. ALL STORM DRAIN STRUCTURES ARE WVDOH STANDARDS. ALL SEWER STRUCTURES ARE CHARLES TOWN UTILITY BOARD STANDARDS. CONTRACTOR MAY USE PRECAST STRUCTURE WHERE AVAILABLE TO MEET THE STANDARD STRUCTURE SPECIFIED.
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5 2.5 0 5 10
GRAPHIC SCALE
VERTICAL: 1" = 5'

30 15 0 30 60
GRAPHIC SCALE
HORIZONTAL: 1" = 30'

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DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SANITARY SEWER PROFILES

SHEET No.

C504

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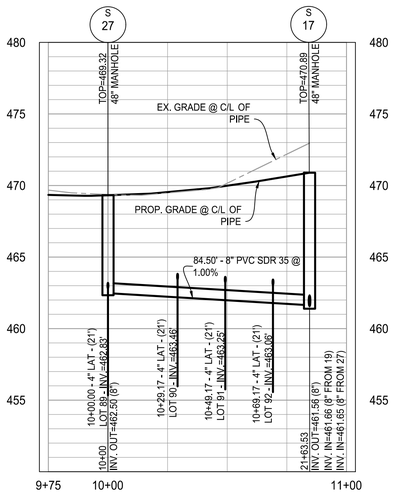
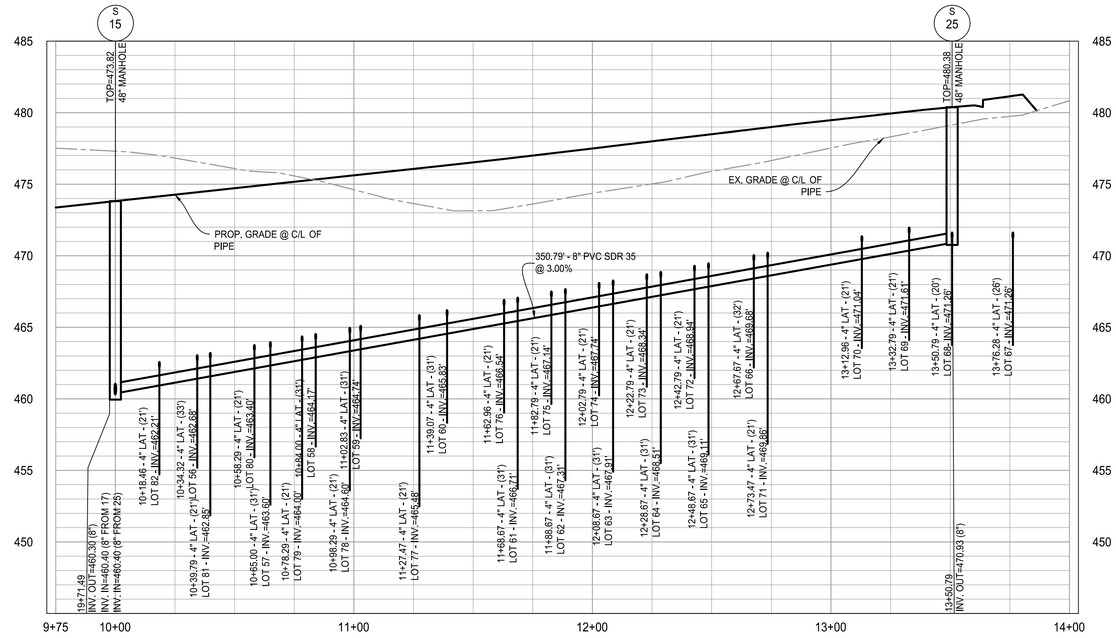



SAN SEW MH17 - MH27 PROFILE




SAN SEW MH15 - MH25 PROFILE

NOTES

1. ALL STORM DRAIN STRUCTURES ARE WVDOH STANDARDS. ALL SEWER STRUCTURES ARE CHARLES TOWN UTILITY BOARD STANDARDS. CONTRACTOR MAY USE PRECAST STRUCTURE WHERE AVAILABLE TO MEET THE STANDARD STRUCTURE SPECIFIED.
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5 2.5 0 5 10
GRAPHIC SCALE
VERTICAL: 1" = 5'

30 15 0 30 60
GRAPHIC SCALE
HORIZONTAL: 1" = 30'

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PRELIM PLAN - SANITARY SEWER
PROFILES HILLSIDE
LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SANITARY SEWER PROFILES

SHEET No.

C505

P:\Projects\22063\00100\111742 Prelim Subdivision - Land Development Plan\C505 Sanitary Sewer Profiles.dwg, 4/7/2024 9:33:54 PM, Matthew Polkhaus,

## SANITARY LATERAL TABULATION

| LOT # | LOWER MH | UPPER MH | LOWER MH INV. IN | UPPER MH INV. OUT | DISTANCE BETWEEN MH | PIPE SLOPE % | HEIGHT OF LAT. ABOVE MAIN | DISTANCE FROM LOWER MH | INV.@ SEWER | LATERAL SLOPE | LENGTH TO RISER | INV.@ RISER | HEIGHT OF RISER | INV. @ END | TOTAL LENGTH | FF | GARAGE | INV. END TO GAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TH 1 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 259.50 | 460.32 | 2.08% | 12 | 460.57 | 4 | 464.68 | 21.00 | 470.71 | 470.38 | 5.70 |
| TH 2 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 232.83 | 459.97 | 2.08% | 12 | 460.22 | 5 | 465.30 | 21.00 | 471.38 | 471.05 | 5.75 |
| TH 3 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 212.83 | 459.70 | 2.08% | 12 | 459.95 | 6 | 466.01 | 21.00 | 472.05 | 471.72 | 5.71 |
| TH 4 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 190.33 | 459.40 | 2.08% | 12 | 459.65 | 7 | 466.69 | 21.00 | 472.05 | 471.72 | 5.03 |
| TH 5 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 170.33 | 459.13 | 2.08% | 12 | 459.38 | 8 | 467.40 | 21.00 | 472.72 | 472.39 | 4.99 |
| TH 6 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 150.50 | 458.87 | 2.08% | 12 | 459.12 | 8 | 467.14 | 21.00 | 473.38 | 473.05 | 5.91 |
| TH 116 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 70.49 | 457.79 | 2.08% | 19 | 458.19 | 11.00 | 469.21 | 31.00 | 475.07 | 474.74 | 5.53 |
| TH 117 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 99.67 | 458.18 | 2.08% | 19 | 458.58 | 10.00 | 468.62 | 31.00 | 475.07 | 474.74 | 6.12 |
| TH 118 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 119.67 | 458.45 | 2.08% | 19 | 458.85 | 9.00 | 467.91 | 31.00 | 474.40 | 474.07 | 6.16 |
| TH 119 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 139.50 | 458.72 | 2.08% | 19 | 459.11 | 8.00 | 467.20 | 31.00 | 473.74 | 473.41 | 6.21 |
| TH 120 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 182.99 | 459.30 | 2.08% | 19 | 459.70 | 7.00 | 466.80 | 31.00 | 472.38 | 472.05 | 5.25 |
| TH 121 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 207.17 | 459.62 | 2.08% | 19 | 460.02 | 6.00 | 466.14 | 31.00 | 472.38 | 472.05 | 5.91 |
| TH 122 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 227.17 | 459.89 | 2.08% | 19 | 460.29 | 5.00 | 465.43 | 31.00 | 471.71 | 471.38 | 5.95 |
| TH 123 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 1.25 | 246.92 | 460.16 | 2.08% | 19 | 460.55 | 4.00 | 464.72 | 31.00 | 471.05 | 470.72 | 6.00 |
| TH 124 | 7 | 21 | 455.60 | 459.21 | 270 | 1.34% | 0.33 | 269.67 | 459.54 | 2.08% | 19 | 459.94 | 4.00 | 464.10 | 31.00 | 470.38 | 470.05 | 5.95 |
| TH 7 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 353.14 | 455.78 | 2.08% | 24 | 456.28 | 12.00 | 468.28 | 36.00 | 473.83 | 473.50 | 5.22 |
| TH 8 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 322.94 | 455.06 | 2.08% | 24 | 455.56 | 11.00 | 466.58 | 36.00 | 472.50 | 472.17 | 5.59 |
| TH 9 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 304.46 | 454.62 | 2.08% | 24 | 455.12 | 11.00 | 466.14 | 36.00 | 471.83 | 471.50 | 5.36 |
| TH 10 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 279.29 | 454.02 | 2.08% | 24 | 454.52 | 10.00 | 464.56 | 36.00 | 471.17 | 470.17 | 5.61 |
| TH 11 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 258.36 | 453.52 | 2.08% | 24 | 454.02 | 11.00 | 465.04 | 36.00 | 470.50 | 470.17 | 5.13 |
| TH 12 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 243.03 | 453.15 | 2.08% | 24 | 453.65 | 10.00 | 463.70 | 36.00 | 469.83 | 469.50 | 5.80 |
| TH 13 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 198.18 | 452.08 | 2.08% | 24 | 452.58 | 9.00 | 461.64 | 36.00 | 467.64 | 467.31 | 5.67 |
| TH 14 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 169.46 | 451.40 | 2.08% | 24 | 451.90 | 9.00 | 460.96 | 36.00 | 466.89 | 466.56 | 5.60 |
| TH 15 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 160.96 | 451.19 | 2.08% | 24 | 451.69 | 9.00 | 460.76 | 36.00 | 466.31 | 465.89 | 5.13 |
| TH 16 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 134.11 | 450.55 | 2.08% | 24 | 451.05 | 8.00 | 459.14 | 36.00 | 464.89 | 464.65 | 5.51 |
| TH 17 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 108.86 | 449.95 | 2.08% | 24 | 450.45 | 8.00 | 458.53 | 36.00 | 464.31 | 463.89 | 5.36 |
| TH 18 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 88.27 | 449.46 | 2.08% | 24 | 449.96 | 8.00 | 458.04 | 36.00 | 463.64 | 463.31 | 5.27 |
| TH 19 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 74.60 | 449.13 | 2.08% | 24 | 449.63 | 7.00 | 456.74 | 36.00 | 462.82 | 462.56 | 5.82 |
| TH 20 | 3 | 1 | 446.10 | 447.00 | 27 | 3.36% | 0.33 | 26.82 | 447.33 | 2.08% | 10 | 447.54 | 8.00 | 455.60 | 21.00 | 459.85 | 459.52 | 3.92 |
| TH 21 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 0.33 |  | 446.43 | 2.08% | 10 | 446.64 | 8.00 | 454.70 | 21.00 | 460.52 | 460.19 | 5.49 |
| TH 22 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 20.00 | 447.83 | 2.08% | 10 | 448.04 | 7.00 | 455.12 | 21.00 | 461.18 | 460.85 | 5.73 |
| TH 23 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 40.00 | 448.31 | 2.08% | 10 | 448.51 | 8.00 | 456.58 | 21.00 | 461.85 | 461.85 | 5.27 |
| TH 24 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 62.50 | 448.84 | 2.08% | 10 | 449.05 | 9.00 | 458.09 | 21.00 | 463.81 | 462.85 | 4.76 |
| TH 25 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 82.60 | 449.32 | 2.08% | 10 | 449.53 | 9.00 | 458.57 | 21.00 | 463.85 | 463.52 | 4.95 |
| TH 26 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 114.36 | 450.08 | 2.08% | 10 | 450.29 | 10.00 | 460.31 | 21.00 | 465.12 | 464.79 | 4.48 |
| TH 27 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 143.28 | 450.77 | 2.08% | 10 | 450.98 | 11.00 | 461.98 | 21.00 | 466.13 | 466.79 | 4.81 |
| TH 28 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 163.28 | 451.25 | 2.08% | 10 | 451.46 | 10.00 | 461.48 | 21.00 | 467.12 | 466.79 | 5.31 |
| TH 29 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 183.78 | 451.74 | 2.08% | 10 | 451.95 | 10.00 | 461.97 | 21.00 | 467.79 | 467.46 | 5.49 |
| TH 30 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 203.78 | 452.22 | 2.08% | 10 | 452.42 | 11.00 | 463.42 | 21.00 | 468.46 | 468.46 | 5.04 |
| TH 31 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 223.62 | 452.69 | 2.08% | 10 | 452.90 | 11.00 | 463.90 | 21.00 | 469.12 | 468.79 | 4.89 |
| TH 32 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 241.68 | 453.12 | 2.08% | 10 | 453.33 | 11.00 | 464.33 | 21.00 | 470.66 | 470.33 | 6.00 |
| TH 33 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 263.86 | 453.65 | 2.08% | 9 | 453.84 | 12.00 | 465.84 | 21.00 | 471.99 | 471.66 | 5.82 |
| TH 34 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 298.96 | 454.49 | 2.08% | 9 | 454.68 | 12.00 | 466.68 | 21.00 | 472.66 | 472.33 | 5.65 |
| TH 35 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 329.79 | 455.23 | 2.08% | 9 | 455.41 | 13.00 | 468.43 | 23.00 | 473.99 | 473.66 | 5.23 |
| TH 36 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 347.29 | 455.64 | 2.08% | 9 | 455.83 | 13.00 | 468.85 | 23.00 | 474.66 | 474.33 | 5.48 |
| TH 37 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 369.79 | 456.18 | 2.08% | 9 | 456.37 | 14.00 | 470.37 | 23.00 | 475.32 | 474.99 | 4.62 |
| TH 38 | 3 | 7 | 446.10 | 455.50 | 394 | 2.39% | 1.25 | 386.63 | 456.58 | 2.08% | 9 | 456.77 | 14.00 | 470.77 | 23.00 | 475.99 | 475.66 | 4.89 |
| TH 39 | 7 | 9 | 455.60 | 457.55 | 173 | 1.13% | 1.25 | 15.99 | 457.03 | 2.08% | 10 | 457.24 | 13.00 | 470.24 | 23.00 | 476.66 | 476.33 | 6.09 |
| TH 40 | 7 | 9 | 455.60 | 457.55 | 173 | 1.13% | 1.25 | 38.44 | 457.28 | 2.08% | 9 | 457.47 | 14.00 | 471.47 | 23.00 | 478.01 | 477.68 | 6.21 |
| TH 41 | 7 | 9 | 455.60 | 457.55 | 173 | 1.13% | 1.25 | 57.71 | 457.50 | 2.08% | 9 | 457.69 | 15.00 | 472.69 | 24.00 | 479.34 | 479.01 | 6.32 |
| TH 42 | 7 | 9 | 455.60 | 457.55 | 173 | 1.13% | 1.25 | 87.82 | 457.84 | 2.08% | 9 | 458.03 | 16.00 | 474.03 | 25.00 | 480.01 | 479.68 | 5.65 |
| TH 43 | 7 | 9 | 455.60 | 457.55 | 173 | 1.13% | 1.25 | 117.86 | 458.18 | 2.08% | 9 | 458.37 | 16.00 | 474.37 | 25.00 | 480.74 | 480.41 | 6.04 |
| TH 44 | 7 | 9 | 455.60 | 457.55 | 173 | 1.13% | 1.25 | 137.82 | 458.40 | 2.08% | 9 | 458.59 | 16.00 | 474.59 | 25.00 | 481.34 | 480.41 | 5.82 |
| TH 45 | 7 | 9 | 455.60 | 457.55 | 173 | 1.13% | 1.25 | 157.82 | 458.63 | 2.08% | 9 | 458.82 | 17.00 | 475.82 | 26.00 | 482.01 | 481.68 | 5.86 |
| TH 46 | 7 | 9 | 455.60 | 457.55 | 173 | 1.13% | 1.25 | 173.18 | 458.80 | 2.08% | 9 | 458.99 | 17.00 | 475.99 | 26.00 | 482.01 | 481.68 | 5.69 |
| TH 47 | 9 | 11 | 457.65 | 458.04 | 64 | 0.60% | 1.25 | 19.00 | 459.02 | 2.08% | 9 | 459.20 | 17.00 | 476.20 | 26.00 | 482.01 | 481.86 | 5.66 |
| TH 48 | 13 | 23 | 458.78 | 471.54 | 160 | 8.00% | 1.25 | 42.17 | 463.41 | 2.08% | 20 | 463.82 | 10 | 473.84 | 31.00 | 479.96 | 479.63 | 5.79 |
| TH 49 | 13 | 23 | 458.78 | 471.54 | 160 | 8.00% | 1.25 | 73.59 | 465.92 | 2.08% | 19 | 466.32 | 9 | 475.38 | 31.00 | 481.29 | 480.96 | 5.58 |
| TH 50 | 13 | 23 | 458.78 | 471.54 | 160 | 8.00% | 1.25 | 93.59 | 467.52 | 2.08% | 19 | 467.92 | 8 | 476.00 | 31.00 | 481.96 | 481.63 | 5.63 |
| TH 51 | 13 | 23 | 458.78 | 471.54 | 160 | 8.00% | 1.25 | 113.59 | 469.12 | 2.08% | 19 | 469.52 | 7 | 476.62 | 31.00 | 482.62 | 482.29 | 5.67 |
| TH 52 | 13 | 23 | 458.78 | 471.54 | 160 | 8.00% | 1.25 | 133.59 | 470.72 | 2.08% | 19 | 471.12 | 6 | 477.24 | 31.00 | 483.29 | 482.96 | 5.72 |
| TH 53 | 13 | 23 | 458.78 | 471.54 | 160 | 8.00% | 0.33 | 159.50 | 471.87 | 2.08% | 10 | 472.08 | 7 | 479.16 | 21.00 | 484.94 | 484.61 | 5.45 |
| TH 54 | 13 | 23 | 458.78 | 471.54 | 160 | 8.00% | 1.25 | 128.08 | 470.28 | 2.08% | 10 | 470.49 | 7 | 477.57 | 21.00 | 483.61 | 483.28 | 5.71 |
| TH 55 | 13 | 23 | 458.78 | 471.54 | 160 | 8.00% | 1.25 | 108.08 | 468.68 | 2.08% | 10 | 468.89 | 7 | 475.97 | 21.00 | 482.28 | 481.95 | 5.98 |
| TH 56 | 13 | 23 | 458.78 | 471.54 | 160 | 8.00% | 1.25 | 88.08 | 467.08 | 2.08% | 10 | 467.29 | 9 | 476.33 | 21.00 | 481.61 | 481.61 | 5.28 |
| TH 57 | 13 | 23 | 458.78 | 471.54 | 160 | 8.00% | 1.25 | 68.08 | 465.48 | 2.08% | 10 | 465.69 | 9 | 474.73 | 21.00 | 480.94 | 480.61 | 5.88 |
| TH 58 | 13 | 23 | 458.78 | 471.54 | 160 | 8.00% | 1.25 | 50.05 | 464.04 | 2.08% | 10 | 464.25 | 10 | 474.27 | 21.00 | 480.28 | 479.95 | 5.68 |
| TH 59 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 34.32 | 462.68 | 2.08% | 26 | 463.22 | 7 | 470.22 | 33.00 | 476.29 | 475.96 | 5.74 |
| TH 60 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 65.00 | 463.60 | 2.08% | 19 | 464.00 | 8 | 472.08 | 31.00 | 476.96 | 476.63 | 4.55 |
| TH 61 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 84.00 | 464.17 | 2.08% | 19 | 464.57 | 8 | 472.65 | 31.00 | 477.62 | 477.29 | 4.64 |
| TH 62 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 102.83 | 464.74 | 2.08% | 19 | 465.13 | 8 | 473.22 | 31.00 | 478.29 | 477.96 | 4.74 |
| TH 63 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 139.07 | 465.83 | 2.08% | 19 | 466.22 | 7 | 473.33 | 31.00 | 478.44 | 478.11 | 4.78 |
| TH 64 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 168.67 | 466.71 | 2.08% | 19 | 467.11 | 7 | 474.21 | 31.00 | 479.11 | 478.78 | 4.57 |
| TH 65 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 188.67 | 467.31 | 2.08% | 19 | 467.71 | 7 | 474.81 | 31.00 | 479.77 | 479.44 | 4.63 |
| TH 66 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 208.67 | 467.91 | 2.08% | 19 | 468.31 | 6 | 474.43 | 31.00 | 479.77 | 479.44 | 5.01 |
| TH 67 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 228.67 | 468.51 | 2.08% | 19 | 468.91 | 7 | 476.01 | 31.00 | 480.44 | 480.11 | 4.10 |
| TH 68 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 248.67 | 469.11 | 2.08% | 19 | 469.51 | 6 | 475.63 | 31.00 | 480.44 | 480.11 | 4.48 |
| TH 69 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 267.67 | 469.68 | 2.08% | 20 | 470.10 | 6 | 476.22 | 32.00 | 481.11 | 480.78 | 4.56 |
| TH 70 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 0.33 | 350.79 | 471.26 | 2.08% | 20 | 471.67 | 6 | 477.67 | 26.00 | 483.13 | 482.80 | 5.13 |
| TH 71 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 0.33 | 350.79 | 471.26 | 2.08% | 8 | 471.42 | 6 | 477.55 | 20.00 | 482.46 | 482.13 | 4.58 |
| TH 72 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 331.89 | 471.61 | 2.08% | 10 | 471.82 | 6 | 477.92 | 21.00 | 482.46 | 482.13 | 4.21 |
| TH 73 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 312.96 | 471.04 | 2.08% | 10 | 471.25 | 5 | 476.38 | 21.00 | 481.79 | 481.46 | 5.08 |
| TH 74 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 273.47 | 469.86 | 2.08% | 10 | 470.07 | 6 | 476.17 | 21.00 | 480.90 | 480.57 | 4.40 |
| TH 75 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 242.79 | 468.94 | 2.08% | 10 | 469.15 | 6 | 475.25 | 21.00 | 480.23 | 479.90 | 4.65 |

## SANITARY LATERAL TABULATION

| LOT # | LOWER MH | UPPER MH | LOWER MH INV. IN | UPPER MH INV. OUT | DISTANCE BETWEEN MH | PIPE SLOPE % | HEIGHT OF LAT. ABOVE MAIN | DISTANCE FROM LOWER MH | INV.@ SEWER | LATERAL SLOPE | LENGTH TO RISER | INV.@ RISER | HEIGHT OF RISER | INV. @ END | TOTAL LENGTH | FF | GARAGE | INV. END TO GAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TH 76 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 222.79 | 468.34 | 2.08% | 10 | 468.55 | 7 | 475.63 | 21.00 | 480.23 | 479.90 | 4.27 |
| TH 77 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 202.79 | 467.74 | 2.08% | 10 | 467.95 | 7 | 475.03 | 21.00 | 479.56 | 479.23 | 4.20 |
| TH 78 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 182.79 | 467.14 | 2.08% | 10 | 467.35 | 7 | 474.43 | 21.00 | 479.56 | 479.23 | 4.80 |
| TH 79 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 162.96 | 466.54 | 2.08% | 10 | 466.75 | 7 | 473.83 | 21.00 | 478.89 | 478.56 | 4.73 |
| TH 80 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 127.47 | 465.48 | 2.08% | 10 | 465.69 | 7 | 472.77 | 21.00 | 477.99 | 477.66 | 4.89 |
| TH 81 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 98.29 | 464.60 | 2.08% | 10 | 464.81 | 8 | 472.87 | 21.00 | 477.79 | 477.46 | 4.59 |
| TH 82 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 78.29 | 464.00 | 2.08% | 10 | 464.21 | 8 | 472.27 | 21.00 | 477.12 | 476.79 | 4.52 |
| TH 83 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 58.29 | 463.40 | 2.08% | 10 | 463.61 | 9 | 472.65 | 21.00 | 477.12 | 476.79 | 4.14 |
| TH 84 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 39.79 | 462.85 | 2.08% | 10 | 463.06 | 9 | 472.10 | 21.00 | 476.46 | 476.13 | 4.03 |
| TH 85 | 15 | 25 | 460.40 | 470.93 | 351 | 3.00% | 1.25 | 18.46 | 462.21 | 2.08% | 10 | 462.42 | 9 | 471.46 | 21.00 | 476.46 | 476.13 | 4.67 |
| TH 86 | 15 | 17 | 460.40 | 461.56 | 192 | 0.60% | 1.25 | 32.53 | 461.85 | 2.08% | 10 | 462.06 | 8 | 470.12 | 21.00 | 475.50 | 475.17 | 5.05 |
| TH 87 | 15 | 17 | 460.40 | 461.56 | 192 | 0.60% | 1.25 | 60.71 | 462.02 | 2.08% | 10 | 462.23 | 7 | 469.31 | 21.00 | 474.84 | 474.51 | 5.20 |
| TH 88 | 15 | 17 | 460.40 | 461.56 | 192 | 0.60% | 1.25 | 81.71 | 462.14 | 2.08% | 10 | 462.35 | 6 | 468.46 | 21.00 | 474.17 | 473.84 | 5.38 |
| TH 89 | 15 | 17 | 460.40 | 461.56 | 192 | 0.60% | 1.25 | 101.71 | 462.26 | 2.08% | 10 | 462.47 | 6 | 468.58 | 21.00 | 474.17 | 473.84 | 5.26 |
| TH 90 | 15 | 17 | 460.40 | 461.56 | 192 | 0.60% | 1.25 | 121.71 | 462.38 | 2.08% | 10 | 462.59 | 5 | 467.72 | 21.00 | 473.50 | 473.17 | 5.45 |
| TH 91 | 15 | 17 | 460.40 | 461.56 | 192 | 0.60% | 1.25 | 138.79 | 462.49 | 2.08% | 10 | 462.69 | 5 | 467.82 | 21.00 | 473.50 | 473.17 | 5.35 |
| TH 112 | 15 | 17 | 460.40 | 461.56 | 192 | 0.60% | 1.25 | 144.29 | 462.52 | 2.08% | 20 | 462.94 | 5 | 468.06 | 31.00 | 473.84 | 473.51 | 5.45 |
| TH 113 | 15 | 17 | 460.40 | 461.56 | 192 | 0.60% | 1.25 | 114.87 | 462.34 | 2.08% | 20 | 462.76 | 5 | 467.88 | 31.00 | 473.84 | 473.51 | 5.63 |
| TH 114 | 15 | 17 | 460.40 | 461.56 | 192 | 0.60% | 1.25 | 94.37 | 462.22 | 2.08% | 20 | 462.64 | 6 | 468.74 | 31.00 | 474.51 | 474.18 | 5.44 |
| TH 115 | 15 | 17 | 460.40 | 461.56 | 192 | 0.60% | 1.25 | 74.53 | 462.10 | 2.08% | 20 | 462.52 | 6 | 468.62 | 31.00 | 473.51 | 474.18 | 5.56 |
| TH 92 | 17 | 27 | 461.66 | 462.50 | 85 | 1.00% | 0.33 | 84.50 | 462.83 | 2.08% | 10 | 463.04 | 5 | 468.16 | 21.00 | 473.10 | 472.77 | 4.61 |
| TH 93 | 17 | 27 | 461.66 | 462.50 | 85 | 1.00% | 1.25 | 55.33 | 463.46 | 2.08% | 10 | 463.67 | 5 | 468.79 | 21.00 | 473.77 | 473.44 | 4.65 |
| TH 94 | 17 | 27 | 461.66 | 462.50 | 85 | 1.00% | 1.25 | 34.50 | 463.25 | 2.08% | 10 | 463.46 | 6 | 469.56 | 21.00 | 474.43 | 474.10 | 4.54 |
| TH 95 | 17 | 27 | 461.66 | 462.50 | 85 | 1.00% | 1.25 | 15.33 | 463.06 | 2.08% | 10 | 463.27 | 6 | 469.37 | 21.00 | 474.43 | 474.10 | 4.73 |
| TH 96 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 7.50 | 463.12 | 2.08% | 10 | 463.33 | 4 | 467.48 | 21.00 | 473.35 | 473.02 | 5.54 |
| TH 97 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 24.67 | 463.62 | 2.08% | 10 | 463.83 | 4 | 467.97 | 21.00 | 474.02 | 473.69 | 5.72 |
| TH 98 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 44.67 | 464.20 | 2.08% | 10 | 464.41 | 4 | 468.55 | 21.00 | 474.02 | 473.69 | 5.14 |
| TH 99 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 85.50 | 465.38 | 2.08% | 10 | 465.59 | 4 | 469.74 | 21.00 | 475.37 | 475.04 | 5.30 |
| TH 100 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 114.67 | 466.23 | 2.08% | 10 | 466.44 | 7 | 473.52 | 21.00 | 476.04 | 475.71 | 2.19 |
| TH 101 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 134.67 | 466.81 | 2.08% | 10 | 467.02 | 4 | 471.17 | 21.00 | 476.70 | 476.37 | 5.20 |
| TH 102 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 154.67 | 467.39 | 2.08% | 10 | 467.60 | 4 | 471.75 | 21.00 | 477.37 | 477.04 | 5.29 |
| TH 103 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 177.17 | 468.04 | 2.08% | 10 | 468.25 | 4 | 472.40 | 21.00 | 478.04 | 477.71 | 5.31 |
| TH 104 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 194.67 | 468.55 | 2.08% | 10 | 468.76 | 4 | 472.91 | 21.00 | 478.70 | 478.37 | 5.46 |
| TH 105 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 214.67 | 469.13 | 2.08% | 10 | 469.34 | 4 | 473.49 | 21.00 | 478.70 | 478.37 | 4.88 |
| TH 106 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 0.33 | 235.99 | 468.83 | 2.08% | 10 | 469.04 | 5 | 474.16 | 21.00 | 479.37 | 479.04 | 4.88 |
| TH 107 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 0.33 | 235.99 | 468.83 | 2.08% | 20 | 469.25 | 5 | 474.37 | 31.00 | 479.46 | 479.13 | 4.76 |
| TH 108 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 207.82 | 468.93 | 2.08% | 20 | 469.35 | 4 | 473.50 | 31.00 | 478.79 | 478.46 | 4.96 |
| TH 109 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 189.32 | 468.40 | 2.08% | 20 | 468.81 | 4 | 472.96 | 31.00 | 478.12 | 477.79 | 4.83 |
| TH 110 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 168.67 | 467.80 | 2.08% | 20 | 468.21 | 4 | 472.36 | 31.00 | 477.46 | 477.13 | 4.77 |
| TH 111 | 17 | 19 | 461.66 | 468.50 | 236 | 2.90% | 1.25 | 149.17 | 467.23 | 2.08% | 20 | 467.65 | 4 | 471.79 | 31.00 | 476.79 | 476.46 | 4.67 |

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PRELIM PLAN - SANITARY LATERAL COMPUTATIONS HILLSIDE
LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SANITARY LATERAL COMPUTATIONS

SHEET No.

C506

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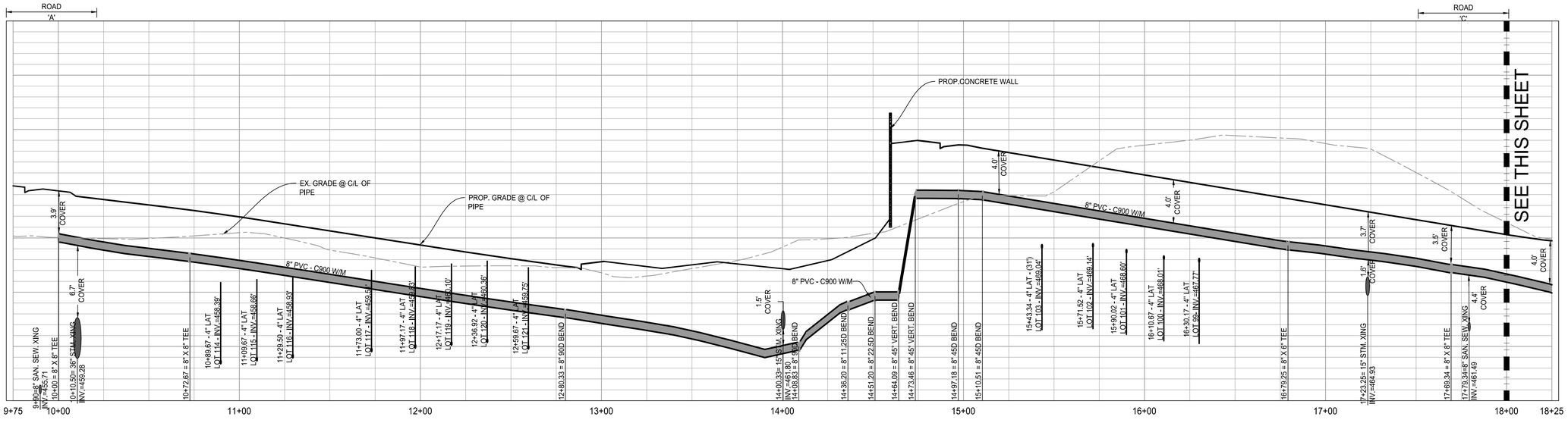
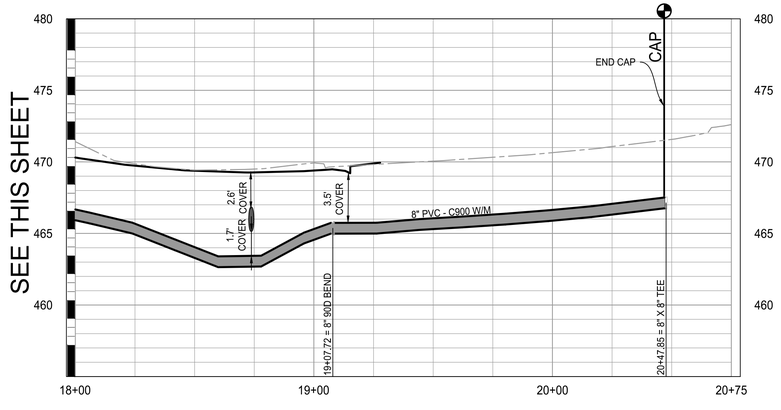



WATER-A PROFILE




WATER-A PROFILE

NOTES

1. ALL STORM DRAIN STRUCTURES ARE WVDOH STANDARDS. ALL SEWER STRUCTURES ARE CHARLES TOWN UTILITY BOARD STANDARDS. CONTRACTOR MAY USE PRECAST STRUCTURE WHERE AVAILABLE TO MEET THE STANDARD STRUCTURE SPECIFIED.
2. ELEVATIONS ARE GIVEN TO TOP OF LID FOR MANHOLES. CONTRACTOR TO ADJUST ELEVATIONS PROVIDED TO MATCH EXISTING PAVEMENT ELEVATIONS AND FIELD CONDITIONS WHERE APPROPRIATE.

NOTE:

CONTRACTOR SHALL TEST PIT AND LOCATE ALL EXISTING UNDERGROUND UTILITIES AT ALL PROPOSED UTILITY CROSSINGS AND CONNECTIONS TO OBTAIN ACTUAL VERTICAL AND HORIZONTAL LOCATIONS AND VERIFY THAT NO CONFLICTS EXIST WITH NEW UTILITIES WELL IN ADVANCE OF CONSTRUCTION START. REPORT ANY CONFLICTS TO ENGINEER SO ANY DESIGN ADJUSTMENTS CAN BE MADE PRIOR TO CONSTRUCTION.

5 2.5 0 5 10
GRAPHIC SCALE
VERTICAL: 1" = 5'

30 15 0 30 60
GRAPHIC SCALE
HORIZONTAL: 1" = 30'

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PRELIM PLAN - WATERLINE PROFILES
LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

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DRAWING No.: 112742
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SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

WATERLINE PROFILES

SHEET No.

C507

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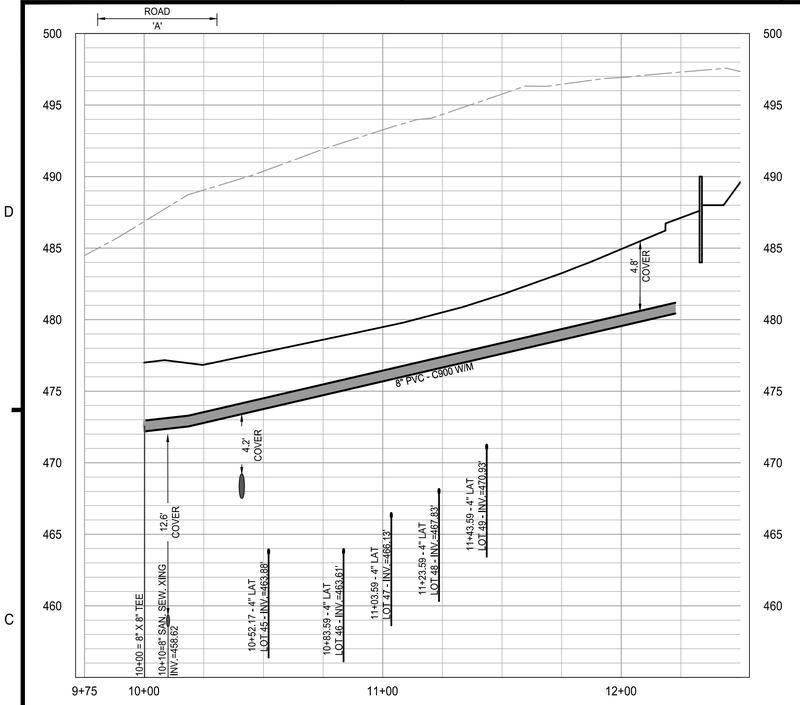


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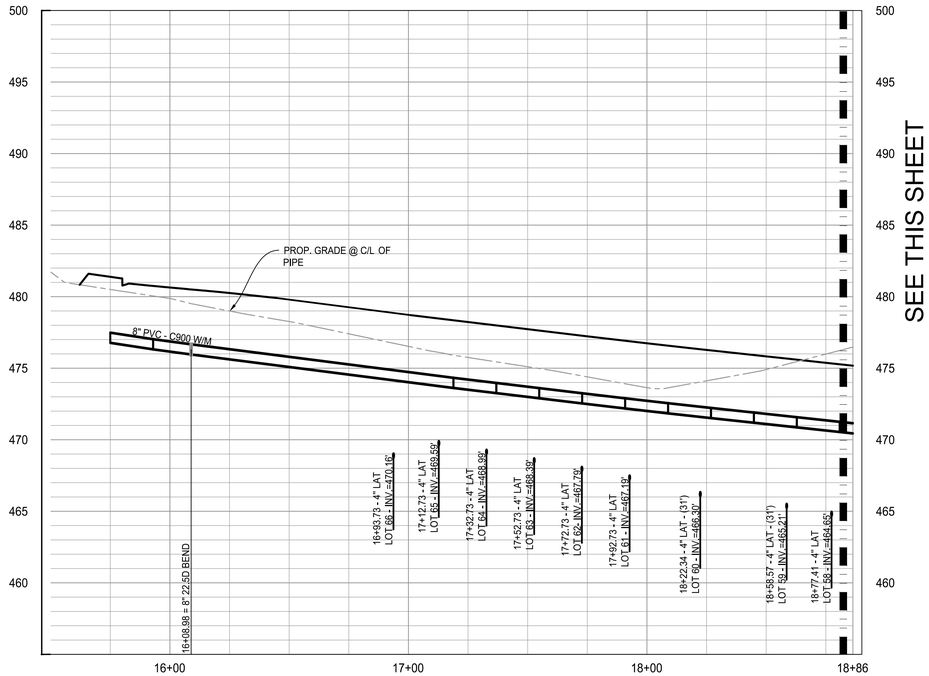


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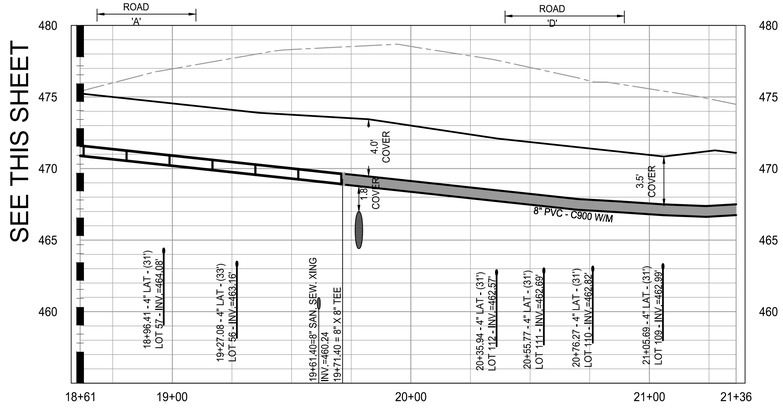


WATER-B PROFILE

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50 25 0 50 100
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SHEET TITLE:

WATERLINE PROFILES

SHEET No.

C508

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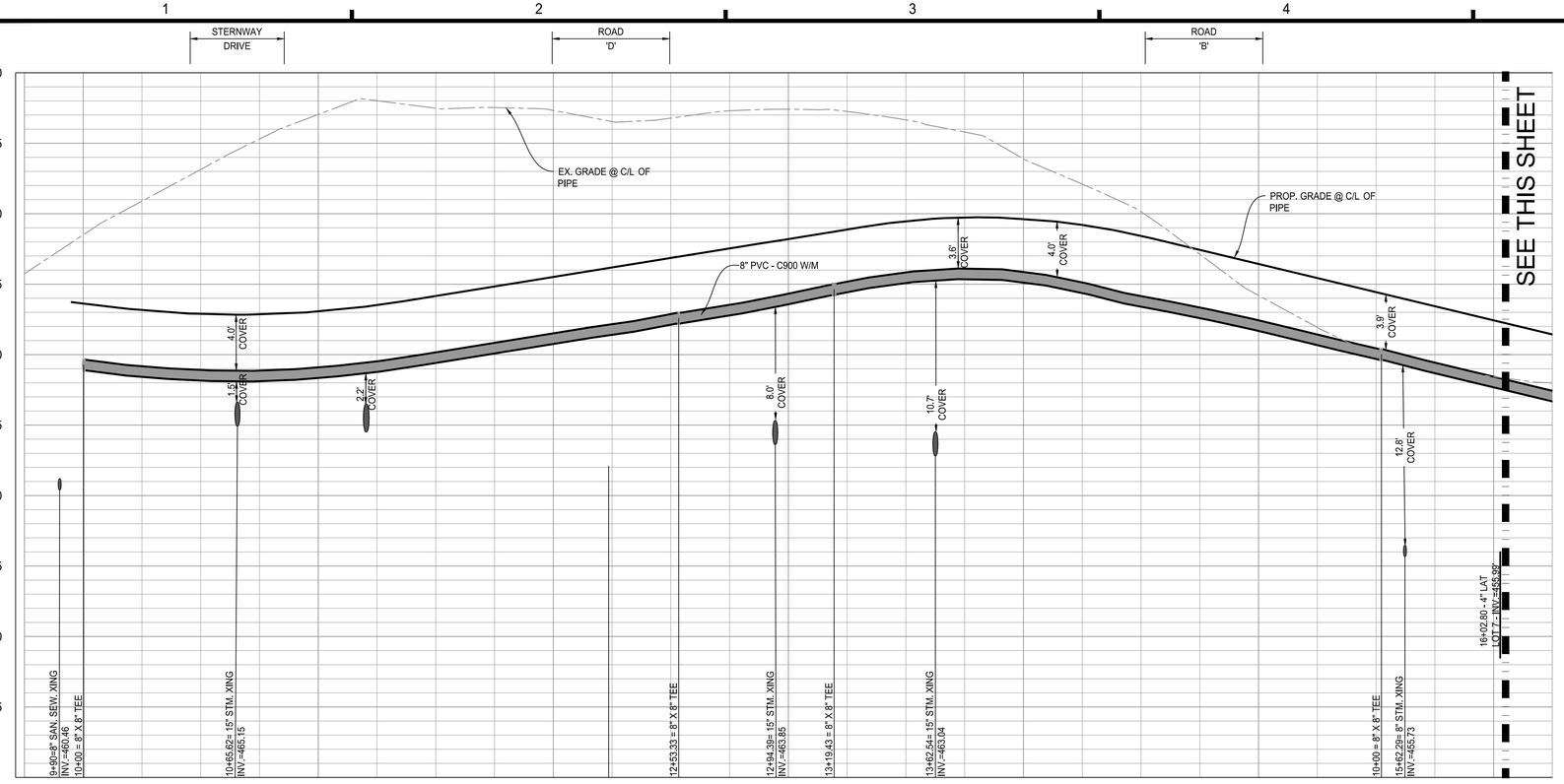


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2. ELEVATIONS ARE GIVEN TO TOP OF LID FOR MANHOLES. CONTRACTOR TO ADJUST ELEVATIONS PROVIDED TO MATCH EXISTING PAVEMENT ELEVATIONS AND FIELD CONDITIONS WHERE APPROPRIATE.

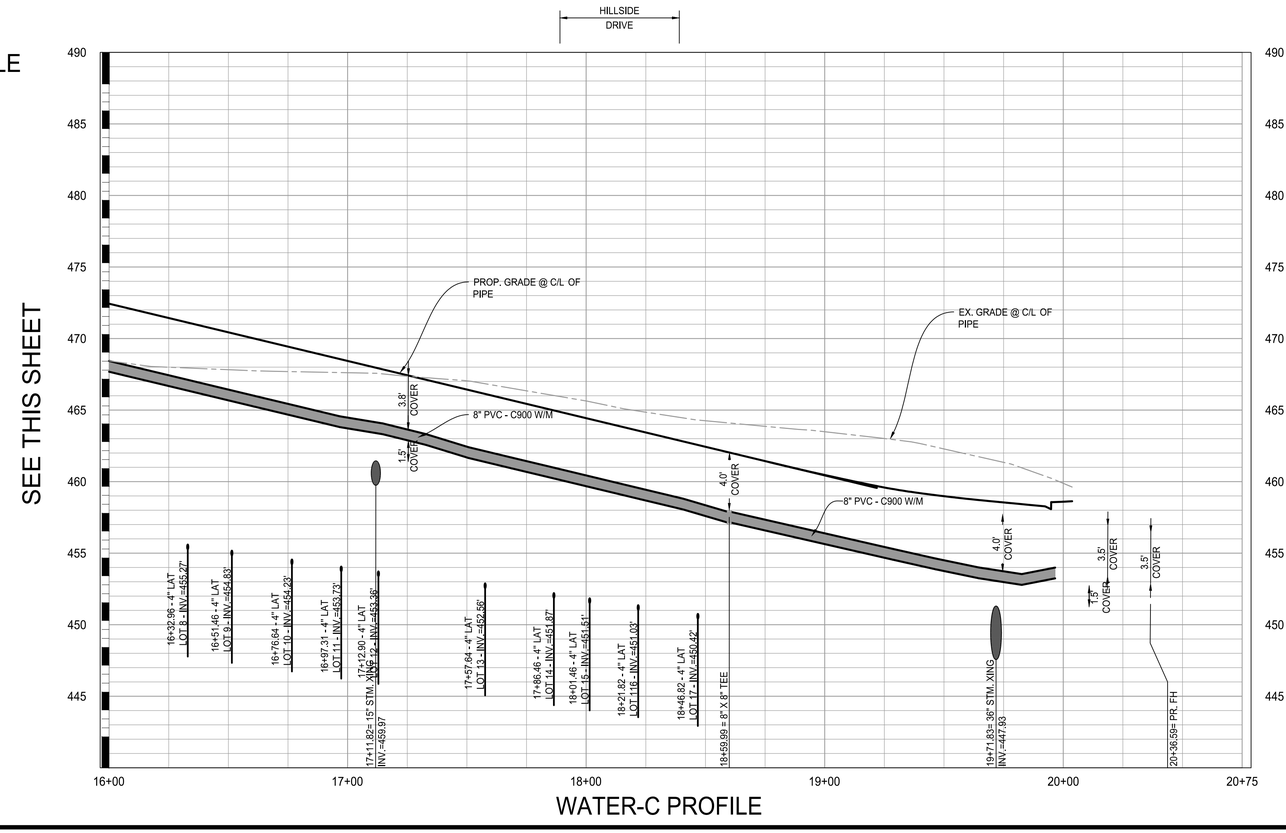
NOTE:

CONTRACTOR SHALL TEST PIT AND LOCATE ALL EXISTING UNDERGROUND UTILITIES AT ALL PROPOSED UTILITY CROSSINGS AND CONNECTIONS TO OBTAIN ACTUAL VERTICAL AND HORIZONTAL LOCATIONS AND VERIFY THAT NO CONFLICTS EXIST WITH NEW UTILITIES WELL IN ADVANCE OF CONSTRUCTION START. REPORT ANY CONFLICTS TO ENGINEER SO ANY DESIGN ADJUSTMENTS CAN BE MADE PRIOR TO CONSTRUCTION.

5 2.5 0 5 10
GRAPHIC SCALE
VERTICAL: 1" = 5'

50 25 0 50 100
GRAPHIC SCALE
HORIZONTAL: 1" = 50'

## WATER-C PROFILE




WATER-C PROFILE

IMEG
50 Catoctin Circle NE, Suite 210
Leesburg, VA 20176 P 703.777.2755
engineering • surveying • land planning

PRELIM PLAN - WATERLINE PROFILES HILLSIDE LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

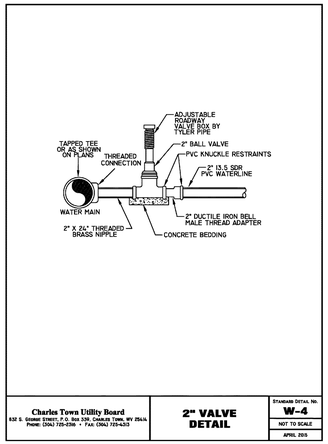
SHEET TITLE:

WATERLINE PROFILES

SHEET No.

C509

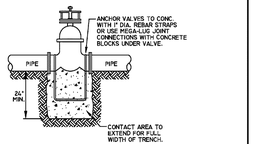
P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C509 Waterline Profiles.dwg, 4/7/2024 9:36:34 PM, Matthew Pohlhaus,




**Charles Town Utility Board**
832 S. George Street, P.O. Box 359, Charles Town, WV 25414
Phone: (304) 725-2316 • Fax: (304) 725-4313

**2" VALVE DETAIL**

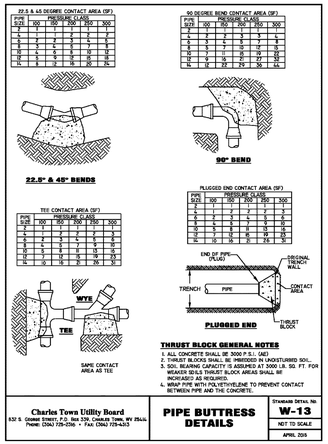
Standard Detail No. **W-4**
NOT TO SCALE
APRIL 2015




**Charles Town Utility Board**
832 S. George Street, P.O. Box 359, Charles Town, WV 25414
Phone: (304) 725-2316 • Fax: (304) 725-4313

**WATER VALVES DETAIL**

Standard Detail No. **W-3**
NOT TO SCALE
APRIL 2015




**THRUST BLOCK GENERAL NOTES**

1. ALL CONCRETE SHALL BE 3000 P.S.I. (AE)
2. THRUST BLOCKS SHALL BE EMBEDDED IN UNDISTURBED SOIL.
3. SOIL BEARING CAPACITY IS ASSUMED AT 3000 LB. SQ. FT. FOR DESIGN OF THRUST BLOCK AREAS SHALL BE INCREASED AS REQUIRED.
4. WRAP PIPE WITH POLYETHYLENE TO PREVENT CONTACT BETWEEN PIPE AND THE CONCRETE.

**Charles Town Utility Board**
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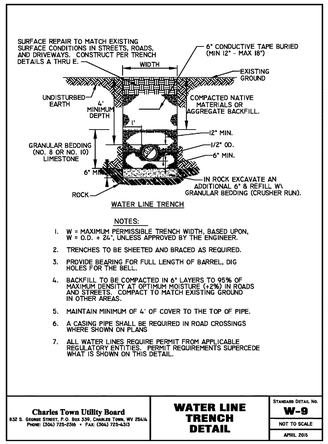
**PIPE BUTTRESS DETAILS**

Standard Detail No. **W-13**
NOT TO SCALE
APRIL 2015




WATER LINE TRENCH

NOTES:

1. W = MAXIMUM PERMISSIBLE TRENCH WIDTH, BASED UPON, W = O.D. + 24", UNLESS APPROVED BY THE ENGINEER.
2. TRENCHES TO BE SHEETED AND BRACED AS REQUIRED.
3. PROVIDE BEARING FOR FULL LENGTH OF BARREL, DIG HOLES FOR THE BELL.
4. BACKFILL TO BE COMPACTED IN 6" LAYERS TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE (±2%) IN ROADS AND STREETS. COMPACT TO MATCH EXISTING GROUND IN OTHER AREAS.
5. MAINTAIN MINIMUM OF 4' OF COVER TO THE TOP OF PIPE.
6. A CASING PIPE SHALL BE REQUIRED IN ROAD CROSSINGS WHERE SHOWN ON PLANS
7. ALL WATER LINES REQUIRE PERMIT FROM APPLICABLE REGULATORY ENTITIES. PERMIT REQUIREMENTS SUPERCEDE WHAT IS SHOWN ON THIS DETAIL.

**Charles Town Utility Board**
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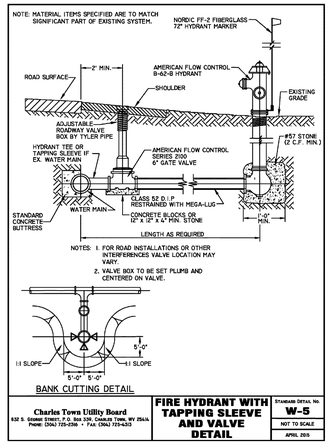
**WATER LINE TRENCH DETAIL**

Standard Detail No. **W-9**
NOT TO SCALE
APRIL 2015

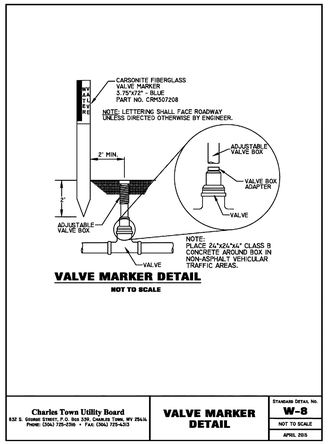



BANK CUTTING DETAIL

**Charles Town Utility Board**
832 S. George Street, P.O. Box 359, Charles Town, WV 25414
Phone: (304) 725-2316 • Fax: (304) 725-4313

**FIRE HYDRANT WITH TAPPING SLEEVE AND VALVE DETAIL**

Standard Detail No. **W-5**
NOT TO SCALE
APRIL 2015



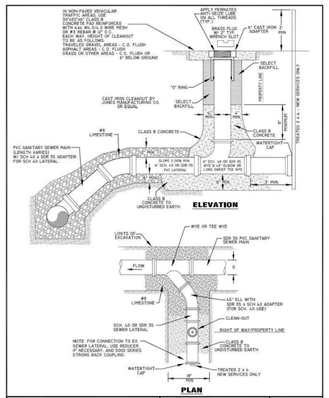

**VALVE MARKER DETAIL**

**NOT TO SCALE**

**Charles Town Utility Board**
832 S. George Street, P.O. Box 359, Charles Town, WV 25414
Phone: (304) 725-2316 • Fax: (304) 725-4313

**VALVE MARKER DETAIL**

Standard Detail No. **W-8**
NOT TO SCALE
APRIL 2015




**Charles Town Utility Board**
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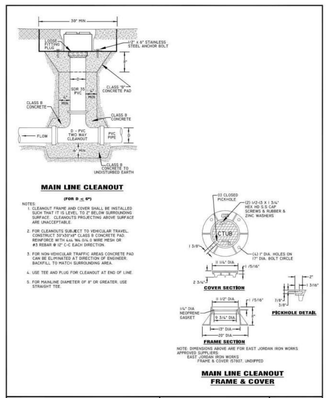
Phone: (304) 725-2316 • Fax: (304) 725-4313

**NEW LATERAL CONNECTION DETAIL**

Standard Detail No. **S-13**
NOT TO SCALE
SEPTEMBER 2015

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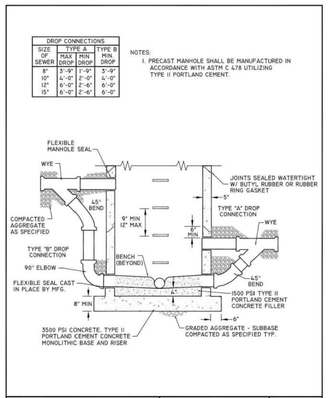
**MAINLINE CLEANOUT & FRAME & COVER DETAIL**

Standard Detail No. **S-12**
NOT TO SCALE
SEPTEMBER 2015




**Charles Town Utility Board**
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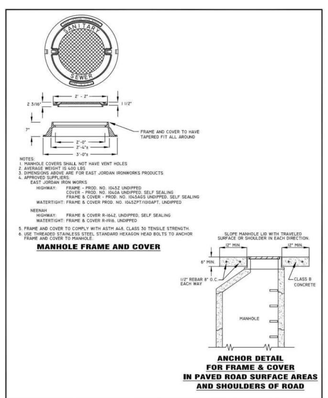
**DROP MANHOLE DETAIL**

Standard Detail No. **S-8**
NOT TO SCALE
SEPTEMBER 2015




**Charles Town Utility Board**
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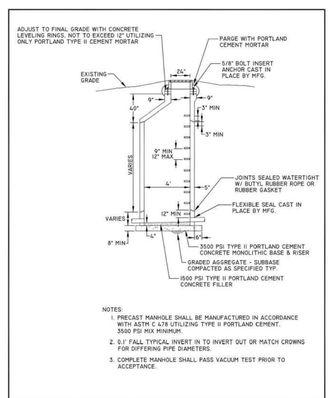
**MANHOLE FRAME & COVER ANCHOR FOR FRAME & COVER DETAIL**

Standard Detail No. **S-7**
NOT TO SCALE
SEPTEMBER 2015




**Charles Town Utility Board**
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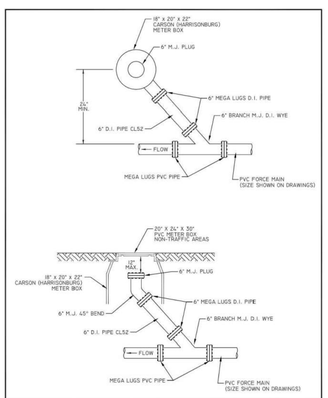
Phone: (304) 725-2316 • Fax: (304) 725-4313

**PRECAST MANHOLE W/ ECCENTRIC TOP DETAIL**

Standard Detail No. **S-6**
NOT TO SCALE
SEPTEMBER 2015




**Charles Town Utility Board**
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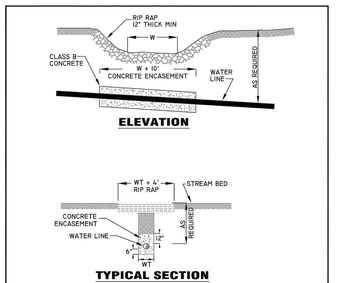
Phone: (304) 725-2316 • Fax: (304) 725-4313

**FORCE MAIN CLEAN OUT DETAIL**

Standard Detail No. **S-18**
NOT TO SCALE
SEPTEMBER 2015




NOTES: STREAMS TO BE DIVERTED DURING CONSTRUCTION TO PREVENT GREEN CONCRETE FROM GETTING INTO WATER.

ALL STREAM CROSSINGS REQUIRE PERMIT FROM THE STATE AND ARMY CORP OF ENGINEERS. PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS SHOWN ON THIS DETAIL.

NOTE: ROCK RIP RAP AND GABION STONE SHALL BE NON-ACIDIC AND OF ADEQUATE HARDNESS WITH SIZES AS FOLLOWS:

| | |
|---|---|
| CLASS 0 (GABION) | 4" TO 7" |
| CLASS I | 3" TO 12" |
| CLASS II | 6" TO 24" |
| CLASS III | 36" TO 42" |

**Charles Town Utility Board**
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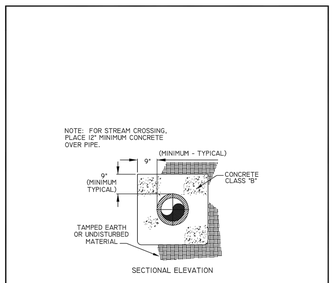
**STREAM CROSSING DETAIL**

Standard Detail No. **W-11**
NOT TO SCALE
APRIL 2015




**Charles Town Utility Board**
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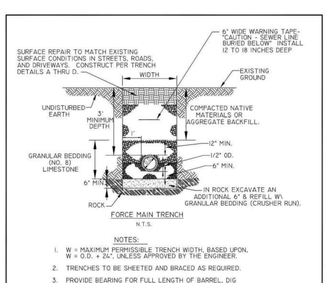
**CONCRETE ENCASEMENT DETAIL**

Standard Detail No. **W-12**
NOT TO SCALE
APRIL 2015




NOTES:

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3. PROVIDE BEARING FOR FULL LENGTH OF BARREL, DIG HOLES FOR THE BELL.
4. BACKFILL TO BE COMPACTED IN 6" LAYERS TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE (+2%) IN ROADS AND STREETS. COMPACT TO MATCH EXISTING GROUND IN OTHER AREAS.
5. MAINTAIN MINIMUM OF 3' OF COVER TO THE TOP OF PIPE.
6. A CASING PIPE SHALL BE REQUIRED IN ROAD CROSSINGS WHERE SHOWN ON PLANS

**Charles Town Utility Board**
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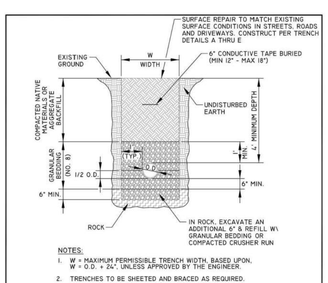
**FORCE MAIN TRENCH DETAIL**

Standard Detail No. **S-2**
NOT TO SCALE
SEPTEMBER 2015




NOTES:

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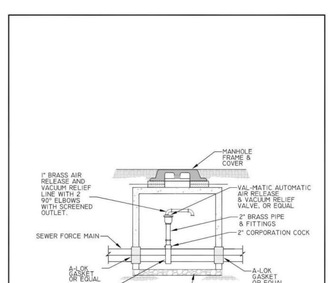
8. ALL WATER LINES REQUIRE PERMIT FROM APPLICABLE REGULATORY ENTITIES. PERMIT REQUIREMENTS SUPERCEDE WHAT IS SHOWN ON THIS DETAIL.

**Charles Town Utility Board**
832 S. George Street, P.O. Box 359, Charles Town, WV 25414
Phone: (304) 725-2316 • Fax: (304) 725-4313

**SEWER LINE TRENCH DETAIL**

Standard Detail No. **S-1**
NOT TO SCALE
SEPTEMBER 2015




**Charles Town Utility Board**
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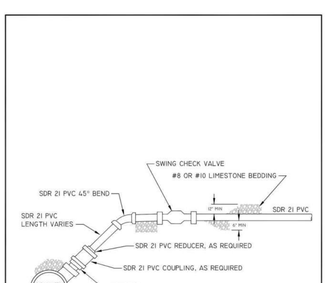
Phone: (304) 725-2316 • Fax: (304) 725-4313

**AIR RELEASE & VACUUM RELIEF VALVE DETAIL**

Standard Detail No. **S-23**
NOT TO SCALE
SEPTEMBER 2015




**Charles Town Utility Board**
832 S. George Street, P.O. Box 359, Charles Town, WV 25414
Phone: (304) 725-2316 • Fax: (304) 725-4313

**FORCE MAIN TO GRAVITY CONNECTION DETAIL**

Standard Detail No. **S-21**
NOT TO SCALE
SEPTEMBER 2015

IMEG
50 Catoctin Circle NE, Suite 210
Leesburg, VA 20176 . P 703.777.2755
engineering • surveying • land planning

PRELIM PLAN - UTILITY DETAILS
HILLSIDE
LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

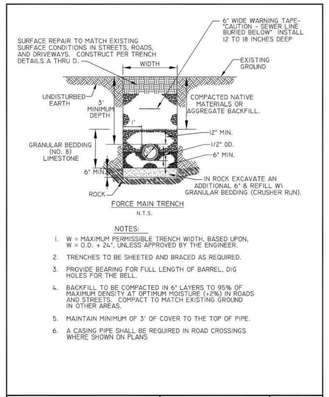
| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
UTILITY DETAILS

SHEET No.
C510

P:\Projects\22063\001\001112742 Prelim Subdivision - Land Development Plan\CS11 Utility Details.dwg, 4/7/2024 9:37:05 PM, Matthew Pollhaus,




FORCE MAIN TRENCH

N.T.S.

NOTES:

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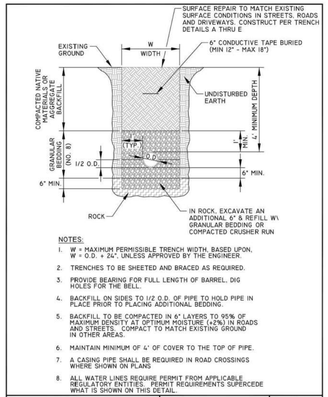
5. MAINTAIN MINIMUM OF 3' OF COVER TO THE TOP OF PIPE.
6. A CASING PIPE SHALL BE REQUIRED IN ROAD CROSSINGS WHERE SHOWN ON PLANS

| Charles Town Utility Board | FORCE MAIN TRENCH DETAIL | Standard Detail No. S-2 |
|---|---|---|
| 852 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4353 | | NOT TO SCALE |
| | | SEPTEMBER 2015 |




NOTES:

1. W = MAXIMUM PERMISSIBLE TRENCH WIDTH, BASED UPON, W = O.D. + 24", UNLESS APPROVED BY THE ENGINEER.
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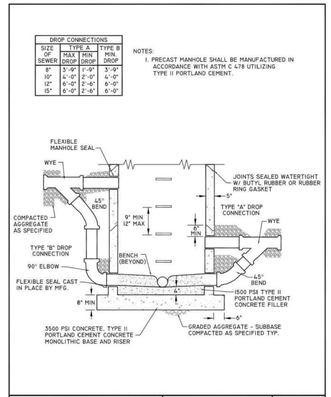
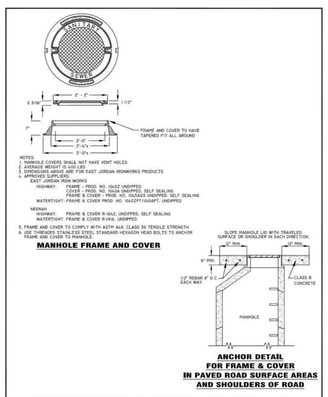
| Charles Town Utility Board | SEWER LINE TRENCH DETAIL | Standard Detail No. S-1 |
|---|---|---|
| 852 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4353 | | NOT TO SCALE |
| | | SEPTEMBER 2015 |




| Charles Town Utility Board | DROP MANHOLE DETAIL | Standard Detail No. S-8 |
|---|---|---|
| 852 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4353 | | NOT TO SCALE |
| | | SEPTEMBER 2015 |

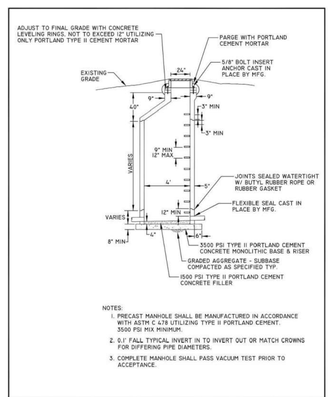



MANHOLE FRAME AND COVER




ANCHOR DETAIL FOR FRAME & COVER IN PAVED ROAD SURFACE AREAS AND SHOULDERS OF ROAD

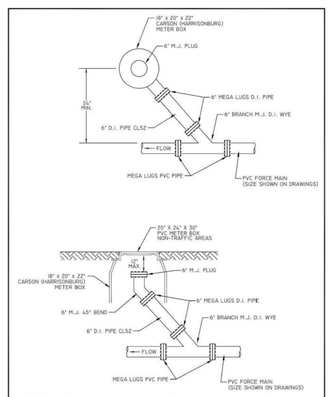
| Charles Town Utility Board | MANHOLE FRAME & COVER ANCHOR FOR FRAME & COVER DETAIL | Standard Detail No. S-7 |
|---|---|---|
| 852 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4353 | | NOT TO SCALE |
| | | SEPTEMBER 2015 |



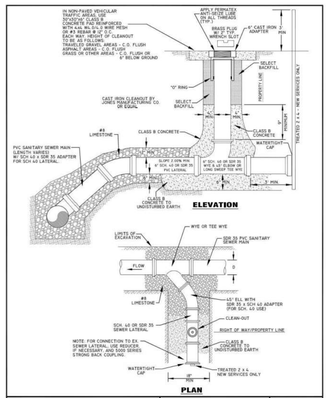

NOTES:

1. PRECAST MANHOLE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C 478 UTILIZING TYPE II PORTLAND CEMENT. 3500 PSI MIX MINIMUM.
2. 0.1' FALL TYPICAL INVERT IN TO INVERT OUT OR MATCH CROWNS FOR DIFFERING PIPE DIAMETERS.
3. COMPLETE MANHOLE SHALL PASS VACUUM TEST PRIOR TO ACCEPTANCE.

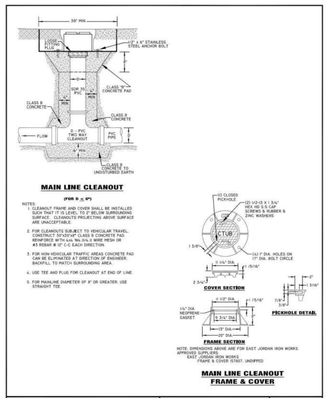
| Charles Town Utility Board | PRECAST MANHOLE W/ ECCENTRIC TOP DETAIL | Standard Detail No. S-6 |
|---|---|---|
| 852 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4353 | | NOT TO SCALE |
| | | SEPTEMBER 2015 |



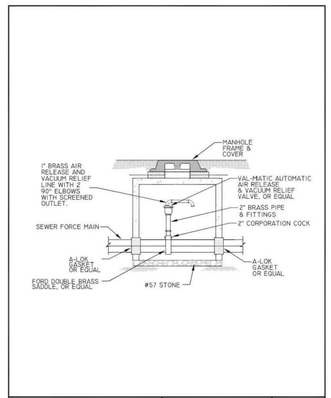

| Charles Town Utility Board | FORCE MAIN CLEAN OUT DETAIL | Standard Detail No. S-18 |
|---|---|---|
| 852 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4353 | | NOT TO SCALE |
| | | SEPTEMBER 2015 |



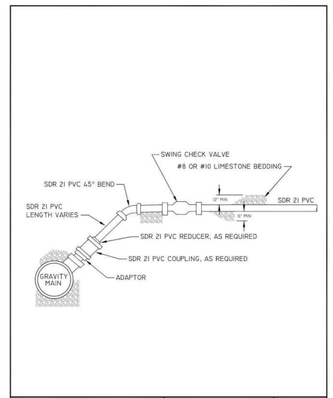

| Charles Town Utility Board | NEW LATERAL CONNECTION DETAIL | Standard Detail No. S-13 |
|---|---|---|
| 852 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4353 | | NOT TO SCALE |
| | | SEPTEMBER 2015 |



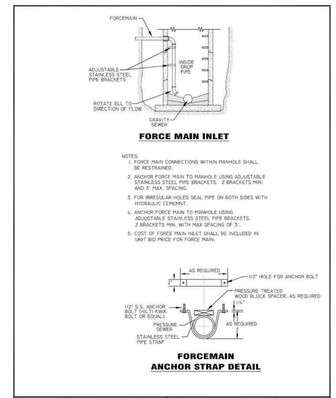

| Charles Town Utility Board | MAINLINE CLEANOUT & FRAME & COVER DETAIL | Standard Detail No. S-12 |
|---|---|---|
| 852 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4353 | | NOT TO SCALE |
| | | SEPTEMBER 2015 |




| Charles Town Utility Board | AIR RELEASE & VACUUM RELIEF VALVE DETAIL | Standard Detail No. S-23 |
|---|---|---|
| 852 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4353 | | NOT TO SCALE |
| | | SEPTEMBER 2015 |




| Charles Town Utility Board | FORCE MAIN TO GRAVITY CONNECTION DETAIL | Standard Detail No. S-21 |
|---|---|---|
| 852 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4353 | | NOT TO SCALE |
| | | SEPTEMBER 2015 |




| Charles Town Utility Board | FORCEMAIN MANHOLE FORCEMAIN ANCHOR STRAP DETAIL | Standard Detail No. S-9 |
|---|---|---|
| 852 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4353 | | NOT TO SCALE |
| | | SEPTEMBER 2015 |

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PRELIM - UTILITY DETAILS
HILLSIDE
LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

UTILITY DETAILS

SHEET No.

C511

P:\Projects\22063\001000\112742 Prelim Subdivision - Land Development Plan\C511 Utility Details.dwg, 4/7/2024 9:37:15 PM, Matthew Pohlhaus,

# STORMWATER MANAGEMENT NARRATIVE

OVERVIEW

HILLSIDE STORMWATER MANAGEMENT (SWM) PLAN,THE PROJECT SITE IS IN CHARLES COUNTY WEST VIRGINIA LOCATED ON THE ADJACENT OF ROUT 340. THE SITE IS 14.474 ACRES, AND THE STORMWATER MANAGEMENT PLANNING AREA IS 14.474 AC THE EXISTING SITE AREA IS UNDEVELOPED AND WITH MOST OF THE AREA BEING OPEN SPACE THE PROJECT SITE WILL BE DEVELOPED INTO A RESIDENTIAL TOWNHOUSES COMMUNITY, WITH ASSOCIATED PARKING AND INFRASTRUCTURE IMPROVEMENTS. THE SITE USE AND ACTIVITIES ASSOCIATED WITH THIS PROJECT WILL NOT STORE, HANDLE, AND/OR DISPENSE PETROLEUM PRODUCTS AND HAZARDOUS SUBSTANCES. THE EXISTING SITE CONSIST OF TYPE "B ,C & D" HYDRAULIC SOILS . THERE ARE NO WETLAND IMPACTS ASSOCIATED WITH THIS DEVELOPMENT.

WATER QUANTITY

THE EXISTING DRAINAGE SYSTEM FLOWS FROM SOUTHWEST TO NORTHEAST AND DRAINS INTO AN EXISTING DITCH OUTFALL THAT IS ADJACENT TO ROUTE 340.

THE PROPOSED DEVELOPMENT AIMS TO MINIMIZE SHEET FLOW RUNOFF BY CAPTURING SITE RUNOFF WITH GRADING OR STORM DRAIN AND DIRECTING IT TO THE PROPOSED POND OR BIORETENTION. THE CONVEYANCE SYSTEM PROTECTION AND FLOOD PROTECTION REQUIREMENTS OF THE WEST VIRGINIA STORMWATER MANAGEMENT MANUAL ARE MET TO SATISFY WATER QUANTITY REQUIREMENTS OF ENERGY BALANCE EQ. REQUIRED FLOW.

THE BIORETENTION POND OUT DRAINS TO AN EXISTING CONCRETE DITCH THAT REACHES DOWNSTREAM OF THE POND A OUTFALL AND ULTIMATELY ENDS UP AT THE SAME LOCATION AS THE POND A OUTFALL. SINCE THE SITE HAS ONLY ONE ULTIMATE OUTFALL, WE CONSIDER ONE WATER ANALYSIS THAT IS LIMITED TO THE SITE BOUNDARY.

THE SITE FLOOD PROTECTION CONCENTRATED OUTFALLS ARE SATISFIED WITH LESS POST CONDITION FLOWS OF 2 AND 10 YEARS THAN PRE CONDITION FLOWS OF 2 AND 10 YEARS.

WATER QUALITY

THE REQUIRED PHOSPHORUS REMOVAL RATE WAS DETERMINED USING THE VIRGINIA RUNOFF REDUCTION METHOD (VRRM) FOR NEW DEVELOPMENTS. THE TOTAL PHOSPHORUS LOAD REDUCTION REQUIRED FOR THIS SITE IS 12.49 POUNDS PER YEAR. VRRM SPREADSHEET COMPUTATIONS PROVIDED ON SHEET C640.

THE TOTAL PHOSPHORUS LOAD REDUCTION REQUIRED FOR THE HILLSIDE DEVELOPMENT IS 10.88 LBS/YEAR. THE PHOSPHORUS REMOVAL WILL BE ACCOMPLISHED USING AN ON-SITE BIORETENTION WITH TP REMOVED 1.52 LB, ONE ON-SITE JELLYFISH FILTERS FROM CONTECH WITH TP REMOVED 3.12 LB, AND WET POND A WITH TP REMOVED 6.24 LB,

| SWM/BMP FACILITY NAME | TYPE OF FACILITY | IMPERVIOUS AREA TREATED | LATITUDE | LONGITUDE | DESCRIPTION OF DISCHARGE POINT |
|---|---|---|---|---|---|
| POND # A | LEVEL 1 WET POND | 5.797 ac. | 39.2776050021 | -77.8403452014 | Principal spillway for the pond is through a riser structure and 30" RCP pipe which then outfalls directly into an existing 60" culvert that crosses under Crosstrail Blvd which then discharged to exisitng natural channel. The pond has no emergency spillway and the 100 year storm will pass through the riser structure while meeting the freeboard requirments. |
| POND # B | LEVEL 1 BIO POND | 1.715 ac. | 39.2768390025 | -77.8414102356 | The principal spillway for the pond is through a riser structure and a 30" rcp pipe. Pond runoff will have outlet protection prior to entering an existing natural channel. The pond has no emergency spillway and the 100 year storm will pass though through the riser structure while meeting the freeboard requiements. |
| STOM FILTER | MANUFACTURE DTREATMENT DEVICE - FILTERING: JELLYFISH FILTER | 5.797 ac. | 39.2776050021 | -77.8403452014 | Outfalls is to a propsed storm drain system that connects into an existing storm drain system located offsite. The existing storm drain system flows into exsiting natural channel. |

## WATER QUANTITY
## CONVEYANCE SYSTEM PROTECTION (CONCENTRATED OUTFALLS)

**ENERGY BALANCE - AREA A**

$$Q_{Dev.} \leq I.F * (Q_{Pre-Dev.} * Rv_{Pre-Dev.})/Rv_{Dev.}$$

$(Q_{Pre-Dev.}) =$ 9.826 cfs

$(Rv_{Pre-Dev.}) =$ 30,377 cf

$(Rv_{Dev.}) =$ 49,228 cf

$(I.F._{.}) =$ 0.80

$(Q_{Dev.}) \leq$ 4.851 cfs

**ENERGY BALANCE SUMMARY TABLE**

| AREA ID | EX. DA | EX. CN-VALUE | EX. Tc | EX. HYD. VOL. | EX $Q_1$ | EX $Q_{1MAX}$ | PR. DA | PR. CN-VALUE | PR. Tc | PR. HYD. VOL. | POST $Q_1$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **AREA** | ######## | **75** | **15.9 min.** | **30,377.00 cfs** | **9.83 cfs** | **4.85 cfs** | ######## | **83** | **5.0 min.** | **49.16 cfs** | **3.49 cfs** |

## WATER QUANTITY
## FLOOD PROTECTION (CONCENTRATED OUTFALLS)

**FLOOD PROTECTION SUMMARY TABLE**

| AREA ID | EX. DA | EX. CN-VALUE | EX. Tc | EX $Q_2$ | EX $Q_{10}$ | EX $Q_{25}$ | PR. DA | PR. CN-VALUE | PR. Tc | POST $Q_2$ | POST $Q_{10}$ | POST $Q_{25}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AREA** | ######## | **75** | **15.9 min.** | **15.32 cfs** | **32.91 cfs** | **45.88 cfs** | **12.700 ac.** | **83** | **5.0 min.** | **4.78 cfs** | **21.04 cfs** | **39.58 cfs** |

## SWM PRE-DEV. DA SUMMARY TABLE

EXISTING

| | A-SOIL | 0 SF | 0.00 AC. | B-SOIL | 139,746 SF | 3.21 AC. | C-SOIL | 1,976 SF | 0.05 AC. | D-SOIL | 488,749 SF | 11.22 AC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS |
| | | | | 139,746 SF | 0 SF | 0 SF | | 1,976 SF | | 0 SF | 481,329 SF | 7,420 SF |
| | | | | 3.208 AC. | 0.000 AC. | 0.000 AC. | | 0.045 AC. | | 0.000 AC. | 11.050 AC. | 0.170 AC. |
| RCN | 30 | 39 | 98 | 55 | 61 | 98 | 70 | 74 | 98 | 77 | 80 | 98 |
| Rv | 0.02 | 0.15 | 0.95 | 0.03 | 0.2 | 0.95 | 0.04 | 0.22 | 0.95 | 0.05 | 0.25 | 0.95 |
| C-VALUE | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 |

TOTAL AREA= 630,471 SF OR 14.474 AC.
TOTAL WOODS= 139,746 SF OR 3.208 AC.
TOTAL PERV.= 483,305 SF OR 11.095 AC.
TOTAL IMP.= 7,420 SF OR 0.170 AC.

WOODS= 72
PRE-DEV.= 75
Rv.= 0.21
C-VALUE= 0.3

## SWM POST-DEV. DA SUMMARY TABLE

PROPOSED

| | A-SOIL | 0 SF | 0.00 AC. | B-SOIL | 139,746 SF | 3.21 AC. | C-SOIL | 1,976 SF | 0.05 AC. | D-SOIL | 488,749 SF | 11.22 AC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS |
| | | | | | 107,814 SF | 31,932 SF | | 1,976 SF | | | 286,301 SF | 202,448 SF |
| | | | | | 2.475 AC. | 0.733 AC. | | 0.045 AC. | | | 6.573 AC. | 4.648 AC. |
| | | | | | 77.1% | 22.9% | | 100.0% | | | 58.6% | 41.4% |
| RCN | 30 | 39 | 98 | 55 | 61 | 98 | 70 | 74 | 98 | 77 | 80 | 98 |
| Rv | 0.02 | 0.15 | 0.95 | 0.03 | 0.2 | 0.95 | 0.04 | 0.22 | 0.95 | 0.05 | 0.25 | 0.95 |
| C-VALUE | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 |

TOTAL AREA= 630,471 SF OR 14.474 AC.
TOTAL WOODS= 0 SF OR 0.000 AC.
TOTAL PERV.= 396,091 SF OR 9.093 AC.
TOTAL IMP.= 234,380 SF OR 5.381 AC.

WOODS= 72
POST-DEV.= 83
Rv.= 0.5
C-VALUE= 0.52

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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

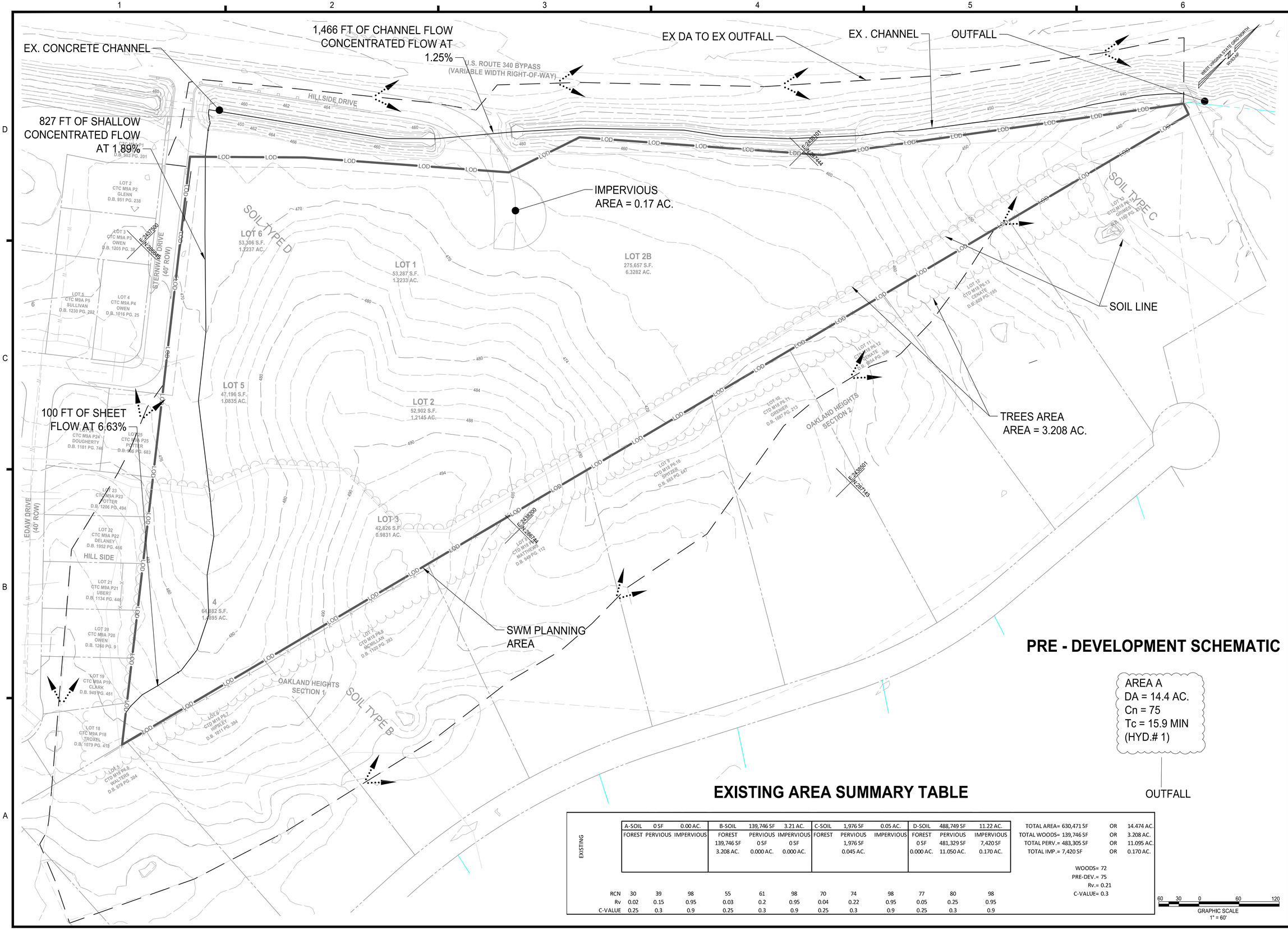
SHEET TITLE:

SWM NARRATIVE

SHEET No.

C600

P:\Projects\22063\001001\112742 Prelim Subdivision - Land Development Plan\C600 SWM NARRATIVE.dwg, 4/7/2024 10:33:54 PM, Matthew Pohlhaus,




## PRE - DEVELOPMENT SCHEMATIC

AREA A
DA = 14.4 AC.
Cn = 75
Tc = 15.9 MIN
(HYD.# 1)

OUTFALL

## EXISTING AREA SUMMARY TABLE

| | A-SOIL | 0 SF | 0.00 AC. | B-SOIL | 139,746 SF | 3.21 AC. | C-SOIL | 1,976 SF | 0.05 AC. | D-SOIL | 488,749 SF | 11.22 AC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXISTING | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS |
| | | | | 139,746 SF | 0 SF | 0 SF | | 1,976 SF | | 0 SF | 481,329 SF | 7,420 SF |
| | | | | 3.208 AC. | 0.000 AC. | 0.000 AC. | | 0.045 AC. | | 0.000 AC. | 11.050 AC. | 0.170 AC. |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RCN | 30 | 39 | 98 | 55 | 61 | 98 | 70 | 74 | 98 | 77 | 80 | 98 |
| Rv | 0.02 | 0.15 | 0.95 | 0.03 | 0.2 | 0.95 | 0.04 | 0.22 | 0.95 | 0.05 | 0.25 | 0.95 |
| C-VALUE | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 |

TOTAL AREA= 630,471 SF OR 14.474 AC.
TOTAL WOODS= 139,746 SF OR 3.208 AC.
TOTAL PERV.= 483,305 SF OR 11.095 AC.
TOTAL IMP.= 7,420 SF OR 0.170 AC.

WOODS= 72
PRE-DEV.= 75
Rv.= 0.21
C-VALUE= 0.3

60 30 0 60 120
GRAPHIC SCALE
1" = 60'

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PRELIM PLAN - SWM
PRE-DEVELOPED DRAINAGE AREA MAP
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

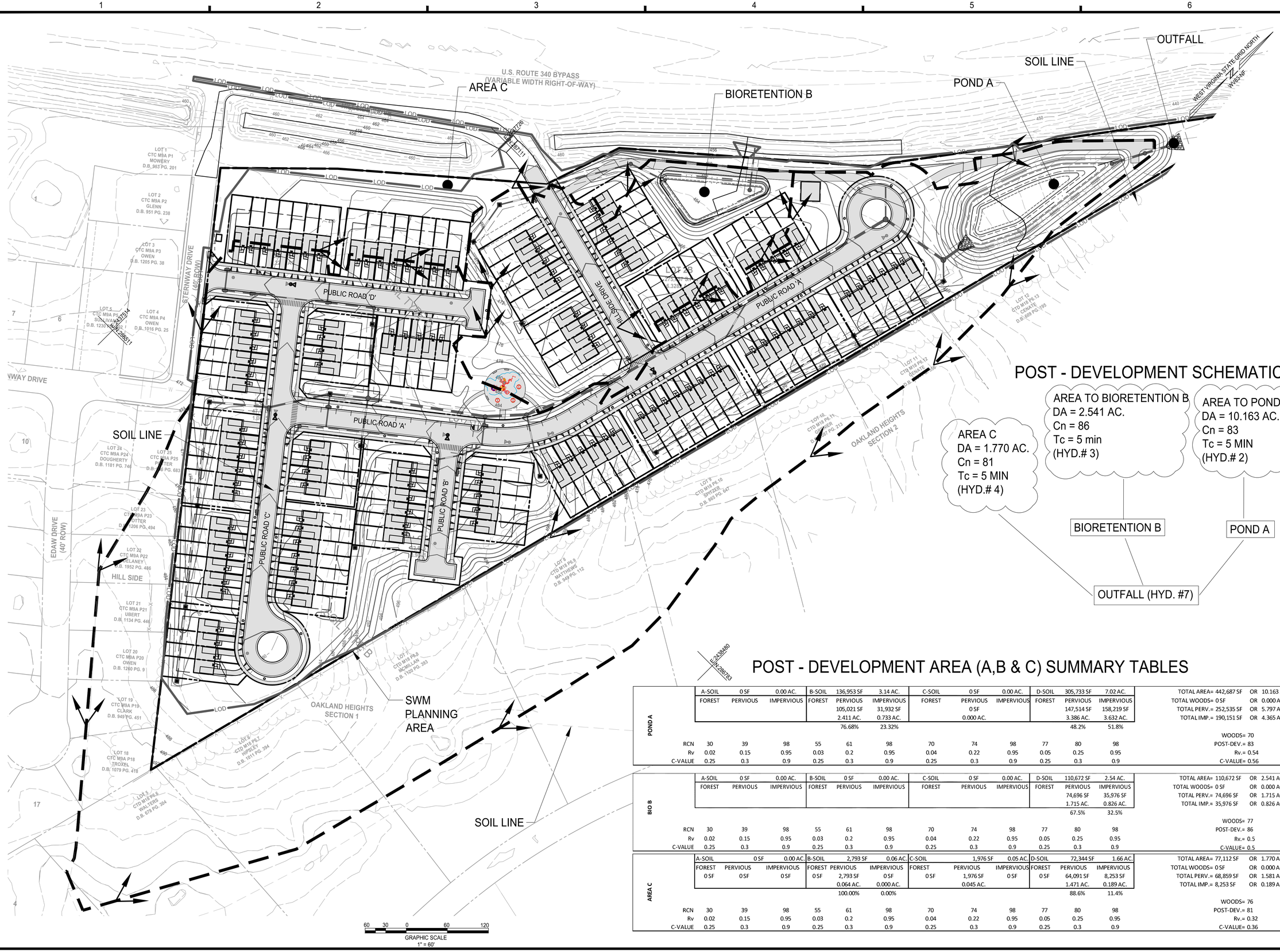
SHEET TITLE:

SWM
PRE-DEVELOPED
DRAINAGE AREA
MAP

SHEET No.

C601

P:\Projects\22063\001\001112742 Prelim Subdivision - Land Development Plan\C601 SWM PRE-DEVELOPED DRAINAGE AREA MAP.dwg, 4/7/2024 8:51:33 PM, Miranda Tison,


AREA C
U.S. ROUTE 340 BYPASS
(VARIABLE WIDTH RIGHT-OF-WAY)
BIORETENTION B
POND A
SOIL LINE
OUTFALL
WEST VIRGINIA STATE GRID NORTH
W-WEST
N-NORTH
PUBLIC ROAD 'A'
PUBLIC ROAD 'B'
PUBLIC ROAD 'C'
PUBLIC ROAD 'D'
HILLSIDE DRIVE
STERNWAY DRIVE (40' ROW)
EDAW DRIVE (40' ROW)
HILL SIDE
OAKLAND HEIGHTS SECTION 1
OAKLAND HEIGHTS SECTION 2
SOIL LINE
SWM PLANNING AREA
SOIL LINE
LOD
LOT 1 CTC M9A P1 MOWERY D.B. 963 PG. 201
LOT 2 CTC M9A P2 GLENN D.B. 951 PG. 238
LOT 3 CTC M9A P3 OWEN D.B. 1205 PG. 38
LOT 4 CTC M9A P4 OWEN D.B. 1016 PG. 25
LOT 5 CTC M9A P5 SULLIVAN D.B. 1230 PG. 2
LOT 22 CTC M9A P22 CLANEY D.B. 1952 PG. 486
LOT 21 CTC M9A P21 UBERT D.B. 1134 PG. 446
LOT 20 CTC M9A P20 OWEN D.B. 1260 PG. 9
LOT 19 CTC M9A P19 CLARK D.B. 949 PG. 451
LOT 18 CTC M9A P18 TROXEL D.B. 1079 PG. 418
LOT 23 CTC M9A P23 CARTER D.B. 1206 PG. 494
LOT 24 CTC M9A P24 DOUGHERTY D.B. 1181 PG. 746
LOT 25 CTC M9A P25 CARTER D.B. 1206 PG. 683
LOT 2B
LOT 12 CTD M18 P6.13 CENATE D.B. 669 PG. 195
LOT 11 CTD M18 P6.12 BENATE
LOT 40 CTD M18 P4.1K SPITZER D.B. 1147 PG. 313
LOT 9 CTD M18 P4.10 SPITZER D.B. 885 PG. 647
LOT 8 CTD M18 P6.9 MATTHEWS D.B. 949 PG. 112
LOT 7 CTD M18 P6.8 MCMILLAN D.B. 1120 PG. 393
LOT 6 CTD M18 P6.7 HINSLEY D.B. 1011 PG. 394
LOT 5 CTD M18 P6.6 WALTERS D.B. 678 PG. 304
N437514 E1438680
N437514 E1438680
N437514 E1438680

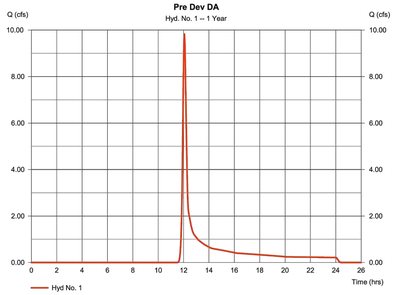
## Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Monday, 10 / 16 / 2023

**Hyd. No. 1**

Pre Dev DA

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 9.826 cfs |
| Storm frequency | = 1 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 30,377 cuft |
| Drainage area | = 14.474 ac | Curve number | = 75 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 15.90 min |
| Total precip. | = 2.40 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |



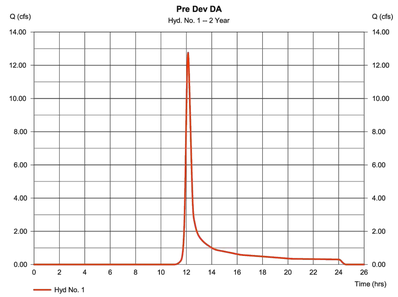

## Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 1**

Pre Dev DA

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 12.76 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.13 hrs |
| Time interval | = 2 min | Hyd. volume | = 47,233 cuft |
| Drainage area | = 14.474 ac | Curve number | = 75 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 20.90 min |
| Total precip. | = 2.88 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |



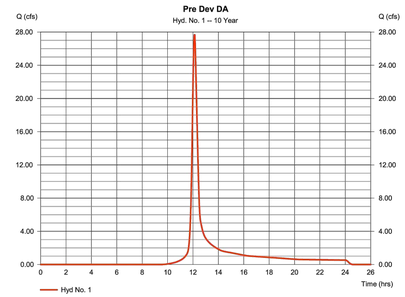

## Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 1**

Pre Dev DA

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 27.67 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.13 hrs |
| Time interval | = 2 min | Hyd. volume | = 97,231 cuft |
| Drainage area | = 14.474 ac | Curve number | = 75 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 20.90 min |
| Total precip. | = 4.20 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |



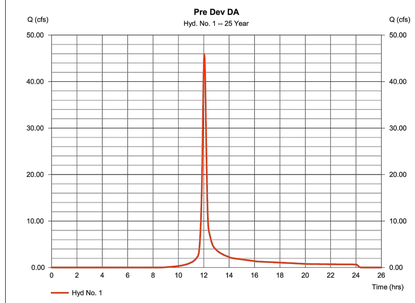

## Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Monday, 10 / 16 / 2023

**Hyd. No. 1**

Pre Dev DA

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 45.88 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.03 hrs |
| Time interval | = 2 min | Hyd. volume | = 128,801 cuft |
| Drainage area | = 14.474 ac | Curve number | = 75 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 15.90 min |
| Total precip. | = 5.08 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |




# EXISTING $T_C$ COMPUTATION

## TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

**Hyd. No. 1**

Pre Dev DA

| Description | A | B | C | Totals |
|---|---|---|---|---|
| **Sheet Flow** | | | | |
| Manning's n-value | = 0.150 | 0.011 | 0.011 | |
| Flow length (ft) | = 100.0 | 0.0 | 0.0 | |
| Two-year 24-hr precip. (in) | = 2.88 | 0.00 | 0.00 | |
| Land slope (%) | = 6.63 | 0.00 | 0.00 | |
| **Travel Time (min)** | **= 6.39 +** | **0.00 +** | **0.00 =** | **6.39** |
| **Shallow Concentrated Flow** | | | | |
| Flow length (ft) | = 827.00 | 0.00 | 0.00 | |
| Watercourse slope (%) | = 1.89 | 0.00 | 0.00 | |
| Surface description | = Unpaved | Paved | Paved | |
| Average velocity (ft/s) | =2.22 | 0.00 | 0.00 | |
| **Travel Time (min)** | **= 6.21 +** | **0.00 +** | **0.00 =** | **6.21** |
| **Channel Flow** | | | | |
| X sectional flow area (sqft) | = 4.50 | 0.00 | 0.00 | |
| Wetted perimeter (ft) | = 10.24 | 0.00 | 0.00 | |
| Channel slope (%) | = 1.25 | 0.00 | 0.00 | |
| Manning's n-value | = 0.013 | 0.015 | 0.015 | |
| Velocity (ft/s) | =7.39 | | | |
| | | 0.00 | | |
| | | | 0.00 | |
| Flow length (ft) | ({0})1466.0 | 0.0 | 0.0 | |
| **Travel Time (min)** | **= 3.31 +** | **0.00 +** | **0.00 =** | **3.31** |
| **Total Travel Time, Tc** ..... | | | | **15.92 min** |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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SWM
PRE-DEVELOPED
HYDROGRAPHS

SHEET No.

C610

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C610 SWM PRE-DEVELOPED HYDROGRAPHS.dwg, 4/7/2024 8:53:18 PM, Miranda Tison,

## Hydrograph Report

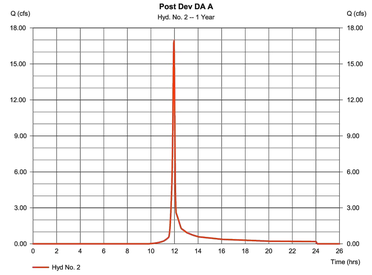
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 2**

Post Dev DA A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 16.94 cfs |
| Storm frequency | = 1 yrs | Time to peak | = 11.97 hrs |
| Time interval | = 2 min | Hyd. volume | = 33,926 cuft |
| Drainage area | = 10.163 ac | Curve number | = 83* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 2.40 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.840 x 55) + (4.440 x 61) + (6.280 x 80) + (0.780 x 98) + (3.240 x 98)] / 10.163



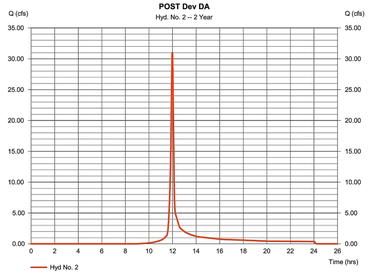

## Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 2**

POST Dev DA

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 30.99 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 11.97 hrs |
| Time interval | = 2 min | Hyd. volume | = 70,961 cuft |
| Drainage area | = 14.474 ac | Curve number | = 83 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 8.00 min |
| Total precip. | = 2.88 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |




## Hydrograph Report

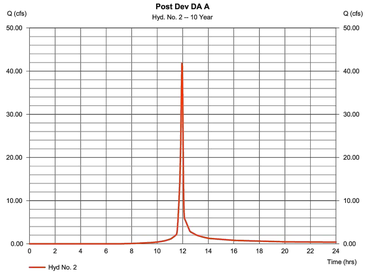
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 18 / 2023

**Hyd. No. 2**

Post Dev DA A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 41.79 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 85,105 cuft |
| Drainage area | = 10.163 ac | Curve number | = 83* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 4.20 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.840 x 55) + (4.440 x 61) + (6.280 x 80) + (0.780 x 98) + (3.240 x 98)] / 10.163




## Hydrograph Report

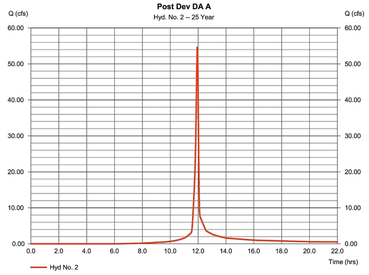
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 2**

Post Dev DA A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 54.60 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 112,286 cuft |
| Drainage area | = 10.163 ac | Curve number | = 83* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.08 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.840 x 55) + (4.440 x 61) + (6.280 x 80) + (0.780 x 98) + (3.240 x 98)] / 10.163




## Hydrograph Report

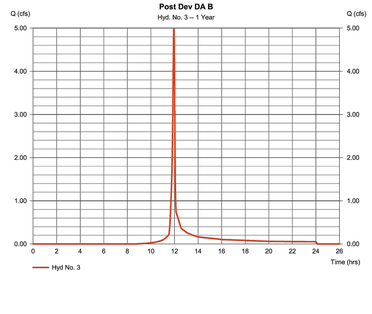
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 3**

Post Dev DA B

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 4.978 cfs |
| Storm frequency | = 1 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 10,051 cuft |
| Drainage area | = 2.541 ac | Curve number | = 86* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 2.40 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.230 x 55) + (0.310 x 61) + (1.300 x 80) + (0.790 x 98)] / 2.541




## Hydrograph Report

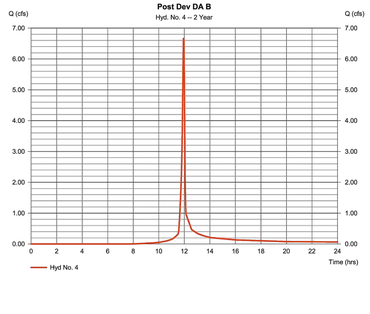
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 4**

Post Dev DA B

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 6.661 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 13,491 cuft |
| Drainage area | = 2.541 ac | Curve number | = 86* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 2.88 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.230 x 55) + (0.310 x 61) + (1.300 x 80) + (0.790 x 98)] / 2.541




## Hydrograph Report

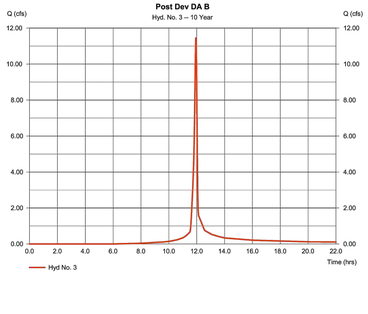
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Friday, 10 / 20 / 2023

**Hyd. No. 3**

Post Dev DA B

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 11.45 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 23,591 cuft |
| Drainage area | = 2.541 ac | Curve number | = 86* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 4.20 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.230 x 55) + (0.310 x 61) + (1.300 x 80) + (0.790 x 98)] / 2.541




## Hydrograph Report

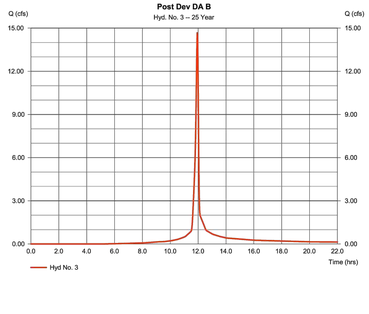
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 3**

Post Dev DA B

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 14.67 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 30,627 cuft |
| Drainage area | = 2.541 ac | Curve number | = 86* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.08 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.230 x 55) + (0.310 x 61) + (1.300 x 80) + (0.790 x 98)] / 2.541




## Hydrograph Report

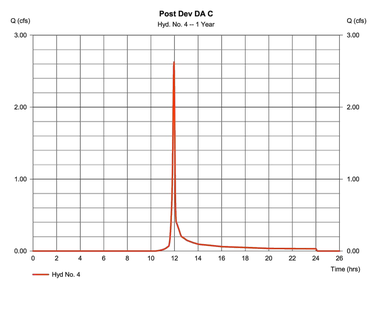
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 4**

Post Dev DA C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 2.626 cfs |
| Storm frequency | = 1 yrs | Time to peak | = 11.97 hrs |
| Time interval | = 2 min | Hyd. volume | = 5,251 cuft |
| Drainage area | = 1.770 ac | Curve number | = 81* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 2.40 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.827 x 98) + (5.986 x 80)] / 1.770




## Hydrograph Report

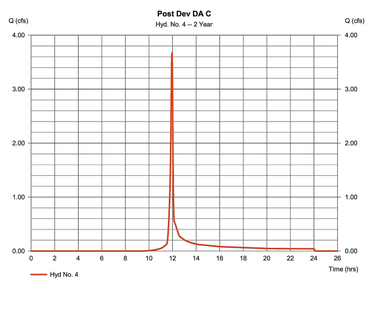
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 18 / 2023

**Hyd. No. 4**

Post Dev DA C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 3.670 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 11.97 hrs |
| Time interval | = 2 min | Hyd. volume | = 7,360 cuft |
| Drainage area | = 1.770 ac | Curve number | = 81* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 2.88 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.827 x 98) + (5.986 x 80)] / 1.770




## Hydrograph Report

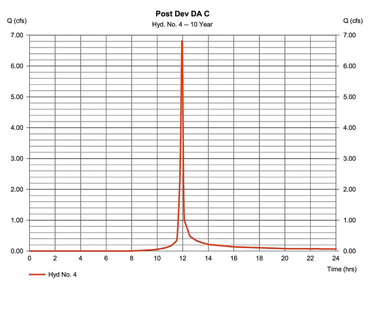
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 4**

Post Dev DA C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 6.810 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 13,798 cuft |
| Drainage area | = 1.770 ac | Curve number | = 81* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 4.20 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.827 x 98) + (5.986 x 80)] / 1.770




## Hydrograph Report

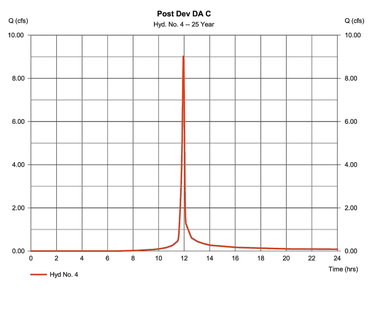
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 4**

Post Dev DA C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 9.017 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 18,409 cuft |
| Drainage area | = 1.770 ac | Curve number | = 81* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.08 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.827 x 98) + (5.986 x 80)] / 1.770

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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SWM POST-DEVELOPED HYDROGRAPHS AREA A

SHEET No.

C620

P:\Projects\22063\001\001112742 Prelim Subdivision - Land Development Plan\C620 SWM POST-DEVELOPED HYDROGRAPHS AREA A.dwg, 4/7/2024 8:53:40 PM, Miranda Tison,

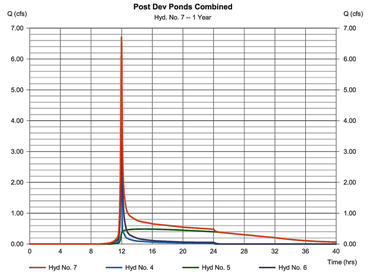
## CONTROLLED 1-YEAR

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 7**

Post Dev Ponds Combined

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 6.710 cfs |
| Storm frequency | = 1 yrs | Time to peak | = 11.97 hrs |
| Time interval | = 2 min | Hyd. volume | = 49,196 cuft |
| Inflow hyds. | = 4, 5, 6 | Contrib. drain. area | = 1.770 ac |



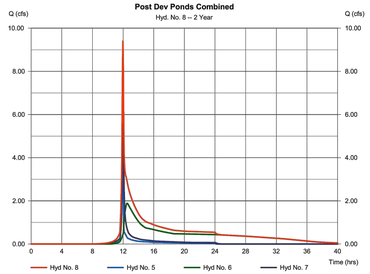

## CONTROLLED 2-YEAR

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 8**

Post Dev Ponds Combined

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 9.397 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 11.97 hrs |
| Time interval | = 2 min | Hyd. volume | = 67,488 cuft |
| Inflow hyds. | = 5, 6, 7 | Contrib. drain. area | = 1.770 ac |



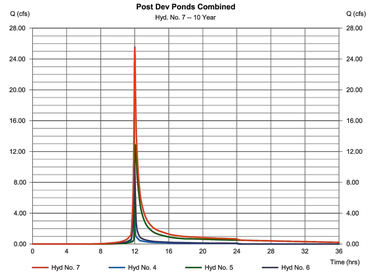

## CONTROLLED 10-YEAR

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 7**

Post Dev Ponds Combined

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 25.55 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.00 hrs |
| Time interval | = 2 min | Hyd. volume | = 122,462 cuft |
| Inflow hyds. | = 4, 5, 6 | Contrib. drain. area | = 1.770 ac |



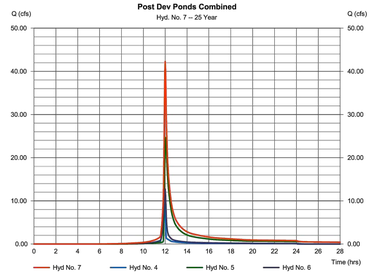

## CONTROLLED 25-YEAR

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 7**

Post Dev Ponds Combined

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 42.28 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.00 hrs |
| Time interval | = 2 min | Hyd. volume | = 161,289 cuft |
| Inflow hyds. | = 4, 5, 6 | Contrib. drain. area | = 1.770 ac |



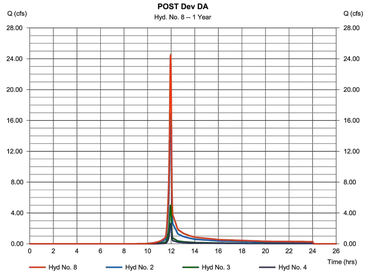

## UNCONTROLLED 1-YEAR

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 8**

POST Dev DA

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 24.53 cfs |
| Storm frequency | = 1 yrs | Time to peak | = 11.97 hrs |
| Time interval | = 2 min | Hyd. volume | = 49,228 cuft |
| Inflow hyds. | = 2, 3, 4 | Contrib. drain. area | = 14.474 ac |



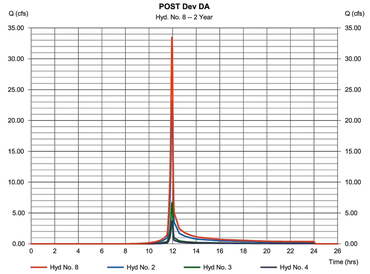

## UNCONTROLLED 2-YEAR

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 18 / 2023

**Hyd. No. 8**

POST Dev DA

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 33.43 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 67,563 cuft |
| Inflow hyds. | = 2, 3, 4 | Contrib. drain. area | = 14.474 ac |



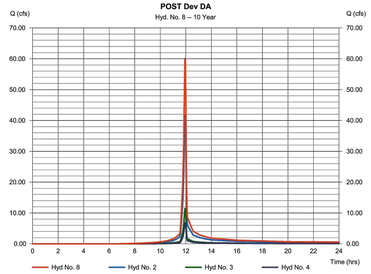

## UNCONTROLLED 10-YEAR

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 8**

POST Dev DA

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 60.05 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 122,494 cuft |
| Inflow hyds. | = 2, 3, 4 | Contrib. drain. area | = 14.474 ac |



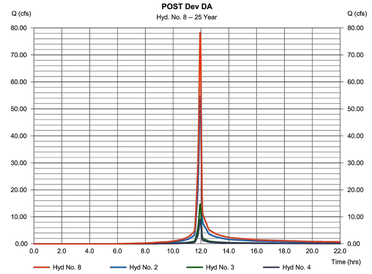

## UNCONTROLLED 25-YEAR

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 8**

POST Dev DA

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 78.29 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 161,321 cuft |
| Inflow hyds. | = 2, 3, 4 | Contrib. drain. area | = 14.474 ac |

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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

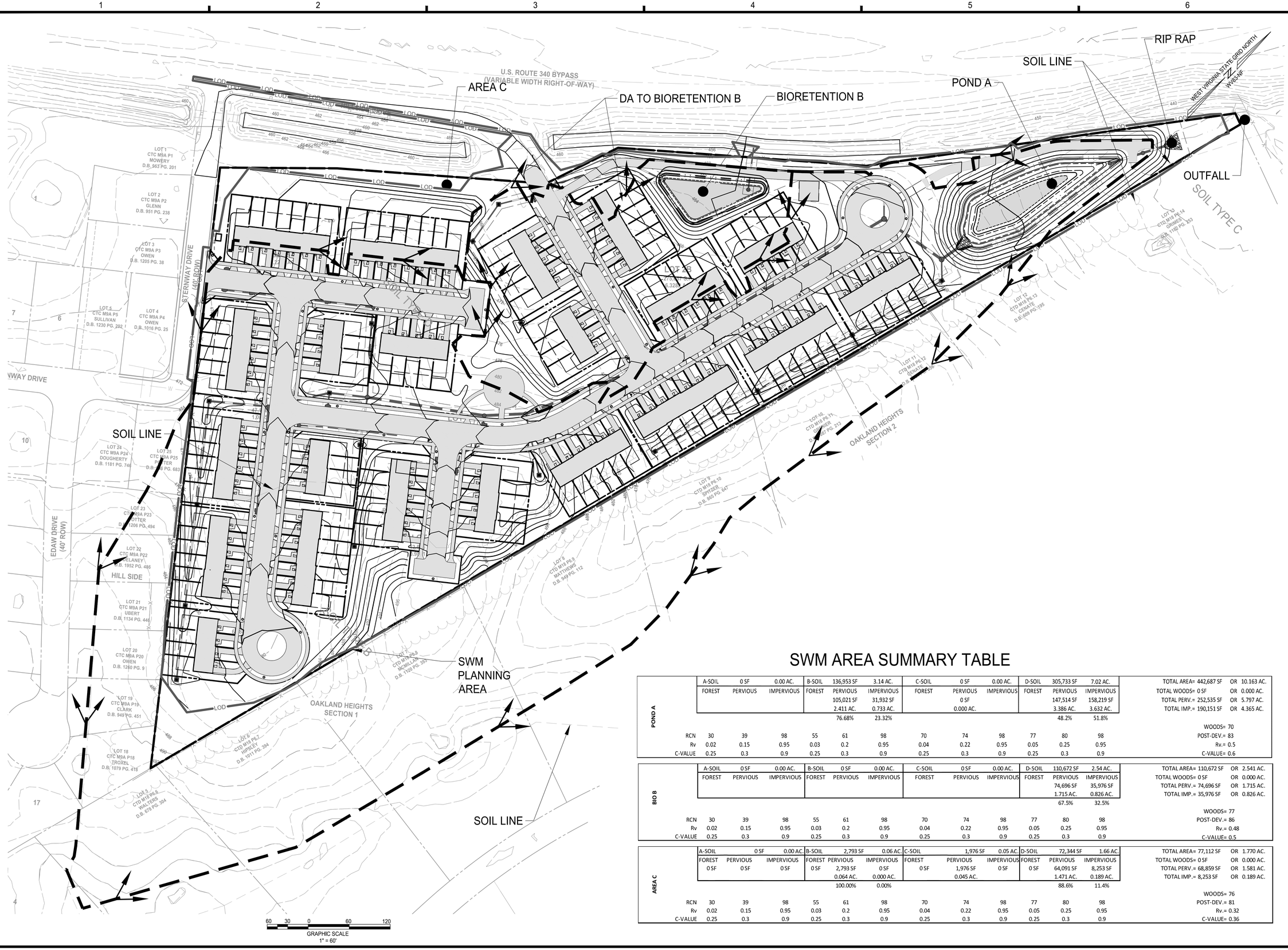
SHEET TITLE:

SWM POST-DEVELOPED HYDROGRAPHS AREA B

SHEET No.

C621

P:\Projects\22063\001\001112742 Prelim Subdivision - Land Development Plan\C621 SWM POST-DEVELOPED HYDROGRAPHS AREA B.dwg, 4/7/2024 8:54:09 PM, Miranda Tison,




## SWM AREA SUMMARY TABLE

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POND A | A-SOIL | 0 SF | 0.00 AC. | B-SOIL | 136,953 SF | 3.14 AC. | C-SOIL | 0 SF | 0.00 AC. | D-SOIL | 305,733 SF | 7.02 AC. | TOTAL AREA= | 442,687 SF | OR 10.163 AC. |
| | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | TOTAL WOODS= | 0 SF | OR 0.000 AC. |
| | | | | | 105,021 SF | 31,932 SF | | 0 SF | | | 147,514 SF | 158,219 SF | TOTAL PERV.= | 252,535 SF | OR 5.797 AC. |
| | | | | | 2.411 AC. | 0.733 AC. | | 0.000 AC. | | | 3.386 AC. | 3.632 AC. | TOTAL IMP.= | 190,151 SF | OR 4.365 AC. |
| | | | | | 76.68% | 23.32% | | | | | 48.2% | 51.8% | | | |
| | | | | | | | | | | | | | WOODS= | 70 | |
| RCN | 30 | 39 | 98 | 55 | 61 | 98 | 70 | 74 | 98 | 77 | 80 | 98 | POST-DEV.= | 83 | |
| Rv | 0.02 | 0.15 | 0.95 | 0.03 | 0.2 | 0.95 | 0.04 | 0.22 | 0.95 | 0.05 | 0.25 | 0.95 | Rv.= | 0.5 | |
| C-VALUE | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | C-VALUE= | 0.6 | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIO B | A-SOIL | 0 SF | 0.00 AC. | B-SOIL | 0 SF | 0.00 AC. | C-SOIL | 0 SF | 0.00 AC. | D-SOIL | 110,672 SF | 2.54 AC. | TOTAL AREA= | 110,672 SF | OR 2.541 AC. |
| | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | TOTAL WOODS= | 0 SF | OR 0.000 AC. |
| | | | | | | | | | | | 74,696 SF | 35,976 SF | TOTAL PERV.= | 74,696 SF | OR 1.715 AC. |
| | | | | | | | | | | | 1.715 AC. | 0.826 AC. | TOTAL IMP.= | 35,976 SF | OR 0.826 AC. |
| | | | | | | | | | | | 67.5% | 32.5% | | | |
| | | | | | | | | | | | | | WOODS= | 77 | |
| RCN | 30 | 39 | 98 | 55 | 61 | 98 | 70 | 74 | 98 | 77 | 80 | 98 | POST-DEV.= | 86 | |
| Rv | 0.02 | 0.15 | 0.95 | 0.03 | 0.2 | 0.95 | 0.04 | 0.22 | 0.95 | 0.05 | 0.25 | 0.95 | Rv.= | 0.48 | |
| C-VALUE | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | C-VALUE= | 0.5 | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AREA C | A-SOIL | 0 SF | 0.00 AC. | B-SOIL | 2,793 SF | 0.06 AC. | C-SOIL | 1,976 SF | 0.05 AC. | D-SOIL | 72,344 SF | 1.66 AC. | TOTAL AREA= | 77,112 SF | OR 1.770 AC. |
| | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | TOTAL WOODS= | 0 SF | OR 0.000 AC. |
| | 0 SF | 0 SF | 0 SF | 0 SF | 2,793 SF | 0 SF | 0 SF | 1,976 SF | 0 SF | 0 SF | 64,091 SF | 8,253 SF | TOTAL PERV.= | 68,859 SF | OR 1.581 AC. |
| | | | | | 0.064 AC. | 0.000 AC. | | 0.045 AC. | | | 1.471 AC. | 0.189 AC. | TOTAL IMP.= | 8,253 SF | OR 0.189 AC. |
| | | | | | 100.00% | 0.00% | | | | | 88.6% | 11.4% | | | |
| | | | | | | | | | | | | | WOODS= | 76 | |
| RCN | 30 | 39 | 98 | 55 | 61 | 98 | 70 | 74 | 98 | 77 | 80 | 98 | POST-DEV.= | 81 | |
| Rv | 0.02 | 0.15 | 0.95 | 0.03 | 0.2 | 0.95 | 0.04 | 0.22 | 0.95 | 0.05 | 0.25 | 0.95 | Rv.= | 0.32 | |
| C-VALUE | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | C-VALUE= | 0.36 | |

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# PRELIM PLAN - SWM BMP MAP

691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SWM BMP MAP

SHEET No.

C630

P:\Projects\22063\001\00100\112742 Prelim Subdivision - Land Development Plan\C630 SWM BMP MAP.dwg, 4/7/2024 8:55:37 PM, Miranda Tison,

| Project Name: | Hillside |
|---|---|
| Date: | 8/1/2023 |

*BMP Design Specifications List:* 2013 Draft Stds & Specs

CLEAR ALL *(Ctrl+Shift+R)*

data input cells
constant values
calculation cells
final results

# Site Information

## Post-Development Project (Treatment Volume and Loads)

### Land Cover (acres)

| | A Soils | B Soils | C Soils | D Soils | Totals |
|---|---|---|---|---|---|
| **Forest/Open Space (acres)** -- undisturbed, protected forest/open space or reforested | | | | | 0.00 |
| **Managed Turf (acres)** -- disturbed, graded for yards or other turf to be | | 2.48 | 0.05 | 6.57 | 9.09 |
| **Impervious Cover (acres)** | | 0.73 | | 4.65 | 5.38 |
| | | | | | 14.47 |

### Constants

| | |
|---|---|
| Annual Rainfall (inches) | 43 |
| Target Rainfall Event (inches) | 1.00 |
| Total Phosphorus (TP) EMC (mg/L) | 0.26 |
| Total Nitrogen (TN) EMC (mg/L) | 1.86 |
| Target TP Load (lb/acre/yr) | 0.41 |
| Pj (unitless correction factor) | 0.90 |

### Runoff Coefficients (Rv)

| | A Soils | B Soils | C Soils | D Soils |
|---|---|---|---|---|
| Forest/Open Space | 0.02 | 0.03 | 0.04 | 0.05 |
| Managed Turf | 0.15 | 0.20 | 0.22 | 0.25 |
| Impervious Cover | 0.95 | 0.95 | 0.95 | 0.95 |

### Post-Development Requirement for Site Area

| TP Load Reduction Required (lb/yr) | 10.62 |
|---|---|

### LAND COVER SUMMARY -- POST DEVELOPMENT

| Land Cover Summary | |
|---|---|
| Forest/Open Space Cover (acres) | 0.00 |
| Weighted Rv (forest) | 0.00 |
| % Forest | 0% |
| Managed Turf Cover (acres) | 9.09 |
| Weighted Rv (turf) | 0.24 |
| % Managed Turf | 63% |
| Impervious Cover (acres) | 5.38 |
| Rv (impervious) | 0.95 |
| % Impervious | 37% |
| Site Area (acres) | **14.47** |
| Site Rv | **0.50** |

| Treatment Volume and Nutrient Loads | |
|---|---|
| **Treatment Volume (acre-ft)** | 0.6050 |
| **Treatment Volume (cubic feet)** | 26,354 |
| **TP Load (lb/yr)** | 16.56 |
| **TN Load (lb/yr) (Informational Purposes Only)** | 118.46 |

**BMP Selections**

| Practice | Managed Turf Credit Area (acres) | Impervious Cover Credit Area (acres) | BMP Treatment Volume (ft³) | TP Load from Upstream Practices (lbs) | Untreated TP Load to Practice (lbs) | TP Removed (lb/yr) | TP Remaining (lb/yr) | Downstream Treatment to be Employed |
|---|---|---|---|---|---|---|---|---|
| **6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9)** | **1.715** | **0.826** | **4,404.82** | **0.00** | **2.76** | **1.52** | **1.24** | |

| | |
|---|---|
| **Total Impervious Cover Treated (acres)** | 0.83 |
| **Total Turf Area Treated (acres)** | 1.72 |
| **Total TP Load Reduction Achieved in D.A. (lb/yr)** | 1.52 |
| **Total TN Load Reduction Achieved in D.A. (lb/yr)** | 12.66 |

**DEQ Virginia Runoff Reduction Method New Development Compliance Spreadsheet - Version 3.0**

*BMP Design Specifications List:* **2013 Draft Stds & Specs**

Update Summary Sheet

Print Preview | Print

### Site Summary

Project Title: Hillside
Date: 45139

**Total Rainfall = 43 inches**

### Site Land Cover Summary

| | A soils | B Soils | C Soils | D Soils | Totals | % of Total |
|---|---|---|---|---|---|---|
| **Forest/Open (acres)** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 |
| **Managed Turf (acres)** | 0.00 | 2.48 | 0.05 | 6.57 | 9.09 | 63 |
| **Impervious Cover (acres)** | 0.00 | 0.73 | 0.00 | 4.65 | 5.38 | 37 |
| | | | | | 14.47 | 100 |

### Site Tv and Land Cover Nutrient Loads

| | |
|---|---|
| **Site Rv** | 0.50 |
| **Treatment Volume (ft³)** | 26,354 |
| **TP Load (lb/yr)** | 16.56 |
| **TN Load (lb/yr)** | 118.46 |
| **Total TP Load Reduction Required (lb/yr)** | 10.62 |

### Site Compliance Summary

| | |
|---|---|
| **Total Runoff Volume Reduction (ft³)** | 1,762 |
| **Total TP Load Reduction Achieved (lb/yr)** | 10.88 |
| **Total TN Load Reduction Achieved (lb/yr)** | 39.43 |
| **Remaining Post Development TP Load (lb/yr)** | 5.68 |
| **Remaining TP Load Reduction (lb/yr) Required** | 0.00 |

** TARGET TP REDUCTION EXCEEDED BY 0.25 LB/YEAR **

### Drainage Area Summary

| | D.A. A | D.A. B | D.A. C | D.A. D | D.A. E | Total |
|---|---|---|---|---|---|---|
| **Forest/Open (acres)** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Managed Turf (acres)** | 5.80 | 1.72 | 0.00 | 0.00 | 0.00 | 7.51 |
| **Impervious Cover (acres)** | 4.37 | 0.83 | 0.00 | 0.00 | 0.00 | 5.19 |
| **Total Area (acres)** | **10.16** | **2.54** | **0.00** | **0.00** | **0.00** | **12.70** |

### Drainage Area Compliance Summary

| | D.A. A | D.A. B | D.A. C | D.A. D | D.A. E | Total |
|---|---|---|---|---|---|---|
| **TP Load Reduced (lb/yr)** | 9.36 | 1.52 | 0.00 | 0.00 | 0.00 | 10.88 |
| **TN Load Reduced (lb/yr)** | 26.77 | 12.66 | 0.00 | 0.00 | 0.00 | 39.43 |

### Drainage Area A Summary

**Land Cover Summary**

| | A Soils | B Soils | C Soils | D Soils | Total | % of Total |
|---|---|---|---|---|---|---|
| **Forest/Open (acres)** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 |
| **Managed Turf (acres)** | 0.00 | 2.41 | 0.00 | 3.39 | 5.80 | 57 |
| **Impervious Cover (acres)** | 0.00 | 0.73 | 0.00 | 3.63 | 4.37 | 43 |
| | | | | | **10.16** | |

**BMP Selections**

| Practice | Managed Turf Credit Area (acres) | Impervious Cover Credit Area (acres) | BMP Treatment Volume (ft³) | TP Load from Upstream Practices (lbs) | Untreated TP Load to Practice (lbs) | TP Removed (lb/yr) | TP Remaining (lb/yr) | Downstream Treatment to be Employed |
|---|---|---|---|---|---|---|---|---|
| **13.a. Wet Pond #1 (Spec #14)** | **5.797** | **4.365** | **19,875.88** | **0.00** | **12.47** | **6.24** | **6.24** | **14.b. MTD - Filtering** |
| **14.b. Manufactured Treatment Device-Filtering** | | | **19,875.88** | **6.24** | **0.00** | **3.12** | **3.12** | |

| | |
|---|---|
| **Total Impervious Cover Treated (acres)** | 4.37 |
| **Total Turf Area Treated (acres)** | 5.80 |
| **Total TP Load Reduction Achieved in D.A. (lb/yr)** | 9.36 |
| **Total TN Load Reduction Achieved in D.A. (lb/yr)** | 26.77 |

### Drainage Area B Summary

**Land Cover Summary**

| | A Soils | B Soils | C Soils | D Soils | Total | % of Total |
|---|---|---|---|---|---|---|
| **Forest/Open (acres)** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 |
| **Managed Turf (acres)** | 0.00 | 0.00 | 0.00 | 1.72 | 1.72 | 67 |
| **Impervious Cover (acres)** | 0.00 | 0.00 | 0.00 | 0.83 | 0.83 | 33 |
| | | | | | **2.54** | |

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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SWM BMP COMPUTATIONS

SHEET No.

C640

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C640 SWM BMP COMPUTATIONS.dwg, 4/7/2024 8:56:21 PM, Miranda Tison,

## Drainage Area A

**Drainage Area A Land Cover (acres)**

CLEAR BMP AREAS

| | A Soils | B Soils | C Soils | D Soils | Totals | Land Cover Rv |
|---|---|---|---|---|---|---|
| Forest/Open Space (acres) | | | | | 0.00 | 0.00 |
| Managed Turf (acres) | | 2.41 | | 3.39 | 5.80 | 0.23 |
| Impervious Cover (acres) | | 0.73 | | 3.63 | 4.37 | 0.95 |
| | | | | Total | 10.16 | |

| | |
|---|---|
| Total Phosphorus Available for Removal in D.A. A (lb/yr) | 12.49 |
| Post Development Treatment Volume in D.A. A ($ft^3$) | 19,876 |

### Stormwater Best Management Practices (RR = Runoff Reduction)

--Select from dropdown lists-

| Practice | Runoff Reduction Credit (%) | Managed Turf Credit Area (acres) | Impervious Cover Credit Area (acres) | Volume from Upstream Practice ($ft^3$) | Runoff Reduction ($ft^3$) | Remaining Runoff Volume ($ft^3$) | Total BMP Treatment Volume ($ft^3$) | Phosphorus Removal Efficiency (%) | Phosphorus Load from Upstream Practices (lb) | Untreated Phosphorus Load to Practice (lb) | Phosphorus Removed By Practice (lb) | Remaining Phosphorus Load (lb) | Downstream Practice to be Employed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **13. Wet Ponds (no RR)** | | | | | | | | | | | | | |
| 13.a. Wet Pond #1 (Spec #14) | 0 | 5.80 | 4.37 | 0 | 0 | 19,876 | 19,876 | 50 | 0.00 | 12.47 | 6.24 | 6.24 | 14.b. MTD - Filtering |
| 13.b. Wet Pond #1 (Coastal Plain) (Spec #14) | 0 | | | 0 | 0 | 0 | 0 | 45 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 13.c. Wet Pond #2 (Spec #14) | 0 | | | 0 | 0 | 0 | 0 | 75 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 13.d. Wet Pond #2 (Coastal Plain) (Spec #14) | 0 | | | 0 | 0 | 0 | 0 | 65 | 0.00 | 0.00 | 0.00 | 0.00 | |
| **14. Manufactured Treatment Devices (no RR)** | | | | | | | | | | | | | |
| 14.a. Manufactured Treatment Device-Hydrodynamic | 0 | | | 0 | 0 | 0 | 0 | 20 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 14.b. Manufactured Treatment Device-Filtering | 0 | | | 19,876 | 0 | 19,876 | 19,876 | 50 | 6.24 | 0.00 | 3.12 | 3.12 | |
| 14.c. Manufactured Treatment Device-Generic | 0 | | | 0 | 0 | 0 | 0 | 20 | 0.00 | 0.00 | 0.00 | 0.00 | |

## Drainage Area B

**Drainage Area A Land Cover (acres)**

CLEAR BMP AREAS

| | A Soils | B Soils | C Soils | D Soils | Totals | Land Cover Rv |
|---|---|---|---|---|---|---|
| Forest/Open Space (acres) | | | | | 0.00 | 0.00 |
| Managed Turf (acres) | | | | 1.72 | 1.72 | 0.25 |
| Impervious Cover (acres) | | | | 0.83 | 0.83 | 0.95 |
| | | | | Total | 2.54 | |

| | |
|---|---|
| Total Phosphorus Available for Removal in D.A. B (lb/yr) | 2.77 |
| Post Development Treatment Volume in D.A. B ($ft^3$) | 4,405 |

### Stormwater Best Management Practices (RR = Runoff Reduction)

--Select from dropdown lists-

| Practice | Runoff Reduction Credit (%) | Managed Turf Credit Area (acres) | Impervious Cover Credit Area (acres) | Volume from Upstream Practice ($ft^3$) | Runoff Reduction ($ft^3$) | Remaining Runoff Volume ($ft^3$) | Total BMP Treatment Volume ($ft^3$) | Phosphorus Removal Efficiency (%) | Phosphorus Load from Upstream Practices (lb) | Untreated Phosphorus Load to Practice (lb) | Phosphorus Removed By Practice (lb) | Remaining Phosphorus Load (lb) | Downstream Practice to be Employed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **6. Bioretention (RR)** | | | | | | | | | | | | | |
| 6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9) | 40 | 1.72 | 0.83 | 0 | 1,762 | 2,643 | 4,405 | 25 | 0.00 | 2.76 | 1.52 | 1.24 | |
| 6.b. Bioretention #2 or Micro-Bioretention #2 (Spec #9) | 80 | | | 0 | 0 | 0 | 0 | 50 | 0.00 | 0.00 | 0.00 | 0.00 | |

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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SWM BMP COMPUTATIONS

SHEET No.

C641

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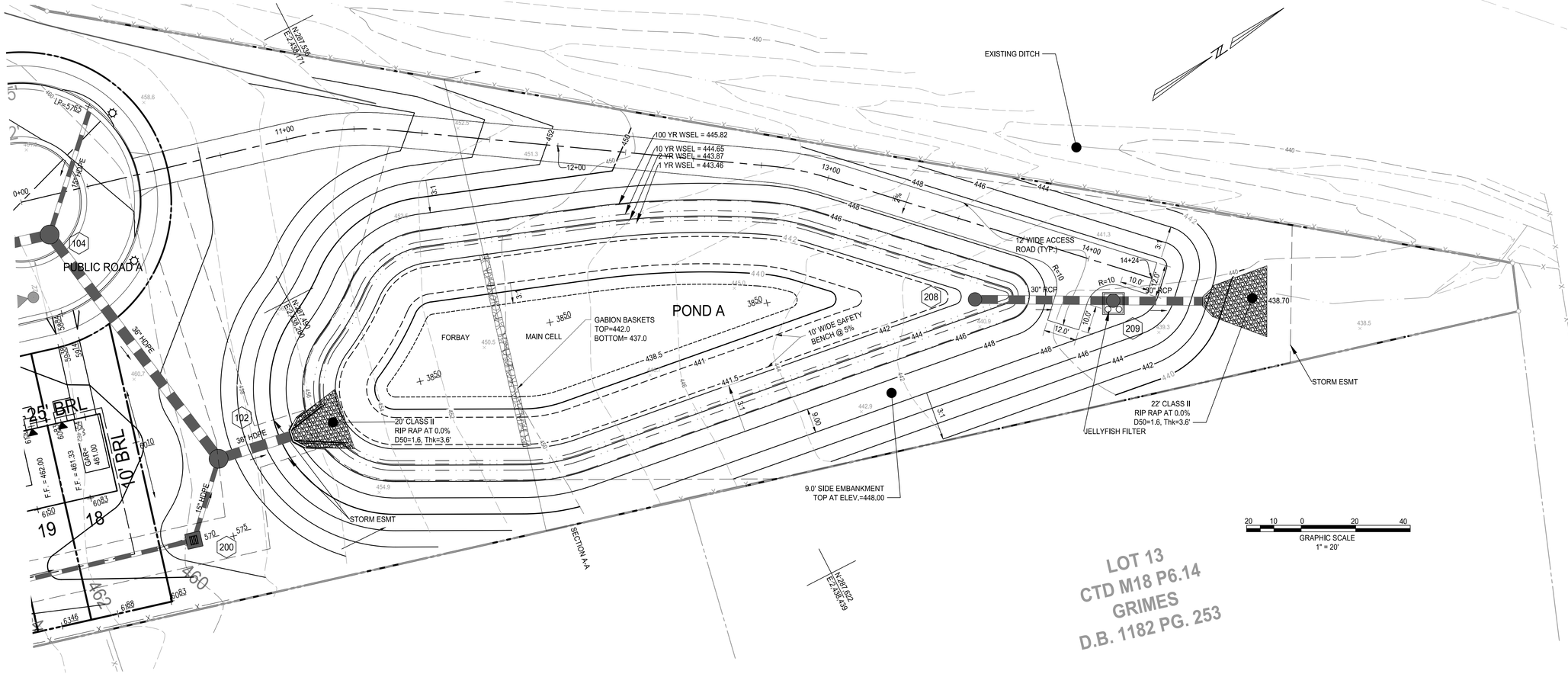


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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SWM POND A

SHEET No.

C650

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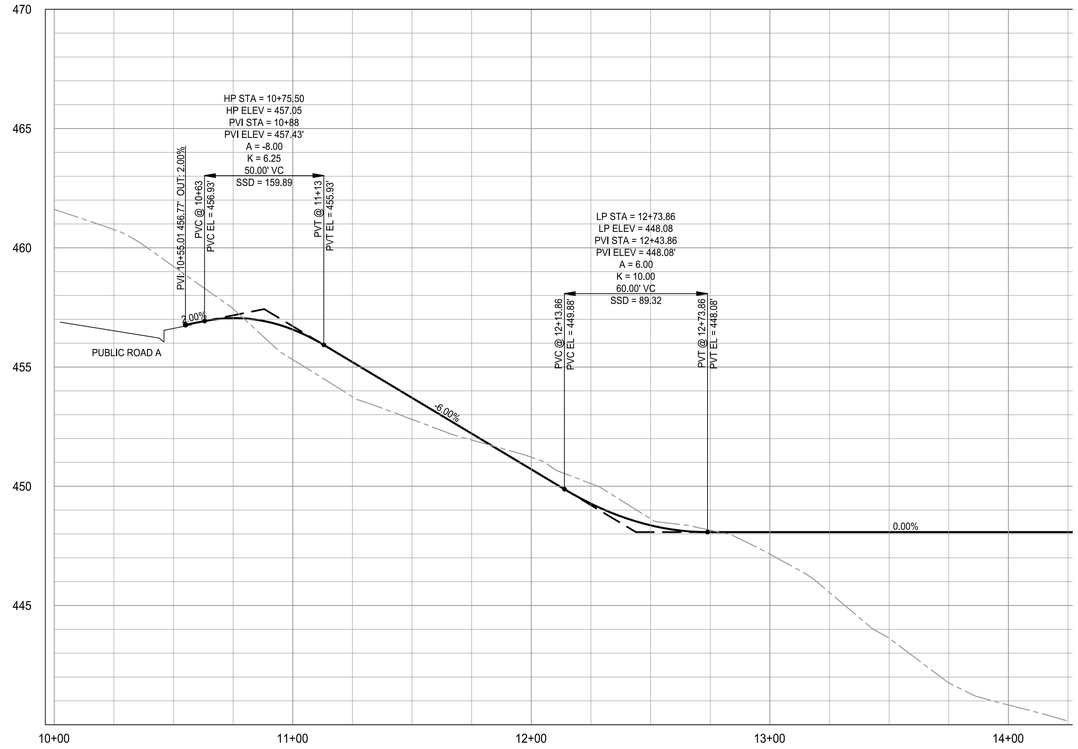
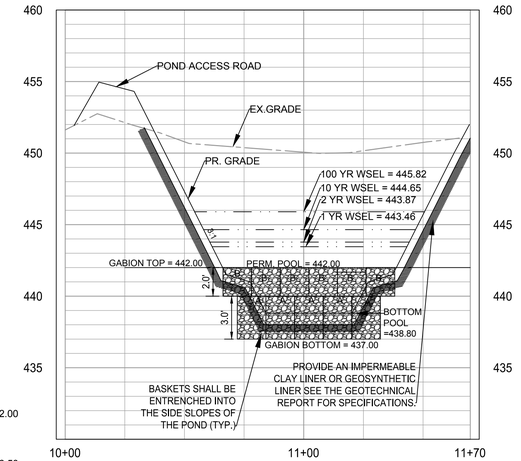
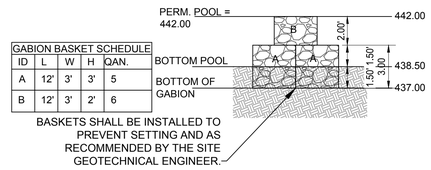



## SWM POND A ACCESS PROFILE

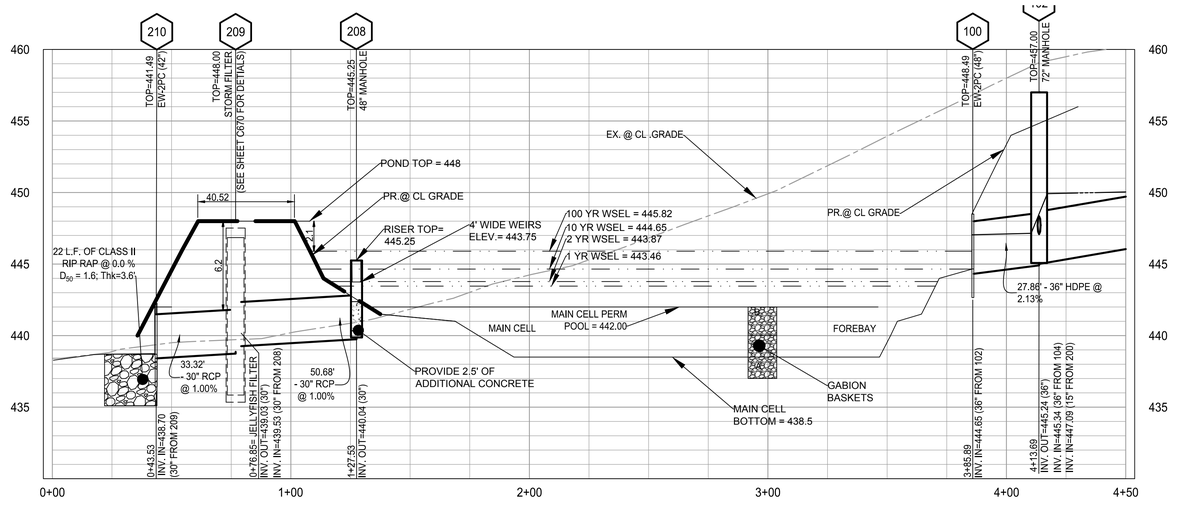



## POND A SECTION A-A PROFILE




| GABION BASKET SCHEDULE | | | | |
|---|---|---|---|---|
| ID | L | W | H | QAN. |
| A | 12' | 3' | 3' | 5 |
| B | 12' | 3' | 2' | 6 |

BASKETS SHALL BE INSTALLED TO PREVENT SETTING AND AS RECOMMENDED BY THE SITE GEOTECHNICAL ENGINEER.




## POND A OUTFALL PROFILE

50 25 0 50 100
HORIZONTAL SCALE
1" = 50'

5 2.5 0 5 10
VERTICAL SCALE
1" = 5'

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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

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DESIGN: AF
DRAWN: KMS
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SHEET TITLE:

SWM POND A PROFILES

SHEET No.
C651

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C651 SWM POND A PROFILES.dwg, 4/7/2024 8:59:18 PM, Miranda Tison,

## POND INFLOW HYDROGRAPH 1-YEAR

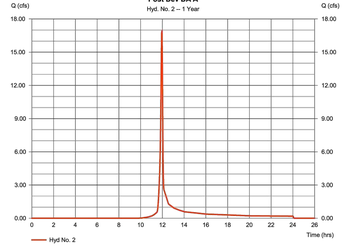
Hydroflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 2**

Post Dev DA A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 16.94 cfs |
| Storm frequency | = 1 yrs | Time to peak | = 11.97 hrs |
| Time interval | = 2 min | Hyd. volume | = 33,926 cuft |
| Drainage area | = 10.163 ac | Curve number | = 83* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 2.40 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.840 x 55) + (4.440 x 61) + (6.280 x 80) + (0.780 x 98) + (3.240 x 98)] / 10.163




## POND INFLOW HYDROGRAPH 2-YEAR

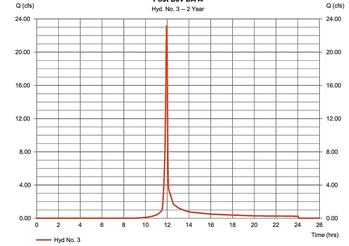
Hydroflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 3**

Post Dev DA A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 23.16 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 11.97 hrs |
| Time interval | = 2 min | Hyd. volume | = 46,711 cuft |
| Drainage area | = 10.163 ac | Curve number | = 83* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 2.88 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.840 x 55) + (4.440 x 61) + (6.280 x 80) + (0.780 x 98) + (3.240 x 98)] / 10.163




## POND INFLOW HYDROGRAPH 10-YEAR

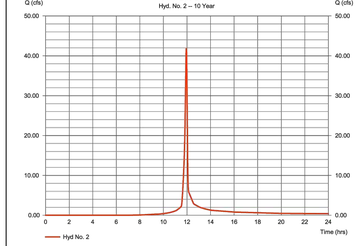
Hydroflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 2**

Post Dev DA A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 41.79 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 85,105 cuft |
| Drainage area | = 10.163 ac | Curve number | = 83* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 4.20 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.840 x 55) + (4.440 x 61) + (6.280 x 80) + (0.780 x 98) + (3.240 x 98)] / 10.163




## POND INFLOW HYDROGRAPH 25-YEAR

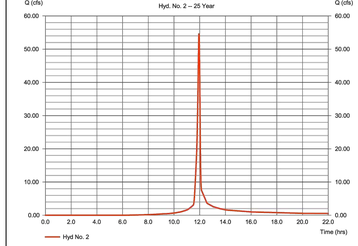
Hydroflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 2**

Post Dev DA A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 54.60 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 112,286 cuft |
| Drainage area | = 10.163 ac | Curve number | = 83* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.08 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.840 x 55) + (4.440 x 61) + (6.280 x 80) + (0.780 x 98) + (3.240 x 98)] / 10.163




## POND INFLOW HYDROGRAPH 100-YEAR

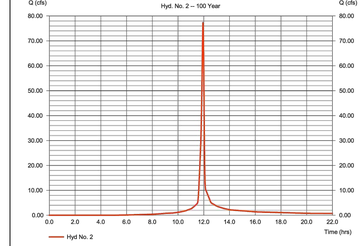
Hydroflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 2**

Post Dev DA A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 77.34 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 161,846 cuft |
| Drainage area | = 10.163 ac | Curve number | = 83* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 6.63 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.840 x 55) + (4.440 x 61) + (6.280 x 80) + (0.780 x 98) + (3.240 x 98)] / 10.163




## POND - REQUIRED VOLUME COMPUTATIONS

| | |
|---|---|
| $TARGET\ VOL. =$ | $\left\{[Target\ Rainfall\ Event] * [(R_{V_{TURF}} * AREA_{Turf}) + (R_{V_{IMP.}} * AREA_{IMP.})] * \left[43560\ {}^{FT^2}/_{AC.}\right] * \left[{}^{1FT}/_{12\ IN.}\right]\right\}$ |
| *Target Rainfall* | *1.00 in.* |
| $R_{V_{TURF}} =$ | $\frac{(0.15 * AREA_{A-SOIL}) + (0.20 * AREA_{B-SOIL}) + (0.22 * AREA_{C-SOIL}) * (0.25 * AREA_{D-SOIL})}{AREA_{TURF}}$ |
| $R_{V_{TURF}} =$ | *0.23* |
| $R_{V_{IMP.}} =$ | *0.95* |
| $AREA_{TURF} =$ | *5.797 ac.* |
| $AREA_{IMP.} =$ | *4.365 ac.* |
| $TARGET\ VOL. =$ | *19,877.22 cf* |

## FOREBAY # 1 - REQUIRED VOLUME COMPUTATIONS

| | |
|---|---|
| *Target Vol=15%* $*$ | $\left\{[Target\ Rainfall\ Event] * [(R_{V_{TURF}} * AREA_{Turf}) + (R_{V_{IMP.}} * AREA_{IMP.})] * \left[43560\ {}^{FT^2}/_{AC.}\right] * \left[{}^{1FT}/_{12\ IN.}\right]\right\}$ |
| *Target Rainfall* | *1.00 in.* |
| $R_{V_{TURF}} =$ | $\frac{(0.15 * AREA_{A-SOIL}) + (0.20 * AREA_{B-SOIL}) + (0.22 * AREA_{C-SOIL}) * (0.25 * AREA_{D-SOIL})}{AREA_{TURF}}$ |
| $R_{V_{TURF}} =$ | *0.23* |
| $R_{V_{IMP.}} =$ | *0.95* |
| $AREA_{TURF} =$ | *5.797 ac.* |
| $AREA_{IMP.} =$ | *4.365 ac.* |
| $TARGET\ VOL. =$ | *2,981.58 cf* |

FOREBAY CELL STAGE STORAGE VOLUME

| ELEV. | SURFACE AREA | INCREMENTAL VOLUME | COMULATIVE VOLUME |
|---|---|---|---|
| 438.50 | 1,144 sf | 0.00 cf | 0.00 cf |
| 440.00 | 1,647 sf | 2,093.66 cf | 2,093.66 cf |
| 441.00 | 2,018 sf | 1,832.50 cf | 3,926.16 cf |
| 441.50 | 2,214 sf | 1,057.89 cf | 4,984.05 cf |
| 442.00 | 2,417 sf | 1,157.62 cf | 6,141.67 cf |

MAIN CELL WET STAGE STORAGE VOLUME

| ELEV. | SURFACE AREA | INCREMENTAL VOLUME | COMULATIVE VOLUME |
|---|---|---|---|
| 438.50 | 2,612 sf | 0.00 cf | 0.00 cf |
| 440.00 | 3,732 sf | 4,757.59 cf | 4,757.59 cf |
| 441.00 | 4,553 sf | 4,142.50 cf | 8,900.09 cf |
| 441.50 | 8,967 sf | 3,380.12 cf | 12,280.20 cf |
| 442.00 | 9,540 sf | 4,626.88 cf | 16,907.08 cf |

TOTAL VOL. FOREBAY + MAIN CELL= 13,146.00 CF

POND STAGE STORAGE TABLE

| ELEV. | SURFACE AREA | INCREMENTAL VOLUME | COMULATIVE VOLUME |
|---|---|---|---|
| 442.00 | 11,957 sf | 0.00 cf | 0.00 cf |
| 444.00 | 15,282 sf | 27,239.00 cf | 27,239.00 cf |
| 446.00 | 18,832 sf | 34,114.00 cf | 61,353.00 cf |
| 448.00 | 22,609 sf | 41,441.00 cf | 102,794.00 cf |

## ENERGY BALANCE - AREA A

$$Q_{Dev.} \leq I.F * (Q_{Pre-Dev.} * Rv_{Pre-Dev.})/Rv_{Dev.}$$

$(Q_{Pre-Dev.}) =$ 9.826 cfs

$(Rv_{Pre-Dev.}) =$ 30,377 cf

$(Rv_{Dev.}) =$ 49,228 cf

$(I.F._{.}) =$ 0.80

$(Q_{Dev.}) \leq$ 4.851 cfs

## Pond Report

Hydroflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Thursday, 10 / 19 / 2023

**Pond No. 1 - Pond A**

**Pond Data**

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 442.00 ft

**Stage / Storage Table**

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 442.00 | 11,973 | 0 | 0 |
| 2.00 | 444.00 | 15,282 | 27,256 | 27,256 |
| 4.00 | 446.00 | 18,832 | 34,114 | 61,369 |
| 6.00 | 448.00 | 22,609 | 41,441 | 102,810 |

**Culvert / Orifice Structures**

| | [A] | [B] | [C] | [PrfRsr] |
|---|---|---|---|---|
| Rise (in) | = 30.00 | 4.00 | Inactive | 0.00 |
| Span (in) | = 30.00 | 4.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 1 | 0 | 0 |
| Invert El. (ft) | = 439.26 | 442.00 | 0.00 | 0.00 |
| Length (ft) | = 84.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 1.00 | 0.00 | 0.00 | n/a |
| N-Value | = .013 | .013 | .013 | n/a |
| Orifice Coeff. | = 0.60 | 0.60 | 0.60 | 0.60 |
| Multi-Stage | = n/a | Yes | No | No |

**Weir Structures**

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| Crest Len (ft) | = 12.78 | 4.00 | Inactive | Inactive |
| Crest El. (ft) | = 445.25 | 443.75 | 0.00 | 0.00 |
| Weir Coeff. | = 3.33 | 3.33 | 3.33 | 3.33 |
| Weir Type | = 1 | Rect | Rect | --- |
| Multi-Stage | = Yes | Yes | No | No |

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

*Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

**Stage / Storage**




## POND - WATER BALANCE EQUATION

| | |
|---|---|
| $DP > ET + INF + RES\ -MB$ | |
| *DP* > | 3.5 in |
| | |
| *ET*= | 8.0 in. |
| *INF*= | 7.2 in. |
| *RES*= | 24.0 in |
| *MB*= | 0.0 in |
| *DP*= | 39.2 in |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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SWM POND A INFLOW COMPUTATIONS

SHEET No.

C652

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C652 SWM POND A INFLOW COMPUTATIONS.dwg, 4/7/2024 8:59:26 PM, Miranda Tison,

## POND OUTLET HYDROGRAPH 1-YEAR

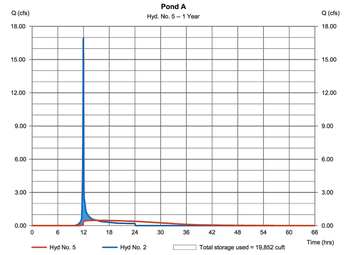
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 11 / 1 / 2023

**Hyd. No. 5**

Pond A

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 0.477 cfs |
| Storm frequency | = 1 yrs | Time to peak | = 15.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 33,894 cuft |
| Inflow hyd. No. | = 2 - Post Dev DA A | Max. Elevation | = 443.46 ft |
| Reservoir name | = Pond A | Max. Storage | = 19,852 cuft |

Storage Indication method used.




## POND OUTLET HYDROGRAPH 2-YEAR

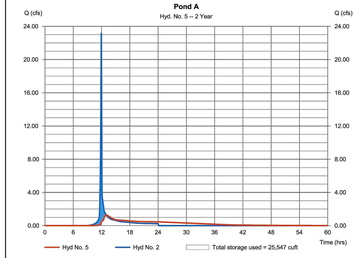
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 11 / 1 / 2023

**Hyd. No. 5**

Pond A

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 1.264 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 13.00 hrs |
| Time interval | = 2 min | Hyd. volume | = 46,679 cuft |
| Inflow hyd. No. | = 2 - Post Dev DA A | Max. Elevation | = 443.97 ft |
| Reservoir name | = Pond A | Max. Storage | = 25,547 cuft |

Storage Indication method used.




## POND OUTLET HYDROGRAPH 10-YEAR

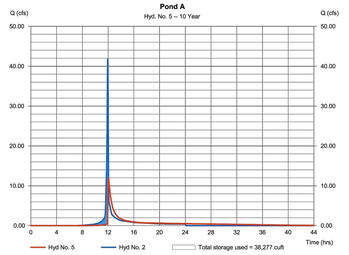
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 11 / 1 / 2023

**Hyd. No. 5**

Pond A

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 12.00 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 85,072 cuft |
| Inflow hyd. No. | = 2 - Post Dev DA A | Max. Elevation | = 444.65 ft |
| Reservoir name | = Pond A | Max. Storage | = 38,277 cuft |

Storage Indication method used.




## POND OUTLET HYDROGRAPH 25-YEAR

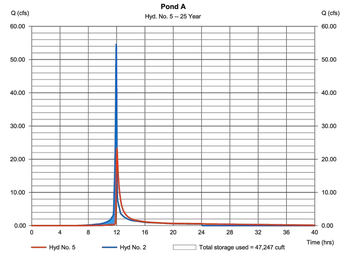
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 11 / 1 / 2023

**Hyd. No. 5**

Pond A

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 23.34 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.03 hrs |
| Time interval | = 2 min | Hyd. volume | = 112,253 cuft |
| Inflow hyd. No. | = 2 - Post Dev DA A | Max. Elevation | = 445.17 ft |
| Reservoir name | = Pond A | Max. Storage | = 47,247 cuft |

Storage Indication method used.




## POND OUTLET HYDROGRAPH 100-YEAR

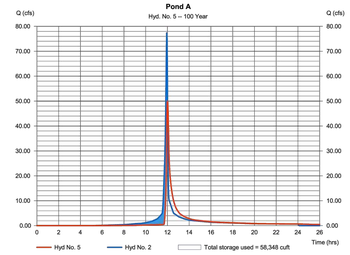
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 11 / 1 / 2023

**Hyd. No. 5**

Pond A

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 49.91 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 12.00 hrs |
| Time interval | = 2 min | Hyd. volume | = 161,813 cuft |
| Inflow hyd. No. | = 2 - Post Dev DA A | Max. Elevation | = 445.82 ft |
| Reservoir name | = Pond A | Max. Storage | = 58,348 cuft |

Storage Indication method used.




## Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Pond No. 1 - Pond A**

**Pond Data**

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 442.00 ft

**Stage / Storage Table**

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 442.00 | 8,865 | 0 | 0 |
| 0.50 | 442.50 | 9,873 | 4,685 | 4,685 |
| 0.90 | 442.90 | 15,839 | 5,142 | 9,827 |
| 2.00 | 444.00 | 18,588 | 18,935 | 28,762 |
| 4.00 | 446.00 | 23,818 | 42,406 | 71,168 |
| 6.00 | 448.00 | 29,406 | 53,224 | 124,392 |

**Culvert / Orifice Structures**

| | [A] | [B] | [C] | [PrfRsr] |
|---|---|---|---|---|
| Rise (in) | = 30.00 | 4.00 | Inactive | 0.00 |
| Span (in) | = 30.00 | 4.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 1 | 0 | 0 |
| Invert El. (ft) | = 441.00 | 442.00 | 0.00 | 0.00 |
| Length (ft) | = 60.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 1.00 | 0.00 | 0.00 | n/a |
| N-Value | = .013 | .013 | .013 | n/a |
| Orifice Coeff. | = 0.60 | 0.60 | 0.60 | 0.60 |
| Multi-Stage | = n/a | Yes | No | No |

**Weir Structures**

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| Crest Len (ft) | = 20.00 | 5.00 | Inactive | Inactive |
| Crest El. (ft) | = 444.75 | 443.50 | 0.00 | 0.00 |
| Weir Coeff. | = 3.33 | 3.33 | 3.33 | 3.33 |
| Weir Type | = 1 | Rect | Rect | --- |
| Multi-Stage | = Yes | Yes | No | No |

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

**Stage / Storage / Discharge Table**

| Stage ft | Storage cuft | Elevation ft | Civ A cfs | Civ B cfs | Civ C cfs | PrfRsr cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | User cfs | Total cfs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0 | 442.00 | 0.00 | 0.00 | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.000 |
| 0.05 | 468 | 442.05 | 6.37 ic | 0.01 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.006 |
| 0.10 | 937 | 442.10 | 6.37 ic | 0.02 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.024 |
| 0.15 | 1,405 | 442.15 | 6.37 ic | 0.05 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.051 |
| 0.20 | 1,874 | 442.20 | 6.37 ic | 0.08 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.083 |
| 0.25 | 2,342 | 442.25 | 6.37 ic | 0.12 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.120 |
| 0.30 | 2,811 | 442.30 | 6.37 ic | 0.15 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.154 |
| 0.35 | 3,279 | 442.35 | 6.37 ic | 0.18 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.180 |
| 0.40 | 3,748 | 442.40 | 6.37 ic | 0.20 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.203 |
| 0.45 | 4,216 | 442.45 | 6.37 ic | 0.22 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.224 |
| 0.50 | 4,685 | 442.50 | 6.37 ic | 0.24 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.243 |
| 0.54 | 5,199 | 442.54 | 6.37 ic | 0.26 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.257 |
| 0.58 | 5,713 | 442.58 | 6.37 ic | 0.27 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.270 |
| 0.62 | 6,227 | 442.62 | 6.37 ic | 0.28 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.283 |
| 0.66 | 6,741 | 442.66 | 6.37 ic | 0.30 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.295 |
| 0.70 | 7,256 | 442.70 | 6.37 ic | 0.31 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.307 |
| 0.74 | 7,770 | 442.74 | 6.37 ic | 0.32 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.318 |
| 0.78 | 8,284 | 442.78 | 6.37 ic | 0.33 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.329 |
| 0.82 | 8,798 | 442.82 | 6.37 ic | 0.34 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.340 |
| 0.86 | 9,312 | 442.86 | 6.37 ic | 0.35 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.350 |
| 0.90 | 9,827 | 442.90 | 6.37 ic | 0.36 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.360 |
| 1.01 | 11,720 | 443.01 | 6.37 ic | 0.39 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.386 |
| 1.12 | 13,614 | 443.12 | 6.37 ic | 0.41 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.410 |
| 1.23 | 15,507 | 443.23 | 6.37 ic | 0.43 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.433 |
| 1.34 | 17,401 | 443.34 | 6.37 ic | 0.46 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.455 |
| 1.45 | 19,294 | 443.45 | 6.37 ic | 0.48 ic | --- | --- | 0.00 | 0.00 | --- | --- | --- | --- | 0.476 |
| 1.56 | 21,188 | 443.56 | 6.37 ic | 0.50 ic | --- | --- | 0.00 | 0.24 | --- | --- | --- | --- | 0.740 |
| 1.67 | 23,081 | 443.67 | 6.37 ic | 0.52 ic | --- | --- | 0.00 | 1.17 | --- | --- | --- | --- | 1.681 |
| 1.78 | 24,975 | 443.78 | 6.37 ic | 0.53 ic | --- | --- | 0.00 | 2.47 | --- | --- | --- | --- | 2.999 |
| 1.89 | 26,868 | 443.89 | 6.37 ic | 0.55 ic | --- | --- | 0.00 | 4.05 | --- | --- | --- | --- | 4.605 |
| 2.00 | 28,762 | 444.00 | 6.59 ic | 0.57 ic | --- | --- | 0.00 | 5.89 | --- | --- | --- | --- | 6.456 |
| 2.20 | 33,002 | 444.20 | 10.33 ic | 0.58 ic | --- | --- | 0.00 | 9.75 | --- | --- | --- | --- | 10.33 |
| 2.40 | 37,243 | 444.40 | 14.78 ic | 0.58 ic | --- | --- | 0.00 | 14.22 | --- | --- | --- | --- | 14.78 |
| 2.60 | 41,484 | 444.60 | 19.77 oc | 0.52 ic | --- | --- | 0.00 | 19.21 | --- | --- | --- | --- | 19.73 |
| 2.80 | 45,724 | 444.80 | 25.12 oc | 0.43 ic | --- | --- | 0.75 | 23.94 s | --- | --- | --- | --- | 25.12 |
| 3.00 | 49,965 | 445.00 | 33.24 oc | 0.34 ic | --- | --- | 8.33 | 24.57 s | --- | --- | --- | --- | 33.24 |
| 3.20 | 54,205 | 445.20 | 38.74 ic | 0.22 ic | --- | --- | 17.83 s | 20.70 s | --- | --- | --- | --- | 38.74 |

Continues on next page...

Pond A

**Stage / Storage / Discharge Table**

| Stage ft | Storage cuft | Elevation ft | Civ A cfs | Civ B cfs | Civ C cfs | PrfRsr cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | User cfs | Total cfs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.40 | 58,446 | 445.40 | 40.99 ic | 0.16 ic | --- | --- | 22.19 s | 18.63 s | --- | --- | --- | --- | 40.98 |
| 3.60 | 62,687 | 445.60 | 42.69 ic | 0.12 ic | --- | --- | 25.18 s | 17.36 s | --- | --- | --- | --- | 42.67 |
| 3.80 | 66,927 | 445.80 | 44.16 ic | 0.10 ic | --- | --- | 27.51 s | 16.53 s | --- | --- | --- | --- | 44.14 |
| 4.00 | 71,168 | 446.00 | 45.51 ic | 0.09 ic | --- | --- | 29.43 s | 15.96 s | --- | --- | --- | --- | 45.48 |
| 4.20 | 76,490 | 446.20 | 46.78 ic | 0.07 ic | --- | --- | 31.11 s | 15.57 s | --- | --- | --- | --- | 46.76 |
| 4.40 | 81,813 | 446.40 | 48.00 ic | 0.07 ic | --- | --- | 32.61 s | 15.30 s | --- | --- | --- | --- | 47.98 |
| 4.60 | 87,135 | 446.60 | 49.18 ic | 0.06 ic | --- | --- | 33.95 s | 15.10 s | --- | --- | --- | --- | 49.11 |
| 4.80 | 92,457 | 446.80 | 50.32 ic | 0.05 ic | --- | --- | 35.22 s | 14.98 s | --- | --- | --- | --- | 50.25 |
| 5.00 | 97,780 | 447.00 | 51.43 ic | 0.05 ic | --- | --- | 36.40 s | 14.90 s | --- | --- | --- | --- | 51.35 |
| 5.20 | 103,102 | 447.20 | 52.52 ic | 0.04 ic | --- | --- | 37.57 s | 14.88 s | --- | --- | --- | --- | 52.50 |
| 5.40 | 108,425 | 447.40 | 53.58 ic | 0.04 ic | --- | --- | 38.64 s | 14.87 s | --- | --- | --- | --- | 53.55 |
| 5.60 | 113,747 | 447.60 | 54.62 ic | 0.04 ic | --- | --- | 39.63 s | 14.86 s | --- | --- | --- | --- | 54.53 |
| 5.80 | 119,069 | 447.80 | 55.64 ic | 0.04 ic | --- | --- | 40.68 s | 14.92 s | --- | --- | --- | --- | 55.63 |
| 6.00 | 124,392 | 448.00 | 56.64 ic | 0.03 ic | --- | --- | 41.44 s | 14.89 s | --- | --- | --- | --- | 56.37 |

...End

## Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Pond No. 1 - Pond A**

**Pond Data**

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 442.00 ft

**Stage / Storage Table**

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 442.00 | 8,865 | 0 | 0 |
| 0.50 | 442.50 | 9,873 | 4,685 | 4,685 |
| 0.90 | 442.90 | 15,839 | 5,142 | 9,827 |
| 2.00 | 444.00 | 18,588 | 18,935 | 28,762 |
| 4.00 | 446.00 | 23,818 | 42,406 | 71,168 |
| 6.00 | 448.00 | 29,406 | 53,224 | 124,392 |

**Culvert / Orifice Structures**

| | [A] | [B] | [C] | [PrfRsr] |
|---|---|---|---|---|
| Rise (in) | = 30.00 | 4.00 | Inactive | 0.00 |
| Span (in) | = 30.00 | 4.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 1 | 0 | 0 |
| Invert El. (ft) | = 441.00 | 442.00 | 0.00 | 0.00 |
| Length (ft) | = 60.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 1.00 | 0.00 | 0.00 | n/a |
| N-Value | = .013 | .013 | .013 | n/a |
| Orifice Coeff. | = 0.60 | 0.60 | 0.60 | 0.60 |
| Multi-Stage | = n/a | Yes | No | No |

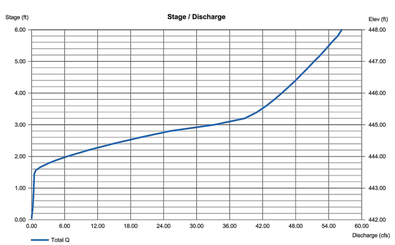
**Weir Structures**

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| Crest Len (ft) | = 20.00 | 5.00 | Inactive | Inactive |
| Crest El. (ft) | = 444.75 | 443.50 | 0.00 | 0.00 |
| Weir Coeff. | = 3.33 | 3.33 | 3.33 | 3.33 |
| Weir Type | = 1 | Rect | Rect | --- |
| Multi-Stage | = Yes | Yes | No | No |

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).




| EMBANKMENT DATA | |
|---|---|
| TOP = | 448.00 |
| BOTTOM = | 438.50 |
| EMBANKMENT HEIGHT = | 9.50 ft |
| 100 YR WSEL = | 445.82 |
| FREEBOARD = | 2.18 ft |
| SETTLEMENT (10% H) = | 0.95 ft |
| SETTLED TOP = | 447.05 |

| WEIR COMPS | |
|---|---|
| RISER DIAM.= | 5.000 ft |
| WEIR LENGTH= | 15.708 ft |
| BREADTH OF WEIR= | 0.500 ft |
| H= | 0.820 ft |
| WEIR COEFF. | 3.33 |
| | |
| MIDDLE DIAM.= | 5.833 ft |
| WEIR LENGTH= | 18.326 ft |
| MAX. SPACING | 0.500 ft |
| # OF REBAR= | 37 |
| REBAR SIZE= | 0.042 ft |
| TOTAL REBAR LENGTH= | 1.542 ft |
| ACTUAL WEIR LENGTH | 16.784 ft |

| POND COMPUTATION SUMMARY TABLE | | | |
|---|---|---|---|
| STORM EVENT | Q | PONDING DEPTH (OVER WEIR) | POND WSEL |
| 1-YEAR | 0.477 cfs | 1.46 ft | 443.46 |
| 2-YEAR | 1.26 cfs | 0.12 ft | 443.87 |
| 10-YEAR | 12.00 cfs | 0.90 ft | 444.65 |
| 25-YEAR | 23.34 cfs | 1.42 ft | 445.17 |
| 100-YEAR | 49.91 cfs | 0.57 ft | 445.82 |

| POND DATA | |
|---|---|
| POND BOTTOM | 438.50 |
| POND TOP | 448.00 |
| OUTFALL PIPE SIZE= | 30 in. |
| OUTFALL PIPE ELEV.= | 434.42 |
| LOW FLOW ORIFICE SIZE= | 4.0 in. |
| LOW FLOW ORIFICE ELEV.= | 442.00 |
| LOW FLOW ORIFICE COEFF.= | 0.60 |
| WEIR LENGTH= | 4.00 ft |
| WEIR ELEV.= | 443.75 |
| WEIR COEFF.= | 3.33 |
| PRINCIPAL SPILLWAY | 12.78 ft |
| PRINCIPAL SPILLWAY ELEV.= | 445.25 |
| PRINCIPAL SPILLWAY BREADTH= | 0.50 ft |
| WEIR COEFF.= | 3.330 |

## BUOYANCY CALCULATIONS - SWM POND A

| | | | | |
|---|---|---|---|---|
| Outside Diameter= | 72 in. | OR | 6.00 ft | |
| Inside Diamater= | 60 in. | OR | 5.00 ft | |
| Diamater Thickness= | 6 in. | OR | 0.50 ft | |
| Top of Riser= | 445.25 | | | |
| Bottom Of Pond= | 438.50 | | | |
| Outfall Pipe Size= | 30 in. | OR | 2.50 ft | |
| $Orifice_1$ Size= | 4 in. | OR | 0.33 ft | |
| $Orifice_2$ Size= | N/A | OR | N/A | |
| $Orifice_3$ Size= | N/A | OR | N/A | |
| $Weir_1$ Size= | 4.00 ft | AT | 443.75 | Area= 6.00 sq.ft |
| $Weir_2$ Size= | N/A | AT | N/A | Area= N/A |
| Depth of Concerete in Riser= | 2.50 ft | | | |
| | | | | |
| Total Vol of Riser Structure and Base= | 190.85 cf | | | |
| Total Bouyant Force= | 11,909.15 lbs. | | | |
| Total Bouyant Force @ FS of 1.25 = | 14,886.44 lbs. | | | |
| | | | | |
| Vol of Riser Structure and Base= | 129.00 cf | | | |
| | | | | |
| Vol of Outfall Pipe= | 2.45 cf | | | |
| $Orifice_1$ = | 0.04 cf | | | |
| $Orifice_2$ = | N/A | | | |
| $Orifice_3$ = | N/A | | | |
| $Weir_1$ = | 3.00 cf | | | |
| $Weir_2$ = | N/A | | | |
| Total Downward Force= | 18,525.55 lbs. | | | |
| | | | | |
| Downward Force is Greater than the Buoyant Force with a FS of 1.25 | | | | |

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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

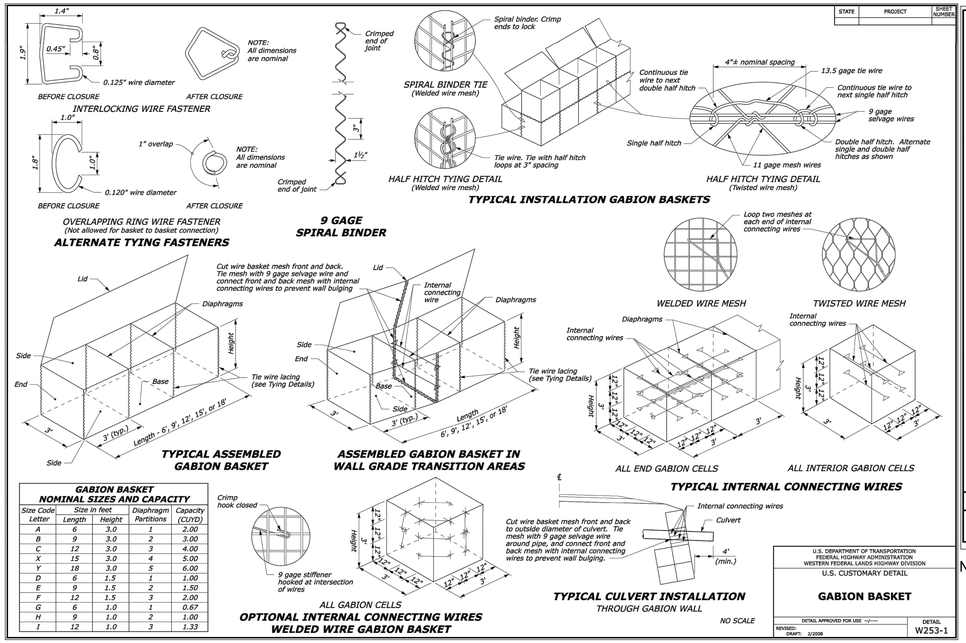
SHEET TITLE:

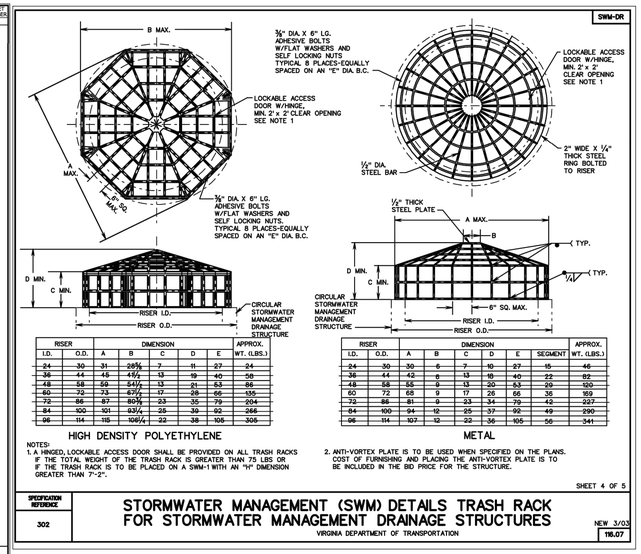
SWM POND A OUTLET COMPUTATIONS

SHEET No.

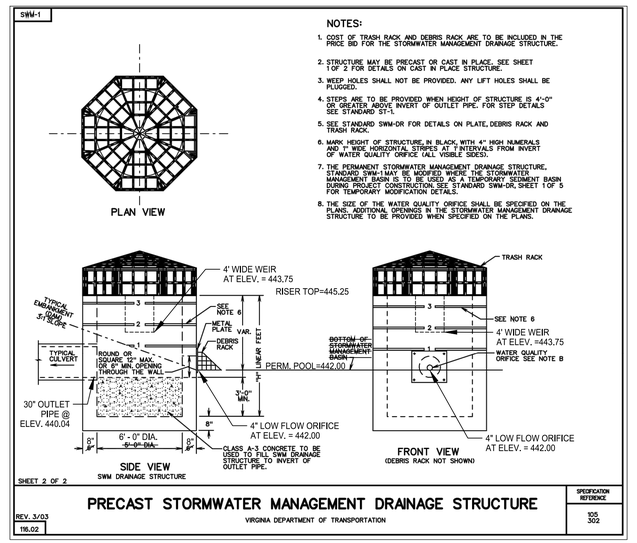
C653

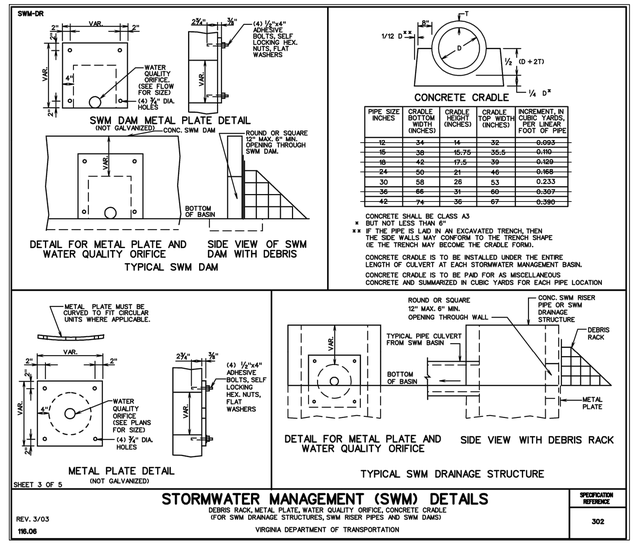
P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C664 SWM POND A OUTLET COMPUTATIONS.dwg, 4/7/2024 9:00:07 PM, Miranda Tison,




NOTE: ANTI-VORTEX PLAT SHALL BE PROVIDED.




## SECTION 8: CONSTRUCTION

### 8.1. Construction Sequence

The following is a typical construction sequence to properly install a wet pond. The steps may be modified to reflect different wet pond designs, site conditions, and the size, complexity and configuration of the proposed facility.

***Step 1: Use of Wet Pond as an E&S Control.*** A wet pond may serve as a sediment basin during project construction. If this is done, the volume should be based on the more stringent sizing rule (erosion and sediment control requirement vs. water quality treatment requirement). Installation of the permanent riser should be initiated during the construction phase, and design elevations should be set with final cleanout of the sediment basin and conversion to the post-construction wet pond in mind. The bottom elevation of the wet pond should be lower than the bottom elevation of the temporary sediment basin. Appropriate procedures should be implemented to prevent discharge of turbid waters when the basin is being converted into a wet pond.

***Step 2: Stabilize the Drainage Area.*** Wet ponds should only be constructed after the contributing drainage area to the pond is completely stabilized. If the proposed pond site will be used as a sediment trap or basin during the construction phase, the construction notes should clearly indicate that the facility will be de-watered, dredged and re-graded to design dimensions after the original site construction is complete.

***Step 3: Assemble Construction Materials*** on-site, make sure they meet design specifications, and prepare any staging areas.

***Step 4: Install E&S Controls*** prior to construction, including temporary de-watering devices and stormwater diversion practices. All areas surrounding the pond that are graded or denuded during construction must be planted with turf grass, native plantings, or other approved methods of soil stabilization.

***Step 5: Clear and Strip*** the project area to the desired sub-grade.

***Step 6: Excavate the Core Trench and Install the Spillway Pipe.***

***Step 7: Install the Riser or Outflow Structure,*** and ensure the top invert of the overflow weir is constructed level at the design elevation.

***Step 8: Construct the Embankment and Any Internal Berms*** in 8- to 12-inch lifts, or as directed by geotechnical recommendations, and compact as required with appropriate equipment.

***Step 9: Excavate/Grade*** until the appropriate elevation and desired contours are achieved for the bottom and side slopes of the pond.

***Step 10: Construct the Emergency Spillway*** in cut or structurally stabilized soils.

***Step 11: Install Outlet Protection*****,** including emergency and primary outlet apron protection.

***Step 12: Stabilize Exposed Soils*** with temporary seed mixtures appropriate for the pond buffer. All areas above the normal pool elevation should be permanently stabilized by hydroseeding or seeding over straw.

***Step 13: Plant the Pond Buffer Area***, following the pondscaping plan (**Section 6.7**).

### 8.2. Construction Inspection

Multiple inspections are critical to ensure that stormwater ponds are properly constructed. Inspections are recommended during the following stages of construction:

- Pre-construction meeting
- Initial site preparation (including installation of E&S controls)
- Excavation/Grading (interim and final elevations)
- Installation of the embankment, the riser/primary spillway, and the outlet structure
- Implementation of the pondscaping plan and vegetative stabilization
- Final inspection (develop a punchlist for facility acceptance)

Upon final inspection and acceptance, the GPS coordinates for all wet ponds should be logged for entry into the VSMP Authority's BMP maintenance tracking data base.

A construction phase inspection checklist for Wet Ponds can be accessed at the end of this specification.

See the E & S Narrative on sheet XX for additional pond / basin construction details.

## SECTION 9: MAINTENANCE

### 9.1. Maintenance Agreements

The Virginia Stormwater Management regulations (4 VAC 50-60) specify the circumstances under which a maintenance agreement must be executed between the owner and the VSMP authority, and sets forth inspection requirements, compliance procedures if maintenance is neglected, notification of the local program upon transfer of ownership, and right-of-entry for local program personnel.

- Restrictive covenants or other mechanism enforceable by the VSMP authority must be in place to help ensure that wet ponds are maintained, as well as to pass the knowledge along to any subsequent property owners.
- Access to wet ponds should be covered by a drainage easement to allow access by the VSMP authority to conduct inspections and perform maintenance when necessary.
- All wet ponds must include a long term maintenance agreements consistent with the provisions of the VSMP regulations, and must include the recommended maintenance tasks and a copy of an annual inspection checklist.
- The maintenance agreement should also include contact information for owners to get local or state assistance to solve common nuisance problems, such as mosquito control, geese, invasive plants, vegetative management and beaver removal.

### 9.2. First Year Maintenance Operations

Successful establishment of wet ponds requires that the following tasks be undertaken during the first year following construction.

***Initial inspections.*** For the first six months following construction, the site should be inspected at least twice after storm events that exceed a 1/2-inch of rainfall.

***Planting of Aquatic Benches.*** The aquatic benches should be planted with emergent wetland species, following the planting recommendations contained in Stormwater Design Specification No. 13 (Constructed Wetlands).

***Spot Reseeding.*** Inspectors should look for bare or eroding areas in the contributing drainage area or around the pond buffer, and make sure they are immediately stabilized with grass cover.

### 9.3. Maintenance Inspections

Maintenance of a wet pond is driven by annual inspections that evaluate the condition and performance of the pond, including the following:

- Measure sediment accumulation levels in the forebay.
- Monitor the growth of wetland plants, trees and shrubs planted. Record the species and their approximate coverage, and note the presence of any invasive plant species.
- Inspect the condition of stormwater inlets to the pond for material damage, erosion or undercutting.
- Inspect the banks of upstream and downstream channels for evidence of sloughing, animal burrows, boggy areas, woody growth, or gully erosion that may undermine embankment integrity.
- Inspect the pond outfall channel for erosion, undercutting, rip-rap displacement, woody growth, etc.
- Inspect the condition of the principal spillway and riser for evidence of spalling, joint failure, leakage, corrosion, etc.
- Inspect the condition of all trash racks, reverse-sloped pipes, or flashboard risers for evidence of clogging, leakage, debris accumulation, etc.
- Inspect maintenance access to ensure it is free of woody vegetation, and check to see whether valves, manholes and locks can be opened and operated.
- Inspect internal and external side slopes of the pond for evidence of sparse vegetative cover, erosion, or slumping, and make needed repairs immediately.

Based on inspection results, specific maintenance tasks will be triggered. Example maintenance inspection checklists for Wet Ponds can be accessed in Appendix C of Chapter 9 of the *Virginia Stormwater Management Handbook* (2010).

### 9.4 Common Ongoing Maintenance Tasks

Maintenance is needed so stormwater ponds continue to operate as designed on a long-term basis. Routine stormwater pond maintenance, such as removing debris and trash, is needed several times each year (See **Table 14.6**). More significant maintenance (e.g., removing accumulated sediment) is needed less frequently but requires more skilled labor and special equipment. Inspection and repair of critical structural features (e.g., embankments and risers) needs to be performed by a qualified professional (e.g., a structural engineer) who has experience in the construction, inspection, and repair of these features.

The maintenance plan should clearly outline how vegetation in the pond and its buffer will be managed or harvested in the future. Periodic mowing of the stormwater buffer is only required along maintenance rights-of-way and the embankment. The remaining buffer can be managed as a meadow (mowing every other year) or forest. The maintenance plan should schedule a shoreline cleanup at least once a year to remove trash and floatables.

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| MARK | DATE | DESCRIPTION |
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CHECKED: SK

SHEET TITLE:
SWM POND A DETAILS

SHEET No.
C654

P:\Projects\22063\001001\112742 Prelim Subdivision - Land Development Plan\C665 SWM POND A DETAILS.dwg, 4/7/2024 9:00:29 PM, Miranda Tison,



## LoCo BMP Construction Inspection Checklist:

## Wet Pond

**Project Name** _____ **Project #** _____ **Dates Inspected** _____ **to** _____

LOCATION of BMP (e.g., BMP 1 @ SE corner of parking lot) _____

GEOGRAPHIC COORDINATES from Plans (Optional): Latitude_____ Longitude_____ (decimal °)

The following checklist provides a basic outline of the anticipated items for the construction inspection of a Wet Pond. Inspectors should review the plans carefully, and adjust these items and the timing of inspection verification as needed to ensure the intent of the design and the inspection is met. Please use "Notes" section at the end of this form to describe additional observations & for explanation when "No" is checked.

**Inspections Performed By One or More of the Following:**

*(Please insert appropriate code adjacent to each inspection item)*

01 Owner/Operator or their Representative

02 Installer/Contractor

03 Geotechnical Engineer

**Prior to Construction:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | All pervious areas of the contributing drainage areas have been adequately stabilized with a thick layer of vegetation or adequate erosion control measures remain in place. | |

**Construction of Embankment and Principal Spillway:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | Digital Photos taken during this stage. | |
| 0__ | ☐ | ☐ | ☐ | Stormwater has been diverted around or through the area of the wet pond embankment to a stabilized conveyance and perimeter erosion control measures to protect the facility during construction have been installed. | |



**Construction of Embankment and Principal Spillway cont'd:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | Materials for construction of the embankment and principal spillway meet the specifications of the approved plans. | |
| 0__ | ☐ | ☐ | ☐ | Construction of "cut-off" trench, principal spillway, including the riser and barrel, anti-seepage controls, outlet protection, etc., is built in accordance with approved plans. | |
| **03** | ☐ | ☐ | ☐ | Geotechnical engineer's analysis and approval of the core (if required) and embankment material has been provided, and the material has been placed in lifts and compacted in accordance with the approved plans. Sign below to verify installation.* | |

Name _____ Signature _____

West Virginia License # _____ Date _____

| | | | | | |
|---|---|---|---|---|---|
| **03** | ☐ | ☐ | ☐ | Design & Construction of "filter and drainage diaphragms," if included, has been supervised by the Geotechnical Engineer. Sign below to verify installation.* | |

Name _____ Signature _____

West Virginia License # _____ Date _____

**Excavation of Wet Pond:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | Digital Photos taken during this stage. | |
| 0__ | ☐ | ☐ | ☐ | Excavation of the wet pond geometry (including bottom width, side slopes, check dams, weir overflow and outlet protection, etc) achieves the elevations in accordance with approved plans. | |
| 0__ | ☐ | ☐ | ☐ | Excavation of internal features: deep pool, forebays, etc., is in accordance with approved plans. | |



**Excavation of Wet Pond cont'd:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | Impermeable geotextile liner (minimum 30 mil poly-liner), when required, meets project specifications as certified by the manufacturer and verified by the installer. | |
| **03** | ☐ | ☐ | ☐ | Impermeable clay liner, when required, is placed per geotechnical engineer's oversight. Note: clay liners must meet the minimum requirements found in Table 14.4 in Specification 14 of the Va. BMP Clearinghouse. Sign below to verify installation.* | |

Name _____ Signature _____

West Virginia License # _____ Date _____

**Landscaping Plan and Stabilization:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | Digital Photos taken during this stage. | |
| 0__ | ☐ | ☐ | ☐ | Exposed soils on pond side slopes above permanent pool elevation are stabilized with specified seed mixtures, stabilization matting, mulch, etc., in accordance with approved plans. | |
| 0__ | ☐ | ☐ | ☐ | Appropriate number and spacing of plants are installed and protected on the aquatic bench and pond buffer in accordance with the approved plans. | |



| Date: | Additional Inspection Notes: |
|---|---|
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| Date: | Additional Inspection Notes: |
|---|---|
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Note: Provide this report, along with digital photos, to the LoCo Dept. of Building & Development coincident with E&S Bond Release. "As-Built" plans of the BMP & P.E. certification must be provided to B&D prior to ~~VSMP~~ Permit Termination.



**BMP INSPECTION CHECKLIST INSTRUCTIONS**

1. **Checklist Basics**

A. The person noted as the **"operator"** on the VSMP permit for the site where the BMP is constructed is ultimately responsible for the inspections being performed & completion of the checklist.

B. There will be one (1) Construction Inspection Checklist per BMP.

C. Use dark ink (blue or black) to fill out the document. ✔

D. Make sure to fill out the grey information box (on the 1st page) describes the location of the BMP on the site, as well as its geographic coordinates (obtain from the approved plans).

E. If construction of a BMP is already underway when this program begins on **August 1, 2017**, please denote all checklist items that have been completed. However, if there is insufficient information available to verify completion of a construction item, check the N/A (not applicable) box and provide a brief explanation in the **"Additional Inspection Notes"** section.

F. Each checklist is divided into phases of construction (e.g., excavation, bioretention soil media placement, etc.) with individual construction items within each phase.

G. For the majority of the checklist items, any of the following individuals may perform inspections and fill out the document*:

i. The operator/owner or his representative (e.g., project engineer);

ii. The contractor who installs the BMP; and/or,

iii. The geotechnical engineer for the project.

*The individual filling out the checklist must indicate so **for each construction item** (i.e., **enter designated number**).

H. Note: A licensed Geotechnical Engineer must inspect & verify the installation of the specific checklist items below via this signature block found in the document:

Name _____ Signature _____

West Virginia License # _____ Date _____

i. Bioretention Facility – Impervious clay liner (when required) must meet specifications found in the Va. BMP Clearinghouse.

ii. Wet Pond & Extended Detention Pond –

a. Embankment core (if required) and embankment material;



**BMP INSPECTION CHECKLIST INSTRUCTIONS (cont'd)**

b. Design & construction of filter & drainage diaphragms (if included); &

c. Impervious clay liner (if required).

iii. Wet & Dry Swales – Impervious clay liner (when required) must meet specifications found in the Va. BMP Clearinghouse.

G. When filling out the checklist, check **"Yes"** when construction of the item is completed per the explanation/description. Concurrently, enter the "Date Completed."

H. Check **"N/A"** (not applicable) if the construction item is not part of the approved design (e.g., an impervious liner is not required) or there is an approved field modification which changes or eliminates the item. When N/A is checked, always explain the reason in the **"Additional Inspection Notes"** section at the end of the checklist.

I. Also use **"Additional Inspection Notes"** for any notes/clarification that will help verify that the BMP was properly constructed.

2. **Photos**

A. Digital photos are required for most phases of BMP construction.

B. The photos will help to verify that each stage of construction met the standards required in the checklist.

3. **Location of BMP Checklists on Site & Checklist Updates**

A. The checklist for a particular BMP will be updated as the different phases of the installation occur. Once the construction of a BMP has begun, attach the **up-to-date** checklist to the on-site Stormwater Pollution & Prevention Plan (SWPPP).

B. BMP Checklists may be reviewed on site by a member of B&D's VSMP Team (as well as the Erosion & Sediment Control Field Manager) during spot checks of the BMP installation.

4. **Construction Complete - Final Step**

A. Once construction of the BMP is complete, submit the completed Loudoun County BMP Checklist along with all digital photos to B&D coincident with Erosion & Sediment Control Bond release.

- **Reminder** – "As-Built" plans & P.E. Certification related to BMP construction must still be provided to B&D for review prior to Permit Termination



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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

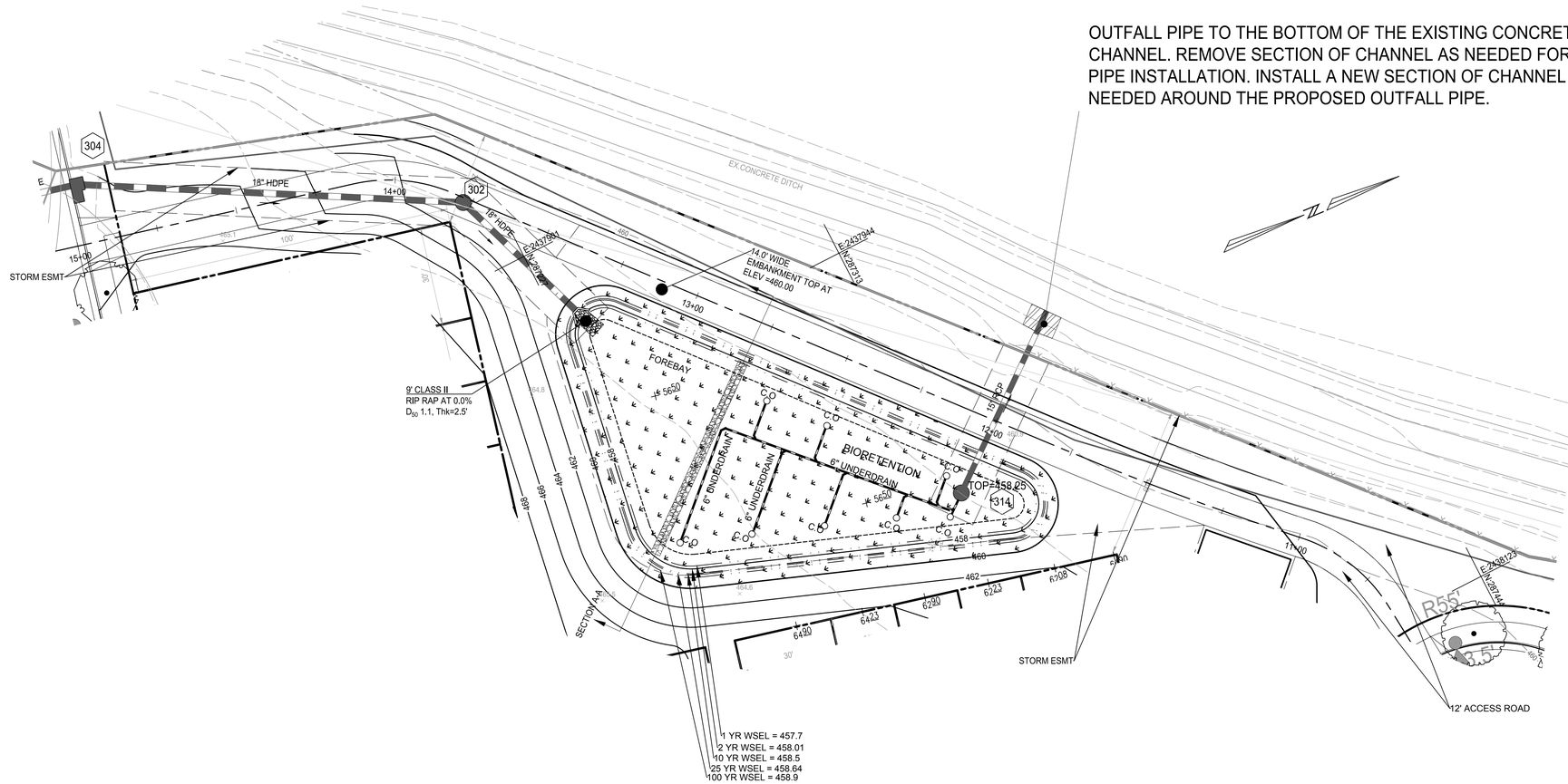
SWM POND A CONSTRUCTION INSPECTION CHECKLIST

SHEET No.

C655

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C655 SWM POND A CONSTRUCTION INSPECTION CHECKLIST.dwg, 4/11/2024 9:02:25 AM, Matthew Pollhaus,

OUTFALL PIPE TO THE BOTTOM OF THE EXISTING CONCRETE CHANNEL. REMOVE SECTION OF CHANNEL AS NEEDED FOR THE PIPE INSTALLATION. INSTALL A NEW SECTION OF CHANNEL AS NEEDED AROUND THE PROPOSED OUTFALL PIPE.

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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

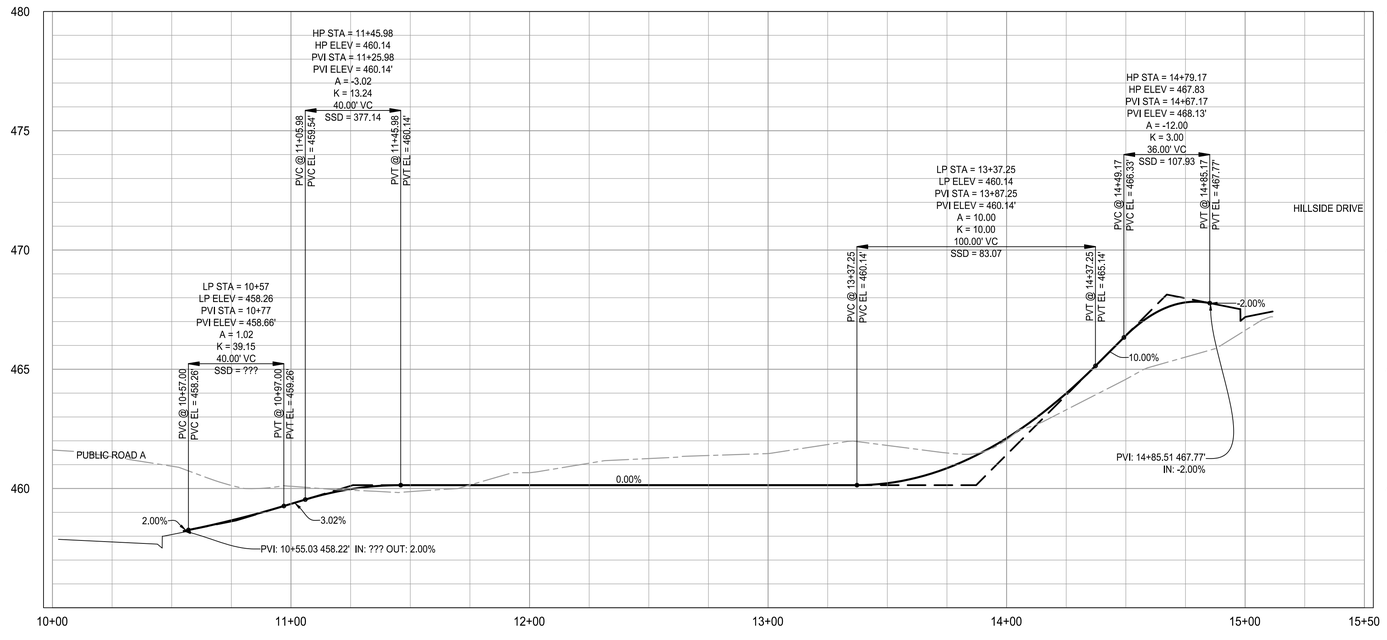
SHEET TITLE:

SWM
BIORETENTION B

SHEET No.

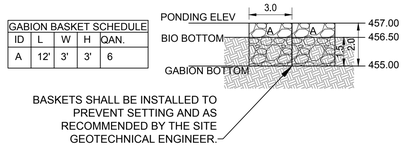
C660

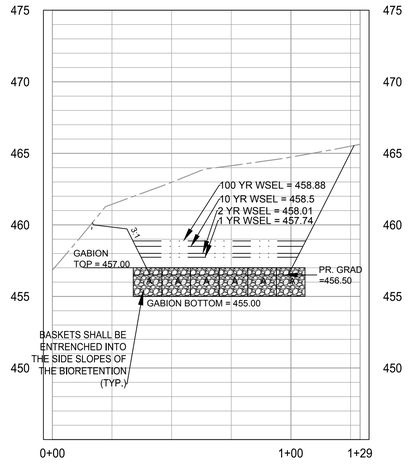
P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C660 SWM BIORETENTION B.dwg, 4/7/2024 9:02:07 PM, Miranda Tison,



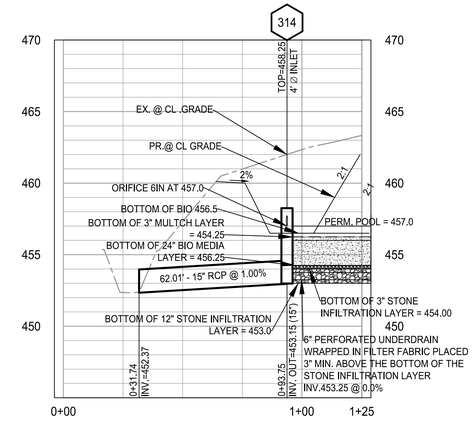

## SWM BIORETENTION B ACCESS PROFILE

| GABION BASKET SCHEDULE | | | | |
|---|---|---|---|---|
| ID | L | W | H | QAN. |
| A | 12' | 3' | 3' | 6 |




## BIORETENTION B SECTION A-A PROFILE




## BIORETENTION- B-OUTFALL PROFILE

50 25 0 50 100
HORIZONTAL SCALE
1" = 50'

5 2.5 0 5 10
VERTICAL SCALE
1" = 5'

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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SWM BIORETENTION B PROFILE

SHEET No.
C661

P:\Projects\22063\001001\112742 Prelim Subdivision - Land Development Plan\C661 SWMBIORETENTION B PROFILES.dwg, 4/7/2024 9:03:56 PM, Miranda Tison,

## POND INFLOW HYDROGRAPH 1-YEAR

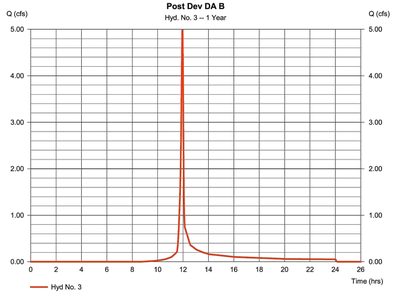
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 3**

Post Dev DA B

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 4.978 cfs |
| Storm frequency | = 1 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 10,051 cuft |
| Drainage area | = 2.541 ac | Curve number | = 86* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 2.40 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.230 x 55) + (0.310 x 61) + (1.300 x 80) + (0.790 x 98)] / 2.541




## POND INFLOW HYDROGRAPH 2-YEAR

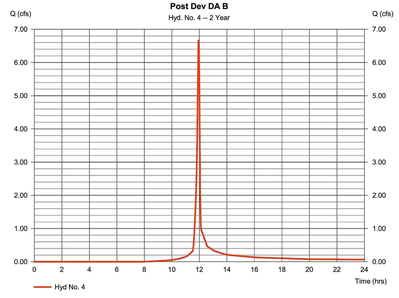
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 4**

Post Dev DA B

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 6.661 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 13,491 cuft |
| Drainage area | = 2.541 ac | Curve number | = 86* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 2.88 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.230 x 55) + (0.310 x 61) + (1.300 x 80) + (0.790 x 98)] / 2.541




## POND INFLOW HYDROGRAPH 10-YEAR

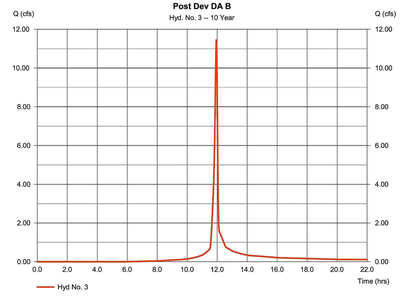
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Friday, 10 / 20 / 2023

**Hyd. No. 3**

Post Dev DA B

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 11.45 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 23,591 cuft |
| Drainage area | = 2.541 ac | Curve number | = 86* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 4.20 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.230 x 55) + (0.310 x 61) + (1.300 x 80) + (0.790 x 98)] / 2.541




## POND INFLOW HYDROGRAPH 25-YEAR

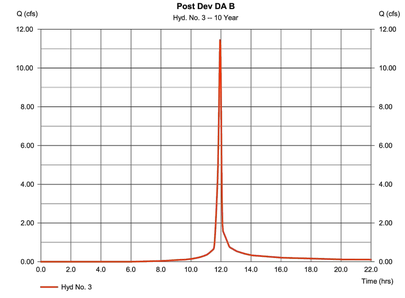
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Friday, 10 / 20 / 2023

**Hyd. No. 3**

Post Dev DA B

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 11.45 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 23,591 cuft |
| Drainage area | = 2.541 ac | Curve number | = 86* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 4.20 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.230 x 55) + (0.310 x 61) + (1.300 x 80) + (0.790 x 98)] / 2.541




## POND INFLOW HYDROGRAPH 100-YEAR

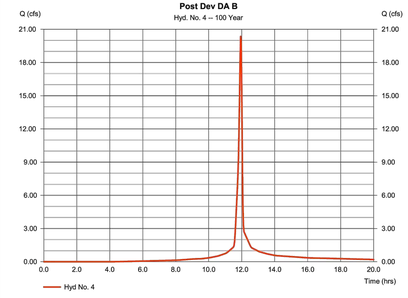
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 10 / 4 / 2023

**Hyd. No. 4**

Post Dev DA B

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 20.35 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 11.93 hrs |
| Time interval | = 2 min | Hyd. volume | = 43,328 cuft |
| Drainage area | = 2.541 ac | Curve number | = 86* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 6.63 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.230 x 55) + (0.310 x 61) + (1.300 x 80) + (0.790 x 98)] / 2.541




## Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Thursday, 11 / 2 / 2023

**Pond No. 2** - BIORETENTION

**Pond Data**

**Contours** -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 457.00 ft

**Stage / Storage Table**

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 457.00 | 5,416 | 0 | 0 |
| 0.50 | 457.50 | 5,938 | 2,837 | 2,837 |
| 1.00 | 458.00 | 6,474 | 3,102 | 5,939 |
| 1.50 | 458.50 | 7,025 | 3,373 | 9,312 |
| 2.00 | 459.00 | 7,589 | 3,652 | 12,965 |
| 2.50 | 459.50 | 8,168 | 3,938 | 16,903 |
| 3.00 | 460.00 | 8,761 | 4,231 | 21,134 |

**Culvert / Orifice Structures**

| | [A] | [B] | [C] | [PrfRsr] |
|---|---|---|---|---|
| Rise (in) | = 15.00 | 6.00 | Inactive | Inactive |
| Span (in) | = 15.00 | 6.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 1 | 0 | 0 |
| Invert El. (ft) | = 452.53 | 457.00 | 0.00 | 0.00 |
| Length (ft) | = 62.01 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 1.00 | 0.00 | 0.00 | n/a |
| N-Value | = .013 | .013 | .013 | n/a |
| Orifice Coeff. | = 0.60 | 0.60 | 0.60 | 0.60 |
| Multi-Stage | = n/a | No | No | No |

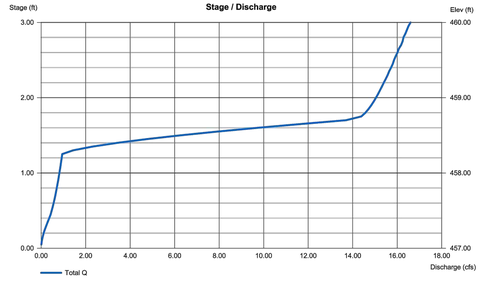
**Weir Structures**

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| Crest Len (ft) | = 12.50 | Inactive | Inactive | Inactive |
| Crest El. (ft) | = 458.25 | 0.00 | 0.00 | 0.00 |
| Weir Coeff. | = 3.33 | 3.33 | 3.33 | 3.33 |
| Weir Type | = 1 | Rect | Rect | --- |
| Multi-Stage | = Yes | No | No | No |

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).




## BIORETENTION SWM SUMMARY TABLE

| | | A-SOIL | 0 SF | 0.00 AC. | B-SOIL | 0 SF | 0.00 AC. | C-SOIL | 0 SF | 0.00 AC. | D-SOIL | 110,672 SF | 2.54 AC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS | FOREST | PERVIOUS | IMPERVIOUS |
| BIO B | | | | | | | | | | | | 74,696 SF | 35,976 SF |
| | | | | | | | | | | | | 1.715 AC. | 0.826 AC. |
| | | | | | | | | | | | | 67.5% | 32.5% |
| | RCN | 30 | 39 | 98 | 55 | 61 | 98 | 70 | 74 | 98 | 77 | 80 | 98 |
| | Rv | 0.02 | 0.15 | 0.95 | 0.03 | 0.2 | 0.95 | 0.04 | 0.22 | 0.95 | 0.05 | 0.25 | 0.95 |
| | C-VALUE | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 | 0.25 | 0.3 | 0.9 |

TOTAL AREA= 110,672 SF OR 2.541 AC.
TOTAL WOODS= 0 SF OR 0.000 AC.
TOTAL PERV.= 74,696 SF OR 1.715 AC.
TOTAL IMP.= 35,976 SF OR 0.826 AC.

WOODS= 77
POST-DEV.= 86
Rv.= 0.48
C-VALUE= 0.5

REQUIRED VOL .FOR THE BIO = 4,405.0)

REQUIRED VOL. FOR THE FOREBAY (606.75)

| BIO AREA PONDING DEPTH | | | |
|---|---|---|---|
| ELEV. | SURFACE AREA | INCREMENTAL VOLUME | COMULATIVE VOLUME |
| 456.50 | 3,295 sf | 0.00 cf | 0.00 cf |
| **457.00** | **3,700 sf** | **1,748.75 cf** | **1,748.75 cf** |

| FORBAY PONDING DEPTH TABLE | | | |
|---|---|---|---|
| ELEV. | SURFACE AREA | INCREMENTAL VOLUME | COMULATIVE VOLUME |
| 456.50 | 1,625 sf | 0.00 cf | 0.00 cf |
| **457.00** | **1,813 sf** | **859.50 cf** | **859.50 cf** |

| PROVIDED VOLUME | | | | |
|---|---|---|---|---|
| LAYER | DEPTH | VOID RATIO | VOLUME | *EQUATION* |
| Ponding Depth= | 6 in. | 1 | 2,608.25 cf | *see main cell area table* |
| Mulch Layer= | 3 in. | 0.25 | 205.94 cf | *3,295*(3/12)*0.25* |
| Soil Media= | 24 in. | 0.25 | 1,647.50 cf | *3,295*(30/12)*0.25* |
| Shoker Stone Layer= | 3 in. | 0.4 | 329.50 cf | *3,295*(3/12)*0.40* |
| Infiltration Sump= | 3 in. | 0.4 | 329.50 cf | *3,295*(3/12)*0.40* |

TOTAL VOL.= **5,120.69 cf**

| POND STAGE STORAGE VOL. | | | |
|---|---|---|---|
| ELEV. | AREA | CUM. VOL. | TOTAL VOL. |
| 457 | 5,400 sf | 0.00 cf | 0.00 cf |
| 458 | 6,475 sf | 5,937.50 cf | 5,937.50 cf |
| 460 | 8,761 sf | 15,236.42 cf | 21,173.92 cf |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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SWM BIORETENTION B INFLOW COMPUTATIONS

SHEET No.

C662


P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C662 SWM BIORETENTION B INFLOW COMPUTATIONS.dwg, 4/7/2024 9:04:35 PM, Miranda Tison,

## Hydrograph Report

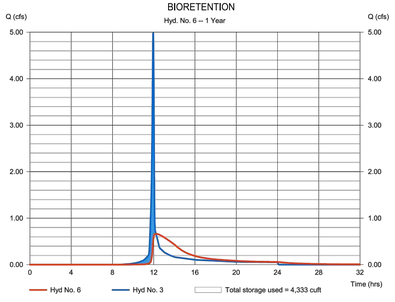
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Thursday, 11 / 2 / 2023

**Hyd. No. 6**

Pond B

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 0.662 cfs |
| Storm frequency | = 1 yrs | Time to peak | = 12.23 hrs |
| Time interval | = 2 min | Hyd. volume | = 10,014 cuft |
| Inflow hyd. No. | = 3 - Post Dev DA B | Max. Elevation | = 457.74 ft |
| Reservoir name | = Pond B | Max. Storage | = 4,333 cuft |

Storage Indication method used.




## Hydrograph Report

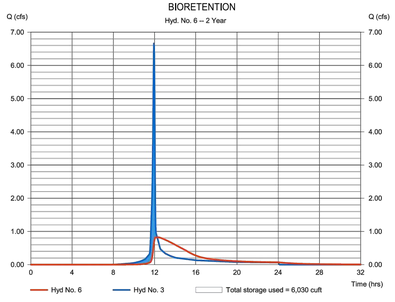
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 11 / 1 / 2023

**Hyd. No. 6**

Pond B

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 0.826 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.27 hrs |
| Time interval | = 2 min | Hyd. volume | = 13,455 cuft |
| Inflow hyd. No. | = 3 - Post Dev DA B | Max. Elevation | = 458.01 ft |
| Reservoir name | = Pond B | Max. Storage | = 6,030 cuft |

Storage Indication method used.




## Hydrograph Report

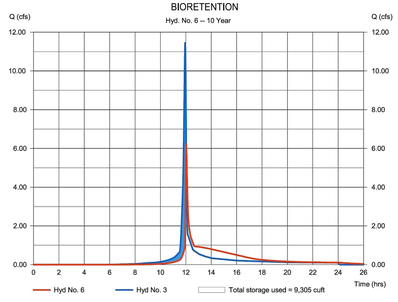
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 11 / 1 / 2023

**Hyd. No. 6**

Pond B

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 6.228 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.03 hrs |
| Time interval | = 2 min | Hyd. volume | = 23,555 cuft |
| Inflow hyd. No. | = 3 - Post Dev DA B | Max. Elevation | = 458.50 ft |
| Reservoir name | = Pond B | Max. Storage | = 9,305 cuft |

Storage Indication method used.




## Hydrograph Report

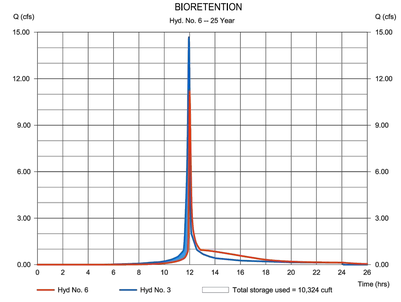
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 11 / 1 / 2023

**Hyd. No. 6**

Pond B

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 11.20 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.00 hrs |
| Time interval | = 2 min | Hyd. volume | = 30,590 cuft |
| Inflow hyd. No. | = 3 - Post Dev DA B | Max. Elevation | = 458.64 ft |
| Reservoir name | = Pond B | Max. Storage | = 10,324 cuft |

Storage Indication method used.




## Hydrograph Report

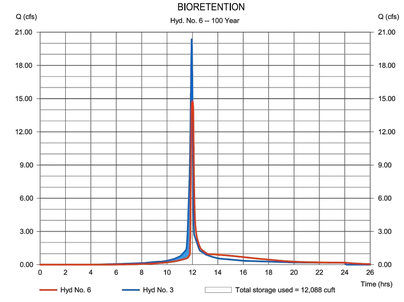
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Thursday, 11 / 2 / 2023

**Hyd. No. 6**

Pond B

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 14.79 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 12.00 hrs |
| Time interval | = 2 min | Hyd. volume | = 43,292 cuft |
| Inflow hyd. No. | = 3 - Post Dev DA B | Max. Elevation | = 458.88 ft |
| Reservoir name | = Pond B | Max. Storage | = 12,088 cuft |

Storage Indication method used.




| BIORETENTION COMPUTATION SUMMARY TABLE | | | |
|---|---|---|---|
| STORM EVENT | Q | PONDING DEPTH (OVER WEIR) | POND WSEL |
| 1-YEAR | 0.662 cfs | 0.70 ft | 457.70 |
| 2-YEAR | 0.83 cfs | 1.01 ft | 458.01 |
| 10-YEAR | 6.23 cfs | 0.25 ft | 458.50 |
| 25-YEAR | 11.20 cfs | 0.39 ft | 458.64 |
| 100-YEAR | 14.14 cfs | 0.65 ft | 458.90 |

| POND DATA | |
|---|---|
| POND BOTTOM | 456.50 |
| POND TOP | 460.00 |
| OUTFALL PIPE SIZE= | 15 in. |
| OUTFALL PIPE ELEV.= | 452.53 |
| LOW FLOW ORIFICE SIZE= | 6.0 in. |
| LOW FLOW ORIFICE ELEV.= | 457.00 |
| LOW FLOW ORIFICE COEFF.= | 0.60 |
| PRINCIPAL SPILLWAY LENGTH= | 12.50 ft |
| PRINCIPAL SPILLWAY ELEV.= | 458.25 |
| PRINCIPAL SPILLWAY BREADTH= | 0.5 ft |
| WEIR COEFF.= | 3.33 ft |

| EMBANKMENT DATA | |
|---|---|
| TOP = | 460.00 |
| BOTTOM = | 456.50 |
| EMBANKMENT HEIGHT = | 3.50 ft |
| 100 YR WSEL = | 458.90 |
| FREEBOARD = | 1.10 ft |
| SETTLEMENT (10% H) = | 0.35 ft |
| SETTLED TOP = | 459.65 |

## Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Thursday, 11 / 2 / 2023

**Pond No. 2 - BIORETENTION**

**Pond Data**

**Contours** -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 457.00 ft

**Stage / Storage Table**

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 457.00 | 5,416 | 0 | 0 |
| 0.50 | 457.50 | 5,938 | 2,837 | 2,837 |
| 1.00 | 458.00 | 6,474 | 3,102 | 5,939 |
| 1.50 | 458.50 | 7,025 | 3,373 | 9,312 |
| 2.00 | 459.00 | 7,589 | 3,652 | 12,965 |
| 2.50 | 459.50 | 8,168 | 3,938 | 16,903 |
| 3.00 | 460.00 | 8,761 | 4,231 | 21,134 |

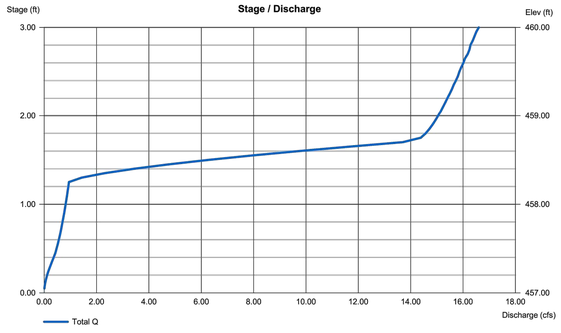
**Culvert / Orifice Structures**

| | [A] | [B] | [C] | [PrfRsr] |
|---|---|---|---|---|
| Rise (in) | = 15.00 | 6.00 | Inactive | Inactive |
| Span (in) | = 15.00 | 6.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 1 | 0 | 0 |
| Invert El. (ft) | = 452.53 | 457.00 | 0.00 | 0.00 |
| Length (ft) | = 62.01 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 1.00 | 0.00 | 0.00 | n/a |
| N-Value | = .013 | .013 | .013 | n/a |
| Orifice Coeff. | = 0.60 | 0.60 | 0.60 | 0.60 |
| Multi-Stage | = n/a | No | No | No |

**Weir Structures**

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| Crest Len (ft) | = 12.50 | Inactive | Inactive | Inactive |
| Crest El. (ft) | = 458.25 | 0.00 | 0.00 | 0.00 |
| Weir Coeff. | = 3.33 | 3.33 | 3.33 | 3.33 |
| Weir Type | = 1 | Rect | Rect | --- |
| Multi-Stage | = Yes | No | No | No |
| Exfil.(in/hr) | = 0.000 (by Contour) | | | |
| TW Elev. (ft) | = 0.00 | | | |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SWM BIORETENTION B OUTLET COMPUTATIONS

SHEET No.

C663

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C663 SWM BIORETENTION B OUTLET COMPUTATIONS.dwg, 4/7/2024 9:05:15 PM, Miranda Tison,

# BIORETENTION DETAILS

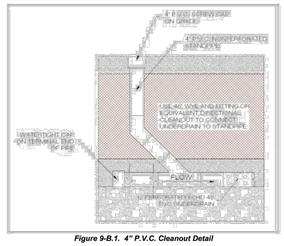


*Figure 9-B.1. 4" P.V.C. Cleanout Detail*

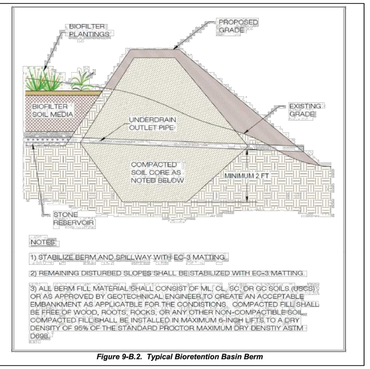


*Figure 9-B.2. Typical Bioretention Basin Berm*

## SECTION 8: CONSTRUCTION

### 8.1. Construction Sequence

***Construction Stage E&S Controls.*** Micro-bioretention and small-scale bioretention areas should be fully protected by silt fence or construction fencing, particularly if they will rely on infiltration (i.e., have no underdrains). Ideally, bioretention should remain outside the limit of disturbance during construction to prevent soil compaction by heavy equipment. Bioretention basin locations may be used as small sediment traps or basins during construction. However, these must be accompanied by notes and graphic details on the ESC plan specifying that (1) the maximum excavation depth at the construction stage must be at least 1 foot above the post-construction maximum excavation, (2) the facility must contain an underdrain, and (3) the plan must also show the proper procedures for converting the temporary sediment control practice to a permanent bioretention facility, including dewatering, cleanout and stabilization.

### 8.2 Bioretention Installation

The following is a typical construction sequence to properly install a bioretention basin. The installation of a bioretention basin will include intermediate inspections at critical stages of construction with inspector sign-off that the particular elements of the bioretention are constructed according the approved plans and specifications. As an alternative, if allowed by the VSMP Authority, the contractor may rely on the engineer of record or other qualified individual to conduct the intermediate inspections and certifications of compliance. The construction sequence for micro-bioretention is more simplified. These steps may be modified to reflect different bioretention applications or expected site conditions:

***Step 1.*** Construction of the bioretention area may only begin after the entire contributing drainage area has been stabilized with vegetation. It may be necessary to block certain curb or other inlets while the bioretention area is being constructed. The proposed site should be checked for existing utilities prior to any excavation.

***Step 2.*** The designer and the installer should have a preconstruction meeting, checking the boundaries of the contributing drainage area and the actual inlet elevations to ensure they conform to original design. Since other contractors may be responsible for constructing portions of the site, it is quite common to find subtle differences in site grading, drainage and paving elevations that can produce hydraulically important differences for the proposed bioretention area. The designer should clearly communicate, in writing, any project changes determined during the preconstruction meeting to the installer and the plan review/inspection authority.

***Step 3.*** Temporary E&S controls are needed during construction of the bioretention area to divert stormwater away from the bioretention area until it is completed. Special protection measures such as erosion control fabrics may be needed to protect vulnerable side slopes from erosion during the construction process.

***Step 4.*** Any pre-treatment cells should be excavated first and then sealed to trap sediments.

***Step 5.*** Excavators or backhoes should work from the sides to excavate the bioretention area to its appropriate design depth and dimensions. Excavating equipment should have scoops with adequate reach so they do not have to sit inside the footprint of the bioretention area. Contractors should use a cell construction approach in larger bioretention basins, whereby the basin is split into 500 to 1,000 sq. ft. temporary cells with a 10-15 foot earth bridge in between, so that cells can be excavated from the side.

***Step 6.*** It may be necessary to rip the bottom soils to a depth of 6 to 12 inches to promote greater infiltration.

***Step 7.*** Place geotextile fabric on the sides of the bioretention area with a 6-inch overlap on the sides. If a stone storage layer will be used, place the appropriate depth of #57 stone on the bottom, install the perforated underdrain pipe, pack #57 stone to 3 inches above the underdrain pipe, and add approximately 3 inches of choker stone/pea gravel as a filter between the underdrain and the soil media layer. If no stone storage layer is used, start with 6 inches of #57 stone on the bottom, and proceed with the layering as described above.

***Step 8.*** Obtain soil the media from a qualified vendor, and store it on an adjacent impervious area or plastic sheeting. After verifying that the media meets the specifications, apply the media in 12-inch lifts until the desired top elevation of the bioretention area is achieved. Wait a few days to check for settlement, and add additional media, as needed, to achieve the design elevation.

***Step 9.*** Prepare planting holes for any trees and shrubs, install the vegetation, and water accordingly. Install any temporary irrigation.

***Step 10.*** Place the surface cover in both cells (mulch, river stone or turf), depending on the design. If coir or jute matting will be used in lieu of mulch, the matting will need to be installed prior to planting (**Step 9**), and holes or slits will have to be cut in the matting to install the plants.

***Step 11.*** Install the plant materials as shown in the landscaping plan, and water them during weeks of no rain for the first two months.

### 8.3 Construction Inspection

Inspections during and immediately after construction are needed to ensure that all the elements of bioretention basins are built in accordance with these specifications. Use a detailed inspection checklist that requires sign-offs by qualified individuals at critical stages of construction and to ensure that the contractor's interpretation of the plan is consistent with the designer's intent. The following identifies the critical stages of construction where an intermediate inspection and sign-off by a qualified individual is recommended since the items can't be verified after construction is completed. A construction inspection checklist that includes certifications of inspection at critical stages is provided at the end of this specification.

The following represents items that are frequently overlooked during construction inspection but represent important elements for ensuring the success of the bioretention facility during the initial break-in period.

- Verify the proper coverage and depth of mulch, vegetation, or soil matting has been achieved following construction, both on the filter bed and the side-slopes.
- Inspect the pre-treatment forbays and filter strips to verify that they are properly installed, stabilized, and working effectively before opening the facility to runoff.
- Check that outfall protection/energy dissipation measures at concentrated inflow and outflow points are stable.

Upon final acceptance of the facility, log the practice's GPS coordinates and submit them for entry into the VSMP Authority's BMP maintenance tracking database.

## SECTION 9: MAINTENANCE

### 9.1. Maintenance Agreements

The Virginia Stormwater Management regulations (4 VAC 50-60) specify the circumstances under which a maintenance agreement must be executed between the owner and the VSMP authority, and sets forth inspection requirements, compliance procedures if maintenance is neglected, notification of the local program upon transfer of ownership, and right-of-entry for local program personnel.

- All bioretention practices must include a long term maintenance agreements consistent with the provisions of the VSMP regulations, and must include the recommended maintenance tasks and a copy of an annual inspection checklist.
- When micro-scale bioretention practices are applied on private residential lots, homeowners should be educated regarding their routine maintenance needs by being provided a simple document that explains their purpose and routine maintenance needs. .
- A deed restriction, drainage easement or other mechanism enforceable by the VSMP authority must be in place to help ensure that rain gardens and bioretention filters are maintained and not converted or disturbed, as well as to pass the knowledge along to any subsequent owners.
- The mechanism should, if possible, grant authority for the VSMP authority to access the property for inspection or corrective action.

### 9.2. First Year Maintenance Operations

Successful establishment of bioretention areas requires that the following tasks be undertaken in the first year following installation:

- ***Initial inspections.*** For the first 6 months following construction, the site should be inspected at least twice after storm events that exceed 1/2 inch of rainfall.
- ***Spot Reseeding.*** Inspectors should look for bare or eroding areas in the contributing drainage area or around the bioretention area, and make sure they are immediately stabilized with grass cover.
- ***Fertilization.*** One-time, spot fertilization may be needed for initial plantings.
- ***Watering.*** Watering is needed once a week during the first 2 months, and then as needed during first growing season (April-October), depending on rainfall.
- ***Remove and replace dead plants.*** Since up to 10% of the plant stock may die off in the first year, construction contracts should include a care and replacement warranty to ensure that vegetation is properly established and survives during the first growing season following construction. The typical thresholds below which replacement is required are 85% survival of plant material and 100% survival of trees.

### 9.3. Maintenance Inspections

It is highly recommended that a spring maintenance inspection and cleanup be conducted at each bioretention area. The following is a list of some of the key maintenance problems to look for:

- Check to see if 75% to 90% cover (mulch plus vegetative cover) has been achieved in the bed, and measure the depth of the remaining mulch.
- Check for sediment buildup at curb cuts, gravel diaphragms or pavement edges that prevents flow from getting into the bed, and check for other signs of bypassing.
- Check for any winter- or salt-killed vegetation, and replace it with hardier species.
- Note presence of accumulated sand, sediment and trash in the pre-treatment cell or filter beds, and remove it.
- Inspect bioretention side slopes and grass filter strips for evidence of any rill or gully erosion, and repair it.
- Check the bioretention bed for evidence of mulch flotation, excessive ponding, dead plants or concentrated flows, and take appropriate remedial action.
- Check inflow points for clogging, and remove any sediment.
- Look for any bare soil or sediment sources in the contributing drainage area, and stabilize them immediately.
- Check for clogged or slow-draining soil media, a crust formed on the top layer, inappropriate soil media, or other causes of insufficient filtering time, and restore proper filtration characteristics.

Example maintenance inspection checklists for Bioretention areas can be accessed in Appendix C of Chapter 9 of the *Virginia Stormwater Management Handbook* (2010).

### 9.4. Routine and Non-Routine Maintenance Tasks

Maintenance of bioretention areas should be integrated into routine landscape maintenance tasks. If landscaping contractors will be expected to perform maintenance, their contracts should contain specifics on unique bioretention landscaping needs, such as maintaining elevation differences needed for ponding, proper mulching, sediment and trash removal, and limited use of fertilizers and pesticides. A customized maintenance schedule must be prepared for each bioretention facility, since the maintenance tasks will differ depending on the scale of bioretention, the landscaping template chosen, and the type of surface cover. A generalized summary of common maintenance tasks and their frequency is provided in **Table 9.8**.

The most common non-routine maintenance problem involves standing water. If water remains on the surface for more than 48 hours after a storm, adjustments to the grading may be needed or underdrain repairs may be needed. The surface of the filter bed should also be checked for accumulated sediment or a fine crust that builds up after the first several storm events. There are several methods that can be used to rehabilitate the filter (try the easiest things first, as listed below):

- Open the underdrain observation well or cleanout and pour in water to verify that the underdrains are functioning and not clogged or otherwise in need of repair. The purpose of this check is to see if there is standing water all the way down through the soil. If there is standing water on top, but not in the underdrain, then there is a clogged soil layer. If the underdrain and stand pipe indicates standing water, then the underdrain must be clogged and will need to be snaked.
- Remove accumulated sediment and till 2 to 3 inches of sand into the upper 8 to 12 inches of soil.
- Install sand wicks from 3 inches below the surface to the underdrain layer. Sand wicks can be installed by excavating or augering (using a tree auger or similar tool) down to the gravel storage zone to create vertical columns which are then filled with a clean open-graded coarse sand material (coarse sand mix similar to the gradation used for the soil media). A sufficient number of wick drains of sufficient dimension should be installed to meet the design dewatering time for the facility.
- Last resort - remove and replace some or all of the soil media.



*Table 9.8. Suggested Annual Maintenance Activities for Bioretention*

| Maintenance Tasks | Frequency |
|---|---|
| • Mowing of grass filter strips and bioretention turf cover | At least 4 times a year |
| • Spot weeding, erosion repair, trash removal, and mulch raking | Twice during growing season |
| • Add reinforcement planting to maintain desired the vegetation density<br>• Remove invasive plants using recommended control methods<br>• Stabilize the contributing drainage area to prevent erosion | As needed |
| • Spring inspection and cleanup<br>• Supplement mulch to maintain a 3 inch layer<br>• Prune trees and shrubs | Annually |
| • Remove sediment in pre-treatment cells and inflow points | Once every 2 to 3 years |
| • Replace the mulch layer | Every 3 years |

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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

SWM BIORETENTION B DETAILS

SHEET No.

C664

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C664 SWM BIORETENTION B DETAILS.dwg, 4/7/2024 9:05:35 PM, Miranda Tison,



## LoCo BMP Construction Inspection Checklist:

## Wet Pond

**Project Name** _____ **Project #** _____ **Dates Inspected** _____ **to** _____

LOCATION of BMP (e.g., BMP 1 @ SE corner of parking lot) _____

GEOGRAPHIC COORDINATES from Plans (Optional): Latitude_____ Longitude_____ (decimal °)

The following checklist provides a basic outline of the anticipated items for the construction inspection of a Wet Pond. Inspectors should review the plans carefully, and adjust these items and the timing of inspection verification as needed to ensure the intent of the design and the inspection is met. Please use "Notes" section at the end of this form to describe additional observations & for explanation when "No" is checked.

**Inspections Performed By One or More of the Following:**

*(Please insert appropriate code adjacent to each inspection item)*

01 Owner/Operator or their Representative

02 Installer/Contractor

03 Geotechnical Engineer

**Prior to Construction:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | All pervious areas of the contributing drainage areas have been adequately stabilized with a thick layer of vegetation or adequate erosion control measures remain in place. | |

**Construction of Embankment and Principal Spillway:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | Digital Photos taken during this stage. | |
| 0__ | ☐ | ☐ | ☐ | Stormwater has been diverted around or through the area of the wet pond embankment to a stabilized conveyance and perimeter erosion control measures to protect the facility during construction have been installed. | |



**Construction of Embankment and Principal Spillway cont'd:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | Materials for construction of the embankment and principal spillway meet the specifications of the approved plans. | |
| 0__ | ☐ | ☐ | ☐ | Construction of "cut-off" trench, principal spillway, including the riser and barrel, anti-seepage controls, outlet protection, etc., is built in accordance with approved plans. | |
| **03** | ☐ | ☐ | ☐ | Geotechnical engineer's analysis and approval of the core (if required) and embankment material has been provided, and the material has been placed in lifts and compacted in accordance with the approved plans. Sign below to verify installation.* | |

Name _____ Signature _____

West Virginia License # _____ Date _____

| | | | | | |
|---|---|---|---|---|---|
| **03** | ☐ | ☐ | ☐ | Design & Construction of "filter and drainage diaphragms," if included, has been supervised by the Geotechnical Engineer. Sign below to verify installation.* | |

Name _____ Signature _____

West Virginia License # _____ Date _____

**Excavation of Wet Pond:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | Digital Photos taken during this stage. | |
| 0__ | ☐ | ☐ | ☐ | Excavation of the wet pond geometry (including bottom width, side slopes, check dams, weir overflow and outlet protection, etc) achieves the elevations in accordance with approved plans. | |
| 0__ | ☐ | ☐ | ☐ | Excavation of internal features: deep pool, forebays, etc., is in accordance with approved plans. | |



**Excavation of Wet Pond cont'd:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | Impermeable geotextile liner (minimum 30 mil poly-liner), when required, meets project specifications as certified by the manufacturer and verified by the installer. | |
| **03** | ☐ | ☐ | ☐ | Impermeable clay liner, when required, is placed per geotechnical engineer's oversight. Note: clay liners must meet the minimum requirements found in Table 14.4 in Specification 14 of the Va. BMP Clearinghouse. Sign below to verify installation.* | |

Name _____ Signature _____

West Virginia License # _____ Date _____

**Landscaping Plan and Stabilization:**

| Inspector | Yes | No | N/A | Construction Item | Date Completed |
|---|---|---|---|---|---|
| 0__ | ☐ | ☐ | ☐ | Digital Photos taken during this stage. | |
| 0__ | ☐ | ☐ | ☐ | Exposed soils on pond side slopes above permanent pool elevation are stabilized with specified seed mixtures, stabilization matting, mulch, etc., in accordance with approved plans. | |
| 0__ | ☐ | ☐ | ☐ | Appropriate number and spacing of plants are installed and protected on the aquatic bench and pond buffer in accordance with the approved plans. | |



| Date: | Additional Inspection Notes: |
|---|---|
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| Date: | Additional Inspection Notes: |
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Note: Provide this report, along with digital photos, to the LoCo Dept. of Building & Development coincident with E&S Bond Release. "As-Built" plans of the BMP & P.E. certification must be provided to B&D prior to ~~VSMP~~ Permit Termination.



**BMP INSPECTION CHECKLIST INSTRUCTIONS**

1. **Checklist Basics**

A. The person noted as the **"operator"** on the VSMP permit for the site where the BMP is constructed is ultimately responsible for the inspections being performed & completion of the checklist.

B. There will be one (1) Construction Inspection Checklist per BMP.

C. Use dark ink (blue or black) to fill out the document. ✔

D. Make sure to fill out the grey information box (on the 1st page) describes the location of the BMP on the site, as well as its geographic coordinates (obtain from the approved plans).

E. If construction of a BMP is already underway when this program begins on **August 1, 2017**, please denote all checklist items that have been completed. However, if there is insufficient information available to verify completion of a construction item, check the N/A (not applicable) box and provide a brief explanation in the **"Additional Inspection Notes"** section.

F. Each checklist is divided into phases of construction (e.g., excavation, bioretention soil media placement, etc.) with individual construction items within each phase.

G. For the majority of the checklist items, any of the following individuals may perform inspections and fill out the document*:

i. The operator/owner or his representative (e.g., project engineer);

ii. The contractor who installs the BMP; and/or,

iii. The geotechnical engineer for the project.

*The individual filling out the checklist must indicate so **for each construction item** (i.e., **enter designated number**).

H. Note: A licensed Geotechnical Engineer must inspect & verify the installation of the specific checklist items below via this signature block found in the document:

Name _____ Signature _____

West Virginia License # _____ Date _____

i. Bioretention Facility – Impervious clay liner (when required) must meet specifications found in the Va. BMP Clearinghouse.

ii. Wet Pond & Extended Detention Pond –

a. Embankment core (if required) and embankment material;



**BMP INSPECTION CHECKLIST INSTRUCTIONS (cont'd)**

b. Design & construction of filter & drainage diaphragms (if included); &

c. Impervious clay liner (if required).

iii. Wet & Dry Swales – Impervious clay liner (when required) must meet specifications found in the Va. BMP Clearinghouse.

G. When filling out the checklist, check **"Yes"** when construction of the item is completed per the explanation/description. Concurrently, enter the "Date Completed."

H. Check **"N/A"** (not applicable) if the construction item is not part of the approved design (e.g., an impervious liner is not required) or there is an approved field modification which changes or eliminates the item. When N/A is checked, always explain the reason in the **"Additional Inspection Notes"** section at the end of the checklist.

I. Also use **"Additional Inspection Notes"** for any notes/clarification that will help verify that the BMP was properly constructed.

2. **Photos**

A. Digital photos are required for most phases of BMP construction.

B. The photos will help to verify that each stage of construction met the standards required in the checklist.

3. **Location of BMP Checklists on Site & Checklist Updates**

A. The checklist for a particular BMP will be updated as the different phases of the installation occur. Once the construction of a BMP has begun, attach the **up-to-date** checklist to the on-site Stormwater Pollution & Prevention Plan (SWPPP).

B. BMP Checklists may be reviewed on site by a member of B&D's VSMP Team (as well as the Erosion & Sediment Control Field Manager) during spot checks of the BMP installation.

4. **Construction Complete - Final Step**

A. Once construction of the BMP is complete, submit the completed Loudoun County BMP Checklist along with all digital photos to B&D coincident with Erosion & Sediment Control Bond release.

- **Reminder** – "As-Built" plans & P.E. Certification related to BMP construction must still be provided to B&D for review prior to Permit Termination



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HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
SWM BIORETENTION B CONSTRUCTION INSPECTION CHECKLIST

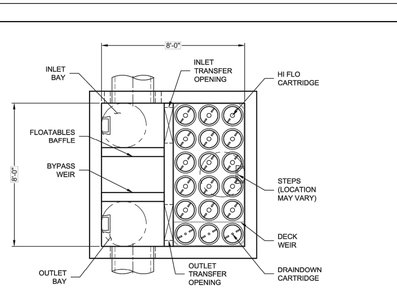
SHEET No.
C665

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C665 SWM BIORETENTION B CONSTRUCTION INSPECTION CHECKLIST.dwg, 4/11/2024 8:56:01 AM, Matthew Polshaus,

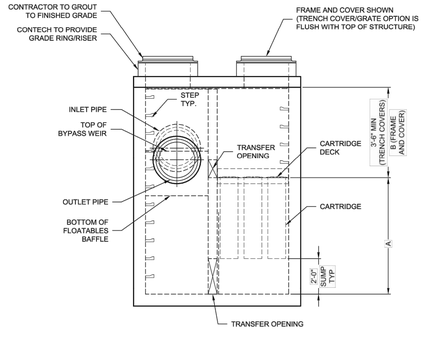
## PROPRIETARY PRODUCTS NOTE

CONTRACTOR SHALL CONTACT THE MANUFACTURER AND OBTAIN THE MOST CURRENT SPECIFICATIONS AND INSTALLATION GUIDELINES PRIOR TO INITIATING WORK AND REVIEW FOR CONFORMANCE WITH PLAN SPECIFICATIONS AND GUIDELINES. ANY DISCREPANCIES OR CHANGES SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER OR OWNER FOR NEEDED ACTION.

IMEG CORP. CERTIFIES THAT THIS SHEET SPECIFIES A PRODUCT PRODUCED AND DESIGNED BY OTHERS. THIS PLAN HAS BEEN DESIGNED TO INCORPORATE THE PRODUCT INTO THE SITE DESIGN IN A MANNER CONSISTENT WITH THE INTENDED USE OF THE PRODUCT. SEE PLANS, PROFILES AND SCHEMATIC DETAILS INCLUDED IN THIS PLAN FOR SITE SPECIFIC INFORMATION APPLICABLE TO ITS USE ON THIS SITE. THE PRODUCT MANUFACTURER IS RESPONSIBLE FOR PROVIDING CURRENT SPECIFICATIONS FOR THE INSTALLATION AND USE OF THE PRODUCT.

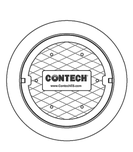



**PLAN VIEW**
(TOP SLAB NOT SHOWN FOR CLARITY)

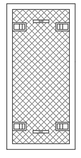



**ELEVATION VIEW**

| JELLYFISH DESIGN NOTES | | | | |
|---|---|---|---|---|
| JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD PEAK DIVERSION STYLE WITH PRECAST TOP SLAB IS SHOWN. ALTERNATE OFFLINE VAULT AND/OR SHALLOW ORIENTATIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD | | | | |
| CARTRIDGE SELECTION | | | | |
| CARTRIDGE LENGTH | 54" | 40" | 27" | 15" |
| OUTLET INVERT TO STRUCTURE INVERT (A) | 6'-6" | 5'-4" | 4'-3" | 3'-3" |
| FLOW RATE HI-FLO / DRAINDOWN (CFS) (PER CART) | 0.178 / 0.089 | 0.133 / 0.067 | 0.089 / 0.045 | 0.049 / 0.025 |
| MAX. TREATMENT (CFS) | 2.94 | 2.21 | 1.47 | 0.81 |
| DECK TO INSIDE TOP (MIN) (B) | 5.00 | 4.00 | 4.00 | 4.00 |




**FRAME AND COVER**
(DIAMETER VARIES)
N.T.S.



**24" TRENCH COVER**
(LENGTH VARIES)
N.T.S.

**SITE SPECIFIC DATA REQUIREMENTS**

| | |
|---|---|
| STRUCTURE ID | * |
| WATER QUALITY FLOW RATE (cfs) | * |
| PEAK FLOW RATE (cfs) | * |
| RETURN PERIOD OF PEAK FLOW (yrs) | * |
| # OF CARTRIDGES REQUIRED (HF / DD) | * |
| CARTRIDGE LENGTH | * |

| PIPE DATA: | I.E. | MAT'L | DIA | SLOPE % | HGL |
|---|---|---|---|---|---|
| INLET #1 | * | * | * | * | * |
| INLET #2 | * | * | * | * | * |
| OUTLET | * | * | * | * | * |

SEE GENERAL NOTES 6-7 FOR INLET AND OUTLET HYDRAULIC AND SIZING REQUIREMENTS.

| | |
|---|---|
| RIM ELEVATION | * |

| ANTI-FLOTATION BALLAST | WIDTH | HEIGHT |
|---|---|---|
| | * | * |

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 10', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-857, ASTM C-978, AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS RECOMMENDED TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE.
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).
D. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION.

Jellyfish® Filter
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING: U.S. PATENT NO. 8,287,726; 8,221,618; US 8,123,935; OTHER INTERNATIONAL PATENTS PENDING

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

JELLYFISH JFPD0808
STANDARD DETAIL
PEAK DIVERSION CONFIGURATION

I:\COMMON\CAD\TREATMENT\13 JELLYFISH FILTER\40 STANDARD DRAWINGS\JFPD\DWG\JFPD0808.DTL NEW.DWG 1/29/2018 10:50 AM

CONTECH ENGINEERED SOLUTIONS

| | | | |
|---|---|---|---|
| **Project Name:** | Hillside | | |
| **Site Designation:** | JF | **Date:** | 10/30/23 |
| **County or Independent City:** | Charles Town | **Design Engineer:** | |
| **State:** | WV | | |

**Mass Loading Calculations:**

| | |
|---|---|
| Peak Design Flow (cfs) | TBD |
| Water Quality Flow (cfs) | 0.48 |
| Annual Rainfall (inches) | 43 |
| Total Drainage Area, A (ac) | 10.17 |
| Post Development Impervious Area, $A_I$ (ac) | 4.37 |
| Pervious Area, $A_P$ (ac) | 0.58 |
| Impervious Runoff Coefficient, Rv | 0.95 |
| Pervious Runoff Coefficient, Rv | 0.25 |
| % Impervious | 43% |
| Runoff Coefficient, Rc | 0.42 |
| TSS Removal By Pretreatment | 40% |
| Agency Required TSS % Removal | 80% |
| Required TSS Removal Efficiency of Filter | 67% |
| Percent Runoff Capture | 90% |
| Mean Annual Runoff, $V_t$ ($ft^3$) | 603,577 |
| Event Mean Concentration of Pollutant, EMC (mg/L) | 60 |
| Annual Mass Load, $M_{total}$ (lbs) | 2259.46 |

**Mass Based Filter Sizing:**

| | |
|---|---|
| Mass to be Captured by System (lbs) | 903.78 |
| Filter Type | Jellyfish |
| Structure Type | Peak Diversion |
| Cartridge Length | 54" |
| Allowable Load Per Hi-Flo Cartridge (lbs) | 125 |
| Allowable Load Per Draindown Cartridge (lbs) | 63 |
| # Hi-Flo Cartridges Required | 7 |
| # Draindown Cartridges Required | 2 |
| | |
| Recommended Model | 8'x8' Peak Diversion |
| TSS Treatment Capacity (lbs) | 1001.00 |
| Maximum Water Quality Flow | 1.43 cfs |

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PRELIM PLAN - SWM POND DETAILS
HILLSIDE
LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
SWM ADDITIONAL POND DETAILS

SHEET No.
C670

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C670 SWM Additional Pond Details.dwg, 4/7/2024 9:06:19 PM, Miranda Tison,

## SEDIMENT BASIN KEY DESIGN ASPECTS

| BASIN NUMBER | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| TYPE (stone weir/pipe) | Pipe | Pipe | | | | |
| DRAINAGE AREA | 6.40 AC | 5.67 AC | | | | |
| WET STORAGE REQ | 11,520 CF | 10,206 CF | | | | |
| WET STORAGE PROV | 13,754 CF | 23,049 CF | | | | |
| DRY STORAGE REQ | 11,520 CF | 10,206 CF | | | | |
| DRY STORAGE PROV | 13,163 CF | 23,834 CF | | | | |
| WEIR WIDTH | N/A | N/A | | | | |
| PIPE DIAMETER | 24 in | 30 in | | | | |
| WEIR/PIPE ELEVATIONS | N/A | N/A | | | | |
| STORAGE DEPTH | 7 ft | 9.5 ft | | | | |
| CLEANOUT ELE | 462.80 ft | 440.25 ft | | | | |
| EMBANKMENT ELE | 468.00 ft | 448.00 ft | | | | |
| BASIN BOTTOM ELE | 462.00 ft | 438.50 ft | | | | |

## LEGEND

- CE — TEMPORARY CONSTRUCTION ENTRANCE
- IP — INLET PROTECTION
- SF — SILT FENCE
- SSF — SUPER SILT FENCE
- DD — DIVERSION DIKE

STERNWAY DRIVE (40' ROW)

PROPOSED SEDIMENT TRAP
PIPE OUTFALL CONNECTION

80'-24" RCP
@ 3.50%

INVERT=460.00

INVERT= 462.80

BAFFLE BOARD

PROPOSED RIP-RAP
INFLOW PROTECTION
(TYP.)

INSET

PROP. TEMPORARY SEDIMENT BASIN (SB) #1
(SEE SCHEDULE ON THIS SHEET)
(SEE PIPE RISER SEDIMENT BASIN
DETAIL ON SHEET C705)

SEE INSET THIS SHEET

SEE SHEET C701

DA= 0.78 AC
TO SF

DA= 6.40 AC
TO SB 1

PROP. LIMITS OF
CLEARING AND
GRADING

SOIL TYPE D

SOIL TYPE B

SSF — TEMPORARY STOCKPILE/ WASTE AREA

WEST VIRGINIA STATE GRID NORTH
WV83-NF

E:2437641
N:286878

E:2437891
N:286956

E:2439001
N:286710

40 20 0 40 80
GRAPHIC SCALE
1" = 40'

60 30 0 60 120
GRAPHIC SCALE
1" = 60'

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PRELIM PLAN - EROSION &
SEDIMENT CONTROL PLAN PHASE 1
LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 60'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

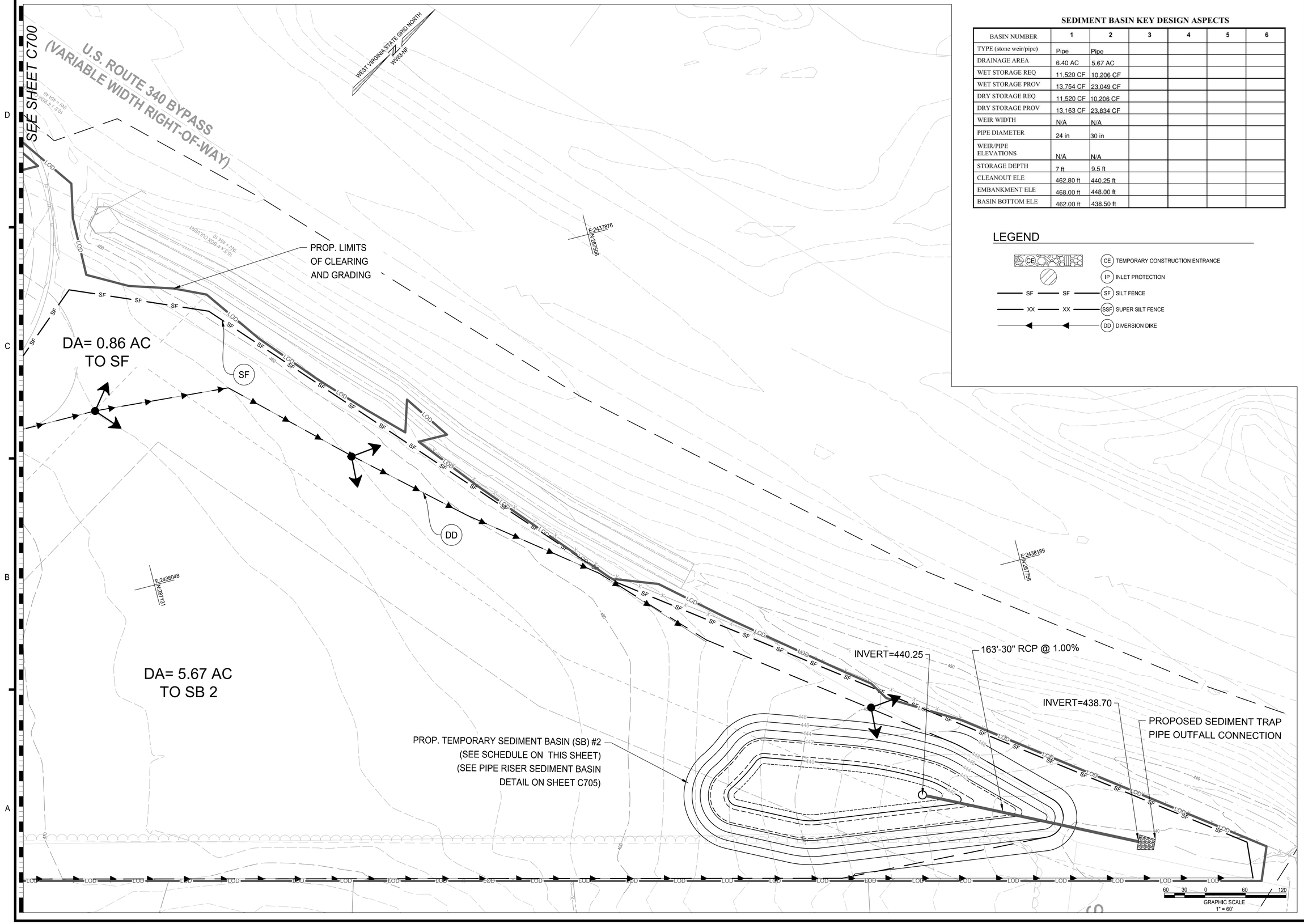
SHEET TITLE:

EROSION &
SEDIMENT
CONTROL PLAN
PHASE 1

SHEET No.

C700

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C701 Erosion & Sediment Control Plan Phase 1.dwg, 4/7/2024 9:10:38 PM, Miranda Tison,




## SEDIMENT BASIN KEY DESIGN ASPECTS

| BASIN NUMBER | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| TYPE (stone weir/pipe) | Pipe | Pipe | | | | |
| DRAINAGE AREA | 6.40 AC | 5.67 AC | | | | |
| WET STORAGE REQ | 11,520 CF | 10,206 CF | | | | |
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| DRY STORAGE PROV | 13,163 CF | 23,834 CF | | | | |
| WEIR WIDTH | N/A | N/A | | | | |
| PIPE DIAMETER | 24 in | 30 in | | | | |
| WEIR/PIPE ELEVATIONS | N/A | N/A | | | | |
| STORAGE DEPTH | 7 ft | 9.5 ft | | | | |
| CLEANOUT ELE | 462.80 ft | 440.25 ft | | | | |
| EMBANKMENT ELE | 468.00 ft | 448.00 ft | | | | |
| BASIN BOTTOM ELE | 462.00 ft | 438.50 ft | | | | |

## LEGEND

- CE — TEMPORARY CONSTRUCTION ENTRANCE
- IP — INLET PROTECTION
- SF — SILT FENCE
- XX — SUPER SILT FENCE
- DD — DIVERSION DIKE

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PRELIM PLAN - EROSION & SEDIMENT CONTROL PLAN PHASE 1
LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

EROSION & SEDIMENT CONTROL PLAN PHASE 1

SHEET No.

C701

P:\Projects\22063\001001\112742 Prelim Subdivision - Land Development Plan\C701 Erosion & Sediment Control Plan Phase 1.dwg, 4/7/2024 9:10:48 PM, Miranda Tison,

STERNWAY DRIVE

STERNWAY DRIVE (40' ROW)

EDAW DRIVE (40' ROW)

SOIL TYPE B

SOIL TYPE D

PUBLIC ROAD 'A'

PUBLIC ROAD 'B'

PUBLIC ROAD 'C'

DA= 0.25 AC
C= 0.77
TO 148

DA= 0.74 AC
C= 0.67
TO 146

DA= 0.21 AC
C= 0.84
TO 144

DA= 0.28 AC
C= 0.83
TO 150

DA= 0.26 AC
C= 0.90
TO 310

DA= 0.46 AC
C= 0.85
TO 120

DA= 0.63 AC
C= 0.71
TO 118

DA= 0.07 AC
C= 0.35
TO 140

DA= 0.56 AC
C= 0.87
TO 116

DA= 0.56 AC
C= 0.86
TO 122

DA= 0.46 AC
C= 0.83
TO 136

DA= 0.14 AC
C= 0.82
TO 132

DA= 0.13 AC
C= 0.81
TO 130

DA= 0.05 AC
C= 0.79
TO 172

DA= 0.51 AC
C= 0.90
TO 312

DA= 0.53 AC
C= 0.87
TO 124

DA= 0.21 AC
C= 0.92
TO 178

DA= 0.07 AC
C= 0.81
TO 174

DA= 0.24 AC
C= 0.74
TO 176

DA= 0.32 AC
C= 0.89
TO 126

DA= 0.59 AC
C= 0.90
TO 162

DA= 0.39 AC
C= 0.86
TO 170

SEE SHEET C703

E:2437686
N:286460

E:2438031
N:286550

TW=496.00
BW=486.00

TW=496.30

WEST VIRGINIA STATE GRID NORTH
WVSNF

GRAPHIC SCALE
1" = 30'

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PRELIM PLAN - EROSION & SEDIMENT CONTROL PLAN PHASE 1
LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

EROSION & SEDIMENT CONTROL PLAN PHASE 2

SHEET No.

C702

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C703 Erosion & Sediment Control Plan Phase 2.dwg, 4/7/2024 10:16:12 PM, Matthew Pohlhaus,

SEE SHEET C702

U.S. ROUTE 340 BYPASS
(VARIABLE WIDTH RIGHT-OF-WAY)

WEST VIRGINIA STATE GRID NORTH
WV83-NF

E:2437861
N:287366

E:2438440
N:287366

E:2438251
N:287679

DA= 0.11 AC
C= 0.90
TO 308

DA= 0.27 AC
C= 0.81
TO 304

DA= 0.34 AC
C= 0.90
TO 306

DA= 0.18 AC
C= 0.06
TO 106

DA= 063 AC
C= 0.85
TO 195

DA= 0.07 AC
C= 0.81
TO 108

DA= 0.44 AC
C= 0.80
TO 190

DA= 0.31 AC
C= 0.90
TO 206

DA= 0.31 AC
C= 0.90
TO 204

DA= 0.22 AC
C= 0.90
TO 202

DA= 0.22 AC
C= 0.90
TO 200

HILLSIDE DRIVE

PUBLIC ROAD 'A'

SOIL TYPE C

GRAPHIC SCALE
1" = 30'

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PRELIM PLAN - EROSION & SEDIMENT CONTROL PLAN PHASE 1
LOTS 2A (RESIDUE) & 2B
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

EROSION & SEDIMENT CONTROL PLAN PHASE 2

SHEET No.

C703

P:\Projects\22063\001001\112742 Prelim Subdivision - Land Development Plan\C703 Erosion & Sediment Control Plan Phase 2.dwg, 4/7/2024 10:17:11 PM, Matthew Polhaus,

## EROSION AND SEDIMENT CONTROL NARRATIVE

Description: The Project delineated hereon is located in the City of Charles Town, WV. This plan proposes construction of 121 town home lots and associated roads and utilities. Approximately 14.255 acres will be disturbed for construction.

Date of construction: Construction will begin following plan approval and is estimated to take up to 6 Months to complete the initial sitework and infrastructure and 3 years to complete the project.

Offsite areas: Top soil will be stripped from graded areas and stockpiled for use in final grading and permanent stabilization. Stockpiles will be kept on site and clear of all construction activities. The stockpiles will be be stabilized with temporary seeding and protected with silt fence or earthern berms.

Erosion And Sediment Control Measures: Unless otherwise indicated, all vegetative and structural erosion and sediment control measures shall be constructed and maintained according to the minimum standards and specifications of the West Virginia Erosion and Sediment Control Handbook.

**Management Strategies:**

Construction shall be sequenced such that grading operations will begin and end as quickly as possible.

The site superintendent shall be responsible for the installation and maintenance of all erosion and sediment control measures. Maintenance of these measures throughout the project is critical to the effectiveness of the program.

After areas above controls have been stabilized, the controls shall be cleaned up and removed.

Electric power, telephone, storm, sanitary, water & gas supply trenches (as applicable) are to be compacted, seeded and mulched within four (4) days after backfilling. No more than 500 feet are to be open at any one time.

All cut and fill slopes are to be seeded and mulched within four (4) days of completion of grading.

Drainage swales shall be stabilized with check dams until vegetation has been well established, at which time the temporary check dams shall be removed.

Devices listed above are considered minimum erosion and sediment controls. Additional control measures may be necessary due to contractor phasing or other unforeseen conditions. It is the contractor's responsibility to provide additional measures to those shown, as needed, in order to control erosion and contain sediment on site. All measures shall be installed according to the standards and specifications in the West Virginia erosion and sediment control handbook.

**Maintenance Program:**

All control measures shall be inspected daily by the site superintendent or his representative and within 24 hours after any storm event greater than 0.25 inches of rain per 24-hour period. Any damaged structural measures are to be repaired by the end of the day. Seeded areas shall be checked regularly to ensure that a good stand of grass is maintained. All areas shall be fertilized and reseeded as needed until grass is established.

Trapped sediment is to be removed as required to maintain 50% trap efficiency and disposed of by spreading on site.

Inlet protection shall be checked regularly for sediment build-up. If the gravel outlet is clogged by sediment, it shall be removed and cleaned or replaced immediately.

The contractor is responsible for keeping existing public roads in a clean, dust and mud free, condition at all times.

**Erosion and sediment control program:**

1. Hold pre-construction meeting on site with inspector.
2. Install construction entrance.
3. Clearing and grubbing for sediment control devices only.
4. Placement of sediment control devices.
5. Obtain inspector's approval prior to beginning grading operations.
6. Clear and grub remainder of site.
7. Rough grade site.
8. Install drainage devices with sediment control. This includes drainage swales with RIP-RAP.
9. Final grading.
10. Restoration and stabilization of disturbed areas.
11. Convert trap to Bio-retention (see Bio-retention Sequence of Construction for details).
12. Remove erosion and sediment control measures with the approval of the inspector.

Note: City of Charles Town Public Officials retain the right to add and/or modify these erosion and sediment control measures during the construction process, within reason, to ensure adequate protection to the public and the environment.

Seeding schedule (soil stabilization):

1. All permanent seeding shall be in accordance with the West Virginia Erosion & Sediment Control Manual.
2. Spread topsoil at a minimum depth of four (4) inches.
3. Incorporate pulverized agricultural limestone into the topsoil at a rate of 92 lbs. per 1,000 square feet (2 tons per acre).
4. Fertilize with 10-10-10 fertilizer at a rate of 23 lbs per 1,000 square feet (1,000 lbs per acre).
5. Seed all areas with a seed mix consisting of 67% Kentucky 31 Tall Fescue and 33% Red Top Clover.
6. Mulch all seeded areas with straw mulch applied at a rate of 3,500 lbs per acre anchored with cutback or emulsified asphalt applied at a rate of 200 gallons per acre.

Dust control:

1. Temporary seeding shall be applied to all disturbed areas subject to little or no construction traffic.
2. All haul roads and other heavy traffic routes shall be sprinkled with water until the surface is wet and repeated as needed to control dust.

Stormwater Management Narrative:

The existing Stormwater Management Facility was approved to service the full build out of the development within its drainage area. The existing pond, as designed, meets the 1999 Virginia Stormwater Management Handbook, which is one of the practices allowable by the City of Charles Town Code. Chapter 2 of the VSMH states sites are allowed to use the Technology-based water quality criteria so that for land development, "the post developed stormwater runoff from the impervious cover shall be treated by an appropriate BMP as required by the post-developed condition percent impervious cover as specified in Table 2-3." Table 2-3 allows an Extended Detention facility to be utilized when the impervious cover is from 22-37%. Our conservative calculations have the existing pond and it contributing drainage area (both currently developed and the proposed full build-out of the remaining drainage area) to be 37% impervious and therefore meeting the technology based criteria. No additional measures are anticipated.

## MINIMUM CONSTRUCTION STANDARDS

**An erosion and sediment control program adopted with this plan must be consistent with the VSECH for 9VAC25-840-40 minimum standards:**

1. **Permanent or temporary soil stabilization shall be applied to denuded areas within four days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within four days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.**

2. **During construction of the project, soil stock piles and borrow areas shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all soil stockpiles on site as well as borrow areas and soil intentionally transported from the project site.**

3. **A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion.**

4. **Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place.**

5. **Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.**

6. **Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin.**

   a. **The minimum storage capacity of a sediment trap shall be 134 cubic yards per acre of drainage area and the trap shall only control drainage areas less than three acres.**

   b. **Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled by a sediment basin. The minimum storage capacity of a sediment basin shall be 134 cubic yards per acre of drainage area. The outfall system shall, at a minimum, maintain the structural integrity of the basin during a 100-year storm of 24-hour duration. Runoff coefficients used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.**

7. **Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.**

8. **Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure.**

9. **Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.**

10. **All storm sewer inlets that are made operable during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.**

11. **Before newly constructed stormwater conveyance channels or pipes are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel.**

12. **When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction. Nonerodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by nonerodible cover materials.**

13. **When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary vehicular stream crossing constructed of nonerodible material shall be provided.**

14. **All applicable federal, state and local requirements pertaining to working in or crossing live watercourses shall be met.**

15. **The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.**

16. **Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:**

    a. **No more than 500 linear feet of trench may be opened at one time.**

    b. **Excavated material shall be placed on the uphill side of trenches.**

    c. **Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property.**

    d. **Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.**

    e. **Restabilization shall be accomplished in accordance with this chapter.**

    f. **Applicable safety requirements shall be complied with.**

17. **Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual development lots as well as to larger land-disturbing activities.**

18. **All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the City of Charles Town authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.**

19. **Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria. Stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels:**

    a. **Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed.**

    b. **Adequacy of all channels and pipes shall be verified in the following manner:**

       (1) **The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question; or**

       (2) (a) **Natural channels shall be analyzed by the use of a two-year storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks.**

       (b) **All previously constructed man-made channels shall be analyzed by the use of a 10-year storm to verify that stormwater will not overtop its banks and by the use of a two-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and**

       (c) **Pipes and storm sewer systems shall be analyzed by the use of a 10-year storm to verify that stormwater will be contained within the pipe or system.**

    c. **If existing natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:**

       (1) **Improve the channels to a condition where a 10-year storm will not overtop the banks and a two-year storm will not cause erosion to the channel, the bed, or the banks; or**

       (2) **Improve the pipe or pipe system to a condition where the 10-year storm is contained within the appurtenances;**

       (3) **Develop a site design that will not cause the pre-development peak runoff rate from a two-year storm to increase when runoff outfalls into a natural channel or will not cause the pre-development peak runoff rate from a 10-year storm to increase when runoff outfalls into a man-made channel; or**

       (4) **Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the City of Charles Town authority to prevent downstream erosion.**

    d. **The applicant shall provide evidence of permission to make the improvements.**

    e. **All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project.**

    f. **If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the City of Charles Town of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance.**

    g. **Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipators shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel.**

    h. **All on-site channels must be verified to be adequate.**

    i. **Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility.**

    j. **In applying these stormwater management criteria, individual lots or parcels in a residential, commercial or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations.**

    k. **All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical and biological integrity of rivers, streams and other waters of the state.**

    l. **Any plan approved prior to July 1, 2014, that provides for stormwater management that addresses any flow rate capacity and velocity requirements for natural or man-made channels shall satisfy the flow rate capacity and velocity requirements for natural or man-made channels if the practices are designed to (i) detain the water quality volume and to release it over 48 hours; (ii) detain and release over a 24-hour period the expected rainfall resulting from the one year, 24-hour storm; and (iii) reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in a good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels as defined in any regulations promulgated pursuant to § 62.1-44.15:54 or 62.1-44.15:65 of the Act.**

    m. **For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of § 62.1-44.15:52 A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (§ 62.1-44.15:24 et seq. of the Code of Virginia) and attendant regulations, unless such land-disturbing activities are in accordance with 9VAC25-870-48 of the Virginia Stormwater Management Program (VSMP) Regulation or are exempt pursuant to subdivision C 7 of § 62.1-44.15:34 of the Act.**

    n. **Compliance with the water quantity minimum standards set out in 9VAC25-870-66 of the Virginia Stormwater Management Program (VSMP) Regulation shall be deemed to satisfy the requirements of this subdivision 19.**

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PRELIM - EROSION & SEDIMENT CONTROL PLAN NARRATIVE

LOTS 2A (RESIDUE) & 2B

LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

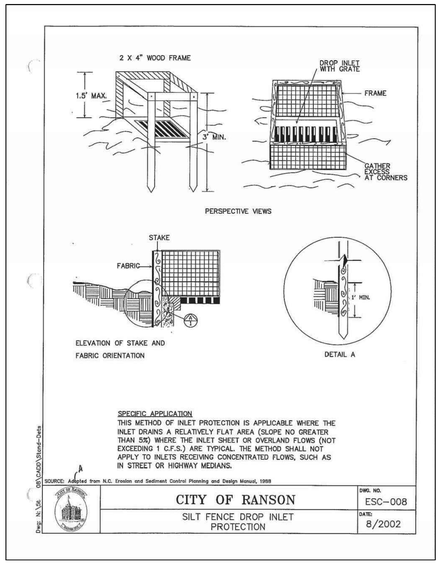
SHEET TITLE:

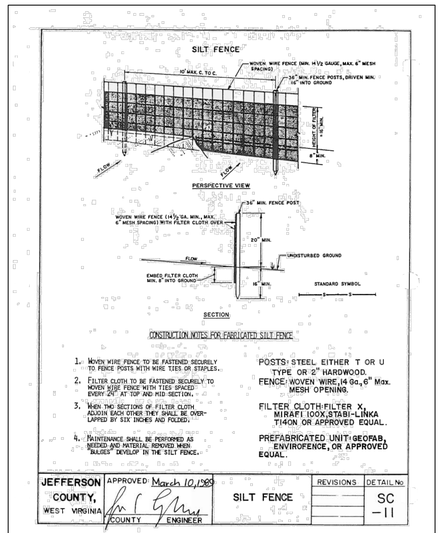
EROSION & SEDIMENT CONTROL PLAN NARRATIVE

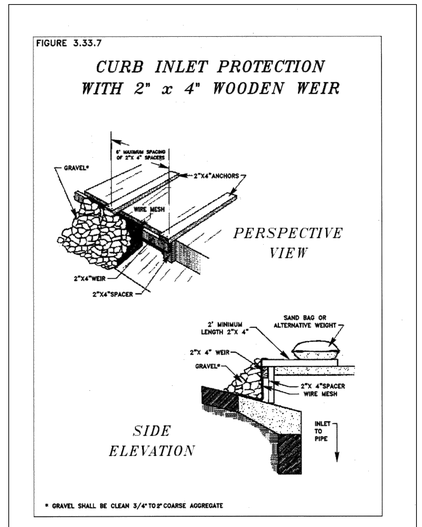
SHEET No.

C704

P:\Projects\22063\001\001112742 Prelim Subdivision - Land Development Plan\C704 Erosion & Sediment Control Plan Narrative.dwg, 4/8/2024 11:28:39 AM, Matthew Pohlhaus,

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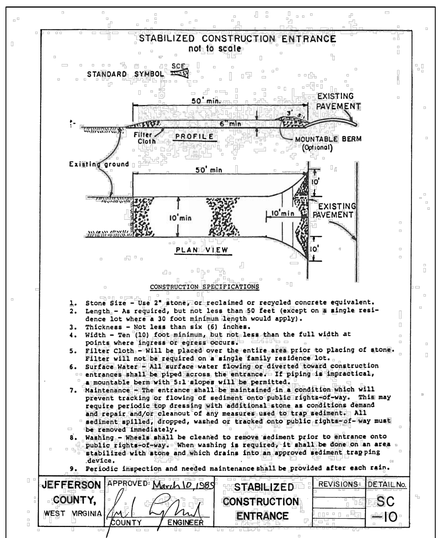


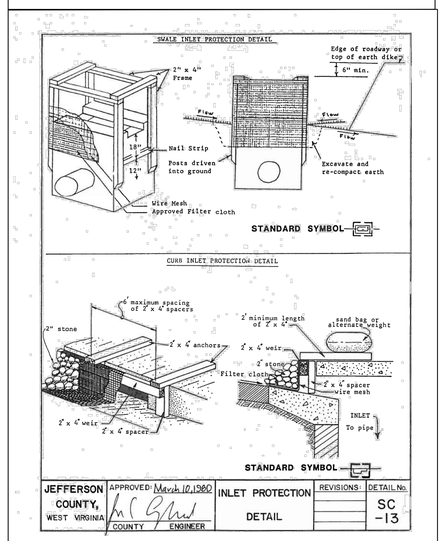


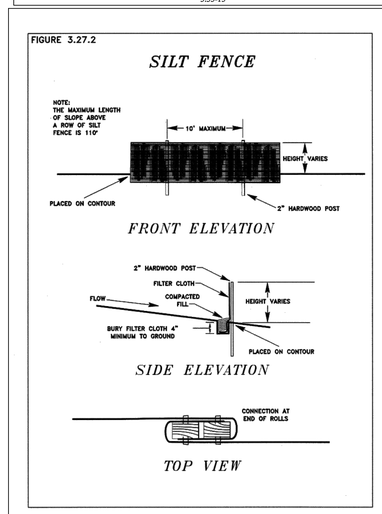


3.27-4

SEQUENCE OF CONSTRUCTION

1. CONTRACTOR TO NOTIFY MISS UTILITY (WV811.COM, DIAL 811 OR 1-800-245-4848) 72 HOURS PRIOR TO ANY EXCAVATION.
2. CONTRACTOR TO CONTACT CITY OF RANSON 48 HOURS BEFORE BEGINNING CONSTRUCTION.
3. ESTABLISH THE LIMIT OF DISTURBANCE AND CLEAR AND GRUB THE SITE TO THE EXTENT NECESSARY TO INSTALL PERIMETER SEDIMENT & EROSION CONTROLS. UTILIZE THE STOCKPILE AREA AS SHOWN ON THE PLAN, AS NEEDED.
4. CONSTRUCT SILT FENCE, SUPER SILT FENCE, STABILIZE CONSTRUCTION ENTRANCE AND INLET PROTECTION AS SHOWN ON PLANS.
5. BEGIN SITE DEMOLITION AS SHOWN ON THE DEMOLITION PLAN.
6. AFTER SITE DEMOLITION, BEGIN MASS GRADING, UTILITY AND STORM DRAIN INSTALLATION.
7. UPON COMPLETION OF UTILITIES AND STORM DRAIN INSTALLATION, BEGIN BUILDING CONSTRUCTION AND UNDER SLAB UTILITIES.
8. UPON COMPLETION OF EXTERIOR UTILITY WORK, SAW CUT EXISTING PAVING ALONG OAK LEE DRIVE AND WHISKERS WAY TO PROVIDE CLEAN AND STRAIGHT CONNECTION TO EXISTING ROADWAYS PAVING TO REMAIN.
9. CONSTRUCT CURB AND GUTTER AND CONCRETE SIDEWALKS.
10. UPON COMPLETION OF CURB AND GUTTER AND SIDEWALKS, INSTALL BASE PAVING. DELAY INSTALLATION OF TOP COURSE UNTIL ALL HEAVY EQUIPMENT HAS BEEN REMOVED FROM THE SITE.
11. UPON COMPLETION OF ALL SITE WORK AND BUILDING CONSTRUCTION, REPAIR ANY DAMAGED PAVING AND INSTALL TOP COURSE PAVING AND MILL AND OVERLAY PAVING AS NECESSARY.
12. APPLY PAVEMENT MARKINGS UPON COMPLETION OF PAVING WORK. STABILIZE ALL LANDSCAPE AREAS WITH GRASS OR PLANT MATERIALS AS SHOWN ON THE PLANS AND INSTALL LIGHTING.
13. UPON COMPLETE STABILIZATION OF ALL AREAS, OBTAIN INSPECTOR APPROVAL AND REMOVE SEDIMENT CONTROL DEVICES. STABILIZE ANY REMAINING AREAS. INSPECTOR MAY APPROVE PHASES STABILIZATION BASED ON BUILDING COMPLETION PHASING.

Soil Survey Information

| Soil Name | Uu | Ua | PmC |
|---|---|---|---|
| Soil Description | Urban land-Udorthents | Udorthents, smoothed | Poplimento silt loam, 8 to 15 percent slopes |
| Hydrological Group | No | No | B |
| Impervious | 0 | 0 | 0 |
| Open Space | 52,887 | 50,291 | 282 |

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PRELIM - EROSION & SEDIMENT CONTROL PLAN DETAILS
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

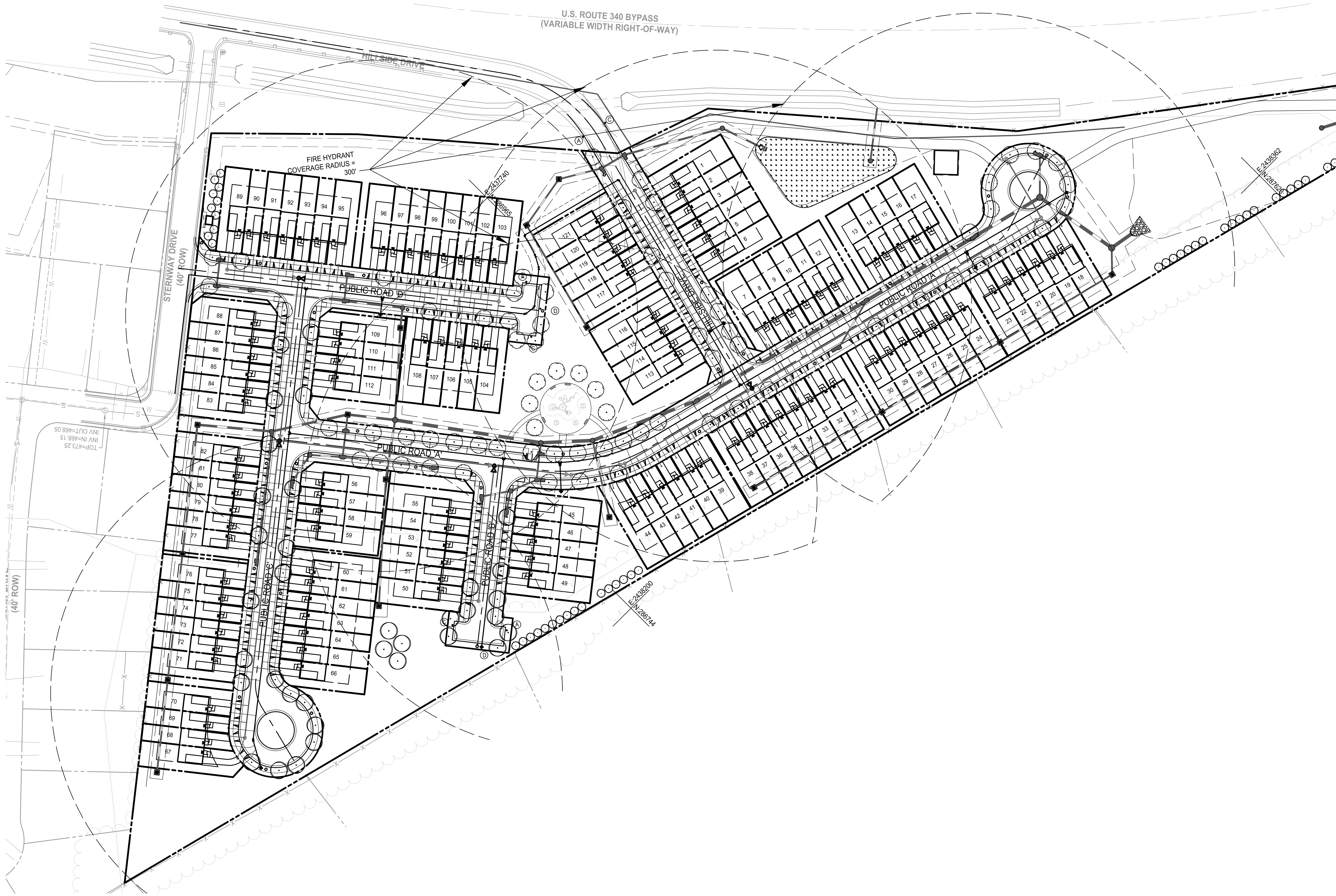
| MARK | DATE | DESCRIPTION |
|---|---|---|

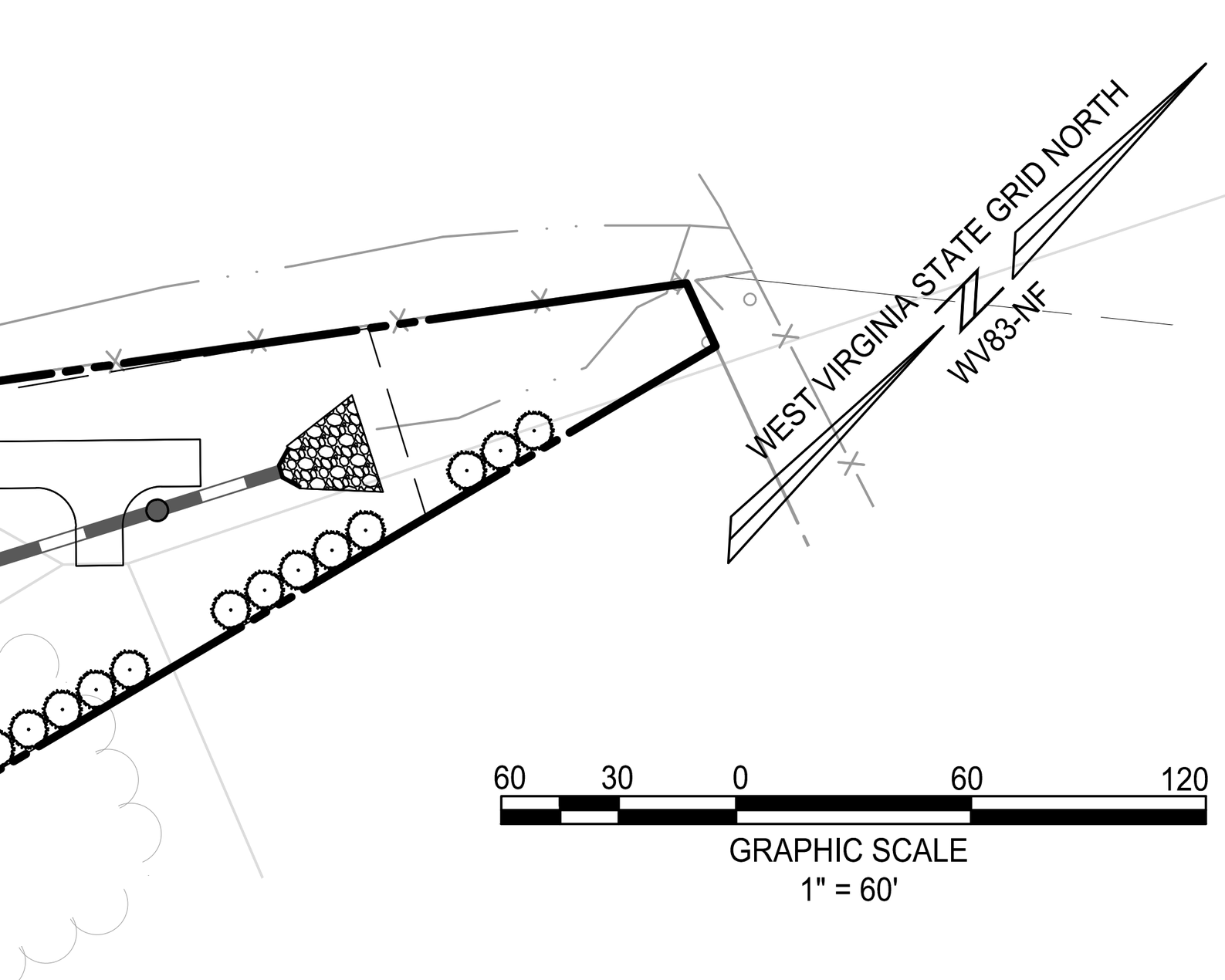
PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
EROSION & SEDIMENT CONTROL PLAN DETAILS

SHEET No.
C705

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C705 Erosion & Sediment Control Plan Details.dwg, 4/7/2024 9:12:47 PM, Miranda Tison,




CODE COMPLIANT LANDSCAPE PLAN:

SCOPE OF WORK
THE LANDSCAPE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT TO COMPLETE ALL LANDSCAPE WORK AS SHOWN ON THE PLANS AND SPECIFICATIONS.

NOTE: IF CONTRACTOR BIDS ACCORDING TO THE PLANT LIST, HE/SHE SHOULD THOROUGHLY CHECK THE PLANT LIST QUANTITIES WITH THE SYMBOLS DRAWN ON THE PLAN, TO BE SURE THERE ARE NO DISCREPANCIES. IF THERE IS A DISCREPANCY BETWEEN THE DRAWING AND THE LIST ON THE PLANS, THE DRAWING TAKES PRECEDENCE.

STANDARDS
ALL PLANT MATERIAL WILL CONFORM TO THE CURRENT ISSUE OF THE AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION (ANLA).PLANT MATERIAL MUST BE SELECTED FROM NURSERIES THAT HAVE BEEN INSPECTED AND CERTIFIED BY STATE PLANT INSPECTORS.COLLECTED MATERIAL MAY BE USED ONLY WHEN APPROVED BY OWNER'S REPRESENTATIVE.NOMENCLATURE WILL BE IN ACCORDANCE WITH HORTUS III BY L.H. BAILEY.

SUBSTITUTIONS: PRE-BID
IT IS THE LANDSCAPE CONTRACTOR'S RESPONSIBILITY TO MAKE EVERY REASONABLE EFFORT TO FIND THE PLANTS SPECIFIED BY THE LANDSCAPE ARCHITECT. THE LANDSCAPE CONTRACTOR MAY OFFER SUBSTITUTIONS TO THE LANDSCAPE ARCHITECT FOR HIS/HER CONSIDERATION. THE LANDSCAPE CONTRACTOR WILL NOTIFY THE LANDSCAPE ARCHITECT IF THERE ARE KNOWN DISEASES OR INSECT RESISTANT SPECIES THAT CAN BE SUBSTITUTED FOR A SELECTED PEST-PRONE PLANT. THE CONTRACTOR SHALL SUBMIT A BASE BID AS PER PLAN PLUS PRICE CLARIFICATIONS FOR ALL RECOMMENDED SUBSTITUTIONS.

SUBSTITUTIONS: POST-BID
IT IS THE INTENT TO ELIMINATE POST-BID SUBSTITUTIONS. HOWEVER, IN THE EVENT THAT THE CONTRACT MATERIAL HAS BECOME UNAVAILABLE, AN APPROPRIATE SUBSTITUTION MUST BE APPROVED BY THE OWNER'S REPRESENTATIVE.

UTILITIES AND UNDERGROUND FEATURES
THE LANDSCAPE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES AND/OR THE GENERAL CONTRACTOR IN ADVANCE OF CONSTRUCTION TO LOCATE UTILITIES. TREES AND/OR SHRUBS SHALL NOT BE PLACED WITHIN WATER AND SEWER EASEMENTS IF THERE IS A CONFLICT WITH UTILITIES AND THE PLANTING, THE LANDSCAPE ARCHITECT SHALL BE RESPONSIBLE FOR RELOCATING PLANTS PRIOR TO THE PLANTING PROCESS. ANY COST DUE TO RELOCATING AFTER PLANTING SHALL BE BORNE BY THE OWNER. IF PLANTS ARE TO BE INSTALLED IN AREAS THAT SHOW OBVIOUS POOR DRAINAGE, AND THE PLANTS ARE INAPPROPRIATE FOR THAT CONDITION, THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT AND OWNER. IF THEY DEEM NECESSARY, THE PLANTS SHALL BE RELOCATED, THE CONTRACT SHALL BE ADJUSTED TO ALLOW FOR DRAINAGE CORRECTION AT A NEGOTIATED COST, OR THE PLANT SELECTION MODIFIED BY THE LANDSCAPE ARCHITECT TO ACCOMMODATE THE POOR DRAINAGE.

WARRANTY
THE STANDARD WARRANTY IS FOR A ONE (1) YEAR PERIOD, EXCLUDING BULBS, SOD AND ANNUALS, COMMENCING ON THE DATE OF INITIAL ACCEPTANCE. ALL PLANTS SHALL BE ALIVE AND IN SATISFACTORY GROWTH AT THE END OF THE GUARANTEE PERIOD. ANY MATERIAL THAT IS 25% DEAD OR MORE SHALL BE CONSIDERED DEAD AND MUST BE REPLACED AT NO CHARGE. A TREE SHALL BE CONSIDERED DEAD WHEN THE MAIN LEADER HAS DIED BACK, OR 25% OF THE CROWN IS DEAD. REPLACEMENTS SHALL BE MADE DURING THE NEXT PLANTING PERIOD. REPLACEMENTS SHALL BE OF THE SAME TYPE, SIZE AND QUALITY AS ORIGINAL SPECIES UNLESS OTHERWISE NEGOTIATED.

CONTAINER - GROWN STOCK
1. THE SIZE OF CONTAINER-GROWN SHRUBS IS MEASURED BY HEIGHT AND WIDTH OF THE PLANT. CONTAINER-GROWN TREES ARE MEASURED BY THE SAME STANDARDS LISTED IN B.3. BELOW. THE ROOT SYSTEM OF CONTAINER-GROWN PLANTS SHALL BE WELL DEVELOPED AND WELL DISTRIBUTED THROUGH OUT THE CONTAINER.
2. ALL CONTAINER-GROWN TREES AND SHRUBS THAT HAVE CIRCLING (GIRDLING) AND MATTED ROOTS SHALL BE TREATED IN THE FOLLOWING MANNER PRIOR TO PLANTING: SEPARATE THE ROOTS BY HAND, UNTANGLING SO CIRCLING ROOTS WILL NOT DAMAGE FUTURE OF THE PLANT. SEE PLANTING PROCEDURES FOR ALL CONTAINER-GROWN TREES & SHRUBS IN THIS SECTION.
3. ALL CONTAINER-GROWN PLANTS SHOULD BE GROUPED AND WATERED DAILY UNTIL THEY ARE PLANTED IN THE LANDSCAPE, THE SOIL SHALL BE KEPT MOIST WITH THE EQUIVALENT OF ONE-INCH OF RAINFALL PER WEEK.
4. PRUNING SHALL BE DONE BEFORE PLANTING OR DURING THE PLANTING OPERATION. PRUNING DETAIL FOR TREES IN THIS SECTION.
5. ALL PLANT MATERIAL IN TRANSIT SHALL BE COVERED TO KEEP MATERIAL FROM DRYING OUT. THE COVERING SHALL COMPLY WITH THE STATE AND LOCAL LAWS PERTAINING TO THE TRANSPORT OF MATERIALS.
6. TREES SHALL BE PLACED IN AN UPRIGHT POSITION WITH THE ROOTBALL COVERED BY MULCH AND KEPT MOIST. TREES AND SHRUBS SHOULD NOT BE LEFT ON SITE UNPLANTED FOR MORE THAN 24-HOURS WITHOUT ADEQUATE WATER TO INSURE ROOT SURVIVAL.

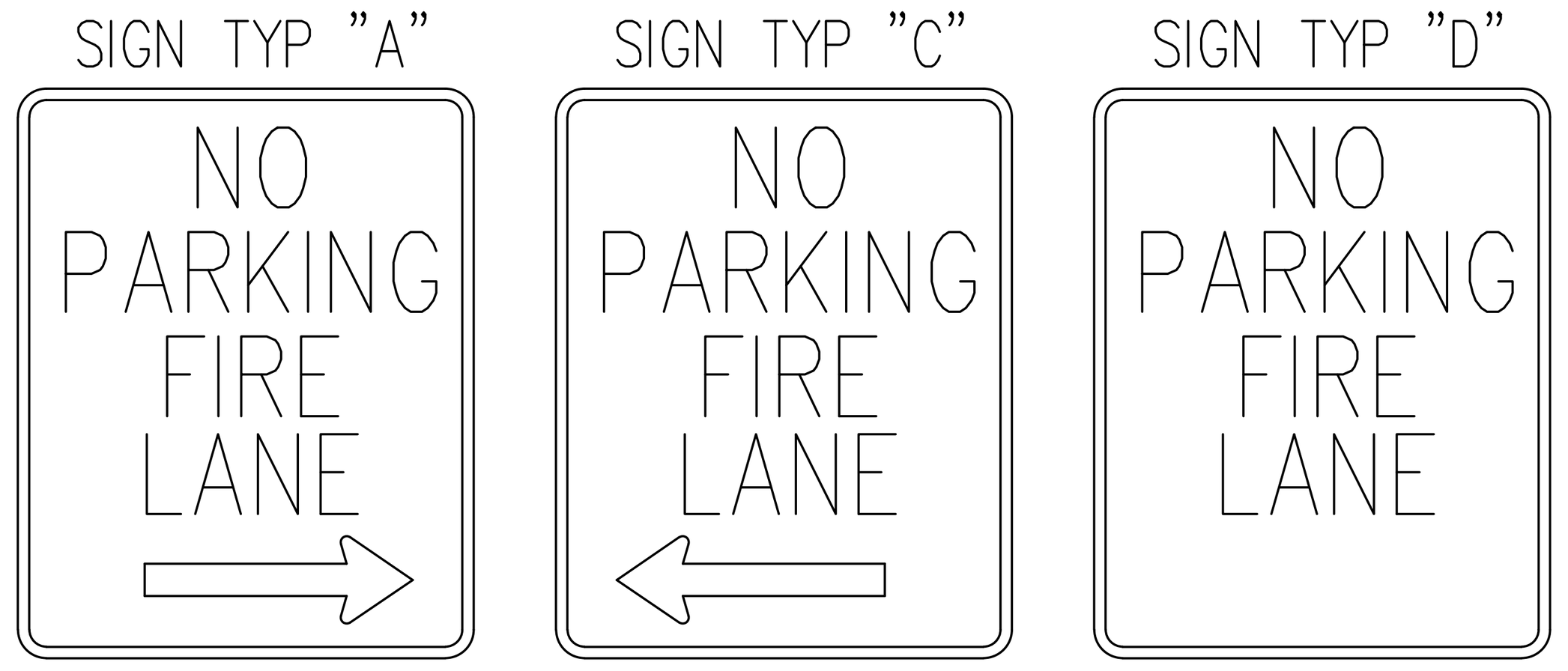
INSPECTION
A. PLANTS MAY BE SUBJECT TO INSPECTION AND APPROVAL BY THE OWNER OR OWNER'S REPRESENTATIVE AT THE PLACE OF GROWTH OR HOLDING YARD FOR CONFORMITY TO SPECIFICATION REQUIREMENTS AS TO QUALITY, SIZE AND VARIETY.
B. PLANTS DAMAGED IN HANDLING OR TRANSPORTATION CAN BE REJECTED BY THE OWNER OR OWNER'S REPRESENTATIVE.
C. STATE NURSERY INSPECTION CERTIFICATES SHALL BE FURNISHED TO THE LANDSCAPE ARCHITECT UPON REQUEST.

STANDARDS
A. PLANTS WILL BE IN ACCORDANCE WITH THE CURRENT ANLA'S STANDARDS AND CONFORM IN GENERAL TO REPRESENTATIVE SPECIES.
B. BALLED AND BURLAPPED (B&B)
1. BALLED AND BURLAPPED PLANTS SHALL BE DUG WITH FIRM ROOT BALLS FREE OF NOXIOUS WEEDS. THERE SHOULD BE NO EXCESS SOIL ON TOP OF THE ROOTBALL OR AROUND THE TRUNK
2. BALL SIZES SHALL BE IN ACCORDANCE WITH ANLA STANDARDS.
3. CALIPER AND HEIGHT MEASUREMENT: IN SIZE GRADING B&B SINGLE TRUNK TREES, CALIPER SHALL TAKE PRECEDENCE OVER HEIGHT. CALIPER OF THE TRUNK SHALL BE TAKEN 6" ABOVE GROUND LEVEL (UP TO AND INCLUDING 4" CALIPER SIZE) AND 12" ABOVE THE GROUND LEVEL FOR LARGER TREES. FOR MULTIPLE-TRUNK TREES, HEIGHT MEASUREMENT SHALL TAKE PRECEDENCE OVER CALIPER.

NOTES:
1) ALL PLANTING SHALL CONFORM WITH SECTION 1333.15, BUFFER AND SCREENING STANDARDS,AND/OR SECTION 1333.16, LANDSCAPING STANDARDS OF THE CHARLESTOWN SUBDIVISION AND LAND DEVELOPMENT ORDINANCE
2) ANY PLANT SUBSTITUTIONS MUST BE APPROVED IN WRITING BY THE CHARLESTOWN DEPARTMENT OF COMMUNITY DEVELOPMENT ZONING AND PLANNING DIVISION.
3) ANY TREES LOCATED ON AN INDIVIDUAL LOT WILL BE INSTALLED PRIOR TO THE REQUEST FOR AN OCCUPANCY PERMIT FOR THAT SPECIFIC LOT. ALL OTHER LANDSCAPING SHOWN ON THIS PLAN WILL BE INSTALLED PRIOR TO BOND RELEASE.
4.) ALL GRADED/DISTURBED AREAS WITHIN THE PROJECT LIMITS EXCEPT FOR BUT NOT LIMITED TO WALKS, ROADS, DRIVES, TEMPORARY EASEMENTS UNDER CULTIVATION, AND AREAS DESIGNATED AS PLANTING BEDS SHALL BE SODDED OR SEEDED

FIRE LANE SIGNS

SIGN TYP "A" — SIGN TYP "C" — SIGN TYP "D"

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# PRELIM PLAN - LANDSCAPE, FIRE SIGNAGE AND LIGHTING PLAN

691/432 MAP 9 PARCEL 67

LOTS 2A (RESIDUE) & 2B

DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 60'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

FIRE SIGNAGE AND LIGHTING PLAN

SHEET No.

C800

P:\Projects\22063\00100\112742 Prelim Subdivision - Land Development Plan\C800 Fire Signage and Lighting Plan.dwg, 4/7/2024 9:13:44 PM, Miranda Tison,

NLS LIGHTING

# SAVANNAH 1

AREA/STREET LIGHTING/ MUNICIPAL

The Savannah adds a touch of class and elegance to any Municipal, or Residential Project. Beautiful by day and efficient by night, the Savannah is the perfect street, curbside and pathway solution. Utilizing the latest in LED technology, the Savannah features the patented Star Power optical system with field adjustment capabilities. Savannah's light source facing a residence can be independently concealed by field adjustment so that maximum lighting levels are targeted where needed—on the street, or between fixtures on sidewalks. Also ideal for storefronts alongside the street, Savannah's light source can be easily adjusted on-site allowing light distribution just before a storefront's entrance.

Kelvin temperature offerings include 2700K, 3000K, 3500K, 4000K and 5000K. The luminaire is powder coated with a textured finish.

The Savannah is available in two different globe designs, three top shades and additional decorative options such as the Filigree + Strut Combo. Shades include 4.38" Cast Finial as standard, powder-coated same finish as fixture. Globe only luminaires have no finial as standard.



**STAR POWER™ OPTICAL SYSTEM**

The Star Power™ reflector is an excellent system which provides great value and performance.

**LED WATTAGE CHART**

| | 16L | 32L | 48L |
|---|---|---|---|
| 350 milliamps | 17w | 34w | 53w |
| 530 milliamps | 26w | 54w | 80w |
| 700 milliamps | 33w | 71w | 104w |

Project Name: Type:

| Cat# | Shade / Lens | Light Dist. | # of LEDs | Milliamps | Kelvin | Volts | Mounting | Color | Options |
|---|---|---|---|---|---|---|---|---|---|
| Savannah 1 **(SVN-1)** | Shade 1 **(SH1)**<br>Shade 2 **(SH2)**<br>Shade 3 **(SH3)**<br>Lens Globe 1 **(LG1)**❶<br>Lens Globe 2 **(LG2)**❶ | Type 2 **(T2)**<br>Type 3 **(T3)**<br>Type 5 **(T5)** | 16 **(16L)**<br>32 **(32L)**<br>48 **(48L)** | 350 **(35)**<br>530 **(53)**<br>700 **(7)** | 2700K, 70 CRI **(27K7)**<br>2700K, 80 CRI **(27K8)**❶<br>3000K, 70 CRI **(30K7)**<br>3000K, 80 CRI **(30K8)**❶<br>3500K, 80 CRI **(35K8)**❶<br>4000K, 70 CRI **(40K7)**<br>4000K, 80 CRI **(40K8)**❶<br>5000K, 70 CRI **(50K7)**<br>5000K, 80 CRI **(50K8)**❶ | 120-277 **(UNV)**<br>347-480 **(HV)** | Post Top Mount<br>Over 3" OD Tenon **(PT)** | Bronze Textured **(BRZ)**<br>White Textured **(WHT)**<br>Smooth White Gloss **(SWT)**<br>Silver **(SVR)**<br>Black Textured **(BLK)**<br>Smooth Black Gloss **(SBK)**<br>Graphite Textured **(GPH)**<br>Grey Textured **(GRY)**<br>Custom **(CS)** | Opal Lens **(OPL)**<br>Polycarbonate Lens **(PLY)**<br>Decorative Filigree + Strut Combo **(FSC)**<br>Button Photocell **(PC)**❷<br>House Side Shield **(HSS)**<br>Finial **(FIN)**<br>Nema 7-Pin Receptacle **(PE7)**<br>Photocell + Receptacle **(PCR)**<br>Receptacle + Shorting Cap **(PER)**<br>Terminal Block **(TB)**<br>Marine Grade Finish **(MGF)** |

Notes:
❶ Use With or Without Shade
❷ Use Without Shade
❸ Consult Factory for Lead Time. Consult Factory for 90 CRI Requests.
❹ Universal Voltage 120-277

REV. 03.22.23

1

## PRODUCT SPECIFICATIONS

**ELECTRICAL**
- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All internal wiring UL certified for 600 VAC and 105°C
- CRI 70, 80 or 90
- Color temperatures: 2700, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KA supplied as standard.

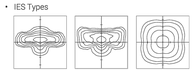
**CONSTRUCTION**
- Cast Aluminum

**OPTIONS**
- Opal Lens
- Polycarbonate Lens
- Decorative Filigree + Strut Combo
- House Side Shield
- Finial
- Terminal Block
- MARINE GRADE FINISH (MGF) - A multi-step process creating protective finishing coat against harsh environments. Chemically washed in a 5 stage cleaning system. Pre-baked, Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer. Oven Baked. Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.

House Side Shield (HSS) is designed for full property line cut-off.

**CONTROL OPTIONS**
- NEMA 7-PIN RECEPTACLE (PE7)—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.
- PHOTOCELL + RECEPTACLE (PCR)—7-Pin Receptacle and Electronic Twist Lock Photocell for dusk to dawn operation.
- RECEPTACLE + SHORTING CAP (PER)—7-Pin Receptacle and Shorting Cap.
- PHOTOCELL - Button type photocell.
- Controls Agnostics: Please contact factory for your preferred controls option.

**OPTICS**
Recessed Star Power Optical System is 95% reflective material. Utilizes a linear diffused pattern, softening the light distribution and eliminating any dark shadows or striations.
- IES Types



TYPE II (T2) TYPE III (T3) TYPE V (T5)

**FINISH**
- 3-5 mils electrostatic powder coat.
- NLS Lighting standard high-quality finishes prevent corrosion and protects against extreme environmental conditions

**WARRANTY**
Five-year limited warranty for drivers and LEDs.

**LISTINGS**
- Certified to UL 1598
- UL 8750
- CSA C22.2 No. 250.0
- 3G Rated

The information and specifications on this document are subject to change without any notification. All values are design, nominal, typical or prorated values when measured under internal and external laboratory conditions.

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701 Kingshill Place, Carson, CA 90746
**Call Us Today** (310) 341-2037
**nlslighting.com**

2

NLS LIGHTING

SAVANNAH 1

AREA/STREET LIGHTING/ MUNICIPAL

The Savannah adds a touch of class and elegance to any Municipal, or Residential Project. Beautiful by day and efficient by night, the Savannah is the perfect street, curbside and pathway solution. Utilizing the latest in LED technology, the Savannah features the patented Star Power optical system with field adjustment capabilities. Savannah's light source facing a residence can be independently concealed by field adjustment so that maximum lighting levels are targeted where needed—on the street, or between fixtures on sidewalks. Also ideal for storefronts alongside the street, Savannah's light source can be easily adjusted on-site allowing light distribution just before a storefront's entrance.

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**LED WATTAGE CHART**

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| 350 milliamps | 17w | 34w | 53w |
| 530 milliamps | 26w | 54w | 80w |
| 700 milliamps | 33w | 71w | 104w |

Project Name: Type:

| Cat# | Shade / Lens | Light Dist. | # of LEDs | Milliamps | Kelvin | Volts | Mounting | Color | Options |
|---|---|---|---|---|---|---|---|---|---|
| Savannah 1 **(SVN-1)** | Shade 1 **(SH1)**<br>Shade 2 **(SH2)**<br>Shade 3 **(SH3)**<br>Lens Globe 1 **(LG1)**❶<br>Lens Globe 2 **(LG2)**❶ | Type 2 **(T2)**<br>Type 3 **(T3)**<br>Type 5 **(T5)** | 16 **(16L)**<br>32 **(32L)**<br>48 **(48L)** | 350 **(35)**<br>530 **(53)**<br>700 **(7)** | 2700K, 70 CRI **(27K7)**<br>2700K, 80 CRI **(27K8)**❶<br>3000K, 70 CRI **(30K7)**<br>3000K, 80 CRI **(30K8)**❶<br>3500K, 80 CRI **(35K8)**❶<br>4000K, 70 CRI **(40K7)**<br>4000K, 80 CRI **(40K8)**❶<br>5000K, 70 CRI **(50K7)**<br>5000K, 80 CRI **(50K8)**❶ | 120-277 **(UNV)**<br>347-480 **(HV)** | Post Top Mount<br>Over 3" OD Tenon **(PT)** | Bronze Textured **(BRZ)**<br>White Textured **(WHT)**<br>Smooth White Gloss **(SWT)**<br>Silver **(SVR)**<br>Black Textured **(BLK)**<br>Smooth Black Gloss **(SBK)**<br>Graphite Textured **(GPH)**<br>Grey Textured **(GRY)**<br>Custom **(CS)** | Opal Lens **(OPL)**<br>Polycarbonate Lens **(PLY)**<br>Decorative Filigree + Strut Combo **(FSC)**<br>Button Photocell **(PC)**❷<br>House Side Shield **(HSS)**<br>Finial **(FIN)**<br>Nema 7-Pin Receptacle **(PE7)**<br>Photocell + Receptacle **(PCR)**<br>Receptacle + Shorting Cap **(PER)**<br>Terminal Block **(TB)**<br>Marine Grade Finish **(MGF)** |

Notes:
❶ Use With or Without Shade
❷ Use Without Shade
❸ Consult Factory for Lead Time. Consult Factory for 90 CRI Requests.
❹ Universal Voltage 120-277

REV. 03.22.23

1

Notes:
1. Proposed light fixture, pole, footer and base to match existing light fixture, pole, footer and base.
2. Contractor to provide architect with signed and sealed shop drawing for final footer design approval.

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PRELIM PLAN - LIGHTING DETAILS
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: AS SHOWN
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:

LIGHTING DETAILS

SHEET No.

C801

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\C801 Lighting Details.dwg, 4/7/2024 9:14:03 PM, Miranda Tison,




| Calculation Summary | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Label | Units | Avg | Max | Min | Avg/Min | Max/Min | PtSpcLr | PtSpcTb |
| HILLSIDE DRIVE | Fc | 0.67 | 3.8 | 0.0 | N.A. | N.A. | 10 | 10 |
| PUBLIC ROAD A | Fc | 0.60 | 3.6 | 0.0 | N.A. | N.A. | | |
| PUBLIC ROAD B | Fc | 0.45 | 3.2 | 0.0 | N.A. | N.A. | | |
| PUBLIC ROAD C | Fc | 0.68 | 4.0 | 0.0 | N.A. | N.A. | | |
| PUBLIC ROAD D | Fc | 0.56 | 3.6 | 0.0 | N.A. | N.A. | | |

| Luminaire Schedule | | | | | | |
|---|---|---|---|---|---|---|
| WLS17454 HILLSIDE CHARLES TOWN, WV PM: HOLLY PLEASE EMAIL US FOR PRICING AT HOLLY@WLSLIGHTING.COM | | | | | | |
| Symbol | Qty | Label | Lum. Lumens | LLF | Description | Lum. Watts |
| | 29 | A | 3298 | 0.950 | WLS-SVN-1-SH3-T3-32L-35-40K-SLW 14' POLE | 34 |

Based on the information provided, all dimensions and luminaire locations shown represent recommended positions. The engineer and/or architect must determine applicability of the layout to existing or future field conditions.

This lighting pattern represents illumination levels calculated from laboratory data taken under controlled conditions utilizing current industry standard lamp ratings in accordance with Illuminating Engineering Society approved methods. Actual performance of any manufacturer's luminaire may vary due to variation in electrical voltage, tolerance in lamps and other variable field conditions.

60 30 0 60 120
GRAPHIC SCALE
1" = 60'

WLS LIGHTING
BRIGHT. SMART. SUSTAINABLE.
6820 CORPORATION PKWY
FORT WORTH, TX 76126
WWW.WLSLIGHTING.COM

WLS-17454

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PRELIM PLAN - PHOTOMETRIC PLAN
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 60'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
PHOTOMETRIC PLAN

SHEET No.
C802

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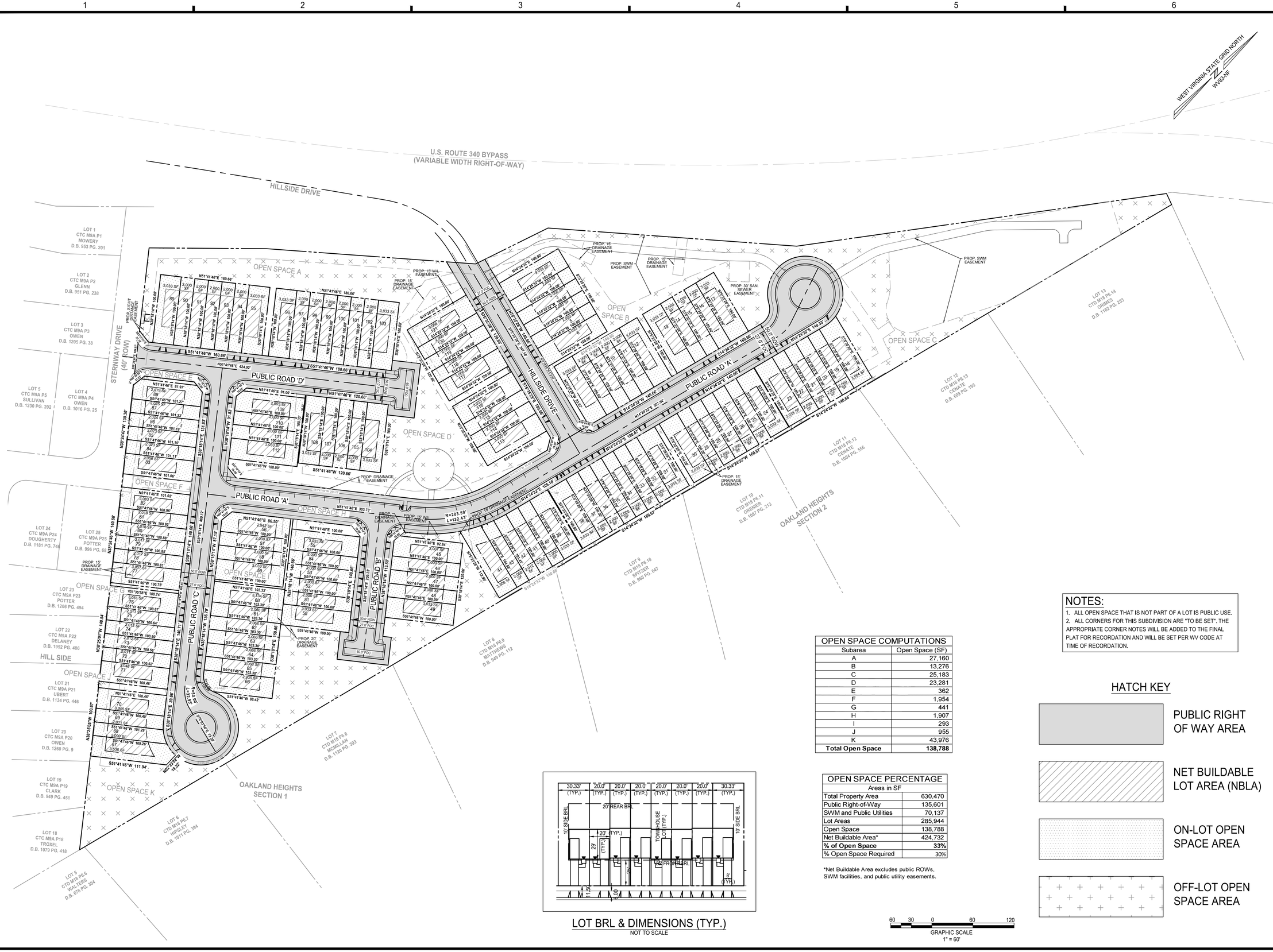


| OPEN SPACE COMPUTATIONS | |
|---|---|
| Subarea | Open Space (SF) |
| A | 27,160 |
| B | 13,276 |
| C | 25,183 |
| D | 23,281 |
| E | 362 |
| F | 1,954 |
| G | 441 |
| H | 1,907 |
| I | 293 |
| J | 955 |
| K | 43,976 |
| **Total Open Space** | **138,788** |

| OPEN SPACE PERCENTAGE | |
|---|---|
| Areas in SF | |
| Total Property Area | 630,470 |
| Public Right-of-Way | 135,601 |
| SWM and Public Utilities | 70,137 |
| Lot Areas | 285,944 |
| Open Space | 138,788 |
| Net Buildable Area* | 424,732 |
| **% of Open Space** | **33%** |
| % Open Space Required | 30% |

*Net Buildable Area excludes public ROWs, SWM facilities, and public utility easements.




LOT BRL & DIMENSIONS (TYP.)
NOT TO SCALE

## NOTES:

1. ALL OPEN SPACE THAT IS NOT PART OF A LOT IS PUBLIC USE.
2. ALL CORNERS FOR THIS SUBDIVISION ARE "TO BE SET". THE APPROPRIATE CORNER NOTES WILL BE ADDED TO THE FINAL PLAT FOR RECORDATION AND WILL BE SET PER WV CODE AT TIME OF RECORDATION.

## HATCH KEY

- PUBLIC RIGHT OF WAY AREA
- NET BUILDABLE LOT AREA (NBLA)
- ON-LOT OPEN SPACE AREA
- OFF-LOT OPEN SPACE AREA

60 30 0 60 120
GRAPHIC SCALE
1" = 60'

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# PRELIM PLAN - PRELIMINARY PLAT
# HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 60'
DESIGN: AF
DRAWN: KMS
CHECKED: SK

SHEET TITLE:
PRELIMINARY PLAT

SHEET No.
C900

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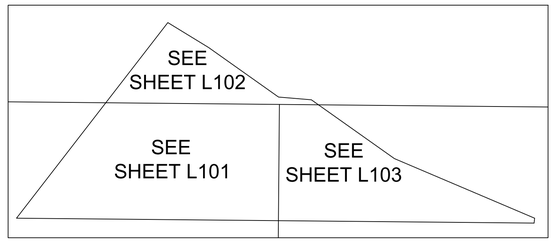



NOTE:
1. 10' BUFFERS WITH FENCING ARE PROVIDED ALONG PARCEL LINES ADJOINING EDAW DRIVE AND OAKLAND TERRACE AS REQUIRED BY SECTION 1333.15 AND APPENDIX C IN THE CHARLES TOWN ZONING ORDINANCE AND AS APPROVED ON SKETCH PLAN REPORT SLD2022-04/200185, 200406.

# PLANT SCHEDULE

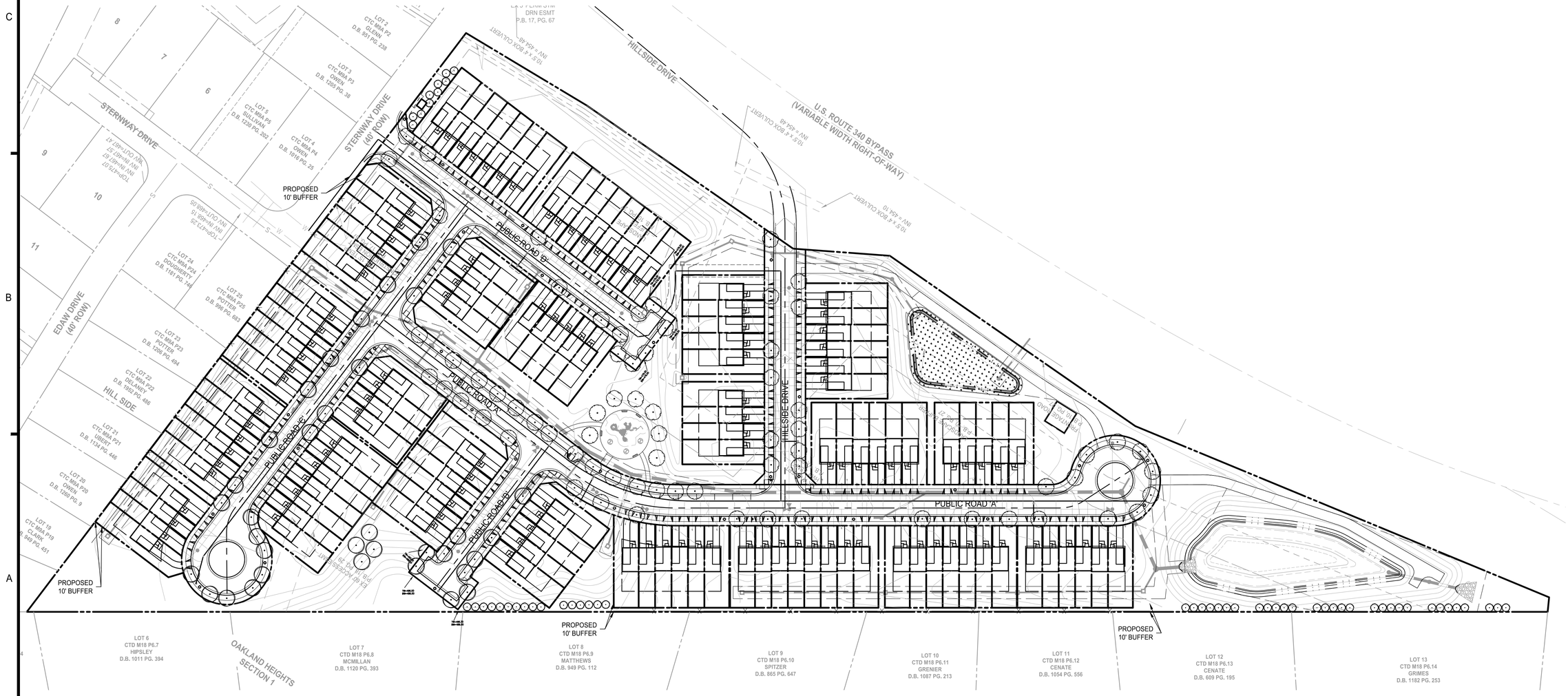
| SCREENING TREE | CODE | BOTANICAL NAME | COMMON NAME | SIZE | NATIVE | QTY |
|---|---|---|---|---|---|---|
| | IA | Ilex opaca | American Holly | 6`-8` ht. | B&B | 56 |

| STREET TREES | CODE | BOTANICAL NAME | COMMON NAME | SIZE | NATIVE | QTY |
|---|---|---|---|---|---|---|
| | CK | Cladrastis kentukea | American Yellowwood | 2" Cal. | B&B | 30 |
| | PB | Platanus x acerifolia 'Bloodgood' | Bloodgood London Plane Tree | 2" Cal. | B&B | 41 |
| | TS | Tilia cordata 'Baileyi' TM | Shamrock Littleleaf Linden | 2" Cal. | B&B | 35 |

BIORETENTION AREA

WEST VIRGINIA STATE GRID NORTH
UTM83-18F

60 30 0 60 120
GRAPHIC SCALE
1" = 60'

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PRELIM PLAN - LANDSCAPE PLAN
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|
| | 10/20/2023 | QC SUB. TO PWC |
| | 11/06/2023 | 1ST SUB TO PWC |
| | 02/12/2024 | 2ND SUB TO PWC |

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1"=60'
DESIGN: GB
DRAWN: GB
CHECKED:

SHEET TITLE:

LANDSCAPE PLAN

SHEET No.
L100

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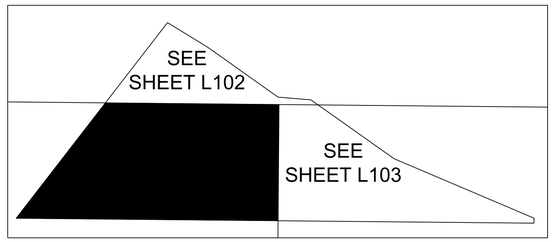


# PLANT SCHEDULE

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|---|---|---|---|---|---|
| | IA | Ilex opaca | American Holly | 6`-8` ht. | B&B |

| STREET TREES | CODE | BOTANICAL NAME | COMMON NAME | SIZE | NATIVE |
|---|---|---|---|---|---|
| | CK | Cladrastis kentukea | American Yellowwood | 2" Cal. | B&B |
| | PB | Platanus x acerifolia 'Bloodgood' | Bloodgood London Plane Tree | 2" Cal. | B&B |
| | TS | Tilia cordata 'Baileyi' TM | Shamrock Littleleaf Linden | 2" Cal. | B&B |

WEST VIRGINIA STATE GRID NORTH
UTM83-18F

30 15 0 30 60
GRAPHIC SCALE
1" = 30'

SEE SHEET L102

SEE SHEET L102

EDAW DRIVE
(40' ROW)

LOT 25
CTC M9A P25
POTTER
D.B. 996 PG. 683

LOT 23
CTC M9A P23
POTTER
D.B. 1206 PG. 494

LOT 22
CTC M9A P22
DELANEY
D.B. 1952 PG. 486

HILL SIDE

PROP. 6'
OPAQUE FENCE

LOT 21
CTC M9A P21
UBERT
D.B. 1134 PG. 446

LOT 20
CTC M9A P20
OWEN
D.B. 1260 PG. 9

LOT 19
CTC M9A P19
CLARK
D.B. 949 PG. 451

PROPOSED 10' BUFFER

PUBLIC ROAD 'C'

PUBLIC ROAD 'A'

PUBLIC ROAD 'B'

HILLSIDE DRIVE

TW=496.00
BW=486.00

TW=496.30
BW=486.00

TW=478.00
BW=468.00

TW=478.00
BW=468.00

PROPOSED 10' BUFFER

PROP. 6'
OPAQUE FENCE

SEE SHEET L103

LOT 6
CTD M18 P6.7
HIPSLEY
D.B. 1011 PG. 394

OAKLAND HEIGHTS
SECTION

LOT 7
CTD M18 P6.8
MCMILLAN
D.B. 1120 PG. 393

LOT 8
CTD M18 P6.9
MATTHEWS
D.B. 949 PG. 112

LOT 9
CTD M18 P6.10
SPITZER
D.B. 865 PG. 647

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PRELIM PLAN - LANDSCAPE PLAN
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
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| | 02/12/2024 | 2ND SUB TO PWC |

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: GB
DRAWN: GB
CHECKED:

SHEET TITLE:

LANDSCAPE
PLAN

SHEET No.

L101

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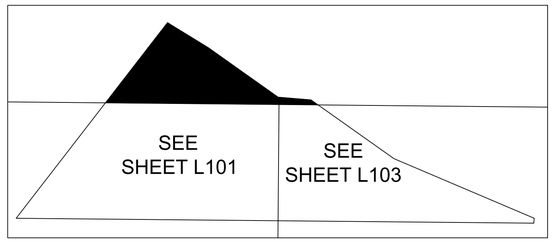


## PLANT SCHEDULE

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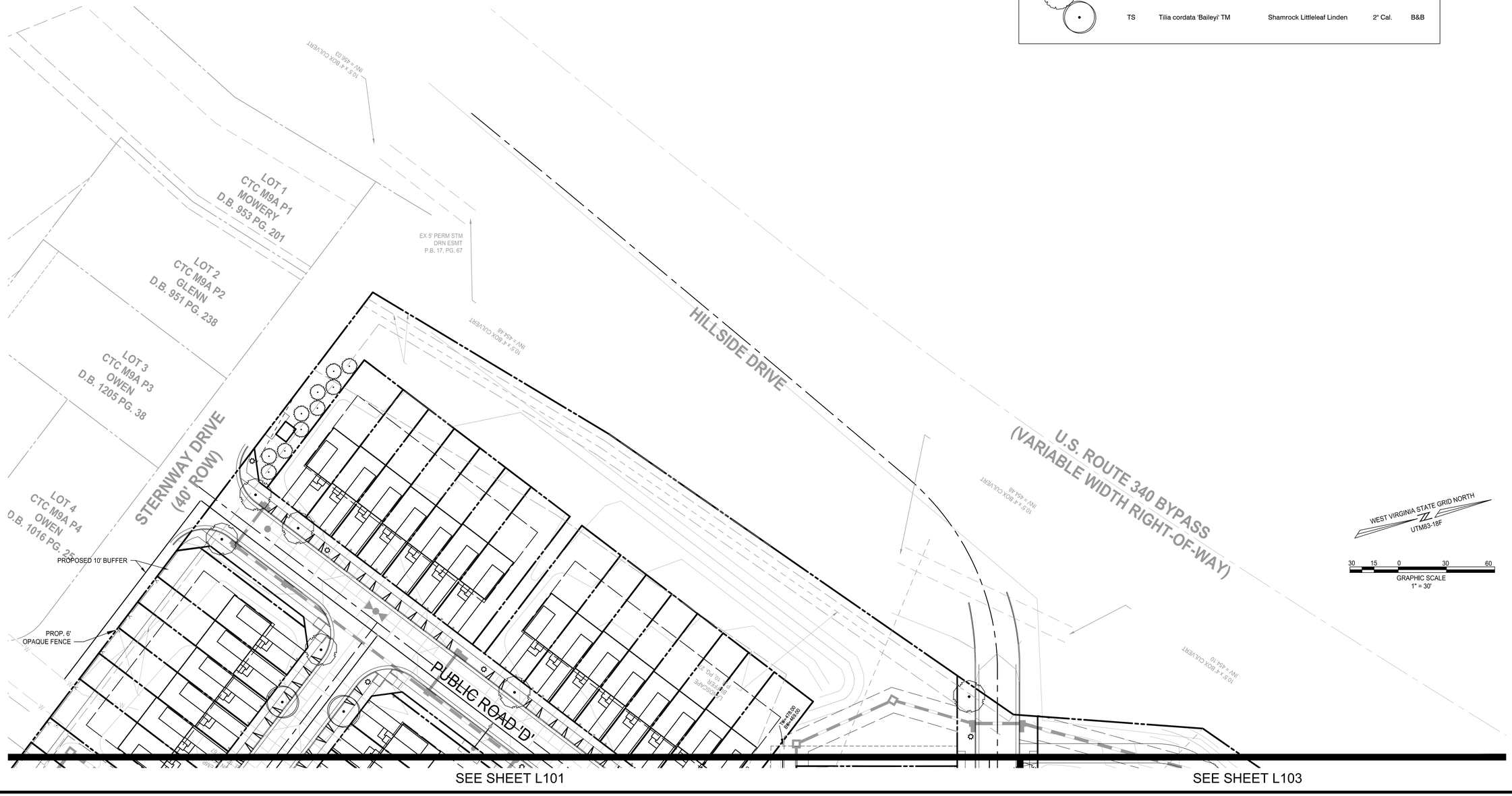


WEST VIRGINIA STATE GRID NORTH
UTM83-18F

30 15 0 30 60
GRAPHIC SCALE
1" = 30'

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CONSTRUCTION

PRELIM PLAN - LANDSCAPE PLAN
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|
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| | 11/06/2023 | 1ST SUB TO PWC |
| | 02/12/2024 | 2ND SUB TO PWC |

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: GB
DRAWN: GB
CHECKED:

SHEET TITLE:

LANDSCAPE
PLAN

SHEET No.

L102

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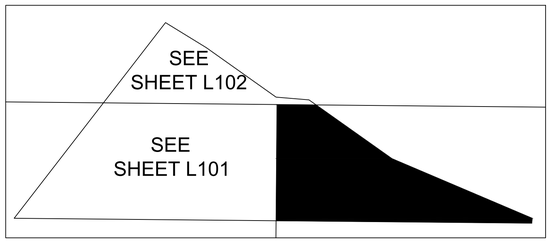
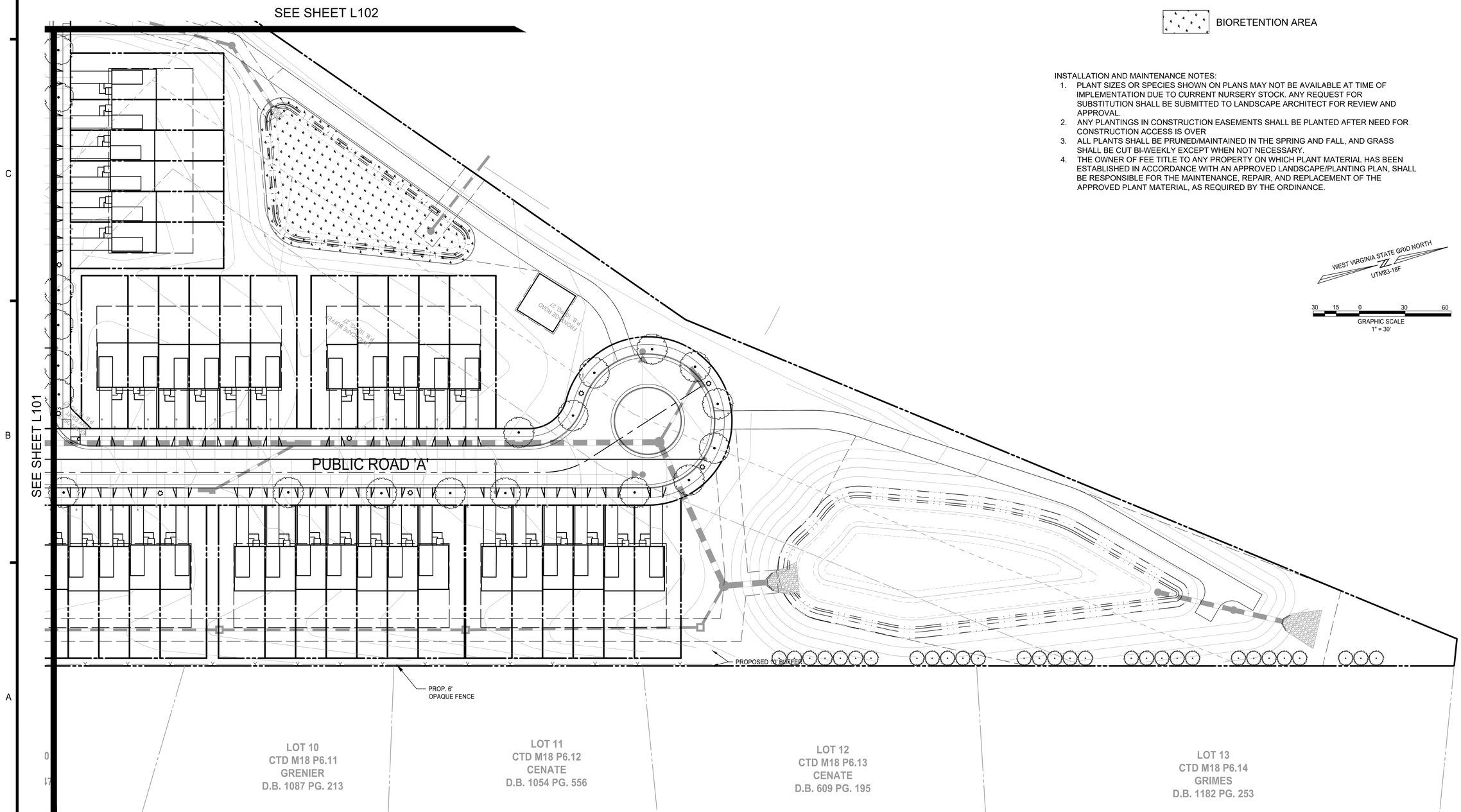



Bioretention Area Seeding Mix

| Botanical Name | Option 1 Common Name | % of Mix | Total lbs. | Botanical Name | Option 2 Common Name | % of Mix | Total lbs. |
|---|---|---|---|---|---|---|---|
| *Lathyrus sylvestris* | Lathco Flat Pea | 30 | | *Lathyrus sylvestris* | Lathco Flat Pea | 50 | |
| *Triticum aestivum* | Winter Wheat | 50 | | *Lolium multiflorum* | Annual Ryegrass | 30 | |
| *Festuca rubra* | Creeping Red Fescue | 20 | | *Festuca rubra* | Creeping Red Fescue | 20 | |

** Apply this mix at 20lbs/acre, or 1/2lb per 1,000 SF. Area of pond is XXX.

**STREET TREES**
STREET TREE REQUIREMENT: 1 TREE PER 50' OF FRONTAGE
STREET FRONTAGE: 5,280' LF
STREET TREES REQUIRED: 106
STREET TREES PROVIDED: 106




# PLANT SCHEDULE

| SCREENING TREE | CODE | BOTANICAL NAME | COMMON NAME | SIZE | NATIVE | QTY |
|---|---|---|---|---|---|---|
| | IA | Ilex opaca | American Holly | 6`-8` ht. | B&B | 56 |

| STREET TREES | CODE | BOTANICAL NAME | COMMON NAME | SIZE | NATIVE | QTY |
|---|---|---|---|---|---|---|
| | CK | Cladrastis kentukea | American Yellowwood | 2" Cal. | B&B | 30 |
| | PB | Platanus x acerifolia 'Bloodgood' | Bloodgood London Plane Tree | 2" Cal. | B&B | 41 |
| | TS | Tilia cordata 'Baileyi' TM | Shamrock Littleleaf Linden | 2" Cal. | B&B | 35 |

BIORETENTION AREA

INSTALLATION AND MAINTENANCE NOTES:
1. PLANT SIZES OR SPECIES SHOWN ON PLANS MAY NOT BE AVAILABLE AT TIME OF IMPLEMENTATION DUE TO CURRENT NURSERY STOCK. ANY REQUEST FOR SUBSTITUTION SHALL BE SUBMITTED TO LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL.
2. ANY PLANTINGS IN CONSTRUCTION EASEMENTS SHALL BE PLANTED AFTER NEED FOR CONSTRUCTION ACCESS IS OVER
3. ALL PLANTS SHALL BE PRUNED/MAINTAINED IN THE SPRING AND FALL, AND GRASS SHALL BE CUT BI-WEEKLY EXCEPT WHEN NOT NECESSARY.
4. THE OWNER OF FEE TITLE TO ANY PROPERTY ON WHICH PLANT MATERIAL HAS BEEN ESTABLISHED IN ACCORDANCE WITH AN APPROVED LANDSCAPE/PLANTING PLAN, SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR, AND REPLACEMENT OF THE APPROVED PLANT MATERIAL, AS REQUIRED BY THE ORDINANCE.

WEST VIRGINIA STATE GRID NORTH
UTM83-18F

30 15 0 30 60
GRAPHIC SCALE
1" = 30'

IMEG
19 Culpeper St. Suite #2
Warrenton, VA 20186 P 703.273.6820
engineering • surveying • land planning

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NOT FOR
CONSTRUCTION

PRELIM PLAN - LANDSCAPE PLAN
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|
| | 10/20/2023 | QC SUB. TO PWC |
| | 11/06/2023 | 1ST SUB TO PWC |
| | 02/12/2024 | 2ND SUB TO PWC |

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 10/13/2023
SCALE: 1" = 30'
DESIGN: GB
DRAWN: GB
CHECKED:

SHEET TITLE:
LANDSCAPE PLAN

SHEET No.
L103

P:\Projects\22063\001\001112742 Prelim Subdivision - Land Development Plan\L200 LANDSCAPE NOTES AND DETAILS.dwg, 4/8/2024 11:38:15 AM, Matthew Polihaus,

IMEG General Landscape Specification Summary - Short Form

Specification: This is a summary of IMEG Consultants Corp. general landscape specification. All work shall follow the procedures outlined in the specifications and details contained herein, which are designed to exceed current industry standards. Should there exist a discrepancy between this specification and the included construction details, the written specification shall take precedence.

References: In lieu of providing comprehensive proprietary specifications, the following are referenced to be general default specifications with the following modifications. These modifications and the construction details shown in this plan set shall take precedence over the general referenced specifications.

- "Landscape Specification Guidelines" Landscape Contractors Association of MD, DC, VA - Most current edition.
- "American Standard for Nursery Stock - ANSI Z60.1" by AmericanHort - Most Current Edition
- "TT-77 Recommended Turfgrass Cultivars for Certified Sod Production in Maryland" - Maryland Turfgrass Council
- ""Landscape Architecture/Design Specifications for Compost Use" - US Composting Council

If there are discrepancies or contradictions in specification sections or details, the stricter specification shall take precedence. A Request for Information (RFI) can also be submitted for clarification.

List of Plant Material: The contractor will verify plant quantities prior to bidding and any discrepancies shall be brought to the attention of the Owner's Representative. The Contractor shall furnish and install all plant materials required to complete the work as shown on the drawings. Quantities in the planting schedule shall take precedence over quantities graphically shown on the plan. Substitutions shall not be made without the written approval of the Owner's Representative.

Plant Identification: All trees shall be true to name as on plant schedule or shown on planting plans and shall be correctly labeled individually or in groups by genus, species, variety and cultivar. Labels are to remain intact until site is approved through agency inspection, substantial completion approval, or per Owner's Representative's instruction.

Plant Quality: All plant materials shall conform to the size and form standards set forth in the latest edition of AmericanHort's "American Standard for Nursery Stock - ANSI Z60.1". Above Ground: Trees shall be healthy with the color, shape, size, and distribution of trunk, stems, branches, buds and leaves typical of the plant specified. Any signs of stress, improper handling (wounds or broken branches), insect or disease damage, or dead/distorted branches should not be present. Trees shall have one central leader (unless otherwise specified) and grafts should be fully closed and visible above the soil line. Below Ground: A minimum of 3 structural roots should be reasonably distributed around the trunk (reject a tree with structural roots only on one side), the root crown should not be more than 2 inches below the soil line, the top 2 structural roots should not be more than 3 inches below the soil line when measured 4 inches away from the trunk. The top of the other structural root should not be more than 5 inches below the surface. The root system should be free of potentially stem-girdling or kinked roots above the root collar and main structural roots.

Inspection: Plants are to be inspected upon delivery to contractor by a contractor's representative and/or owner's representative. Trees not presenting proper form, incorrect variety, signs of poor health or over-stress, and girdling roots are to be rejected.

Storage & Transport: Plant materials should be protected from dessication during transport via breathable fabric covering the canopy and by watering rootball/pot thoroughly immediately prior to transport. Plant materials should be installed on day of delivery to site. If that is not possible, a temporary storage area can be constructed on-site. Plants are not to be stored on bare asphalt. If storage area is asphalt, cover bare asphalt with a layer of woodchips. Storage should be in shade, and plants be regularly watered at root-ball level, and spaced so foliage from one plant does not interfere with foliage of another. Tall plant materials are to remain upright during storage. Longer term storage plants are to be heeled-in or stored in mulch to the top of the container/root ball. Plant materials shall not be stored on-site for more than two weeks. Plants stored improperly or for too long may be subject to rejection and replacement dependent on ultimate planting condition.

Planting: Plantings shall be installed in accordance with details and specifications on this sheet. Details and specifications for other specific landscape items, such as tree preservation or erosion control may be found elsewhere in this drawing set on their own respective sheet. For items not specifically addressed by this plan set, refer to the latest edition of the "Landscape Specification Guidelines" developed by the Landscape Contractors Association of MD, DC, and VA. Should there be any ambiuguities or questions, please utilize the formal RFI/Submittal process.

Trees: The planting hole diameter is to be at a minimum three times the diameter of the root ball. The depth of the planting hole shall be dug so that the shoulder of the root ball is level with the existing grade leaving the root flare slightly higher. When planting on a slope, the depth of the hole shall be dug so that the bottom of the root flare is at the level of the existing grade at the sides of the hole. If the planting hole is mechanically dug, the hole is to be scarified by slightly enlarging hole by hand digging the sides and bottom to prevent glazing. The sides of the hole should be vertical or sloping outwards. Holes are not to be dug when soil is saturated. For balled and burlapped trees, the wire root ball cage is to be removed and burlap is to be cut and completely removed from the top and a minimum of 8" to 12" down the side of the root ball. Do not fold burlap down into hole, it must be removed. Any synthetic materials are to be completely removed from the trunk and root ball. Backfill in lifts using the same soil dug to create the hole, being careful not to over-compact the soil. Inoculate backfill soil or rootball with an approved balanced (Endo/Ecto) commercial mycorrhizae application. Do not amend or add fertilizer unless expressly specified to do so or is part of the approved mycorrhizae innoculant product. Do not place any soil on top of root ball. Trees are to be mulched to full depth specified immediately after planting. A ½" layer of approved compost is to be placed under the mulch layer. Do not place mulch against tree trunk.

Staking: Staking (if any) is to be installed per the accompanying details, utilizing tree webbing straps with grommets to prevent wire from coming in contact with the tree. While not preferred, full tree webbing systems are also permissible if approved through submittal, and installed per manufacturer's instructions. Wire is to be tensioned to allow for 1/2 inch of deflection up or down, and tension shall be rechecked and adjusted on a regular basis. Staking is to be removed as soon as possible after one year. GARDEN HOSE IS NOT TO BE UTILIZED FOR STAKING.

Irrigation: For permanent systems, irrigation should be largely installed prior to plant installation to avoid having to disturb planting beds or move plants to accommodate the installation of the irrigation system. For sites with no permanent irrigation system, Trees are to be irrigated until established by the use of temporary water bags through one growing year or until established. Shrubs, perennial beds, and lawns are to be thoroughly hand-watered or by movable temporary irrigation (sprinklers or drip hose) as necessary to reflect local weather conditions. Watering is to be deep into the soil and infrequent, as opposed to light surficial watering performed often.

Shrubs: For container shrubs, the planting hole is to be dug 3 times the width of the intact container. The container is to be completely removed and the sides of the soil/root clump scarified with a sterile sharp knife. They shall be planted so that the top of the soil level of the container is no more than 1.5" above the original grade. For balled and burlapped shrubs, remove as much burlap as possible from the top and sides of the rootball. Do not fold burlap into hole. Plant with the root flare slightly higher than the surrounding grade. Backfill with soil dug to create the hole. Do not cover top of root ball/clump.

Ground Covers/Perennials: Beds are to be prepared by tilling well to a minimum depth of 6", and soils shall be amended by incorporating 1" of compost meeting the US Composting Council reference specification, 1" of worm castings and/or well decomposed commercially produced compost, or a Class A biosolid also meeting the referenced US Composting Council specification prior to planting. Apply 3" of shredded non-dyed hardwood mulch immediately after planting.

Compacted or Poorly Drained Soils: For sites with heavily compacted or poorly draining soils, alternate planting methods will need to be employed. Contact project Landscape Architect for additional planting details and specifications should either unforeseen condition be encountered.

Conflicts with Existing Roots: Proposed landscape may be shown to be planted in the Critical Root Zones of existing large trees. Should, in the course of planting, large woody roots be discovered belonging to adjacent large trees that are to be preserved, shift the planting location of the tree to be planted to avoid cutting the woody root. Should a suitable planting location not be found within the proximity of where a proposed tree is to be planted, contact the project landscape architect for alternate planting location and recording of the discrepancy for landscape inspection/approval purposes.

Irrigation: New plant materials are to be watered as necessary to maintain health. If no permanent irrigation system is installed, trees are to be watered until established through the use of temporary water bags. Shrubs, perennials, and ground covers shall be hand-watered. Infrequent deep watering is preferred to more frequent quick/shallow watering.

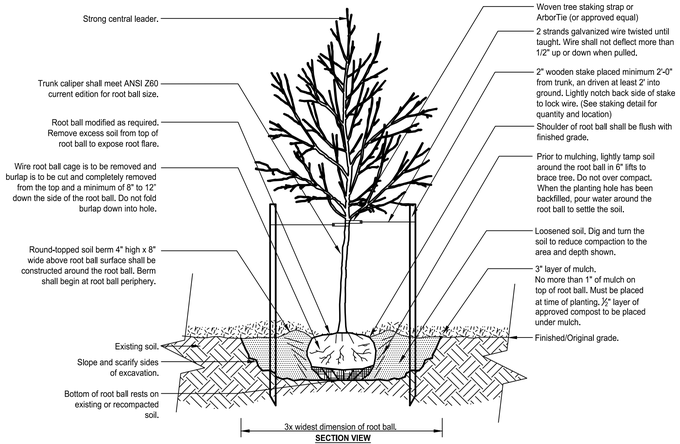
Lawn Areas:

Seeded Lawn Area: Areas to be seeded shall have planting soil tilled to a depth of 6" and free of stones greater than 1" diameter or length. Any amendments that are to be added should be tilled into soil prior to seeding. A seed mix composition chart shall be submitted for review prior to installation. Unless specified by the Owner's Representative, the seed mix must contain a minimum of three cultivars or types of grass in the blend, chosen from the recommended cultivars list of the most recent "TT-77 Recommended Turfgrass Cultivars for Certified Sod Production in Maryland" document produced by the University of Maryland and the Maryland Turfgrass Council. Use of cultivars also appearing on the Turfgrass Water Conservation Alliance approved list is encouraged. Seeds coatings that aid in germination, moisture retention and prevent loss to bird consumption are acceptable. Seeded areas are to be covered by a light and loose layer of rapidly degradable mulch such as straw or hydraulically applied cellulose. Use of erosion control blankets or any synthetic webbing is not permissible for lawn areas unless specified by the Owner's Representative.

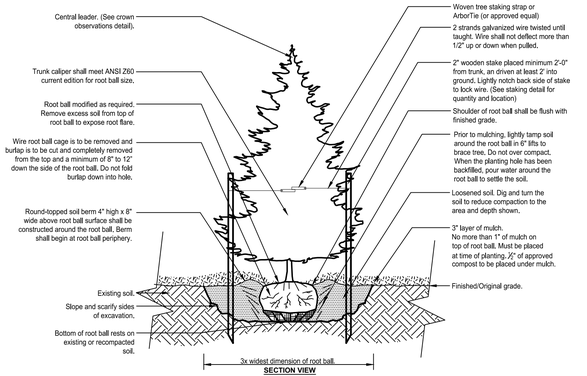
Sodded Lawn Area: Unless a proprietary sod is specified by the Owner's Representative, sod must be of a Maryland or Virginia certified variety suited to the specific growing requirements of where it is to be installed, Grower and variety to be submitted to Owner's Representative for review prior to ordering. Certification documentation for all sod is to be provided to the Owner's Representative upon delivery. For installation on slopes, the Contractor shall use biodegradable sod spikes to secure sod in place. Metal sod staples are not to be utilized for installation.

Invasive Species: Existing invasive species are to be removed utilizing appropriate approved methods including in the invasive species management plan (if applicable) prior to the installation of new plant materials, and is subject to inspection, and is a factor in the Certification of Installation.

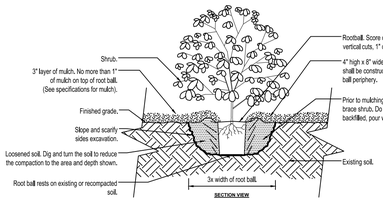
NOTE: These specifications and details are based on those developed by the Urban Tree Foundation, and have been improved to reflect current research and in planting. The ISA has also accepted and reference the UTF details in place of their own. The specifications and details illustrated in this plan set exceed the standards set in the ISA, LCA, and local jurisdictional planting details and specifications.




DECIDUOUS TREE PLANTING DETAIL
SCALE: NOT TO SCALE

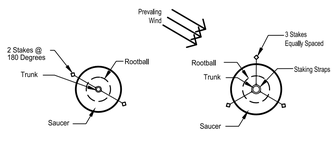



EVERGREEN TREE PLANTING DETAIL
SCALE: NOT TO SCALE



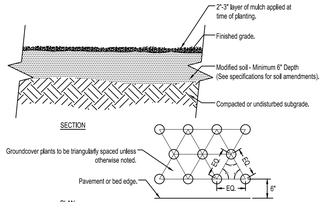

Notes:
1. For ball and burlapped shrubs, remove completely as much burlap as possible, minimum halfway down the side of the rootball. Do not fold burlap down into hole.
2. See specifications for further requirements relating to this detail.

SHRUB PLANTING DETAIL
SCALE: NOT TO SCALE



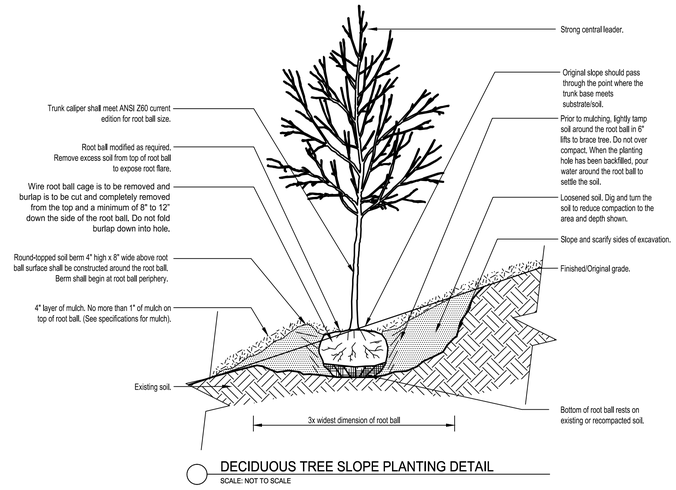

Notes:
1. Utilize only Arbor-tie or approved equal or staking straps against tree trunks.
2. Reference manufacturer's detail of approved system for installation instructions.
3. Wire tension (if used) should not allow greater than 1/2" of play in any direction.
4. Staking should be removed on year after planting or as instructed.

TREE STAKING DETAIL
SCALE: NOT TO SCALE

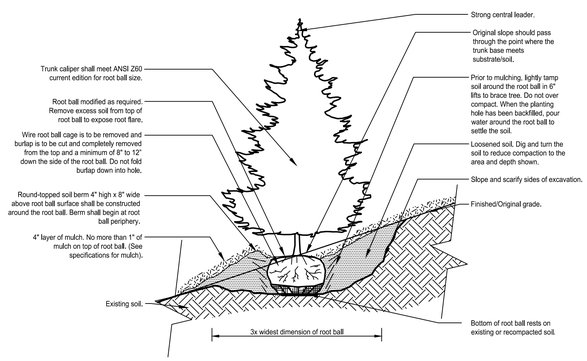



Notes:
1. Plant in triangular arrangement unless otherwise noted on plan.
2. See planting schedule for groundcover species, size, and spacing dimension.
3. Small roots (0" or less) that grow around, up, or down the root ball periphery are considered a normal condition in container production and are acceptable however they should be eliminated at the time of planting. Roots on the periphery can be removed at the time of planting. (See root ball shaving container detail).
4. Settle soil around root ball of each groundcover prior to mulching.

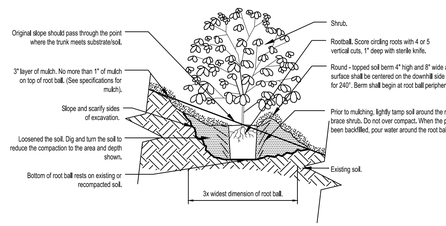
PERENNIAL/GROUNDCOVER DETAIL
SCALE: NOT TO SCALE




DECIDUOUS TREE SLOPE PLANTING DETAIL
SCALE: NOT TO SCALE




EVERGREEN TREE SLOPE PLANTING DETAIL
SCALE: NOT TO SCALE




Notes:
1. For ball and burlapped shrubs, remove completely as much burlap as possible, minimum halfway down the side of the rootball. Do not fold burlap down into hole.
2. See written specifications for further requirements related to this detail.

SHRUB SLOPE PLANTING DETAIL
SCALE: NOT TO SCALE

IMEG
19 Culpeper St. Suite #2
Warrenton, VA 20186 P 703.273.6820
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PRELIM PLAN - LANDSCAPE PLAN
HILLSIDE
691/432 MAP 9 PARCEL 67
LOTS 2A (RESIDUE) & 2B
DISTRICT 3, JEFFERSON COUNTY, WV

| MARK | DATE | DESCRIPTION |
|---|---|---|
| | 10/20/2023 | QC SUB. TO PWC |
| | 11/06/2023 | 1ST SUB TO PWC |
| | 02/12/2024 | 2ND SUB TO PWC |

PROJECT No.: 22063.001.00
DRAWING No.: 112742
DATE: 04/05/2024
SCALE: 1" = 30'
DESIGN: GB
DRAWN: GB
CHECKED:

SHEET TITLE:
LANDSCAPE NOTES AND DETAILS

SHEET No.
L200

P:\Projects\22063\001\001\112742 Prelim Subdivision - Land Development Plan\L200 LANDSCAPE NOTES AND DETAILS.dwg, 4/7/2024 9:25:40 PM, Miranda Tison,

Kimley»Horn

# Memorandum

To: Sylke Knuppel
IMEG
4601 Forbes Boulevard #140
Lanham, MD 20706

From: Mark Phillips, P.E.

Through: James Newman
City of Charles Town
101 E Washington Street
Charles Town, WV 25414

Date: April 8, 2024

**Subject: Hillside Preliminary Subdivision/Land Development Plat Review**

This memorandum summarizes our review of the Preliminary Subdivision/Land Development Plat for the Hillside Development (dated April 5, 2024, prepared by IMEG) for a proposed 124 Townhouses on approximately 14.24 acres. The site is currently zoned Residential Medium-High (R-15) per the City of Charles Town Subdivision and Land Development Ordinance dated June 23, 2012 (Rev. June 21, 2023). This application proposes a by-right development of approximately 14.47 acres of property.

The site abuts the eastern side of Route 340 and will connect to Hillside Drive. There is one access point proposed at the current terminus of Hillside Drive. The site is proposed to consist of 124 townhouse units.

Kimley-Horn's review of this application is limited to the Preliminary Subdivision/Land Development Plat and Application provided. Based upon our review, we have no further comments on the materials provided.

Thank you for the opportunity to review this Preliminary Subdivision/Land Development Plat. Please feel free to contact us at 703-870-3631 should you have any questions.

**KIMLEY-HORN & ASSOCIATES, INC.**

Mark Phillips, P.E.
Project Manager, Associate

**Planning Commission**
101 East Washington Street
Charles Town, WV 25414

**SCHEDULED**

Meeting: 04/22/24
Department: Planning Commission
Category: Report
Initiator:

## AGENDA ITEM (ID # )

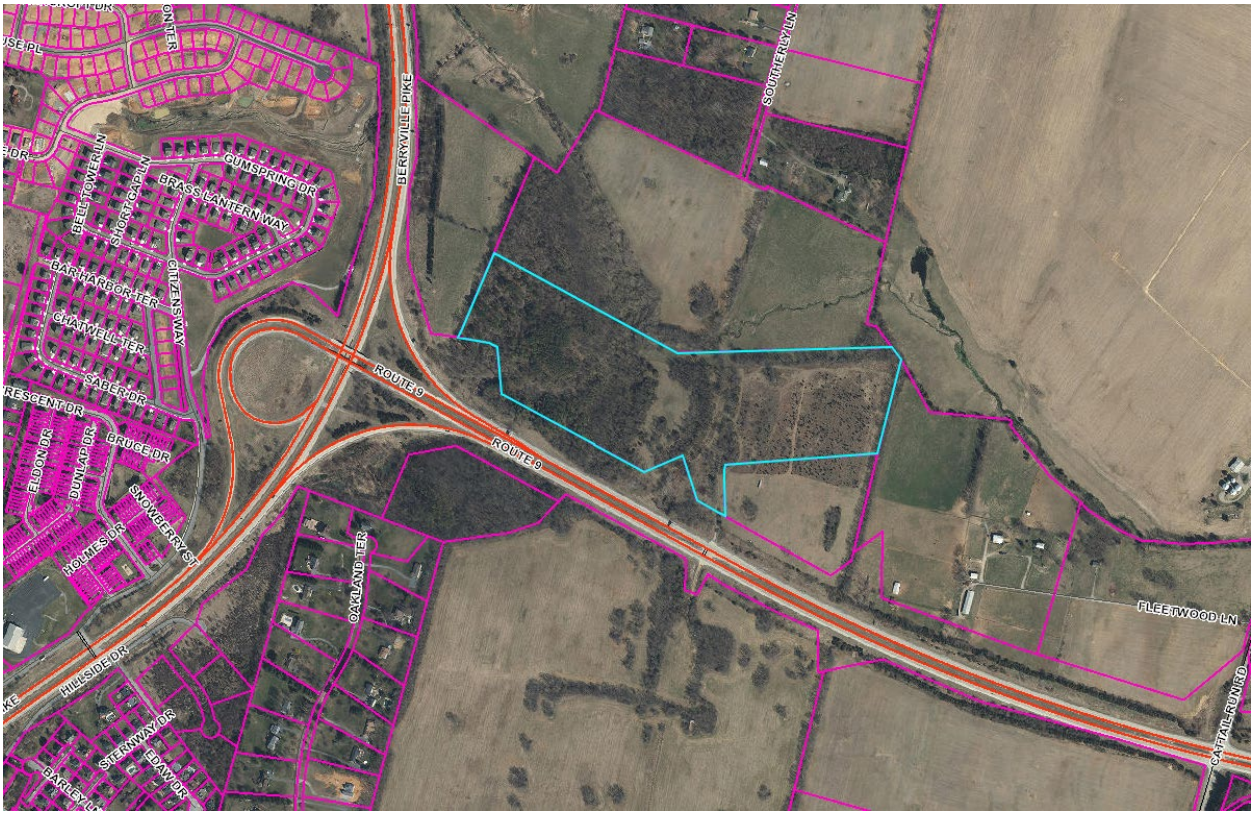
***Commission Review*: SLD2024-01: *University Healthcare* Sketch Plan**
**Note: Applicant will have a sketch plan public hearing next month**

**ATTACHMENTS:**

- 1. Staff Report.pdf
- 2. Application.pdf
- 3. Plans.pdf
- 4. KH Comments.pdf

Sketch Plan Review
**SLD2024-01**

**Date:** For the March 25, 2024 Planning Commission meeting
**Applicant**: Gresham Smith
**Property Owner:** University Healthcare Foundation Inc.
**Report by**: James Newman, City Planner, Zoning/Subdivision Administrator.
**Proposal:** Major Land Development.
**Property Location:** U.S. Rte. 9
**Current Zoning:** General Commercial




**NOTE**: This item is for Planning Commission **review only**. A public hearing will be scheduled at a later date. The applicant has requested, and the Chair has accepted, this request as the applicant desires to modify their plans to meet Commissioner comments, if any, while the rezoning process plays out.

## PROJECT OVERVIEW

The applicant is seeking to develop an access road, medical office building, parking lot, and stormwater management facilities.

**PLANNING COMMISSION**

The Planning Commission deemed this application complete at their March 25, 2024 meeting.

**ZONING REVIEW**

The property is zoned General Commercial.

*Setbacks*

Front: 40 ft.
Sides: 10 ft (25 when adjacent to a residential district).
Rear: 30 ft.

All setback requirements are met.

*Density*

Not applicable.

*Lot coverage*

Up to 90% of the lot may be developed. There is no open space requirement. Applicant has not specified what percentage of the property is being developed; a view of the plans shows the majority of the site is open space.

*Parking*

Required parking for a medical /dental lab (or a medical/dental office building) is 3.53 spaces per 1,000 sq. ft. GFA. With a 40,000 sq. ft. building, they are required to have 12 spaces (40,000/1000 = 40. 40/3.53= 11.3, round up to 12). Applicant is proposing 276 parking spaces. Nine of the spaces are designated for handicap parking.

The plans show parking split into a lower level with 75 spaces, and an upper level with 201 spaces.

Parking lot landscaping is required to be shown on the Preliminary Plan. This will include islands with vegetation and trees surrounding the parking lot(s).

*Sidewalks*

The plans show sidewalks on both sides of the planned roadway and roundabout, which meets the City's requirements.

*Easement*

The applicant shows easements for electric lines and the location of water lines.

*Dumpster Pad*

A dumpster pad is shown. Pads must be screened form view with a masonry wall and landscaping.

*Buffers*

Buffers are not required to be shown on a sketch plan. Additional review will be performed for the Preliminary Plan. The required buffer must be between 10 -20 ft wide, and consist of opaque fencing, an evergreen buffer, an earthen berm with vegetation, or a mixture of those options.

*Lighting*

Lighting is not required to be shown on a sketch plan. Additional review will be performed for the Preliminary Plan. Lighting will be required along the roadways and within the parking lot(s).

*Stormwater*

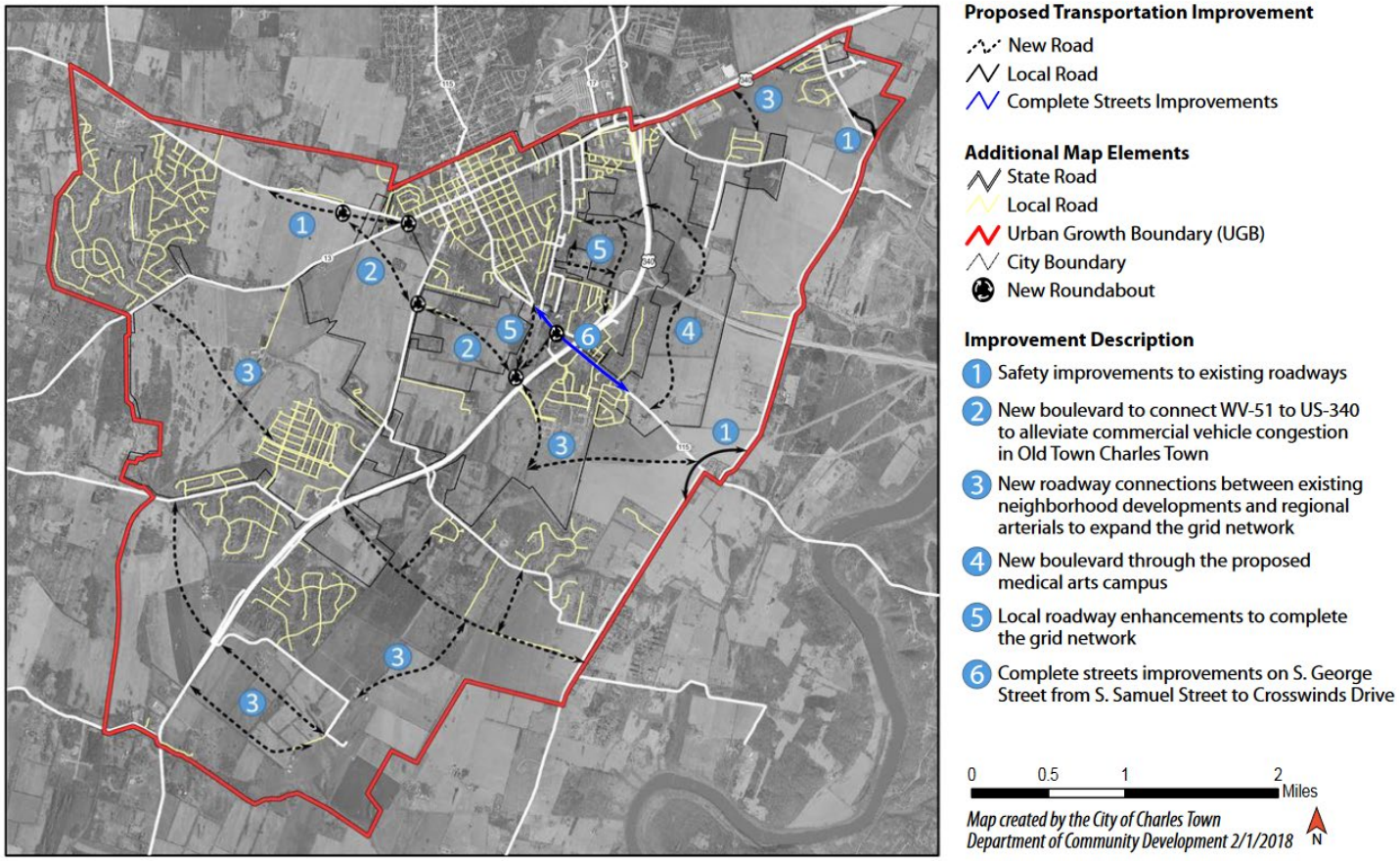
The City's Engineering firm has no comments at this stage. Additional review will be performed for the Preliminary Plan.

**COMPREHENSIVE PLAN**

The 2040 Comprehensive Plan identifies these parcels as Professional Office and Institutional District. The Comprehensive Plan Future Roadway Network Improvements Plan shows this property as a connection point between WV Route 9 and US Route 340, see point no. 4 below on the next page:

CITY OF CHARLES TOWN COMPREHENSIVE PLAN

## Future Roadway Network Improvements




**CONCLUSION**

The applicant has requested feedback on this version of their sketch plan. Additional details regarding lighting, buffering, and landscaping can be provided, but are not required at the sketch plan phase. Parking should be reduced, however, the City has no maximum requirements for parking, only minimums.

**RECOMMENDATION**

No recommendation. A public hearing will be scheduled for a later date.

Sketch Plan Application No._____

# SKETCH PLAN APPLICATION

## SUBDIVISION AND LAND DEVELOPMENT ORDINANCE
## ARTICLE 1332, SUBDIVISION AND LAND DEVELOPMENT APPLICATION & APPROVAL REQUIREMENTS

**To assist the Subdivision Administrator in the review of a Sketch Plan Application, the Applicant must utilize this form to supply the City with the information prescribed under Section 1332.03 of the Charles Town S/LD Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as the Applicant's Sketch Plan Application as required by Ordinance Section 1332.03. Applicant is responsible to ensure the standards of Ordinance Section 1332.04, Sketch Plan Requirements, are met and provided herein is a checklist of the Sketch Plan requirements.**

1. DATE _____ December 28 , 2023

2. APPLICATION TYPE* ☐ Zoning Use Permit, Special Exception Use and Sketch Plan requirements found in the Supplemental Regulations of the Zoning Ordinance
   - Submit Three (3) 11" x 17" copies of the Sketch Plan shall be submitted and in Adobe PDF format

   ☒ Major S/LD Development
   - Submit Three (3) 18" x 24" copies of the Sketch Plan shall be submitted and in Adobe PDF format

*There are two types of Sketch Plan submissions:

1. For Zoning Use Permit, Special Exception Use and Sketch Plan requirements found in the Supplemental Regulations of the Zoning Ordinance. Submission standards are found in Section 1332.04(D).
2. For a Sketch Plan for a Major S/LD application, submission standards are found in Section 1332.04(E)

3. APPLICANT'S NAME* Gresham Smith - Contact: Rob Whitson

Address: 222 2nd Ave S, Suite 1400, Nashville, TN 37201

Telephone Number (615)770-8312 Fax Number ( )

Email Address rob.whitson@greshamsmith.com

4. PROPERTY OWNER'S NAME University Healthcare Foundation, Inc. - Contact: Brad Freeman

Address: 2500 Hospital Dr, Martinsburg, WV 25401

Telephone Number (304)596-2847 Fax Number ( )

Email Address bradley.freeman.m@wvumedicine.org

5. LEGAL DESCRIPTION OF THE SUBJECT PROPERTY (list all parcels that apply)

Property Address: NE of Highways 9 and 340 interchange

Tax Map # and Parcel: Charles Town Corp District, Tax Map 15, Parcels 7.2, 7.3, part of 7.4, and 8

Deed Book and Page #: Book/Page: 1147/325, 1262/140, 1030/343, 1248/348

Property Area in Square Feet or Acres: 73.65 acres (includes 9.4 acres of adjacent Langlet property)

6. DESCRIPTION OF PROJECT AND PROPOSED USE(S) OF THE PROPERTY:

Proposed 40,000 SF medical office building,

along with infrastructure for additional future development

7. DESCRIPTION OF THE EXISTING (OR FORMER) USE(S) OF THE PROPERTY AND CURRENT ZONING:

Vacant land / wooded and agriculture

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

8. ARE THERE ANY ANTICIPATED WAIVERS OR VARIANCES? IF YES, PROVIDE DETAILS.

Not for this application. A separate application is made for rezoning of 9.4 acres from Neighborhood Residential to General Commercial, to be included in the proposed project property and zoned consistently.

9. HAS THE PROPERTY BEEN THE SUBJECT OF ANY COURT ACTION?

☐ Yes (Please specify nature of all proceedings and current status and attach any documents showing court decisions, etc.)

☒ No

10. PARCEL HISTORY (List all pending or previously approved applications on the subject parcels inventoried above, including previous site plan applications if this application is a site plan amendment)

| Application No. | Project Name and Phase | Status | Approval Date |
|---|---|---|---|
| None | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

11. INTERESTED PARTY ADDRESSES, FOR PUBLIC NOTICE (including across street)
(Interested parties are defined as adjacent properties within 100 feet).

| Owner | # and Street | City, State, Zip |
|---|---|---|
| Springfield Partners, LLC | 412 Keyes Ferry Road | Charles Town, WV 25414 |
| Mark F. Langlet, as Trustee of the Jules F. Langlet and Mary Lou Langlet Irrevocable Trust | 544 Lego Drive | Charlottesville, VA 22911 |
| Thomas W. Newcomer & Kim Yeunshin | P.O. Box 515 | Charles Town, WV 25414 |
| Federal Hill Farms, Inc. | 1434 Cattail Run Road | Charles Town, WV 25414 |
| | | |
| | | |
| | | |
| | | |
| | | |

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Section 1332.02 of the Charles Town S/LD Ordinance and relevant provisions of the Charles Town City Code.

Signature of Applicant

Nelson R White Date 12/14/2023

Signature of Property Owner (If different than Applicant)

Dean Thomas Date 12/21/23

Please submit an original completed Application and specified number of Site Plan copies to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

---

***FOR CITY USE ONLY***

Application Number:_____ Date Application Received:_____

Fee: $_____ Paid:$_____ Check No._____

Receipt No._____

Subdivision Administrator Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

Comments:_____

_____

_____

_____

_____

_____

# CHARLES TOWN, WEST VIRGINIA
## Department of Community Development
Division of Planning and Zoning
101 East Washington Street, P.O. Box 14
Charles Town, West Virginia 25414

Phone: (304) 725-2311 □

Fax (304) 725-1014


File Number: _____
Staff Initials: _____
Fees Paid: _____

https://goo.gl/KGzDMZ

## Sketch Plan Review Checklist
### Amended 2017 Subdivsion Ordinance

(please check one) __X__ **Major S/LD Application** or
_____ **Zoning Use Permit, Special Exception Use, or Sketch Plan (requirements found in the Supplemental Regulations of the Zoning Ordinance)**

**Project Name:** WVU Medicine Medical Office Building

| ***Property Owner Information*** | | | | | |
|---|---|---|---|---|---|
| Property Owner: | University Healthcare Foundation, Inc. - Contact: Brad Freeman | | | | |
| Mailing Address: | 2500 Hospital Drive | | | | |
| City: | Martinsburg | State: | WV | Zip Code: | 25401 |
| Phone Number: | (304) 596-2847 | Email: | bradley.freeman.m@wvumedicine.org | | |
| Signature: | | | | Date: | |

| ***Applicant's Registered Engineer or Surveyor or Design Consultant*** | | | | | |
|---|---|---|---|---|---|
| Name: | Gresham Smith - Contact: Rob Whitson | | | | |
| Mailing Address: | 222 2nd Ave S, Suite 1400 | | | | |
| City: | Nashville | State: | TN | Zip Code: | 37201 |
| Phone Number: | (615) 770-8312 | Email: | rob.whitson@greshamsmith.com | | |

| ***Physical Property Details*** | | | | | |
|---|---|---|---|---|---|
| Physical Address: | NE of Highways 9 and 340 interchange | | | | |
| City: | Charles Town | State: | WV | Zip Code: | 25401 |
| Tax District: | 3 - Charles Town Corp District | Map No: | 15 | Parcel No: | 7.2, 7.3, part of 7.4, & 8 |
| Parcel Size: | 73.65 total acres | Deed Book: | | Page No: | |
| | | Book/Page: 1147/325, 1262/140, 1030/343, 1248/348 | | | |

| Zoning of Subject Property | | | Is the Project to Be: | Is Property In: |
|---|---|---|---|---|
| Urban Reserve (UR) | Residential Medium-High Density (R-15) | Neighborhood Commercial (NC) | Planned Unit Development (PUD) | Historic Overlay District (HOD) |
| General Commercial (GC) | Old Town Residential (OT-R) | | | Floodplain Overlay District (FOD) |
| Old Town Mixed Use Commercial (OT-MUC) | Neighborhood Residential (NR) | | | |

| City Use Only | 1st Review | 2nd Review | 3rd Review | 4th Review |
|---|---|---|---|---|
| Submittal Date | | | | |
| Zoning Administrator | | | | |
| City Planner | | | | |
| GIS/Addressing | | | | |
| Return Date | | | | |

***Conditions of Approval (Attach Additional Comments As Needed)***

***Instructions***

1. This checklist is provided as a quick reference guide only. The Consultant/Developer is responsible for reading the regulations and fully complying with all the requirements. All references to the Subdivision Ordinance and Zoning Ordinance are cited for informational purposes only.

2. The checklist shall be completed by the Engineer/Surveyor or Design Consultant and attached to the Sketch Plan review submission.

***Requried Submittal Information***

__x__ 1 Check for Applciation Fees

__x__ 1 Completed Application and Checklist (Signed by owner)

__x__ 3 Sets of Sketch Plans and Adobe PDF Format

| | *Ordinance Requirements:*<br>*(See instructions on page 2)* | Engineer /Surveyor | 1st Review | 2nd Review | 3rd Review | 4th Review | Review Key<br>✓ Ok<br>O Incomplete<br>N/A Not Applicable<br>X Unacceptable |
|---|---|---|---|---|---|---|---|
| **Sub-Section** | **SUBDIVISION ORDINANCE**<br>**Section 1332.04, Sketch Plan Requirements** | | | | | | |
| A | **THERE ARE TWO TYPES OF SKETCH PLAN SUBMISSIONS:**<br>**Sections in Red and Blue are depict the different types.** | | | | | | |
| A1 and D | For:<br>• **Zoning Use Permit**<br>• **Special Exception Use**<br>• **Sketch Plan requirements found in the Supplemental Regulations of the Zoning Ordinance**<br>The following information shall be provided for Sketch Plan review: | | | | | | |
| D1 | Three (3) 11" x 17" copies of the Sketch Plan shall be submitted and in Adobe PDF format. | | | | | | |
| D2 | The Sketch Plan shall be drawn to a 1"=50' scale | | | | | | |
| D2 | The Sketch Plan must illustrate the following elements in such a way that the Subdivision Administrator or authorized designee can determine if the proposed Subdivision or Land Development meets the criteria of this Ordinance, **as applicable:** | | | | | | |
| D2a | Existing conditions, including boundary lines of the property | | | | | | |
| D2b | A land use plan, showing the location, arrangement and approximate boundaries of all proposed land uses | | | | | | |
| D2c | Vicinity map, north arrow, scale (written and graphic) and date | | | | | | |
| D2d | Name of proposed project or other identifying title and date plan was prepared. Name and address of the Engineer, Surveyor, Architect, Landscape Architect, Land Planner or Property Owner who prepared the plan | | | | | | |
| D2e | Current zoning and total area of the property | | | | | | |
| D2f | Maximum and proposed density | | | | | | |
| D2g | Available utilities | | | | | | |
| D2h | All existing sanitary sewer facilities and combined sewer facilities | | | | | | |
| D2i | Depict location or statement of proposed water and sewer supply and other utility improvements | | | | | | |
| D2j | Existing covenants | | | | | | |
| D2k | General layout of any proposed number of Lots, average Lot sizes and any proposed commercial uses, including any associated parking. Include proposed height of structures | | | | | | |
| D2l | Statement of total acreage of the tract being subdivided or developed | | | | | | |
| D2m | Location of proposed Street layout, including connections to adjoining streets or vacant lots | | | | | | |
| D2n | The location of sidewalks, trails and crosswalks | | | | | | |
| D2o | Proposed open space and/or recreation areas, including notes on the plan describing the proposed use, activity area and/or improvement | | | | | | |
| D2p | Any other information requested by the Subdivision Administrator in order for the Subdivision Administrator to make an accurate determination. | | | | | | |
| A2 and E | For a **Major S/LD Application**. The following information shall be provided for Sketch Plan review: | X | | | | | |
| E1 | Three (3) 18" x 24" copies of the Sketch Plan shall be submitted and in Adobe PDF format. | X | | | | | |
| E2 | The Sketch Plan shall be drawn to a 1"=50' scale | X | | | | | |
| E2 | The Sketch Plan must illustrate the following elements in such a way that the Subdivision Administrator or authorized designee can determine if the proposed Subdivision or Land Development meets the criteria of this Ordinance: | X | | | | | |
| E2a | Existing conditions, including boundary lines of the property | X | | | | | |
| E2b | A land use plan, showing the location, arrangement and approximate boundaries of all proposed land uses | X | | | | | |

| | *Ordinance Requirements: (See instructions on page 2)* | Engineer /Surveyor | 1st Review | 2nd Review | 3rd Review | 4th Review | Review Key: ✓ Ok; O Incomplete; N/A Not Applicable; X Unacceptable |
|---|---|---|---|---|---|---|---|
| E2c | Vicinity Map, North arrow, scale (written and graphic) and date | X | | | | | |
| E2d | Names of the abutting owners, adjoining lot lines and structures on abutting lots within 100 feet of the property | X | | | | | |
| E2e | Title of the proposed project; the date, month and year the plan was prepared or revised; the name of the applicant(s), owner(s), and contract owner(s) and the name and address of the Engineer, Surveyor, Architect, Landscape Architect, or Land Planner who prepared the plan, including firm name | X | | | | | |
| E2f | Current zoning and total area of the property | X | | | | | |
| E2g | Maximum and proposed density based on the Net Buildable Land Area | X | | | | | |
| E2h | Available utilities | X | | | | | |
| E2i | All existing sanitary sewer facilities and combined sewer facilities | X | | | | | |
| E2j | Depict location or statement of proposed water and sewer supply and other utility improvements | X | | | | | |
| E2k | Existing covenants | X | | | | | |
| E2l | General layout of any proposed number of Lots, average Lot sizes and any proposed commercial uses, including any associated parking. Include proposed height of structures | X | | | | | |
| E2m | Statement of total acreage of the tract being subdivided or developed, including the Net Buildable Land Area | X | | | | | |
| E2n | The approximate acreage in common open space, in each use and housing type and in roads, streets or rights-of-way for the total development | X | | | | | |
| E2o | The proposed number of dwelling units of each type in each in the total development | X | | | | | |
| E2p | Location of proposed Street layout, including connections to adjoining streets or vacant lots | X | | | | | |
| E2q | The location of sidewalks, trails and crosswalks, as may be applicable | X | | | | | |
| E2r | Proposed open space and/or recreation areas, including notes on the plan describing the proposed use, activity area and/or improvement. The amount, approximate boundaries and location of common open space, with the percentage of the total acreage of the site to be placed in common open space | X | | | | | |
| E2s | The location of environmental sensitive land to be included in common open space | X | | | | | |
| E2t | Notes indicating any modifications, waivers, variances, special exceptions and/or conditional uses that are required | X | | | | | |
| E2u | The location and extent of proposed buffers | X | | | | | |
| E2v | The proposed location, arrangement, and right-of-way widths of roads and streets, including roads and streets providing access to adjoining parcels. The location and arrangement of street entrances, driveways and parking areas | X | | | | | |
| E2w | Calculations describing all proposed bonus factors with the location of and specifications for bonus improvements, when proposed | X | | | | | |
| E2x | Any other information requested by the Subdivision Administrator in order for the Subdivision Administrator to make an accurate determination | X | | | | | |
| **Sub-Section** | **SUBDIVISION ORDINANCE Section 1333.01, General Site Planning and Design Specifications** | | | | | | |
| D1d | There is **no** requirement that a Sketch Plan or Preliminary Plat show phasing. | | | | | | |

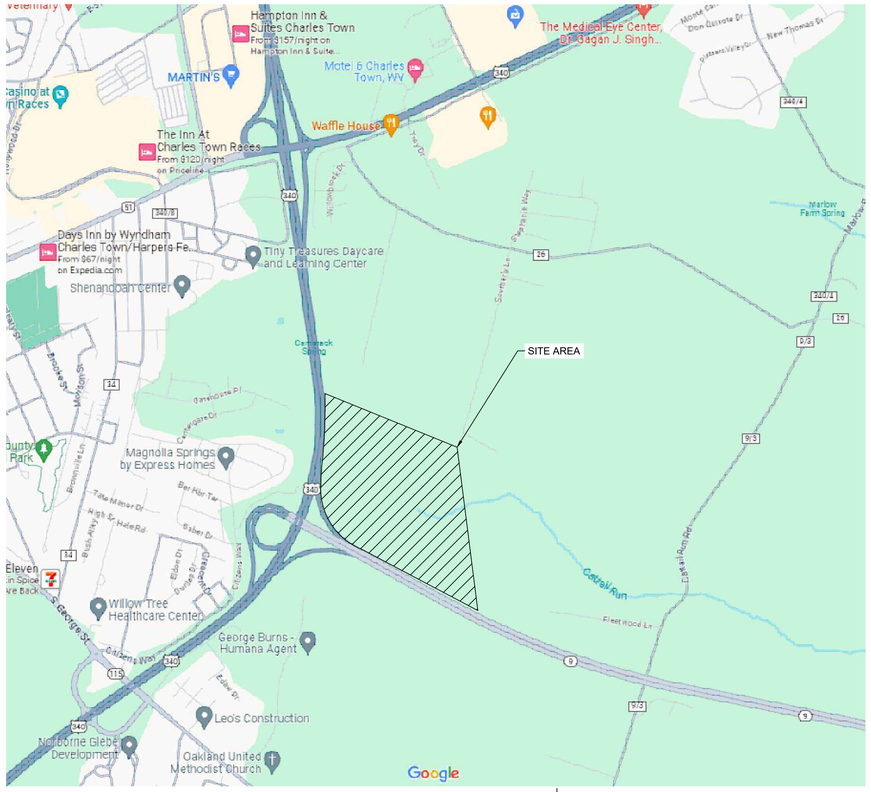
Drawn By: KL
Checked By: RW
Approved By: RW

SKETCH PLAN FOR

# WVU - BLUE RIDGE CROSSING

INTERSECTION OF ROUTE 9 AND 340
JEFFERSON COUNTY
CHARLES TOWN, WV

GRESHAM SMITH PROJECT NO. 45550.02




VICINITY MAP
NOT TO SCALE

| Sheet List Table | |
|---|---|
| Sheet Number | Sheet Title |
| C000 | COVER SHEET |
| C100 | EXISTING CONDITIONS |
| C101 | PROPERTY INFORMATION |
| C200 | OVERALL SITE PLAN |
| C201 | DETAILED SITE PLAN |
| L200 | OVERALL LANDSCAPE PLAN |
| L201 | DETAILED LANDSCAPE PLAN |


OWNER / DEVELOPER

WVU Medicine

2500 Hospital Drive
Martinsburg, WV 25401
Owner Contact: Brad Freeman
Phone: (304) 596-2847

ENGINEER/ARCHITECT/LANDSCAPE ARCHITECT

Gresham Smith

222 Second Avenue South
Suite 1400
Nashville, TN 37201

Architect Contact: Laurel Nee, AIA, NCARB, EDAC
Phone: (704) 944-7989
Email: laurel.nee@greshamsmith.com

Civil Contact: Rob Whitson
Phone: (615) 770-8312
Email: rob.whitson@greshamsmith.com

Landscape Architect Contact: Trey Rudolph
Phone: (615) 770-8148
Email: trey.rudolph@greshamsmith.com

SURVEYOR

TRIAD ENGINEERING, INC.

1075-D Sherman Avenue
Hagerstown, MD 21740
Survey Contact: Ron Bidle, PLS
Phone: (301) 797-6400
Email: rbidle@triaeng.com


ISSUE DATE:
JANUARY 2, 2024


Gresham Smith

201 South College Street
Suite 1950
Charlotte, NC 28244
704.944.7970

Firm Certification
Nos. 51100 / C-416 / C-2056

GreshamSmith.com


WVU Medicine

BLUE RIDGE CROSSING -
MEDICAL OFFICE BUILDING

WVU MEDICINE
CHARLES TOWN, WEST VIRGINIA

PRELIMINARY
NOT FOR
CONSTRUCTION

| Revision | | |
|---|---|---|
| No. | Date | Description |
| | | |

COVER SHEET

C000

45550.02
1/2/2024

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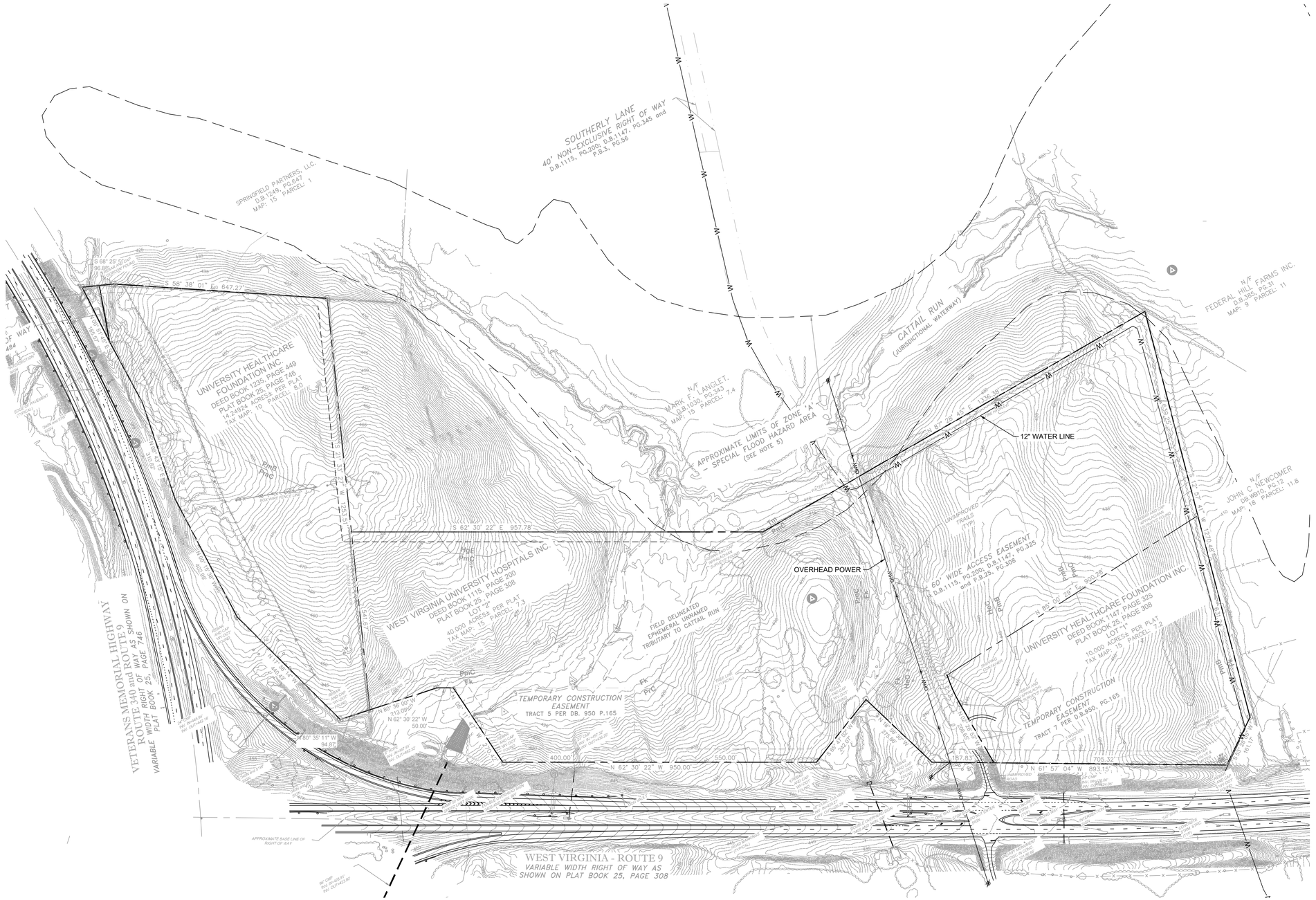
Checked By: RW
Approved By: RW





Gresham Smith

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Suite 1950
Charlotte, NC 28244
704.944.7970

Firm Certification
Nos. 51100 / C-416 / C-2056

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WVU Medicine

# BLUE RIDGE CROSSING - MEDICAL OFFICE BUILDING

## WVU MEDICINE

CHARLES TOWN, WEST VIRGINIA

PRELIMINARY NOT FOR CONSTRUCTION

| Revision | | |
|---|---|---|
| No. | Date | Description |
| | | |

EXISTING CONDITIONS

**C100**

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1/2/2024

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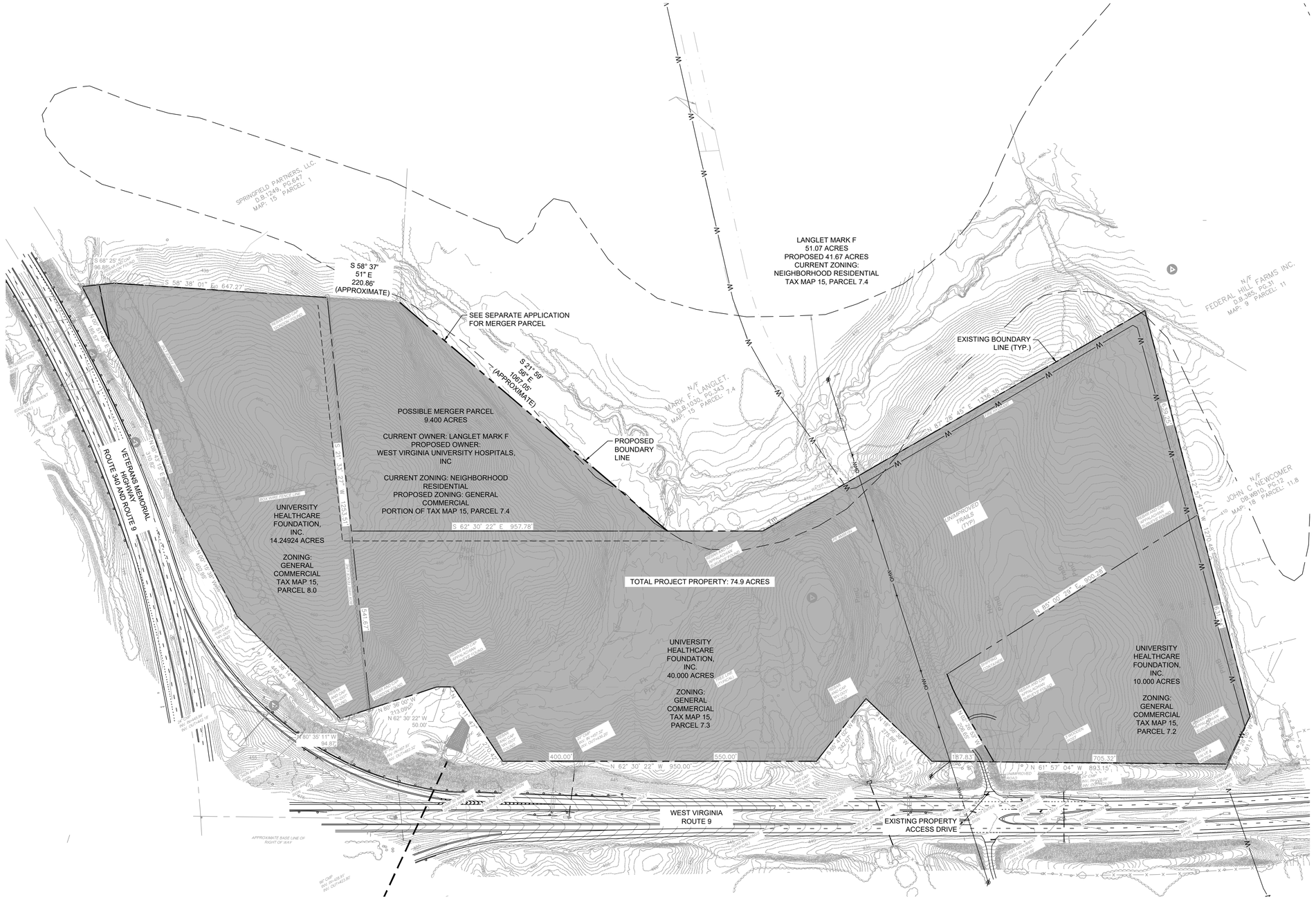
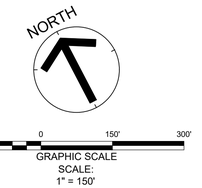
Drawn By: KL
Checked By: RW
Approved By: RW




150' 0 150' 300'
GRAPHIC SCALE
SCALE:
1" = 150'

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WVU Medicine

# BLUE RIDGE CROSSING - MEDICAL OFFICE BUILDING

## WVU MEDICINE

CHARLES TOWN, WEST VIRGINIA

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Revision

| No. | Date | Description |
|---|---|---|
| | | |

PROPERTY INFORMATION

**C101**

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Drawn By: KL
Checked By: RW
Approved By: RW

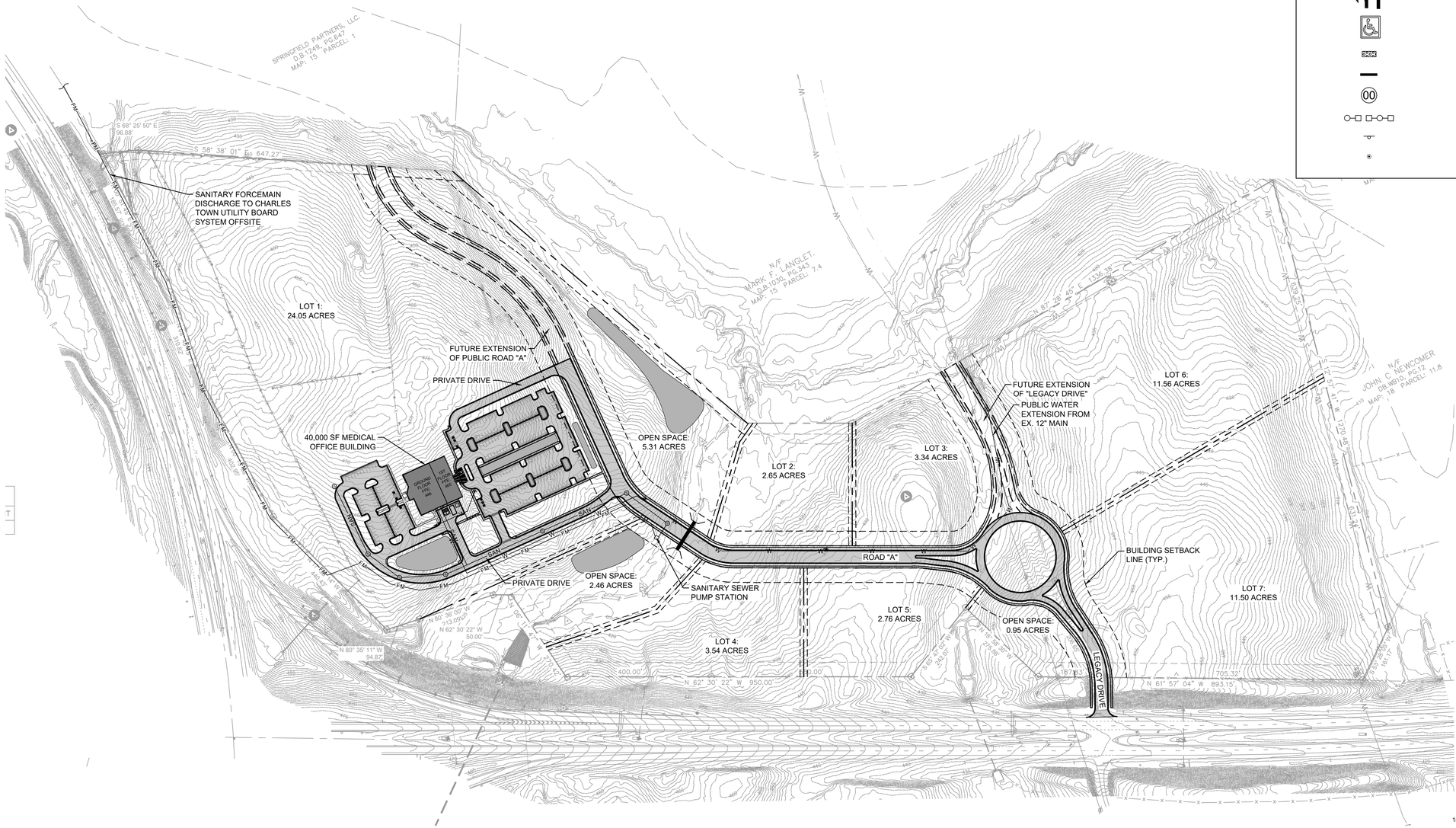
## ZONING CRITERIA FOR GENERAL COMMERCIAL (GC):

PROPOSED USE: MEDICAL OFFICE, ITE CODE: 720 (PERMITTED USE)

MAX. DENSITY: NO REQUIREMENT
MIN. LOT SIZE: NO REQUIREMENT
MIN. SETBACKS:

FRONT YARD: 40 FT
SIDE YARD: 10 FT (25 FT ADJACENT TO RESIDENTIAL)
REAR YARD: 30 FT

MAX. LOT COVERAGE: 90 PERCENT
MIN. REQUIRED OPEN SPACE: NO REQUIREMENT
MAX. BUILDING HEIGHT: 55 FT
MAX. STORIES HEIGHT: 5




## LEGEND

- EXISTING PROPERTY LINE
- PROPOSED LOT LINE
- PROPERTY SETBACK LINE
- BUILDING LINE
- BUILDING CANOPY
- FENCE
- CURB
- CURB & GUTTER
- RETAINING WALL
- LIGHT DUTY CONCRETE PAVEMENT
- HEAVY DUTY CONCRETE PAVEMENT
- LIGHT DUTY ASPHALT PAVEMENT
- HEAVY DUTY ASPHALT PAVEMENT
- GRAVEL
- CONCRETE SIDEWALK
- CROSS-WALK
- TRANSFORMER PAD
- TURN ARROW
- ACCESSIBLE PARKING SPACE SYMBOL
- DETECTABLE WARNING SURFACE
- WHEEL STOP
- PARKING COUNT
- LIGHT POLE
- SIGN
- BOLLARD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BLUE RIDGE CROSSING - MEDICAL OFFICE BUILDING

WVU MEDICINE

CHARLES TOWN, WEST VIRGINIA

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| No. | Date | Description |
|---|---|---|
| | | |

OVERALL SITE PLAN

# C200

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1/2/2024

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Drawn By: KL
Checked By: RW
Approved By: RW

SANITARY FORCEMAIN DISCHARGE TO CHARLES TOWN UTILITY BOARD SYSTEM OFFSITE

FUTURE ROAD EXTENSION TO STONE SPRING SUBDIVISION

BUILDING SETBACK LINE (TYP.)

40'

40'

UPPER PARKING: 201 SPACES

24'

SANITARY MANHOLE STUB FOR FUTURE BUILDOUT

LOWER PARKING: 75 SPACES

ADA PARKING (TYP.)

24'

18'

GROUND FLOOR FFE: 446

1ST FLOOR FFE: 460

STORMWATER

9'

18'

7.5'

5'

36'

7.5'

5'

DUMPSTER

TRANSFORMER

GENERATOR PAD

SCREEN WALL

FIRE HYDRANT (TYP.)

SANITARY SERVICE

WATER SERVICE

STORMWATER (TYP.)

STORMWATER

STORMWATER

GRAVITY SANITARY SEWER (TYP.)

SANITARY MANHOLE (TYP.)

8" WATER LINE (TYP.)

FORCE MAIN (TYP.)

10'

10'

N 80° 36' 00" W
213.09'

N 80° 35' 11" W
94.87'

N 62° 30' 22" W
50.00'

N 06° 11' 47" W

SANITARY PUMP STATION

BOX CULVERT FOR STORMWATER CONVEYANCE

PROPOSED BOUNDARY LINE (TYP.)

EPHEMERAL STREAM TOP OF BANK

30'

50' BUFFER FROM TOP OF BANK

50'

5' CONCRETE SIDEWALK (TYP.)

10'

10'

100-YR FLOODPLAIN

## LEGEND

- EXISTING PROPERTY LINE
- PROPOSED LOT LINE
- PROPERTY SETBACK LINE
- BUILDING LINE
- BUILDING CANOPY
- FENCE
- CURB
- CURB & GUTTER
- RETAINING WALL
- LIGHT DUTY CONCRETE PAVEMENT
- HEAVY DUTY CONCRETE PAVEMENT
- LIGHT DUTY ASPHALT PAVEMENT
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- TRANSFORMER PAD
- TURN ARROW
- ACCESSIBLE PARKING SPACE SYMBOL
- DETECTABLE WARNING SURFACE
- WHEEL STOP
- PARKING COUNT
- LIGHT POLE
- SIGN
- BOLLARD

NORTH

50' 0 50' 100'
GRAPHIC SCALE
SCALE: 1" = 50'


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WVUMedicine

BLUE RIDGE CROSSING - MEDICAL OFFICE BUILDING

WVU MEDICINE
CHARLES TOWN, WEST VIRGINIA

PRELIMINARY NOT FOR CONSTRUCTION

Revision

| No. | Date | Description |
|---|---|---|
| | | |

DETAILED SITE PLAN

# C201

45550.02
1/2/2024

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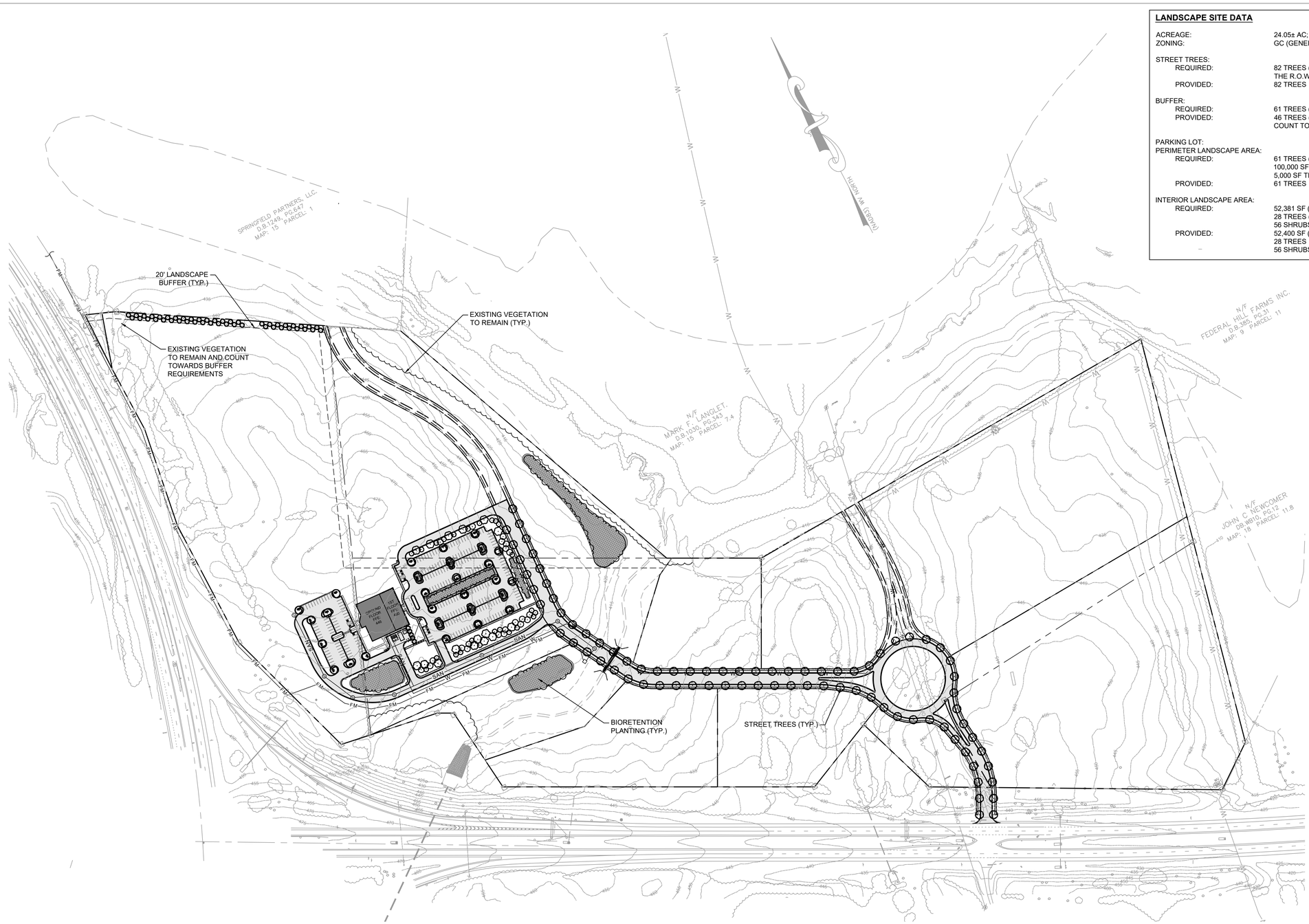
Drawn By: KL
Checked By: RW
Approved By: RW




**LANDSCAPE SITE DATA**

| | |
|---|---|
| ACREAGE: | 24.05± AC; 1,047,618± SF (MOB SITE ONLY) |
| ZONING: | GC (GENERAL COMMERCIAL) |
| STREET TREES: | |
| REQUIRED: | 82 TREES (1 PER 50 LF ON BOTH SIDES OF THE R.O.W.- 2,040± LF) |
| PROVIDED: | 82 TREES |
| BUFFER: | |
| REQUIRED: | 61 TREES (1 PER 12 LF- 730± LF) |
| PROVIDED: | 46 TREES (EXISTING VEGETATION TO COUNT TOWARDS BUFFER REQUIREMENTS) |
| PARKING LOT: | |
| PERIMETER LANDSCAPE AREA: | |
| REQUIRED: | 61 TREES (1 PER 2,000 SF FOR FIRST 100,000 SF OF IMPERVIOUS AREA, 1 PER 5,000 SF THEREAFTER - 155,835± SF) |
| PROVIDED: | 61 TREES |
| INTERIOR LANDSCAPE AREA: | |
| REQUIRED: | 52,381 SF (5% OF TOTAL LOT AREA)<br>28 TREES (1 PER 10 SPACES- 276 SPACES)<br>56 SHRUBS (2 PER 10 SPACES) |
| PROVIDED: | 52,400 SF (5%)<br>28 TREES<br>56 SHRUBS |

NORTH

150' 0 150' 300'
GRAPHIC SCALE
SCALE:
1" = 150'


Gresham Smith

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BLUE RIDGE CROSSING - MEDICAL OFFICE BUILDING

WVU MEDICINE

CHARLES TOWN, WEST VIRGINIA

PRELIMINARY NOT FOR CONSTRUCTION

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|---|---|---|
| No. | Date | Description |
| | | |

OVERALL LANDSCAPE PLAN

# L200

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1/2/2024

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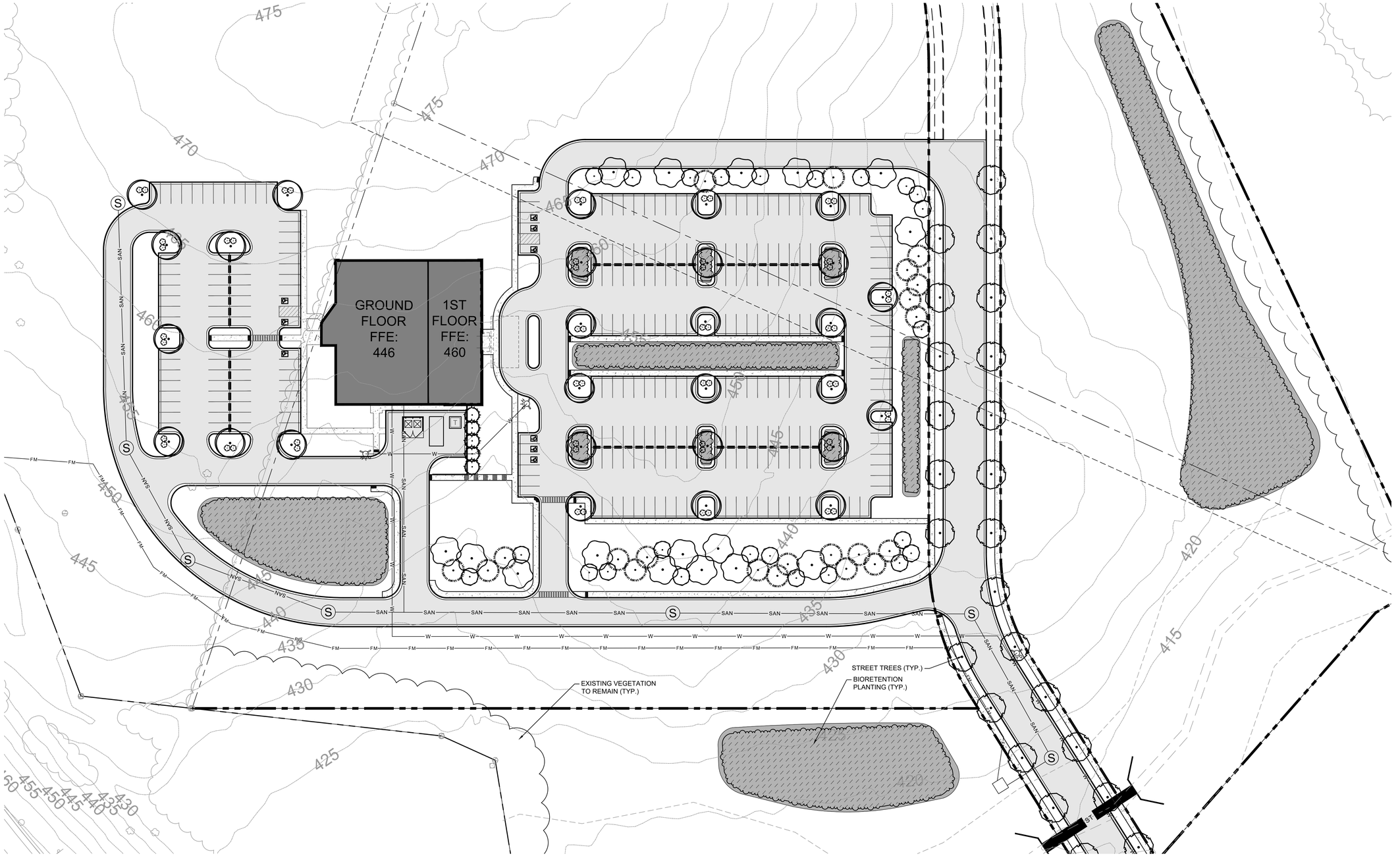
Drawn By: KL
Checked By: RW
Approved By: RW




NORTH

40' 0 40' 80'
GRAPHIC SCALE
SCALE:
1" = 40'


Gresham Smith

201 South College Street
Suite 1950
Charlotte, NC 28244
704.944.7970

Firm Certification
Nos. 51100 / C-416 / C-2056

GreshamSmith.com


WVUMedicine

BLUE RIDGE CROSSING - MEDICAL OFFICE BUILDING

WVU MEDICINE

CHARLES TOWN, WEST VIRGINIA

PRELIMINARY NOT FOR CONSTRUCTION

| Revision | | |
|---|---|---|
| No. | Date | Description |
| | | |

DETAILED LANDSCAPE PLAN

**L201**

45550.02
1/2/2024

12/20/2023 2:55:12 PM \\global.gsp\data\nfch_nf02\45550\02\01Work\01CAD\06LP\Sheets\L200.dwg

Kimley»Horn

# Memorandum

To: Rob Whitson
Gresham Smith
222 2nd Ave S, Suite 1400
Nashville, TN 37201

From: Mark Phillips, P.E.

Through: James Newman
City of Charles Town
101 E Washington Street
Charles Town, WV 25414

Date: January 9, 2024

**Subject: WVU-Blue Ridge Crossing Sketch Plan Review**

This memorandum summarizes our review of the Sketch Plan for the WVU – Blue Ridge Crossing (dated January 2, 2024, prepared by Gresham Smith) for a proposed medical office building. The site contains 4 parcels; three are currently zoned General Commercial and one is zoned as Neighborhood Residential per the City of Charles Town Zoning Ordinance dated June 18, 2012 (Rev. July 6, 2020). This application proposes a by-right development of approximately 74.9 acres of property.

Kimley-Horn's review of this application is limited to the Sketch Plan and Application provided. Based upon our review, we have no comments as this application is generally in conformance with the Sketch Plan requirements per the City of Charles Town Subdivision and Land Development Ordinance dated June 23, 2012 (Rev. July 1, 2019).

Thank you for the opportunity to review this Sketch Plan. Please feel free to contact us at 703-870-3631 should you have any questions.

**KIMLEY-HORN & ASSOCIATES, INC.**

Mark Phillips, P.E.
Project Manager, Associate

**Planning Commission**
101 East Washington Street
Charles Town, WV 25414

**SCHEDULED**

Meeting: 04/22/24
Department: Planning Commission
Category: Report
Initiator:

## AGENDA ITEM (ID # )

### *Commission Review*: BR2024-05 - Huntfield Bond Extension Request

**ATTACHMENTS:**

- 1. Staff Report.pdf
- 2. Application.pdf
- 3. Bond Letter of Credit (United Bank).pdf
- 4. Surety bond.pdf

**Date:** For the April 22, 2024 Planning Commission meeting
**Applicant:** DR Acquisitions, LLC
**Report by:** James Newman, City Planner, Zoning/Subdivision Administrator.
**Proposal:** A bond extension for multiple phases of Huntfield

Bonds

| Surety | NVR MS Cavalier Underwriter | Bond # | Current Amount | Instrument Description / Reference | Renewal Date | Obligee |
|---|---|---|---|---|---|---|
| Lexon | HUB | 1014104 | $357,056.46 | Huntfield - Union Ridge T/H (2A-3) | 5/26/20 | City of Charles Town |
| Platte River | Potomac Underwriters | 41346510 | 63,878.00 | Huntfield - Phase 5A | 5/12/20 | City of Charles Town |
| Lexon | HUB | 1004711 | 257,720.35 | Huntfield - Phase 3A | 4/28/20 | City of Charles Town |
| Lexon | HUB | 1004712 | 30,000.00 | Huntfield - Phase 3A SWM | 4/28/20 | City of Charles Town |
| Lexon | HUB | 1014079 | 873,056.54 | Huntfield - Phase 2B-2 | 10/5/21 | City of Charles Town |
| Lexon | HUB | 1014105 | 606,907.46 | Huntfield - Site Development for Recreation Center | 5/26/20 | City of Charles Town |
| Totals | | | $2,188,618.81 | | | |

**CURRENT BOND:** $2,188,618.81

**OVERVIEW:** *DR Acquisitions LLC* is seeking a bond extensions for multiple phases of development in the Huntfield subdivision:

-Phase 2A-3

-Phases 2B-2

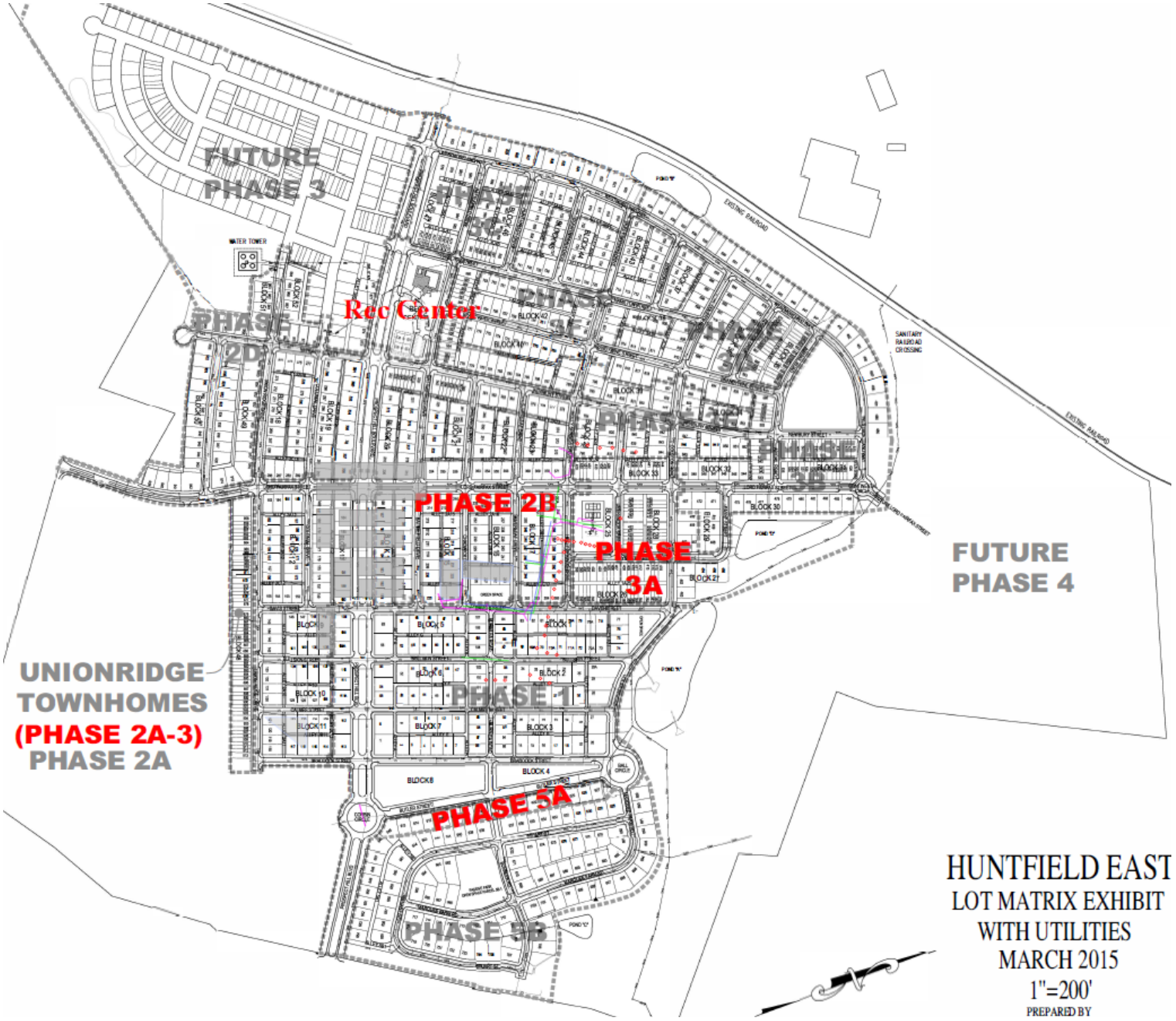
-Phase 3

-Phase 3A Stormwater facilities

-Phase 5A

-Recreation Center

The image on the next page highlights those areas:




**BACKGROUND:** A series of bonds were originally established for these phases in the amount of $2,188,618.81 by a developer "Huntfield L.C.", but were transferred to "NVR MS Cavalier Huntfield LLC" in September 2021. On October 13, 2021, "DR Acquisitions LLC" received a letter of credit from United Bank in the amount of $2,188,618.81.

The expiration date was set for October 21, 2023, with the condition that I would be automatically extended for six months unless the City objected in writing to that extension. The bonds had a final expiration date of April 13, 2024 and rather than have the City pull the bonds, the applicant is seeking an extension while they work on the various phases.

The applicant is seeking a 2-year bond extension.

**EXTENSION CRITERIA**

Section 1335.07.B.2.:

A. Except as provided in this paragraph, no Performance Agreement shall be extended beyond five (5) years from the date of the original Agreement. Thus, if the initial period of completion was 2 years, no more than three (3) extensions, each of one (1) year, shall be granted.

   However, upon recommendation by the Bond Committee, the Planning Commission may, at the request of the owner/Developer submitted prior to the fifth extension, grant extensions beyond the five (5) year limit, provided the Bond Committee determines that such additional extensions are reasonably justified due to the magnitude of the bonded project, the reasonableness of the construction schedule and the diligence of the Developer in carrying out the schedule, a reasonable estimate of the time necessary to satisfy West Virginia Department of Highways public Improvement requirements, and such other factors as may be deemed relevant by the Bond Committee.

B. The owner/Developer can make a formal request to the Planning Commission for an extension of the completion date for a maximum period of one (1) year. The owner/Developer must indicate the reasons and conditions which have prevented completion of the required Improvements. The owner/Developer shall furnish to the Planning Commission an Extension Agreement, the surety's written consent to the extension and an extension of the surety or security.

**APPLICANT NARRATIVE**

"Seeking a two-year extension because this covers several phases within Huntfield."

**BOND COMMITTEE**

The Bond Committee was unable to meet due to lack of personnel.

**STAFF RECOMMENDATION**: Approval of the bond extension until April 22, 2025.

**Bond Request No.**_____

# BOND REQUEST AND REDUCTION

**To assist the Subdivision Administrator in the review of a Bond Request Application, the Applicant must utilize this form to supply the City with the information prescribed under Article 1335 and Section 1332 of the Subdivision and Land Development Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as the Applicant's Bond Request Application as required by Ordinance Article 1335.**

1. DATE April 12, 2024

2. APPLICATION TYPE ☐ Bond | Initiation ☐ Bond | Reduction ☐ Bond | Reallocation ☐ Bond | Release** Bond - extension

3. PROJECT NAME Huntfield

Address Charles Town, WV

4. APPLICANT'S NAME* DR Acquisitions, LLC

Address 7945 Wormans Mill Rd. Frederick MD 2170

Telephone Number 304) 433.1718 Fax Number ( )

Email Address awolf@dmrdev.com

5. PROPERTY OWNER'S NAME DR Acquisitions, LLC

Address 7945 Wormans Mill Rd. Frederick MD 21701

Telephone Number 304) 433.1718 Fax Number ( )

Email Address awolf@dmrdev.com

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

**Requires a Public Hearing and landscaping surety for one year after release

**Bond Request No.**_____

6. DESCRIPTION OF REQUETED INITIATION, REDUCTION, OR RELEASE:

Current bond reaches maturity on April 13, 2024. Seeking a two (2) year extension because this covers several Tranches within Huntfield.

7. A) CURRENT BOND AMOUNT $2,188,618.81

B) PROPOSED BOND AMOUNT $2,188,618.81

8. PARCEL INVENTORY: (List all parcels that are part of this application):

| Tax Map No. | Parcel No. | Deed Book | Page No. | Zoning District |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

9. PARCEL HISTORY: (List all pending or previously approved applications on the subject parcels inventoried above, including previous plat applications if this application is an amendment)

| Application No. | Project Name and Phase | Status | Approval Date |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Bond Request No.**_____

10. BOND RELEASE ATTACHMENTS.

The following shall be included with this request:

A. To the extent not previously submitted pursuant to bond reduction request, copies of inspection and test reports if work was inspected and tested by a third-party inspector.

B. Certification that all bonded Improvements, other than Improvements accepted by West Virginia Department of Highways (WVDOH), have been completed in accordance with the approved plans, profiles, and specifications and the requirements of any applicable manual. For Improvements to be accepted for maintenance by WVDOH, such Certification shall state that the Improvements have been installed and inspected in accordance with WVDOH's requirements.

C. A copy of the City-approved As-Built Drawings as required for facilities within public rights-of-way or Easements submitted pursuant to Section 1332.10 of this Ordinance.

Date of As-Builts _____ Prepared By _____

D. A letter from a Professional Engineer or Professional Land Surveyor certifying that property corners and Monuments have been set as required under this Ordinance.

E. Documentation of acceptance by WVDOH for public roadways and rights-of-way, or a maintenance and indemnification agreement and bond approved by the Planning Commission for public roadways that have been completed in accordance with WVDOH standards but which, due to factors other than their quality of construction, are not eligible for acceptance by WVDOH.

F. For private roadways, a letter of acceptance by the entity responsible for maintenance and a Latent Defects Indemnification Agreement and Bond in accordance with this Section.

G. Private Roadway Maintenance Bonds. Before a Performance Agreement and surety for private roadway construction shall be released, a Latent Defects Indemnification Agreement and Bond shall be provided by the applicant/Developer and approved by the Planning Commission. The guarantee provided by such Agreement and Bond must be for a period of two (2) years following the date of performance bond release, and must be in an amount equal to no less than 5% of the original performance bond estimate in accordance with Section 1335.07 (F) of the Subdivision Ordinance.

H. Landscaping Surety. Surety is required to ensure the landscaping shown on the Major S/LD plans is maintained for one (1) year. The one (1) year shall start from the date at which the surety for the site has been released, with the exception of this landscaping surety. The landscaping surety amount shall not be less than $5,000.00 or 10% of the total landscaping cost for the project, which every is greater.

**Bond Request No.**_____

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Article 1335 of the S/LD Ordinance.

Signature of Applicant _____ Date 4/12/24

Signature of Property Owner (If different than Applicant) _____ Date 4/12/24

Please submit an original completed Application, 1 digital copy and 1 paper copy of the As-Built Plans (if applicable) to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

Please also send a copy of the completed Application as well as the As-Builts to the following:

Hatch/Chester Engineers
Attn: Elizabeth Adamowicz
705 Quince Orchard Road, Suite 310
Gaithersburg, MD 20878

***FOR CITY USE ONLY***

Application Number:_____ Date Application Received:_____

Fee: $_____ Check No._____

Receipt No._____

Site Inspection Date:_____ Inspector:_____

Subdivision Administrator Approval:_____ Date:_____

Engineer Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

City Council Approval:_____ Date:_____

Comments:_____

_____

_____

_____

_____

UNITED BANK

@ your service™

City of Charles Town
101 East Washington Street
P.O. Box 14
Charles Town, WV 25414

**RE: Irrevocable Letter- of- Credit# 4832911-63**
**AMOUNT: $2,188,618.81**

**Projects:** **Union Ridge Townhomes - 2A-3 (Lots 858-882, 884-891, 893-908, 910-913)**
**Huntfield Phase 5A (Lots 613-627)**
**Huntfield Phase 3A (Lots 379-467)**
**Huntfield Phase 3A Storm Water Management Basin**
**Phase 2B-2 (Lots 278-378, 277A, 311A, 347A, 366A)**
**Recreation Center Sitework**

Dear City of Charles Town Council:

By this letter, United Bank, hereby establishes Irrevocable Letter-of-Credit, No. **4832911-63**, and authorizes you to draw on us for the account of DR ACQUISITIONS, LLC up to an aggregate amount of **TWO MILLION ONE HUNDRED EIGHTY-EIGHT THOUSAND SIX HUNDRED EIGHTEEN AND 81/100 U.S. DOLLARS ($2,188,618.81),** subject to the terms and conditions stated herein.

Draws under this Letter-of-Credit are available by your draft presented to our Bank at 14048 Parkeast Circle, Suite 100, Chantilly, Virginia 20151, on or before its expiration on October 13, 2023, and accompanied by the following documents:

1. A certification executed and signed by a duly authorized member of the City Council of City of Charles Town, West Virginia, that DR ACQUISITIONS, LLC has failed to perform its obligation under, and according to, the terms of those certain Performance Bond Agreements, attached hereto and made a part hereof; and

2. The original Letter-of- Credit.

We hereby agree that drafts under and in compliance with the terms of this Letter-of-Credit will be duly honored if presented as aforesaid on or before its expiration on October 13, 2023. However, it is a condition of this Letter of Credit that it will be automatically extended for a single period of six (6) months unless thirty (30) days prior to an expiration date we notify City Council of City of Charles Town, West Virginia, in writing by registered mail, that we elect not to renew this Letter of Credit for such additional period. This Letter-of-Credit shall reach its final expiration date on April 13, 2024.

Except as otherwise stated herein, this credit is subject to the Uniform Commercial Code and shall be construed under the laws of the State of West Virginia. Any draft upon this Letter-of-Credit shall be marked "Drawn under United Bank Letter-of-Credit" for DR ACQUISITIONS, LLC dated October 13, 2021.

Very Truly Yours,

UNITED BANK

Devin McCreery
Market President

Date: October 13, 2021

# City of Charles Town

101 East Washington Street, P.O. Box 14, Charles Town, WV 25414
Phone: (304) 725-2311 ♦ Web: www.charlestownwv.us



**MAYOR**
*Robert M. Trainor*

**CITY COUNCIL**
*James Kratovil*
*Elizabeth Ricketts*
*Jeff Hynes*
*Kevin Tester*
*Jean Petti*
*Julie Philabaum*
*Micheal George*
*Rikki Twyford*

**City Manager**
*Daryl Hennessy*


October 13, 2021

Greg McGowan
Jack Carney
NVR MS Cavalier Huntfield, LLC
11700 Plaza America Drive, #310
Reston, VA 20190

Re: Huntfield – Substitute Bonds / Collateral Posted by DR Acquisitions LLC.

Dear Mr. McGowan and Mr. Carney:

This letter shall serve to confirm the City has accepted collateral posted by DR Acquisitions LLC (successor developer of Huntfield) that is deemed both sufficient and appropriate to replace all bonds outstanding from NVR MS Cavalier Huntfield LLC. We affirm the individual release letters dated September 15, 2021 (attached for reference) and that all bonds issued by NVR MS Cavalier Huntfield LLC for the Huntfield project are released and all responsibilities of NVR/MS Cavalier Huntfield are fully discharged and/or released. Below is a summary of the outstanding amount of these bonds:

| Bond | Surety | Instrument Description | Current Amount |
|---|---|---|---|
| 1014104 | Lexon | Union Ridge town homes - 2A-3 | 357,056.46 |
| 41346510 | Platte River | Huntfield Phase 5A (Replaces B10009262) | 63,878.00 |
| 1004711 | Lexon | Huntfield Phase 3A | 257,720.35 |
| 1014712 | Lexon | Huntfield Phase 3A Storm Water Mgmt. Basin | 30,000.00 |
| 1014079 | Lexon | Phase 2B-2 | 873,056.54 |
| 1014105 | Lexon | Rec. Center (development to serve rec. center) | 606,907.46 |
| Total | | | 2,188,618.81 |

The City will subsequently release and / or return the actual hard copies of these bonds it has in its files. If you have any questions regarding this letter, please do not hesitate to ask. I can be reached by email at citymanager@charlestownwv.us or by phone at 304-724-3244.

Regards,

Daryl Hennessy
City Manager

Attachments

cc: Matt Powell, DRB Group
Rashedul Deepon, Charles Town City Planner

# City of Charles Town

Department of Community Development
Division of Planning and Zoning

101 East Washington Street, P.O. Box 14, Charles Town, WV 25414
Phone: (304) 724-3248 ♦ Fax: (304) 725-1014 ♦ Web: www.charlestownwv.us


September 15, 2021

Lenox Insurance Company
12890 Lebanon Road
Mt. Juliet, TN 37122

Re: Huntfield Phase 2A-3 Site Development Improvements
Plan Name: Union Ridge Townhomes
Surety Bond Number 1014104

Gentlemen:

Your company issued the above referenced Performance Bond on behalf of Huntfield, L.C. as Principal, such Principal being subsequently changed to NVR MS Cavalier Huntfield, LLC, in the initial amount of $530,989.00 and subsequently reduced to $357,056.46, to insure completion of work under the above-referenced Plan Name.

This is to advise you that this Office has now received other bond securities to cover the work under the above-referenced Plan Name. You may, therefore, consider all obligations and responsibilities under the subject Performance Bond, Surety Bond Number 1014104 in association with the work described therein, fulfilled and hereby released.

Should you have any questions concerning this matter, please contact me at 304-724-3251 or by email at rdeepon@charlestownwv.us.

Respectfully,

Rashedul H. Deepon
Rashedul Hasan Deepon
City Planner I

# City of Charles Town

Department of Community Development
Division of Planning and Zoning

101 East Washington Street, P.O. Box 14, Charles Town, WV 25414
Phone: (304) 724-3248 ♦ Fax: (304) 725-1014 ♦ Web: www.charlestownwv.us


September 15, 2021

Platte River Insurance Company
115 Glastonbury Blvd. Suite 5
Glastonbury, CT 06033

Re: Huntfield 5A Site Development Improvements
Plan Name: 5A
Surety Bond Number 41346510

Gentlemen:

Your company issued the above referenced Performance Bond on behalf of NVR MS Cavalier Huntfield, LLC as Principal in the amount of $63,878.00 which is the current outstanding amount to insure completion of work under the above-referenced Plan Name. This bond was a replacement bond for a prior insurance company. The original bond under this plan (as Huntfield L.C.) was for $597,188.00 and was subsequently reduced to $63,878.00.

This is to advise you that this Office has now received other bond securities to cover the work under the above-referenced Plan Name. You may, therefore, consider all obligations and responsibilities under the subject Performance Bond, Surety Bond Number 41346510 in association with the work described therein, fulfilled and hereby released.

Should you have any questions concerning this matter, please contact me at 304-724-3251 or by email at rdeepon@charlestownwv.us.

Respectfully,

Rashedul H. Deepon

Rashedul Hasan Deepon
City Planner I

# City of Charles Town

Department of Community Development
Division of Planning and Zoning

101 East Washington Street, P.O. Box 14, Charles Town, WV 25414
Phone: (304) 724-3248 ♦ Fax: (304) 725-1014 ♦ Web: www.charlestownwv.us


September 15, 2021

Lenox Insurance Company
12890 Lebanon Road
Mt. Juliet, TN 37122

Re: Huntfield Phase 3A Site Development Improvements
Plan Name: Phase 3A
Surety Bond Number 1004711

Gentlemen:

Your company issued the above referenced Performance Bond on behalf of Huntfield, L.C. as Principal, such Principal being subsequently changed to NVR MS Cavalier Huntfield, LLC, in the initial amount of $1,280,908.00 and subsequently reduced to $257,720.35, to insure completion of work under the above-referenced Plan Name.

This is to advise you that this Office has now received other bond securities to cover the work under the above-referenced Plan Name. You may, therefore, consider all obligations and responsibilities under the subject Performance Bond, Surety Bond Number 1004711 in association with the work described therein, fulfilled and hereby released.

Should you have any questions concerning this matter, please contact me at 304-724-3251 or by email at rdeepon@charlestownwv.us.

Respectfully,

Rashedul H. Deepon
Rashedul Hasan Deepon
City Planner I

# City of Charles Town

Department of Community Development
Division of Planning and Zoning

101 East Washington Street, P.O. Box 14, Charles Town, WV 25414
Phone: (304) 724-3248 ♦ Fax: (304) 725-1014 ♦ Web: www.charlestownwv.us


September 15, 2021

Lenox Insurance Company
12890 Lebanon Road
Mt. Juliet, TN 37122

Re: Huntfield Phase 3A Site Development Improvements
Plan Name: Phase 3A Storm Water Management Basin
Surety Bond Number 1004712

Gentlemen:

Your company issued the above referenced Performance Bond on behalf of Huntfield, L.C. as Principal, such Principal being subsequently changed to NVR MS Cavalier Huntfield, LLC, in the initial amount of $250,000.00 and subsequently reduced to $30,000.00, to insure completion of work under the above-referenced Plan Name.

This is to advise you that this Office has now received other bond securities to cover the work under the above-referenced Plan Name. You may, therefore, consider all obligations and responsibilities under the subject Performance Bond, Surety Bond Number 1004712 in association with the work described therein, fulfilled and hereby released.

Should you have any questions concerning this matter, please contact me at 304-724-3251 or by email at rdeepon@charlestownwv.us.

Respectfully,

Rashedul H. Deepon

Rashedul Hasan Deepon
City Planner I

# City of Charles Town

Department of Community Development
Division of Planning and Zoning

101 East Washington Street, P.O. Box 14, Charles Town, WV 25414
Phone: (304) 724-3248 ♦ Fax: (304) 725-1014 ♦ Web: www.charlestownwv.us


September 15, 2021

Lenox Insurance Company
12890 Lebanon Road
Mt. Juliet, TN 37122

Lenox Insurance Company
12890 Lebanon Road
Mt. Juliet, TN 37122

Re: Huntfield Phase 2B-2 Site Development Improvements
Plan Name: Phase 2B-2
Surety Bond Number 1014079

Gentlemen:

Your company issued the above referenced Performance Bond on behalf of Huntfield, L.C. as Principal, such Principal being subsequently changed to NVR MS Cavalier Huntfield, LLC, in the initial amount of $2,285,734.00 and subsequently reduced to $873,056.54, to insure completion of work under the above-referenced Plan Name.

This is to advise you that this Office has now received other bond securities to cover the work under the above-referenced Plan Name. You may, therefore, consider all obligations and responsibilities under the subject Performance Bond, Surety Bond Number 1014079 in association with the work described therein, fulfilled and hereby released.

Should you have any questions concerning this matter, please contact me at 304-724-3251 or by email at rdeepon@charlestownwv.us.

Respectfully,

Rashedul H. Deepon

Rashedul Hasan Deepon
City Planner I

# City of Charles Town

Department of Community Development
Division of Planning and Zoning

101 East Washington Street, P.O. Box 14, Charles Town, WV 25414
Phone: (304) 724-3248 ♦ Fax: (304) 725-1014 ♦ Web: www.charlestownwv.us


September 15, 2021

Lenox Insurance Company
12890 Lebanon Road
Mt. Juliet, TN 37122

Re: Huntfield Site Development Improvements for Future Recreation Center
Plan Name: Recreation Center
Surety Bond Number 1014105

Gentlemen:

Your company issued the above referenced Performance Bond on behalf of Huntfield, L.C. as Principal, such Principal being subsequently changed to NVR MS Cavalier Huntfield, LLC, in the initial amount of $1,217,148.00 and subsequently reduced to $606,907.46, to insure completion of work under the above-referenced Plan Name.

This is to advise you that this Office has now received other bond securities to cover the work under the above-referenced Plan Name. You may, therefore, consider all obligations and responsibilities under the subject Performance Bond, Surety Bond Number 1014105 in association with the work described therein, fulfilled and hereby released.

Should you have any questions concerning this matter, please contact me at 304-724-3251 or by email at rdeepon@charlestownwv.us.

Respectfully,

Rashedul H. Deepon

Rashedul Hasan Deepon
City Planner I

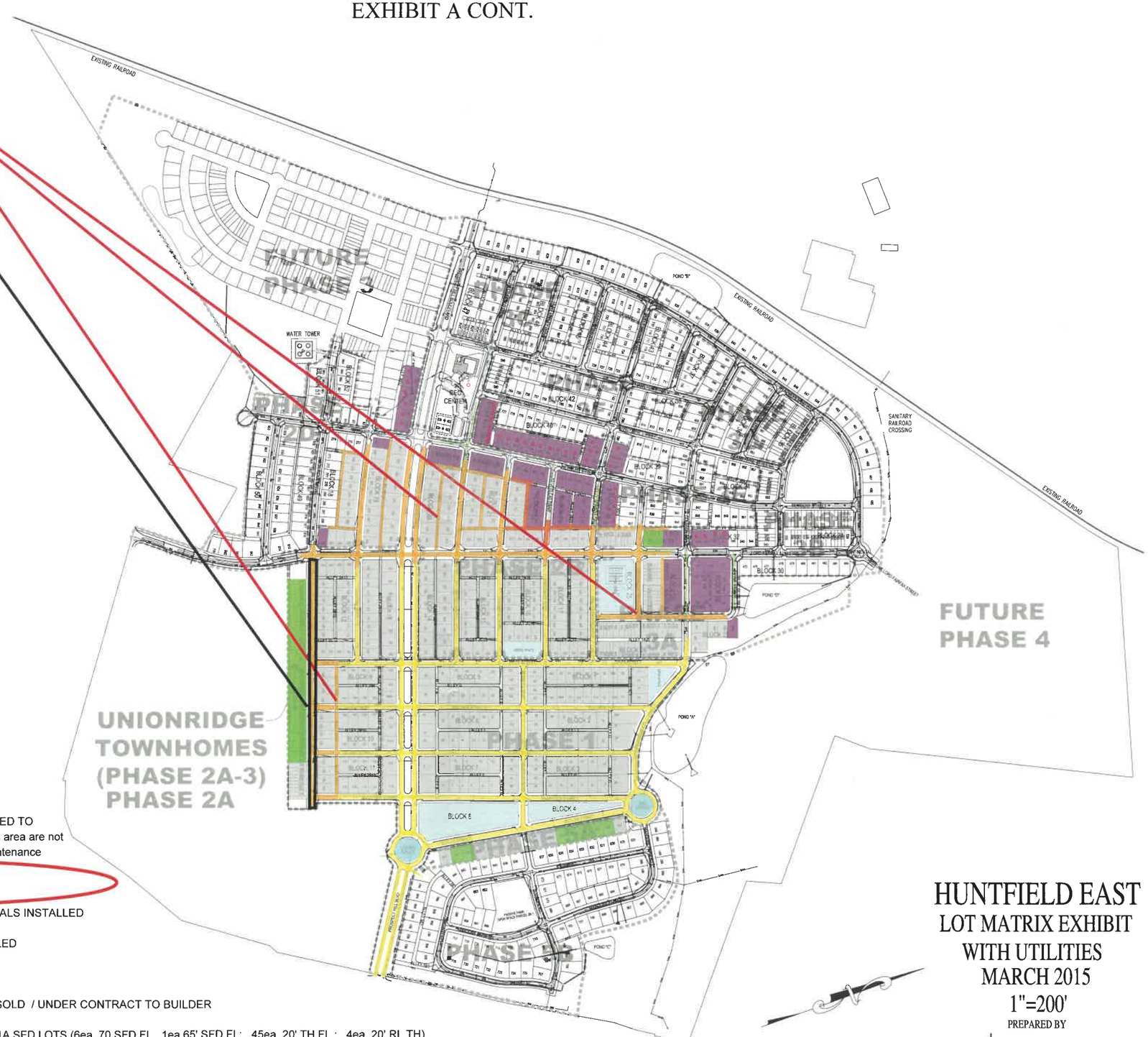
# EXHIBIT A CONT.

DRA Site Walk

Future bond reduction will apply to:

- Phases 2A, 2B, and 3A - surface paving & line striping will be completed.

- Phase 2A-3 surface paving will NOT yet be completed (outlined in black).




LEGEND

STREETS FINAL PAVED AND CONVEYED TO CITY OF CHARLES TOWN *alleys in this area are not shaded, final paved and under HOA maintenance

STREETS AND ALLEYS BASE PAVED

SANITARY SEWER MAINS AND LATERALS INSTALLED

WATER MAIN AND SERVICES INSTALLED

STORM DRAIN INSTALLED

GRAY SHADED LOTS = SETTLED OR SOLD / UNDER CONTRACT TO BUILDER

GREEN SHADED LOTS = REMAINING 1A SFD LOTS (6ea. 70 SFD FL, 1ea 65' SFD FL; 45ea. 20' TH FL ; 4ea. 20' RL TH)

PURPLE SHADED LOTS = 1B LOTS (11 SFD FL of which 4ea 70' lots rest are 75' ; 52 SFD RL 50' lots; 42 TH RL 20' lots)

Denotes "NOT RECORDED"

Common Areas Conveyed to the HOA

# HUNTFIELD EAST
## LOT MATRIX EXHIBIT
## WITH UTILITIES
## MARCH 2015
## 1"=200'

PREPARED BY

urban
Planners Engineers Landscape Architects Land Surveyors