NJ WIND PORT SITEWIDE PARCELS B1, B2, C2 & D

STORMWATER MANAGEMENT REPORT

PREPARED FOR:

New Jersey Economic Development Authority

New Jersey Economic Development Authority (NJEDA)
36 West State Street
Trenton, New Jersey 08625

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Section 1 - Introduction and Project Description

The offshore wind (OSW) industry in the northeast of the United States (US) is a relatively new industry that is poised for significant growth and development. Multiple states have passed legislation mandating offshore wind power to be included in their energy portfolio. As a result, several power purchasing agreements (PPAs) have been awarded to various offshore wind developers. These new offshore wind farms will be commercial scale (over 300 MW). Additional northeastern states are in process to solicit and award additional PPAs. Due to the awarded power purchases and the pipeline of soon to be awarded work, significant infrastructure retrofits/enhancements will be required to prepare the region to support the offshore wind farm supply chain.

Offshore wind components are extremely large and require port facilities with significant laydown areas and high loading capacities. Due to the size and weight of the components, they are typically transported over water rather than overland. Currently, there are no manufacturing facilities in the northeast US capable of producing the required components; therefore, initially they will be imported from overseas manufacturers.

The New Jersey Economic Development Authority (NJEDA) is in the process of developing a marine terminal on land owned by Public Service Enterprise Group (PSEG) located directly to the north of the existing Hope Creek Nuclear Generating Station in Lower Alloways Creek, New Jersey. This development, the New Jersey Wind Port (NJWP), is being designed and constructed to serve as a wind turbine generation (WTG) port facility to service the offshore wind industry. WTG port facilities typically serve to import, stage, preassemble and loadout large components for the commercial-scale wind installation sites. These components consist of tower sections, nacelles, and blades. Other components such as transition pieces and monopiles may also be moved through these types of facilities. The marine facilities for this project are referred to as Site A, which is the subject of a separate report.

The NJWP will serve as an import, storage, pre-assembly and loadout facility for wind towers, nacelles, and blades to service the offshore wind market. The marshalling port to be located at Site A will have the potential to import and loadout the new GE Haliade-X 12 MW turbines as well as the associated towers and blades.

This report will address the remaining proposed development of the full sitewide NJWP that has not been addressed in a prior stormwater report. The remaining sitewide development encompasses the following areas: Site B1, Site B2, Site C2, Site D, and Site E. This report will not address the Site E development because that parcel is being proposed for use as a confined disposal facility (CDF) where the land use change does not meet the description of a major development for stormwater management purposes. The Site B1 facility is proposed for development as a second marshalling port with another installation berth and delivery berth along the riverfront and the uplands will be developed as laydown yard. Site B2 area will be developed as a blade manufacturing facility and additional laydown area with the extension of the delivery berth from B1 extending to the northern property line. Site C2 is proposed for development as a nacelle assembly parcel expanded from Site C1. Site D will be developed as an administrative parcel with an office building, employee parking lot, and a maintenance yard.

The proposed uses of the Site B1, B2 and C2 areas as a secondary marshalling port, blade manufacturing facility, and a nacelle assembly plant with additional laydown areas necessitate that the sites be capable of handling heavy surface loadings from self-propelled modular transporters (SPMTs) and OSW components.

The overarching goal of the storm drain collection system proposed for the sitewide permit is to manage and treat the storm runoff from motor vehicle surfaces close to the area where it accumulates. This goal is achieved through the proper grading of the site to limit the size of proposed drainage basins and the use of manufactured treatment devices (MTDs) installed locally in the proposed drainage basins on site. The treated stormwater and stormwater overflows will be conveyed through underground reinforced concrete pipes to either underground storage vaults for infiltration or discharged. The stormwater from the western half of Sites B1 and B2 will be discharged directly to the Delaware River and the stormwater from the eastern half of the sites will be discharged to the adjacent tidal wetlands. The stormwater from Site C2 will be discharged to the adjacent tidal wetlands, and the stormwater from Site D will be discharged to the existing stormwater collection system to the northwest developed and constructed in Site G.

High mast lighting will be installed along the sites' perimeters. Power for lighting the nacelle laydown area and required building power will be supplied from the substation being provided for the development under a separate scope of work. Underground conduit and duct bank will be installed to create the power distribution network for the site. Infrastructure (e.g. empty conduit) only for telecommunication systems will also be installed.

Fire hydrants will be placed at the base of light poles for ease in locating and to minimize site obstructions. Water supply to the site, both potable and fire water, will be provided by a proposed well field within the heavy haul road parcel that is pumped from the wells to an elevated storage tank sited adjacent to the wells. The water distribution network will extend from the storage tank throughout each parcel with individualized loops and pressurized by gravity. The sanitary sewer collection network is proposed as a series of gravity manholes to collect the building discharges and then localized parcel lift stations to pump the sewage through the proposed force main to the existing PSEG treatment plant. A modular expansion of the existing PSEG treatment plant is in the planning stages between PSEG and NJEDA to accommodate the additional sewage loading. It is currently planned that temporary restroom facilities with pump-out shall be utilized on the marshalling ports, Sites B1 and A, and are assumed to be provided by the end user of the facility.

The finished surface of the laydown areas and the heavy haul road will be compacted dense graded aggregate base through B1, B2, and C2. The aggregate will be imported from an offsite source. The site access POV roadway through B1, B2, and C2 will have a dense graded aggregate surface. The building loading docks on C2 will be concrete base. The Site D development will utilize a finished asphalt surface for the perimeter access road and the parking lot with the maintenance yard finished with dense graded aggregate base.

This Stormwater Management Report and permit package covers all of Site B1 and B2, Site C2, and Site D. The NJWP site location is shown in Figure 1-1 below. The limits of the Sites B1, B2, C2, D and CDF E are shown below in Figure 1-2 and described in more detail in Section 1.1.

1.1. Site Location and Project Overview

1.1.1. Existing Site Land Uses

This site is located directly adjacent to the existing Hope Creek Nuclear Generating Station in Lower Alloways Creek Township, in Salem County, New Jersey. Site B1 is bounded to the north by Site B2, to the east by the NJDEP tidal wetlands delineation line, to the south by Site A, and to the west by the Delaware River. Site B2 is bounded to the north and east by the NJDEP tidal wetlands delineation line, to the south by Site B1, and to the west by the Delaware River. Site C2 is bounded by the Site C1 development to the west, the NJDEP tidal wetlands delineation line to the north and east, and the proposed heavy haul road of Site G to the south. Site D is bounded to the north and west by the high voltage electric transmission lines easement, to the east by undeveloped PSEG land vegetated with phragmites, and to the south by the primary access Material Center Road. Finally, Site E is bounded by the Material Center Road to the north and east, by the southern access road to the south, and by the Salem Generating Station to the west. Refer to Figure 1-1 below for the overall location map and Figure 1-2 for the aerial site photo with parcel labels.

Sites B1 and B2 are currently being utilized as confined disposal facilities (CDF) for the US Army Corps of Engineers to deposit dredge material recovered from the Delaware River. Site E is currently unoccupied land overgrown by phragmites through the eastern half and cleared unoccupied land used for deposition of concrete debris removed from excavation in Site A. Site D is located just southeast of the existing high voltage electrical transmission lines and is currently unoccupied PSEG land overgrown by phragmites. The current land use at Site C2 is dedicated to the existing PSEG security force target ranges and the nuclear dredging CDF.

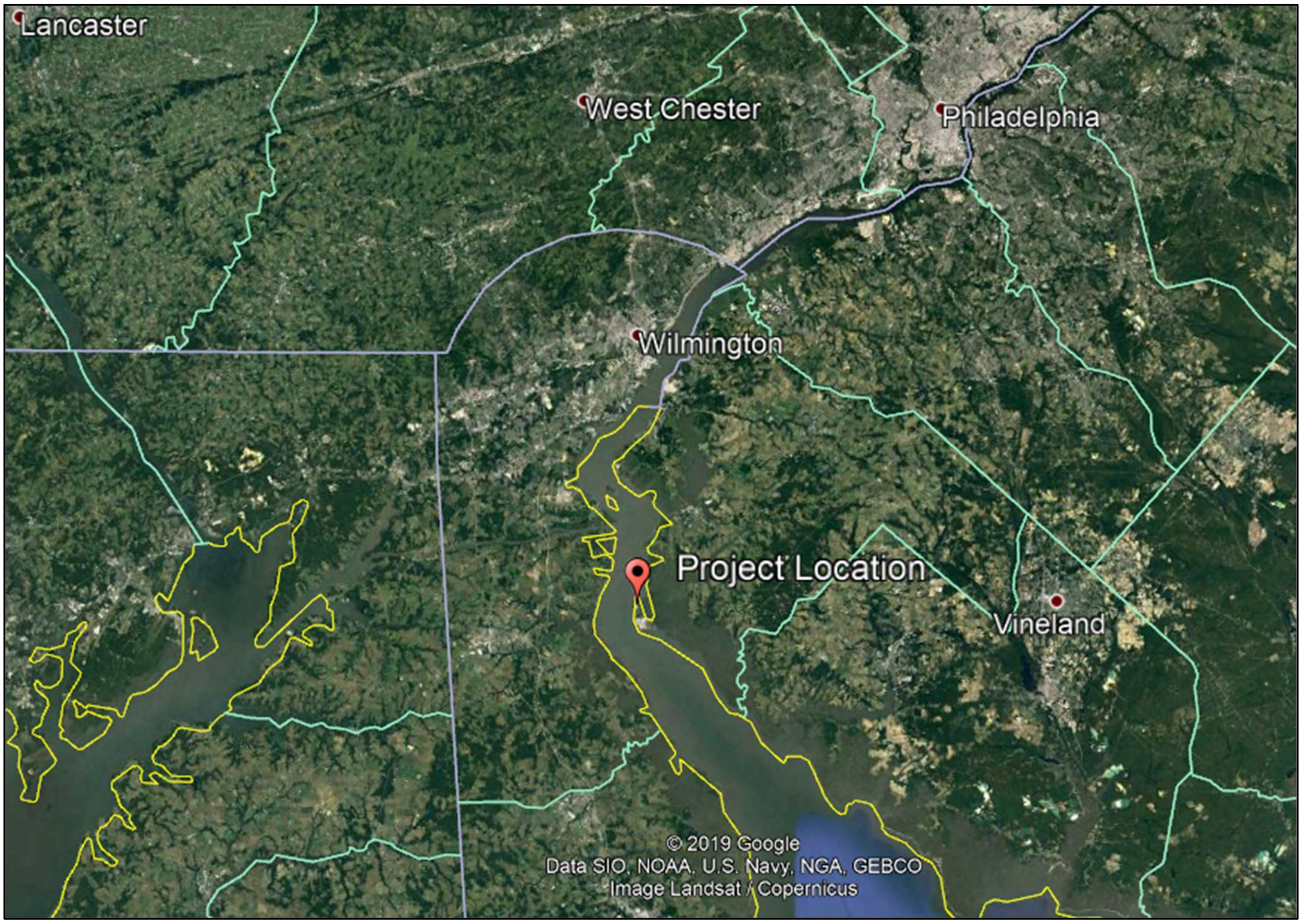


Figure 1-1 - Overall Location Map

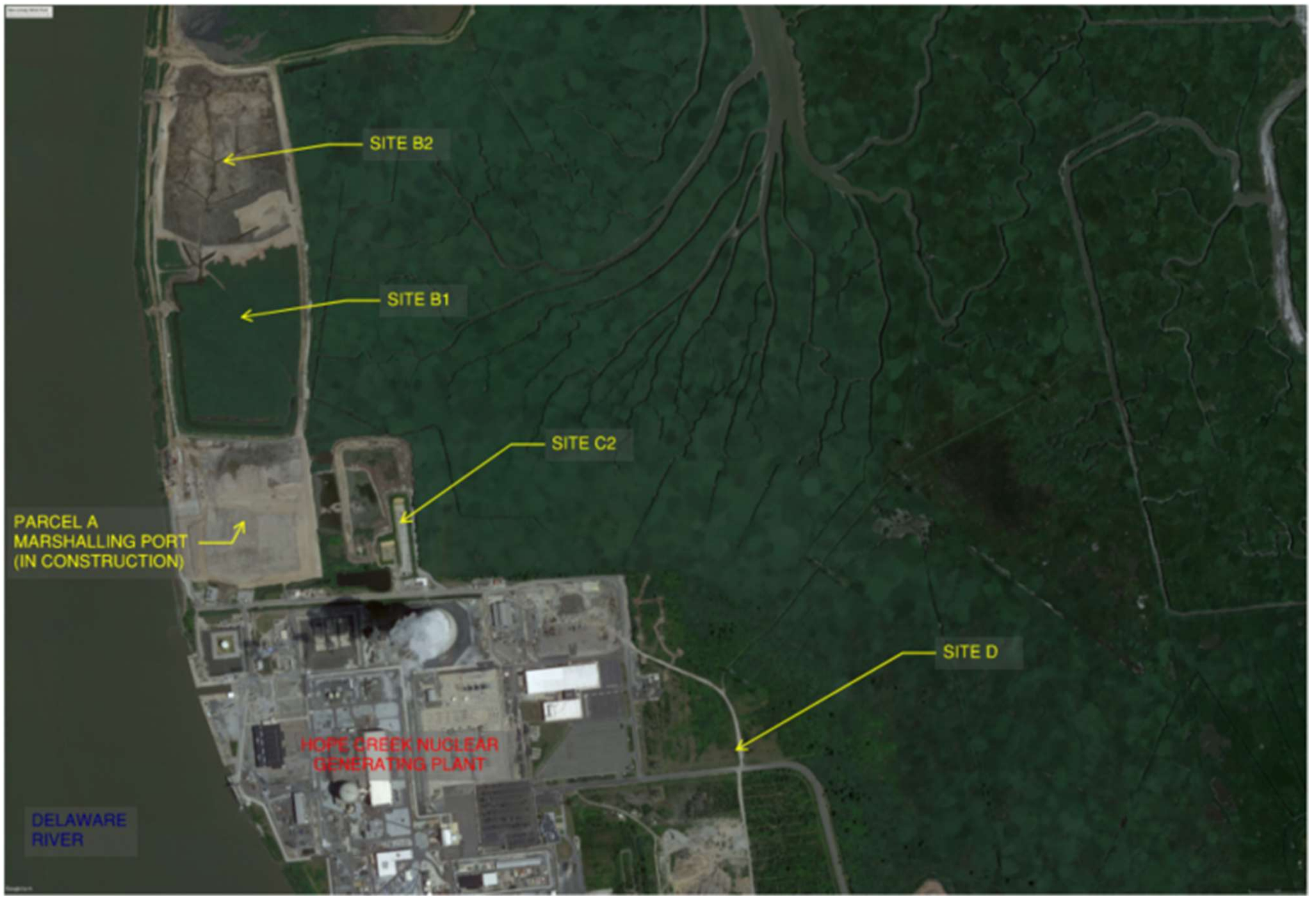


Figure 1-2 - Project Site Aerial

1.1.2. Proposed Site Conditions

Site B1 is currently being considered for use as a secondary marshalling port to being operated independently from Site A's marshalling port. The development of Site B1 will include an additional installation berth and delivery berth at the riverfront, and the uplands area will provide addition laydown area for the OSW parts with a minor warehouse facility. The heavy haul road will continue from Parcel A to the south and run north-south along the eastern edge of the parcel with an east-west connection to the installation berth along the northern parcel line. Site B2 will be developed just north of Site B1, and the east-west heavy haul road will divide the two sites. This Site B2 has a proposed end use of blade manufacturing within the uplands portion of the site, and the installation berth from B1 will continue north through B2 to the northern parcel boundary. The blade manufacturing and assembly facility will occupy the majority of the site.

Site C2 is planned for development as a final assembly plant for nacelles, which would then be stored after completion on the laydown yard to be developed in Site C1. A 60,000 square foot building is proposed within the footprint of Site C2, and the remainder of the parcel will provide building access, parking, and laydown yard for the completed nacelles. Proposed development for Site D includes the construction of an administrative office building, associated parking and access roads, and a maintenance yard. The area of Site E will be repurposed to serve as the US Army Corps of Engineers' CDF to replace the areas of B1 and B2.

Outside of the building footprints, the site layouts for B1, B2, and C2 will provide for as much open space as possible, while considering location of utility components such as high mast light poles, fire hydrants, storage tanks, etc. The topping surface in these laydown areas shall be compacted dense graded aggregate. The pavement surface for the POV access road that runs through the three sites shall be dense graded aggregate (DGA), and the loading dock areas around the building in C2 will be concrete pavement. In Site D, the immediate area around the administrative building shall be concrete curbing and access ramps, the transit corridor around the building perimeter and the parking lot shall be asphalt pavement, and the maintenance yard to the north of the access route will be dense graded aggregate.

The transport of OSW components will occur via self-propelled modular transporters (SPMT). The SPMT transits will primarily occur within the marshalling port yard at B1 and the laydown areas of B2 and C2. SPMT's will be able to access other parcels like Sites A and G by transiting along the heavy haul road, which will run north and south along the eastern edge of Sites B2, B1, and A, and then run east and west between A and G, just south of the Sites C1 and C2. An existing road utilized by PSE&G, called the Material Center Access Road, will provide access to Site A, where a POV access road will allow for non-SPMT traffic to gain access to the Sites C2, B1 and B2. Access to Site D will be directly from the Material Center Access Road further to the east.

1.2. Site Zoning

According to the Township of Lower Alloways Zoning map, all sites within this sitewide permit application are listed in an existing "Industrial" Zoning District along with the adjacent properties. Consequently, the proposed wind port facility shall comply with the relevant permitted and condition use regulations (Section 5.15), as well as bulk and area regulations (Section 5.16) of the Land Development Ordinance for the Township of Lower Alloways Creek.

1.3. Hydrologic Soil Classification

As common practice, all sites within this sitewide permit application were classified according to the NRCS Web Soil Survey to determine the corresponding hydrologic soil group. The hydrologic soil report from NRCS was printed and included as Appendix H. Due to the historical use of these sites as disposal facilities for dredge material, the soils have been classified similarly as Udorthents (UddfB), dredged fine material with minimal slopes. As such, the Sites B1, B2, and C2 classified as UddfB have been rated as hydrologic soil group C. The soils from hydrologic group C are classified by the NRCS as:

Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a soil rate of water transmission.

Site D has a different historical use and additionally has been classified differently by the NRCS. The soils have site D have been classified as Urban Land (UR), which signals that the hydrologic soil group is unknown.

1.4. FEMA Flood Levels

The Flood Insurance Rate Map (FIRM) Numbers 34033C0256C and 34033C0259C published by FEMA and made effective on June 16, 2016, cover the limits of the Parcels B1, B2, C2, and D. Nearly the entirety of the proposed development for Sites B1, B2, and C2 currently falls within the AE zone, with some small areas of B2 and C2 within the 0.2% annual flood zone. The strip of land along the riverfront in Sites B1 and B2 also falls within

Zone VE with BFE at 13 feet. The proposed development of Site D falls within the limits of Zone X, and the FEMA zones are defined as follows.

- Zone AE (Site Base Flood Elevation – EL 9ft NAVD 88): Special flood hazard area designation by FEMA as having a 1 percent annual chance of flooding. This flood is also called the 100-year flood.
- Zone VE: Special flood hazard area designation wherein a greater hazard exists. Buildings must be built to withstand simultaneous wind and water loads, as well as the impact of waves.
- Zone X: The areas of minimal flood hazard, which are the areas outside the Special Flood Hazard Area and higher than the elevation of the 0.2-percent-annual-chance flood (500-year).
- 0.2-percent-annual-chance flood: Areas of 0.2% annual chance flood, also termed 500-year.

As shown below in a FIRMette from FIRM #34033C0256C, Site B1 is within a special flood hazard zone AE with a base flood elevation of +9 ft NAVD. There is a narrow strip of riverfront land that is designated as Zone VE with a BFE of +13 ft NAVD, which is an area where there is greater hazard from wave and wind impacts.

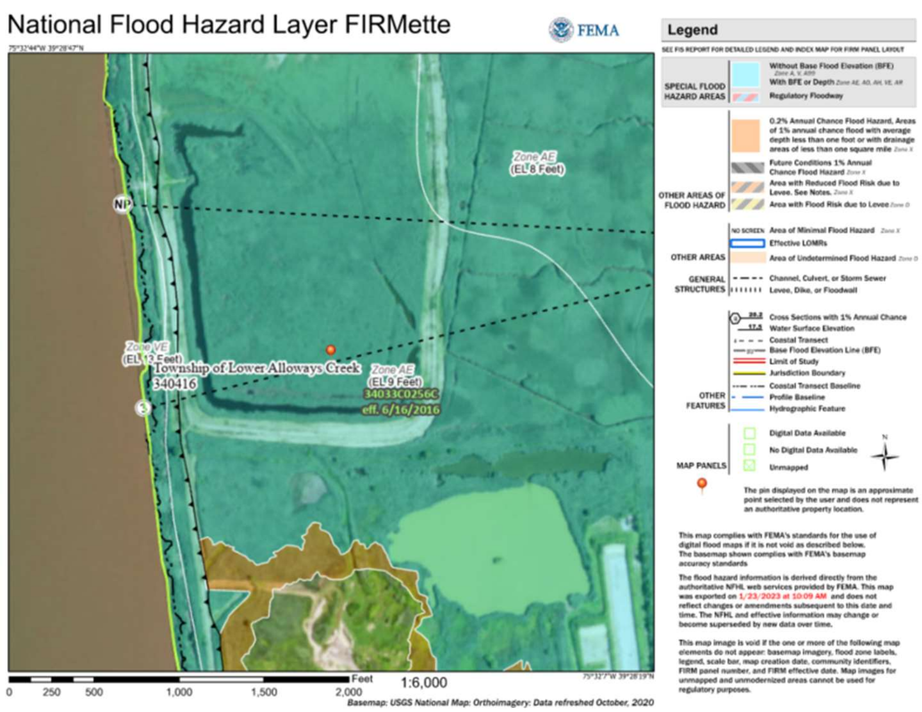


Figure 1-3 - Site B1 FEMA FIRMette

According to the FIRM Number 34033C0256C, published by FEMA and made effective on June 16, 2016, the Site B2 is primarily designated as Zone AE with a base flood elevation of +9 feet (NAVD 88). The riverfront strip of the site is designated as a VE zone with greater hazards due to wind and wave exposure, and the BFE varies from +13 feet to +17 feet NAVD. The majority of the northern half of the site is located within the area of minimal risk defined as Zone X, and there exists a transition zone between Zone X and Zone AE (BFE 9 ft) that runs west to east along the middle of the site and towards the north along the parcel line that is designated as the 500-year floodplain. These four zones of flood risk are shown in Figure 1-4 as the Site B2 FIRMette.

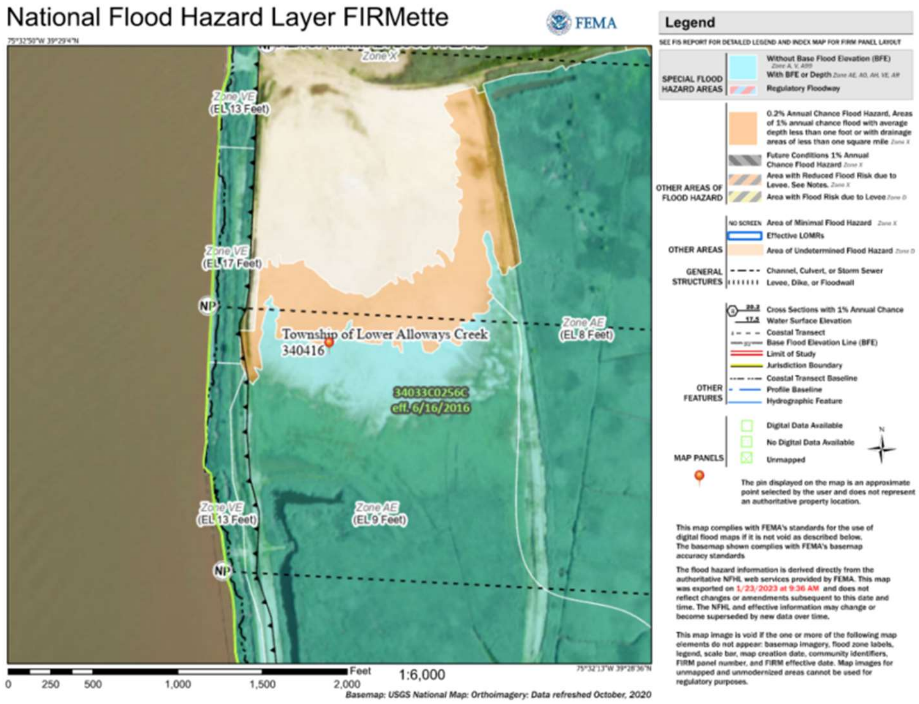


Figure 1-4 - Site B2 FEMA FIRMette

Site C2 is located entirely within the FEMA designated Zone AE with a base flood elevation of 9 feet (NAVD 88). This zone designation can be seen on FIRM Number 34033C0256C, published, and made effective on June 16, 2016, and the FIRMette can be seen as Figure 1-5 below.

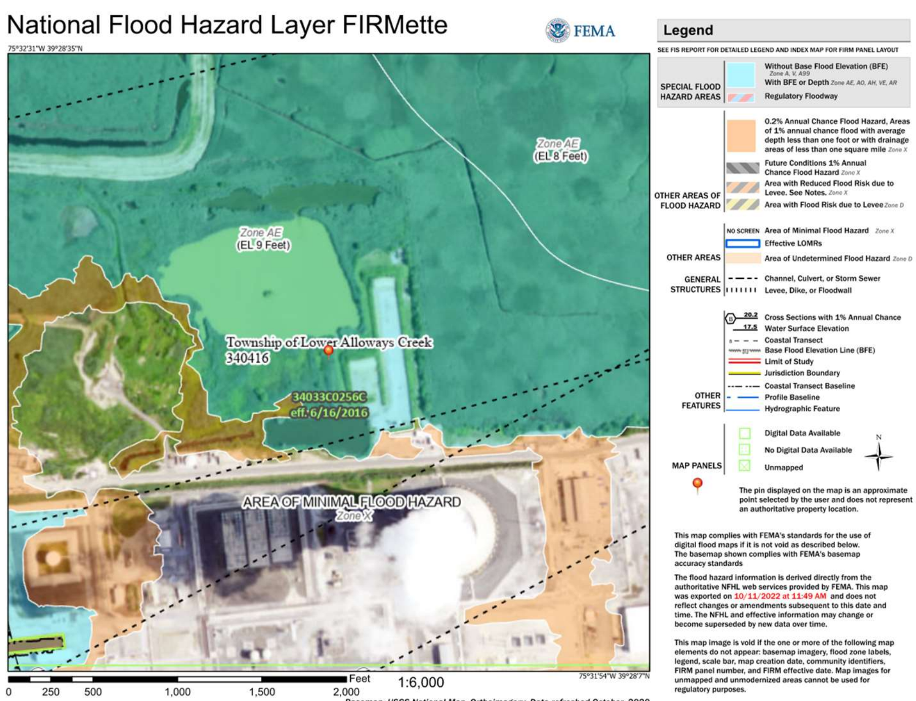


Figure 1-5 – Site C2 FIRMette

Site D is located entirely within the FEMA designated Zone X with a minimal flood risk. This zone designation can be seen on FIRM Number 34033C0259C, published, and made effective on June 16, 2016, and the FIRMette can be seen as Figure 1-6 below.

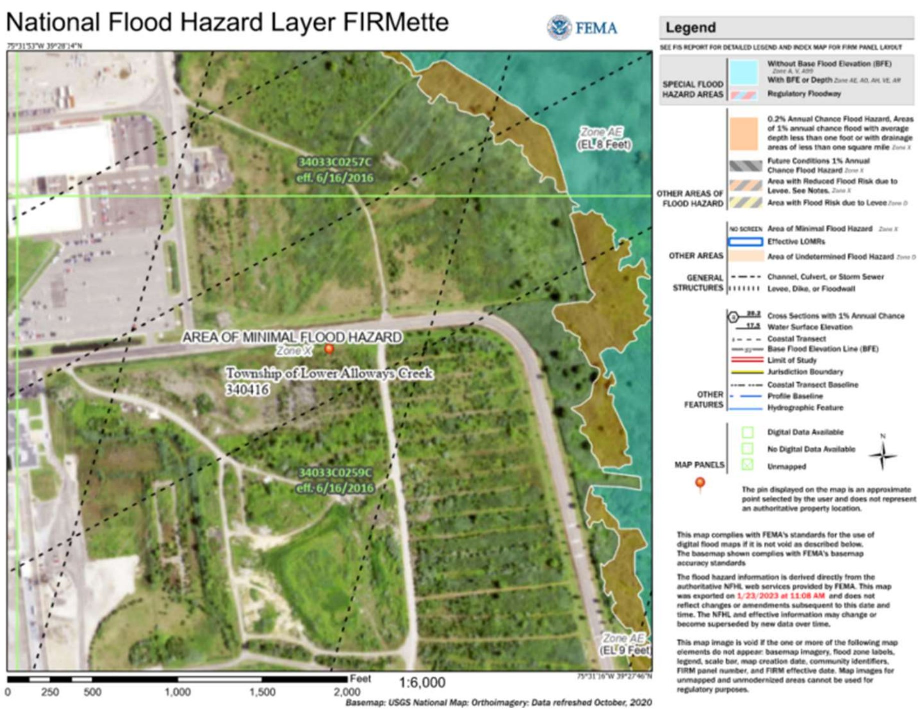


Figure 1-6 – Site D FIRMette

Section 2 -Proposed Stormwater Management Measures

All stormwater management plans, and stormwater control ordinances shall, according to the goals and requirements of NJDEP, be designed to:

- Reduce flood damage
- Minimize, to the extent practical, any increase in stormwater runoff from any new development
- Reduce soil erosion from any construction project
- Assure the adequacy of existing and proposed culverts and bridges, and other instream structures
- Maintain groundwater recharge
- Prevent, to the greatest extent feasible, an increase in nonpoint pollution
- Maintain the integrity of stream channels for their biological functions, as well as for drainage
- Minimize pollutants in stormwater runoff from new and existing development
- Protect public safety.

The proposed stormwater management system shall be designed to adequately collect, treat locally, and convey channelized runoff for sites B1 (+/- 65 acres), B2 (+/-40 acres), C2 (+/-14 acres), and D (+/-10 acres) and to satisfy all applicable NJDEP stormwater management requirements for major development. This shall be accomplished using structural and nonstructural stormwater management strategies. Proposed features include: cover stabilization practices, a stormwater collection and conveyance system, green infrastructure and manufactured treatment devices, and discharge control practices. Specific details pertinent to the design elements specified are as follows:

- The stormwater collection system shall be designed to manage the 25-yr, 24-hour storm event consistent with the NJDOT Roadway Drainage Design Manual Table 10-2 and the Township of Lower Alloways Creek Land Development Ordinance Section 4.30.B.2.
- Green infrastructure and Manufactured Treatment Devices (MTDs) shall be incorporated into the proposed system to remove total suspended solids and floating debris prior to discharge. The proposed systems for Sites B1, B2, and C2 incorporate Contech StormFilters and Filterras capable of achieving an 80% TSS removal efficiency prior to discharge into the Delaware River or the tidal wetlands. The proposed system for Site D utilizes the Contech Filterra HC MTDs with internal bypasses to achieve the treatment requirement prior to discharging to the conveyance system which connects to the north to the stormwater network in Site G that outfalls to the tidal wetlands.
- The green infrastructure requirement is fulfilled in Sites B1, B2, and C2 through designed use of infiltration. The key to the different stormwater approach for C2, B1, and B2 is the current existing conditions and proposed construction sequence of these parcels. Currently, the sitewide permit parcels (B1, B2, and C2) exist as Confined Disposal Facilities (CDF) for placement of dredged material. As such, infiltration field testing at this stage would provide non-representative results. The construction process proposes the deposition of dredge material from offshore within these parcels to dewater and fill to the initial proposed grade. Additional fill material will be deposited as well for surcharge to ensure proper dewatering and settlement. The field geotechnical and infiltration testing are proposed to be completed after removal of the surcharge within the recently placed dredged fill material, which will be predominantly sand. As such it is anticipated that the proposed fill material from dredging will be more prone to effective infiltration throughout the site. This approach allows for conservative projections of the infiltration rate to be used to model the stormwater management and treatment system, and then future in-situ infiltration testing to be used to field verify the original assumptions and modify the model as necessary.
- Stormwater outfalls were sized and located to facilitate the green infrastructure requirement and drainage area restriction so as to create efficiently sized conveyance networks throughout each site. Each outfall will consist of a discharge pipe, a backflow preventer, and a riprap apron (for energy dissipation and scour protection). Five outfalls within sites B1 and B2 will discharge directly to the Delaware River through the wharf. Five eastern outfalls within sites B1 and B2 will discharge directly to the adjacent tidal wetlands. Five outfalls from Parcel C2 will discharge to the north and east of the site just past the tidal wetland boundary to ensure the hydraulic connection to the tidal system. Finally, the stormwater network within Site D will combine internally, cross the ACE easement to the north, and tie in directly to the conveyance network in Parcel G that discharges to the tidal wetland to the north of that parcel.

2.1. Design and Performance Standards for Stormwater Management Measures

NJDEP's objectives for stormwater management are directed at erosion control, groundwater recharge, storm water runoff quantity, and stormwater runoff quality. NJDEP supports and encourages use of non-structural stormwater management measures to satisfy design and performance standards; however, the most recent stormwater rule amendment, which took effect on March 2, 2021, requires the use of Green Infrastructure (GI) to meet these quantity, quality, and recharge design standards. Specifically in New Jersey, the Stormwater Management Rules at N.J.A.C. 7:8-1.2 define green infrastructure as:

"a stormwater management measure that manages stormwater close to its source by:

1. Treating stormwater runoff through infiltration into subsoil;
2. Treating stormwater runoff through filtration by vegetation or soil; or
3. Storing stormwater runoff for reuse."

There is a wide range of stormwater management measures that are used to address the impacts of development on groundwater, water quality and water quantity to meet the recently updated requirements of NJDEP guidelines. Applicable compliance standards for the new collection system are discussed below.

2.1.1. Erosion Control

The wind port facility will conform to the design and performance standards for erosion control established under the Soil Erosion and Sediment Control Act, NJSA 4:24-39 et eq. and implementing rules. Key structural elements of the Erosion and Sediment Control (ESC) plan include: installation of silt fencing, installation of stabilized construction entrances, use of crushed stone cover in equipment laydown and staging areas, and erosion control for temporary soil stockpiles. All structural ESCs shall be installed in accordance with applicable NJDEP recommended practices, as well as NJDEP's "Standards for Soil and Erosion Sediment Control," and operational prior to initial site disturbance and subsequent construction phasing. The proposed erosion and sediment control plans for the different phases of earthwork movement for sitewide construction are included in Appendix E.

2.1.2. Groundwater Recharge

The groundwater recharge requirements outlined in NJAC 7:8 5.4 would not be recommended for the following reasons:

- Per NJAC 7:8-5.4. (b).3.ii., site stormwater exposed to "source material," i.e. any material(s) or machinery, located at an industrial facility, that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater, shall not be recharged.
- Source materials include, but are not limited to, raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels, and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.

Based on the above considerations, it has been evaluated that groundwater recharge shall not be considered as a principal stormwater management control measure for the sites B1, B2, and C2 at the Wind Port facility. This is due to the proposed end uses of each parcel where industrial processes and movement of industrial products will take place on all three parcels. On sites B2 and C2, manufacturing and assembly processes will occur that take raw materials and parts to assemble and store the wind turbine components. On sites B1 and B2, the marshalling, delivery, and installation processes that occur will involve industrial size equipment such as cranes and self-propelled modular transporters (SPMTs). All of these processes involve the use and transport of industrial materials and machinery which justifies the exclusion of groundwater recharge requirements from consideration.

However, site D will be used primarily for employee parking and administrative office space, so groundwater recharge must be taken into account. The limits of site D fall within the classification of urban land from the NRCS web soil survey, so a field exploration is planned to categorize the hydrologic soil group. The results from the soil testing will provide clarity to the pending calculations for groundwater recharge in site D, which will be presented in a supplemental report.

2.1.3. Stormwater Runoff Quantity Standards

In accordance with stormwater design standards established by the New Jersey Department of Transportation (NJDOT), the proposed stormwater management collection system for the wind port site shall be designed to safely manage runoff from the 25-year, 24-hour storm event (See Appendix A for design parameters and model), a flood recurrence level consistent with the NJDOT Roadway Drainage Design Manual Table 10-2 and the Township of Lower Alloways Creek Land Development Ordinance Article VI, Section 4.30.B.2. Water quantity control is not applicable to this site in accordance with the N.J.A.C. 7:8-5.6(b)4 due to the locations of the site's points of discharge to the tidal zone of the Delaware Bay.

2.1.4. Stormwater Runoff Quality Standards

2.1.4.1. Total Suspended Solids Reduction

The project is subject to the NJDEP's stormwater quality standards for major development established in N.J.A.C. 7:8 where an 80% reduction in total suspended solids loading is required for new motor vehicle surfaces. This reduction must be achieved for the NJDEP's stormwater quality design storm of 1.25 inches of rainfall falling with a specific distribution over a 2-hour period. The amended stormwater rule establishes that the water quality treatment standards of 80% TSS reduction must be achieved through the implementation of approved green infrastructure techniques as detailed in the NJ BMP manual.

To achieve the mandatory water quality standard for Sites B1, B2, C2 and D, multiple strategies are proposed to be implemented distributed throughout the site. Figure 2-1 demonstrates the applicable treatment technology for every proposed drainage area throughout the sitewide permit area. The techniques proposed for utilization around the site include GI-approved manufactured treatment devices (MTDs), MTD's as pretreatment to infiltration, and rainwater capture for reuse for consideration as volume reduction. The green infrastructure MTD solutions achieve the 80% TSS reduction required for all development where they are proposed to be installed in Site B2 and D. The MTD's proposed for use as a pretreatment filter prior to infiltration meet the 80% TSS reduction where they will be installed in Sites B1, B2, and C2. The infiltration of the water quality volume after pretreatment allows for compliance with the green infrastructure requirement.

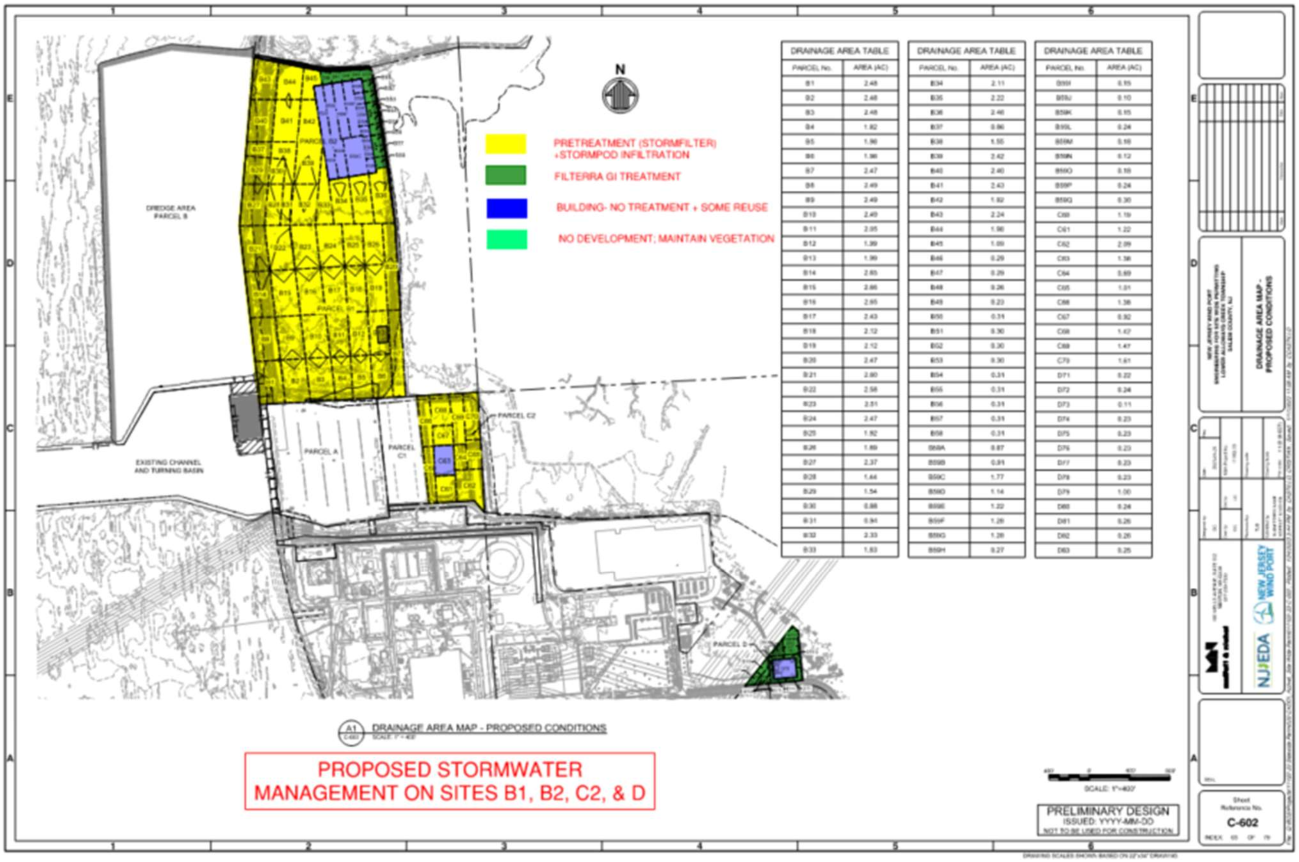


Figure 2-1 – Stormwater Treatment Measure Proposed for Sitewide Parcels B1, B2, C2, & D

2.1.4.2. Manufactured Treatment Device Certification

Two principal manufactured treatment devices (MTD) have been proposed for the sitewide parcels to be developed within this permit submittal. Within Sites B1 and C2 and a portion of B2, the MTDs to be installed shall all be the Stormwater Management StormFilter by Contech Engineered Solutions, LLC as a pretreatment device prior to infiltration. The StormFilter uses rechargeable, media-filled cartridges to absorb and retain pollutants from stormwater runoff including total suspended solids, hydrocarbons, nutrients, metals, and other common pollutants. The StormFilters used for the 80% TSS reduction pretreatment will be housed within StormPods manufactured by Rotondo, and then the treated water quality volume will be conveyed to a downstream chamber of Rotondo StormPods where the stormwater can be stored and infiltrated. The MTD proposed for the northeastern portion of Site B2 around the perimeter of the blade assembly building and throughout Site D will be the Filterra Bioretention System (Filterra) by Contech Engineered Solutions LLC. The Filterra uses “physical, chemical, and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff.” The specific configuration and model of the Filterra to be used shall be the Filterra HC with an internal bypass for high flows configured in the curb inlet position. The individual sizes to be used in each drainage area shall be specified on the grading and drainage plans.

N.J.A.C. 7:8-5.5(b) and 5.7(c) allows for the use of manufactured treatment devices for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by NJDEP. NJDEP has certified the use of both the StormFilter System and the Filterra Bioretention System by Contech Engineered Solutions LLC at a TSS removal rate of 80% when designed, operated, and maintained as stipulated by NJDEP in the terms of its certification. Please refer to Appendix B for the MTDs certification and to Appendix C for the MTDs design, respectively.

2.1.5. Non-Structural Stormwater Management Controls

A Stormwater Pollution Prevention Plan (SWPPP), as required, will be developed prior to operation of the wind port site. The SWPPP will reflect the enhanced drainage, conveyance, and treatment systems for the site area, including routine inspection and maintenance practices. The SWPPP will also address material off-loading and storage practices for any oils (i.e. fuel oil, lubrication oil, etc.).

2.2. Proposed Alternative Compliance Pathways for Permitting

Due to the historical usage and current conditions of the sites B1, B2, and C2, in situ infiltration testing is impossible and nonrepresentative of the proposed development conditions. In order to ensure proper compliance with the infiltration requirement of the green infrastructure regulations, two alternate compliance pathways are proposed to allow for permitting. Both compliance pathways assume that no infiltration testing will take place prior to the granting of the permit. This is because the existing conditions of the sites are not conducive to infiltration testing and the initial construction sequence to prepare the sites for the projected loads is to install wick drains and place surcharge preload material for consolidation. The calculations within this stormwater report and permit package utilize the most conservative infiltration rate allowable to remain within compliance and demonstrate the feasibility of the design solution. The primary compliance pathway will be achieved through over-excavation of the subbase material and placement of stone fill under the footprints of the underground infiltration chambers. The over-excavation would occur after the surcharge preload has been removed, and the footprints of the chambers would need to be excavated down to the groundwater table (~ +6ft). The volume between the groundwater table and the invert of the underground storage chambers will be filled with No. 57 stone, or 1" – No. 4 coarse aggregate according to Table 901.03-1 from the NJDOT Standard Specifications. This material would guarantee the capacity for infiltration under each storage chamber, maintain the structural integrity of the surrounding soil after the surcharge, and eliminate the schedule impacts of infiltration and soils laboratory testing.

The secondary compliance pathway also seeks to minimize the schedule impacts of infiltration testing, while encouraging potential efficiencies of earthwork movement on site. The construction sequencing would be similar to the primary pathway; however, instead of No. 57 stone the over-excavation under the infiltration chambers would be backfilled by on-site sand available with an approved gradation curve. This secondary pathway would require additional soils testing of the sand backfill material, yet it would provide economic savings unavailable through the primary pathway. By detailing these alternative compliance pathways, this proposed project seeks permitting transparency that allows for the effective beginning of site preparation, while using infiltration to comply with the green infrastructure regulations.

Section 3 - Stormwater Management System Design

3.1. Storm Drainage Design

The proposed stormwater management system for the Wind Port Sites B1, B2, C2, and D has been designed to comply with the applicable regulations of N.J.A.C. 7:8, the NJDOT Roadway Drainage Design Manual, and the Township of Lower Alloways Creek Land Development Ordinance Article VI, Section 4.30.B2. The NJDOT drainage regulations state in Table 10.2-C the design recurrence interval for this grade of stormwater management facility and network, which is 25-year storm events. In addition to compliance with the newly implemented green infrastructure rules of N.J.A.C., the design team accounted for the New Jersey extreme precipitation projections recently published by the NJDEP. The stormwater network was designed to account for the 25-year extreme precipitation event to accommodate projected additional flooding due to climate change and increase the facility's resilience.

The technical demands of the project site impose limitations on the options of what BMPs can be implemented on the New Jersey Wind Port site. The natural conditions of the site inhibit the feasibility of infiltration of the stormwater runoff. The proximity of the tidal Delaware River, the high groundwater table (~EL+6ft), and the poorly draining clay soils on site provide existing conditions that do not favor infiltration as a stormwater solution. Additionally, due to the technical loading requirements of the site, the full area will be surcharged with a preload and wick drains to accelerate projected settling, which will further impact any proposed infiltration of stormwater. Reuse of the stormwater runoff would be considered feasible in small areas of the project site; however, it would require treatment and storage of large volumes of water and the continuous cycling of the stored runoff to ensure storage availability in the case of a new storm. It may be considered as a minor option, but as a large-scale solution on the full project, it is not feasible due to a lack of recycled water demand. Biofiltration by vegetation and soil would be the preferred approach for this site due to the limitations for infiltration and reuse. However, any biofiltration BMPs utilized on site must be located underground due to the site end use that requires the site be fully paved with complete layout flexibility and a loading capacity of 3000 psf for SPMT traffic. These end user requirements strongly limit the possibility of incorporating open vegetated green infrastructure BMPs such as small-scale bioretention systems and sand filters, and several of the green infrastructure certified MTDs. Pervious paving systems are restricted as an option due to the SPMT traffic loads and the additional maintenance demands in highly trafficked zones.

There are two other major green infrastructure stormwater limitations that impact the stormwater management approach for this project. The first constraint to consider is the configuration requirement of all green infrastructure certified MTDs. As mentioned above, the preference on a site like this would be install vault configuration GI MTDs under the pavement so that the treatment of the water quality storm does not interrupt the fully impervious site pads. However, all potential GI MTDs that may be installed as underground vaults only retain their GI certification if the MTD is designed to infiltrate the full water quality volume storm after treatment. Therefore, use of these GI MTDs encounters the same challenges as any other BMP solution involving infiltration. The other major constraint is the applicability of drainage area limitations. The new stormwater regulation mandates that the maximum drainage area size for treatment of stormwater runoff quality be limited to 2.5 acres for most potentially applicable BMPs like bioretention systems, infiltration basins, and GI MTDs. The updated regulation also states that all water quality flows must be treated locally within the drainage area so that the stormwater management is distributed throughout the project site, which requires more underground stormwater structures for fully impervious sites like these sitewide parcels.

The wind port site B1 has been divided into 30 total drainage areas to meet the drainage area limitations, manage the stormwater close to its source, and treat the stormwater locally through green infrastructure measures. The wind port site B2 has been divided into a total of 29 drainage areas; however, the 29th drainage area is representative of the building footprint which has been further divided into 17 drainage areas that can be directly connected to the perimeter stormwater networks. The drainage areas around the perimeter of the building in B2 were size limited to allow for maximum treatment flow rates of Filterras. The wind port site C2 was divided into eleven smaller drainage areas based on the proposed site plan layout. The wind port site D has been divided into thirteen size-restricted drainage areas, yet the single drainage area of the building footprint was also subdivided into four smaller drainage areas to directly connect to the stormwater network. Please refer to the drawing set included in Appendix E that details the proposed drainage areas of the sitewide permit parcels. Appendix F demonstrates the proposed stormwater management system and all accompanying stormwater conveyance pipes.

Within Site B1, all stormwater runoff from each drainage area shall be intercepted by trench drains that are oriented in the north-south direction and parallel to the marshalling wharf, which will convey the flow into a storm drain network. Junction boxes set in line with the trench drains will function as diversion structures and will direct the NJDEP 1.25-inch, 2-hour water quality storm to the Contech Stormfilter pretreatment units for 80% TSS treatment; all larger storm events will bypass the MTD. These junction boxes are diversion structures that distribute flow to appropriately sized pipes located at different depths. The lowest outlet pipe will connect to the Stormfilter pretreatment, and the higher outlet pipe will divert the overflow storm events to the downstream storm network. The water quality volume flow will continue through the pretreatment units to the Rotondo StormPods, which will function as underground storage and infiltration chambers. The underground storage is sized based on the contributing area water quality design storm runoff volume. Therefore, the diversion structure provides the initial flow control towards the treatment train, then the outlet of the Stormfilters allows a constant flow to pass from the treatment stage to the storage chambers. The StormFilter MTD is certified by the NJCAT to achieve the required 80% TSS removal efficiency for water quality treatment. Stormfilter system will provide the necessary pretreatment prior to allowing the water quality flow to pass to another Stormpod underground storage facility where the WQDS volume will be allowed to infiltrate through the bottom of the structures. The Stormfilter pretreatment facility is sized by using HydroCAD and modeling the water quality peak flows. The Stormpod underground chambers shall be positioned such that the open bottom invert is at elevation +8.0, which is two feet above the seasonal high groundwater table elevation of +6.0' in the area. The Stormpod chambers were sized through HydroCAD modeling based on the water quality design storm volume of the contributing drainage area. The capacity to infiltrate this water quality design storm has yet to be confirmed by the approved NJDEP infiltration testing procedures because the current existing conditions of the sites are being utilized as confined disposal facilities. The proposed construction sequencing for the sites involves the further placement of dredge material to bring the site to a working pad elevation, the installation of wick drains and placement of a preload surcharge, monitoring of the consolidation, and eventual removal of the surcharge. Based on geotechnical field tests, the dredge material to be placed on the sites is a well-draining sand, which will improve infiltration feasibility. Due to the existing conditions, which are not representative of the final proposed field conditions, the proposal is due delay field infiltration testing until after the additional dredge fill material has been placed and the surcharge has been removed after consolidation. The infiltration calculations have assumed an infiltration rate equal to 0.5 inches per hour, which is the minimum allowable by NJDEP, to remain conservative in the sizing of the infiltration structures. The field infiltration rates will be verified during the construction sequence to ensure compliance with a field infiltration rate equal to or greater than 1 inch per hour, which grants a factor of safety of 2. If higher field infiltration rates are achieved as anticipated, the infiltration calculations will be reevaluated to improve efficiencies. In order to comply with the Stormwater Management infiltration rules stated in N.J.A.C. 7:8-5.2(h), the individual storage structures that facilitate infiltration were evaluated by the Hantush Method to determine all hydraulic impacts on the groundwater table underneath each structure. The results of the Hantush Method groundwater assessment are found in Appendix G, and they show that no groundwater mounding reaches the bottom invert of the infiltration chambers. By infiltrating the water quality storm, this stormwater management system complies with the green infrastructure guidelines. The treated stormwater runoff from the Stormfilters will be infiltrated, and the larger storms will be conveyed to the outfalls discharging through the wharf into the adjacent Delaware River or to the east to the adjacent tidal wetlands.

Within Site B2, all stormwater runoff from the western half of the site shall be intercepted by trench drains that are oriented in the north-south direction and parallel to the extended delivery wharf. Trench drains will also be located in a north-south configuration just to the south of the proposed assembly building. Junction boxes set in line with the trench drains will function as diversion structures and will direct the NJDEP 1.25-inch, 2-hour water quality storm to the Contech Stormfilter pretreatment units for 80% TSS treatment; all larger storm events will bypass the MTD. The water quality volume flow will continue past through the pretreatment units to the Rotondo StormPods, which will function as underground storage and infiltration chambers, which have been sized based on the contributing area water quality design storm volume. The treated stormwater runoff from the Stormfilters will all be infiltrated, and the larger storms will be conveyed to the western outfalls discharging through the wharf into the adjacent Delaware River or to the east to the adjacent tidal wetlands. The southwestern storm network will be a phased construction, where the outfall, O-B5 and the downstream branches are constructed within the limits of B1, but the upstream trench drains, pretreatment units, and infiltration chambers are constructed in B2.

The eastern half of Site B2 around the perimeter of the blade manufacturing building shall utilize Filterra HC Bioretention systems configured with curb inlets and internal diversion structures. The internal diversion structures will allow the NJDEP water quality design storm (WQDS) flows to enter the bioretention cell and divert larger storm events downstream. The overflow storm events and the treated stormwater shall be directed to small conveyance networks along the perimeter pavement around the building. The drainage areas were delineated around the assembly building to reach a maximum area of 0.30 acres, which was back-calculated as the maximum impervious area that a Filterra HC can treat as a single unit. As such, the Filterra placement was governed by the peak treatment flows from the independent drainage areas. The Filterra HC Biofiltration is certified by the NJCAT to achieve the required 80% TSS removal efficiency for water quality treatment. These conveyance networks will be sized to accommodate the additional stormwater runoff captured from the building rooflines and then carry the flows to the two proposed outfalls to the adjacent eastern tidal wetlands and tie into the northwestern network that discharges to outfall O-B7 into the Delaware River.

Within Site C2, all stormwater runoff from the northern half of the site shall be intercepted by trench drains that are oriented in the north-south direction and located just north of the proposed nacelle assembly building. Trench drains will also be in a north-south configuration just to the south of the proposed assembly building, and two trench drains will be configured in an east-west configuration at the edge of the concrete loading docks located on the north and south ends of the assembly building. Junction boxes set in line with the trench drains will function as diversion structures and will direct the NJDEP 1.25-inch, 2-hour water quality storm to the Contech Stormfilter pretreatment units for 80% TSS treatment; all larger storm events will bypass the MTD. The water quality volume flow will continue past through the pretreatment units to the Rotondo StormPods, which will function as underground storage and infiltration chambers, which have been sized based on the contributing area water quality design storm volume. The treated stormwater runoff from the Stormfilters will all be infiltrated, and the larger storms will be conveyed to the northern outfalls discharging to the adjacent tidal wetlands. The runoff from the building roof will be collected and transferred via gutters to the manhole located to the southeast. There will be two inlet grate structures located at low points within the parking lot to the southeast of the building, and these will be connected to the adjacent trench drain diversion structure so that the water quality flow can be treated, and the overflow can continue within the southern drainage network which outfalls to the tidal wetlands to the east at outfall O-C1.

Within Site D, the stormwater runoff from the maintenance yard, access road, and parking lot shall be collected through the Filterra Bioretention systems configured with curb inlets and internal diversion structures. The internal diversion structures will allow the NJDEP water quality design storm (WQDS) flows to enter the bioretention cell and all larger storm events will be diverted downstream. The treated flows from the Filterra units and the diverted flows will be conveyed downstream through the drainage network. The runoff from the building roof will be directly connected to the drainage network through gutter connections to the adjacent manholes. The Filterra HC Biofiltration is certified by the NJCAT to achieve the required 80% TSS removal efficiency for water quality treatment. The drainage network will convey stormwater to the northern point of the site where an underground stormwater pipe will cross the Atlantic City Electric easement towards the parcel line of Site G. The Site D drainage network will then tie into manhole XXX in Site G, which has been verified for capacity and depth to accept the additional flow. This Site G stormwater system conveys flow to the northern limits of the parcel and discharges to the adjacent tidal wetland.

Please refer to Appendix A for the full stormwater network SewerGEMS modeling results where the stormwater system profiles demonstrate the hydraulic grade line (HGL) results for the model storm return periods. The stormwater system was designed with pipe sizes, materials and slopes that maintain the extreme 25-year HGL below the allowable water elevation, which in this case is below the rim of the inlets and catch basins. This ensures that no flooding takes place during the 25-year extreme storm event, and minimal flooding occurs during larger storms like the 100-year event.

3.1.1. Hydrologic and Hydraulic Analysis and Approach

The Bentley SewerGEMS software was utilized to model the proposed stormwater management network. The SewerGEMS software is a superset of multiple Bentley programs including SewerCAD, StormCAD, and CivilStorm, and is capable of performing both hydrologic and hydraulic analysis for stormwater drainage systems. SewerGEMS uses the implicit dynamic solver engine to run the dynamic wave equation for hydraulic routing. According to the SewerGEMS user guide:

Solves the full St. Venant equations using an implicit numerical method developed by Bentley based on the US National Weather Service FLDWAV model. It simultaneously solves for both flow and hydraulic grade and uses the same equations for gravity and pressure portions of the system. It only solves dynamic flows (no steady state). It can be applied to storm, sanitary and combined sewers.

The hydrologic calculations were performed by the unit hydrograph NRCS method. The manufactured treatment devices (MTDs) were designed and sized appropriately using HydroCAD which uses a unit hydrograph for calculating peak runoff and volume storage of the devices.

Runoff volume, drainage collection system pipe sizing, and MTD sizing were determined using SewerGEMS and HydroCAD. The following assumptions were utilized for modeling the system.

1. Point Precipitation Frequency Estimates are sourced from NOAA Atlas 14, Volume 2, Version 3 (Location name: Salem, New Jersey, USA)
   a. 25-year, 24-hour SCS Type III design storm (6.25 inches – based on NOAA).
   b. 25-yr, 24-hour rainfall intensity (7.25 in/hr – based on NOAA).
2. Time of concentration (Tc) = 0.1 hour was utilized as the minimum for the sheet flow within drainage basins. All times of concentration were calculated using the NRCS TR-55 method.
3. For all developed areas, it was assumed 100% impervious area.
4. New Jersey Extreme Precipitation Projection tool was used to model additional extreme precipitation estimates for the 25-year return period (https://njprojectedprecipitationchanges.com/)
   a. 25-year, 24-hour design storm median projection (7.01 inches)

Please refer to Appendix A for full model input parameters and current design results.

Section 4 -Maintenance Procedures and Practices

Section 7:8-5.8 of the NJDEP stormwater management regulations outline requirements necessary to develop a maintenance plan for all proposed stormwater management measures incorporated into the design of a major development. Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure and can include repairs or replacement to the structure, and removal of debris. The maintenance plan shall contain specific preventative maintenance tasks and schedules, as well as cost estimates for sediment, debris, or trash removal. Please refer to Appendix D for manufacturer's detailed maintenance procedures as required by the NJDEP certification of the MTDs.

4.1. Responsibility

The facility manager shall be responsible for ensuring that the stormwater management system will be properly maintained. The facility manager shall ensure that all preventative and corrective maintenance tasks, including routine inspections are accomplished, and shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures, including a record of all inspections and copies of all maintenance-related work orders. In addition, the person responsible for maintenance shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan as needed.

4.2. Preventative and Corrective Maintenance Measures

Please refer to Appendix D for the approved maintenance manuals provided by the manufacturers. The primary purpose of the StormFilter is to screen and prevent pollutants and debris from discharging into protected waterway and periodically these pollutants must be removed to restore the filter to its full efficiency. Additional inspections and maintenance may occur as a result of excessive sediment loading from site erosion or extreme storms. Regulatory requirements or a chemical spill can shift maintenance timing as well. The required frequency of maintenance may be adjusted as additional monitoring information becomes available during the inspection program but, ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual site. While the average maintenance lifecycle of the device is approximately 1-5 years, it is recommended that the site owner develop a database to properly manage inspection and maintenance programs.

The initial step recommended for maintenance is to inspect the StormFilter vault to assess the condition of the filter cartridges. If the submerged cartridges are severely plugged (if pore space between media granules is absent), then the cartridges will need to be replaced. Prior to replacement, however, all cartridges shall be emptied onto the vault floor, and the empty shells returned to the manufacturer. It is recommended that cartridge replacement be done in dry weather.

Second, the level of visual sediment loading will need to be assessed. If the level of accumulation within the vault appears excessive (>4" on the vault floor), it is recommended that all accumulated material be removed from the vault and forebay via a vacuum truck. Prior to removal, samples of the accumulated sediment and media should be obtained to determine concentrations of any heavy metals and organic chemicals (such as petroleum products) and coordinate appropriate disposal requirements. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. This typically requires coordination with a local landfill for solid waste disposal. Liquid waste disposal may necessitate one of several options, including: a municipal vacuum truck decant facility; a local wastewater treatment plant; or on-site treatment and discharge.

The Filterra HC systems function with internal bypass weirs and a special soil media mix and plants that provide biofiltration of the water quality design storm. With the purchase of the Filterra HC system, Contech includes the activation of the system and a one-year maintenance plan that includes up to two visits. Maintenance is recommended on an annual basis, with additional occurrences as a result of excessive sediment loading from site erosion or extreme storms. Regulatory requirements or a chemical spill can shift maintenance timing as well. The required frequency of maintenance may be adjusted as additional monitoring information becomes available during the inspection program but, ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual site. While the average maintenance lifecycle of the device is approximately 1-5 years, the site owner shall develop a database to properly manage inspection and maintenance programs. The maintenance plan for the Filterra HC has several initial requirements prior to activation of the system. The site landscaping must be fully stabilized in the area, final paving must be completed, and the curb inlet throat opening should measure at least four inches. The routine maintenance visits by Contech include debris removal, pretreatment mulch replacement, and a plant health evaluation. These routine maintenance procedures may be contracted through Contech after the first year or may become the responsibility of the site owner or operator.

Appendix A – SewerGEMS Model Parameters and Output

FlexTable: Conduit Table

Current Time: 0.00 hours

Label	Material	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n
CO-1	Concrete	CB-1	7.53	MH-1	5.00		25.1	0.101	24.0	0.013
CO-2	Concrete	CB-2	7.54	MH-2	5.33		24.6	0.090	24.0	0.013
CO-3	Concrete	CB-3	7.54	MH-3	5.71		25.1	0.073	24.0	0.013
CO-4	Concrete	CB-4	7.55	MH-4	6.05		24.9	0.060	24.0	0.013
CO-5	Concrete	CB-5	7.35	MH-5	7.10		25.2	0.010	24.0	0.013
CO-6	Concrete	CB-6	7.22	MH-6	4.39		25.6	0.111	24.0	0.013
CO-7	Concrete	CB-7	7.07	MH-7	6.31		27.6	0.028	24.0	0.013
CO-8	Concrete	CB-8	7.19	MH-8	6.92		27.5	0.010	24.0	0.013
CO-9	Concrete	CB-9	7.41	MH-9	5.36		19.7	0.104	24.0	0.013
CO-10	Concrete	CB-10	7.28	MH-10	5.73		19.9	0.078	24.0	0.013
CO-11	Concrete	CB-11	6.82	MH-12	6.73	10.0	12.7	0.009	24.0	0.013
CO-12	Concrete	CB-12	6.84	MH-13	6.76	8.0	12.0	0.010	24.0	0.013
CO-14	Concrete	MH-2	5.33	MH-1	5.00		76.0	0.004	24.0	0.013
CO-15	Concrete	MH-3	5.71	MH-2	5.33		73.7	0.005	24.0	0.013
CO-16	Concrete	MH-4	6.05	MH-3	5.71		77.2	0.004	24.0	0.013
CO-17	Concrete	MH-5	7.10	MH-4	6.05		210.3	0.005	24.0	0.013
CO-19	Concrete	MH-12	6.57	MH-11	6.06		63.2	0.008	24.0	0.013
CO-20	Concrete	MH-13	6.76	MH-12	6.57		80.0	0.002	24.0	0.013
CO-23	Concrete	MH-8	6.92	MH-7	6.31		125.1	0.005	24.0	0.013
CO-25	Concrete	MH-10	5.73	MH-9	5.36		79.5	0.005	24.0	0.013
CO-26	Concrete	MH-11	6.06	MH-10	5.73		68.7	0.005	24.0	0.013
CO-28	Concrete	MH-15	-2.61	O-1	-3.62		207.5	0.005	30.0	0.013
CO-29	Concrete	MH-18	7.55	MH-17	6.95	60.0	39.1	0.010	24.0	0.013
CO-30	Concrete	MH-16	7.15	MH-17	6.95	20.0	56.0	0.010	24.0	0.013
CO-31	Concrete	MH-17	6.95	O-2	3.88		308.6	0.010	30.0	0.013
CO-32	Concrete	MH-19	6.45	O-3	5.88		56.9	0.010	24.0	0.013
CO-33	Concrete	MH-20	6.26	O-4	5.69		56.5	0.010	24.0	0.013
CO-34	Concrete	MH-21	6.26	O-5	0.00		58.6	0.107	24.0	0.013
CO-35	Concrete	MH-34	7.41	MH-22	7.21	20.0	27.5	0.010	24.0	0.013
CO-36	Concrete	MH-22	6.99	MH-23	6.71		27.5	0.010	24.0	0.013
CO-37	Concrete	MH-35	8.33	MH-22	6.99	18.6	26.3	0.072	24.0	0.013

FlexTable: Conduit Table

Current Time: 0.00 hours

Label	Material	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n
CO-38	Concrete	MH-23	6.71	MH-24	5.60	227.0	235.5	0.005	24.0	0.013
CO-39	Concrete	MH-24	5.60	MH-25	4.63		198.9	0.005	30.0	0.013
CO-40	Concrete	MH-25	4.63	MH-26	4.32		64.1	0.005	36.0	0.013
CO-41	Concrete	MH-26	4.32	MH-29	3.88		89.8	0.005	36.0	0.013
CO-42	Concrete	MH-29	3.88	MH-30	3.60		60.4	0.005	36.0	0.013
CO-43	Concrete	MH-30	3.60	O-6	3.06		110.1	0.005	42.0	0.013
CO-46	Concrete	CB-16	7.41	CB-15	6.66		75.6	0.010	24.0	0.013
CO-48	Concrete	MH-32	7.75	MH-31	7.15		60.0	0.010	30.0	0.013
CO-49	Concrete	MH-31	6.91	MH-30	6.76		14.7	0.010	30.0	0.013
CO-50	Concrete	MH-33	7.26	MH-31	6.91		35.1	0.010	30.0	0.013
CO-51	Concrete	CB-17	7.00	MH-36	6.73		55.4	0.005	24.0	0.013
CO-52	Concrete	MH-36	6.73	MH-37	6.25		97.8	0.005	36.0	0.013
CO-53	Concrete	MH-37	6.25	MH-38	5.76		100.7	0.005	36.0	0.013
CO-54	Concrete	MH-38	5.76	MH-39	5.28		97.2	0.005	36.0	0.013
CO-55	Concrete	MH-39	5.28	MH-40	4.57	145.0	167.4	0.005	36.0	0.013
CO-56	Concrete	MH-40	4.57	MH-41	3.82	153.0	175.2	0.005	36.0	0.013
CO-57	Concrete	CB-18	7.00	MH-37	6.68		64.7	0.005	24.0	0.013
CO-58	Concrete	CB-19	7.00	MH-38	6.63		74.8	0.005	24.0	0.013
CO-59	Concrete	CB-20	6.91	MH-39	6.49		84.9	0.005	24.0	0.013
CO-60	Concrete	CB-21	6.89	MH-44	6.60		57.9	0.005	24.0	0.013
CO-61	Concrete	MH-44	6.60	MH-45	6.02		119.8	0.005	24.0	0.013
CO-62	Concrete	MH-45	6.02	MH-46	5.50		110.2	0.005	24.0	0.013
CO-63	Concrete	MH-46	5.50	MH-47	4.98		109.4	0.005	24.0	0.013
CO-64	Concrete	MH-47	4.98	MH-48	4.73		55.4	0.004	24.0	0.013
CO-65	Concrete	MH-48	4.73	O-11	4.27		98.6	0.005	24.0	0.013
CO-66	Concrete	CB-25	6.92	MH-49	6.26		70.3	0.009	24.0	0.013
CO-67	Concrete	MH-49	6.26	MH-48	5.99		55.5	0.005	24.0	0.013
CO-68	Concrete	CB-24	6.92	MH-47	6.21		67.3	0.011	24.0	0.013
CO-69	Concrete	CB-23	6.93	MH-46	6.23		71.1	0.010	24.0	0.013
CO-70	Concrete	CB-22	6.93	MH-45	6.24		68.7	0.010	24.0	0.013
CO-71	Concrete	CB-26	6.91	MH-50	6.19		71.9	0.010	24.0	0.013

FlexTable: Conduit Table

Current Time: 0.00 hours

Label	Material	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n
CO-72	Concrete	MH-50	6.19	MH-51	5.15		109.6	0.010	24.0	0.013
CO-73	Concrete	MH-51	5.15	MH-52	4.57		54.8	0.011	24.0	0.013
CO-74	Concrete	MH-52	4.57	O-10	3.77		83.4	0.010	24.0	0.013
CO-75	Concrete	CB-29	6.91	MH-54	6.17		73.6	0.010	24.0	0.013
CO-76	Concrete	MH-54	6.17	MH-53	5.10		110.9	0.010	24.0	0.013
CO-77	Concrete	MH-53	5.10	MH-52	4.57		55.0	0.010	24.0	0.013
CO-78	Concrete	CB-28	6.91	MH-53	6.18		73.1	0.010	24.0	0.013
CO-79	Concrete	CB-27	6.91	MH-51	6.18		72.8	0.010	24.0	0.013
CO-80	Concrete	MH-41	3.75	MH-42	3.65	20.0	60.2	0.005	48.0	0.013
CO-81	Concrete	MH-42	3.65	MH-43	2.66	202.0	230.6	0.005	48.0	0.013
CO-82	Concrete	MH-43	2.66	MH-60	1.42	251.0	187.9	0.005	48.0	0.013
CO-83	Concrete	MH-60	1.42	O-7	0.80		123.3	0.005	48.0	0.013
CO-84	Concrete	MH-55	6.59	MH-56	5.88	153.0	158.7	0.005	36.0	0.013
CO-85	Concrete	MH-56	5.88	MH-57	4.90	202.0	213.2	0.005	36.0	0.013
CO-86	Concrete	MH-57	4.90	MH-58	3.91	201.0	185.9	0.005	42.0	0.013
CO-87	Concrete	MH-58	3.91	MH-59	3.71		47.4	0.004	48.0	0.013
CO-88	Concrete	MH-59	3.71	O-9	3.45		52.5	0.005	48.0	0.013
CO-89	Concrete	MH-61	6.03	MH-62	4.82		275.4	0.004	42.0	0.013
CO-90	Concrete	MH-62	4.82	MH-63	3.60		226.0	0.005	48.0	0.013
CO-91	Concrete	MH-63	3.60	O-8	3.00		125.4	0.005	48.0	0.013
CO-92	Concrete	MH-65	7.00	MH-41	6.80	20.0	24.0	0.010	30.0	0.013
CO-93	Concrete	MH-64	3.75	MH-42	3.65	20.0	23.6	0.005	30.0	0.013
CO-94	Concrete	MH-66	6.66	MH-43	6.46	20.0	27.2	0.010	30.0	0.013
CO-95	Concrete	MH-67	6.66	MH-43	6.46	20.0	28.5	0.010	30.0	0.013
CO-96	Concrete	MH-68	7.03	MH-60	6.83	20.0	27.7	0.010	30.0	0.013
CO-97	Concrete	MH-69	7.03	MH-60	6.84	20.0	23.8	0.010	30.0	0.013
CO-98	Concrete	MH-70	6.23	MH-61	6.03		30.6	0.007	30.0	0.013
CO-99	Concrete	MH-71	6.08	MH-61	6.03		35.2	0.001	30.0	0.013
CO-100	Concrete	MH-72	6.22	MH-62	6.02	20.0	36.6	0.010	30.0	0.013
CO-101	Concrete	MH-73	6.22	MH-62	6.02	20.0	27.5	0.010	30.0	0.013
CO-102	Concrete	MH-75	6.63	MH-63	6.43	20.0	35.7	0.010	30.0	0.013

FlexTable: Conduit Table

Current Time: 0.00 hours

Label	Material	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n
CO-103	Concrete	MH-74	6.48	MH-63	6.43	20.0	28.9	0.003	30.0	0.013
CO-104	Concrete	MH-76	6.79	MH-55	6.59	20.0	33.5	0.010	30.0	0.013
CO-105	Concrete	MH-77	6.49	MH-56	6.29	20.0	31.8	0.010	30.0	0.013
CO-106	Concrete	MH-78	6.49	MH-57	6.29	20.0	33.2	0.010	30.0	0.013
CO-107	Concrete	MH-79	6.49	MH-58	6.29	20.0	31.9	0.010	30.0	0.013
CO-108	Concrete	MH-80	6.02	MH-81	4.80		254.6	0.005	42.0	0.013
CO-109	Concrete	MH-81	4.80	MH-82	3.56		252.0	0.005	48.0	0.013
CO-110	Concrete	MH-82	3.56	O-12	2.95		126.1	0.005	48.0	0.013
CO-111	Concrete	MH-94	6.22	MH-80	6.02	20.0	39.5	0.010	30.0	0.013
CO-112	Concrete	MH-95	6.22	MH-80	6.02	20.0	41.8	0.010	30.0	0.013
CO-113	Concrete	MH-96	6.16	MH-81	5.96	20.0	46.4	0.010	30.0	0.013
CO-114	Concrete	MH-97	6.22	MH-81	6.02	20.0	42.2	0.010	30.0	0.013
CO-115	Concrete	MH-98	6.55	MH-82	6.35	20.0	43.6	0.010	30.0	0.013
CO-116	Concrete	MH-99	6.52	MH-82	6.32	20.0	55.2	0.010	30.0	0.013
CO-117	Concrete	MH-100	6.25	MH-83	6.05	20.0	45.3	0.010	30.0	0.013
CO-118	Concrete	MH-83	6.05	MH-84	4.97		221.8	0.005	36.0	0.013
CO-120	Concrete	MH-84	4.97	MH-85	3.99		193.6	0.005	42.0	0.013
CO-121	Concrete	MH-85	3.99	MH-86	3.19		176.2	0.005	48.0	0.013
CO-122	Concrete	MH-86	3.19	O-13	2.89		45.9	0.006	48.0	0.013
CO-123	Concrete	MH-101	6.25	MH-83	6.05	20.0	47.9	0.010	30.0	0.013
CO-124	Concrete	MH-102	6.35	MH-84	6.15	20.0	46.2	0.010	30.0	0.013
CO-125	Concrete	MH-103	6.35	MH-84	6.15	20.0	40.7	0.010	30.0	0.013
CO-126	Concrete	MH-104	6.35	MH-85	6.15	20.0	42.8	0.010	30.0	0.013
CO-127	Concrete	MH-105	6.35	MH-85	6.15	20.0	50.2	0.010	30.0	0.013
CO-128	Concrete	MH-87	6.16	MH-88	4.94		251.6	0.005	42.0	0.013
CO-129	Concrete	MH-88	4.94	MH-89	4.25	141.0	244.1	0.005	48.0	0.013
CO-130	Concrete	MH-89	4.25	O-14	3.09		134.9	0.009	48.0	0.013
CO-131	Concrete	MH-90	6.30	MH-91	5.34		196.9	0.005	36.0	0.013
CO-132	Concrete	MH-91	5.34	MH-92	4.35		201.1	0.005	42.0	0.013
CO-133	Concrete	MH-92	4.35	MH-93	3.56		166.4	0.005	48.0	0.013
CO-134	Concrete	MH-93	3.56	O-15	3.26		68.2	0.004	48.0	0.013

FlexTable: Conduit Table

Current Time: 0.00 hours

Label	Material	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n
CO-135	Concrete	MH-107	6.36	MH-87	6.16		29.8	0.007	30.0	0.013
CO-136	Concrete	MH-108	6.36	MH-87	6.16		23.4	0.009	30.0	0.013
CO-137	Concrete	MH-109	6.36	MH-88	6.16	20.0	35.6	0.010	30.0	0.013
CO-138	Concrete	MH-110	6.36	MH-88	6.16	20.0	27.1	0.010	30.0	0.013
CO-139	Concrete	MH-111	6.75	MH-89	6.55	20.0	41.0	0.010	30.0	0.013
CO-140	Concrete	MH-112	6.75	MH-89	6.55	20.0	27.3	0.010	30.0	0.013
CO-141	Concrete	MH-113	6.50	MH-90	6.30	20.0	33.1	0.010	30.0	0.013
CO-142	Concrete	MH-114	6.50	MH-90	6.30	20.0	32.9	0.010	30.0	0.013
CO-143	Concrete	MH-115	6.49	MH-91	6.29	20.0	33.0	0.010	30.0	0.013
CO-144	Concrete	MH-116	6.49	MH-91	6.29	20.0	30.7	0.010	30.0	0.013
CO-145	Concrete	MH-117	6.26	MH-92	6.06	20.0	26.4	0.010	30.0	0.013
CO-146	Concrete	MH-118	6.49	MH-92	6.29	20.0	34.1	0.010	30.0	0.013
CO-148	Concrete	MH-120	8.00	MH-119	7.80	20.0	19.7	0.010	24.0	0.013
CO-149	Concrete	MH-121	6.72	MH-117	6.26		44.1	0.010	24.0	0.013
CO-152	Concrete	CB-15	6.66	MH-27	6.48		19.6	0.009	24.0	0.013
CO-153	Concrete	MH-27	6.18	MH-29	5.98		20.0	0.010	30.0	0.013
CO-22(1)	Concrete	MH-124	4.99	MH-6	4.39		120.0	0.005	30.0	0.013
CO-22(2)	Concrete	MH-7	6.31	MH-124	5.77		107.8	0.005	24.0	0.013
CO-154	Concrete	MH-9	5.36	MH-124	4.99		74.0	0.005	24.0	0.013
CO-155	Concrete	MH-6	4.39	MH-125	3.50		180.5	0.005	30.0	0.013
CO-156	Concrete	MH-1	5.00	MH-125	4.72		60.7	0.005	30.0	0.013
CO-157	Concrete	MH-125	3.50	MH-126	0.34		635.2	0.005	36.0	0.013
CO-158	Concrete	MH-126	0.34	MH-127	-1.50		366.3	0.005	36.0	0.013
CO-159	Concrete	MH-127	-1.50	O-16	-1.55	10.0	29.0	0.005	36.0	0.013
CO-160	Concrete	MH-123	8.00	MH-122	7.80		19.6	0.010	24.0	0.013
CO-161	Concrete	MH-122	7.80	MH-93	7.55		25.3	0.010	24.0	0.013
CO-162	Concrete	MH-119	7.80	MH-86	7.35		44.8	0.010	24.0	0.013

FlexTable: Catch Basin Table

Current Time: 0.00 hours

Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Length (ft)	Structure Type	Width (ft)	Inlet Type	Capture Efficiency (Calculated) (%)	Hydraulic Grade Line (In) (ft)	Is Ever Overflowing?
CB-1	12.87	7.53	16.00	Box Structure	8.00	Full Capture	100.0	7.53	False
CB-2	12.81	7.54	16.00	Box Structure	8.00	Full Capture	100.0	7.54	False
CB-3	12.87	7.54	16.00	Box Structure	8.00	Full Capture	100.0	7.54	False
CB-4	12.94	7.55	16.00	Box Structure	8.00	Full Capture	100.0	7.55	False
CB-5	12.78	7.35	16.00	Box Structure	8.00	Full Capture	100.0	7.35	False
CB-6	13.21	7.22	16.00	Box Structure	8.00	Full Capture	100.0	7.22	False
CB-7	12.48	7.07	16.00	Box Structure	8.00	Full Capture	100.0	7.07	False
CB-8	12.84	7.19	16.00	Box Structure	8.00	Full Capture	100.0	7.19	False
CB-9	12.70	7.41	16.00	Box Structure	8.00	Full Capture	100.0	7.41	False
CB-10	12.62	7.28	16.00	Box Structure	8.00	Full Capture	100.0	7.28	False
CB-11	12.04	6.82	16.00	Box Structure	8.00	Full Capture	100.0	6.82	False
CB-12	12.05	6.84	16.00	Box Structure	8.00	Full Capture	100.0	6.84	False
CB-15	12.70	6.66	6.00	Box Structure	6.00	Full Capture	100.0	6.66	False
CB-16	12.69	7.41	6.00	Box Structure	6.00	Full Capture	100.0	7.41	False
CB-17	12.31	7.00	16.00	Box Structure	8.00	Full Capture	100.0	7.00	False
CB-18	12.25	7.00	16.00	Box Structure	8.00	Full Capture	100.0	7.00	False
CB-19	12.20	7.00	16.00	Box Structure	8.00	Full Capture	100.0	7.00	False
CB-20	12.16	6.91	16.00	Box Structure	8.00	Full Capture	100.0	6.91	False
CB-21	12.14	6.89	16.00	Box Structure	8.00	Full Capture	100.0	6.89	False
CB-22	12.18	6.93	16.00	Box Structure	8.00	Full Capture	100.0	6.93	False
CB-23	12.18	6.93	16.00	Box Structure	8.00	Full Capture	100.0	6.93	False
CB-24	12.17	6.92	16.00	Box Structure	8.00	Full Capture	100.0	6.92	False
CB-25	12.17	6.92	16.00	Box Structure	8.00	Full Capture	100.0	6.92	False
CB-26	12.16	6.91	16.00	Box Structure	8.00	Full Capture	100.0	6.91	False
CB-27	12.17	6.91	6.00	Box Structure	6.00	Full Capture	100.0	6.91	False
CB-28	12.16	6.91	16.00	Box Structure	8.00	Full Capture	100.0	6.91	False
CB-29	12.16	6.91	16.00	Box Structure	8.00	Full Capture	100.0	6.91	False

FlexTable: Manhole Table

Current Time: 0.00 hours

Label	Length (ft)	Width (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Hydraulic Grade Line (Out) (ft)	Structure Type	Hydraulic Grade Line (In) (ft)	Is Ever Overflowing?
MH-1	6.00	6.00	12.95	5.00	5.00	Box Structure	5.00	False
MH-2	6.00	6.00	12.95	5.33	5.33	Box Structure	5.33	False
MH-3	6.00	6.00	12.95	5.71	5.70	Box Structure	5.71	False
MH-4	6.00	6.00	13.72	6.05	6.05	Box Structure	6.05	False
MH-5	6.00	6.00	13.00	7.10	7.10	Box Structure	7.10	False
MH-6	6.00	6.00	12.81	4.39	4.39	Box Structure	4.39	False
MH-7	6.00	6.00	12.57	6.31	6.31	Box Structure	6.31	False
MH-8	6.00	6.00	12.68	6.92	6.92	Box Structure	6.92	False
MH-9	6.00	6.00	13.51	5.36	5.36	Box Structure	5.36	False
MH-10	6.00	6.00	13.00	5.73	5.73	Box Structure	5.73	False
MH-11	6.00	6.00	12.25	6.06	6.06	Box Structure	6.06	False
MH-12	6.00	6.00	12.14	6.57	6.57	Box Structure	6.57	False
MH-13	6.00	6.00	12.25	6.76	6.76	Box Structure	6.76	False
MH-16	6.00	6.00	12.64	7.15	7.15	Box Structure	8.65	False
MH-17	6.00	6.00	12.45	6.95	6.95	Box Structure	6.95	False
MH-18	6.00	6.00	12.83	7.55	7.55	Box Structure	9.00	False
MH-19	6.00	6.00	11.70	6.45	6.45	Box Structure	8.66	False
MH-20	6.00	6.00	11.51	6.26	6.26	Box Structure	8.07	False
MH-21	6.00	6.00	12.45	6.26	6.26	Box Structure	8.08	False
MH-22	6.00	6.00	12.49	6.99	6.99	Box Structure	7.21	False
MH-23	6.00	6.00	12.62	6.71	6.71	Box Structure	6.71	False
MH-24	6.00	6.00	12.61	5.60	5.60	Box Structure	5.60	False
MH-25	6.00	6.00	13.60	4.63	4.63	Box Structure	4.63	False
MH-26	6.00	6.00	13.90	4.32	4.32	Box Structure	4.32	False
MH-27	6.00	6.00	12.64	6.18	6.18	Box Structure	6.48	False
MH-29	6.00	6.00	12.85	3.88	3.88	Box Structure	3.88	False
MH-30	6.00	6.00	12.61	3.60	3.60	Box Structure	3.60	False
MH-31	6.00	6.00	12.82	6.91	6.91	Box Structure	7.15	False
MH-32	6.00	6.00	13.00	7.75	7.75	Box Structure	7.75	False
MH-33	6.00	6.00	12.51	7.26	7.26	Box Structure	7.26	False
MH-34	6.00	6.00	12.66	7.41	7.41	Box Structure	8.25	False

FlexTable: Manhole Table

Current Time: 0.00 hours

Label	Length (ft)	Width (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Hydraulic Grade Line (Out) (ft)	Structure Type	Hydraulic Grade Line (In) (ft)	Is Ever Overflowing?
MH-35	6.00	6.00	12.33	8.33	8.33	Box Structure	8.50	False
MH-36	6.00	6.00	12.71	6.73	6.73	Box Structure	6.73	False
MH-37	6.00	6.00	12.71	6.25	6.24	Box Structure	6.25	False
MH-38	6.00	6.00	12.72	5.76	5.76	Box Structure	5.76	False
MH-39	6.00	6.00	12.73	5.28	5.28	Box Structure	5.28	False
MH-40	6.00	6.00	12.87	4.57	4.57	Box Structure	4.57	False
MH-41	6.00	6.00	12.29	3.75	3.75	Box Structure	3.82	False
MH-42	6.00	6.00	12.29	3.65	3.65	Box Structure	3.65	False
MH-43	6.00	6.00	11.87	2.66	2.66	Box Structure	2.66	False
MH-44	6.00	6.00	12.54	6.60	6.60	Box Structure	6.60	False
MH-45	6.00	6.00	12.70	6.02	6.02	Box Structure	6.02	False
MH-46	6.00	6.00	12.70	5.50	5.50	Box Structure	5.50	False
MH-47	6.00	6.00	12.70	4.98	4.98	Box Structure	4.98	False
MH-48	6.00	6.00	12.80	4.73	4.73	Box Structure	4.73	False
MH-49	6.00	6.00	12.70	6.26	6.26	Box Structure	6.26	False
MH-50	6.00	6.00	12.70	6.19	6.19	Box Structure	6.19	False
MH-51	6.00	6.00	12.70	5.15	5.15	Box Structure	5.15	False
MH-52	6.00	6.00	12.80	4.57	4.57	Box Structure	4.57	False
MH-53	6.00	6.00	12.70	5.10	5.09	Box Structure	5.10	False
MH-54	6.00	6.00	12.70	6.17	6.17	Box Structure	6.17	False
MH-55	6.00	6.00	12.00	6.59	6.59	Box Structure	6.59	False
MH-56	6.00	6.00	11.70	5.88	5.88	Box Structure	5.88	False
MH-57	6.00	6.00	11.70	4.90	4.89	Box Structure	4.90	False
MH-58	6.00	6.00	11.70	3.91	3.91	Box Structure	3.91	False
MH-59	6.00	6.00	11.94	3.71	3.71	Box Structure	3.71	False
MH-60	6.00	6.00	12.25	1.42	1.42	Box Structure	1.42	False
MH-61	6.00	6.00	11.44	6.03	6.03	Box Structure	6.03	False
MH-62	6.00	6.00	11.43	4.82	4.82	Box Structure	4.82	False
MH-63	6.00	6.00	11.84	3.60	3.60	Box Structure	3.60	False
MH-64	6.00	6.00	12.33	3.75	3.75	Box Structure	9.19	False
MH-65	6.00	6.00	12.30	7.00	7.00	Box Structure	8.29	False

FlexTable: Manhole Table

Current Time: 0.00 hours

Label	Length (ft)	Width (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Hydraulic Grade Line (Out) (ft)	Structure Type	Hydraulic Grade Line (In) (ft)	Is Ever Overflowing?
MH-66	6.00	6.00	11.91	6.66	6.66	Box Structure	8.48	False
MH-67	6.00	6.00	11.91	6.66	6.66	Box Structure	8.09	False
MH-68	6.00	6.00	12.28	7.03	7.03	Box Structure	8.23	False
MH-69	6.00	6.00	12.28	7.03	7.03	Box Structure	8.09	False
MH-70	6.00	6.00	11.48	6.23	6.23	Box Structure	7.59	False
MH-71	6.00	6.00	11.48	6.08	6.07	Box Structure	8.07	False
MH-72	6.00	6.00	11.47	6.22	6.22	Box Structure	8.10	False
MH-73	6.00	6.00	11.47	6.22	6.22	Box Structure	7.55	False
MH-74	6.00	6.00	11.88	6.48	6.48	Box Structure	8.52	False
MH-75	6.00	6.00	11.88	6.63	6.63	Box Structure	8.09	False
MH-76	6.00	6.00	12.04	6.79	6.79	Box Structure	8.09	False
MH-77	6.00	6.00	11.75	6.49	6.49	Box Structure	7.61	False
MH-78	6.00	6.00	11.74	6.49	6.49	Box Structure	7.63	False
MH-79	6.00	6.00	11.74	6.49	6.49	Box Structure	7.65	False
MH-80	6.00	6.00	11.37	6.02	6.02	Box Structure	6.02	False
MH-81	6.00	6.00	11.37	4.80	4.80	Box Structure	4.80	False
MH-82	6.00	6.00	11.75	3.56	3.56	Box Structure	3.56	False
MH-83	6.00	6.00	11.40	6.05	6.05	Box Structure	6.05	False
MH-84	6.00	6.00	11.50	4.97	4.97	Box Structure	4.97	False
MH-85	6.00	6.00	11.50	3.99	3.98	Box Structure	3.99	False
MH-86	6.00	6.00	11.69	3.19	3.19	Box Structure	3.19	False
MH-87	6.00	6.00	11.51	6.16	6.16	Box Structure	6.16	False
MH-88	6.00	6.00	11.51	4.94	4.94	Box Structure	4.94	False
MH-89	6.00	6.00	11.90	4.25	4.24	Box Structure	4.25	False
MH-90	6.00	6.00	11.65	6.30	6.30	Box Structure	6.30	False
MH-91	6.00	6.00	11.64	5.34	5.34	Box Structure	5.34	False
MH-92	6.00	6.00	11.64	4.35	4.35	Box Structure	4.35	False
MH-93	6.00	6.00	11.83	3.56	3.56	Box Structure	3.56	False
MH-94	6.00	6.00	11.47	6.22	6.22	Box Structure	8.04	False
MH-95	6.00	6.00	11.47	6.22	6.22	Box Structure	7.92	False
MH-96	6.00	6.00	11.41	6.16	6.16	Box Structure	8.00	False

FlexTable: Manhole Table

Current Time: 0.00 hours

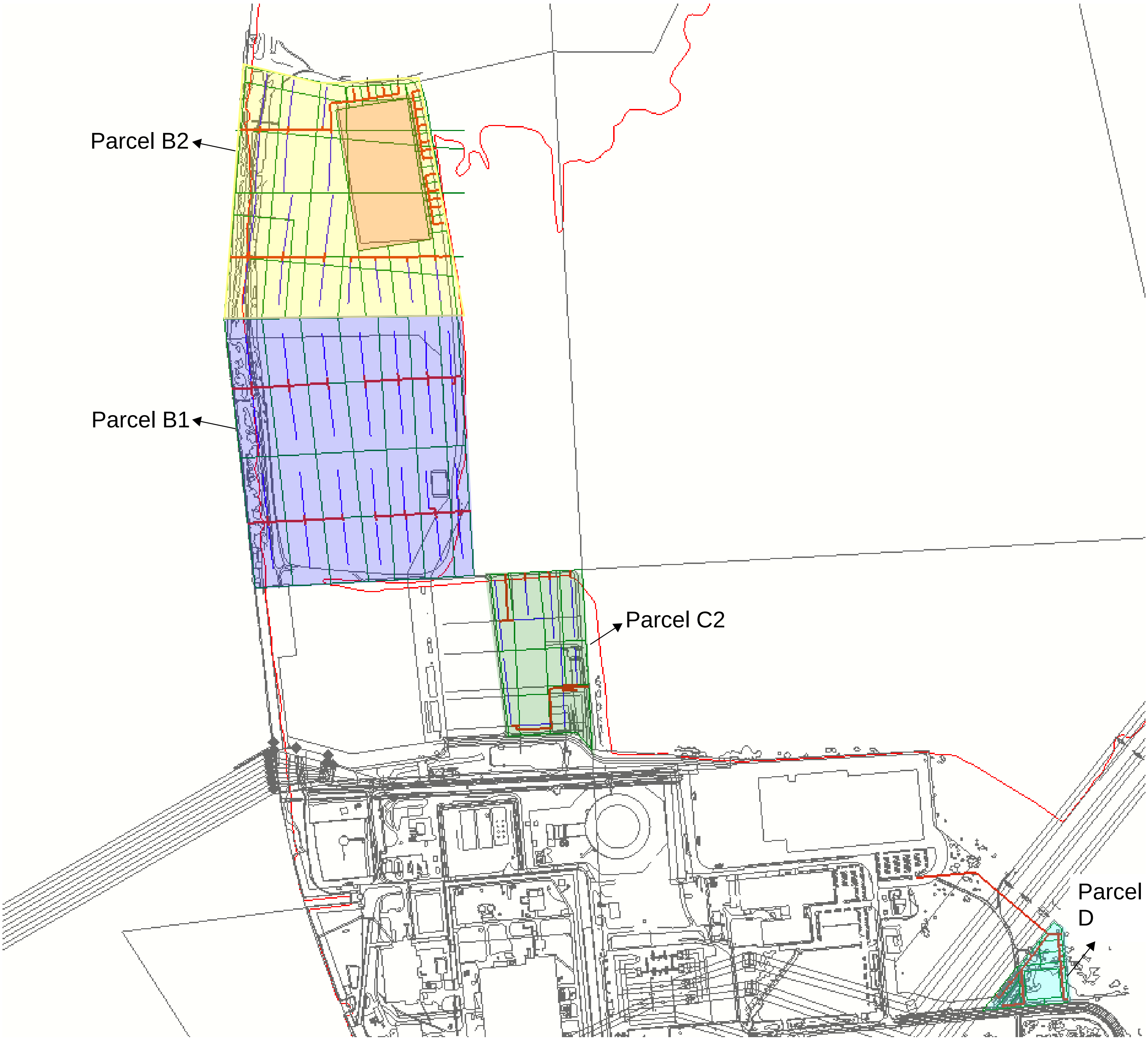
Label	Length (ft)	Width (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Hydraulic Grade Line (Out) (ft)	Structure Type	Hydraulic Grade Line (In) (ft)	Is Ever Overflowing?
MH-97	6.00	6.00	11.47	6.22	6.22	Box Structure	7.92	False
MH-98	6.00	6.00	11.80	6.55	6.55	Box Structure	8.45	False
MH-99	6.00	6.00	11.77	6.52	6.52	Box Structure	8.28	False
MH-100	6.00	6.00	11.50	6.25	6.25	Box Structure	8.59	False
MH-101	6.00	6.00	11.50	6.25	6.25	Box Structure	8.42	False
MH-102	6.00	6.00	11.60	6.35	6.35	Box Structure	8.63	False
MH-103	6.00	6.00	11.60	6.35	6.35	Box Structure	8.42	False
MH-104	6.00	6.00	11.60	6.35	6.35	Box Structure	8.67	False
MH-105	6.00	6.00	11.60	6.35	6.35	Box Structure	8.42	False
MH-107	6.00	6.00	11.61	6.36	6.36	Box Structure	8.57	False
MH-108	6.00	6.00	11.61	6.36	6.36	Box Structure	8.57	False
MH-109	6.00	6.00	11.61	6.36	6.36	Box Structure	8.57	False
MH-110	6.00	6.00	11.61	6.36	6.36	Box Structure	8.57	False
MH-111	6.00	6.00	12.00	6.75	6.75	Box Structure	8.57	False
MH-112	6.00	6.00	12.00	6.75	6.75	Box Structure	8.57	False
MH-113	6.00	6.00	11.75	6.50	6.50	Box Structure	8.57	False
MH-114	6.00	6.00	11.75	6.50	6.50	Box Structure	8.57	False
MH-115	6.00	6.00	11.74	6.49	6.49	Box Structure	8.57	False
MH-116	6.00	6.00	11.74	6.49	6.49	Box Structure	8.57	False
MH-117	6.00	6.00	11.87	6.26	6.26	Box Structure	6.26	False
MH-118	6.00	6.00	11.74	6.49	6.49	Box Structure	8.57	False
MH-119	6.00	6.00	11.79	7.80	7.80	Box Structure	7.80	False
MH-120	6.00	6.00	11.79	8.00	8.00	Box Structure	8.42	False
MH-121	6.00	6.00	11.97	6.72	6.72	Box Structure	8.71	False
MH-122	6.00	6.00	11.93	7.80	7.80	Box Structure	7.80	False
MH-123	6.00	6.00	11.93	8.00	8.00	Box Structure	8.57	False
MH-124	3.00	3.00	12.68	4.99	4.99	Box Structure	5.77	False
MH-125	3.00	3.00	13.34	3.50	3.50	Box Structure	4.72	False
MH-126	3.00	3.00	15.00	0.34	0.34	Box Structure	0.34	False
MH-127	3.00	3.00	13.00	-1.50	-1.50	Box Structure	-1.50	False

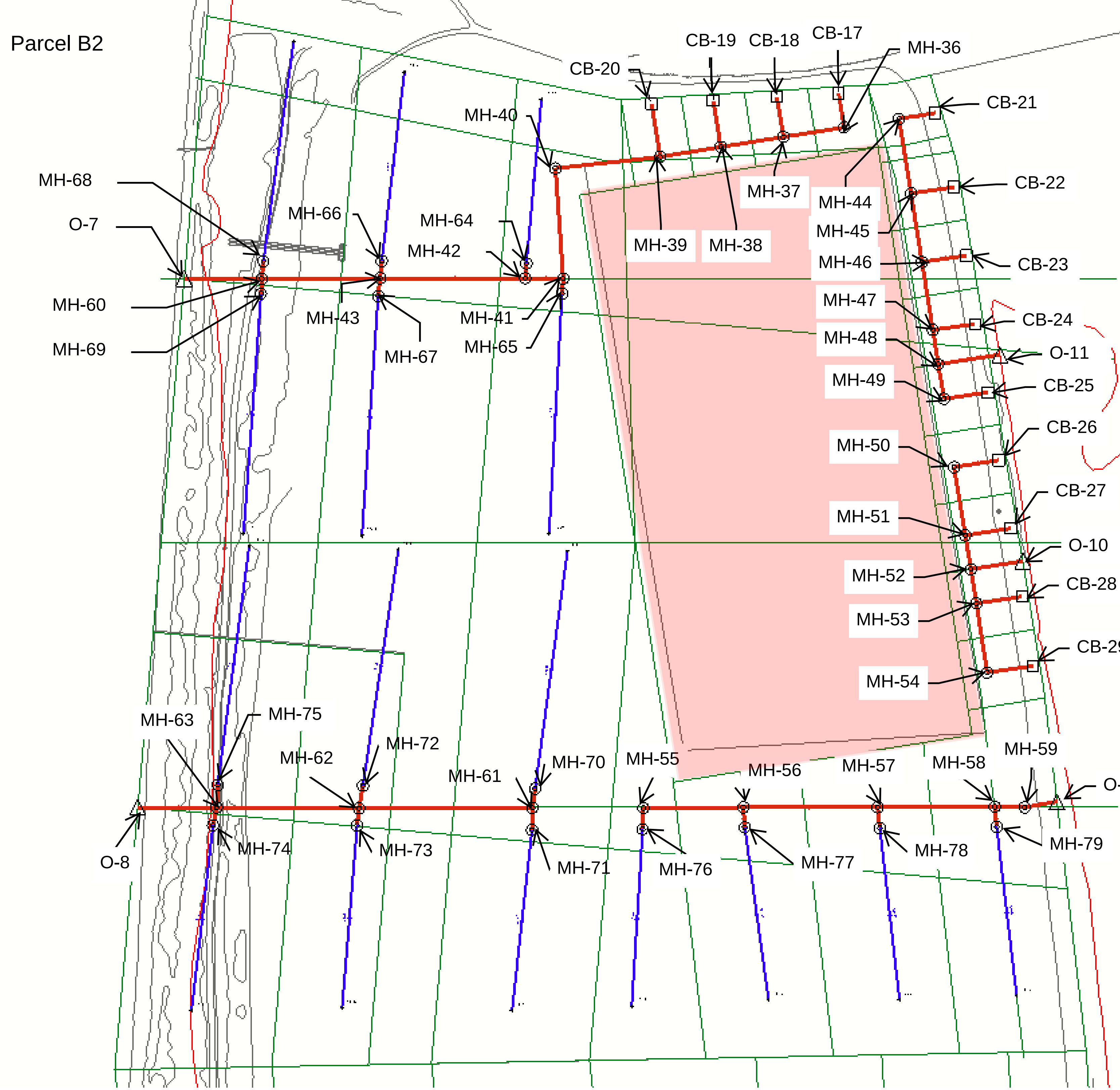
FlexTable: Outfall Table

Current Time: 0.00 hours

Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Boundary Condition Type	Tidal Gate?	Hydraulic Grade (ft)
O-2	3.88	3.88	Free Outfall	False	3.88
O-3	5.88	5.88	Free Outfall	False	5.88
O-4	5.69	5.69	Free Outfall	False	5.69
O-5	5.50	5.50	Free Outfall	False	0.00
O-6	3.06	3.06	Free Outfall	False	3.06
O-7	0.80	0.80	Free Outfall	True	0.80
O-8	3.00	3.00	Free Outfall	True	3.00
O-9	3.45	3.45	Free Outfall	False	3.45
O-10	3.77	3.77	Free Outfall	False	3.77
O-11	4.27	4.27	Free Outfall	False	4.26
O-12	2.95	2.95	Free Outfall	False	2.95
O-13	2.89	2.89	Free Outfall	False	2.89
O-14	3.09	3.09	Free Outfall	False	3.09
O-15	3.26	3.26	Free Outfall	False	3.26
O-1	13.00	-1.55	Free Outfall	False	-1.55

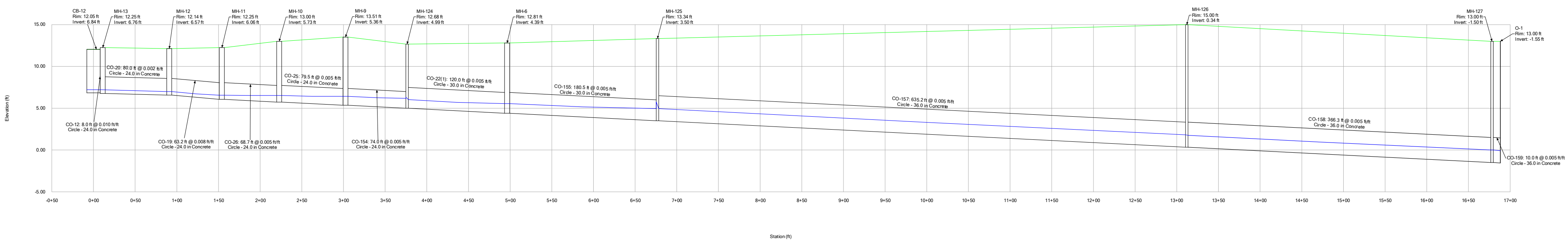
Sewer Gems - Site Layout



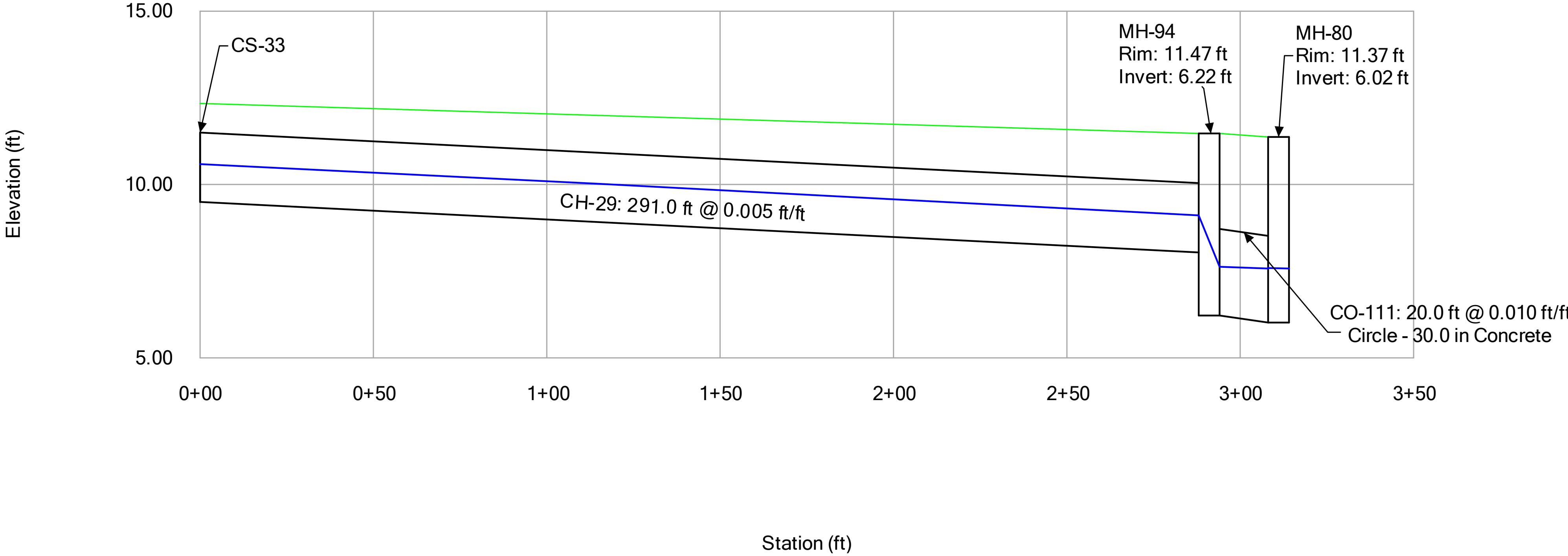

Parcel B2
CB-20
CB-19
CB-18
CB-17
MH-36
CB-21
MH-40
MH-68
O-7
MH-66
MH-64
MH-42
MH-37
MH-44
MH-45
MH-39
MH-38
CB-22
MH-46
CB-23
MH-60
MH-69
MH-43
MH-67
MH-41
MH-65
MH-47
CB-24
MH-48
O-11
MH-49
CB-25
CB-26
MH-50
CB-27
MH-51
O-10
MH-52
CB-28
MH-53
CB-29
MH-54
MH-63
MH-75
MH-72
MH-62
MH-61
MH-70
MH-55
MH-56
MH-57
MH-58
MH-59
O-9
O-8
MH-74
MH-73
MH-71
MH-76
MH-77
MH-78
MH-79

Profile Report

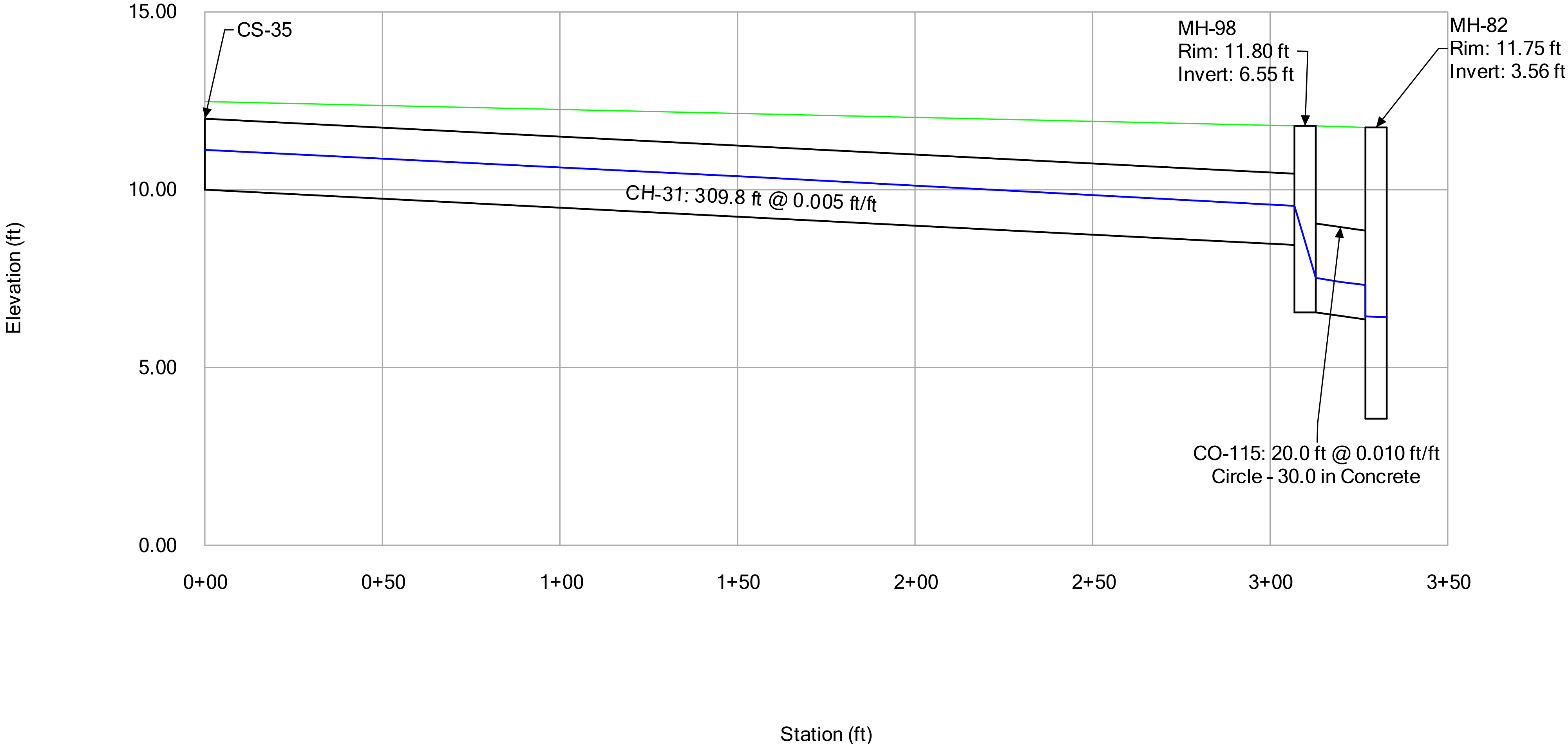
Engineering Profile - CB-12 to O-16 (SitewidePermit-STORM_rev1.stsw)



Profile Report
Engineering Profile - CS-33 to MH-80 (SitewidePermit-STORM_rev1.stsw)

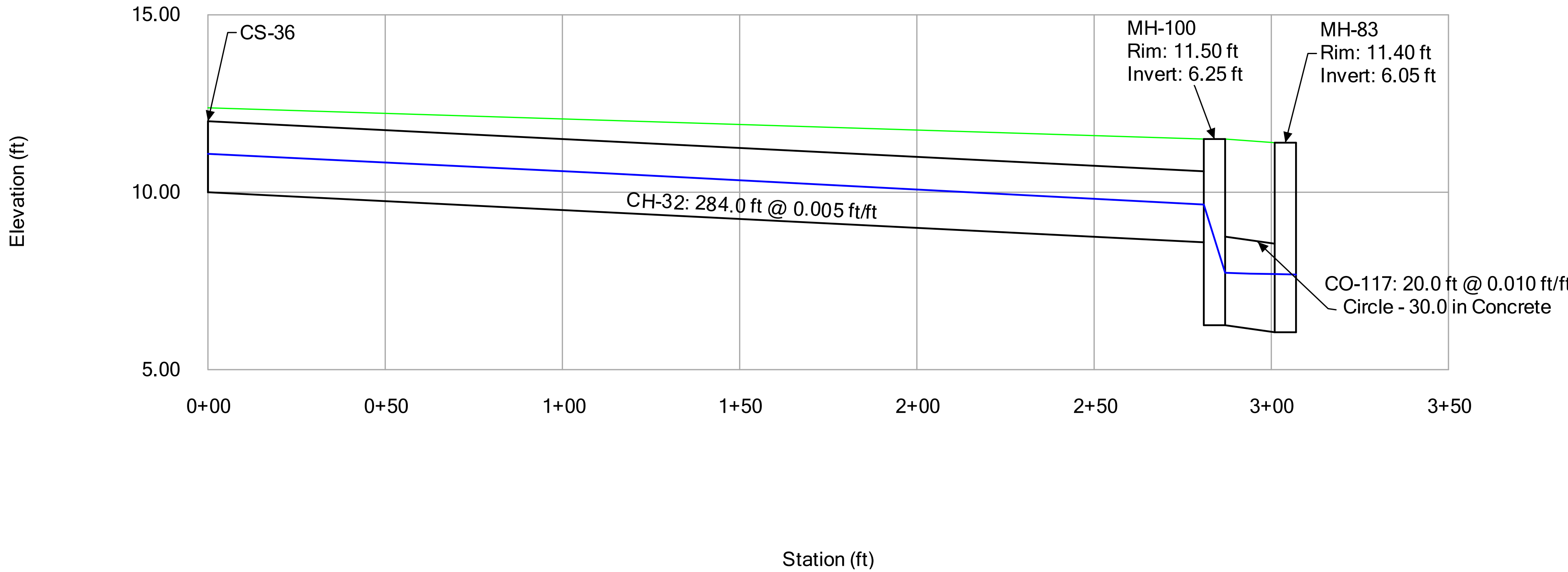


Profile Report
Engineering Profile - CS-35 to MH-82 (SitewidePermit-STORM_rev1.stsw)



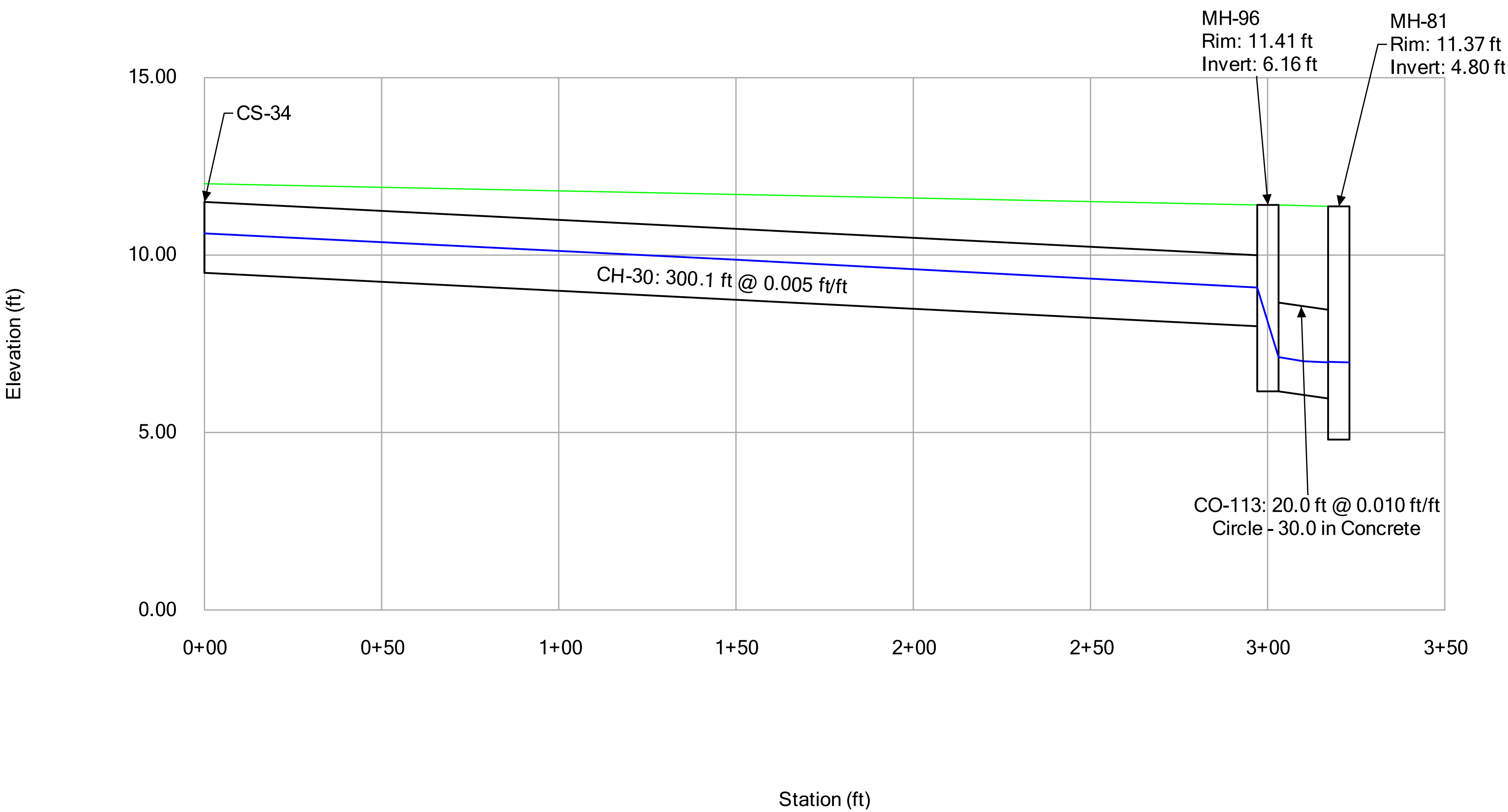
Profile Report

Engineering Profile - CS-36 to MH-83 (SitewidePermit-STORM_rev1.stsw)

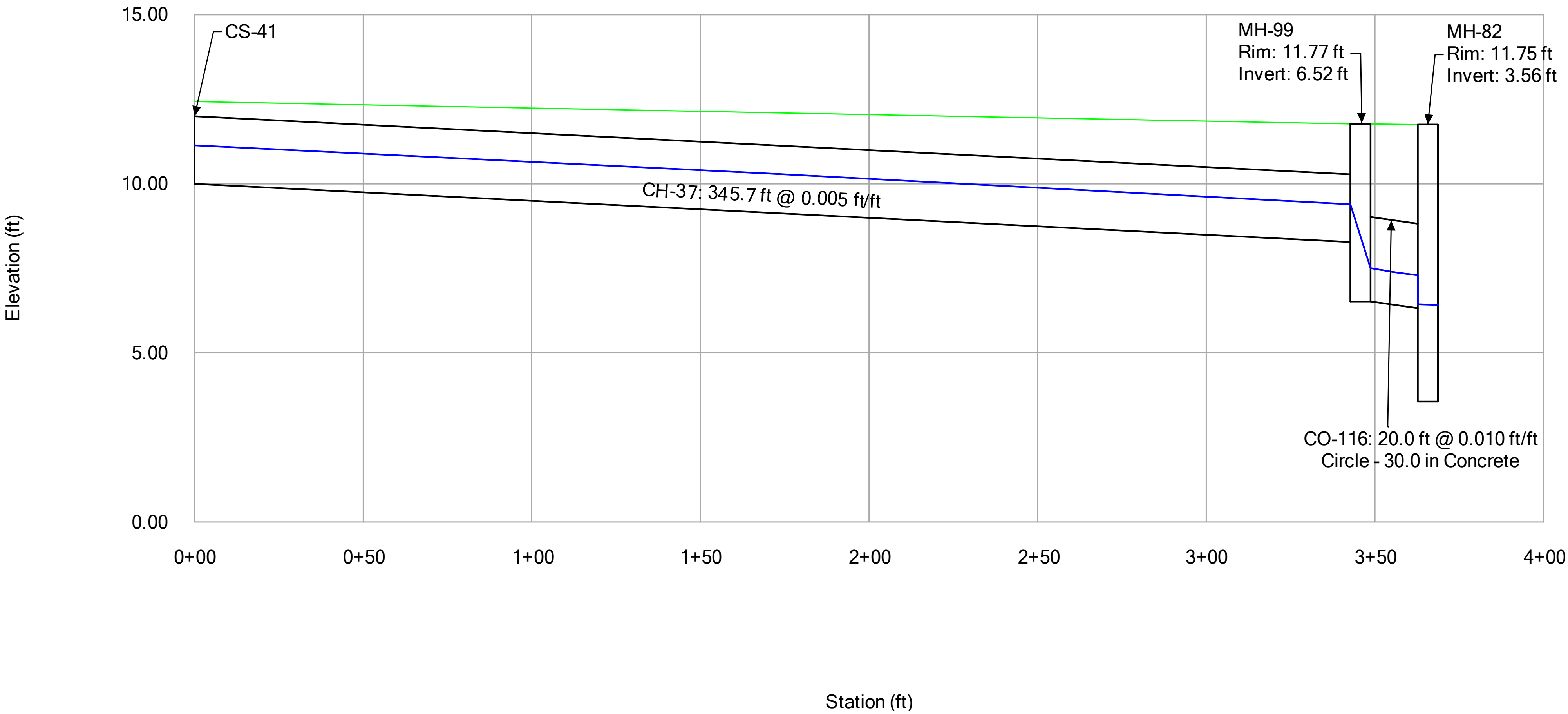


Profile Report

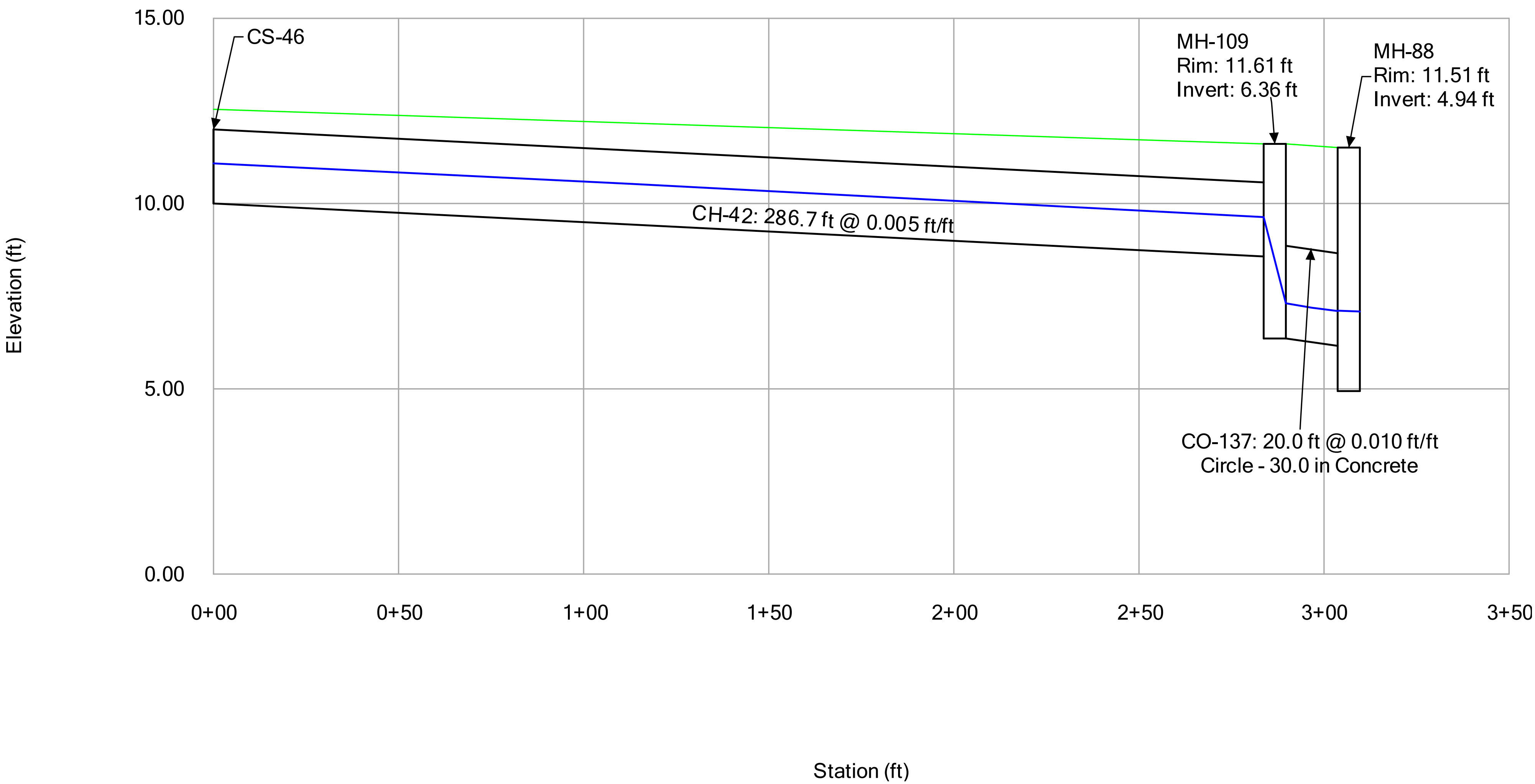
Engineering Profile - CS-34 to MH-81 (SitewidePermit-STORM_rev1.stsw)



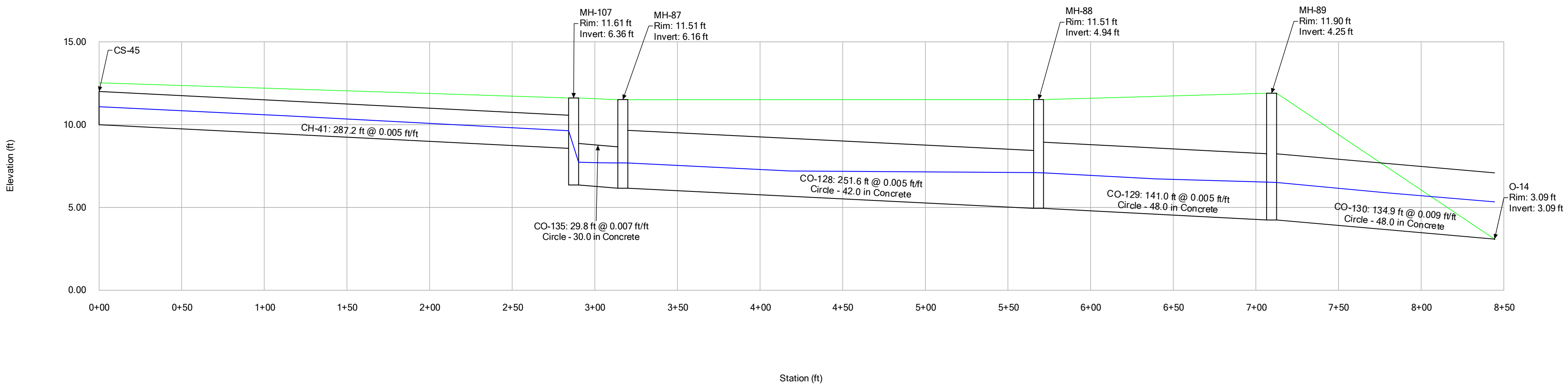
Profile Report
Engineering Profile - CS-41 to MH-82 (SitewidePermit-STORM_rev1.stsw)



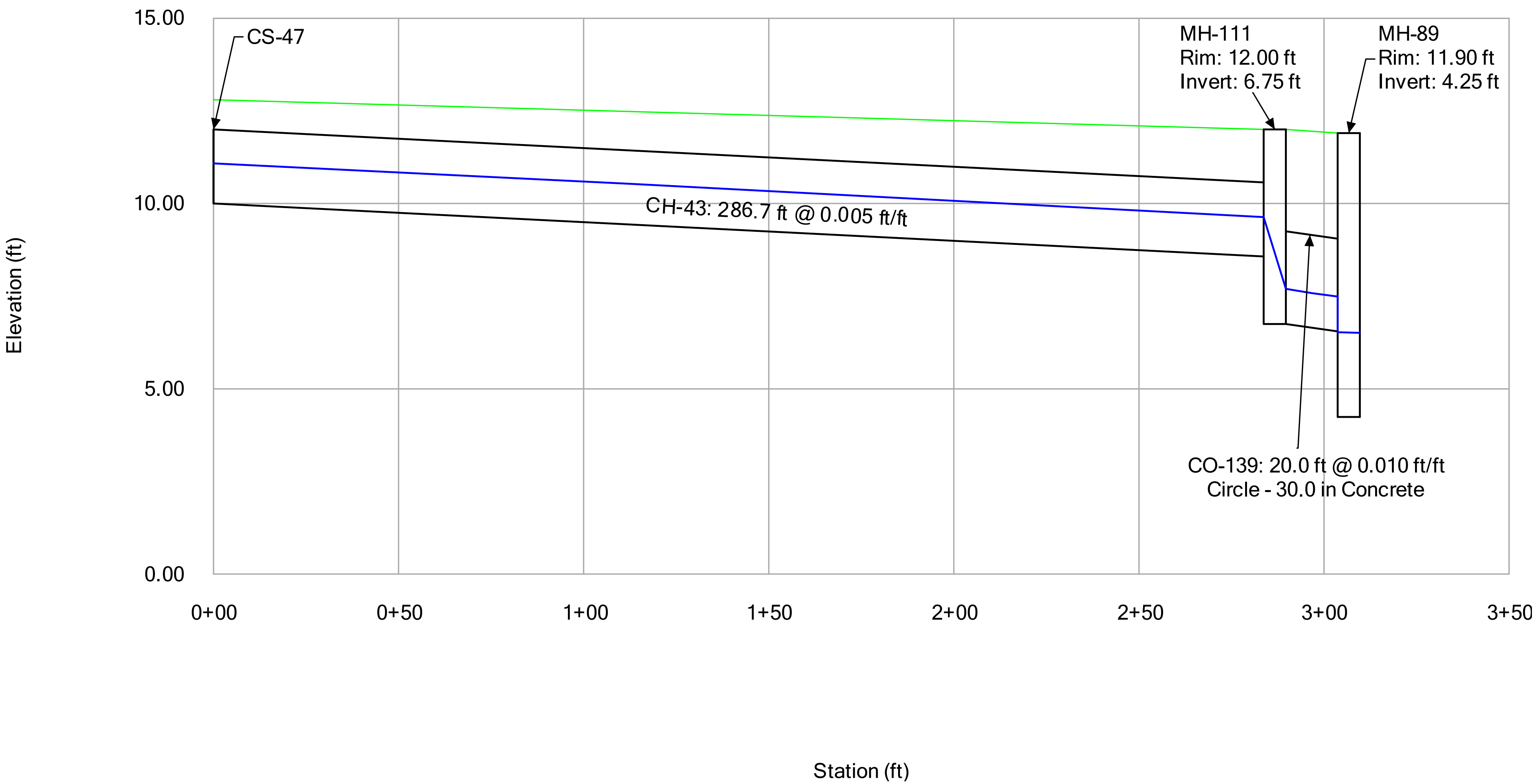
Profile Report
Engineering Profile - CS-46 to MH-88 (SitewidePermit-STORM_rev1.stsw)



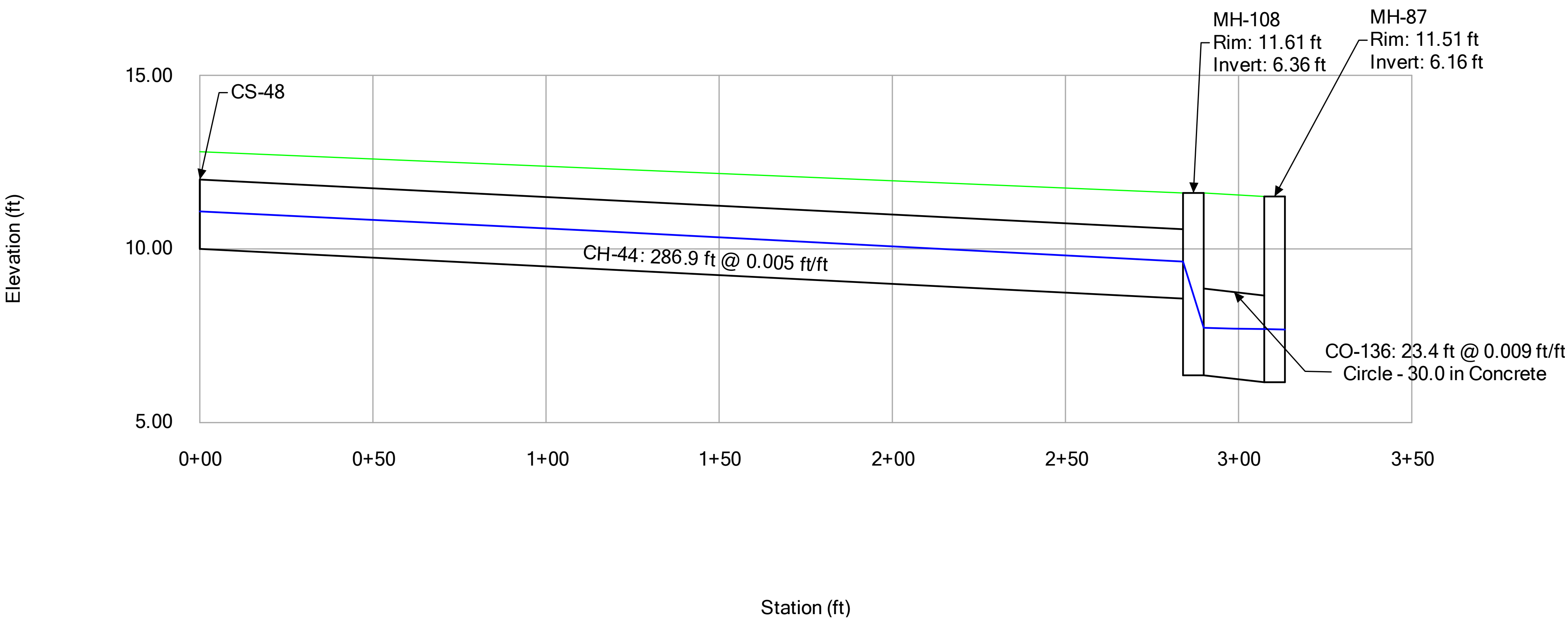
Profile Report
Engineering Profile - CS-45 to O-14 (SitewidePermit-STORM_rev1.stsw)



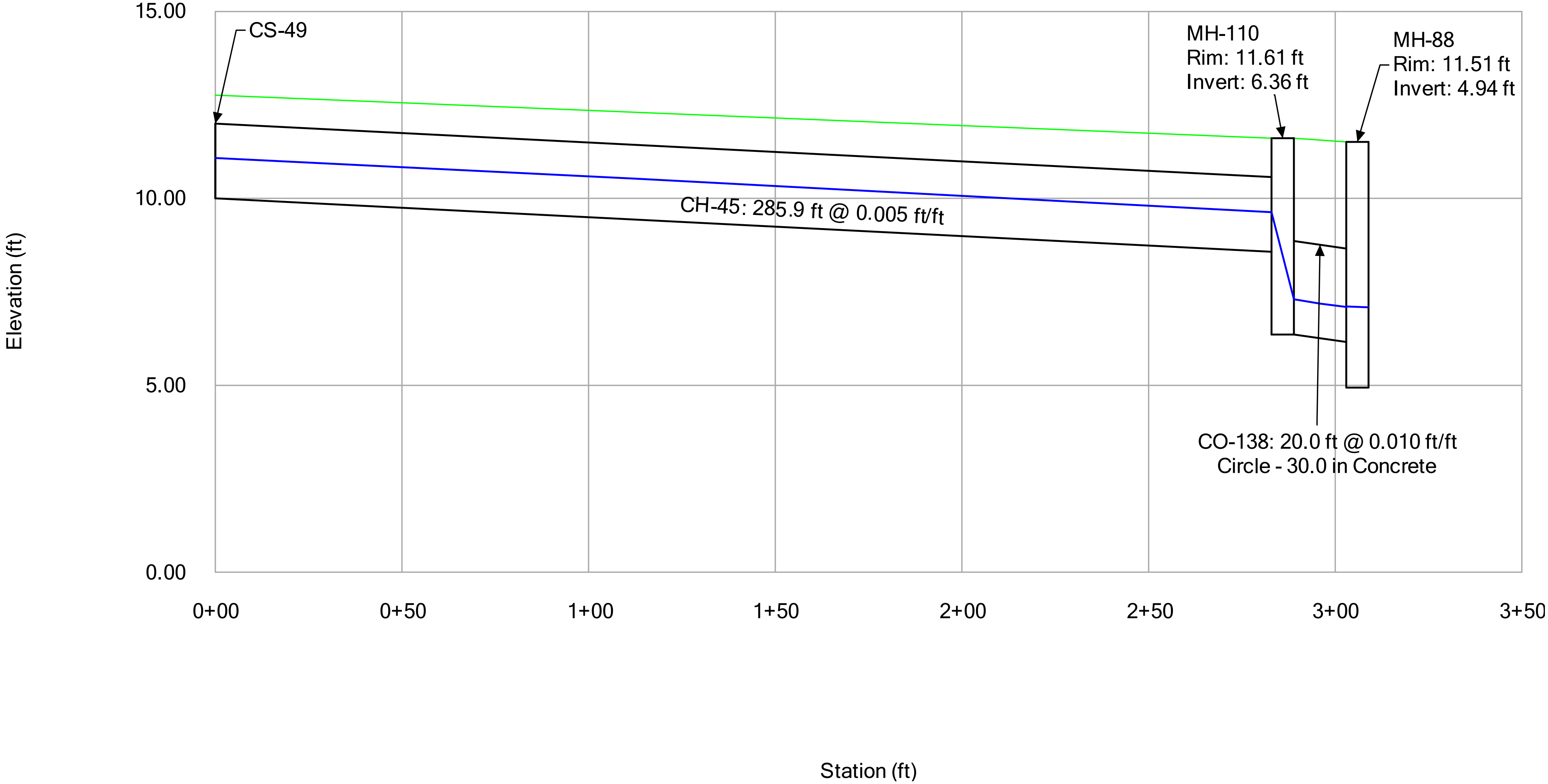
Profile Report
Engineering Profile - CS-47 to MH-89 (SitewidePermit-STORM_rev1.stsw)



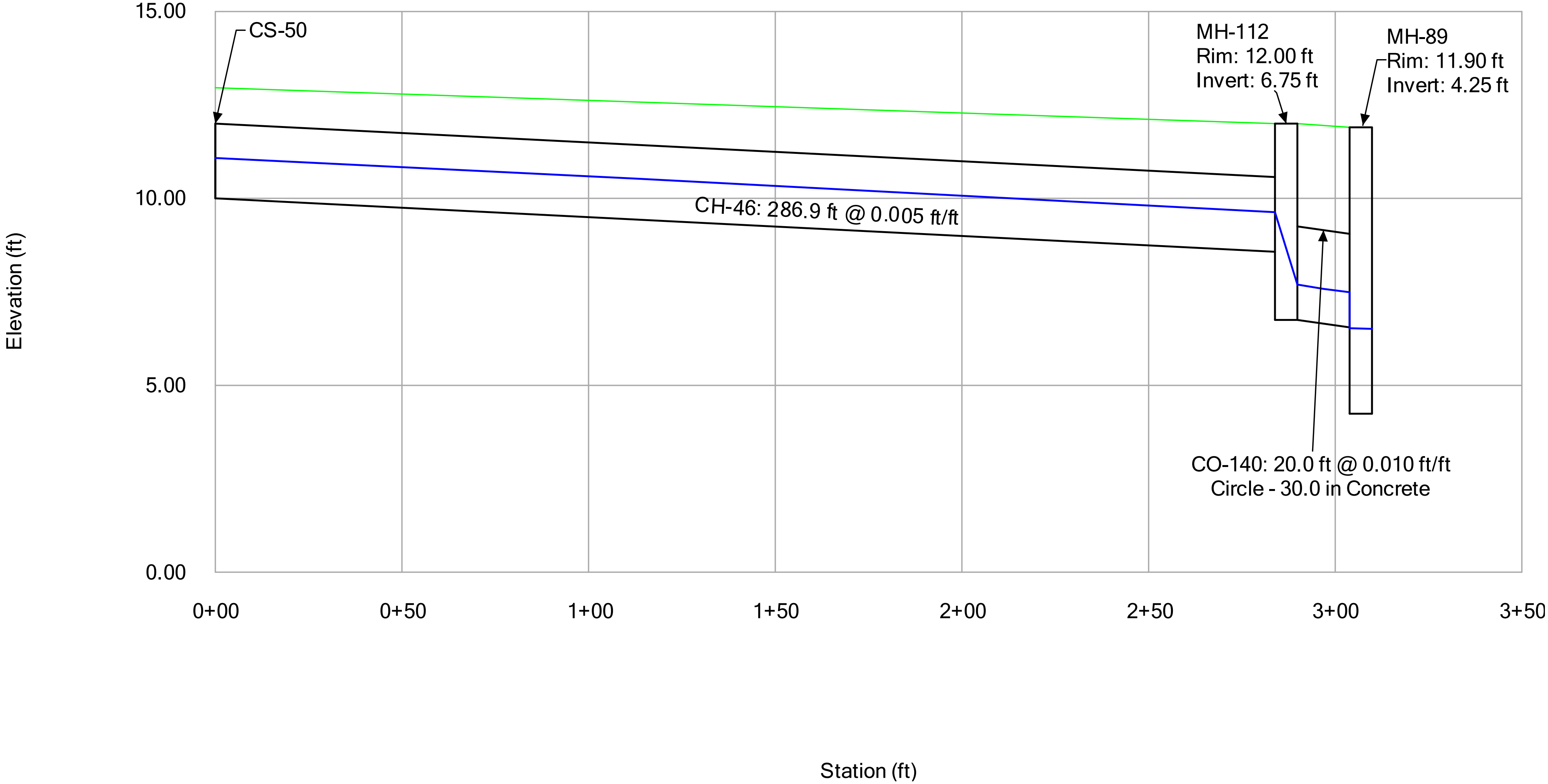
Profile Report
Engineering Profile - CS-48 to MH-87 (SitewidePermit-STORM_rev1.stsw)



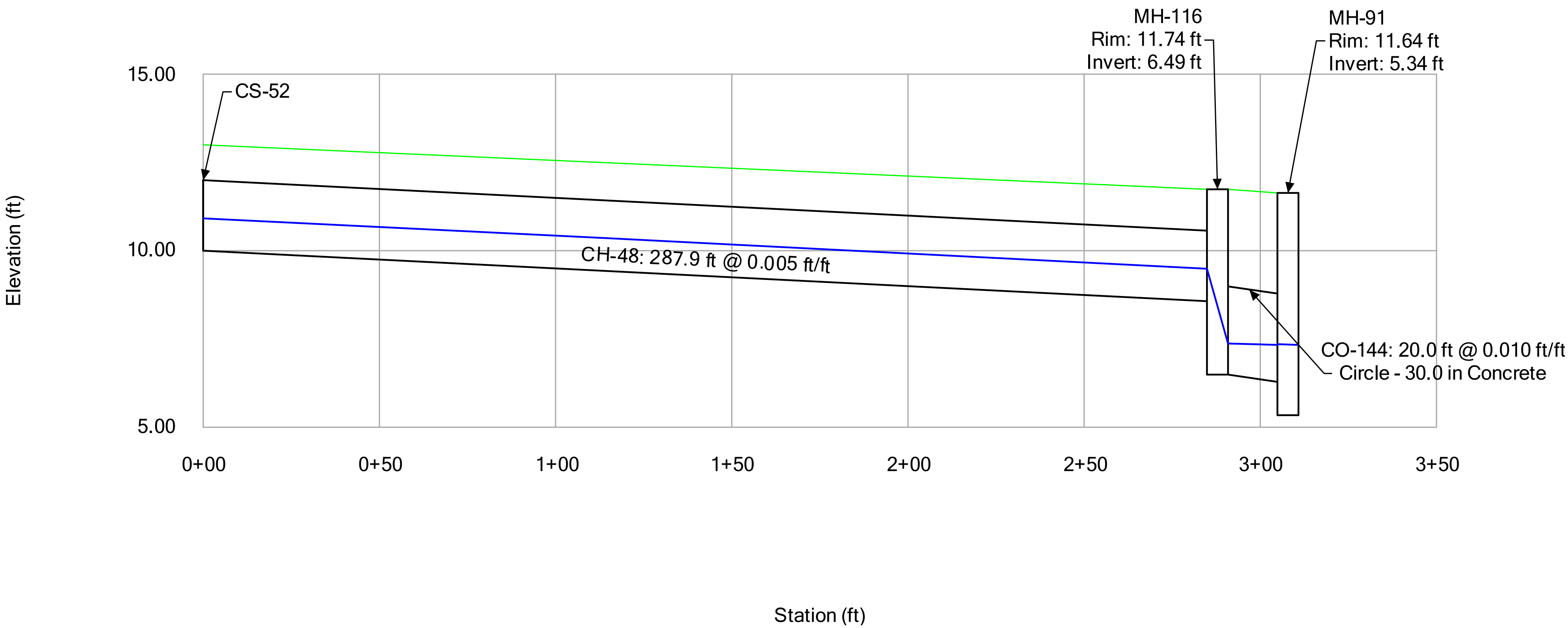
Profile Report
Engineering Profile - CS-49 to MH-88 (SitewidePermit-STORM_rev1.stsw)



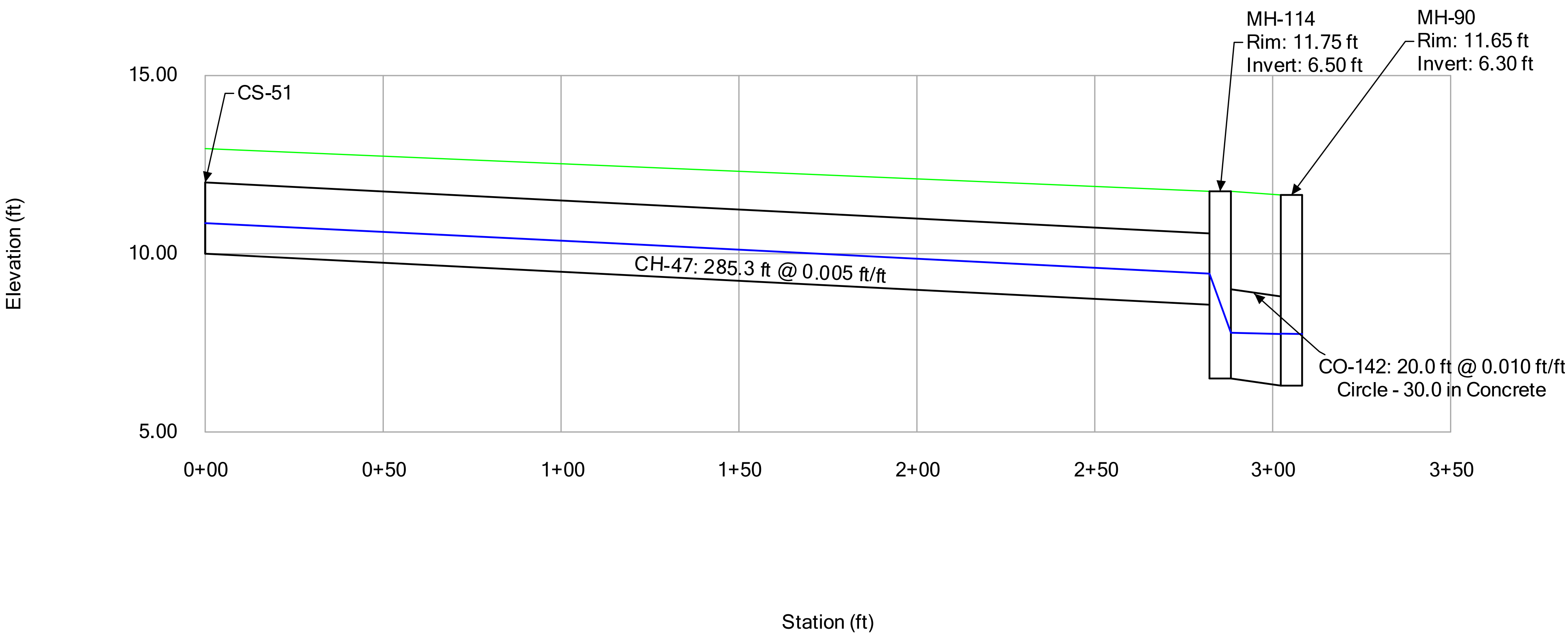
Profile Report
Engineering Profile - CS-50 to MH-89 (SitewidePermit-STORM_rev1.stsw)



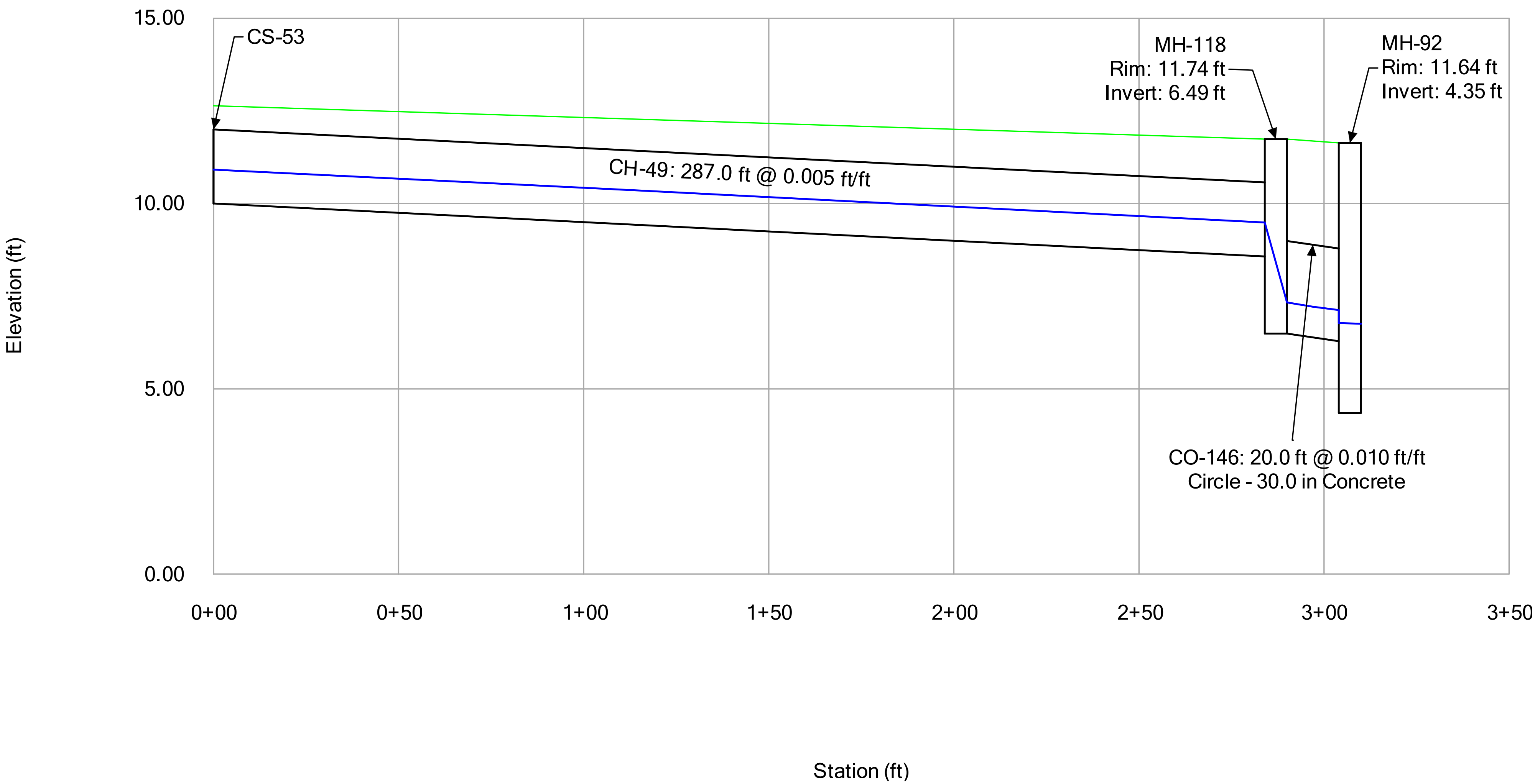
Profile Report
Engineering Profile - CS-52 to MH-91 (SitewidePermit-STORM_rev1.stsw)



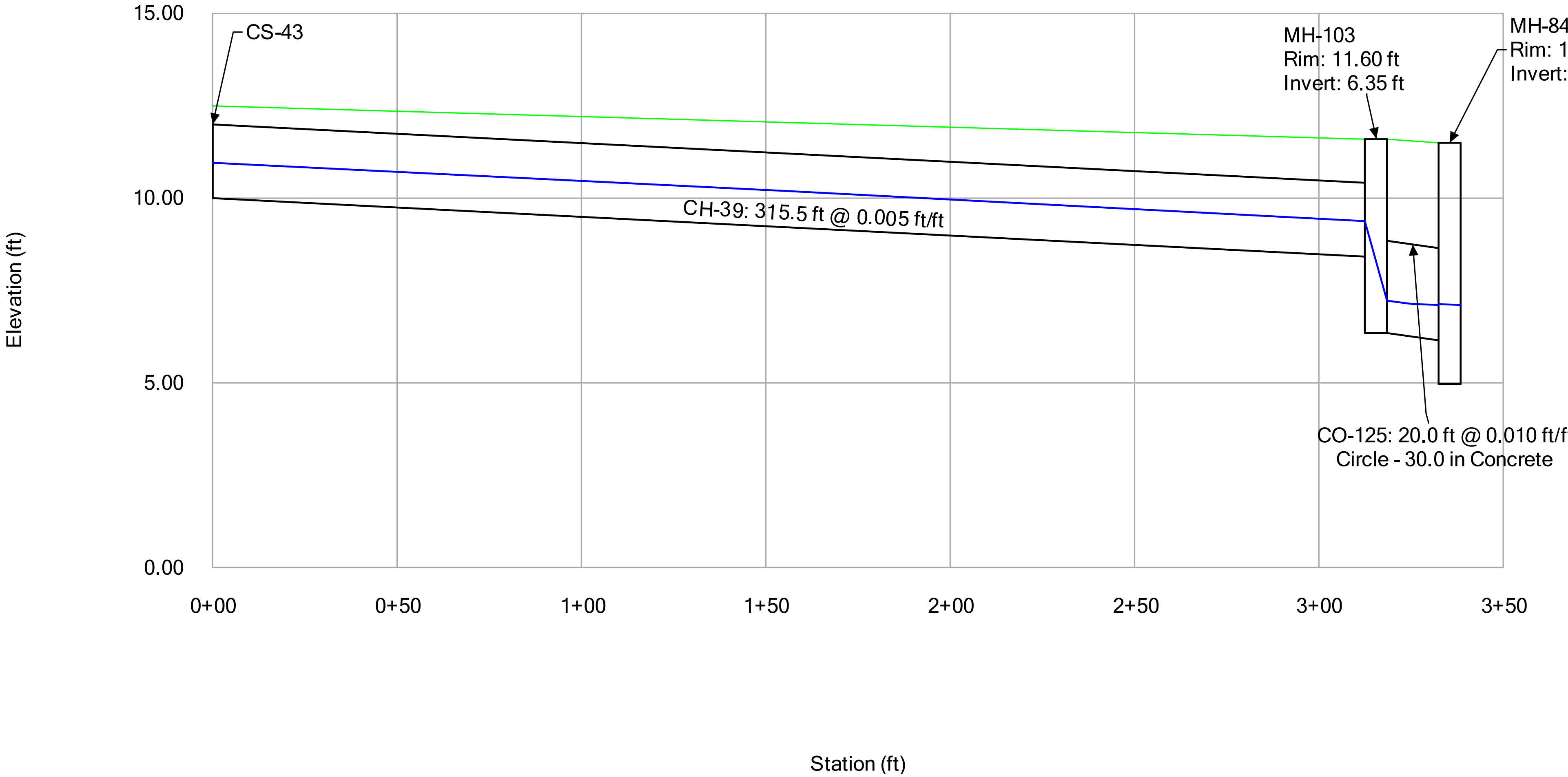
Profile Report
Engineering Profile - CS-51 to MH-90 (SitewidePermit-STORM_rev1.stsw)



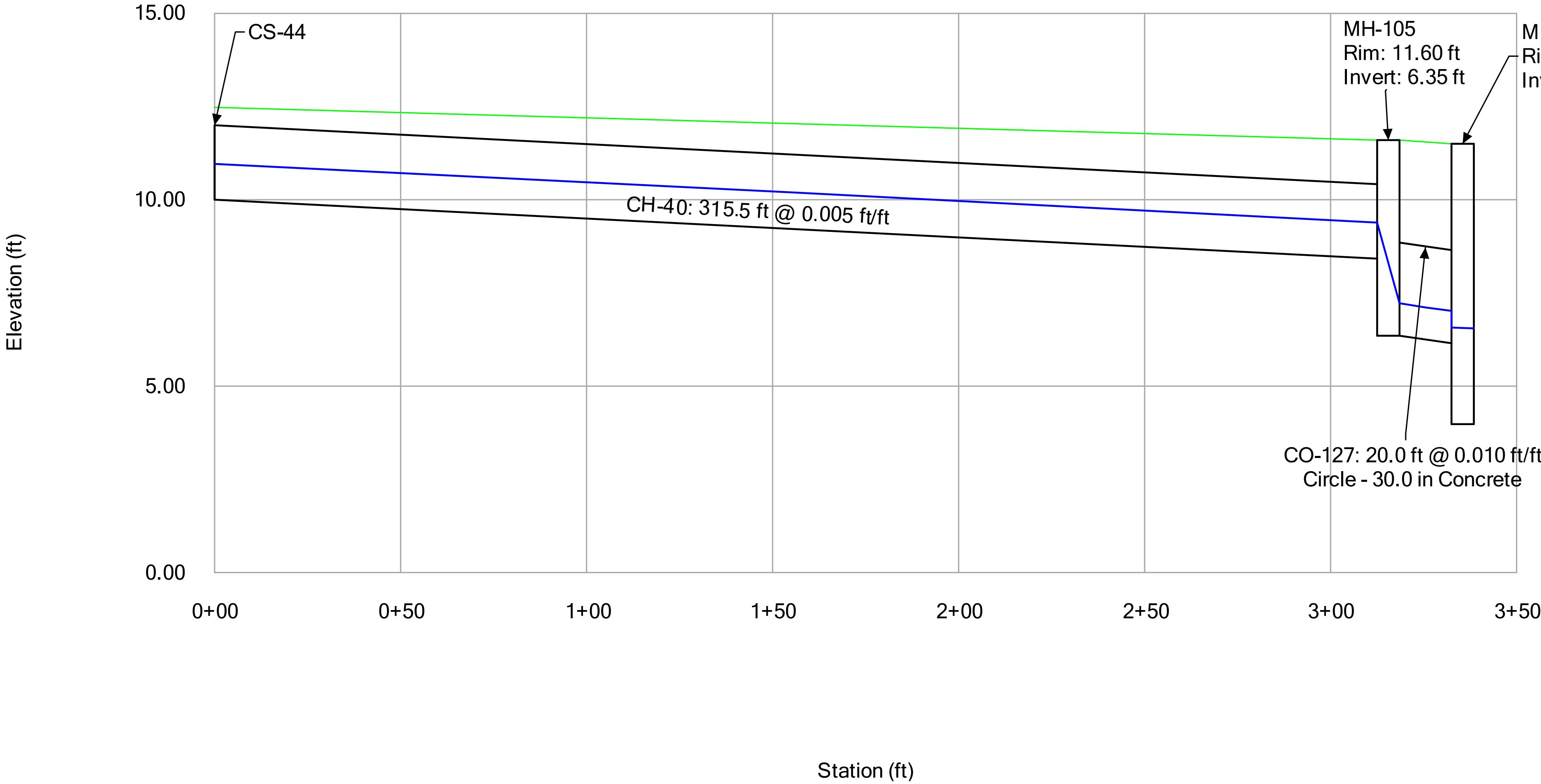
Profile Report
Engineering Profile - CS-53 to MH-92 (SitewidePermit-STORM_rev1.stsw)



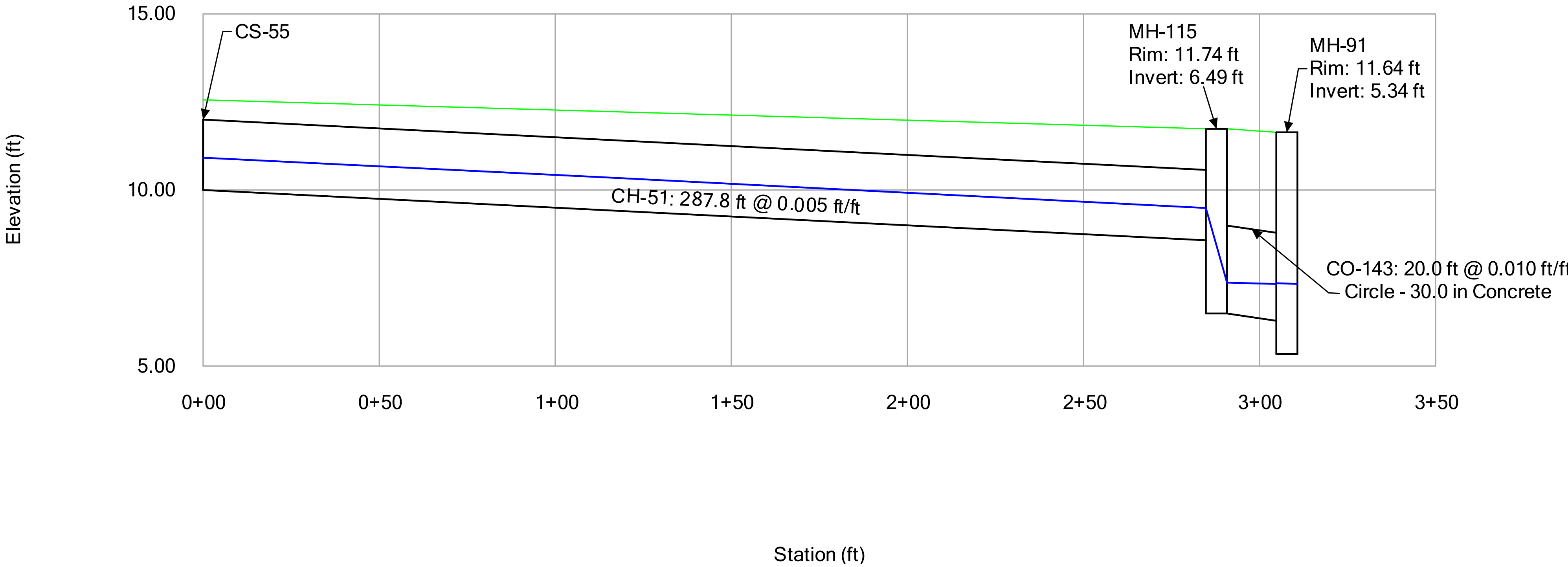
Profile Report
Engineering Profile - CS-43 to MH-84 (SitewidePermit-STORM_rev1.stsw)



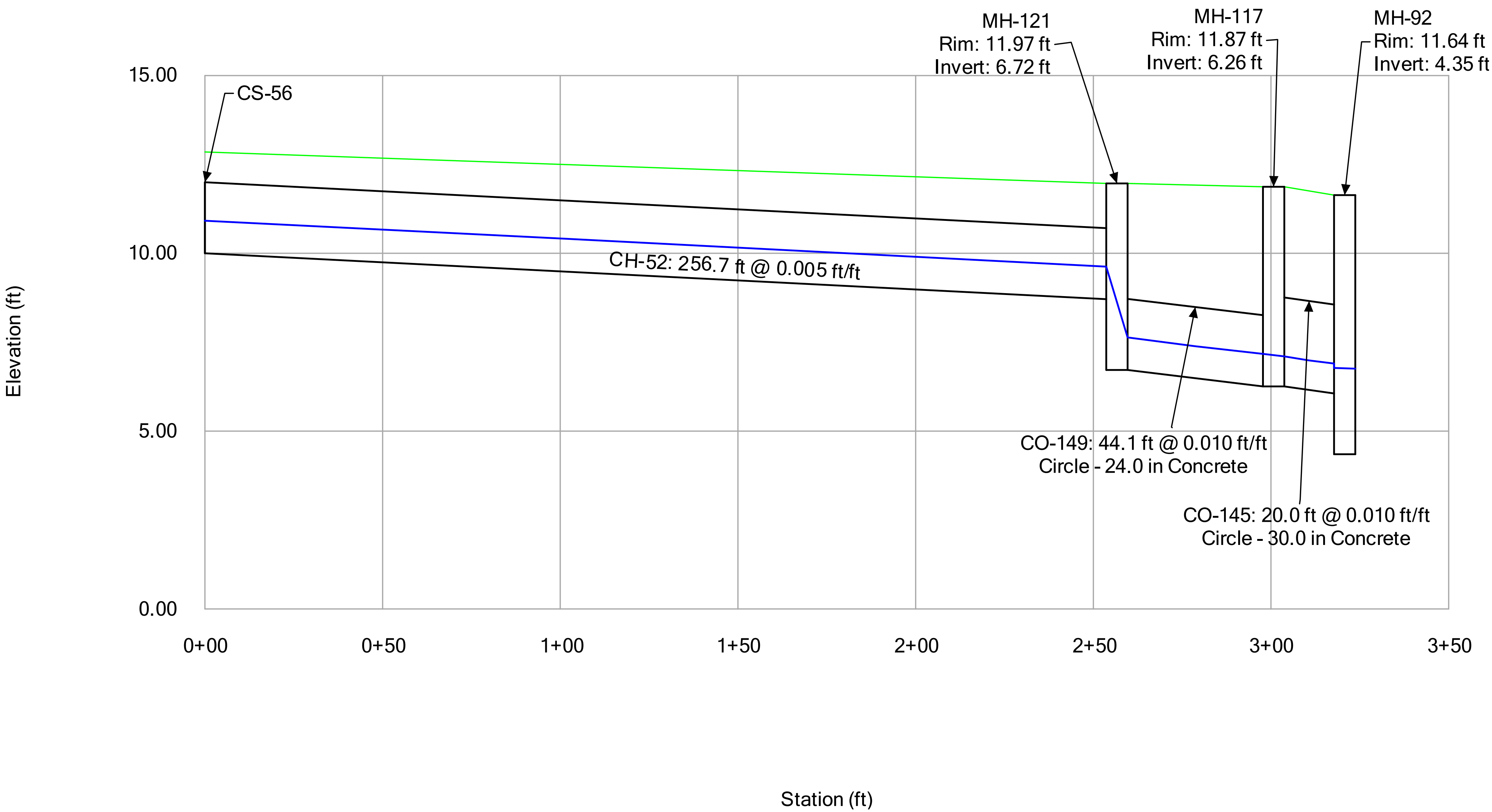
Profile Report
Engineering Profile - CS-44 to MH-85 (SitewidePermit-STORM_rev1.stsw)



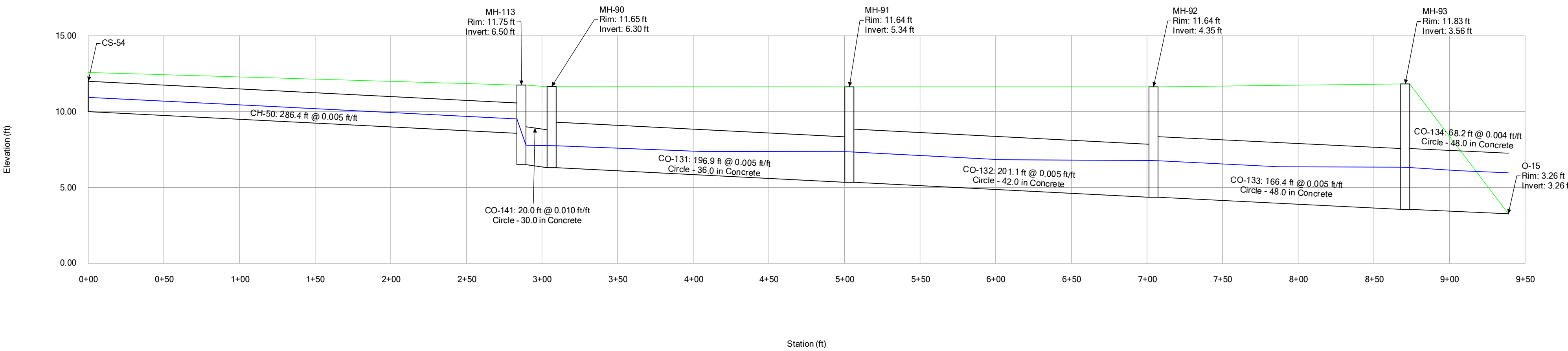
Profile Report
Engineering Profile - CS-55 to MH-91 (SitewidePermit-STORM_rev1.stsw)



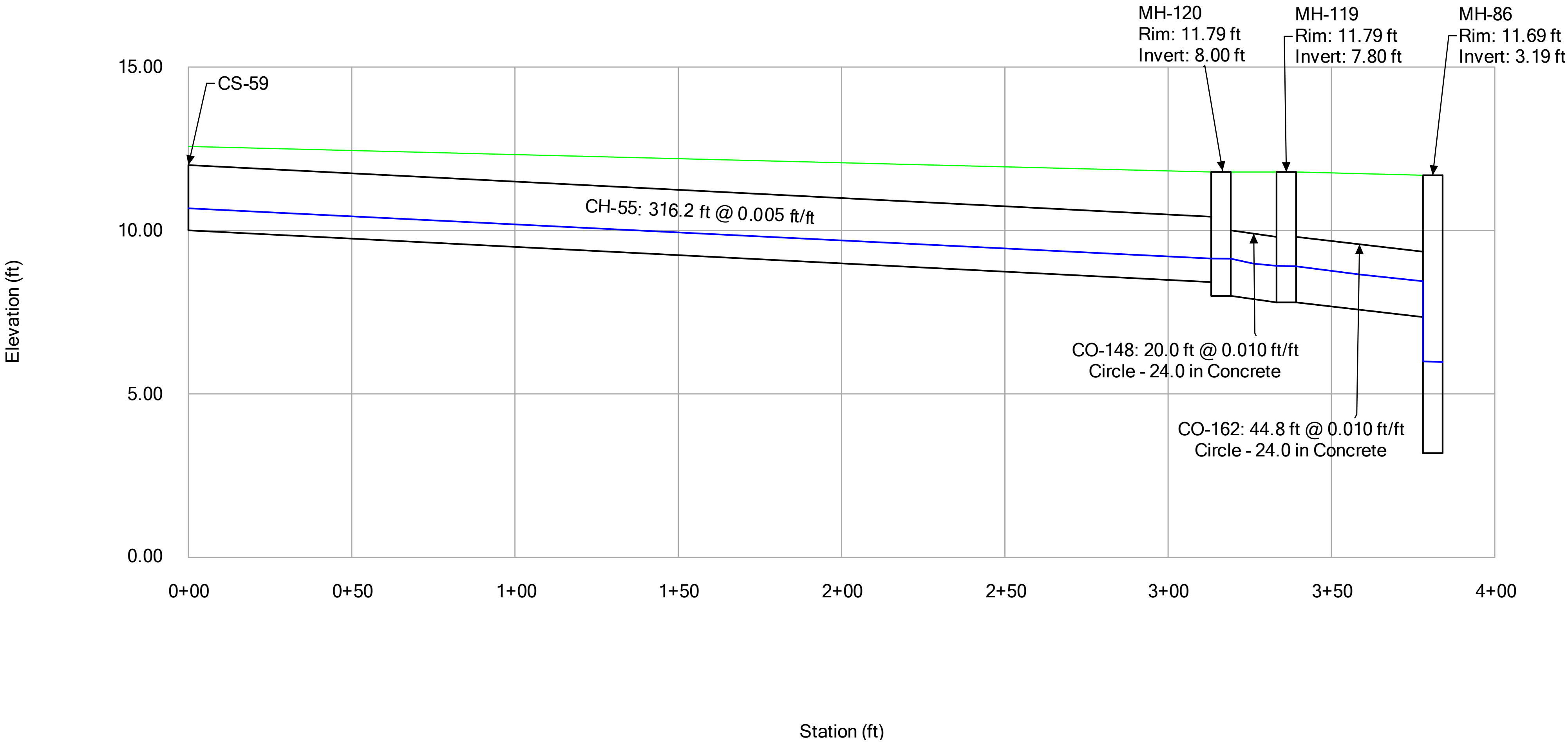
Profile Report
Engineering Profile - CS-56 to MH-92 (SitewidePermit-STORM_rev1.stsw)



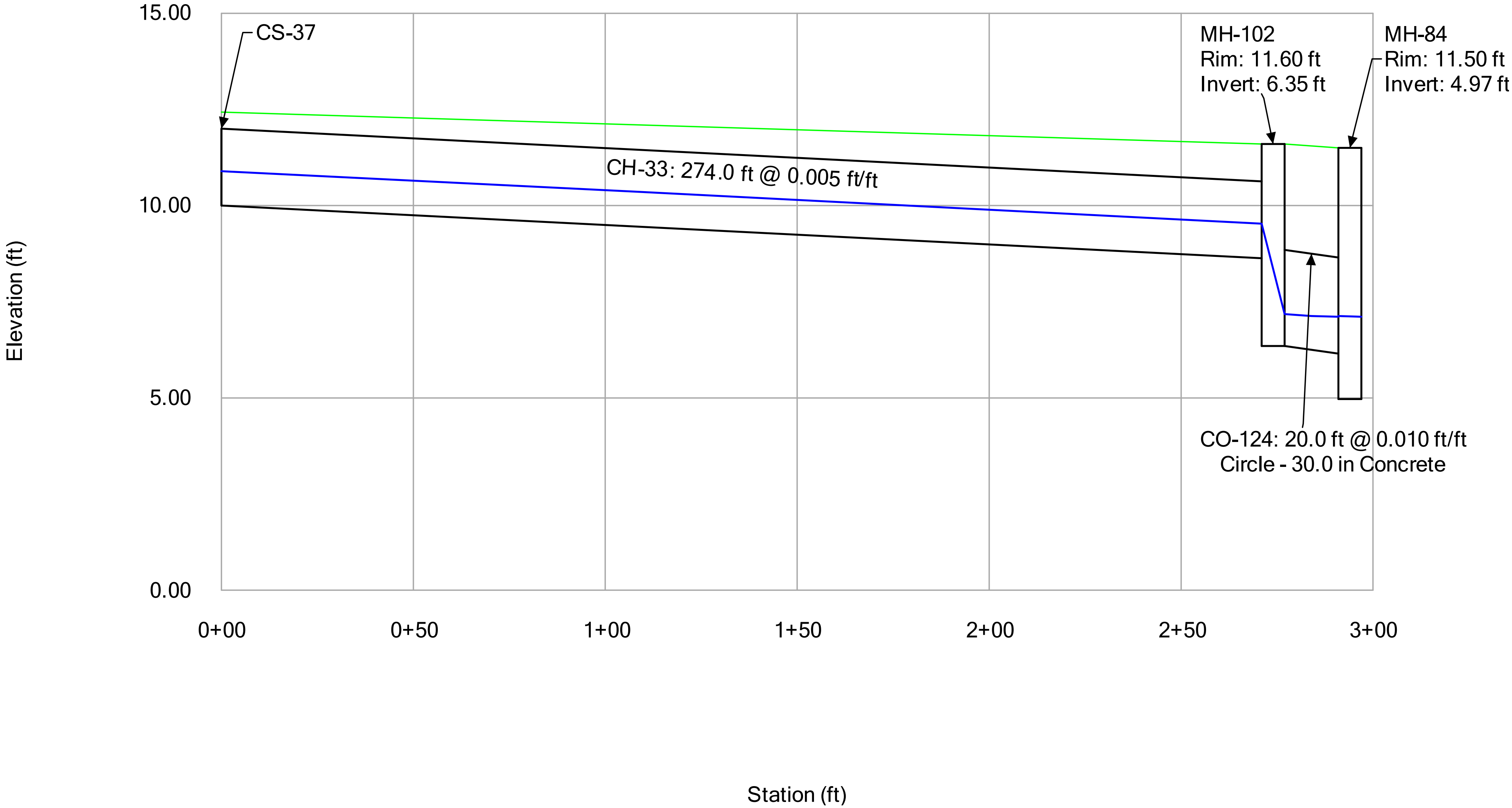
Profile Report
Engineering Profile - CS-54 to O-15 (SitewidePermit-STORM_rev1.stsw)



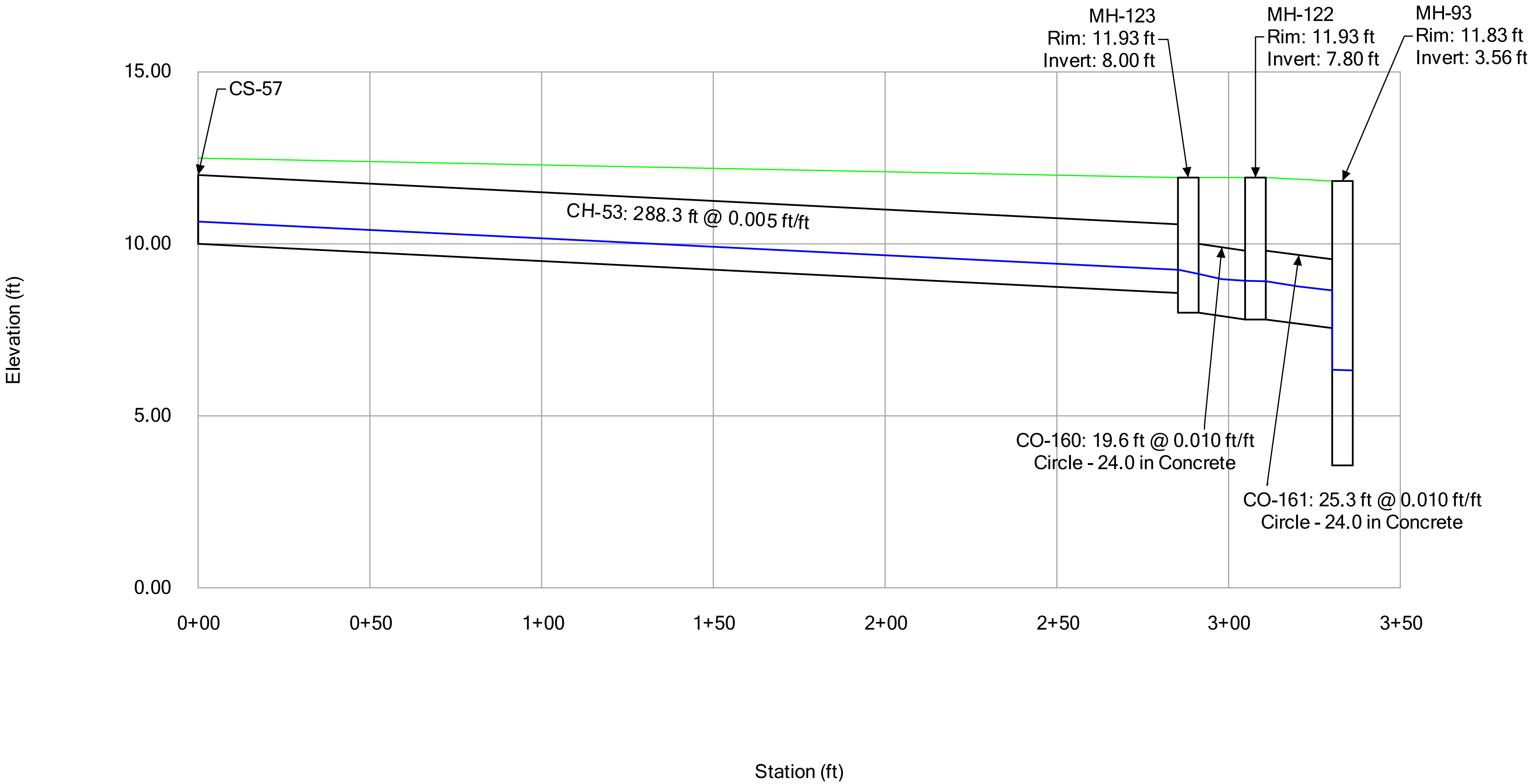
Profile Report
Engineering Profile - CS-59 to MH-86 (SitewidePermit-STORM_rev1.stsw)



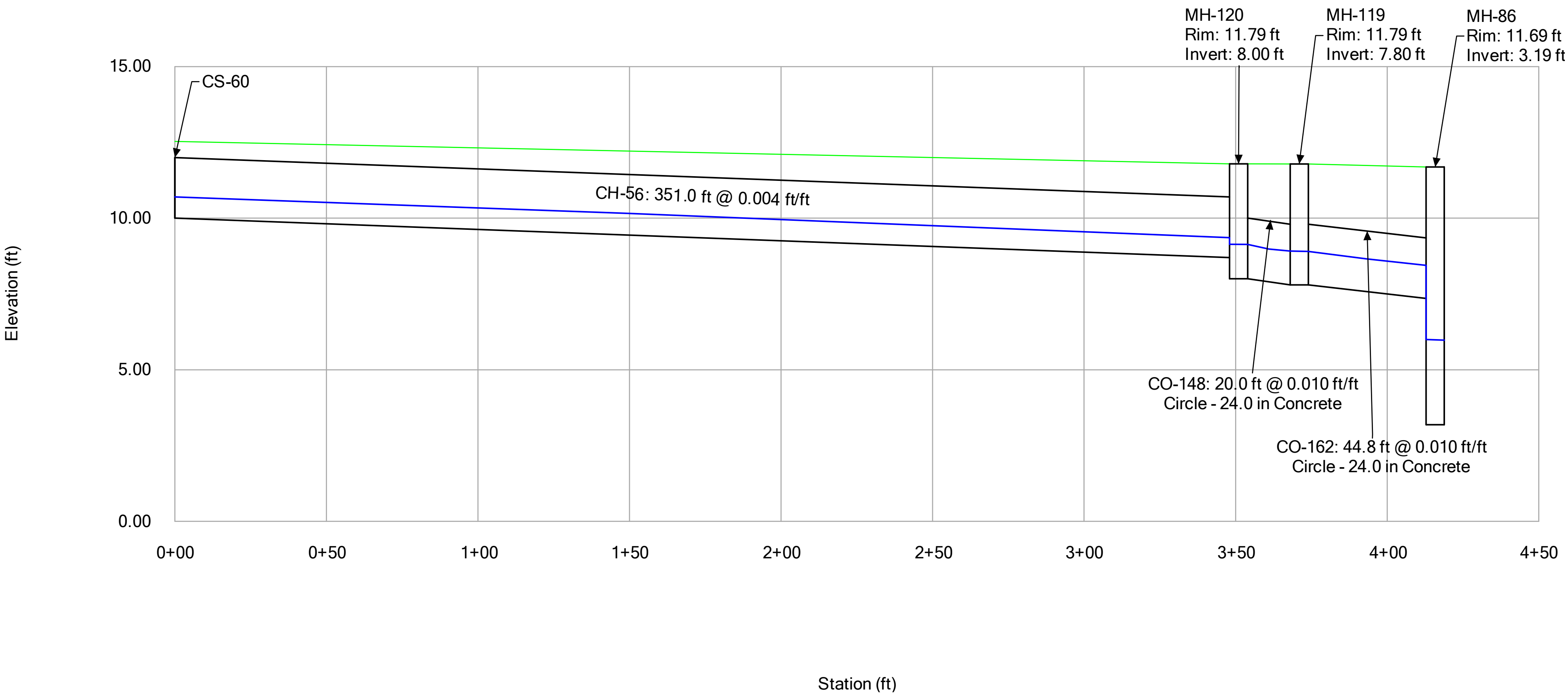
Profile Report
Engineering Profile - CS-37 to MH-84 (SitewidePermit-STORM_rev1.stsw)



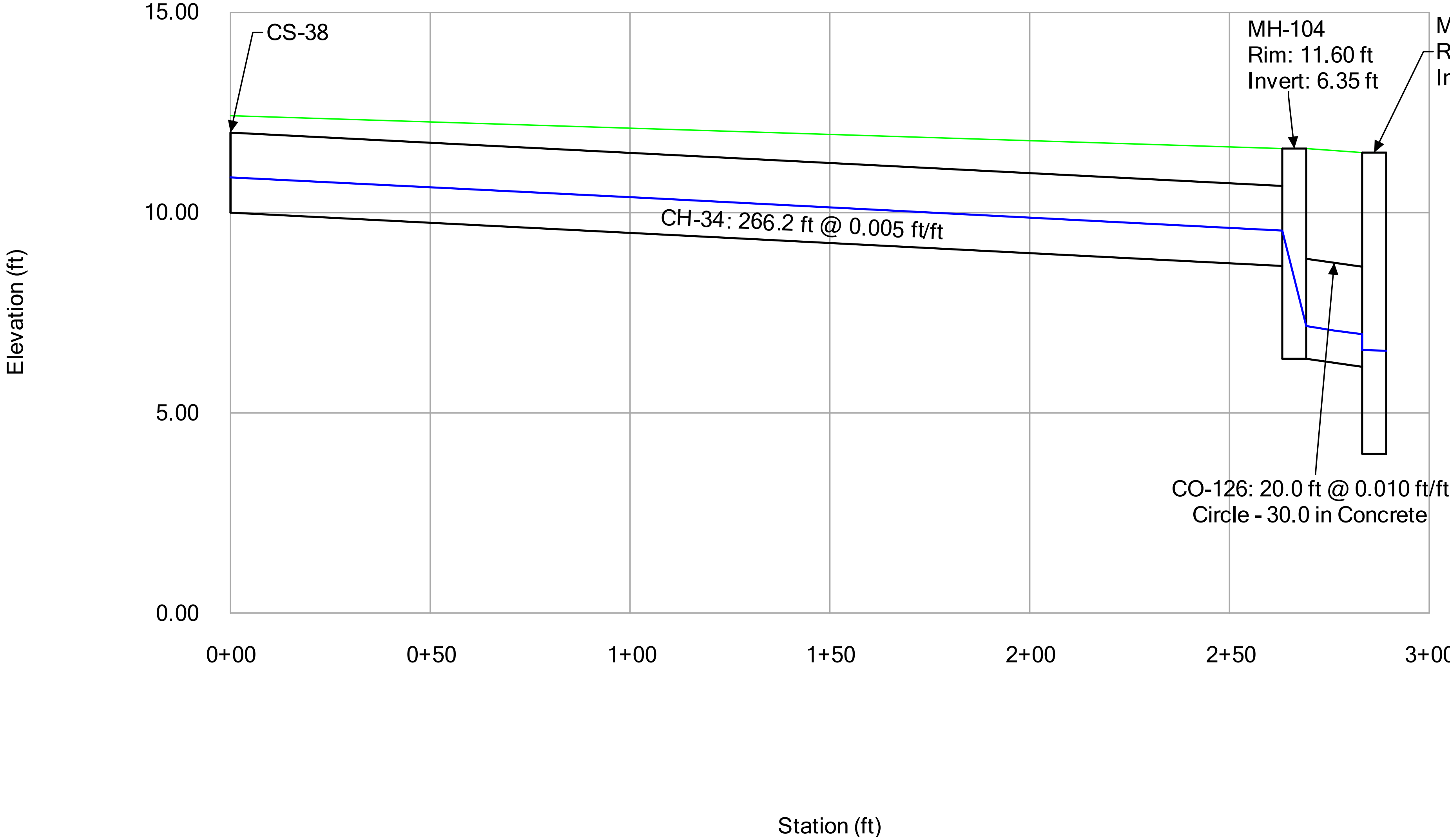
Profile Report
Engineering Profile - CS-57 to MH-93 (SitewidePermit-STORM_rev1.stsw)



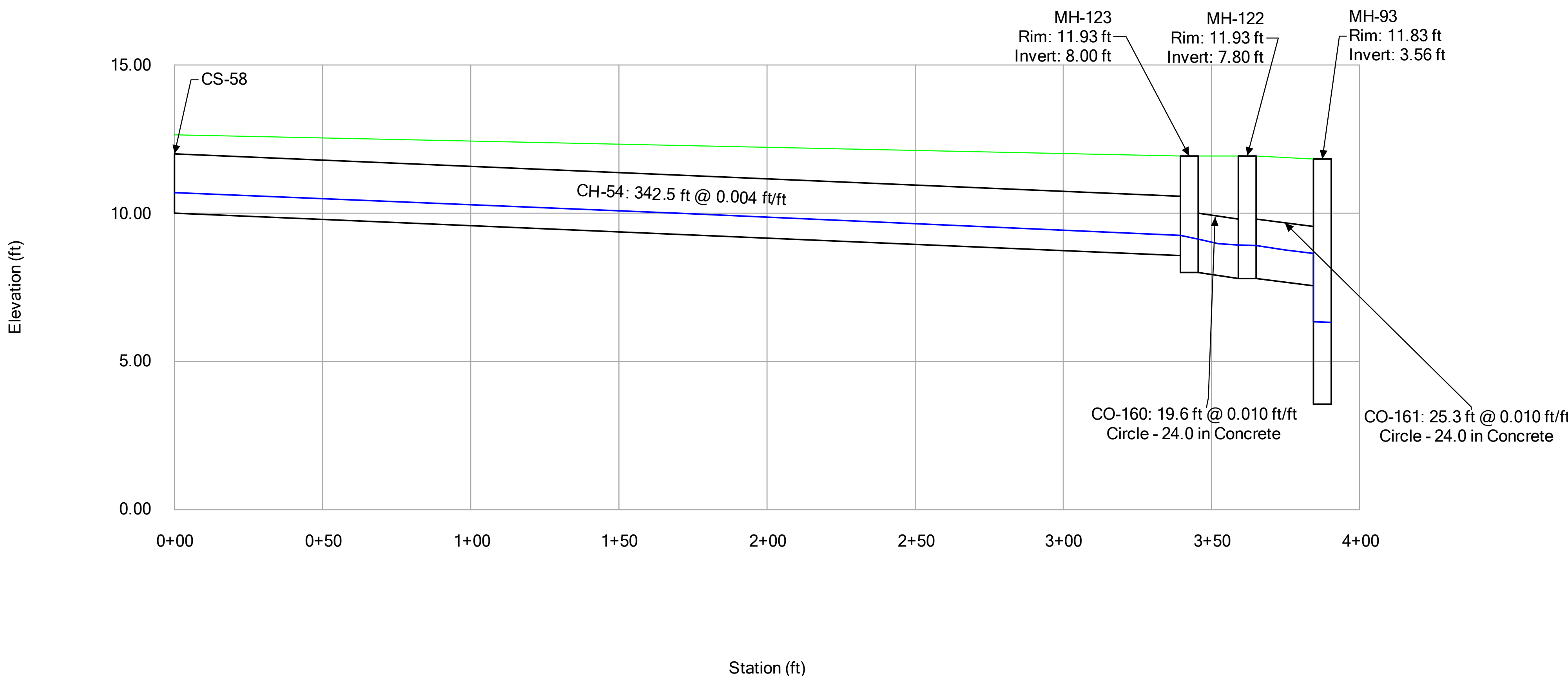
Profile Report
Engineering Profile - CS-60 to MH-86 (SitewidePermit-STORM_rev1.stsw)



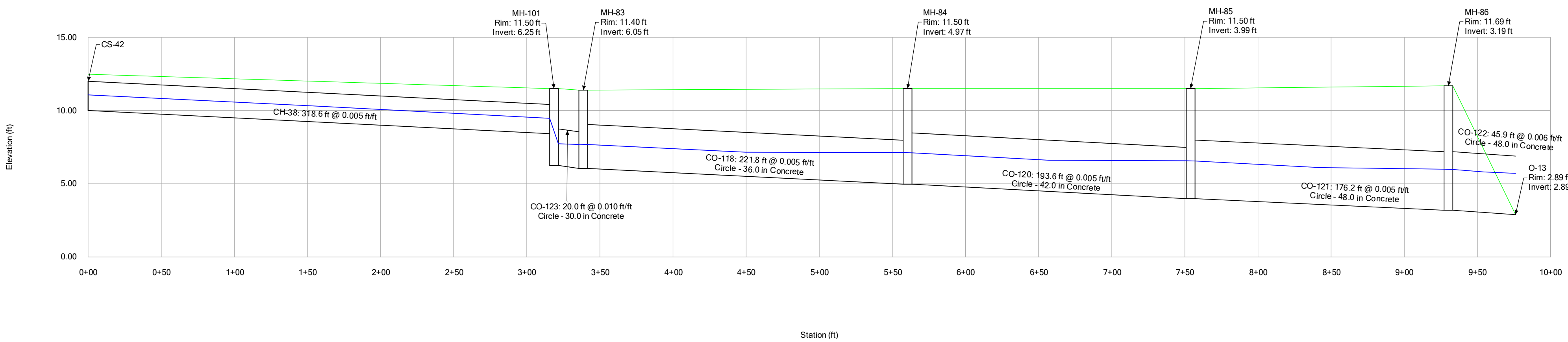
Profile Report
Engineering Profile - CS-38 to MH-85 (SitewidePermit-STORM_rev1.stsw)



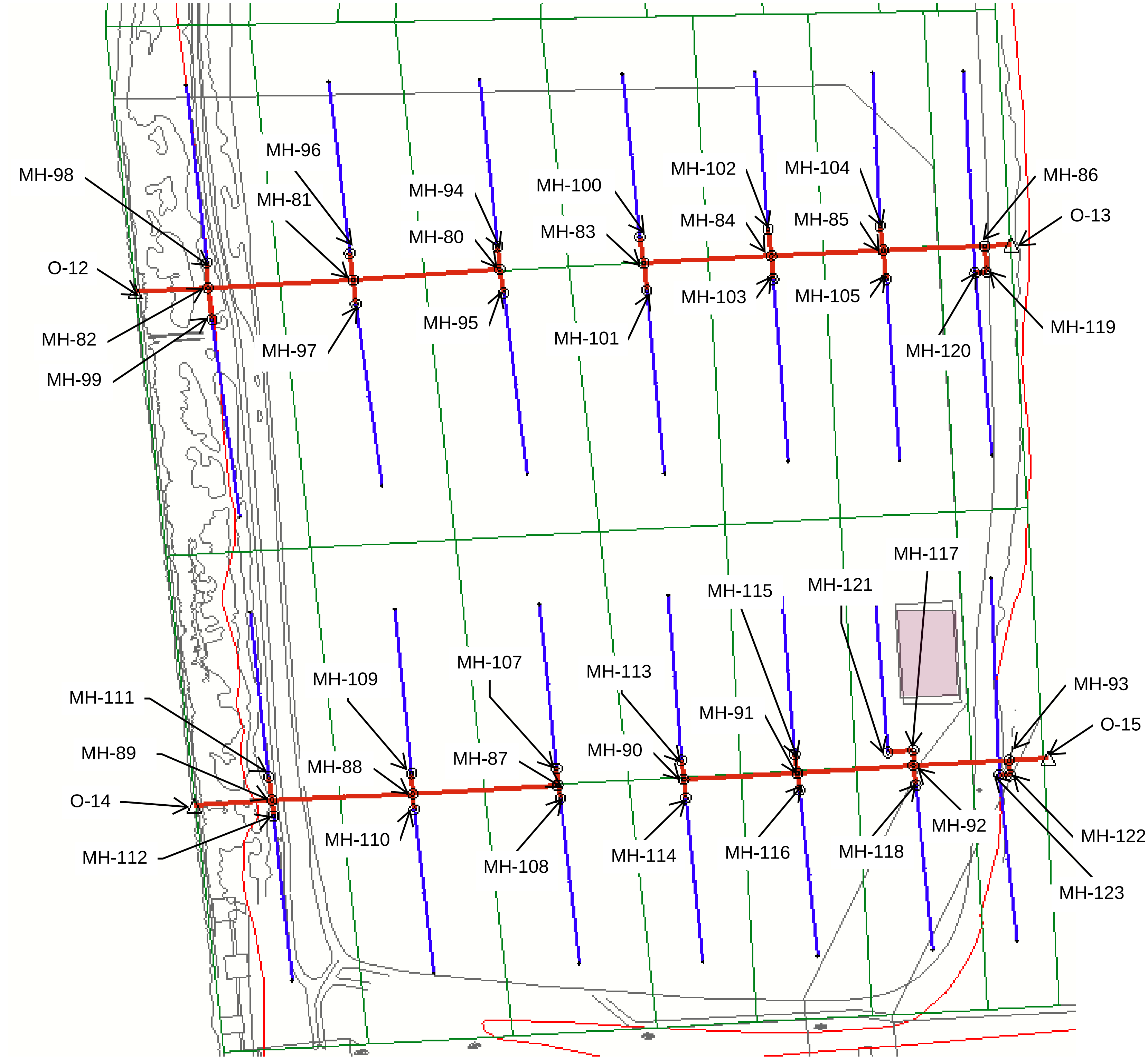
Profile Report
Engineering Profile - CS-58 to MH-93 (SitewidePermit-STORM_rev1.stsw)



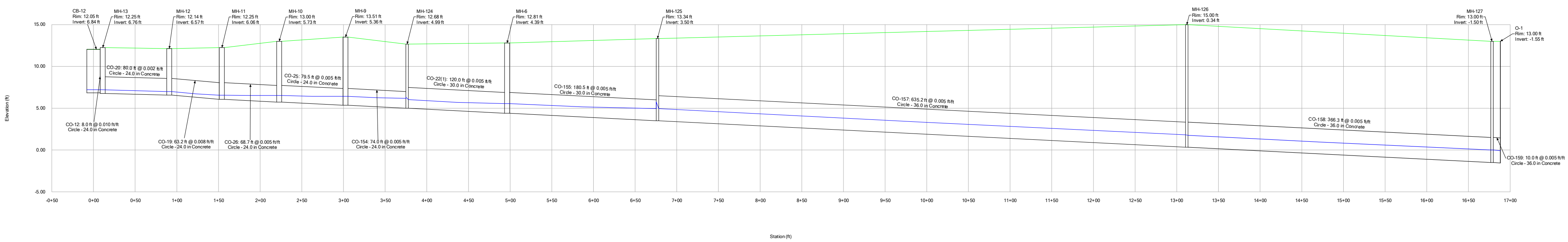
Profile Report
Engineering Profile - CS-42 to O-13 (SitewidePermit-STORM_rev1.stsw)



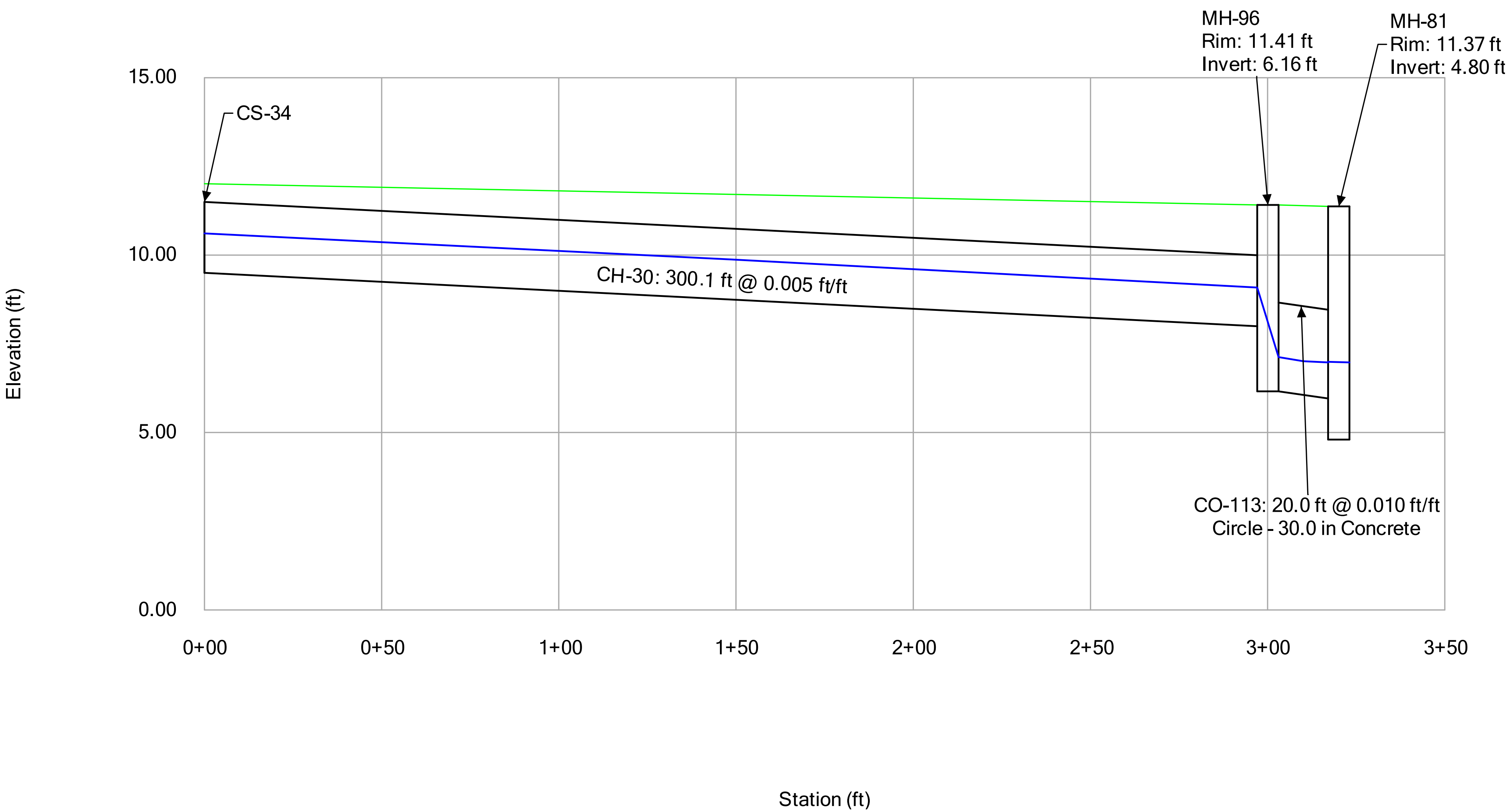
Parcel B1


MH-98
MH-96
MH-81
MH-94
MH-80
MH-100
MH-83
MH-102
MH-84
MH-104
MH-85
MH-86
O-13
O-12
MH-82
MH-99
MH-97
MH-95
MH-101
MH-103
MH-105
MH-120
MH-119
MH-117
MH-115
MH-121
MH-109
MH-107
MH-113
MH-111
MH-89
O-14
MH-112
MH-88
MH-110
MH-87
MH-108
MH-90
MH-114
MH-91
MH-116
MH-118
MH-92
MH-93
O-15
MH-122
MH-123

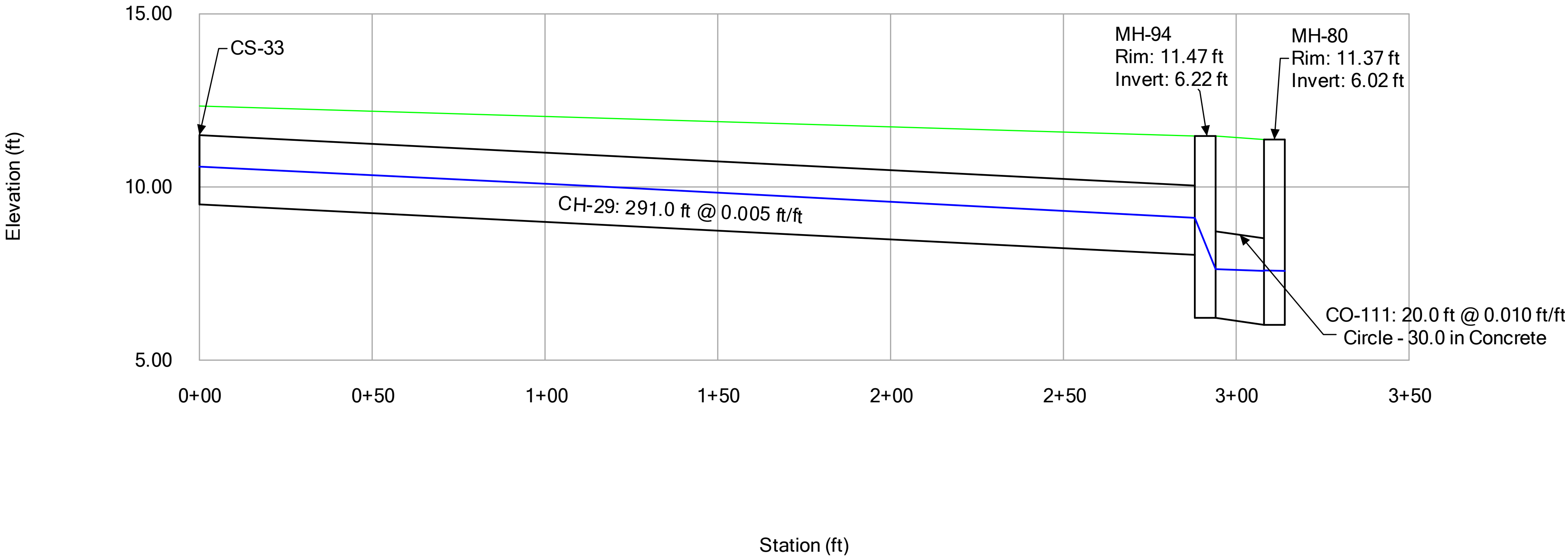
Profile Report
Engineering Profile - CB-12 to O-16 (SitewidePermit-STORM_rev1.stsw)



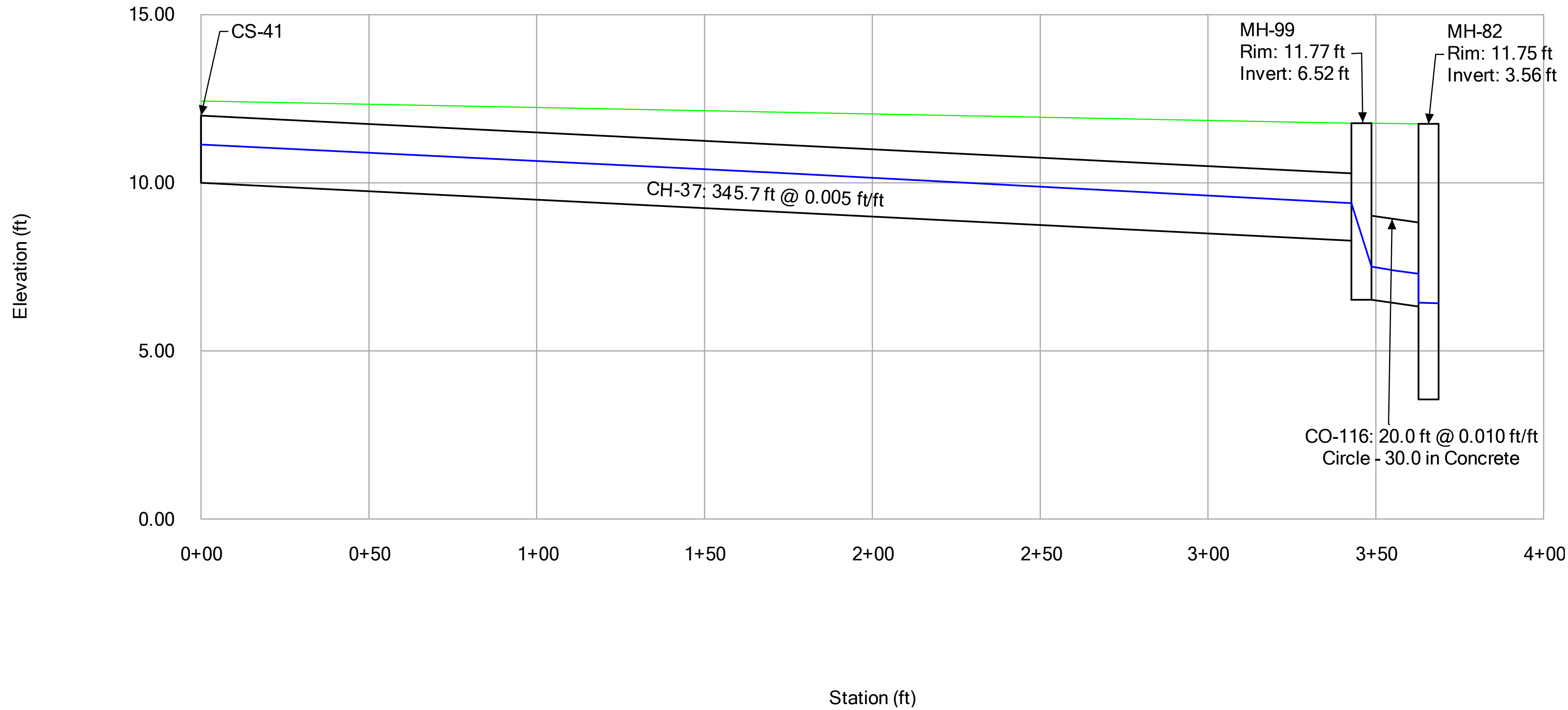
Profile Report
Engineering Profile - CS-34 to MH-81 (SitewidePermit-STORM_rev1.stsw)



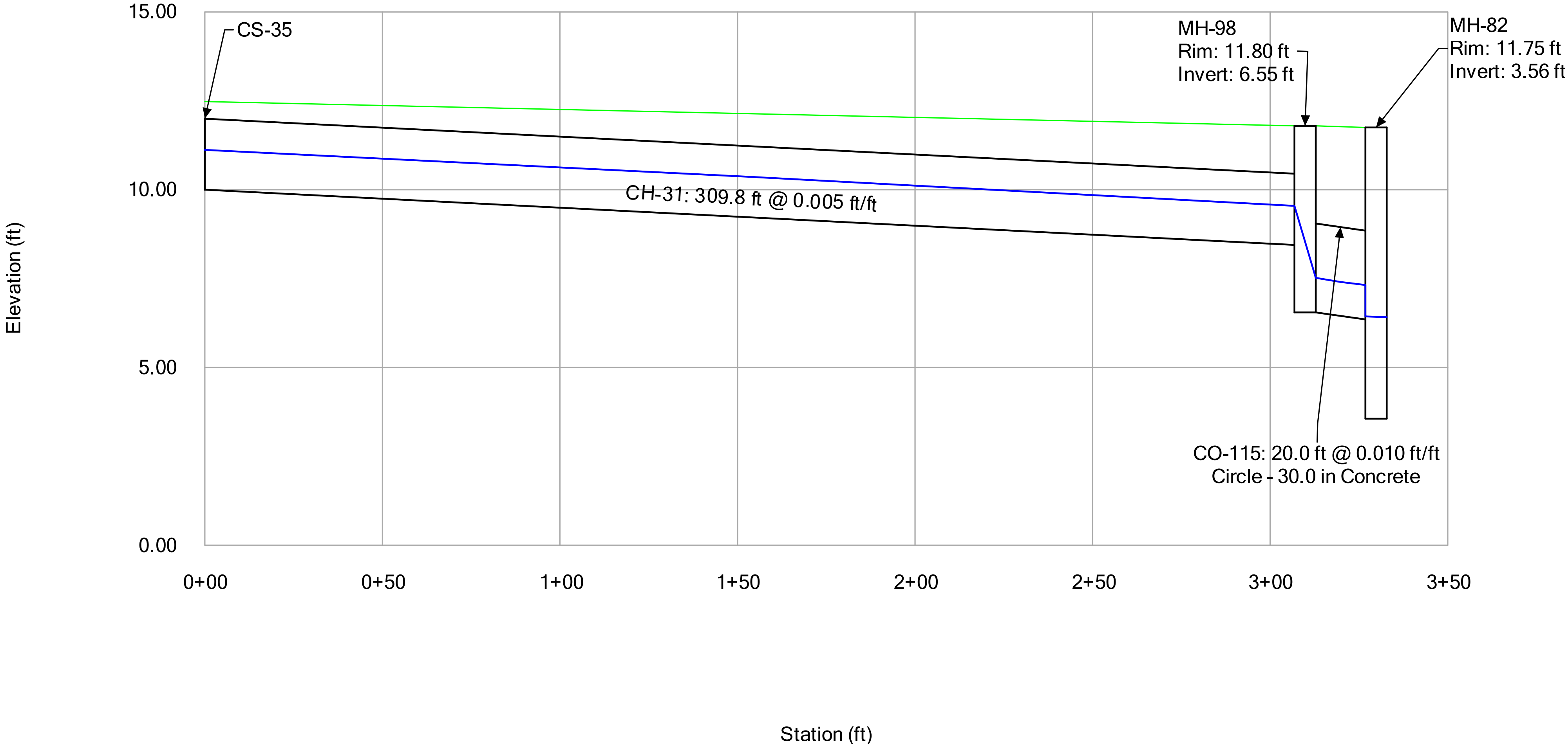
Profile Report
Engineering Profile - CS-33 to MH-80 (SitewidePermit-STORM_rev1.stsw)



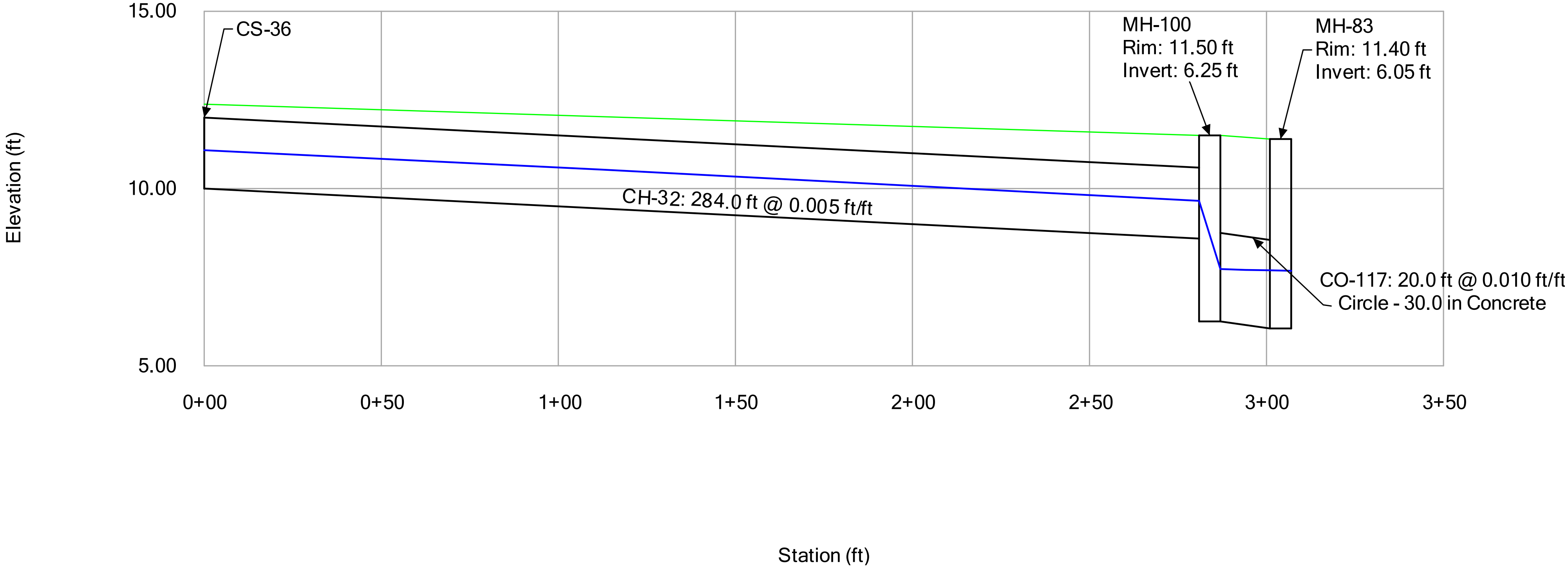
Profile Report
Engineering Profile - CS-41 to MH-82 (SitewidePermit-STORM_rev1.stsw)



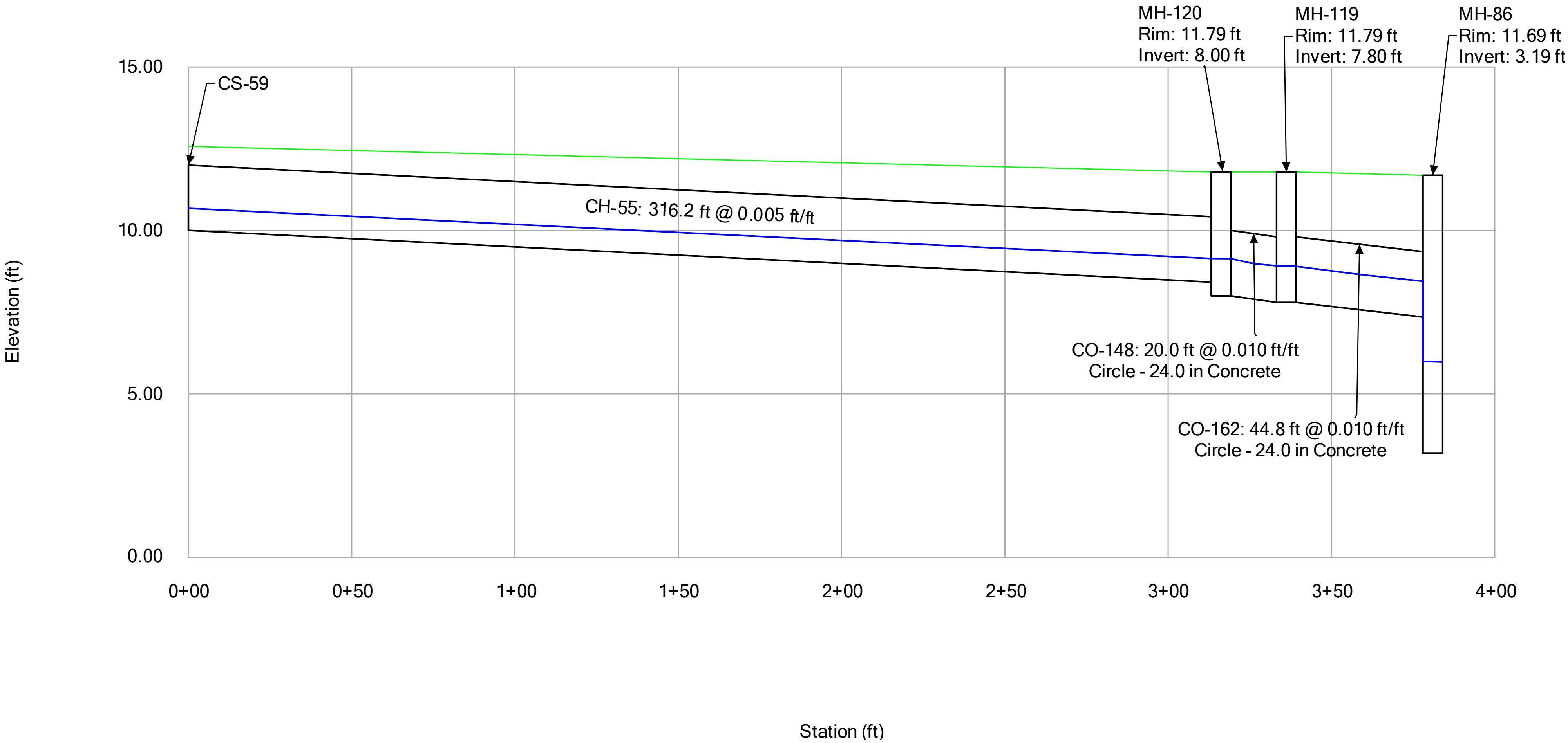
Profile Report
Engineering Profile - CS-35 to MH-82 (SitewidePermit-STORM_rev1.stsw)



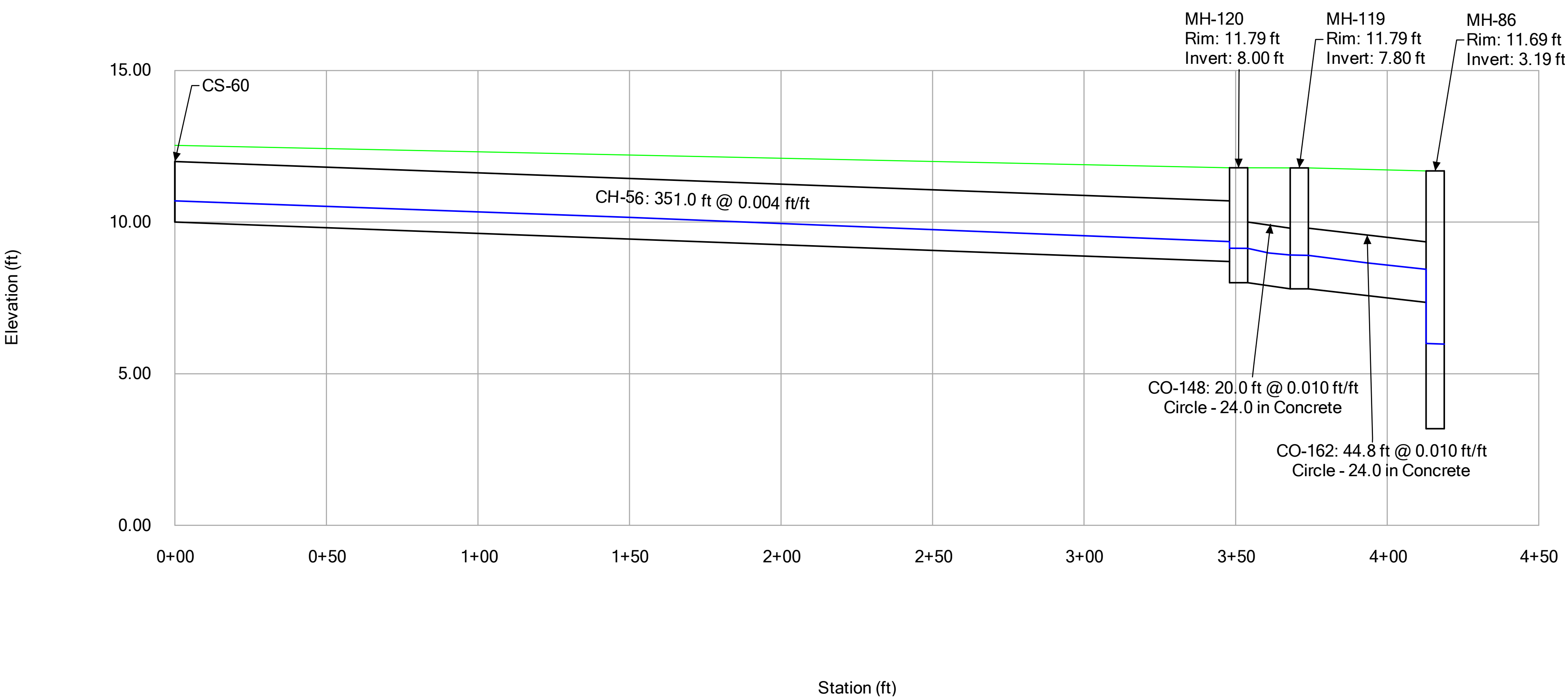
Profile Report
Engineering Profile - CS-36 to MH-83 (SitewidePermit-STORM_rev1.stsw)



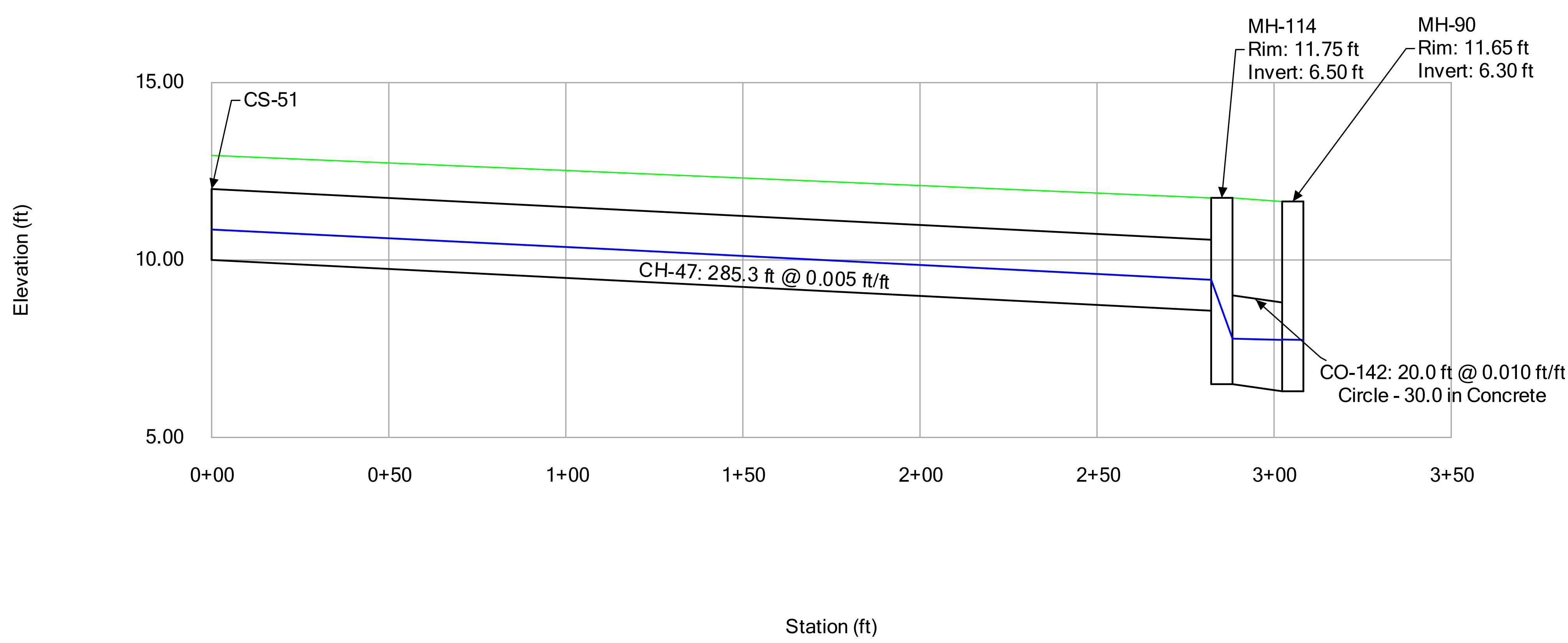
Profile Report
Engineering Profile - CS-59 to MH-86 (SitewidePermit-STORM_rev1.stsw)



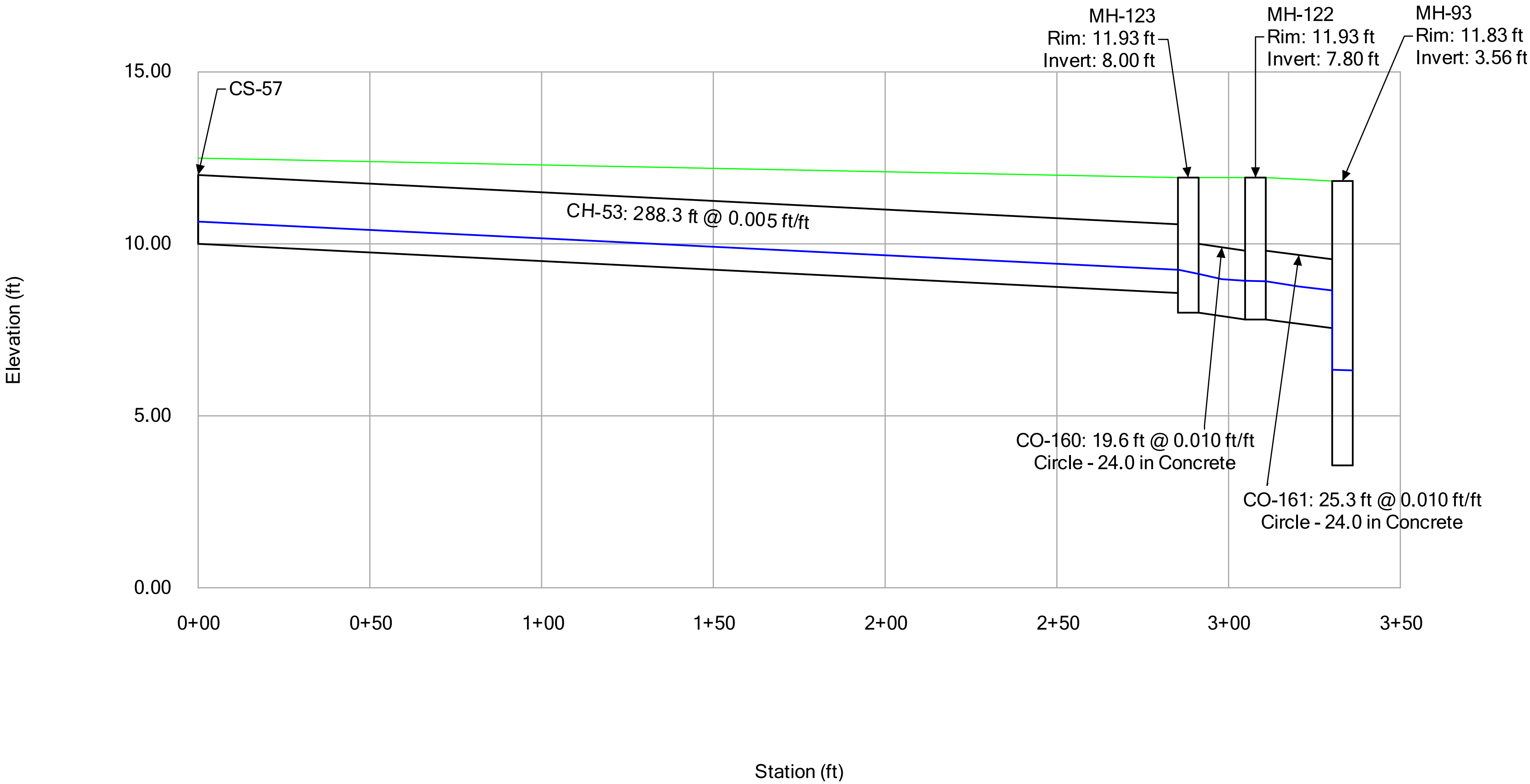
Profile Report
Engineering Profile - CS-60 to MH-86 (SitewidePermit-STORM_rev1.stsw)



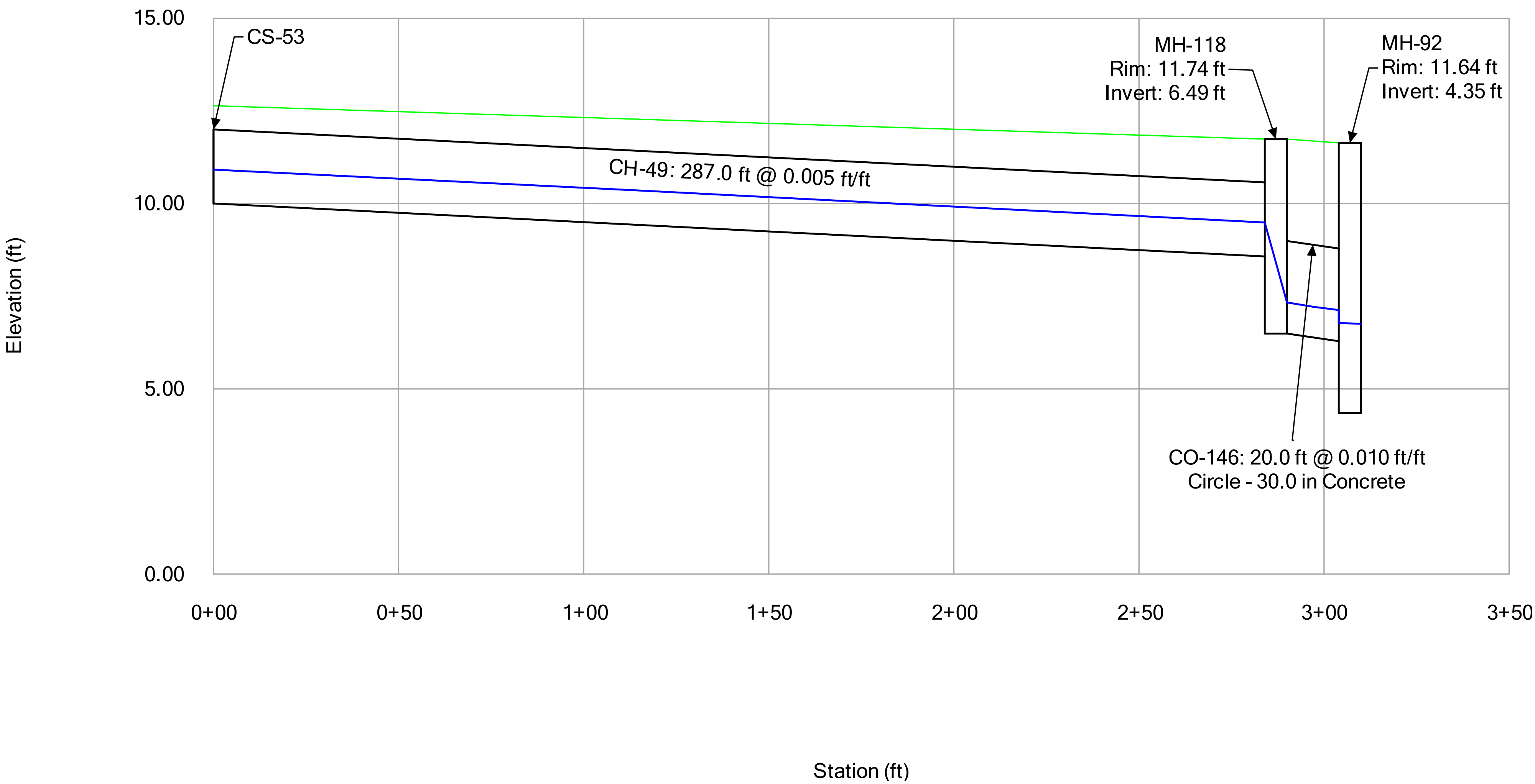
Profile Report
Engineering Profile - CS-51 to MH-90 (SitewidePermit-STORM_rev1.stsw)



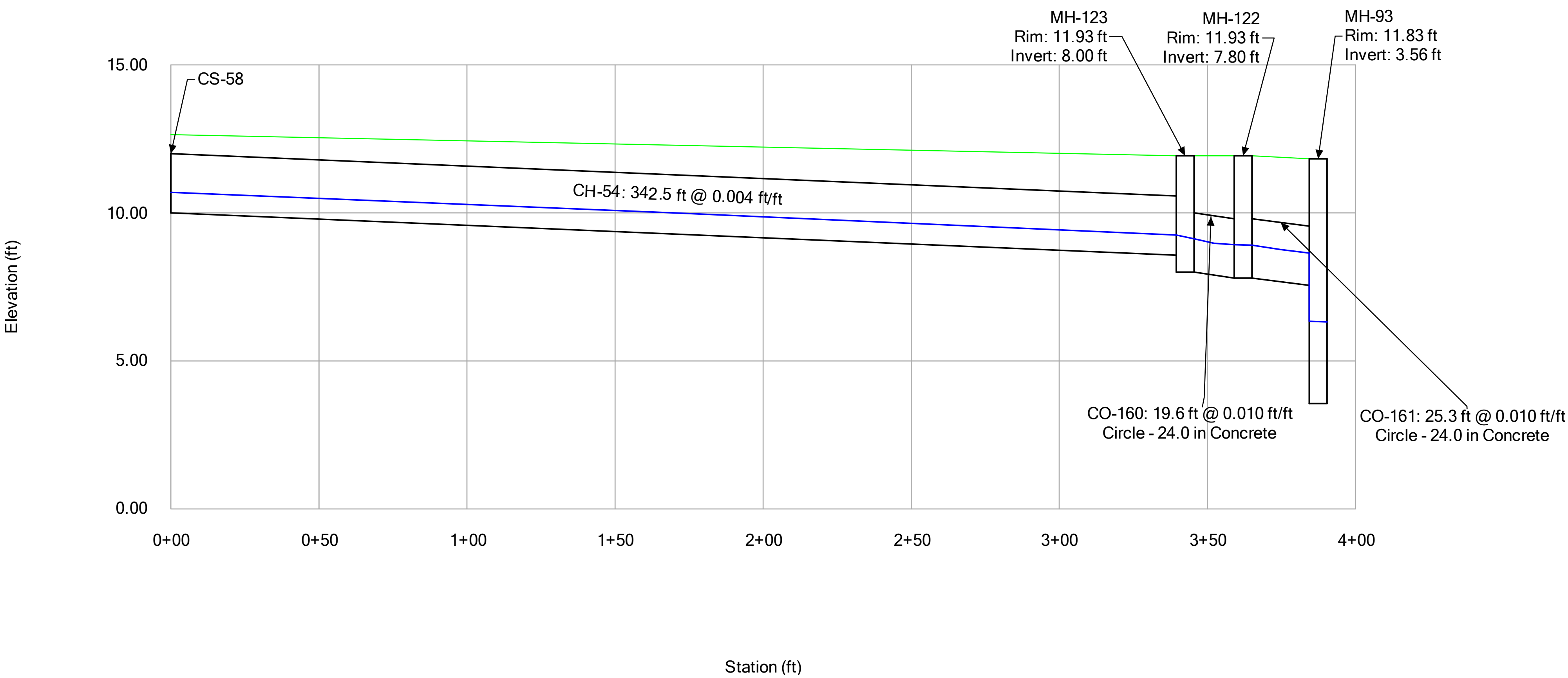
Profile Report
Engineering Profile - CS-57 to MH-93 (SitewidePermit-STORM_rev1.stsw)



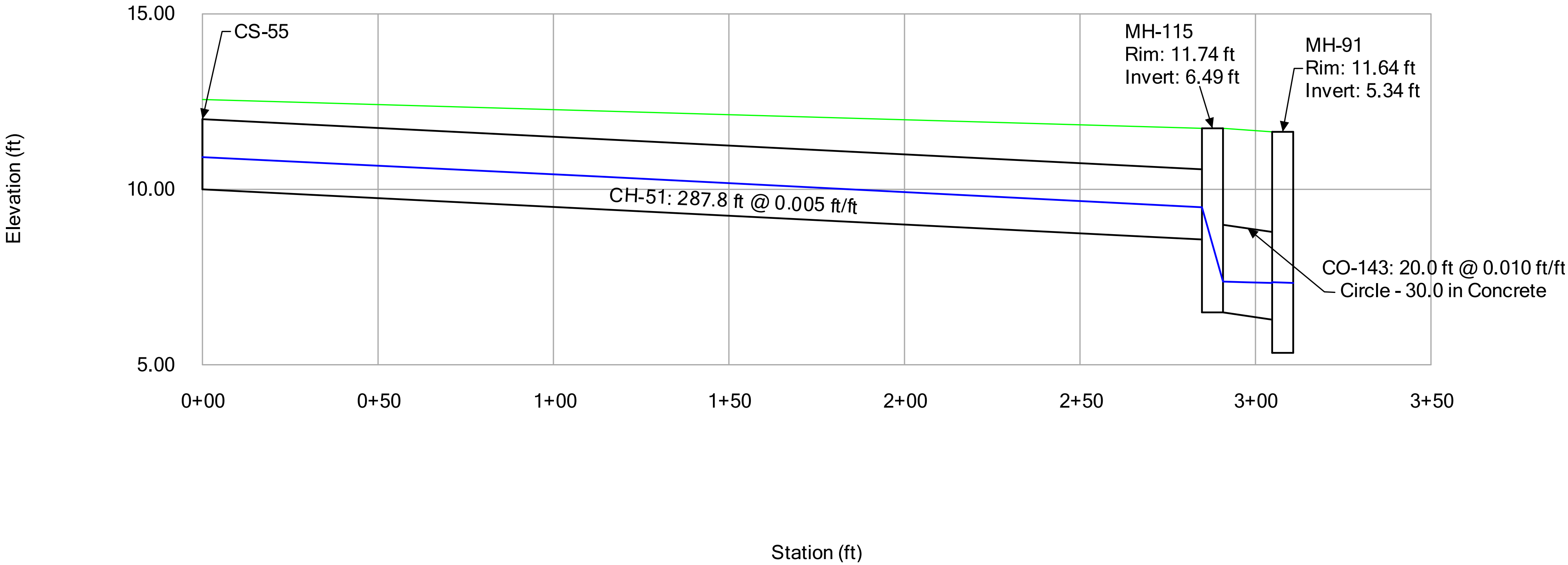
Profile Report
Engineering Profile - CS-53 to MH-92 (SitewidePermit-STORM_rev1.stsw)



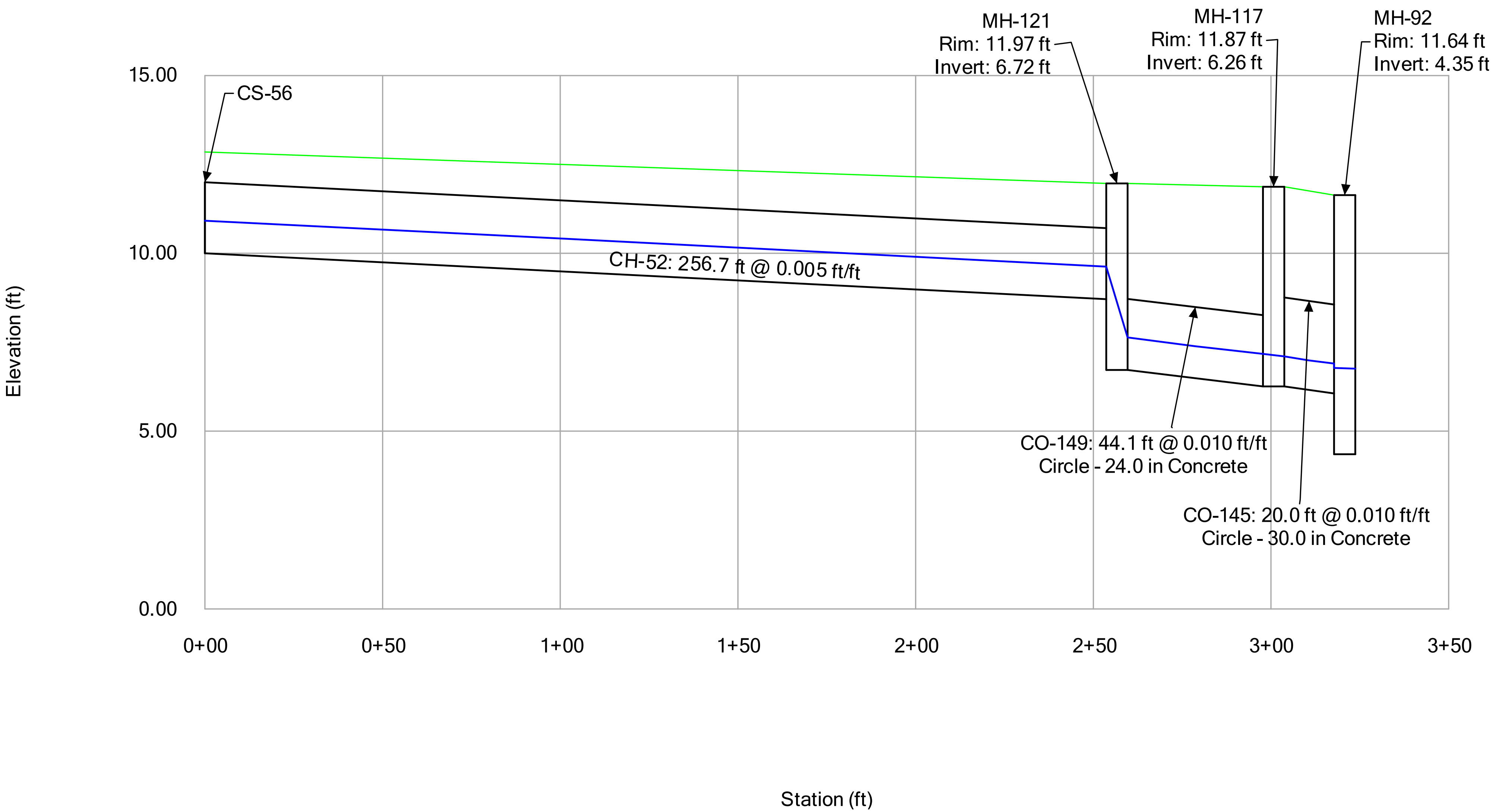
Profile Report
Engineering Profile - CS-58 to MH-93 (SitewidePermit-STORM_rev1.stsw)



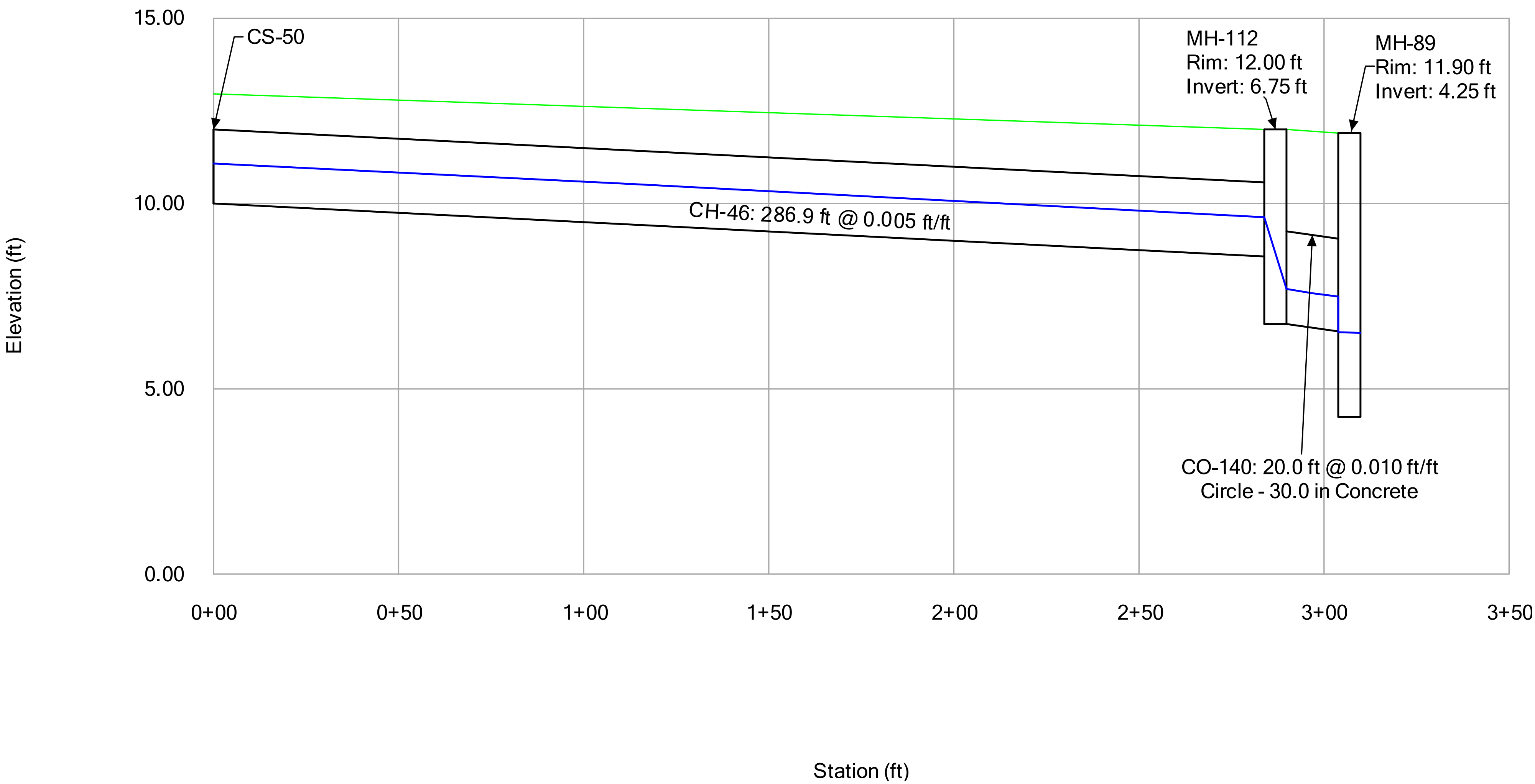
Profile Report
Engineering Profile - CS-55 to MH-91 (SitewidePermit-STORM_rev1.stsw)



Profile Report
Engineering Profile - CS-56 to MH-92 (SitewidePermit-STORM_rev1.stsw)

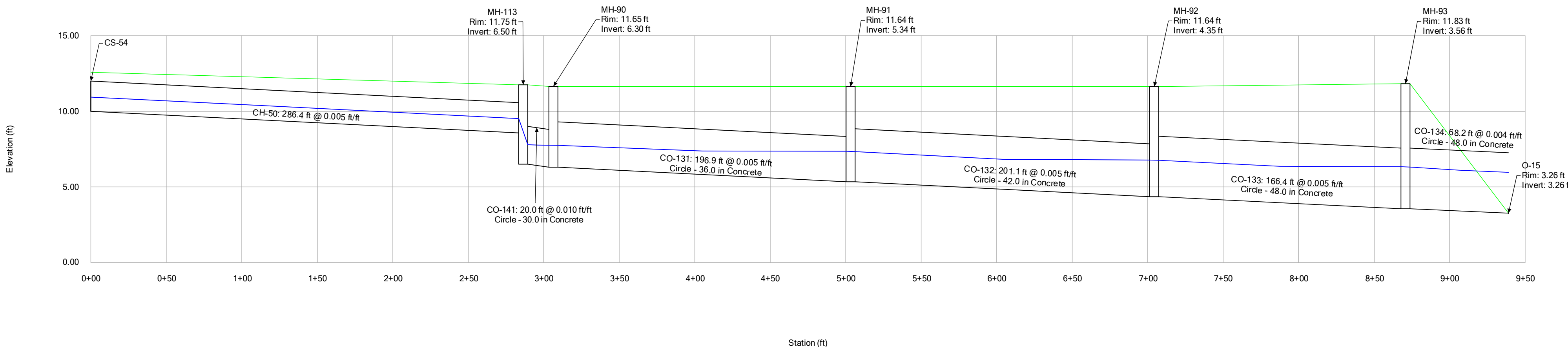


Profile Report
Engineering Profile - CS-50 to MH-89 (SitewidePermit-STORM_rev1.stsw)

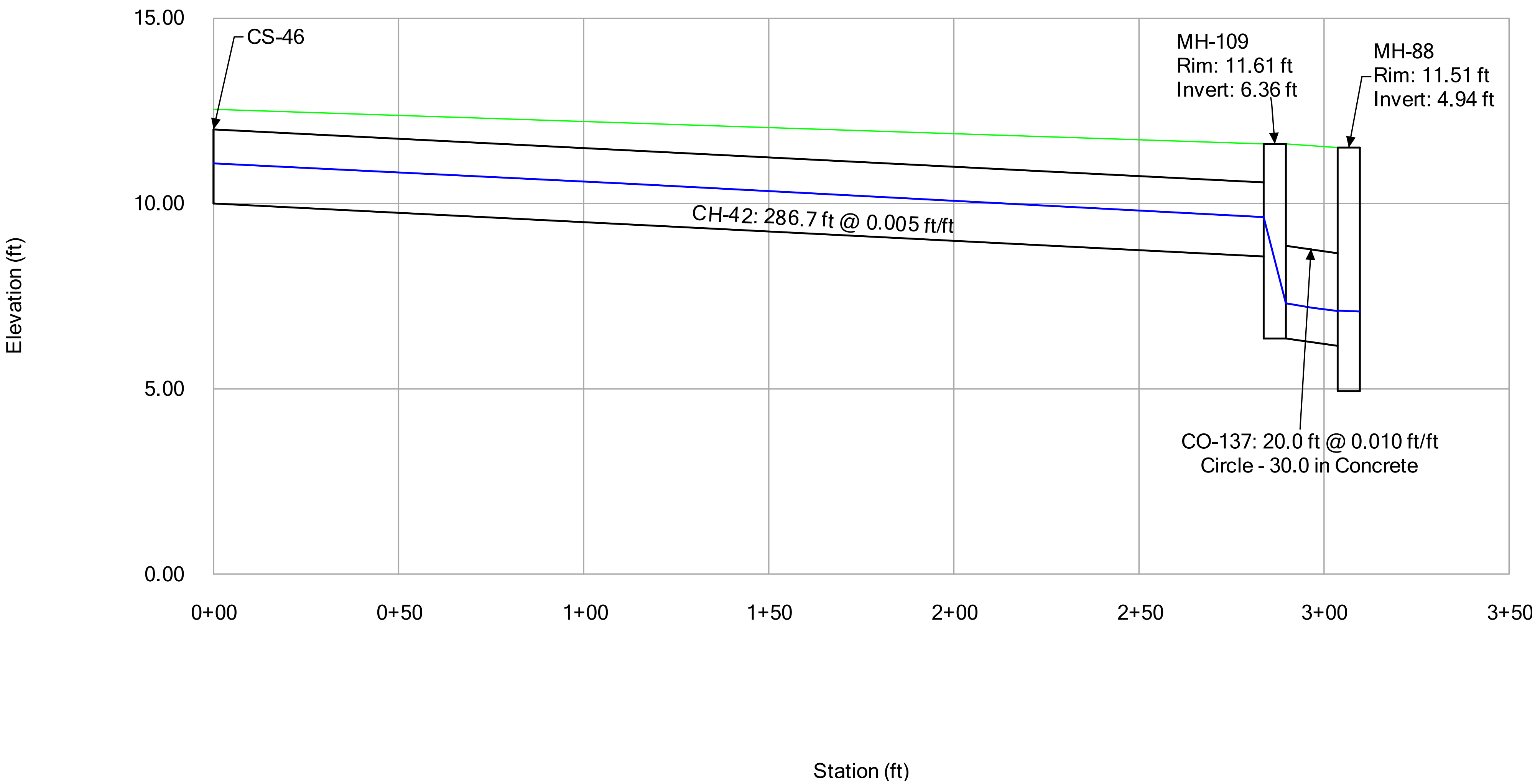


Profile Report

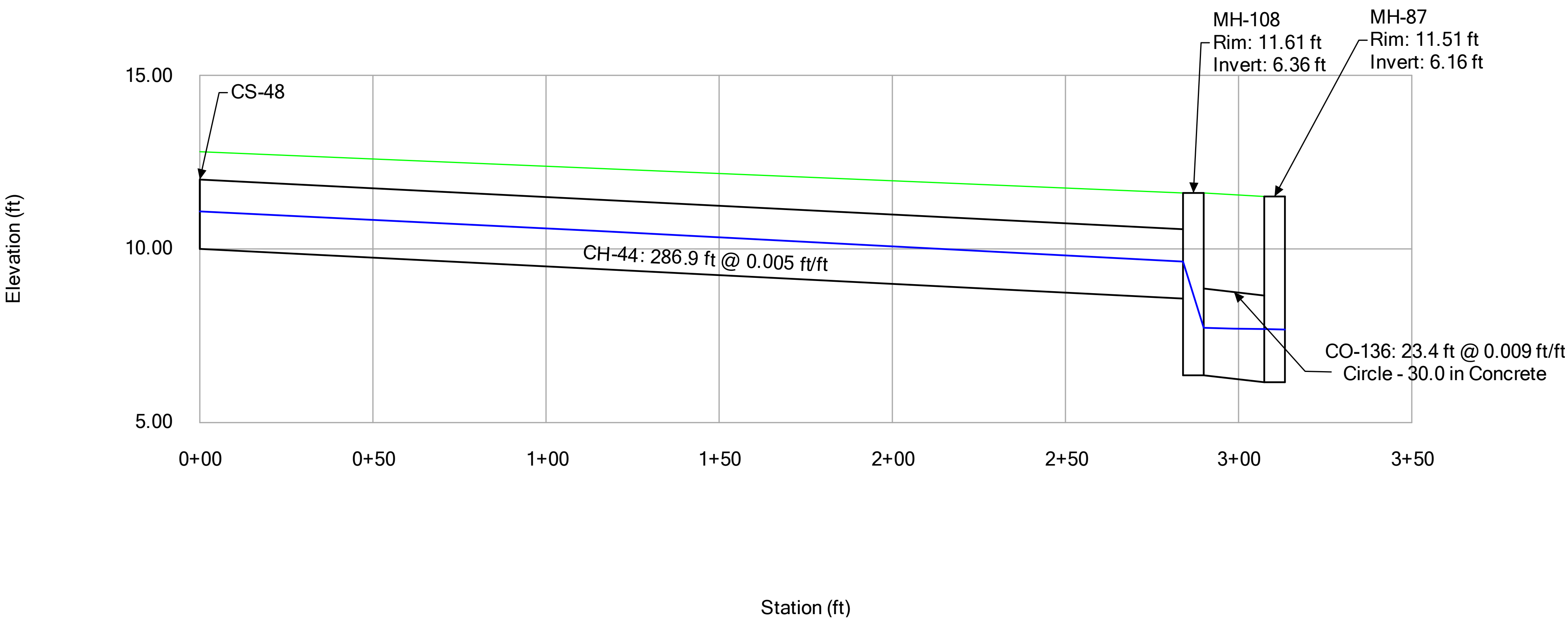
Engineering Profile - CS-54 to O-15 (SitewidePermit-STORM_rev1.stsw)



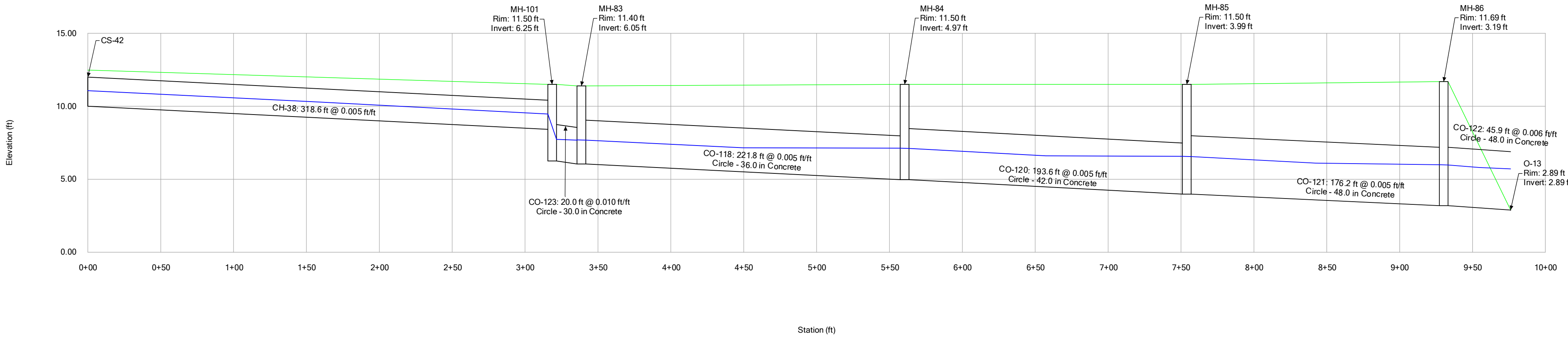
Profile Report
Engineering Profile - CS-46 to MH-88 (SitewidePermit-STORM_rev1.stsw)



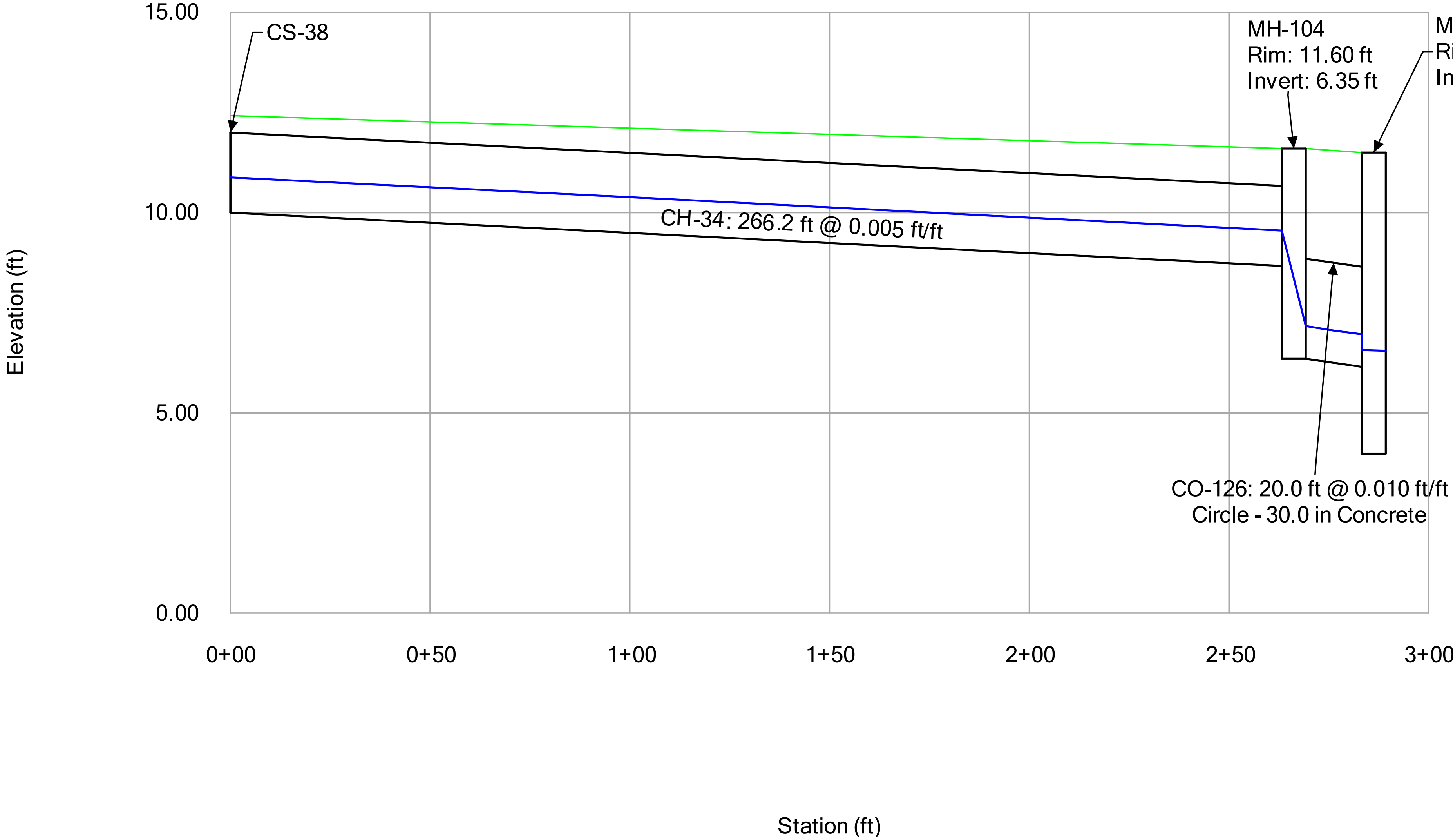
Profile Report
Engineering Profile - CS-48 to MH-87 (SitewidePermit-STORM_rev1.stsw)



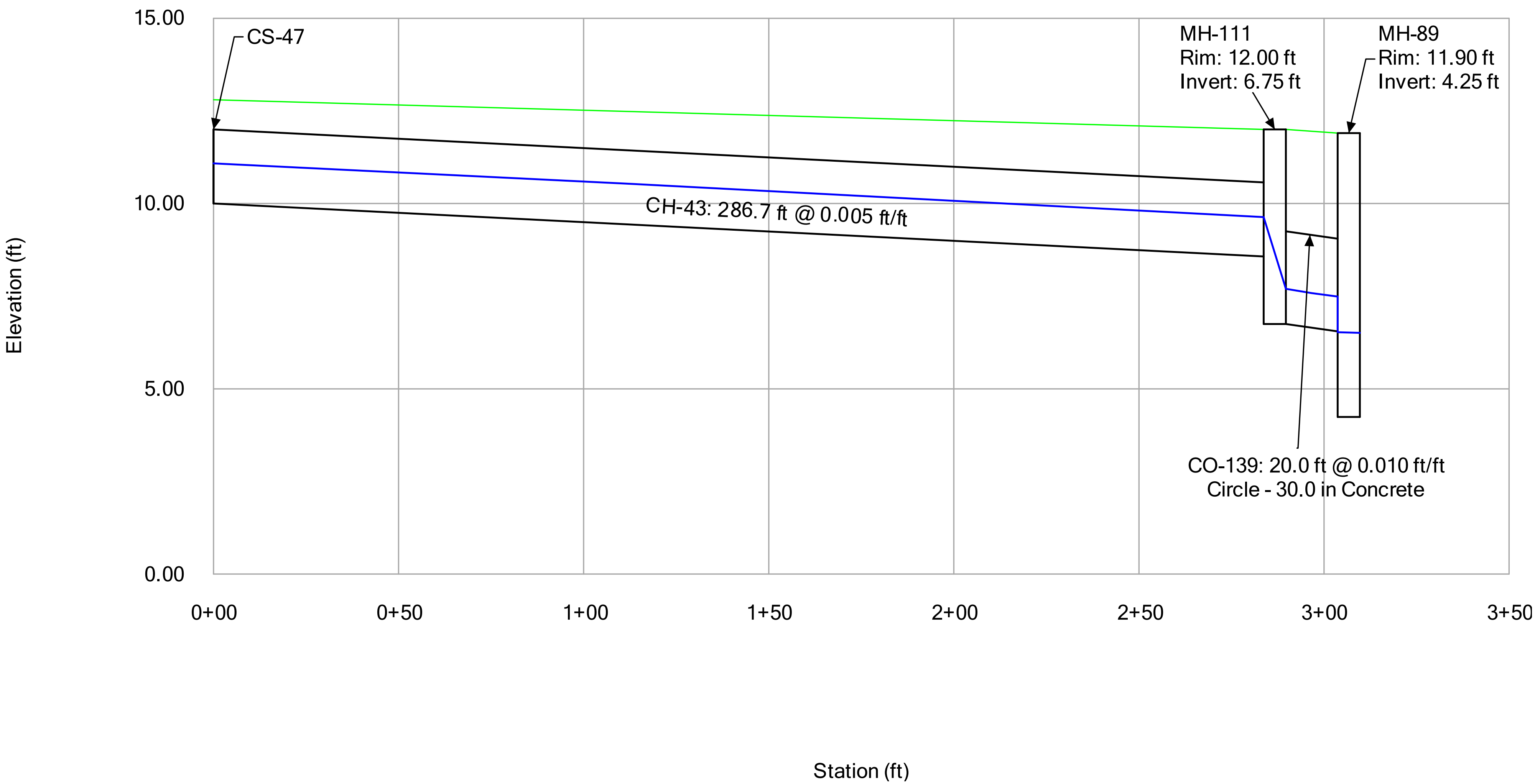
Profile Report
Engineering Profile - CS-42 to O-13 (SitewidePermit-STORM_rev1.stsw)



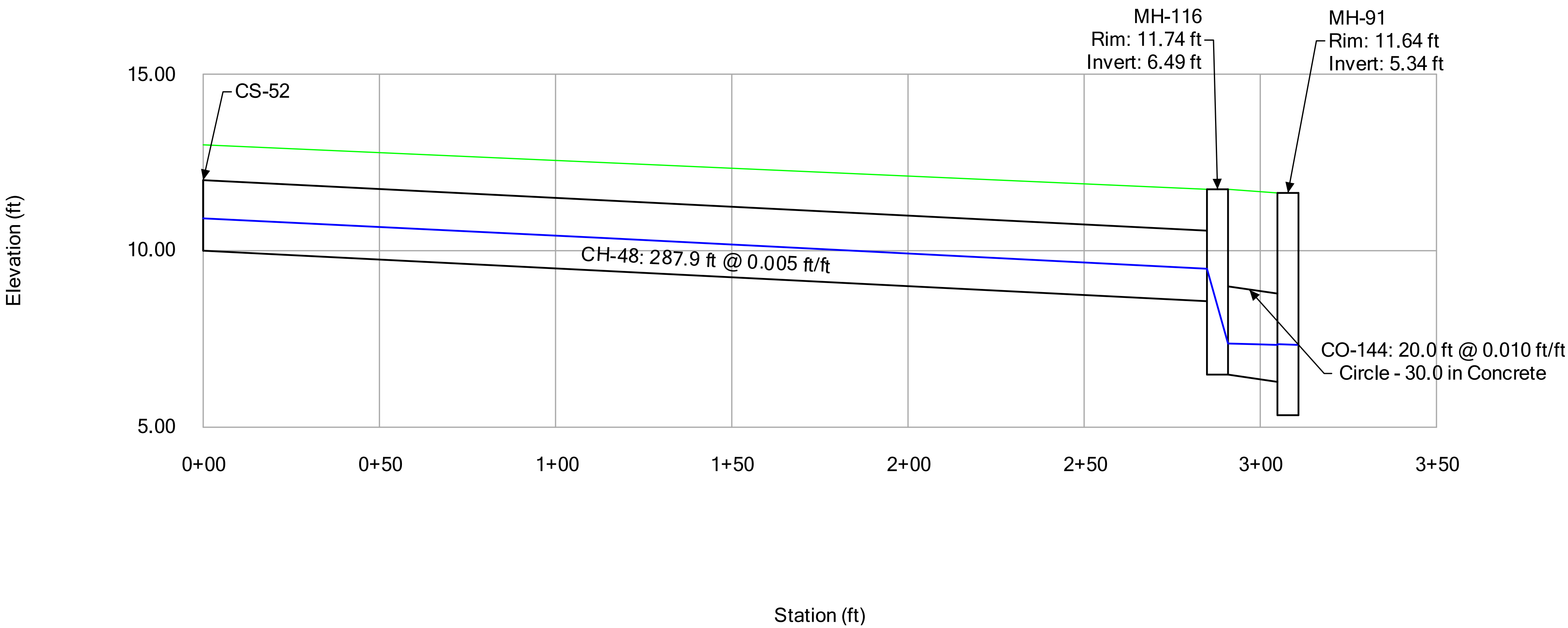
Profile Report
Engineering Profile - CS-38 to MH-85 (SitewidePermit-STORM_rev1.stsw)



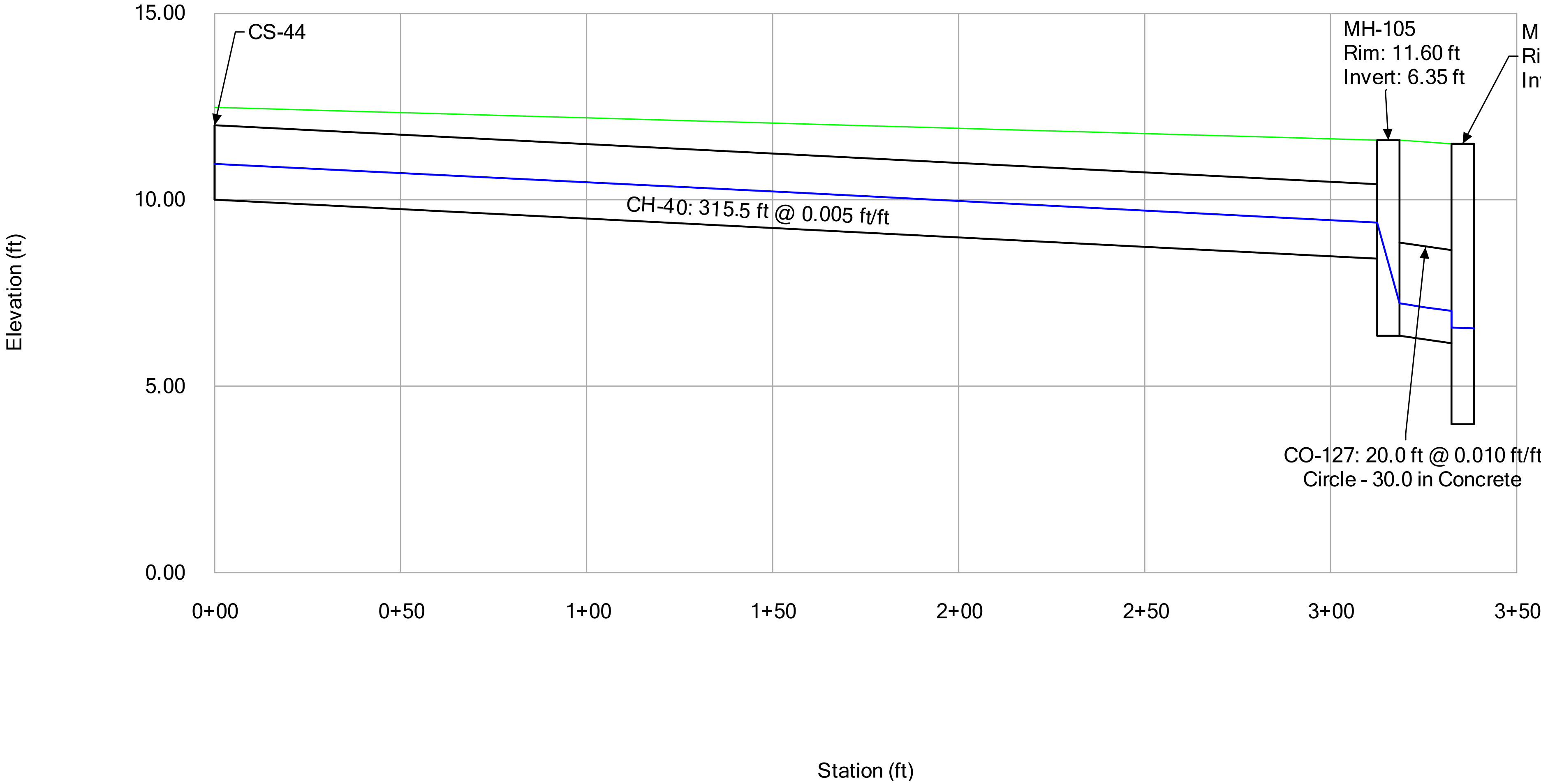
Profile Report
Engineering Profile - CS-47 to MH-89 (SitewidePermit-STORM_rev1.stsw)



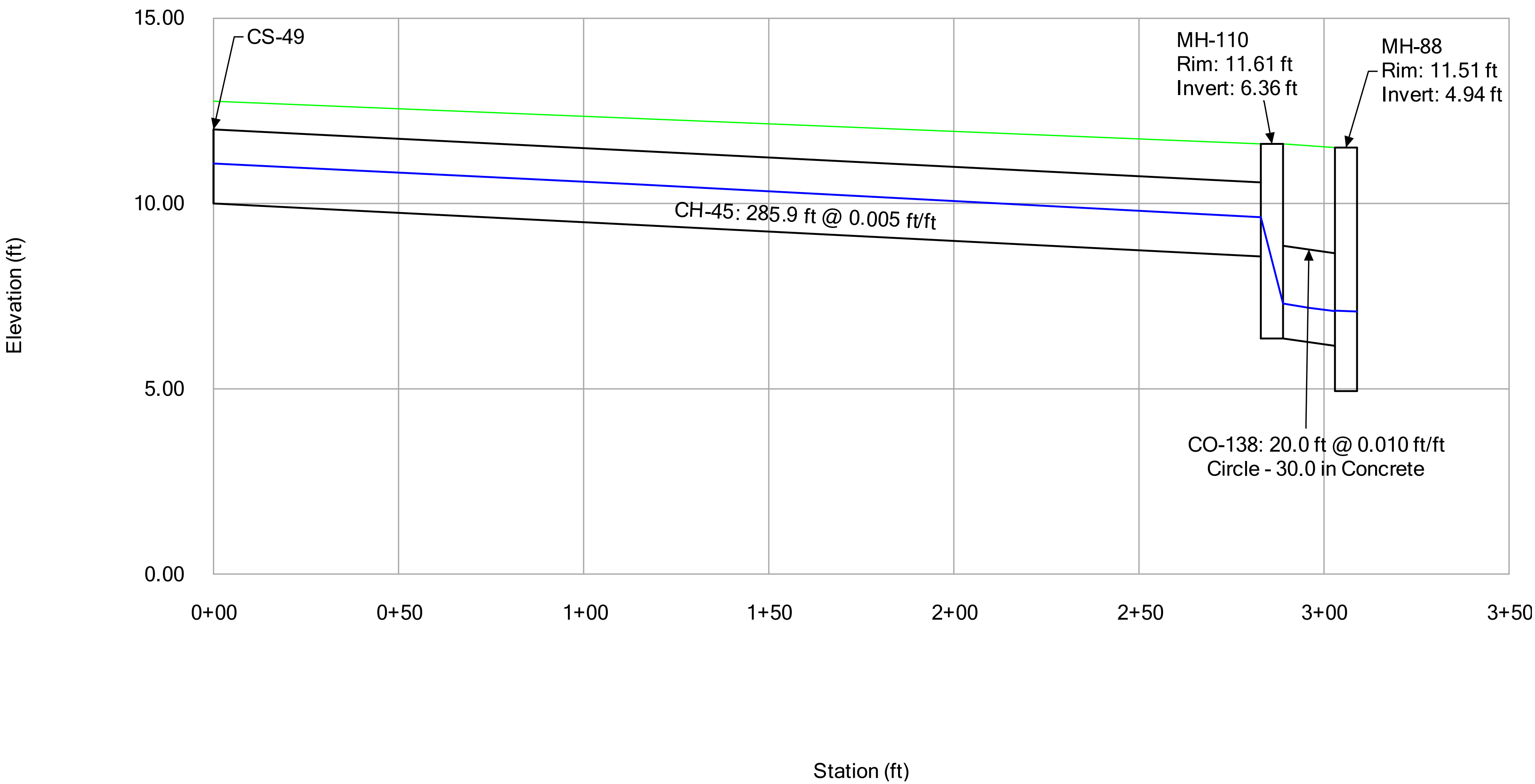
Profile Report
Engineering Profile - CS-52 to MH-91 (SitewidePermit-STORM_rev1.stsw)



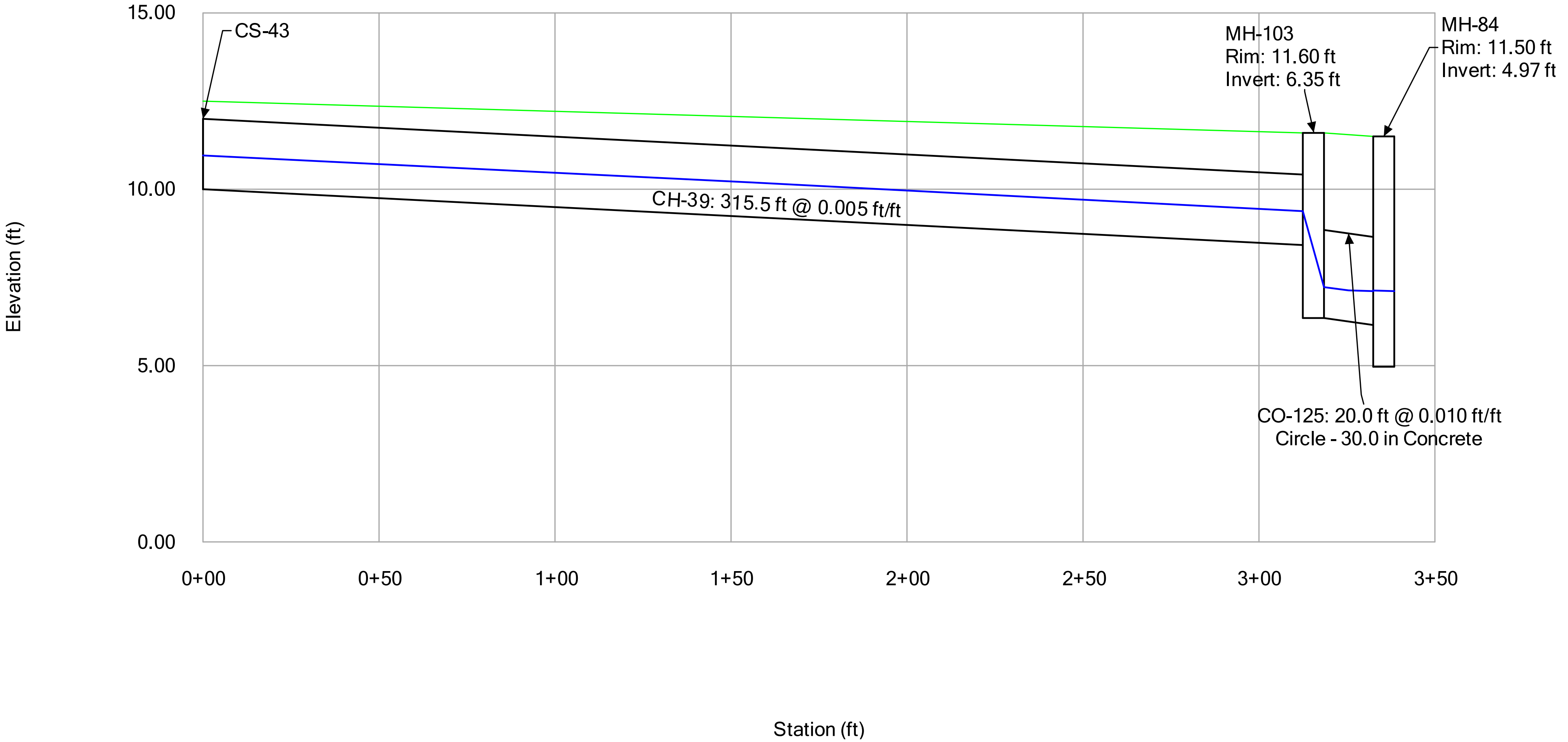
Profile Report
Engineering Profile - CS-44 to MH-85 (SitewidePermit-STORM_rev1.stsw)



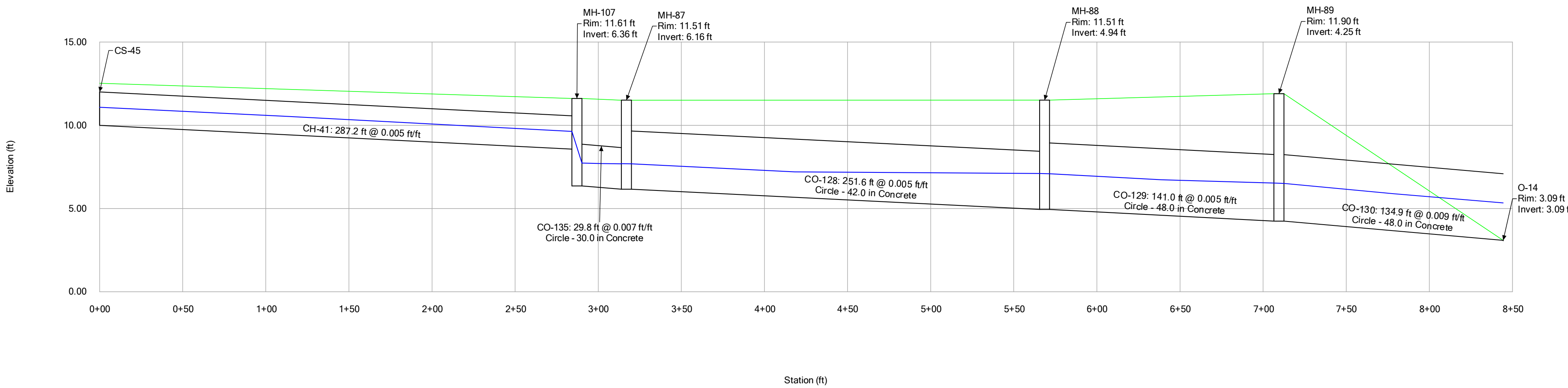
Profile Report
Engineering Profile - CS-49 to MH-88 (SitewidePermit-STORM_rev1.stsw)



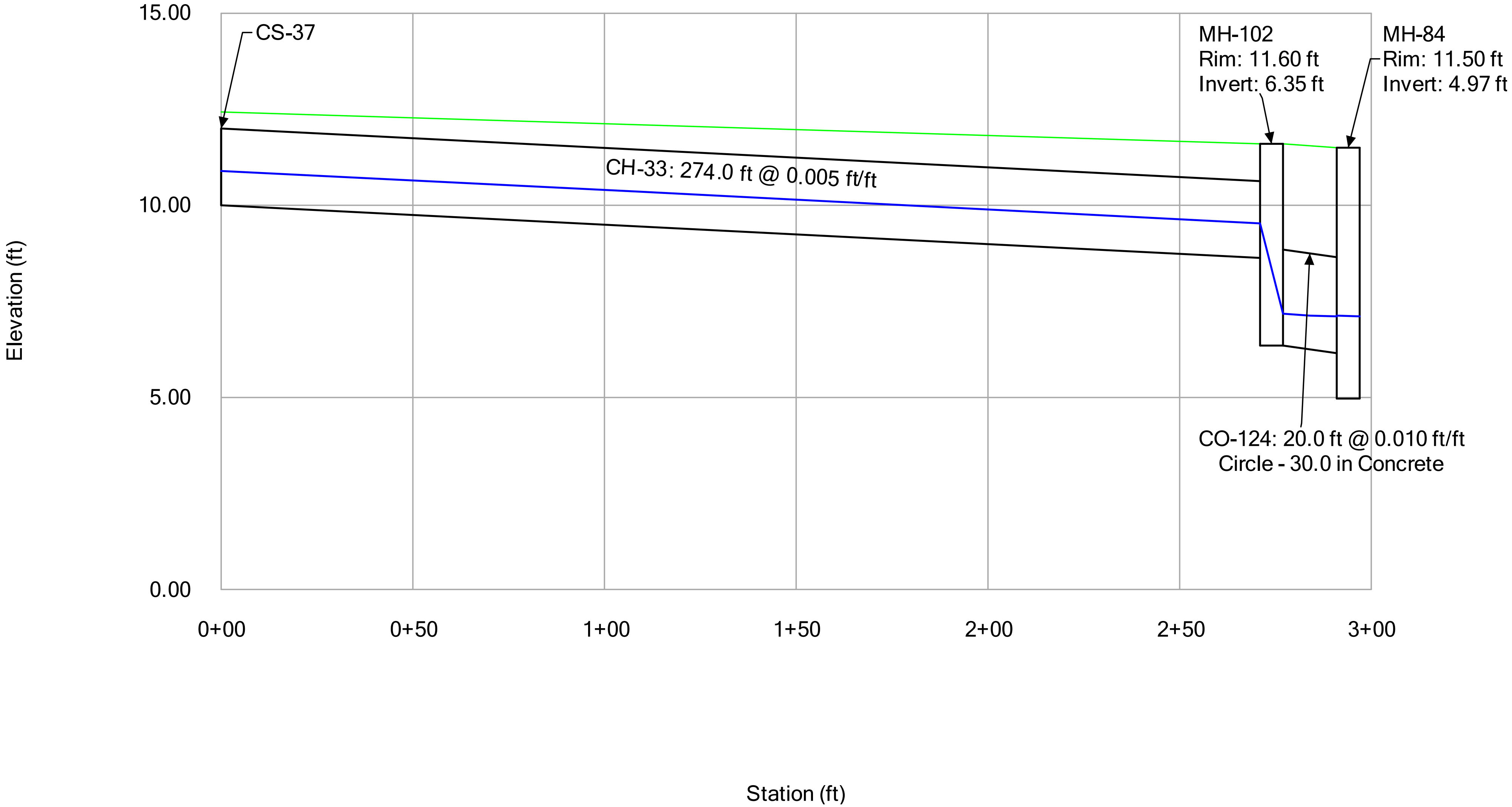
Profile Report
Engineering Profile - CS-43 to MH-84 (SitewidePermit-STORM_rev1.stsw)



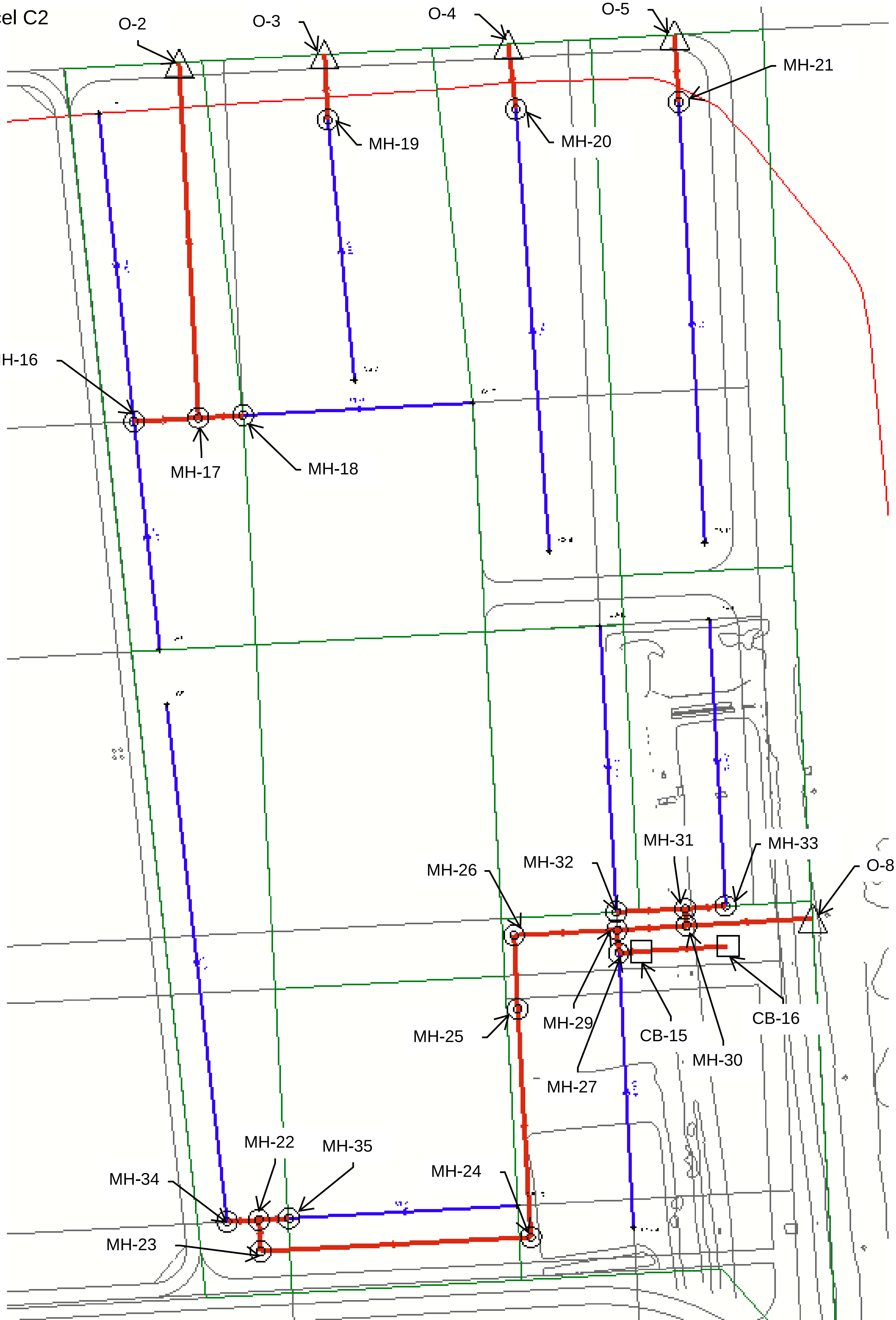
Profile Report
Engineering Profile - CS-45 to O-14 (SitewidePermit-STORM_rev1.stsw)



Profile Report
Engineering Profile - CS-37 to MH-84 (SitewidePermit-STORM_rev1.stsw)

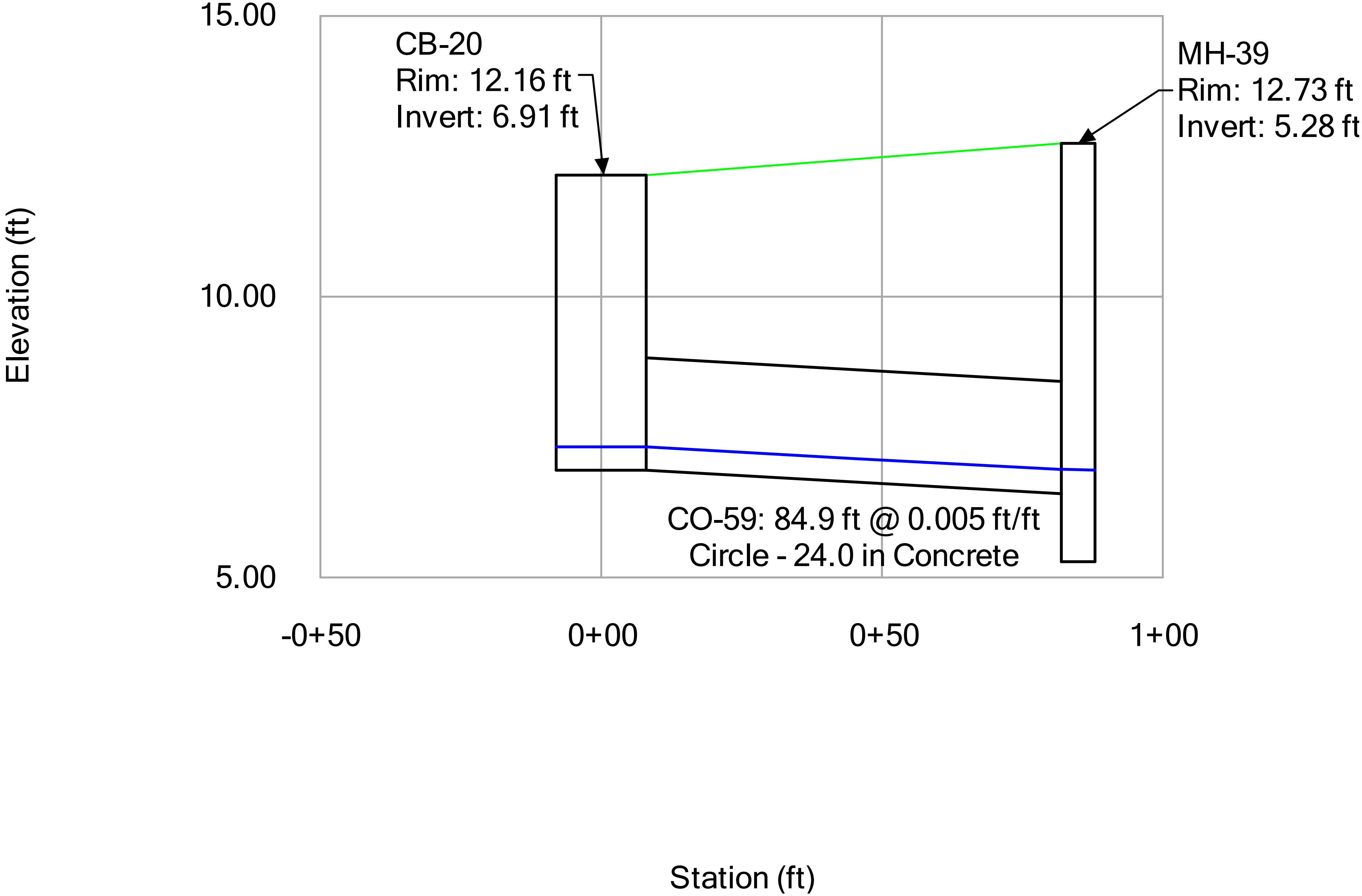


Parcel C2

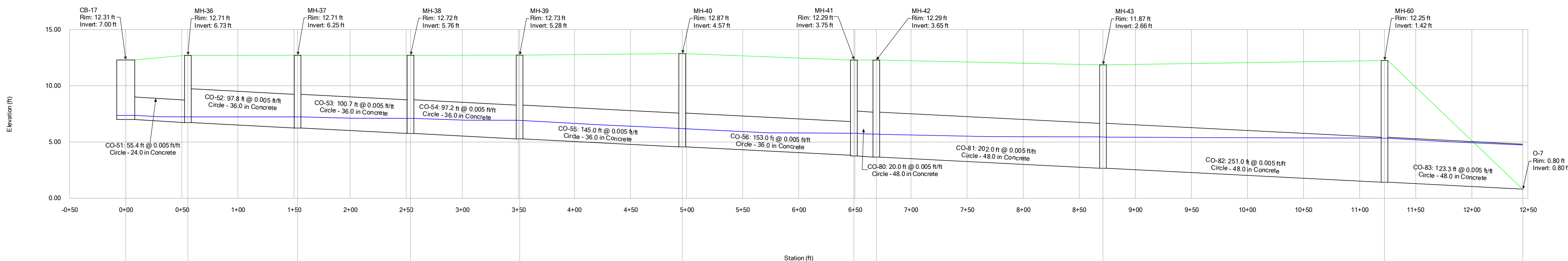

O-2
O-3
O-4
O-5
MH-21
MH-19
MH-20
MH-16
MH-17
MH-18
MH-31
MH-33
MH-26
MH-32
O-8
MH-29
CB-16
MH-25
CB-15
MH-30
MH-27
MH-22
MH-35
MH-24
MH-34
MH-23

Profile Report

Engineering Profile - CB-20 to MH-39 (SitewidePermit-STORM_rev1.stsw)



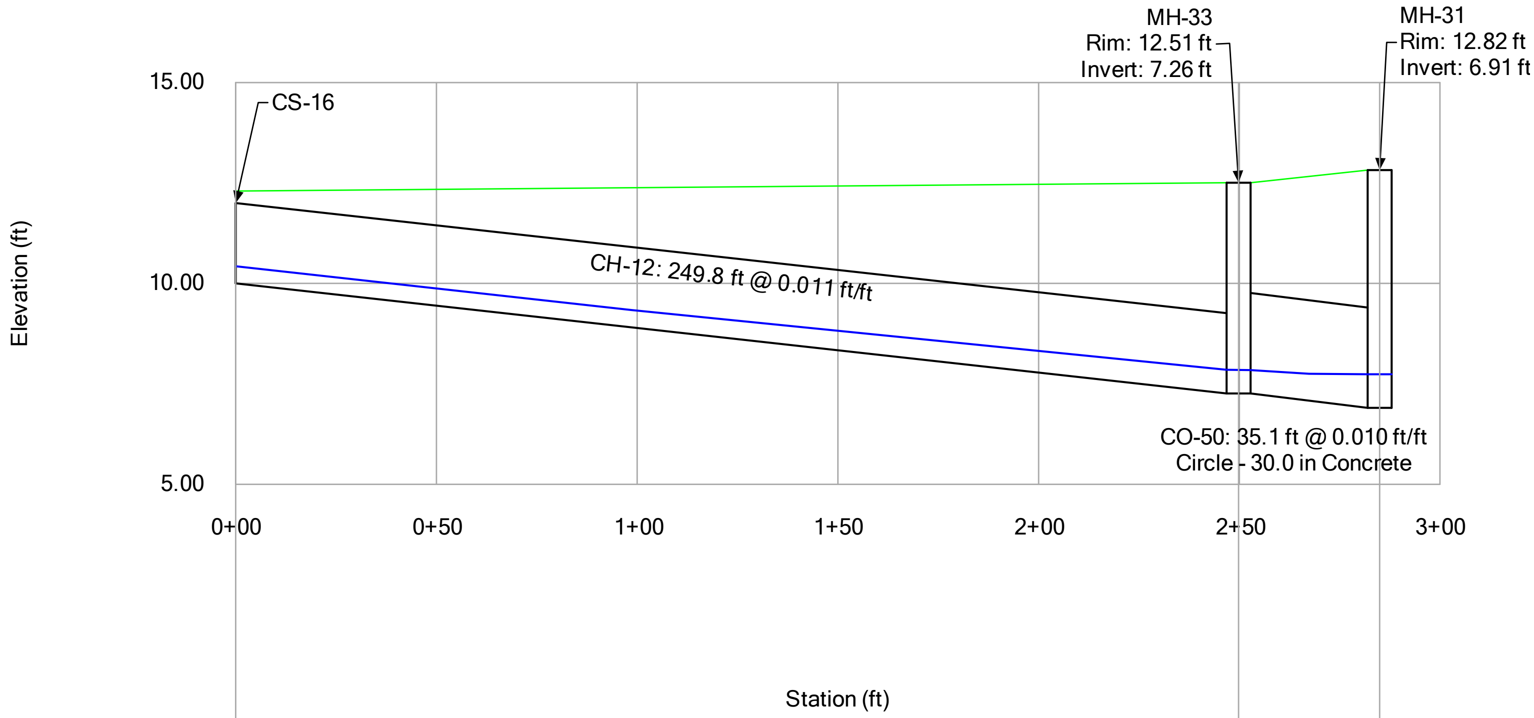
Profile Report
Engineering Profile - CB-17 to O-7 (SitewidePermit-STORM_rev1.stsw)



Element ID\Label	242\CO-51	243\CO-52	244\CO-53	245\CO-54	246\CO-55	247\CO-56	271\CO-80	272\CO-81	273\CO-82	274\CO-83
Rise (Unified) (ft)\Material	2.00\Concrete	3.00\Concrete	3.00\Concrete	3.00\Concrete	3.00\Concrete	3.00\Concrete	4.00\Concrete	4.00\Concrete	4.00\Concrete	4.00\Concrete
Flow (cfs)	1.15	1.23	9.03	17.03	25.04	25.34	41.10	47.59	73.52	88.24

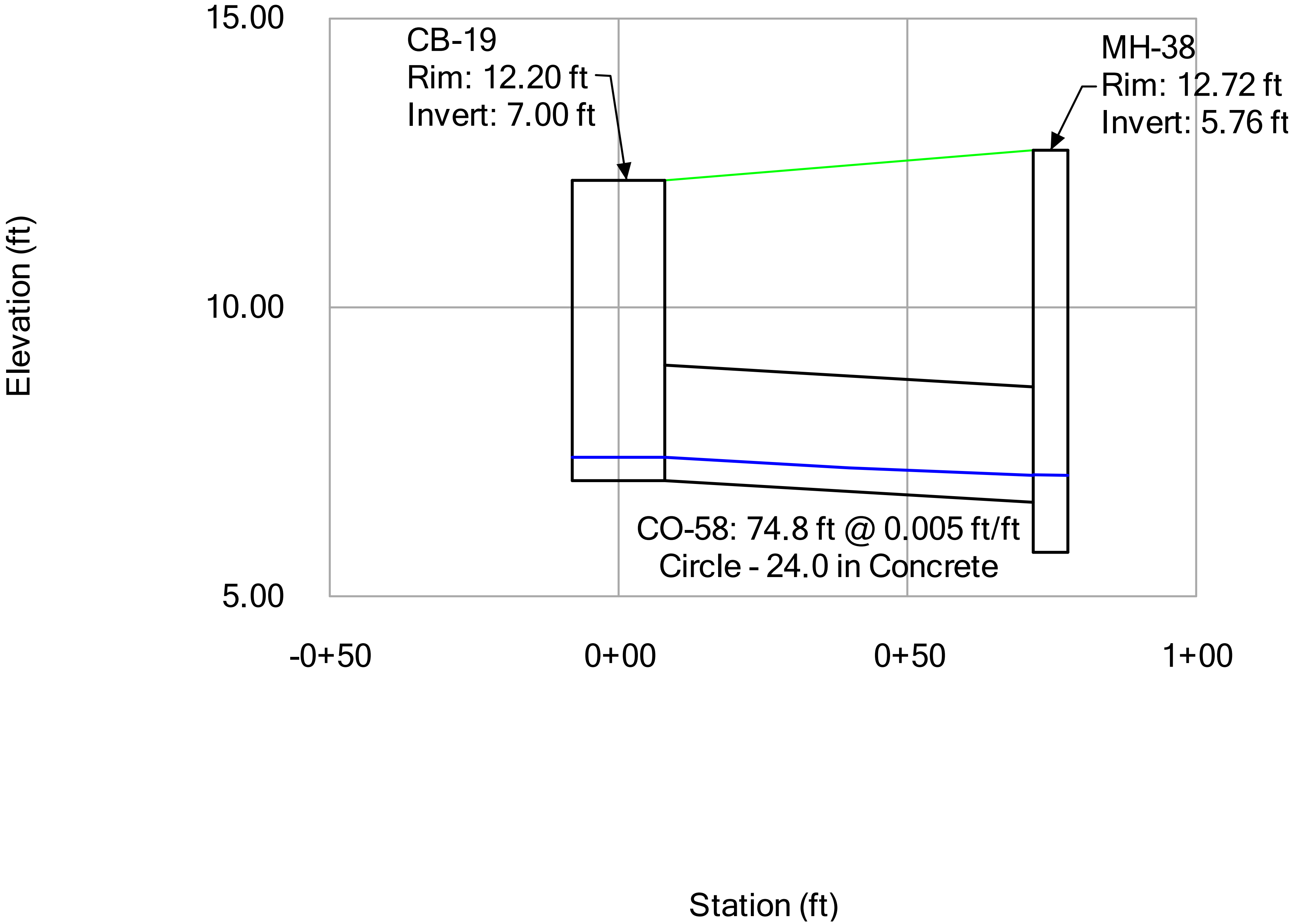
Station (ft)	0+00	0+55	1+53	2+54	3+51	4+96	6+49	6+69	8+71	11+22	12+45

Profile Report
Engineering Profile - CS-16 to MH-31 (SitewidePermit-STORM_rev1.stsw)

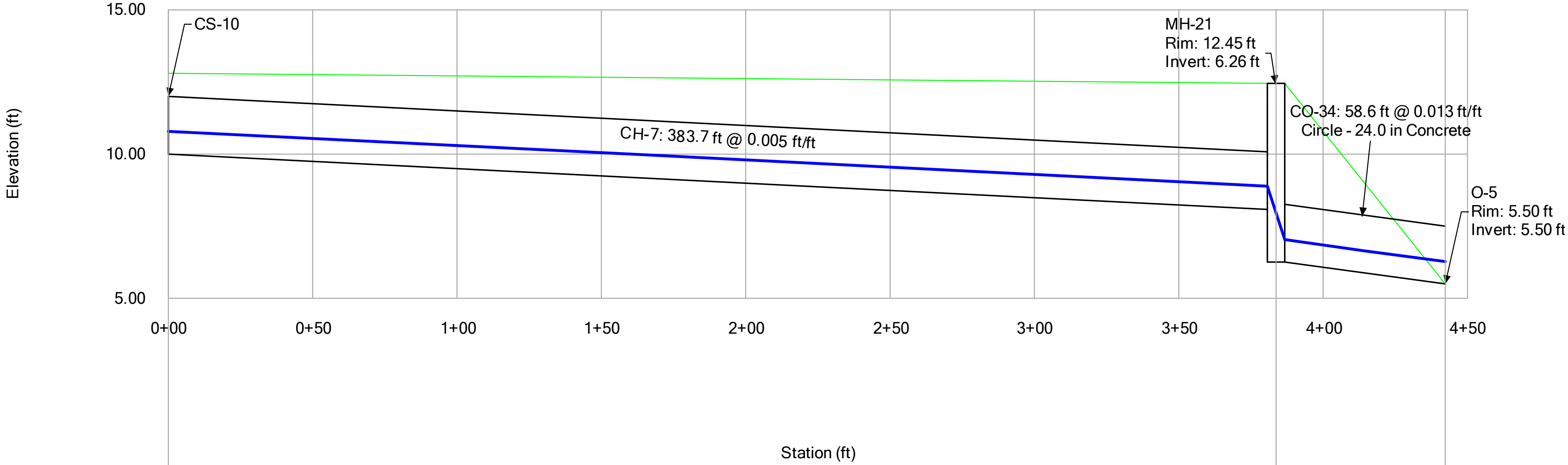


Element ID\Label	165\CH-12	159\CO-50
Rise (Unified) (ft)\Material	2.0\Concrete	2.50\Concrete
Flow (cfs)	4.57	4.73
Station (ft)	0+00	2+50 2+85

Profile Report
Engineering Profile - CB-19 to MH-38 (SitewidePermit-STORM_rev1.stsw)

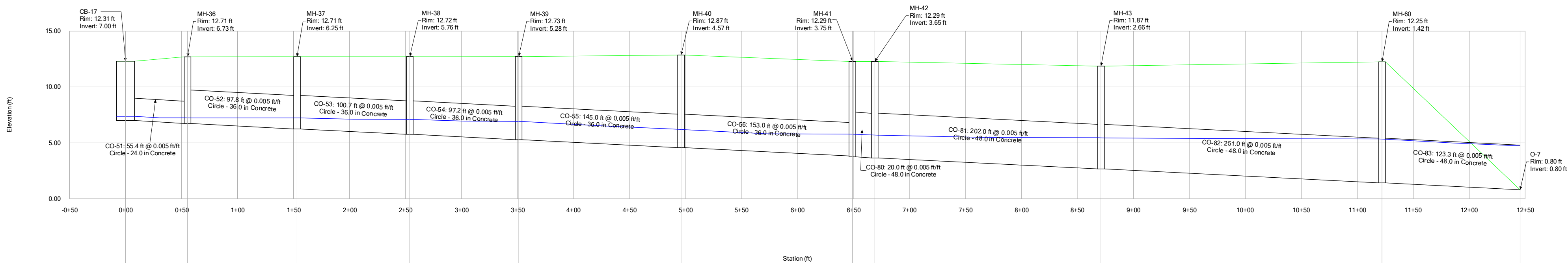


Profile Report
Engineering Profile - CS-10 to O-5 (SitewidePermit-STORM_rev1.stsw)



Element ID\Label	119\CH-7	122\CO-34
Rise (Unified) (ft)\Material	2.0\Concrete	2.00\Concrete
Flow (cfs)	7.47	7.84
Station (ft)	0+00	3+84 / 4+42

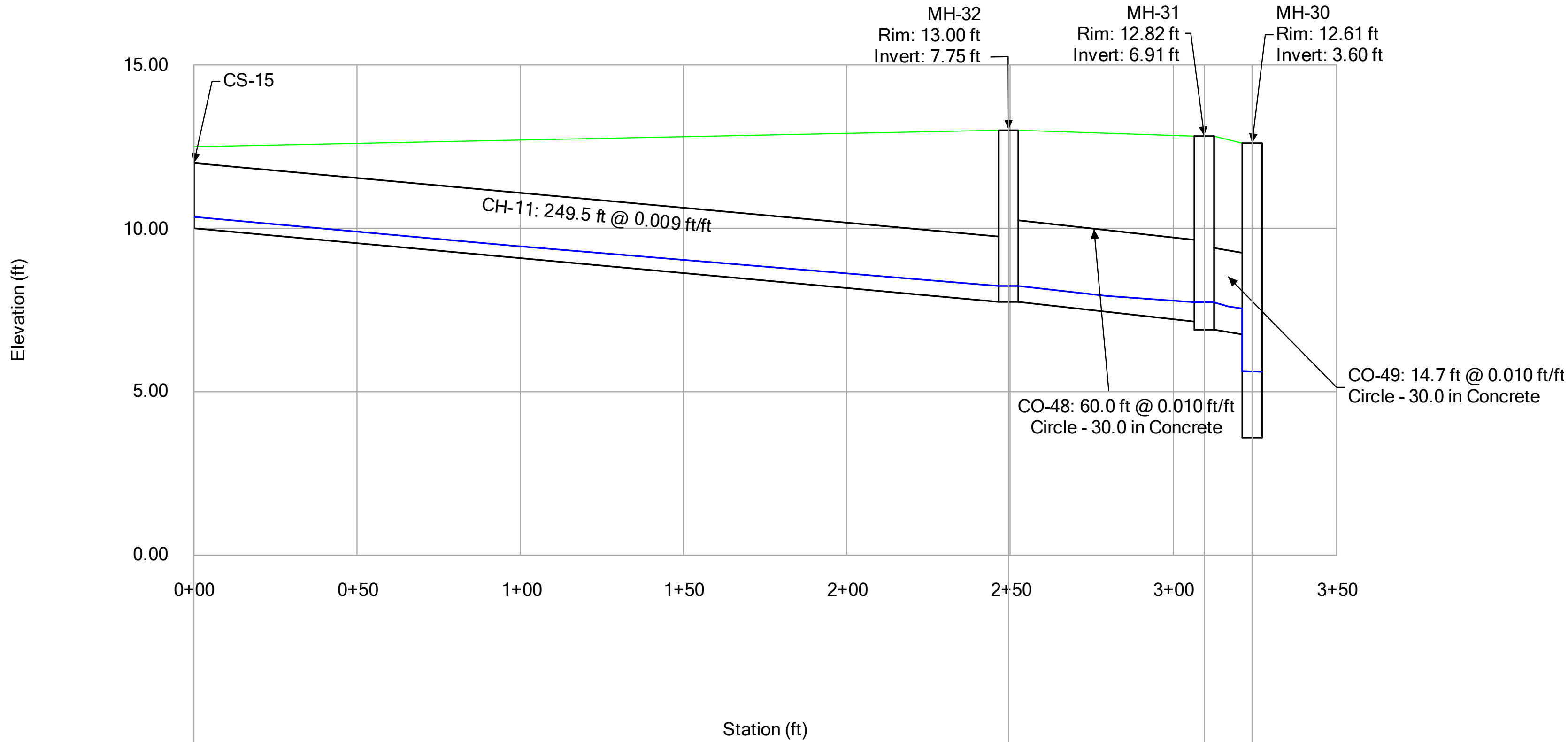
Profile Report
Engineering Profile - CB-17 to O-7 (SitewidePermit-STORM_rev1.stsw)



Element ID\Label	242\CO-51	243\CO-52	244\CO-53	245\CO-54	246\CO-55	247\CO-56	271\CO-80	272\CO-81	273\CO-82	274\CO-83
Rise (Unified) (ft)\Material	2.00\Concrete	3.00\Concrete	3.00\Concrete	3.00\Concrete	3.00\Concrete	3.00\Concrete	4.00\Concrete	4.00\Concrete	4.00\Concrete	4.00\Concrete
Flow (cfs)	1.15	1.23	9.03	17.03	25.04	25.34	41.10	47.59	73.52	88.24

Station (ft)	0+00	0+55	1+53	2+54	3+51	4+96	6+49	6+69	8+71	11+22	12+45

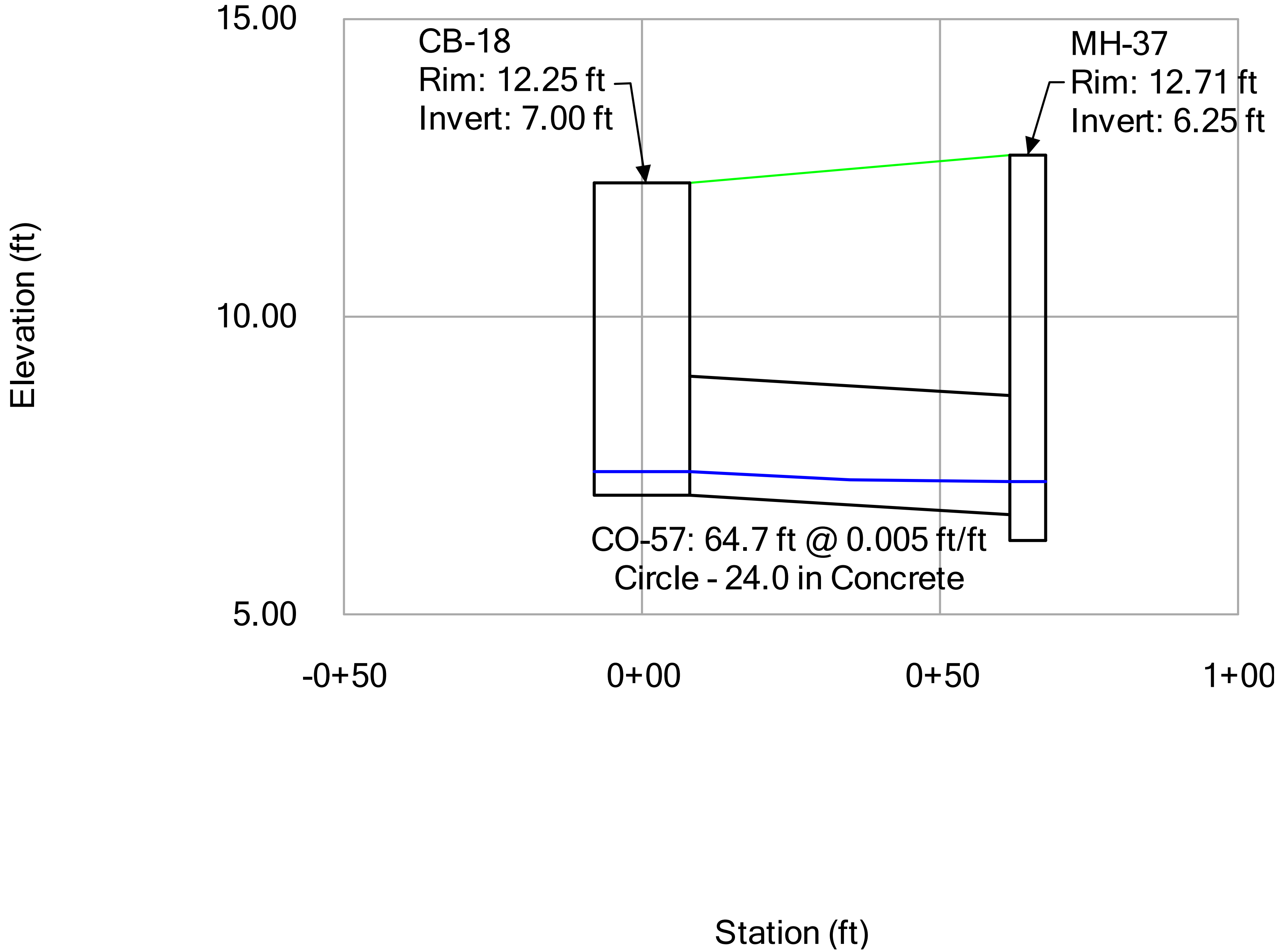
Profile Report
Engineering Profile - CS-15 to MH-30 (SitewidePermit-STORM_rev1.stsw)



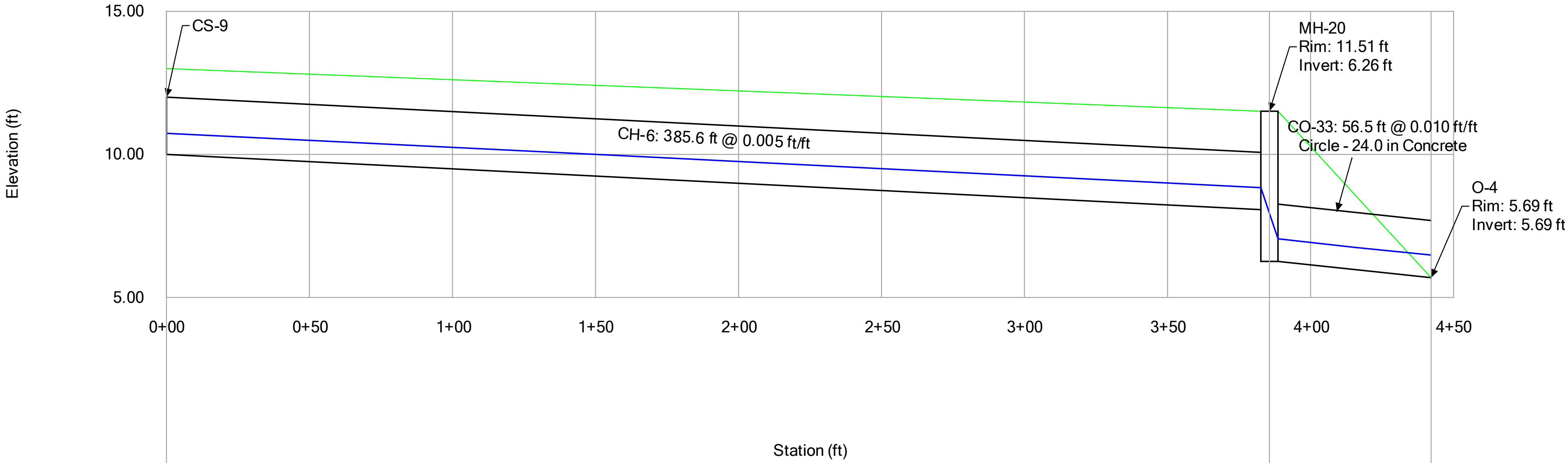
Element ID\Label	163\CH-11	157\CO-48	158\CO-49
Rise (Unified) (ft)\Material	2.0\Concrete	2.50\Concrete	2.50\Concrete
Flow (cfs)	3.14	3.27	8.64
Station (ft)	0+00	2+50	3+09 3+24

Profile Report

Engineering Profile - CB-18 to MH-37 (SitewidePermit-STORM_rev1.stsw)

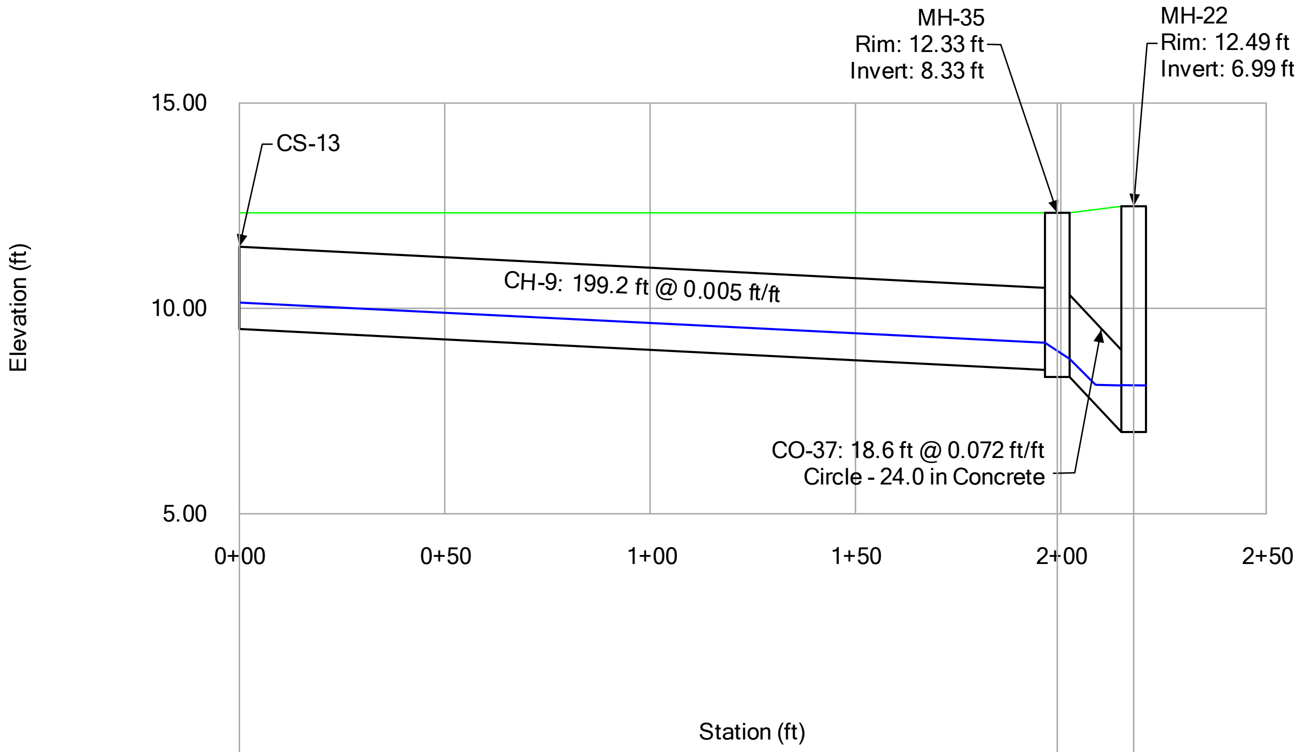


Profile Report
Engineering Profile - CS-9 to O-4 (SitewidePermit-STORM_rev1.stsw)



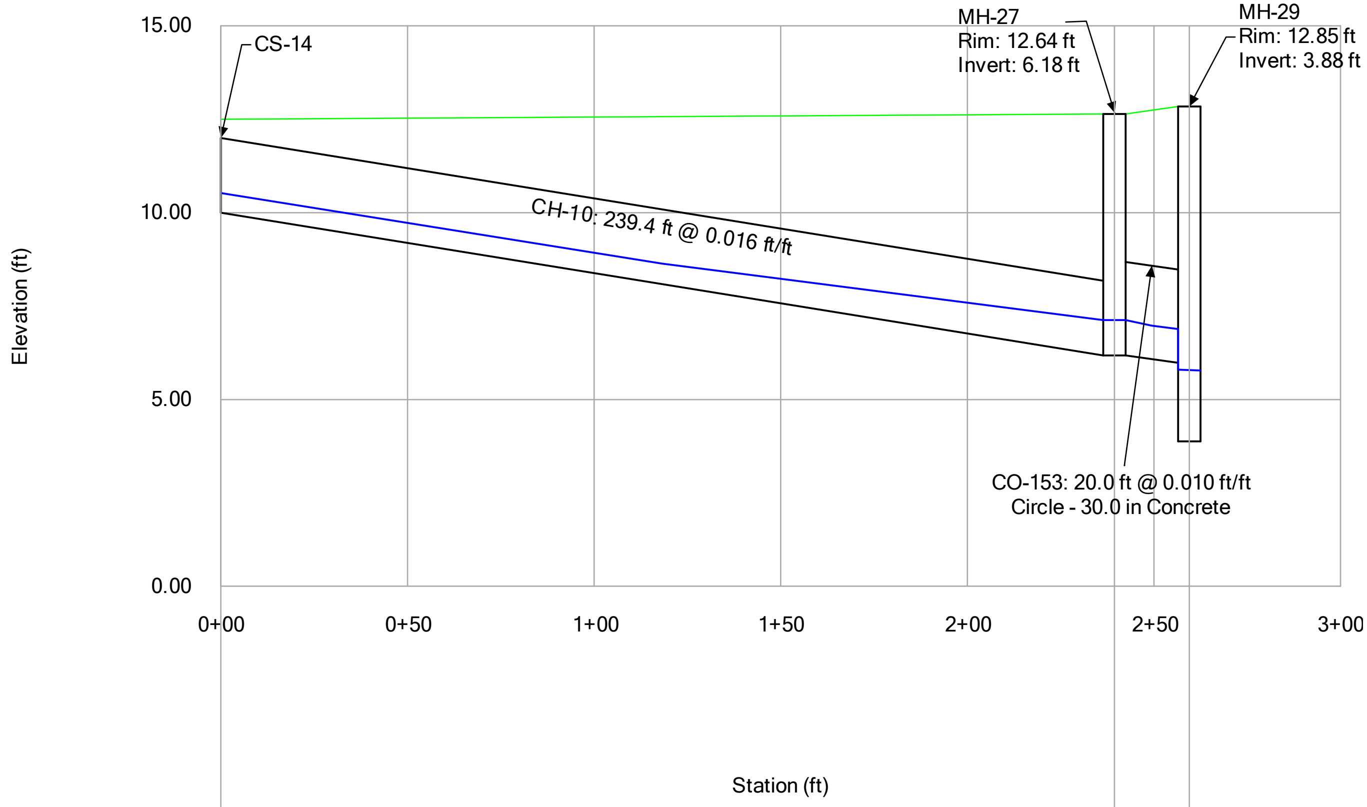
Element ID\Label	117\CH-6	121\CO-33
Rise (Unified) (ft)\Material	2.0\Concrete	2.00\Concrete
Flow (cfs)	6.83	7.15
Station (ft)	0+00	3+86 / 4+42

Profile Report
Engineering Profile - CS-13 to MH-22 (SitewidePermit-STORM_rev1.stsw)



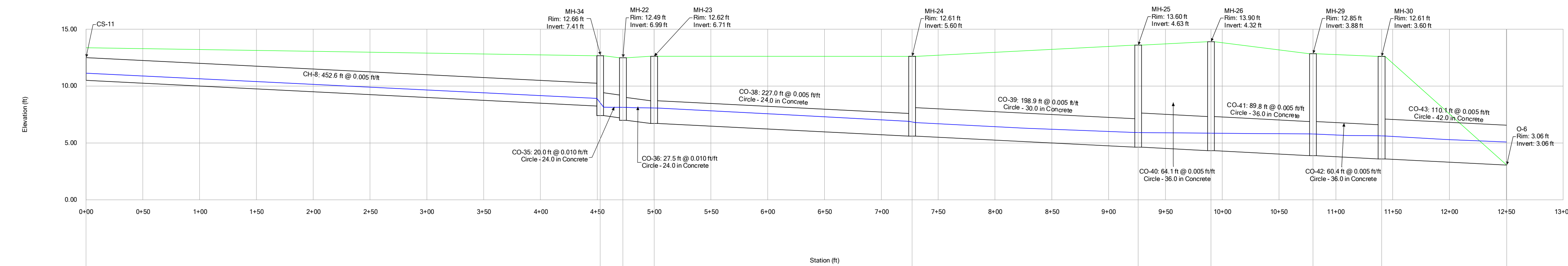
Element ID\Label	143\CH-9	146\CO-37
Rise (Unified) (ft)\Material	2.0\Concrete	2.00\Concrete
Flow (cfs)	5.56	5.70
Station (ft)	0+00	1+99 2+18

Profile Report
Engineering Profile - CS-14 to MH-29 (SitewidePermit-STORM_rev1.stsw)



Element ID\Label	161\CH-10	551\CO-153
Rise (Unified) (ft)\Material	2.0\Concrete	2.50\Concrete
Flow (cfs)	7.48	10.96
Station (ft)	0+00	2+39 2+59

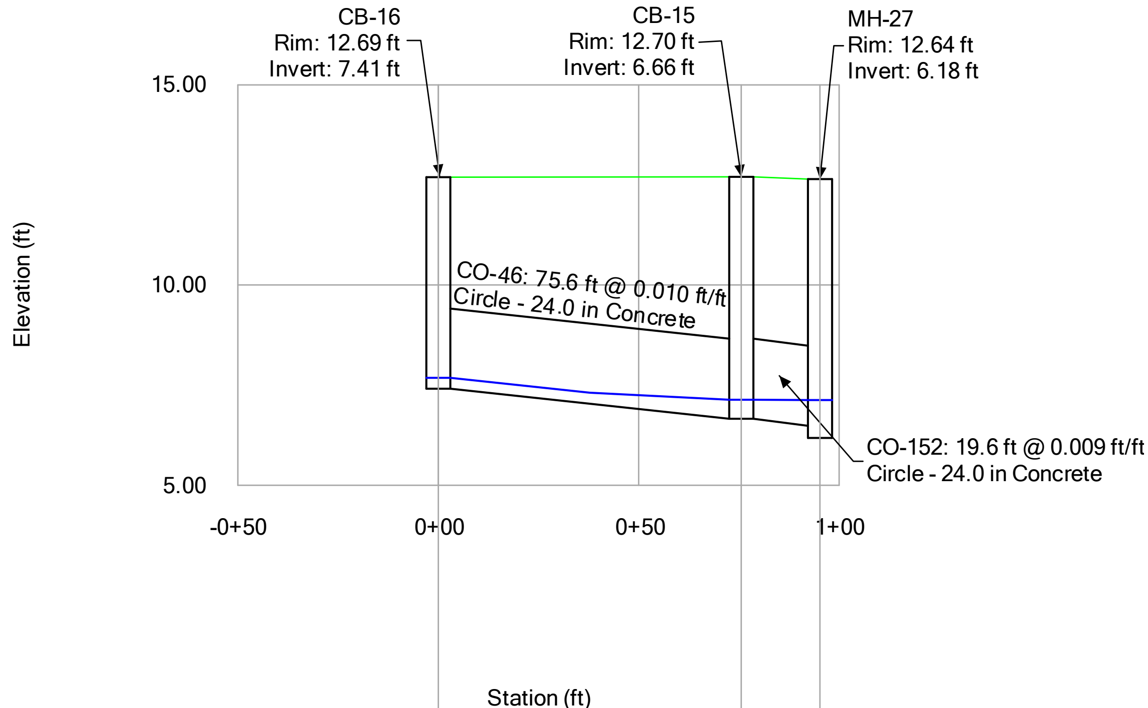
Profile Report
Engineering Profile - CS-11 to O-6 (SitewidePermit-STORM_rev1.stsw)



Element ID\Label	139\CH-8	144\CO-35	145\CO-36	147\CO-38	148\CO-39	149\CO-40	150\CO-41	151\CO-42	152\CO-43	
Rise (Unified) (ft)\Material	2.0\Concrete	2.00\Concrete	2.00\Concrete	2.00\Concrete	2.50\Concrete	3.00\Concrete	3.00\Concrete	3.00\Concrete	3.50\Concrete	
Flow (cfs)	5.57	5.87	12.28	12.50	12.78	12.95	19.69	31.73	41.23	
Station (ft)	0+00	4+53	4+73	5+00	7+27	9+26	9+90	10+80	11+40	12+50

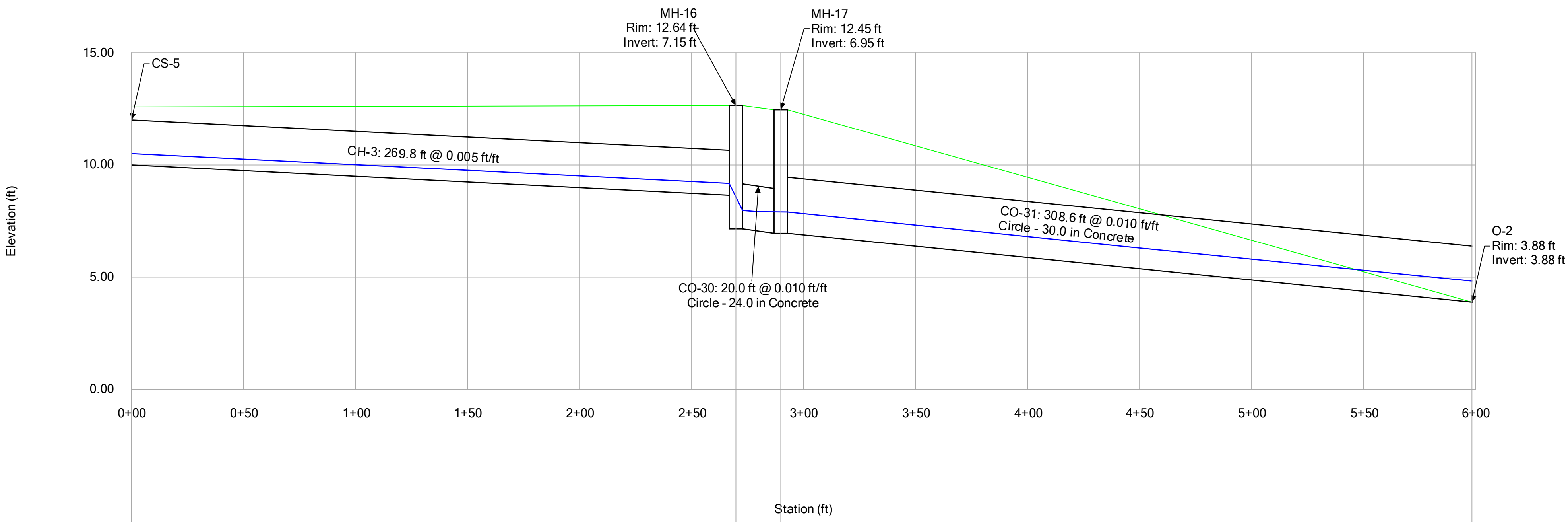
Profile Report

Engineering Profile - CB-16 to MH-27 (SitewidePermit-STORM_rev1.stsw)



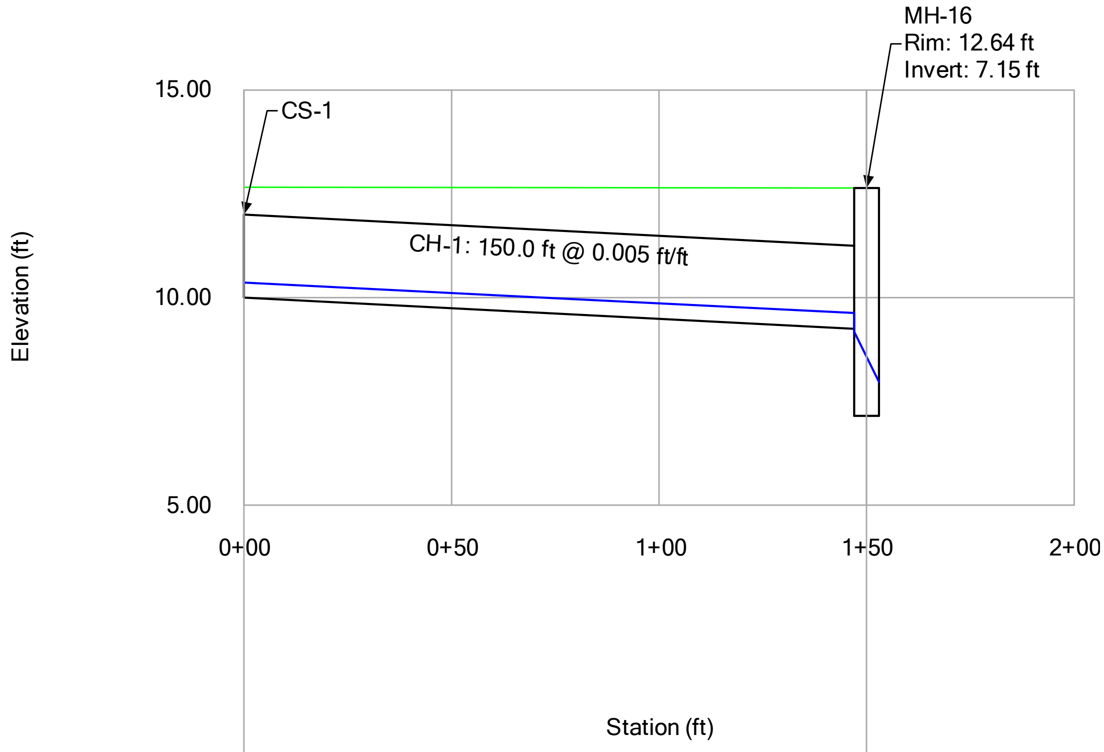
Element ID\Label		155\CO-46	550\CO-152
Rise (Unified) (ft)\Material		2.00\Concrete	2.00\Concrete
Flow (cfs)		0.87	2.12
Station (ft)	0+00	0+76	0+95

Profile Report
Engineering Profile - CS-5 to O-2 (SitewidePermit-STORM_rev1.stsw)



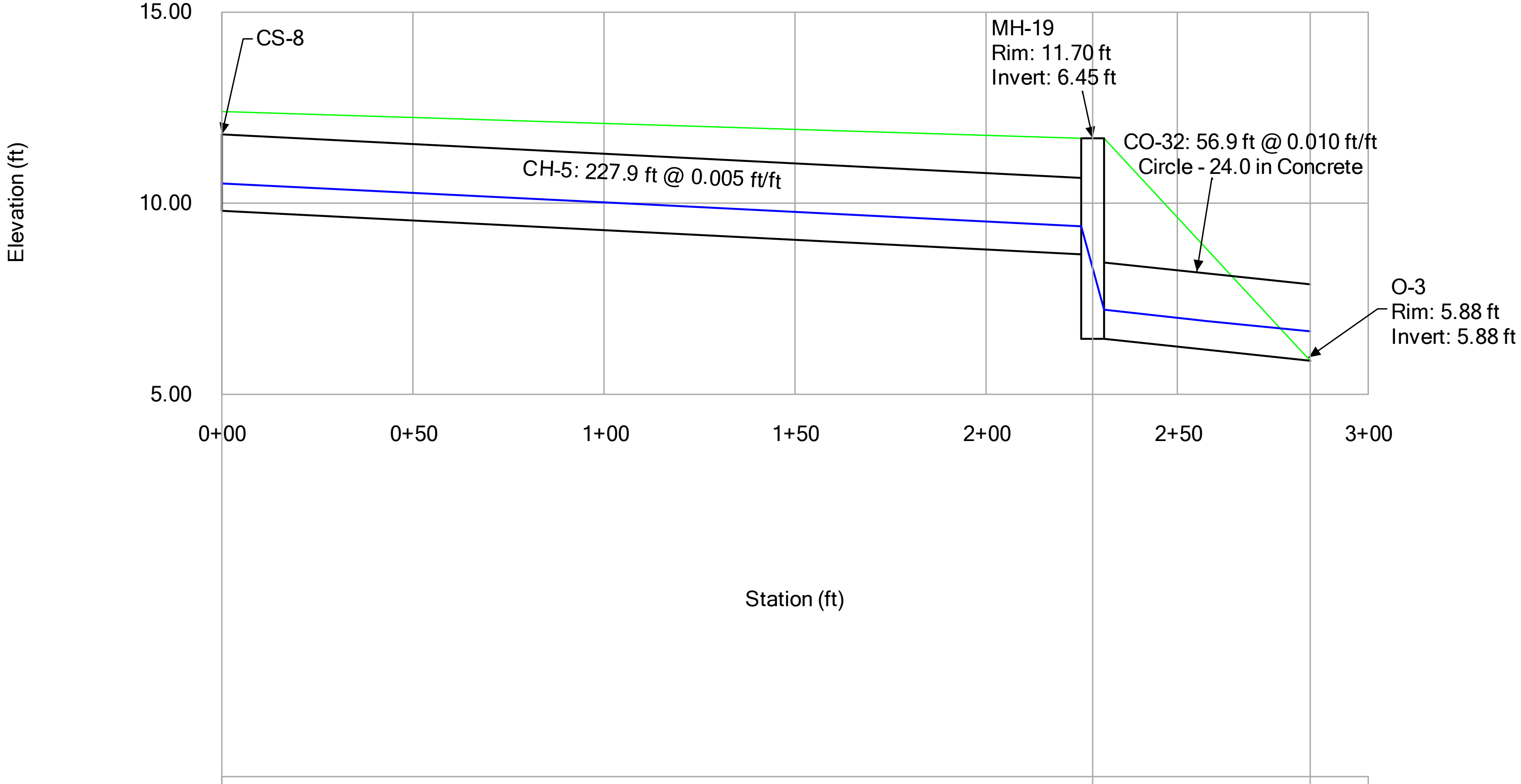
Element ID\Label	98\CH-3	104\CO-30	106\CO-31
Rise (Unified) (ft)\Material	2.0\Concrete	2.00\Concrete	2.50\Concrete
Flow (cfs)	3.94	6.85	11.85
Station (ft)	0+00	2+70	2+90	5+98

Profile Report
Engineering Profile - CS-1 to MH-16 (SitewidePermit-STORM_rev1.stsw)



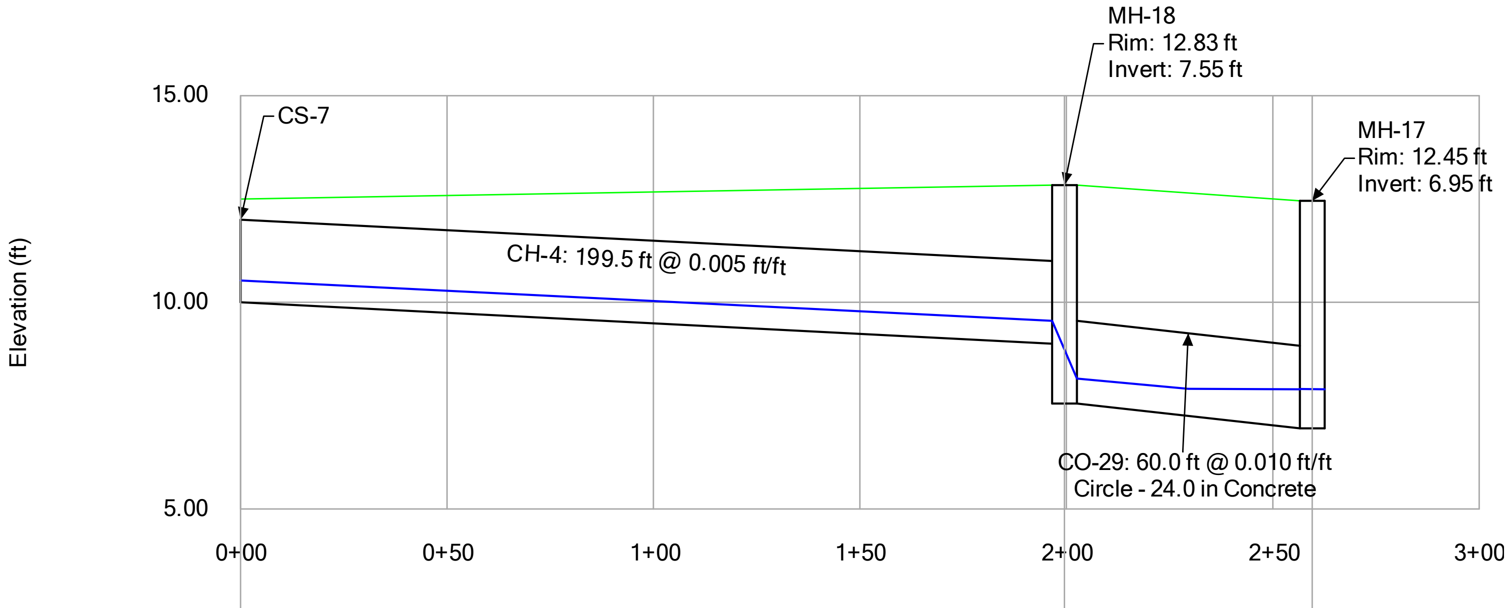
Element ID\Label	91\CH-1	
Rise (Unified) (ft)\Material	2.0\Concrete	
Flow (cfs)	2.40	
Station (ft)	0+00	1+50

Profile Report
Engineering Profile - CS-8 to O-3 (SitewidePermit-STORM_rev1.stsw)

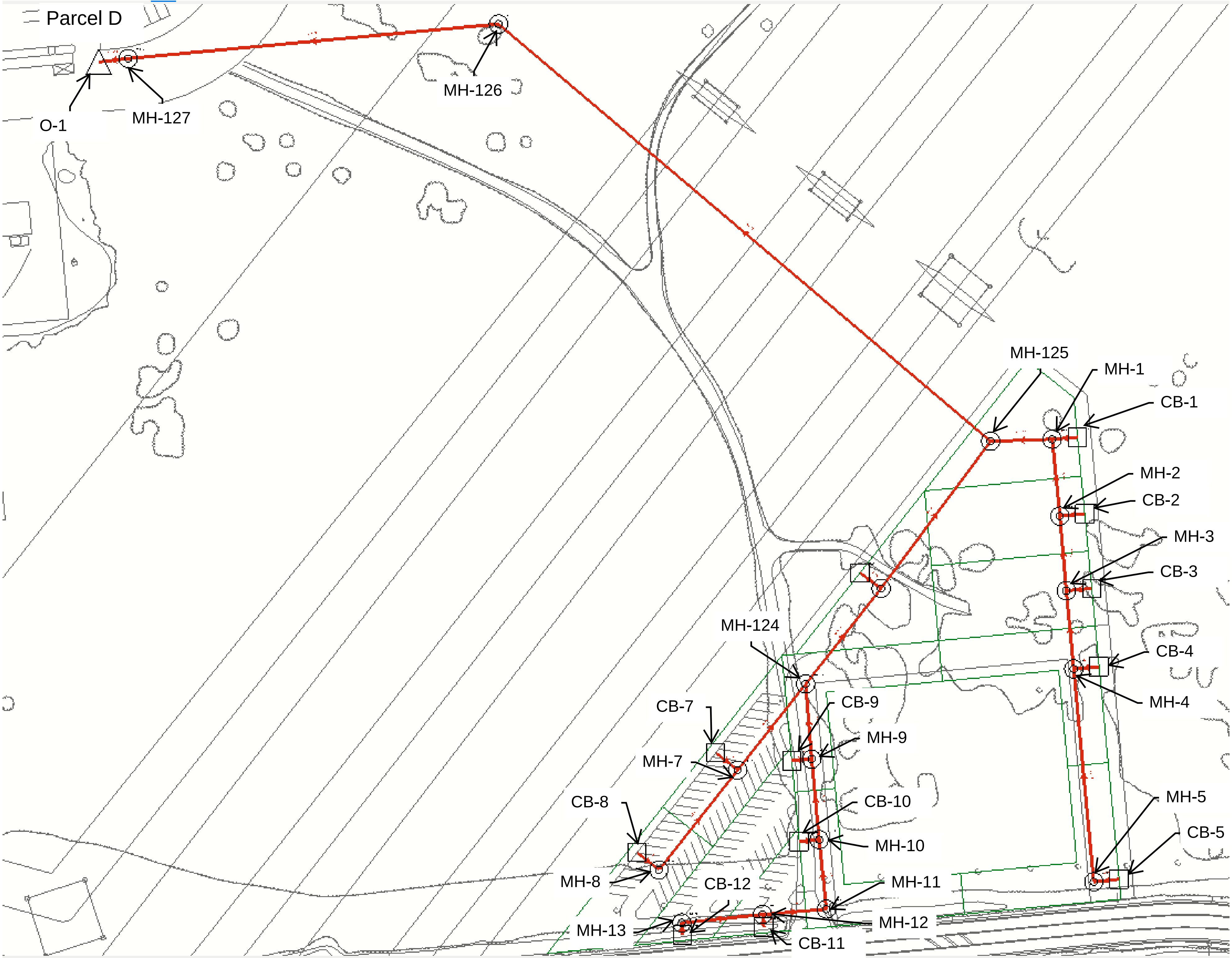


Element ID\Label	115\CH-5	120\CO-32
Rise (Unified) (ft)\Material	2.0\Concrete	2.00\Concrete
Flow (cfs)	6.51	6.70
Station (ft)	0+00	2+28	2+85

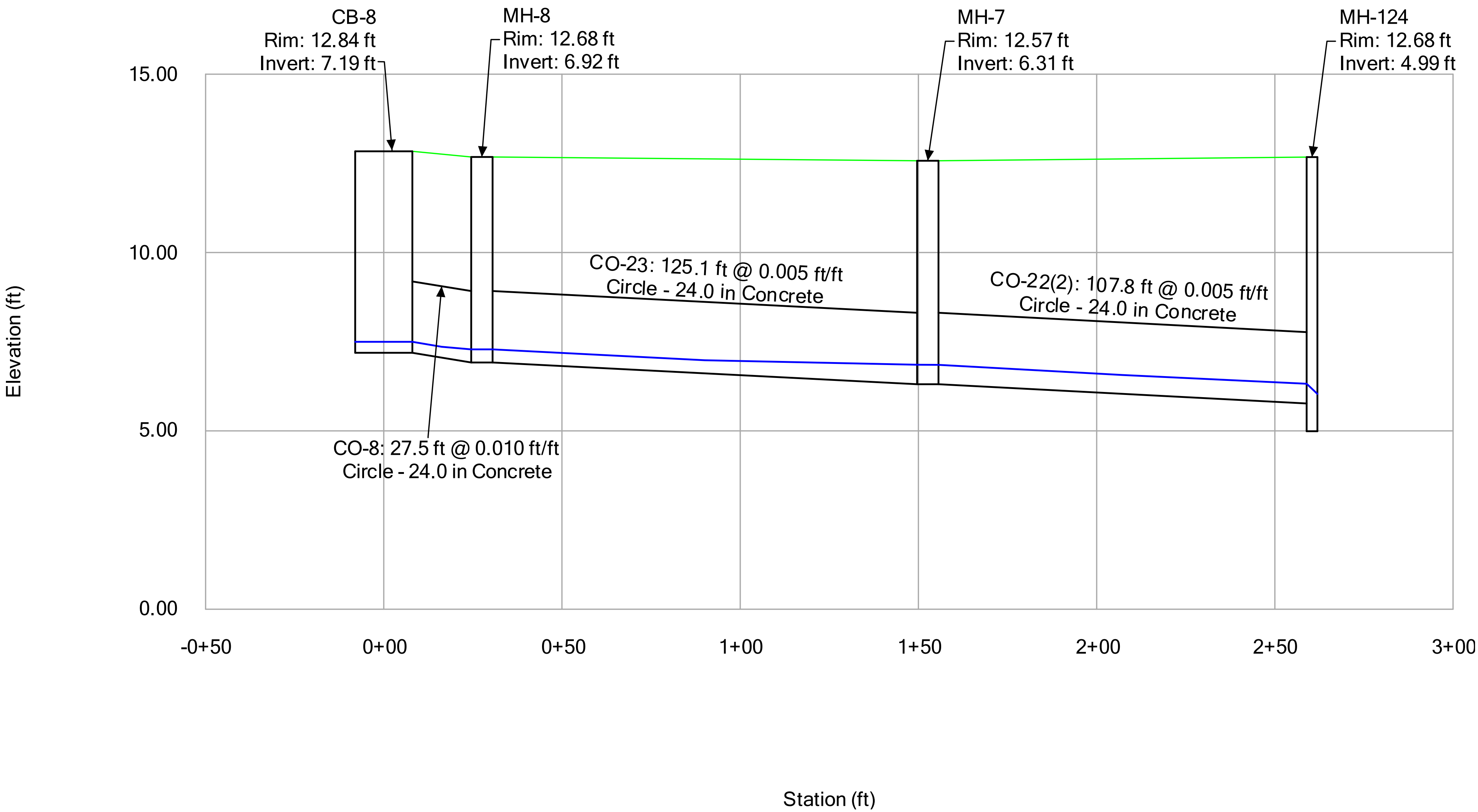
Profile Report
Engineering Profile - CS-7 to MH-17 (SitewidePermit-STORM_rev1.stsw)



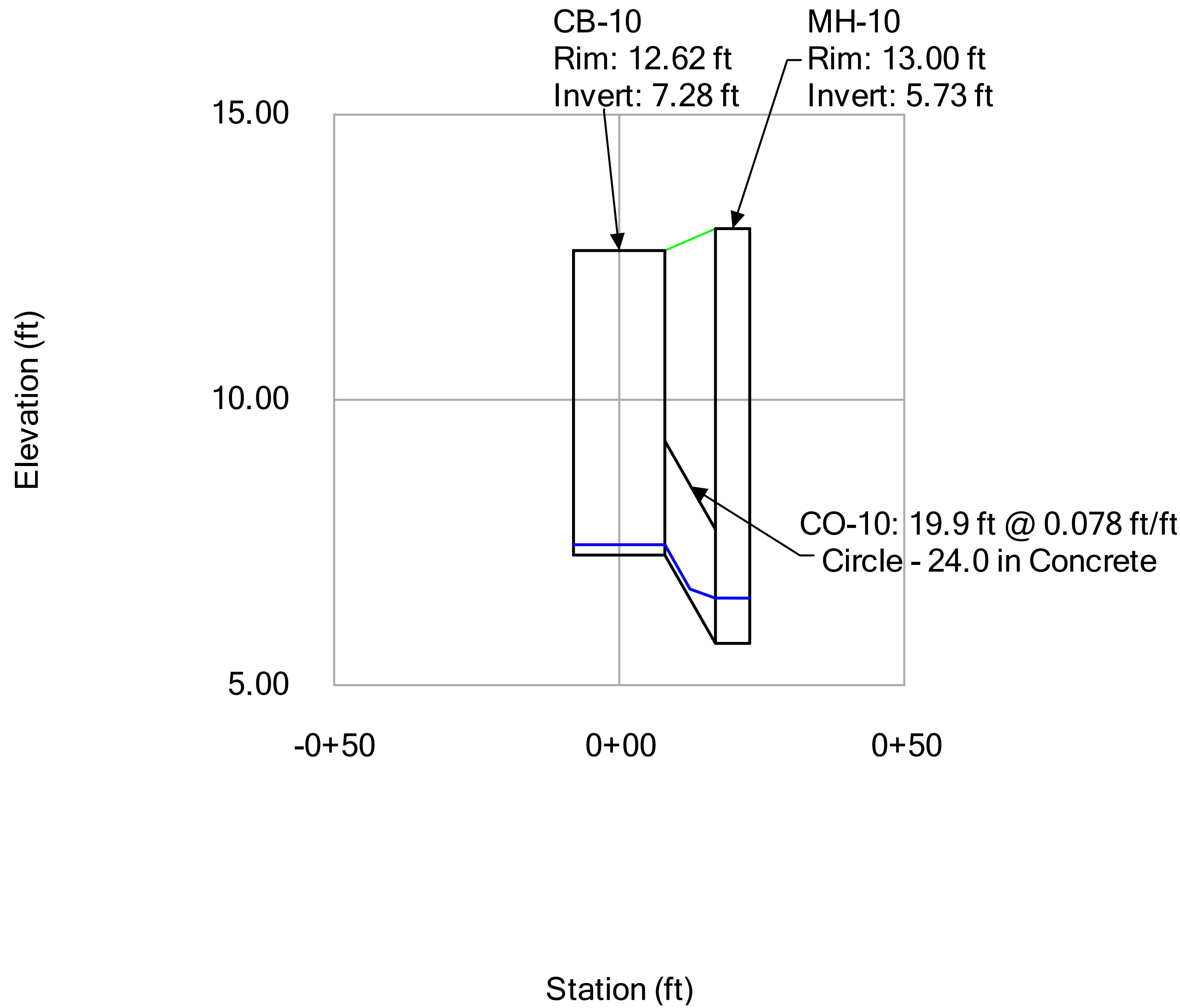
Element ID\Label	102\CH-4	103\CO-29
Rise (Unified) (ft)\Material	2.0\Concrete	2.00\Concrete
Flow (cfs)	4.21	4.43
Station (ft)	0+00	2+00	2+60


Parcel D
O-1
MH-127
MH-126
MH-125
MH-1
CB-1
MH-2
CB-2
MH-3
CB-3
CB-4
MH-4
MH-124
CB-9
MH-9
CB-7
MH-7
CB-8
CB-10
MH-10
MH-8
CB-12
MH-11
MH-13
MH-12
CB-11
MH-5
CB-5

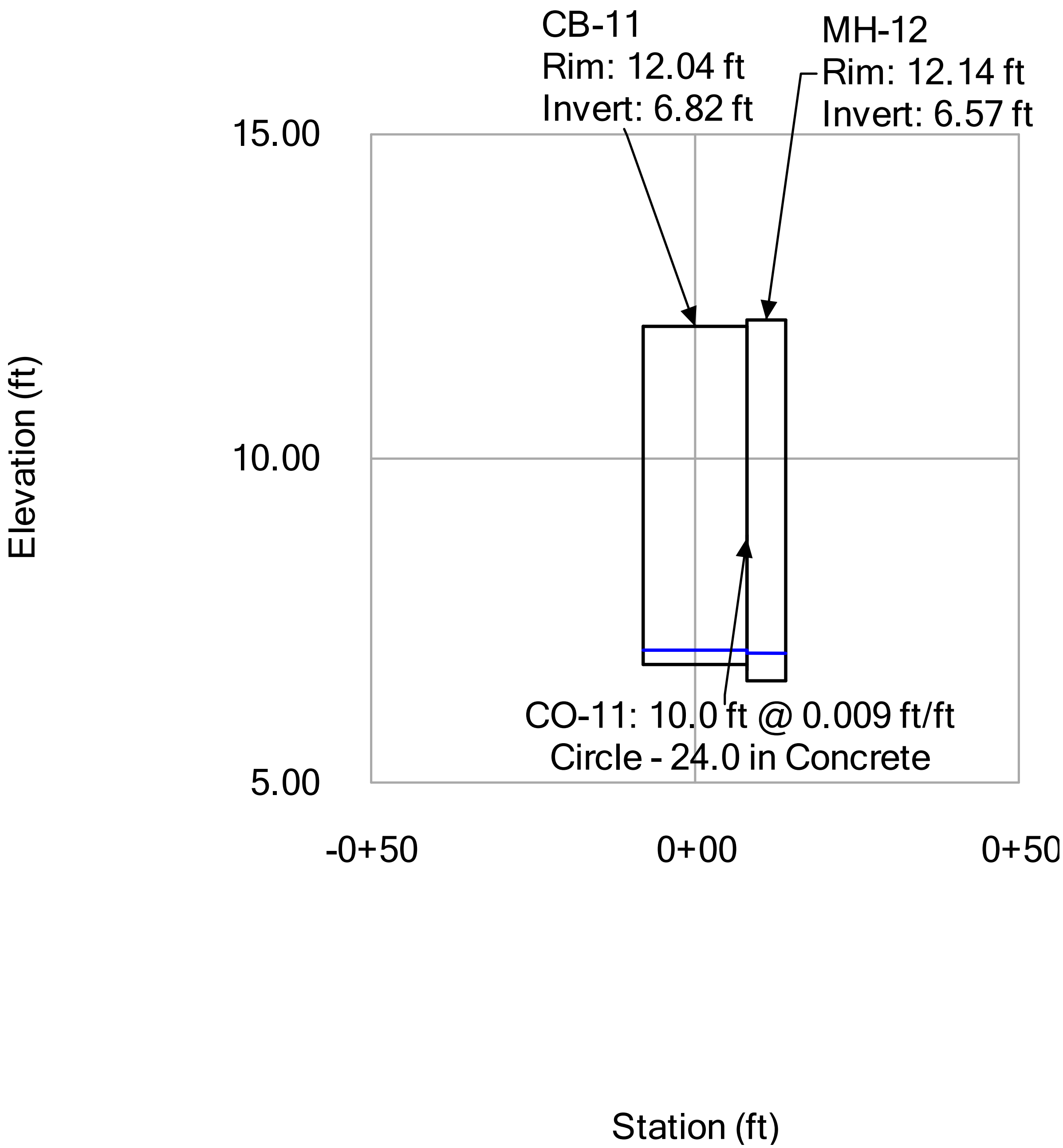
Profile Report
Engineering Profile - CB-8 to MH-124 (SitewidePermit-STORM_rev1.stsw)



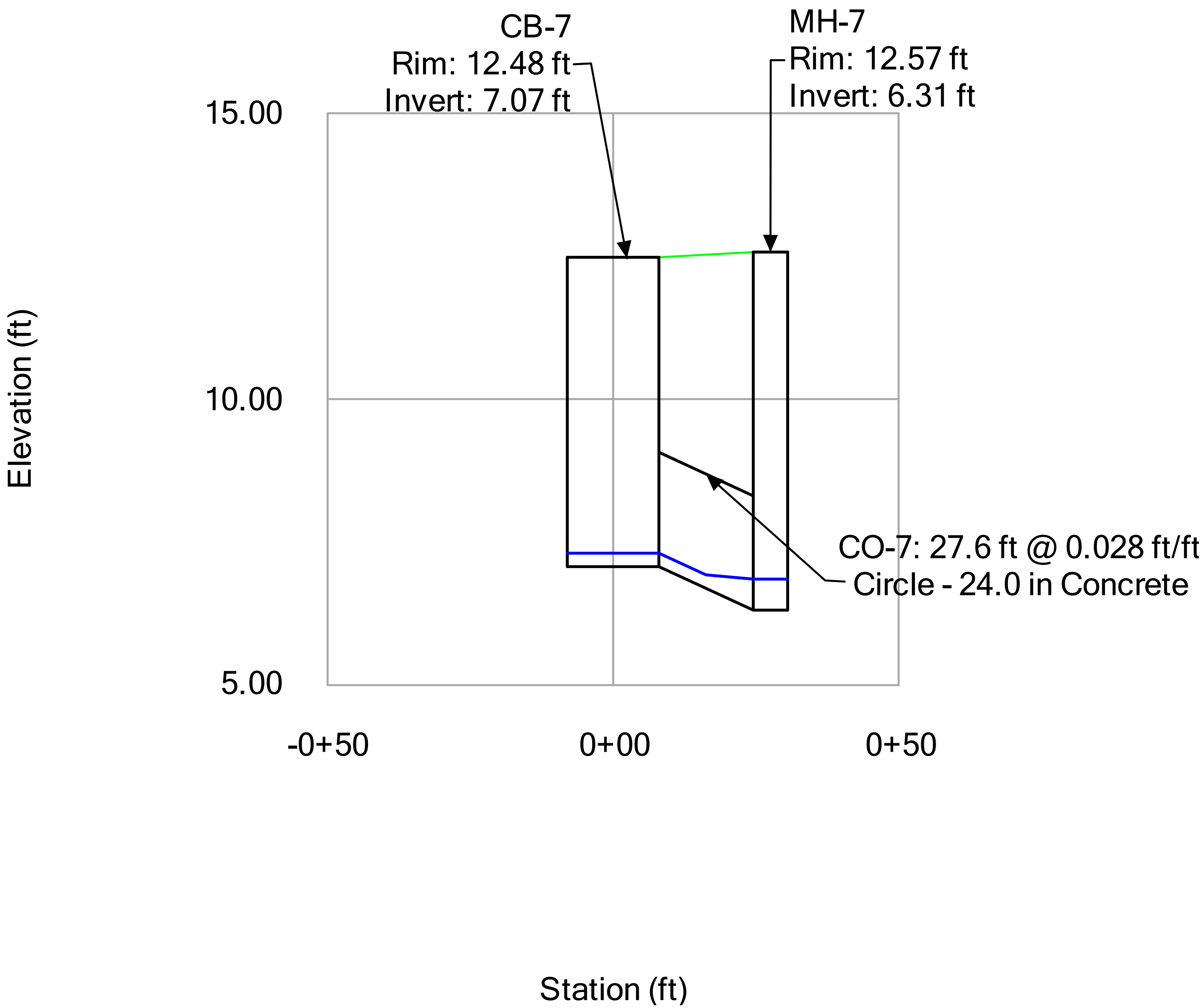
Profile Report
Engineering Profile - CB-10 to MH-10 (SitewidePermit-STORM_rev1.stsw)



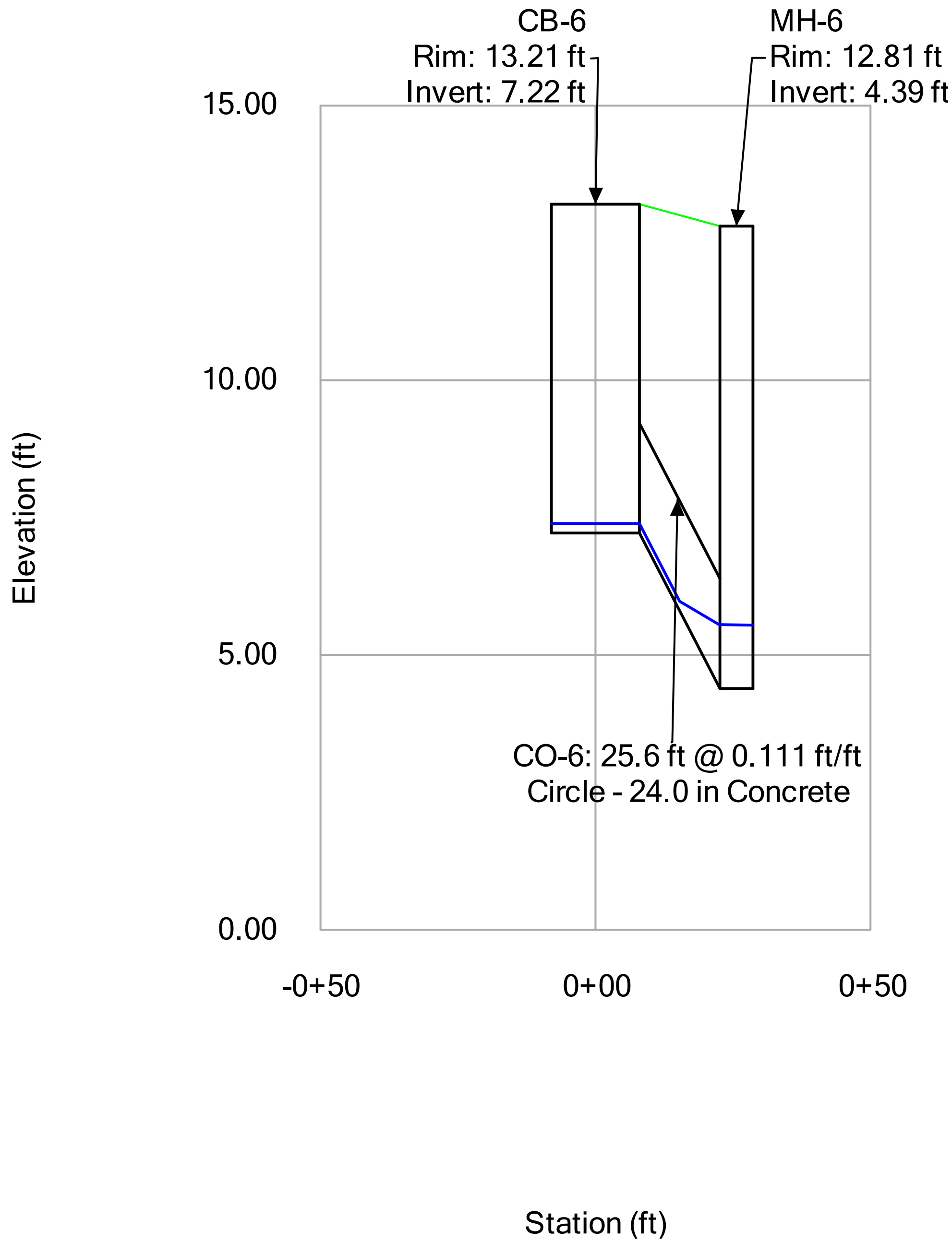
Profile Report
Engineering Profile - CB-11 to MH-12 (SitewidePermit-STORM_rev1.stsw)



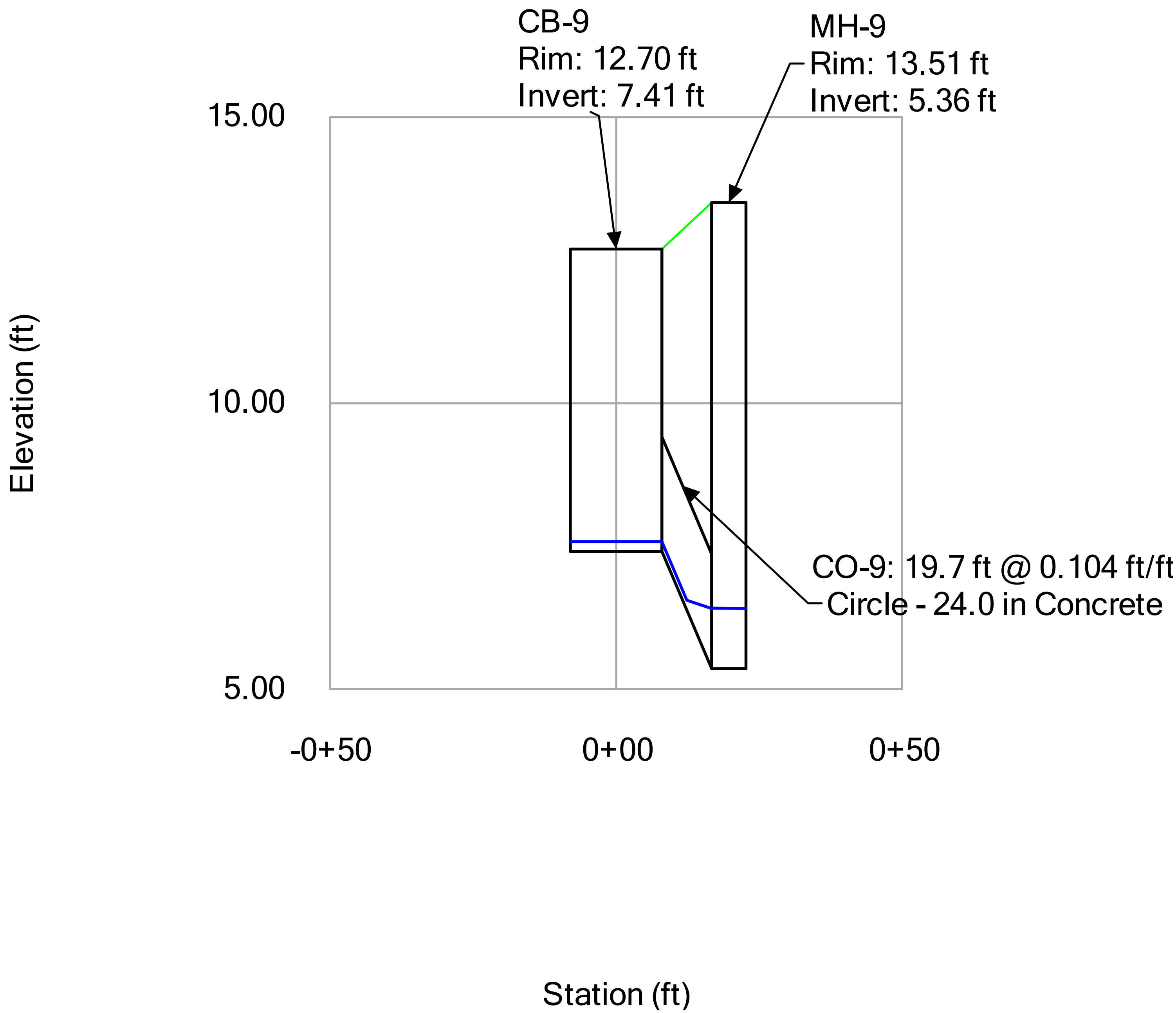
Profile Report
Engineering Profile - CB-7 to MH-7 (SitewidePermit-STORM_rev1.stsw)



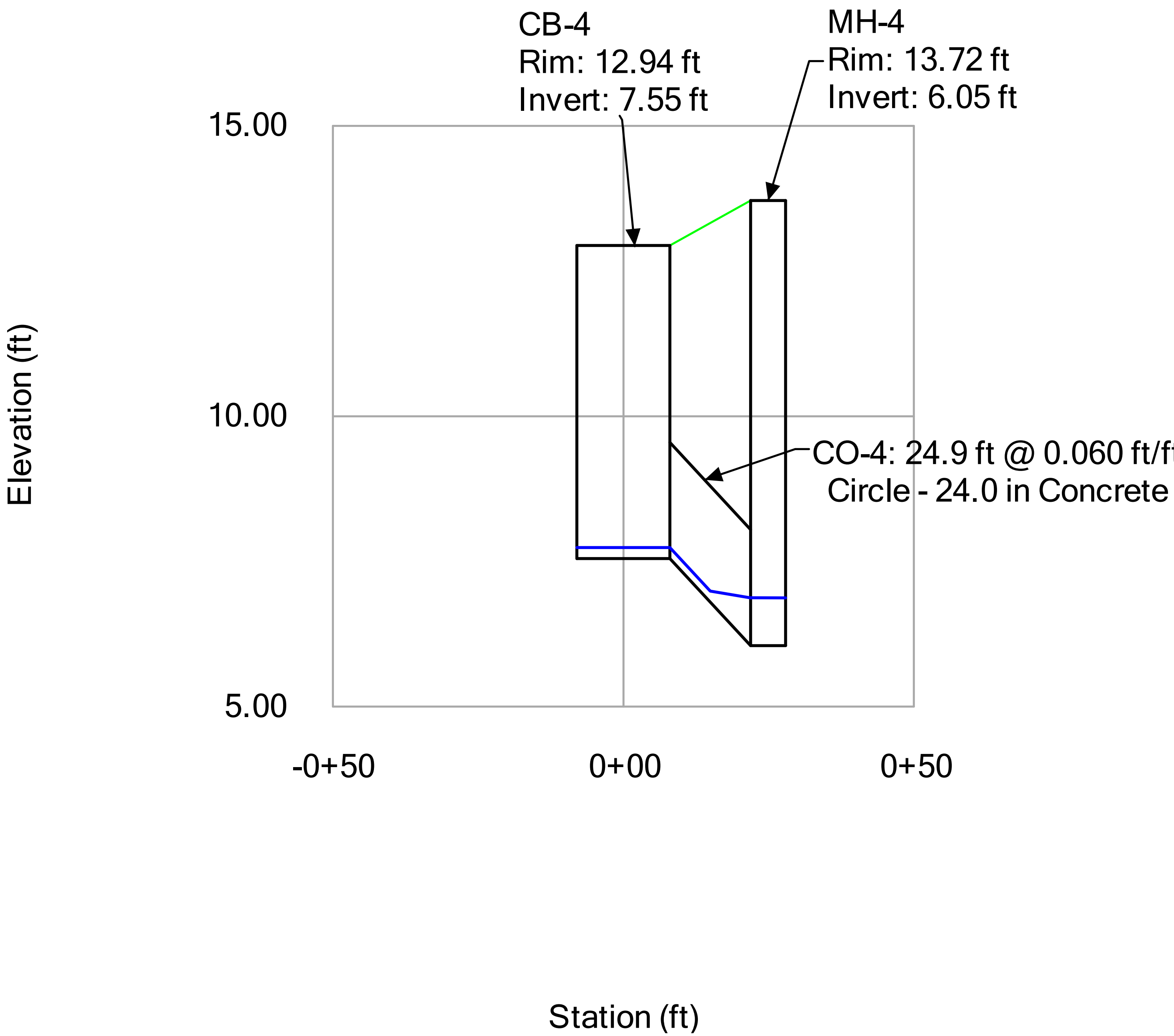
Profile Report
Engineering Profile - CB-6 to MH-6 (SitewidePermit-STORM_rev1.stsw)



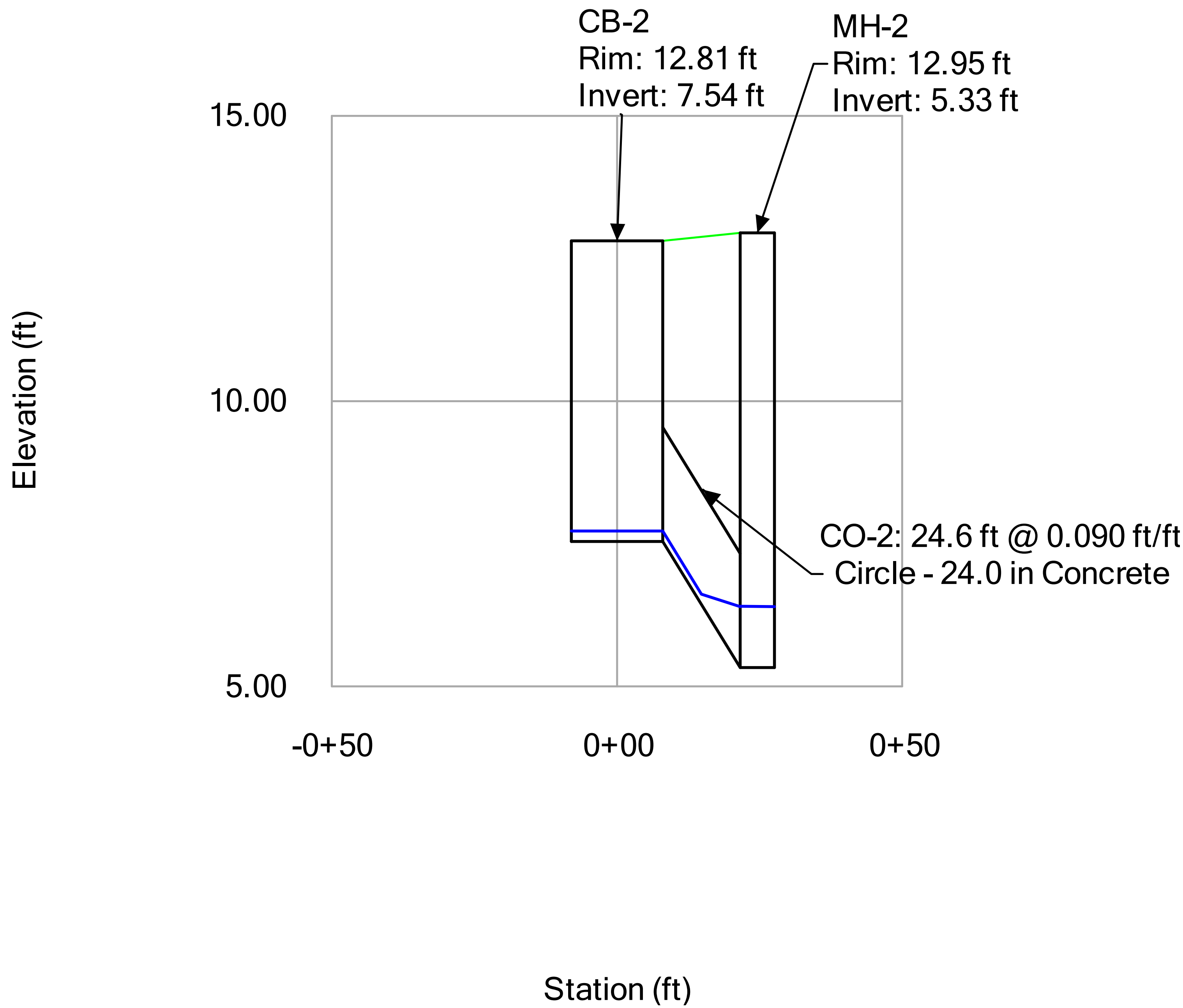
Profile Report
Engineering Profile - CB-9 to MH-9 (SitewidePermit-STORM_rev1.stsw)



Profile Report
Engineering Profile - CB-4 to MH-4 (SitewidePermit-STORM_rev1.stsw)

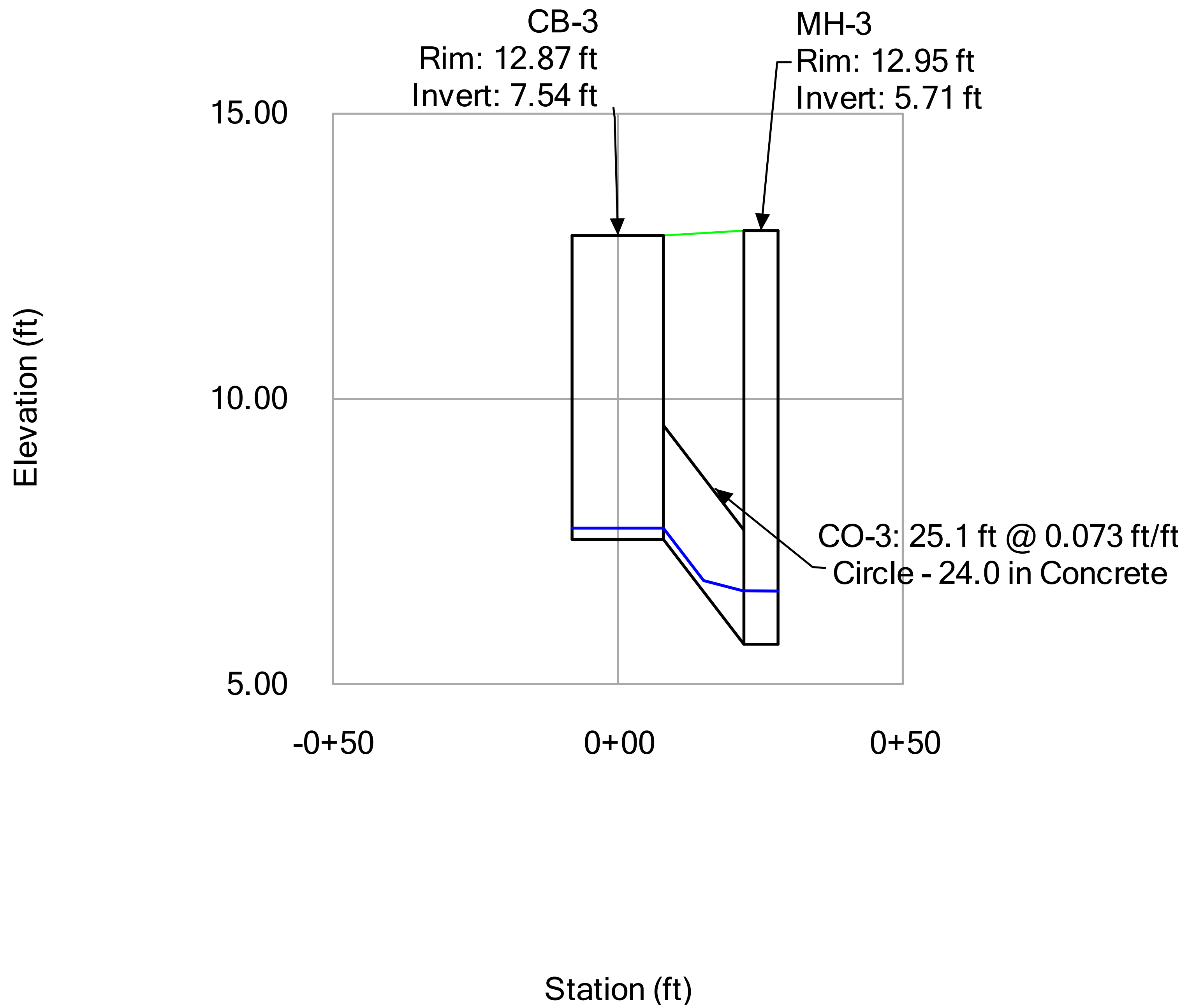


Profile Report
Engineering Profile - CB-2 to MH-2 (SitewidePermit-STORM_rev1.stsw)

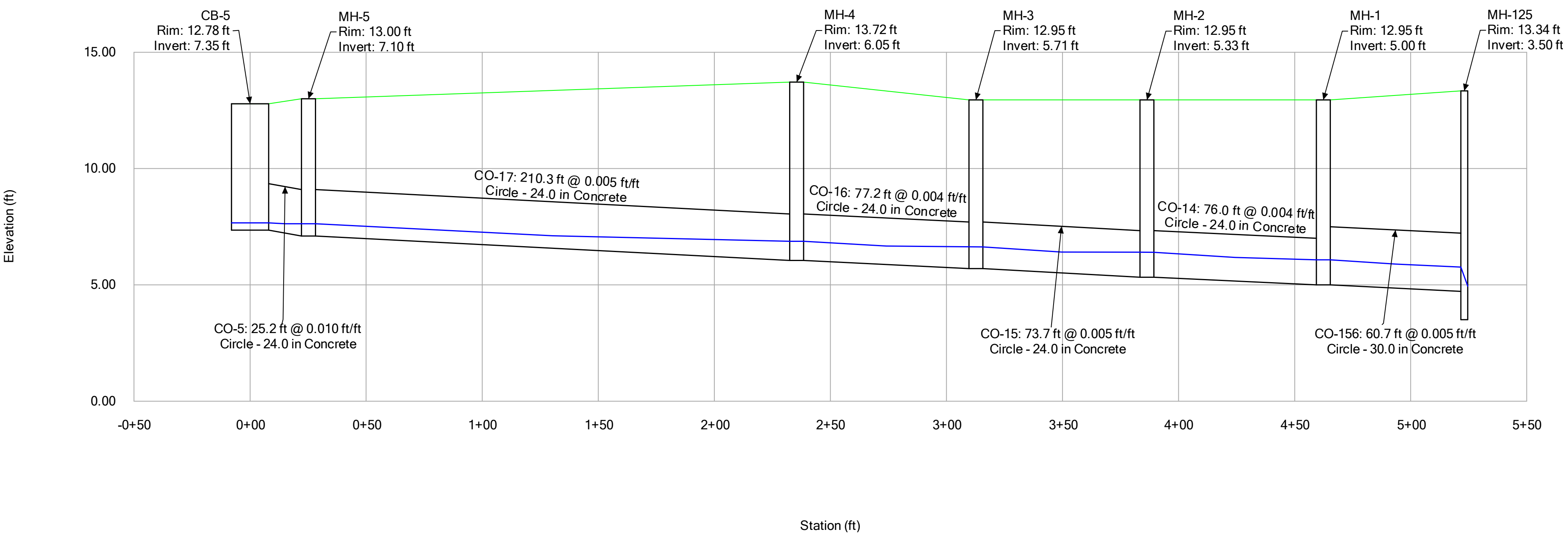


Profile Report

Engineering Profile - CB-3 to MH-3 (SitewidePermit-STORM_rev1.stsw)

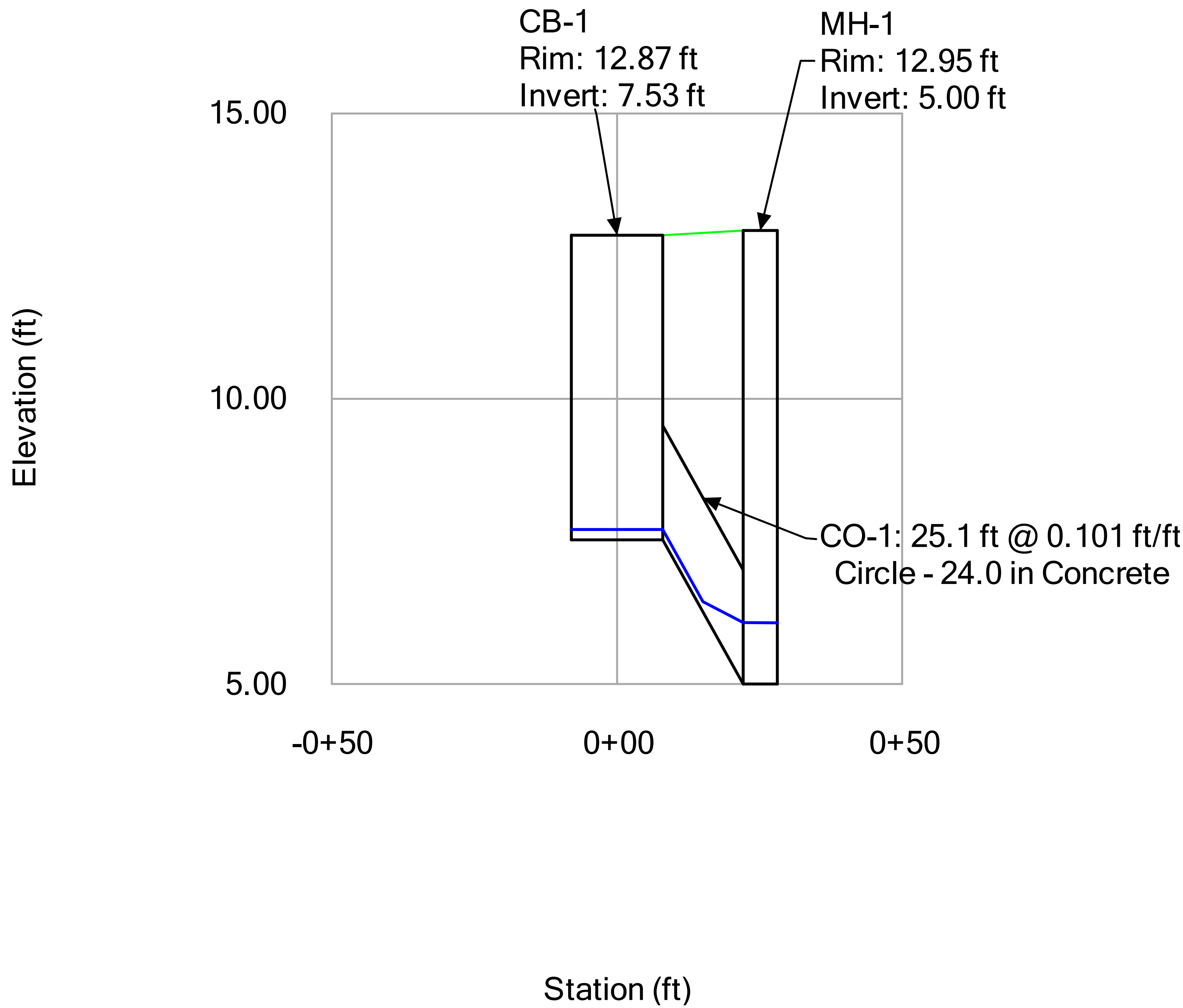


Profile Report
Engineering Profile - CB-5 to MH-125 (SitewidePermit-STORM_rev1.stsw)

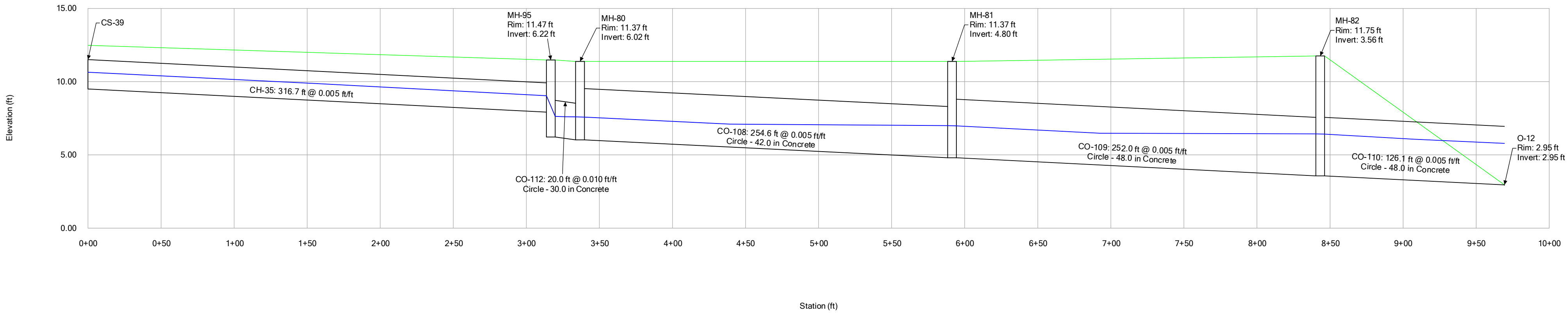


Profile Report

Engineering Profile - CB-1 to MH-1 (SitewidePermit-STORM_rev1.stsw)



Profile Report
Engineering Profile - CS-39 to O-12 (SitewidePermit-STORM_rev1.stsw)



Appendix B – NJDEP/NJCAT MTD Certification Letters

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER QUALITY
Bureau of Stormwater Permitting
401 East State Street
P.O. Box 420 Mail Code 401-02B
Trenton, NJ 08625-0420
Tel. (609) 633-7021 • Fax (609) 777-0432
www.nj.gov/dep/dwq/bnpc_home.htm

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

SHAWN M. LATOURETTE
Acting Commissioner

February 12, 2021

Derek M. Berg
Director – Stormwater Regulatory Management - East
Contech Engineered Solutions LLC
71 US Route 1, Suite F
Scarborough, ME 04074

Re: MTD Lab Certification
Filterra® HC Bioretention System
Off-line Installation Approved

TSS Removal Rate 80%

Dear Mr. Berg:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Contech Engineered Solutions LLC has requested a Laboratory Certification for the Filterra® HC Bioretention System (Filterra® HC.)

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated January 2021) for this device is published online at http://www.njcat.org/uploads/newDocs/NJCATFilterraTechnologyVerificationReportFinal._.pdf.

The NJDEP certifies the use of the Filterra® HC stormwater treatment unit by Contech Engineered Solutions LLC at a TSS removal rate of 80% when designed, operated, and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5. The MTFR is calculated based on a verified loading rate of 3.12 gpm/ft^2 of effective filtration treatment area.

2. The Filterra® HC stormwater treatment unit shall be installed using the same configuration reviewed by NJCAT, and sized in accordance with the criteria specified in item 7 below.

3. This device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.

4. Additional design criteria for MTDs can be found in the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual, which can be found online at www.njstormwater.org.

5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the Filterra® HC. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at https://www.conteches.com/Portals/0/Documents/Maintenance%20Guides/Filterra%20HC%20OM%20Packet.pdf for any changes to the maintenance requirements.

6. For an MTD to be considered "green infrastructure" (GI) in accordance with the March 2, 2020 amendments to the Stormwater Management rules at N.J.A.C. 7:8, the MTD must meet the GI definition noted at amended N.J.A.C. 7:8-1.2. Specifically, the MTD shall (1) treat stormwater runoff through infiltration into subsoil; and/or (2) treat stormwater runoff through filtration by vegetation or soil; or (3) store stormwater runoff for reuse.

   The Filterra® HC filters stormwater runoff through an engineered biofiltration soil media and, thus, meets the definition of GI. Filterra® HC can be configured with or without a precast vault. Installations that will not include a precast vault will additionally need to comply the NJDEP Stormwater BMP Manual conditions regarding separation from the seasonal high water table and, if infiltration is proposed as an outlet, minimum vertical saturated hydraulic conductivity of the subsoil. Installations without a precast vault that do not rely on infiltration are required to maintain at least a one-foot separation from the seasonal high water table measured from the lowest point of the system. Installations without a precast vault that utilize infiltration are required to have the most hydraulically restrictive soil layer below the MTD meet the minimum tested vertical saturated hydraulic conductivity of one inch per hour and have at least two feet of separation from the seasonal high water table measured from the lowest point of the system.

7. Sizing Requirement:

   The example below demonstrates the sizing procedure for the Filterra® HC:

   Example: A 0.25-acre impervious site is to be treated to 80% TSS removal using the Filterra® HC. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

   The selection of the appropriate model of Filterra® HC is based upon both the maximum inflow drainage area and the MTFR. It is necessary to calculate the required model using both methods and to use the largest model determined by the two methods.

   <u>Inflow Drainage Area Evaluation:</u>

   The drainage area to the Filterra® HC in this example is 0.25 acres. Included in Table 1 below, all of the Filterra® HC models are designed with a maximum allowable drainage area greater than 0.25 acres. Specifically, the Filterra® HC with a 4'x4' media bay and a maximum allowable drainage area of 0.40 acres would be the smallest model able to treat runoff without exceeding the maximum allowable drainage area.

   <u>Maximum Treatment Flow Rate (MTFR) Evaluation:</u>

   The site runoff (Q) was based on the following:
   time of concentration = 10 minutes
   i = 3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)
   c = 0.99 (runoff coefficient for impervious)
   Q = ciA = 0.99 x 3.2 x 0.25 = 0.79 cfs

   Given the site runoff is 0.79 cfs and based on the MTFR's listed in Table 1 below, the Filterra® HC with a 16'x8' media bay and an MTFR of 0.889 cfs would be the smallest model that could be used to treat the impervious area without exceeding the MTFR. If using more than one unit for treating runoff, the units should be configured such that the flowrate to each unit does not exceed the design MTFR for each unit and ensuring the entire 0.25 acre area is treated.

The MTFR evaluation results will be used since that method results in the highest minimum configuration determined by the two methods.

The sizing table corresponding to the available system models is noted below:

Table 1. Filterra® HC MTFRs and Maximum Allowable Drainage Areas

	Available Filterra® Media Bay Sizes (feet)	Effective Filtration Treatment Area (ft^2)	Treatment Flow Rate (cfs)	Maximum Allowable Drainage Area (ac)
Standard Configuration Filterra and Filterra Biosape Vaults	4x4	16	0.111	0.40
	4x6 or 6x4	24	0.167	0.60
	4.5x7.83 or 7.83x4.5 (Nominal 4x8/8x4)	35.24	0.245	0.89
	6x6	36	0.250	0.91
	6x8 or 8x6	48	0.333	1.21
	6x10 or 10x6	60	0.417	1.51
	6x12 or 12x6	72	0.500	1.81
	7x13 or 13x7	91	0.632	2.29
	14x8	112	0.778	2.82
	16x8	128	0.889	3.22
	18x8	144	1.000	3.62
	20x8	160	1.111	4.03
	22x8	176	1.222	4.43
Peak Diversion Filterra Vaults	4x4	16	0.111	0.40
	4.5x5.83 (Nominal 4x6)	26.24	0.182	0.66
	6x4	24	0.167	0.60
	6x6	36	0.250	0.91
	6x8	48	0.333	1.21
	6x10 or 10x6	60	0.417	1.51
	7x10	70	0.486	1.76
	8x10.5	84	0.583	2.11
	8x12.5	100	0.694	2.52
	Custom and/or Filterra Bioscape	Media Area in ft^2	0.00694 * (Media Area in ft^2)	0.0252 * (Media Area in ft^2)

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact me at (609) 633-7021.

Sincerely,

Gabriel Mahon

Gabriel Mahon, Chief
Bureau of Stormwater Permitting

Attachment: Maintenance Plan
cc: Chron File
Richard Magee, NJCAT
Vince Mazzei, NJDEP – Water & Land Management
Nancy Kempel, NJDEP– BSTP
Keith Stampfel, NJDEP – DLRP
Dennis Contois, NJDEP – DLRP

Filterra HC
Owner's Manual

filterra®
Bioretention Systems

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Table of Contents

Introduction

Thank you for your purchase of the Filterra® HC Bioretention System. Filterra HC is a specially engineered stormwater treatment system incorporating high performance biofiltration media to remove pollutants from stormwater runoff. All components of the system work together to provide a sustainable long-term solution for treating stormwater runoff.

The Filterra HC system has been delivered to you with protection in place to resist intrusion of construction related sediment which can contaminate the biofiltration media and result in inadequate system performance. These protection devices are intended as a best practice and cannot fully prevent contamination. It is the purchaser's responsibility to provide adequate measures to prevent construction related runoff from entering the Filterra HC system.

Included with your purchase is Activation of the Filterra HC system by the manufacturer as well as a 1-year warranty from delivery of the system and 1-year of routine maintenance (mulch replacement, debris removal, and pruning of vegetation) up to twice during the first year after activation.

Design and Installation

Each project presents different scopes for the use of Filterra HC systems. Information and help may be provided to the design engineer during the planning process. Correct Filterra HC box sizing (per local regulations) is essential to predict pollutant removal rates for a given area. The engineer shall submit calculations for approval by the local jurisdiction. The contractor is responsible for the correct installation of Filterra HC units as shown in approved plans. A comprehensive installation manual covering all Filterra configurations is available at www.ContechES.com.

Activation Overview

Activation of the Filterra HC system is a procedure completed by the manufacturer to place the system into working condition. This involves the following items:

- Removal of construction runoff protection devices
- Planting of the system's vegetation
- Placement of pretreatment mulch layer using mulch certified for use in Filterra HC systems.

Activation MUST be provided by the manufacturer to ensure proper site conditions are met for Activation, proper installation of the vegetation, and use of pretreatment mulch certified for use in Filterra HC systems.

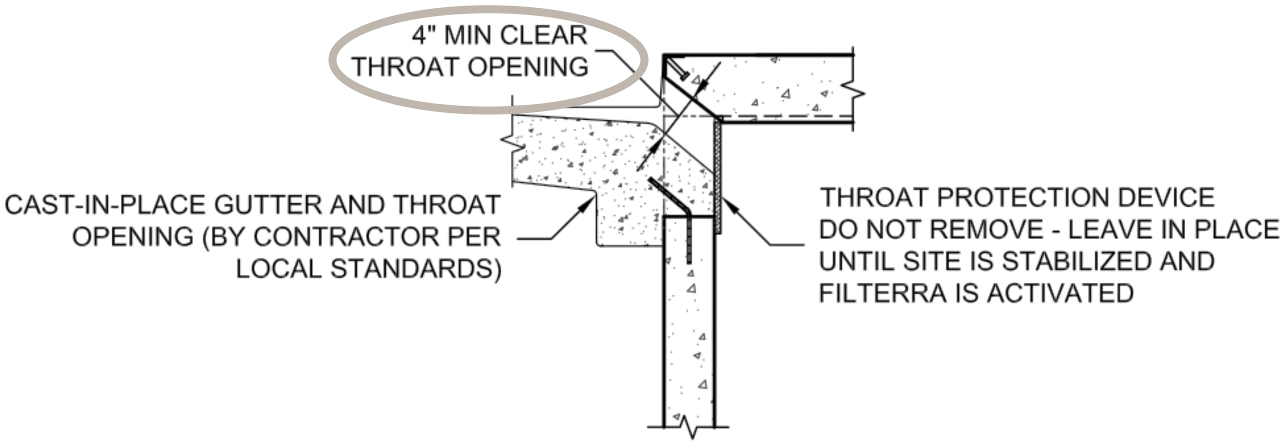
Minimum Requirements

The minimum requirements for Filterra HC Activation are as follows:

1. The site landscaping must be fully stabilized, i.e. full landscaping installed and some grass cover (not just straw and seed) is required to reduce sediment transport. Construction debris and materials should be removed from surrounding area.

2. Final paving must be completed. Final paving ensures that paving materials will not enter and contaminate the Filterra HC system during the paving process, and that the plant will receive runoff from the drainage area, assisting with plant survival for the Filterra HC system.

3. Filterra HC throat opening (if applicable) should be at least 4" in order to ensure adequate capacity for inflow and debris.



An Activation Checklist is included on page 12 to ensure proper conditions are met for Contech to perform the Activation services. A charge of $500.00 will be invoiced for each Activation visit requested by Customer where Contech determines that the site does not meet the conditions required for Activation.

Filterra HC Plant Selection Overview

Plant Lists are available on the Contech website highlighting recommended plants for Filterra systems in your area. Keep in mind that plants are subject to availability due to seasonality and required minimum size for the Filterra HC system. Plants installed in the Filterra HC system are container plants (max 15 gallon) from nursery stock and will be immature in height and spread at Activation.

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant of the Filterra HC system.

The "Planting Requirements for Filterra HC Systems" document is included as an appendix and discusses proper selection and care of the plants within Filterra HC systems.

Warranty Overview

Refer to the Contech Engineered Solutions LLC Stormwater Treatment System LIMITED WARRANTY for further information. The following conditions may void the Filterra HC system's warranty and waive the manufacturer provided Activation and Maintenance services:

- Unauthorized activation or performance of any of the items listed in the activation overview
- Any tampering, modifications or damage to the Filterra HC system or runoff protection devices
- Removal of any Filterra HC system components
- Failure to prevent construction related runoff from entering the Filterra HC system
- Failure to properly store and protect any Filterra HC components (including media and underdrain stone) that may be shipped separately from the vault

Routine Maintenance Guidelines

Routine maintenance is included by the manufacturer on all Filterra HC systems for the first year after activation. This includes a maximum of 2 visits to remove debris, replace pretreatment mulch, and prune the vegetation. More information is provided in the Operations and Maintenance Guidelines. Some Filterra HC systems also contain diversion bypass or outlet bays. Depending on site pollutant loading, these bays may require periodic removal of debris, however this is not included in the first year of maintenance and would likely not be required within the first year of operation.

These services, as well as routine maintenance outside of the included first year, can be provided by certified maintenance providers listed on the Contech website. Training can also be provided to other stormwater maintenance or landscape providers.

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement. Other reasons to maintain are:

- Avoiding legal challenges from your jurisdiction's maintenance enforcement program.
- Prolonging the expected lifespan the media in the Filterra HC system.
- Avoiding more costly media replacement.
- Helping reduce pollutant loads leaving your property.

Simple maintenance of the Filterra HC is required to continue effective pollutant removal from stormwater runoff before discharge into downstream waters. This procedure will also extend the longevity of the living biofilter system. The Filterra HC system is also subjected to various materials entering the inlet, including trash, silt, leaves, etc. which will be contained above the mulch layer. Too much silt may inhibit the Filterra HC system flow rate, which is the reason for site stabilization before activation. Regular replacement of the mulch stops accumulation of such sediment.

If the system is not maintained on regular intervals, is subject to a catastrophic spill or other event, or subject to unusual pollutant loading, full media bed replacement could be required. Please contact Contech for further evaluation if you feel this may be necessary.

When to Maintain?

Contech includes a 1-year maintenance plan with each system purchase. Annual included maintenance consists of a maximum of two (2) scheduled visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated.

Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands while the fall visit helps the system by removing excessive leaf litter.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required; regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency;

e.g. some fast food restaurants require more frequent trash removal. Contributing drainage areas which are subject to new development wherein the recommended erosion and sediment control measures have not been implemented may require additional maintenance visits.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the Supplier and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the (maintenance) Supplier of any damage to the plant(s), which constitute(s) an integral part of the bioretention technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance to the Supplier (i.e. no pruning or fertilizing) during the first year.

Exclusion of Services

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the Supplier maintenance contract. Should a major contamination event occur the Owner must block off the outlet pipe of the Filterra HC (where the cleaned runoff drains to, such as drop inlet) and block off the inlet of the Filterra HC. The Supplier should be informed immediately.

Maintenance Visit Summary

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of Filterra HC and surrounding area
2. Removal of tree grate and erosion control stones
3. Removal of debris, trash and mulch
4. Mulch replacement
5. Plant health evaluation & pruning or replacement as necessary
6. Clean area around Filterra HC
7. Complete paperwork

Maintenance Tools, Safety Equipment and Supplies

Ideal tools include camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working near traffic and also safety hats and shoes. A T-Bar or crowbar should be used for moving the tree grates (up to 170 lbs ea.). Most visits require minor trash removal and a full replacement of mulch. See below for actual number of bagged mulch that is required in each media bay size. Mulch should be a double shredded, hardwood variety. Some visits may require additional Filterra engineered soil media for the Filterra HC system, available from the Supplier.

	Available Filterra® HC Media Bay Sizes (feet)	Filter Surface Area (ft^2)	Mulch Volume at 3" Depth (ft^2)	# of 2 ft^2 Mulch Bags
Standard Configuration Filterra and Filterra Biosape Vaults	4x4	16	4	2
	4x6 or 6x4	24	6	3
	4.5x7.83 or 7.83x4.5 (Nominal 4x8/8x4)	35.24	9	5
	6x6	36	9	5
	6x8 or 8x6	48	12	6
	6x10 or 10x6	60	15	8
	6x12 or 12x6	72	18	9
	7x13 or 13x7	91	23	12
	14x8	112	28	14
	16x8	128	32	16
	18x8	144	36	18
	20x8	160	40	20
	22x8	176	44	22
Peak Diversion Filterra Vaults	4x4	16	4	2
	4.5x5.83 or 5.83x4.5 (Nominal 4x6/6x4)	26.24	7	4
	6x6	36	9	5
	6x8	48	12	6
	6x10 or 10x6	60	15	8
	7x10	70	18	9
	8x10.5	84	21	11
	8x12.5	100	25	13
	Custom and/or Filterra Bioscape	Media Area in ft^2	0.25 x (Media Area in ft^2)	0.125 x (Media Area in ft^2)

Maintenance Visit Procedure

Keep sufficient documentation of maintenance actions to predict location specific maintenance frequencies and needs. An example Maintenance Report is included in this manual.

1. Inspection of Filterra HC and surrounding area

- Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

Record on Maintenance Report the following:

Standing Water	yes | no
Damage to Box Structure	yes | no
Damage to Grate	yes | no
Is Bypass Clear	yes | no

If yes answered to any of these observations, record with close-up photograph (numbered).

2. Removal of tree grate and erosion control stones

- Remove cast iron grates for access into Filterra HC box.
- Dig out silt (if any) and mulch and remove trash & foreign items.

3. Removal of debris, trash and mulch

Record on Maintenance Report the following:

Silt/Clay	yes | no
Cups/ Bags	yes | no
Leaves	yes | no
Buckets Removed	________

- After removal of mulch and debris, measure distance from the top of the Filterra engineered media soil to the top of the top slab. Compare the measured distance to the distance shown on the approved Contract Drawings for the system. Add Filterra media (not top soil or other) to bring media up as needed to distance indicated on drawings.

Record on Maintenance Report the following:

Distance to Top of Top Slab (inches)	________
Inches of Media Added	________

4. Mulch replacement

- Add double shredded mulch evenly across the entire unit to a depth of 3".
- Refer to Filterra Mulch Specifications for information on acceptable sources.
- Ensure correct repositioning of erosion control stones by the Filterra HC inlet to allow for entry of trash during a storm event.
- Replace Filterra HC grates correctly using appropriate lifting or moving tools, taking care not to damage the plant.

5. Plant health evaluation and pruning or replacement as necessary

- Examine the plant's health and replace if necessary.
- Prune as necessary to encourage growth in the correct directions

Record on Maintenance Report the following:

Height above Grate	______________________ (ft)
Width at Widest Point	______________________ (ft)
Health	healthy | unhealthy
Damage to Plant	yes | no
Plant Replaced	yes | no

6. Clean area around Filterra HC

- Clean area around unit and remove all refuse to be disposed of appropriately.

7. Complete paperwork

- Deliver Maintenance Report and photographs to appropriate location (normally Contech during maintenance contract period).
- Some jurisdictions may require submission of maintenance reports in accordance with approvals. It is the responsibility of the Owner to comply with local regulations.

Maintenance Checklist

Drainage System Failure	Problem	Conditions to Check	Condition that Should Exist	Actions
Inlet	Excessive sediment or trash accumulation.	Accumulated sediments or trash impair free flow of water into Filterra HC.	Inlet should be free of obstructions allowing free distributed flow of water into Filterra HC HC.	Sediments and/or trash should be removed.
Mulch Cover	Trash and floatable debris accumulation.	Excessive trash and/or debris accumulation.	Minimal trash or other debris on mulch cover.	Trash and debris should be removed and mulch cover raked level. Ensure bark nugget mulch is not used.
Mulch Cover	“Ponding” of water on mulch cover.	“Ponding” in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils.	Stormwater should drain freely and evenly through mulch cover.	Recommend contact manufacturer and replace mulch as a minimum.
Vegetation	Plants not growing or in poor condition.	Soil/mulch too wet, evidence of spill. Incorrect plant selection. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact manufacturer for advice.
Vegetation	Plant growth excessive.	Plants should be appropriate to the species and location of Filterra HC.		Trim/prune plants in accordance with typical landscaping and safety needs.
Structure	Structure has visible cracks.	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through the cracks.		Vault should be repaired.
Maintenance is ideally to be performed twice annually.				

Filterra HC Inspection & Maintenance Log

Filterra HC System Size/Model: ________________________ Location: ____

Date	Mulch & Debris Removed	Depth of Mulch Added	Mulch Brand	Height of Vegetation Above Grate	Vegetation Species	Issues with System	Comments
1/1/17	*5 – 5 gal Buckets*	*3″*	*Lowe’s Premium Brown Mulch*	*4′*	*Galaxy Magnolia*	*- Standing water in downstream structure*	*- Removed blockage in downstream structure*

Appendix 1 – Filterra® Activation Checklist

Project Name:____________________ Company:____________________

Site Contact Name: ____________________ Site Contact Phone/Email: ____________________

Site Owner/End User Name:____________________ Site Owner/End User Phone/Email: ____________________

Preferred Activation Date: ____________________ (provide 2 weeks minimum from date this form is submitted)

Site Designation	System Size	Final Pavement / Top Coat Complete	Landscaping Complete / Grass Emerging	Construction materials / Piles / Debris Removed	Throat Opening Measures 4" Min. Height	Plant Species Requested
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	

Attach additional sheets as necessary.

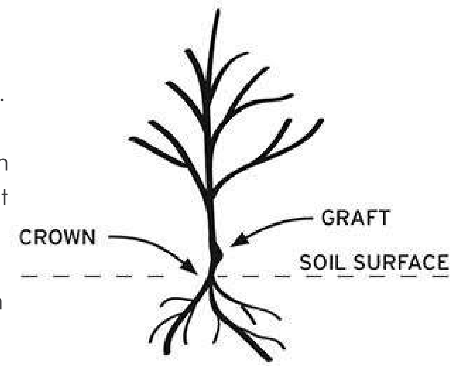
NOTE: A charge of $500.00 will be invoiced for each Activation visit requested by Customer where Contech determines that the site does not meet the conditions required for Activation. ONLY Contech authorized representatives can perform Activation of Filterra HC systems; unauthorized Activations will void the system warranty and waive manufacturer supplied Activation and 1st Year Maintenance.

____________________ ____________________

Signature Date

Appendix 2 – Planting Requirements for Filterra® HC Systems

Plant Material Selection



- Select plant(s) as specified in the engineering plans and specifications.
- Select plant(s) with full root development but not to the point where root bound.
- Use local nursery container plants only. Ball and burlapped plants are not permitted.
- For precast Filterra HC systems with a tree grate, plant(s) must not have scaffold limbs at least 14 inches from the crown due to spacing between the top of the mulch and the tree grate. Lower branches can be pruned away provided there are sufficient scaffold branches for tree or shrub development.
- For precast Filterra HC systems with a tree grate, at the time of installation, it is required that plant(s) must be at least 6” above the tree grate opening at installation for all Filterra configurations. This DOES NOT apply to Full Grate Cover designs.
- Plant(s) shall not have a mature height greater than 25-30 feet.
- A 7-15 gallon container size shall be used.
- For precast Filterra HC systems, plant(s) should have a single trunk at installation, and pruning may be necessary at activation and maintenance for some of the faster growing species, or species known to produce basal sprouts

Plant Installation

- During transport protect the plant leaves from wind and excessive jostling.
- Prior to removing the plant(s) from the container, ensure the soil moisture is sufficient to maintain the integrity of the root ball. If needed, pre-wet the container plant.
- Cut away any roots which are growing out of the container drain holes. Plants with excessive root growth from the drain holes should be rejected.
- Plant(s) should be carefully removed from the pot by gently pounding on the sides of the container with the fist to loosen root ball. Then carefully slide out. Do not lift plant(s) by trunk as this can break roots and cause soil to fall off. Extract the root ball in a horizontal position and support it to prevent it from breaking apart. Alternatively, the pot can be cut away to minimize root ball disturbance.
- Remove any excess soil from above the root flare after removing plant(s) from container.
- Excavate a hole with a diameter 4” greater than the root ball, gently place the plant(s).
- If plant(s) have any circling roots from being pot bound, gently tease them loose without breaking them.
- If root ball has a root mat on the bottom, it should be shaved off with a knife just above the mat line.
- Plant the tree/shrub/grass with the top of the root ball 1” above surrounding media to allow for settling.
- All plants should have the main stem centered in the tree grate (where applicable) upon completion of installation.
- With all trees/shrubs, remove dead, diseased, crossed/rubbing, sharply crotched branches or branches growing excessively long or in wrong direction compared to majority of branches.
- To prevent transplant shock (especially if planting takes place in the hot season), it may be necessary to prune some of the foliage to compensate for reduced root uptake capacity. This is accomplished by pruning away some of the smaller secondary branches or a main scaffold branch if there are too many. Too much foliage relative to the root ball can dehydrate and damage the plant.
- Plant staking may be required.

Mulch Installation

- Only mulch that has been meeting Contech Engineered Solutions' mulch specifications can be used in the Filterra HC system.
- Mulch must be applied to a depth of 3" evenly over the surface of the media.

Irrigation Requirements

- Each Filterra HC system must receive adequate irrigation to ensure survival of the living system during periods of drier weather.
- Irrigation sources include rainfall runoff from downspouts and/or gutter flow, applied water through the tree grate or in some cases from an irrigation system with emitters installed during construction.
- At Activation: Apply about one (cool climates) to two (warm climates) gallons of water per inch of trunk diameter over the root ball.
- During Establishment: In common with all plants, each Filterra HC plant will require more frequent watering during the establishment period. One inch of applied water per week for the first three months is recommended for cooler climates (2 to 3 inches for warmer climates). If the system is receiving rainfall runoff from the drainage area, then irrigation may not be needed. Inspection of the soil moisture content can be evaluated by gently brushing aside the mulch layer and feeling the soil. Be sure to replace the mulch when the assessment is complete. Irrigate as needed**.
- Established Plants: Established plants have fully developed root systems and can access the entire water column in the media. Therefore, irrigation is less frequent but requires more applied water when performed. For a mature system assume 3.5 inches of available water within the media matrix. Irrigation demand can be estimated as 1" of irrigation demand per week. Therefore, if dry periods exceed 3 weeks, irrigation may be required. It is also important to recognize that plants which are exposed to windy areas and reflected heat from paved surfaces may need more frequent irrigation. Long term care should develop a history which is more site specific.

** Five gallons per square yard approximates 1 inch of water. Therefore, for a 6' by 6' Filterra HC approximately 20-60 gallons of water is needed. To ensure even distribution of water it needs to be evenly sprinkled over the entire surface of the filter bed, with special attention to make sure the root ball is completely wetted. NOTE: if needed, measure the time it takes to fill a five-gallon bucket to estimate the applied water flow rate then calculate the time needed to irrigate the Filterra HC system. For example, if the flow rate of the sprinkler is 5 gallons/minute then it would take 12 minutes to irrigate a 6' by 6' filter.

Notes

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State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

Bureau of Nonpoint Pollution Control
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Mail Code 401-02B
Post Office Box 420
Trenton, New Jersey 08625-0420
609-633-7021 Fax: 609-777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

BOB MARTIN
Commissioner

December 14, 2016

Derek M. Berg
Director - Stormwater Regulatory Management - East
Contech Engineered Solutions LLC
71 US Route 1, Suite F
Scarborough, ME 04074

Re: MTD Laboratory Certification
Stormwater Management StormFilter® (StormFilter) by Contech Engineered Solutions LLC
Off-line Installation

TSS Removal Rate 80%

Dear Mr. Berg:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Contech Engineered Solutions LLC has requested a Laboratory Certification for the StormFilter System.

This project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix for this device is published online at http://www.njcat.org/verification-process/technology-verification-database.html.

The NJDEP certifies the use of the StormFilter System by Contech Engineered Solutions LLC at a TSS removal rate of 80%, when designed, operated and maintained in accordance with the information provided in the Verification Appendix and subject to the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5. The MTFR is calculated based on a verified loading rate of 2.12 gpm/sf of effective filtration treatment area.

2. The StormFilter System shall be installed using the same configuration as the unit tested by NJCAT, and sized in accordance with the criteria specified in item 6 below.

3. This device cannot be used in series with another MTD or a media filter (such as a sand filter), to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.

4. Additional design criteria for MTDs can be found in Chapter 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at www.njstormwater.org.

5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the StormFilter, which is attached to this document. However, it is recommended to review the maintenance website at http://www.conteches.com/DesktopModules/Bring2mind/DMX/Download.aspx?EntryId=2813&PortalId=0&DownloadMethod=attachment for any changes to the maintenance requirements.

6. Sizing Requirements:

   The example below demonstrates the sizing procedure for a StormFilter System.

   Example: A 0.25 acre impervious site is to be treated to 80% TSS removal using a StormFilter System. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs or 354.58 gpm.

   The calculation of the minimum number of cartridges for use in the StormFilter System is based upon both the MTFR and the maximum inflow drainage area. It is necessary to calculate the required cartridges using both methods and to rely on the method that results in the highest minimum number of cartridges determined by the two methods.

   Inflow Drainage Area Evaluation:

   The drainage area to the StormFilter System in this example is 0.25 acres. Based upon the information in Table 1 below, the following minimum number of cartridges are required in a StormFilter System to treat the impervious area without exceeding the maximum drainage area:

1. Five (5) 12” cartridges,
2. Three (3) 18” cartridges, or
3. Two (2) 27” cartridges

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was determined based on the following:

time of concentration = 10 minutes
i=3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)
c=0.99 (runoff coefficient for impervious)
Q=ciA=0.99x3.2x0.25=0.79 cfs=0.79x448.83 gpm=354.58 gpm

Based on a flow rate of 354.58 gpm, the following minimum number of cartridges are required in a StormFilter System to treat the impervious area without exceeding the MTFR:

1. Thirty-six (36) 12” cartridges,
2. Twenty-four (24) 18” cartridges, or
3. Sixteen (16) 27” cartridges

The MTFR Evaluation results will be used since that method results in the higher minimum number of cartridges determined by the two methods.

The sizing table corresponding to the available system models are noted below:

TABLE 1 STORMFILTER CARTRIDGE HEIGHTS AND NEW JERSEY TREATMENT CAPACITIES

StormFilter Cartridge Heights and New Jersey Treatment Capacities				
StormFilter Cartridge Height	**Filtration Surface Area (sq.ft)**	**MTFR[1] (GPM)**	**Mass Capture Capacity (lbs)**	**Maximum Allowable Inflow Area[2] (acres)**
Low Drop (12")	4.71	10	36.3	0.061
18"	7.07	15	54.5	0.09
27"	10.61	22.5	81.8	0.136

Notes:
1. *MTFR calculated based on 4.72x10-3 cfs/sf (2.12 gpm/sf) of effective filtration treatment area.*
2. *Based upon the equation found in the NJDEP Filter Protocol Maximum Inflow Drainage Area (acres) = weight of TSS before 10% loss in MTFR (lbs)/600 lbs/acre of drainage area annually.*

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact Shashi Nayak of my office at (609) 633-7021.

Sincerely,

James J. Murphy, Chief
Bureau of Nonpoint Pollution Control

Attachment: Maintenance Plan

cc: Chron File
Richard Magee, NJCAT
Vince Mazzei, NJDEP - DLUR
Ravi Patraju, NJDEP - BES
Gabriel Mahon, NJDEP - BNPC
Shashi Nayak, NJDEP - BNPC

StormFilter Inspection and Maintenance Procedures

Maintenance Guidelines

The primary purpose of the Stormwater Management StormFilter® is to filter and prevent pollutants from entering our waterways. Like any effective filtration system, periodically these pollutants must be removed to restore the StormFilter to its full efficiency and effectiveness.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance activities may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. It is a good practice to inspect the system after major storm events.

Maintenance Procedures

Although there are many effective maintenance options, we believe the following procedure to be efficient, using common equipment and existing maintenance protocols. The following two-step procedure is recommended::

1. **Inspection**
   - Inspection of the vault interior to determine the need for maintenance.
2. **Maintenance**
   - Cartridge replacement
   - Sediment removal

Inspection and Maintenance Timing

At least one scheduled inspection should take place per year with maintenance following as warranted.

First, an inspection should be done before the winter season. During the inspection the need for maintenance should be determined and, if disposal during maintenance will be required, samples of the accumulated sediments and media should be obtained.

Second, if warranted, a maintenance (replacement of the filter cartridges and removal of accumulated sediments) should be performed during periods of dry weather.

In addition to these two activities, it is important to check the condition of the StormFilter unit after major storms for potential damage caused by high flows and for high sediment accumulation that may be caused by localized erosion in the drainage area. It may be necessary to adjust the inspection/ maintenance schedule depending on the actual operating conditions encountered by the system. In general, inspection activities can be conducted at any time, and maintenance should occur, if warranted, during dryer months in late summer to early fall.

Maintenance Frequency

The primary factor for determining frequency of maintenance for the StormFilter is sediment loading.

A properly functioning system will remove solids from water by trapping particulates in the porous structure of the filter media inside the cartridges. The flow through the system will naturally decrease as more and more particulates are trapped. Eventually the flow through the cartridges will be low enough to require replacement. It may be possible to extend the usable span of the cartridges by removing sediment from upstream trapping devices on a routine as-needed basis, in order to prevent material from being re-suspended and discharged to the StormFilter treatment system.

The average maintenance lifecycle is approximately 1-5 years. Site conditions greatly influence maintenance requirements. StormFilter units located in areas with erosion or active construction may need to be inspected and maintained more often than those with fully stabilized surface conditions.

Regulatory requirements or a chemical spill can shift maintenance timing as well. The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after major storms. Ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual StormFilter system or site. It is recommended that the site owner develop a database to properly manage StormFilter inspection and maintenance programs..

Inspection Procedures

The primary goal of an inspection is to assess the condition of the cartridges relative to the level of visual sediment loading as it relates to decreased treatment capacity. It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, then typically large amounts of sediments will be present and very little flow will be discharged from the drainage pipes. If this is the case, then maintenance is warranted and the cartridges need to be replaced.

Warning: In the case of a spill, the worker should abort inspection activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct an inspection:

Important: Inspection should be performed by a person who is familiar with the operation and configuration of the StormFilter treatment unit.

1. If applicable, set up safety equipment to protect and notify surrounding vehicle and pedestrian traffic.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the access portals to the vault and allow the system vent.
4. Without entering the vault, visually inspect the inside of the unit, and note accumulations of liquids and solids.
5. Be sure to record the level of sediment build-up on the floor of the vault, in the forebay, and on top of the cartridges. If flow is occurring, note the flow of water per drainage pipe. Record all observations. Digital pictures are valuable for historical documentation.
6. Close and fasten the access portals.
7. Remove safety equipment.
8. If appropriate, make notes about the local drainage area relative to ongoing construction, erosion problems, or high loading of other materials to the system.
9. Discuss conditions that suggest maintenance and make decision as to weather or not maintenance is needed.

Maintenance Decision Tree

The need for maintenance is typically based on results of the inspection. The following Maintenance Decision Tree should be used as a general guide. (Other factors, such as Regulatory Requirements, may need to be considered)

1. Sediment loading on the vault floor.
   a. If >4" of accumulated sediment, maintenance is required.
2. Sediment loading on top of the cartridge.
   a. If >1/4" of accumulation, maintenance is required.
3. Submerged cartridges.
   a. If >4" of static water above cartridge bottom for more than 24 hours after end of rain event, maintenance is required. (Catch basins have standing water in the cartridge bay.)
4. Plugged media.
   a. If pore space between media granules is absent, maintenance is required.
5. Bypass condition.
   a. If inspection is conducted during an average rain fall event and StormFilter remains in bypass condition (water over the internal outlet baffle wall or submerged cartridges), maintenance is required.
6. Hazardous material release.
   a. If hazardous material release (automotive fluids or other) is reported, maintenance is required.
7. Pronounced scum line.
   a. If pronounced scum line (say ≥ 1/4" thick) is present above top cap, maintenance is required.

Maintenance

Depending on the configuration of the particular system, maintenance personnel will be required to enter the vault to perform the maintenance.

Important: If vault entry is required, OSHA rules for confined space entry must be followed.

Filter cartridge replacement should occur during dry weather. It may be necessary to plug the filter inlet pipe if base flows is occurring.

Replacement cartridges can be delivered to the site or customers facility. Information concerning how to obtain the replacement cartridges is available from Contech Engineered Solutions.

Warning: In the case of a spill, the maintenance personnel should abort maintenance activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct cartridge replacement and sediment removal maintenance:

1. If applicable, set up safety equipment to protect maintenance personnel and pedestrians from site hazards.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the doors (access portals) to the vault and allow the system to vent.
4. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
5. Make notes about the external and internal condition of the vault. Give particular attention to recording the level of sediment build-up on the floor of the vault, in the forebay, and on top of the internal components.
6. Using appropriate equipment offload the replacement cartridges (up to 150 lbs. each) and set aside.
7. Remove used cartridges from the vault using one of the following methods:

Method 1:

A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

   Using appropriate hoisting equipment, attach a cable from the boom, crane, or tripod to the loose cartridge. Contact Contech Engineered Solutions for suggested attachment devices.

B. Remove the used cartridges (up to 250 lbs. each) from the vault.

Important: Care must be used to avoid damaging the cartridges during removal and installation. The cost of repairing components damaged during maintenance will be the responsibility of the owner.

C. Set the used cartridge aside or load onto the hauling truck.

D. Continue steps a through c until all cartridges have been removed.

Method 2:

A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

B. Unscrew the cartridge cap.

C. Remove the cartridge hood and float.

D. At location under structure access, tip the cartridge on its side.

E. Empty the cartridge onto the vault floor. Reassemble the empty cartridge.

F. Set the empty, used cartridge aside or load onto the hauling truck.

G. Continue steps a through e until all cartridges have been removed.

8. Remove accumulated sediment from the floor of the vault and from the forebay. This can most effectively be accomplished by use of a vacuum truck.
9. Once the sediments are removed, assess the condition of the vault and the condition of the connectors.
10. Using the vacuum truck boom, crane, or tripod, lower and install the new cartridges. Once again, take care not to damage connections.
11. Close and fasten the door.
12. Remove safety equipment.
13. Finally, dispose of the accumulated materials in accordance with applicable regulations. Make arrangements to return the used **empty** cartridges to Contech Engineered Solutions.

Related Maintenance Activities - Performed on an as-needed basis

StormFilter units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the StormFilter to be successful, it is imperative that all other components be properly maintained. The maintenance/repair of upstream facilities should be carried out prior to StormFilter maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads.

Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Inspection Report

Date: Personnel:

Location: ________________________ System Size: ____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

Sediment Thickness in Forebay: ____ Date: ______________

Sediment Depth on Vault Floor: ____

Structural Damage: ____

Estimated Flow from Drainage Pipes (if available): ____

Cartridges Submerged: Yes ☐ No ☐ Depth of Standing Water: ____

StormFilter Maintenance Activities (check off if done and give description)

☐ Trash and Debris Removal: ____

☐ Minor Structural Repairs: ____

☐ Drainage Area Report ____

Excessive Oil Loading: Yes ☐ No ☐ Source: ____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: ____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: ____

Items Needing Further Work: ____

Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals.

Other Comments:

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Review the condition reports from the previous inspection visits.

StormFilter Maintenance Report

Date: ______________________ Personnel: ____

Location: ______________________ System Size: ____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

List Safety Procedures and Equipment Used: ____

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System Observations

Months in Service:

Oil in Forebay (if present): Yes ☐ No ☐

Sediment Depth in Forebay (if present): ____

Sediment Depth on Vault Floor: ____

Structural Damage: ____

Drainage Area Report

Excessive Oil Loading: Yes ☐ No ☐ Source: ______________________

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: ______________________

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: ______________________

StormFilter Cartridge Replacement Maintenance Activities

Remove Trash and Debris: Yes ☐ No ☐ Details: ______________________

Replace Cartridges: Yes ☐ No ☐ Details: ______________________

Sediment Removed: Yes ☐ No ☐ Details: ______________________

Quantity of Sediment Removed (estimate?):

Minor Structural Repairs: Yes ☐ No ☐ Details: ______________________

Residuals (debris, sediment) Disposal Methods: ____

Notes:

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Support

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- Site-specific design support is available from our engineers.

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Appendix C – MTD HydroCAD Analysis and Drawings

StormPod-Stormfilter System:	
NO. OF STORMPOD - STORMFILTER SYSTEMS:	55
NO. OF 3 X SPSF SYSTEMS:	38
NO. OF 2 X SPSF SYSTEMS:	14
NO. OF 1 X SPSF SYSTEMS:	3

StormPod-Infiltration System:	
75TH PERCENTILE (SIZE OF INFILTRATION SYSTEM):	27

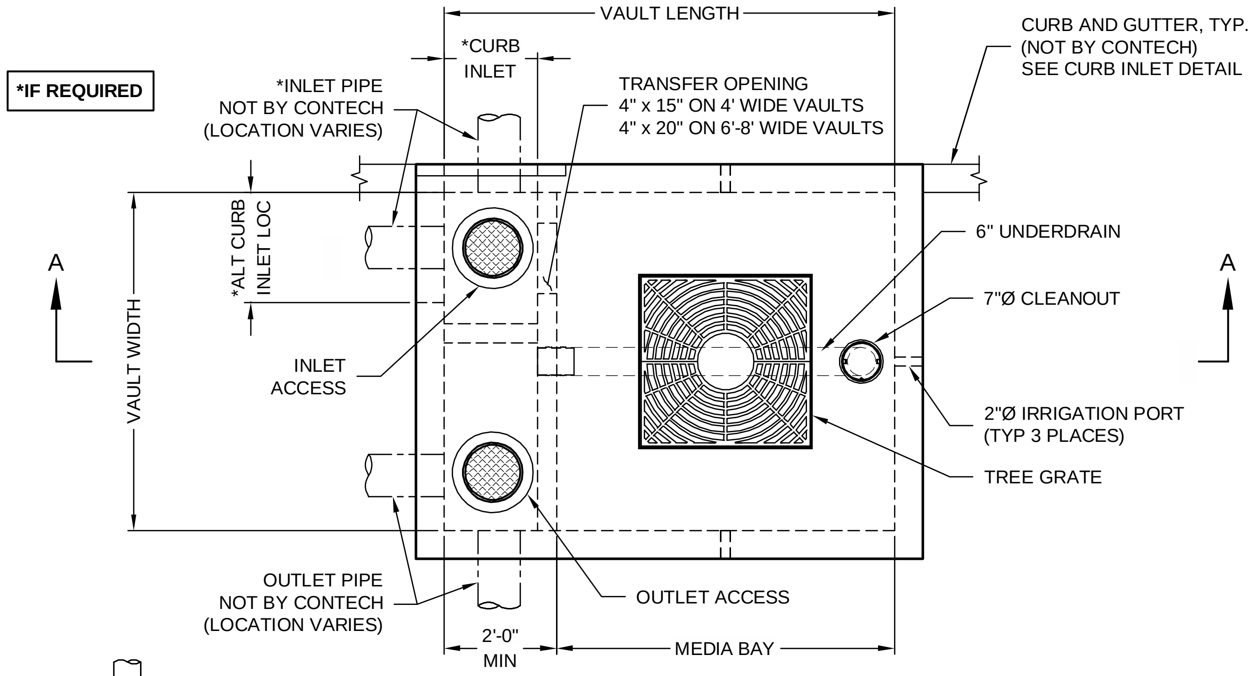
NUMBER OF INFILTRATION MODULES REQUIRED TO SATISFY WQV:	NO. OF SYSTEMS EACH
29	4
28	2
27	13
26	3
25	1
24	1
23	5
22	4
21	3
20	2
19	0
18	2
17	2
16	3
15	1
14	1
13	1
12	1
11	2
10	3
9	0
8	1
TOTAL:	55

Drainage Area ID	Area (acres)	Treatment Area (acres)	WQ Volume to Infiltrate (cf)	tc (hr)	Peak WQ Flow (cfs)	Structure Name	Structure Name	Area (ft2)	Calc Acres	NOTES	# of 18" StormFilter Cartridges required	# Modules w/ SF Required	# Infiltration Modules Required
B1	2.48	2.48	9269	0.1	2.24	TD-B2	JB-B1	107984	2.479		**68**	**3**	**27**
B2	2.48	2.48	9269	0.1	2.24	TD-B4	JB-B2	107984	2.479		**68**	**3**	**27**
B3	2.48	2.48	9269	0.1	2.24	TD-B6	JB-B3	107984	2.479		**68**	**3**	**27**
B4	1.82	1.82	6803	0.1	1.64	TD-B8	JB-B4	79259	1.820		**50**	**3**	**20**
B5	1.98	1.98	7388	0.1	1.79	TD-B10	JB-B5	86079	1.976		**54**	**3**	**22**
B6	1.98	1.98	7402	0.1	1.79	TD-B12	JB-B6	86237	1.980		**54**	**3**	**22**
B7	2.47	2.47	9225	0.1	2.23	TD-B14	JB-B7	107471	2.467		**67**	**3**	**27**
B8	2.49	2.49	9302	0.1	2.25	TD-B1	JB-B1	108373	2.488		**68**	**3**	**27**
B9	2.49	2.49	9302	0.1	2.25	TD-B3	JB-B2	108373	2.488		**68**	**3**	**27**
B10	2.49	2.49	9302	0.1	2.25	TD-B5	JB-B3	108373	2.488		**68**	**3**	**27**
B11	2.05	2.05	7668	0.1	1.85	TD-B7	JB-B4	89335	2.051		**56**	**3**	**23**
B12	1.99	1.99	7429	0.1	1.80	TD-B9	JB-B5	86548	1.987		**54**	**3**	**22**
B13	1.99	1.61	6038	0.1	1.46	TD-B11	JB-B6	86548	1.987	Assembly Building	**44**	**2**	**18**
B14	2.65	2.65	9894	0.1	2.39	TD-B16	JB-B8	115269	2.646		**72**	**3**	**29**
B15	2.66	2.66	9929	0.1	2.40	TD-B18	JB-B9	115675	2.656		**72**	**3**	**29**
B16	2.65	2.65	9911	0.1	2.40	TD-B20	JB-B10	115472	2.651		**72**	**3**	**29**
B17	2.43	2.43	9084	0.1	2.20	TD-B22	JB-B11	105829	2.429		**66**	**3**	**27**
B18	2.12	2.12	7915	0.1	1.91	TD-B24	JB-B12	92217	2.117		**58**	**3**	**23**
B19	2.12	2.12	7915	0.1	1.91	TD-B26	JB-B13	92217	2.117		**58**	**3**	**23**
B20	2.47	2.47	9251	0.1	2.24	TD-B28	JB-B14	107777	2.474		**67**	**3**	**27**
B21	2.60	2.60	9726	0.1	2.35	TD-B15	JB-B8	113314	2.601		**71**	**3**	**29**
B22	2.58	2.58	9630	0.1	2.33	TD-B17	JB-B9	112192	2.576		**70**	**3**	**28**
B23	2.51	2.51	9383	0.1	2.27	TD-B19	JB-B10	109311	2.509		**68**	**3**	**28**
B24	2.48	2.48	9257	0.1	2.24	TD-B21	JB-B11	107848	2.476		**67**	**3**	**27**
B25	1.92	1.92	7190	0.1	1.74	TD-B23	JB-B12	83772	1.923		**53**	**3**	**21**
B26	1.89	1.89	7066	0.1	1.71	TD-B25	JB-B13	82328	1.890		**52**	**3**	**21**
B27	2.37	2.37	8857	0.1	2.14	TD-B30	JB-B15	103184	2.369	To expand with B2	**65**	**3**	**26**
B28	1.44	1.44	5378	0.1	1.30	TD-B32	JB-B16	62652	1.438	To expand with B2	**39**	**2**	**16**
B29	1.53	1.53	5708	0.1	1.38	TD-B29	JB-B15	66502	1.527	To expand with B2	**42**	**2**	**17**
B30	0.87	0.87	3270	0.1	0.79	TD-B31	JB-B16	38092	0.874	To expand with B2	**24**	**1**	**10**

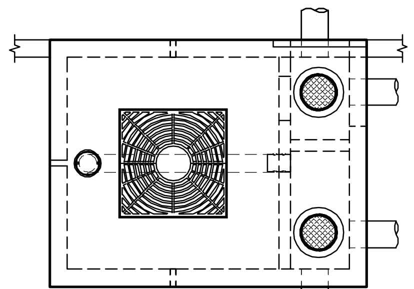
Drainage Area ID	Area (acres)	Treatment Area (acres)	WQ Volume to Infiltrate (cf)	Peak WQ Flow (cfs)	Structure Name	Structure Name	Area (ft2)	Calc Acres	NOTES	**Filterra HC Model**	**# of 18" StormFilter Cartridges required**	**# Modules w/ Filters Required**	**# Infiltration Modules Required**
B31	0.94	0.94	3498	0.85	TD-B32	JB-B16	40749	0.935			**26**	**2**	**11**
B32	2.33	2.33	8708	2.10	TD-B34	JB-B17	101450	2.329			**63**	**3**	**26**
B33	0.87	0.87	3267	0.79	TD-B36	JB-B18	38058	0.874			**24**	**1**	**10**
B34	1.56	1.56	5830	1.41	TD-B38	JB-B19	67926	1.559			**43**	**2**	**17**
B35	2.42	2.42	9037	2.18	TD-B40	JB-B20	105287	2.417			**66**	**3**	**27**
B36	1.83	1.83	6826	1.65	TD-B42	JB-B21	79531	1.826			**50**	**3**	**20**
B37	2.11	2.11	7871	1.90	TD-B29	JB-B15	91702	2.105			**57**	**3**	**23**
B38	2.22	2.22	8299	2.01	TD-B31	JB-B16	96686	2.220			**61**	**3**	**24**
B39	2.46	2.46	9194	2.22	TD-B33	JB-B17	107118	2.459			**67**	**3**	**27**
B40	2.40	2.40	8975	2.17	TD-B40	JB-B22	104560	2.400			**65**	**3**	**26**
B41	2.43	2.43	9100	2.20	TD-B42	JB-B23	106018	2.434			**66**	**3**	**27**
B42	1.92	1.92	7182	1.74	TD-B44	JB-B24	83669	1.921			**52**	**3**	**21**
B43	2.24	2.24	8376	2.02	TD-B39	JB-B22	97579	2.240			**61**	**3**	**25**
B44	1.98	1.98	7413	1.79	TD-B41	JB-B23	86361	1.983			**54**	**3**	**22**
B45	1.09	1.09	4086	0.99	TD-B43	JB-B24	47599	1.093			**30**	**2**	**12**
B46	0.29	0.29	0	0.27	F-B13		12778	0.293	Filterra	**8'x12.5' Peak Diversion Filterra HC**			
B47	0.29	0.29	0	0.26	F-B12		12486	0.287	Filterra	**8'x12.5' Peak Diversion Filterra HC**			
B48	0.26	0.26	0	0.24	F-B11		11496	0.264	Filterra	**8'x10.5' Peak Diversion Filterra HC**			
B49	0.23	0.23	0	0.21	F-B10		10127	0.232	Filterra	**8'x10.5' Peak Diversion Filterra HC**			
B50	0.31	0.31	0	0.28	F-B9		13394	0.307	Filterra	**8'x12.5' Peak Diversion Filterra HC**			
B51	0.30	0.30	0	0.27	F-B8		13116	0.301	Filterra	**8'x12.5' Peak Diversion Filterra HC**			
B52	0.30	0.30	0	0.27	F-B7		13212	0.303	Filterra	**8'x12.5' Peak Diversion Filterra HC**			
B53	0.30	0.30	0	0.28	F-B6		13280	0.305	Filterra	**8'x12.5' Peak Diversion Filterra HC**			
B54	0.31	0.31	0	0.28	F-B5		13348	0.306	Filterra	**8'x12.5' Peak Diversion Filterra HC**			
B55	0.31	0.31	0	0.28	F-B4		13417	0.308	Filterra	**8'x12.5' Peak Diversion Filterra HC**			
B56	0.31	0.31	0	0.28	F-B3		13485	0.310	Filterra	**8'x12.5' Peak Diversion Filterra HC**			
B57	0.31	0.31	0	0.28	F-B2		13554	0.311	Filterra	**8'x12.5' Peak Diversion Filterra HC**			
B58	0.31	0.31	0	0.28	F-B1		13618	0.313	Filterra	**8'x12.5' Peak Diversion Filterra HC**			
B59	10.41	10.41	0	9.41			453405	10.409	BUILDING				

Drainage Area ID	Area (acres)	Treatment Area (acres)	WQ Volume to Infiltrate (cf)	Peak WQ Flow (cfs)	Structure Name	Structure Name	NOTES	**# of 18" StormFilter Cartridges required**	**# Modules w/ Filters Required**	**# Infiltration Modules Required**
C60	1.19	1.19	4449	1.08	TD-C1	JB-C1		**33**	**2**	**13**
C61	1.22	1.22	4561	1.10	TD-C2	JB-C2		**33**	**2**	**14**
C62	2.09	2.09	7814	1.89	TD-C3	JB-C8		**57**	**3**	**23**
C63	1.38	0	0	0.00		JB-C6	Building			
C64	0.69	0.69	2580	0.62		CB-C2		**19**	**1**	**8**
C65	1.01	1.01	3776	0.91		CB-C1		**28**	**2**	**11**
C66	1.38	1.38	5160	1.25	TD-C6/C6A	JB-C12		**38**	**2**	**15**
C67	0.92	0.92	3440	0.83	TD-C7	JB-C13		**25**	**2**	**10**
C68	1.42	1.42	5309	1.28	TD-C8	DS-C5		**39**	**2**	**16**
C69	1.47	1.47	5496	1.33	TD-C9	DS-C6		**40**	**2**	**16**
C70	1.61	1.61	6020	1.45	TD-C10	DS-C7		**44**	**2**	**18**

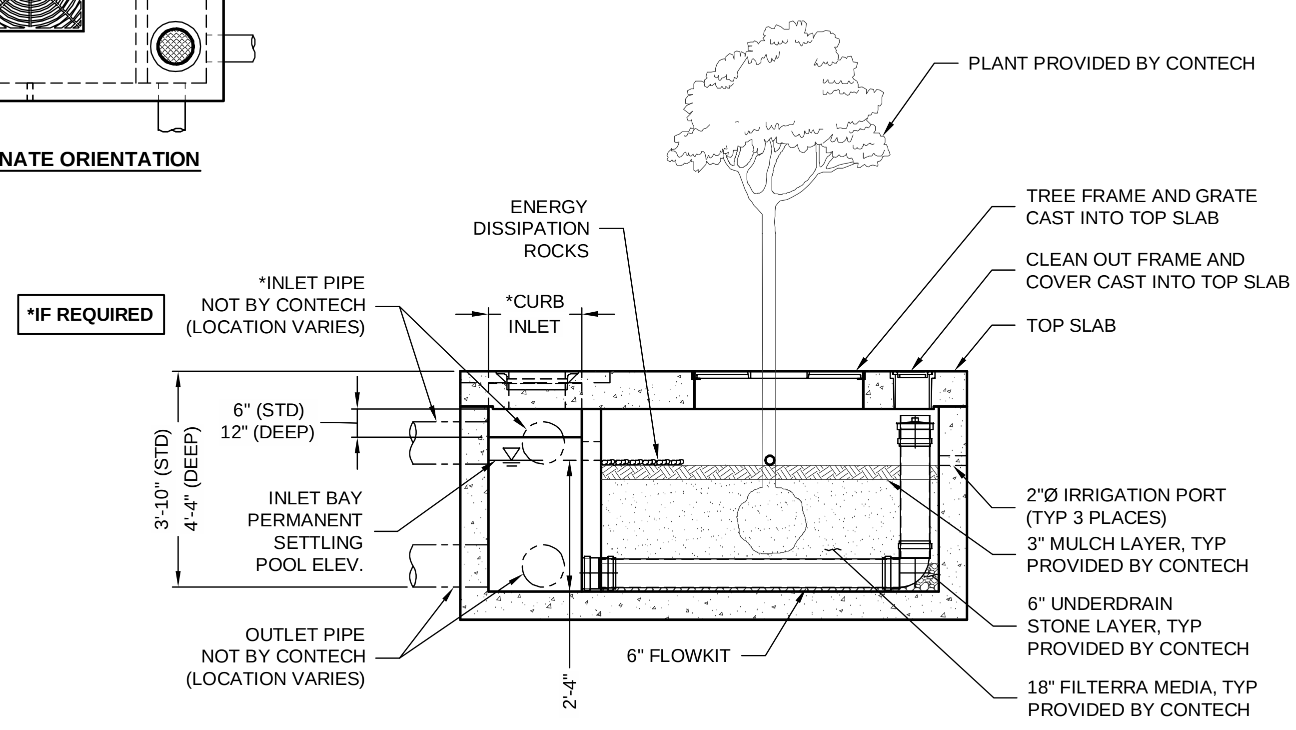
Drainage Area ID	Area (acres)	Treatment Area (acres)	WQ Volume to Infiltrate (cf)	Peak WQ Flow (cfs)	Structure Name	SWM Structure	NOTES	**Filterra HC Model**
D71	0.22	0.22	0	0.20	F-D3	Filterra HC Internal Bypass	Parking	**7'x10' Peak Diversion Filterra HC**
D72	0.24	0.24	0	0.22	F-D12	Filterra HC Internal Bypass	Parking	**8'x10.5' Peak Diversion Filterra HC**
D73	0.11	0.11	0	0.10	F-D11	Filterra HC Internal Bypass	Parking	**6'x6' Peak Diversion Filterra HC**
D74	0.23	0.23	0	0.21	F-D5	Filterra HC Internal Bypass		**8'x10.5' Peak Diversion Filterra HC**
D75	0.23	0.23	0	0.21	F-D10	Filterra HC Internal Bypass		**8'x10.5' Peak Diversion Filterra HC**
D76	0.23	0.23	0	0.20	F-D2	Filterra HC Internal Bypass	Parking	**8'x10.5' Peak Diversion Filterra HC**
D77	0.23	0.23	0	0.21	F-D4	Filterra HC Internal Bypass		**8'x10.5' Peak Diversion Filterra HC**
D78	0.23	0.23	0	0.21	F-D9	Filterra HC Internal Bypass		**8'x10.5' Peak Diversion Filterra HC**
D79	1.00	0	0	0.00			Building	
d79a	0.25	0	0	0.00	JB-D5			
d79b	0.25	0	0	0.00	JB-D10			
d79c	0.25	0	0	0.00	JB-D4			
d79d	0.25	0	0	0.00	JB-D9			
D80	0.24	0.24	0	0.22	F-D1	Filterra HC Internal Bypass	Laydown	**8'x10.5' Peak Diversion Filterra HC**
D81	0.26	0.26	0	0.24	F-D8	Filterra HC Internal Bypass	Laydown	**8'x10.5' Peak Diversion Filterra HC**
D82	0.26	0.26	0	0.24	F-D7	Filterra HC Internal Bypass	Laydown	**8'x10.5' Peak Diversion Filterra HC**
D83	0.25	0.25	0	0.22	F-D6	Filterra HC Internal Bypass	Laydown	**8'x10.5' Peak Diversion Filterra HC**



PLAN VIEW



ALTERNATE ORIENTATION



SECTION A-A
(STANDARD DEPTH SHOWN)

FTPD-HC STANDARD HEIGHT CONFIGURATION

DESIGNATION (OPTIONS: -P, -T, -PT)	DESIGNATION (OPTIONS: -P, -T, -PT)	MEDIA BAY SIZE	VAULT SIZE (W x L)	WEIR LENGTH/ MAX CURB OPENING	*MAX BYPASS FLOW (CFS)	INLET/ OUTLET ACCESS DIA	TREE GRATE QTY & SIZE
FTPD0404-HC	ALL	4 x 4	4 x 6	1'-8"	1.4	12"/12"	(1) 3' x 3'
FTPD0406-HC	N/A DE, MD, NJ, PA, VA, WV	4 x 6	4 x 8	1'-8"	1.4	12"/12"	(1) 3' x 3'
FTPD045058-HC	DE, MD, NJ, PA, VA, WV ONLY	4.5 x 5.83	4.5 x 7.83	1'-8"	1.4	12"/12"	(1) 3' x 3'
FTPD0604-HC	ALL	6 x 4	6 x 6	1'-8"	1.4	12"/12"	(1) 3' x 3'
FTPD0606-HC	ALL	6 x 6	6 x 8	1'-8"	1.4	12"/12"	(1) 3' x 3'
FTPD0608-HC	ALL	6 x 8	6 x 10	1'-8"	1.4	12"/12"	(1) 4' x 4'
FTPD0610-HC	ALL	6 x 10	6 x 12	1'-8"	1.4	12"/12"	(1) 4' x 4'
FTPD0710-HC	ALL	7 x 10	7 x 13	2'-6"	2.1	24"/24"	(1) 4' x 4'
FTPD08105-HC	ALL	8 x 10.5	8 x 14	3'-0"	2.5	24"/24"	(1) 4' x 4'
FTPD08125-HC	N/A OR, WA	8 x 12.5	8 x 16	3'-0"	2.5	24"/24"	(2) 4' x 4'
FTPD09115-HC	OR, WA ONLY	9 x 11.5	9 x 15	3'-0"	2.5	24"/24"	(2) 4' x 4'

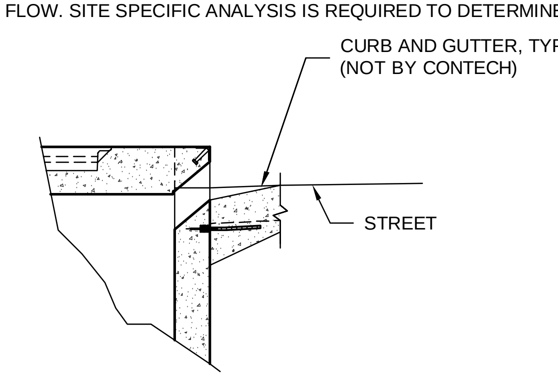
N/A = NOT AVAILABLE

FTPD-D-HC DEEP OPTION CONFIGURATION

DESIGNATION (OPTIONS: -P, -T, -PT)	AVAILABILITY	MEDIA BAY SIZE	VAULT SIZE (W x L)	WEIR LENGTH/ MAX CURB OPENING	*MAX BYPASS FLOW (CFS)	INLET/ OUTLET ACCESS DIA	TREE GRATE QTY & SIZE
FTPD0404-D-HC	ALL	4 x 4	4 x 6	1'-8"	4.6	12"/12"	(1) 3' x 3'
FTPD0406-D-HC	N/A DE, MD, NJ, PA, VA, WV	4 x 6	4 x 8	1'-8"	4.6	12"/12"	(1) 3' x 3'
FTPD045058-D-HC	DE, MD, NJ, PA, VA, WV ONLY	4.5 x 5.83	4.5 x 7.83	1'-8"	4.6	12"/12"	(1) 3' x 3'
FTPD0604-D-HC	ALL	6 x 4	6 x 6	1'-8"	4.6	12"/12"	(1) 3' x 3'
FTPD0606-D-HC	ALL	6 x 6	6 x 8	1'-8"	4.6	12"/12"	(1) 3' x 3'
FTPD0608-D-HC	ALL	6 x 8	6 x 10	1'-8"	4.6	12"/12"	(1) 4' x 4'
FTPD0610-D-HC	ALL	6 x 10	6 x 12	1'-8"	4.6	12"/12"	(1) 4' x 4'
FTPD0710-D-HC	ALL	7 x 10	7 x 13	2'-6"	6.8	24"/24"	(1) 4' x 4'
FTPD08105-D-HC	ALL	8 x 10.5	8 x 14	3'-0"	8.2	24"/24"	(1) 4' x 4'
FTPD08125-D-HC	N/A OR, WA	8 x 12.5	8 x 16	3'-0"	8.2	24"/24"	(2) 4' x 4'
FTPD09115-D-HC	OR, WA ONLY	9 x 11.5	9 x 15	3'-0"	2.5	24"/24"	(2) 4' x 4'

N/A = NOT AVAILABLE

*MAX BYPASS FLOW IS INTERNAL WEIR FLOW. SITE SPECIFIC ANALYSIS IS REQUIRED TO DETERMINE CURB INLET FLOW CAPACITY



CURB INLET DETAIL

filterra

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

FILTERRA HC PEAK DIVERSION (FTPD-HC)
CONFIGURATION DETAIL

INTERNAL PIPE CONFIGURATION MAY VARY DEPENDING UPON OUTLET LOCATION.

I:\STORMWATER\COMMOPS\54 FILTERRA\40 STANDARD DRAWINGS\FT-HC - FILTERRA HC (NEW JERSEY ONLY)\FTPD-HC - FILTERRA PEAK DIVERSION CONFIG DTL.DWG 9/8/2022 11:36 AM

THE DRAWINGS AND SPECIFICATIONS, HEREIN, ARE THE EXCLUSIVE CONFIDENTIAL PROPERTY OF ROTONDO ENVIRONMENTAL SOLUTIONS, LLC. COPYING, DISCLOSURES TO OTHERS, OR OTHER USE IS PROHIBITED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF ROTONDO ENVIRONMENTAL SOLUTIONS, LLC. CONTRACTOR IS TO VERIFY THAT ALL INFORMATION SHOWN ON DRAWINGS HAS BEEN THOROUGHLY CHECKED, COMPLIES WITH THE CONTRACT DOCUMENTS, AND IS ADEQUATE TO MEET THE FIELD CONDITIONS. ROTONDO ENVIRONMENTAL SOLUTIONS, LLC ACCEPTS NO RESPONSIBILITY FOR INSTALLATION ERRORS BY THE CONTRACTOR AND ERRORS OR OMISSIONS RESULTING AFTER RECEIPT OF APPROVED SHOP DRAWINGS.

NOTE: PRODUCTION WILL NOT COMMENCE UNTIL RECEIPT OF SIGNED APPROVED SHOP DRAWINGS.

PRECAST CONCRETE DESIGN SPECIFICATIONS:
- CONCRETE MINIMUM (28-DAY) COMPRESSIVE STRENGTH: 6,000 PSI
- REINFORCING DEFORMED BAR CONFORMING TO ASTM A615 (FY=60 KSI)
- REINFORCING WELDED WIRE CONFORMING TO ASTM A1064 (FY=80 KSI)
- STRUCTURAL REINFORCING FIBERS CONFORMING TO ASTM C1116
- DESIGN LIVE LOAD: 3.0 KSF UNIFORM LIVE LOAD W/ IMPACT
- DESIGN EARTH COVER: 1'-0" MIN. TO 5'-0" MAX.
- SOIL UNIT WEIGHT: 120 PCF
- GROUNDWATER TABLE ASSUMED TO BE AT OR BELOW INVERT OF STRUCTURE
- DESIGN CRITERIA IN ACCORDANCE TO AASHTO LRFD 8TH ED.

WATERTIGHT JOINT NOTES:
- STOMFILTER SYSTEMS TO BE WATERTIGHT
- INTERNAL CAULK JOINTS TO BE A CONTINUOUS SEAL THROUGHOUT EACH CHAMBER BY FILLING JOINTS WITH SIKAFLEX 2CNS OR 1A POLYURETHANE ELASTOMERIC SEALANT WITH SIKAFLEX PRIMER.
- JOINTS TO BE SEALED ON SITE BY THE SYSTEM MANUFACTURER.
- WATERTIGHTNESS OF SYSTEM IS THE RESPONSIBILITY OF THE SYSTEM MANUFACTURER.

STRUCTURE CONSTRUCTION NOTES:
- TOP & BOTTOM SECTIONS TO BE BOLTED TOGETHER WITH (6) ¾"Ø BOLTS TO HELP PREVENT DIFFERENTIAL SETTLEMENT.
- LATERAL INTERLOCKING TONGUE & GROOVES CAST INTO SIDES OF MODULES TO PROVIDE A LATERAL SHEAR CONNECTION BETWEEN MODULES TO PREVENT DIFFERENTIAL SETTLEMENT.
- LATERAL OPENINGS TO BE CAST IN AT PRECAST FACILITY.
- LATERAL PIPES TO EXTEND INTO THE STRUCTURE FLUSH WITH THE INSIDE WALL AND SEALED WITH GROUT. ANNULAR SPACE BETWEEN PIPE AND WALL OPENING TO BE SEALED WITH AN EXPANDABLE WATER-STOP AND AN APPROVED NON-SHRINK GROUT.
- LADDERS TO BE PROVIDED BY RES AND INSTALLED IN FIELD BY CONTRACTOR.
- MANHOLE ACCESS RISERS AND MANHOLE FRAMES & COVERS TO BE PROVIDED BY CONTECH, AND INSTALLED ON SITE BY THE CONTRACTOR.
- CONTRACTOR TO GROUT GRADE RINGS TO MATCH FINISHED GRADE.

DELIVERY
(Two modules per trailer)

HANDLING
(Base slab bolted to arch at factory)

INSTALLATION

INSTALLED SYSTEM

INSIDE VIEW
(Smooth floor w/ no obstructions)

ENDWALL INSTALLATION

STORMPOD W/ CARTRIDGES (INSIDE VIEW)

SEALING JOINTS

WATERTIGHT JOINTS
(Tested to 17.25 psi hydrostatic pressure)

BACKFILL
(On-site soils around perimeter & #57 stone in aquifers)

REVISIONS	
NO	DATE
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StormPod®
UNIVERSAL STORMWATER MANAGEMENT SYSTEM
by ROTONDO Environmental Solutions LLC
www.Rotondo-ES.com
US PATENT # 9580899 B2

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
The Stormwater Management StormFilter®
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,322,629; 5,524,576; 5,707,527; 5,985,157; 6,027,639; 6,649,048; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

DRAWN BY:	PAS
CHECKED BY:	JAR
DATE:	01/25/2023
SCALE:	NTS
JOB NO.:	----

PROJECT:
3FT LO-PRO STORMPOD-STORMFILTER
NEW JERSEY WIND PORT - B1, B2, C2, D
SALEM, NJ

CUSTOMER: ----

DWG. NO. L-1

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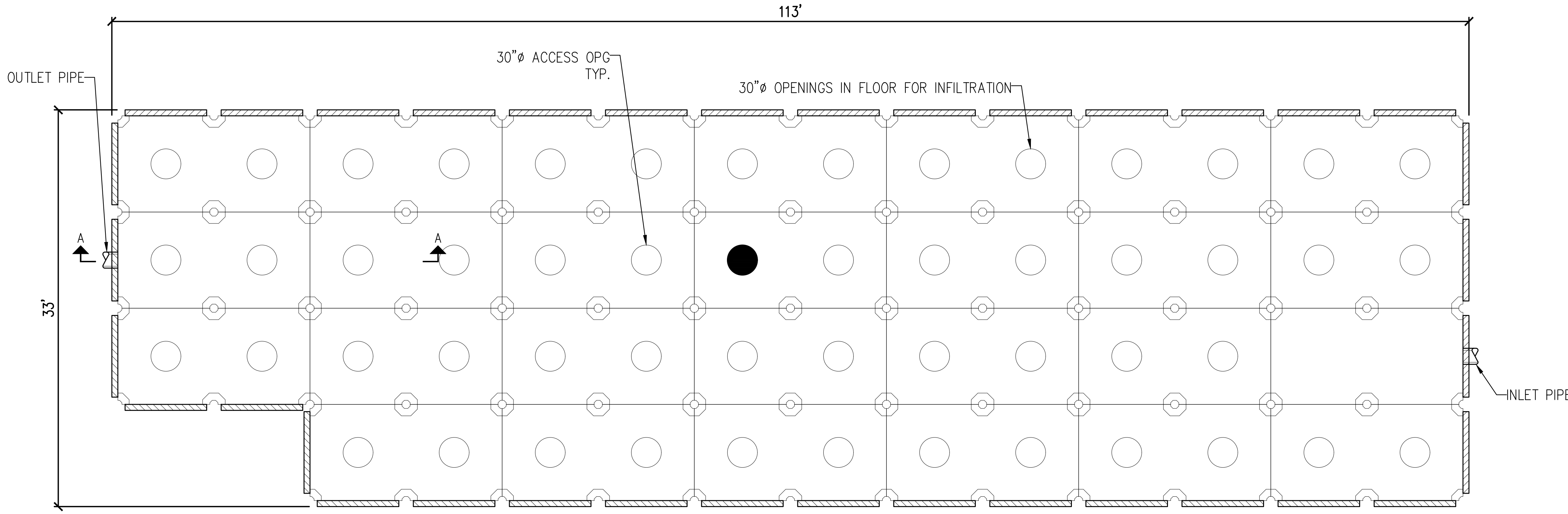
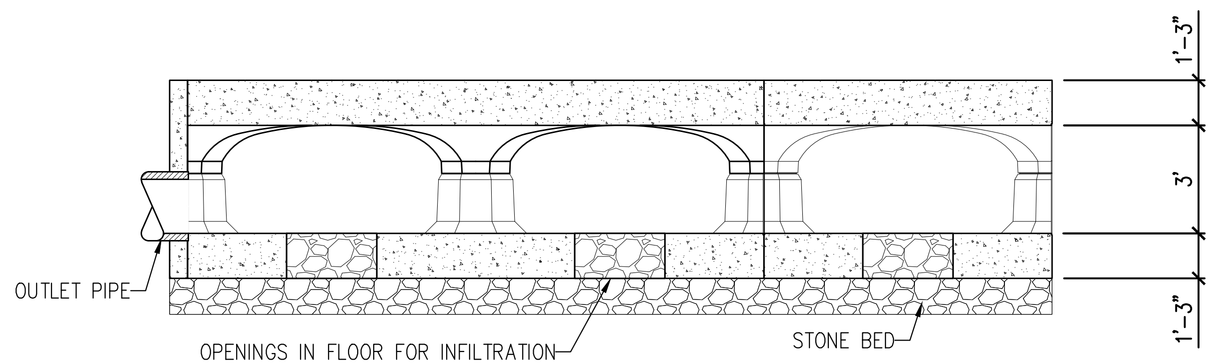
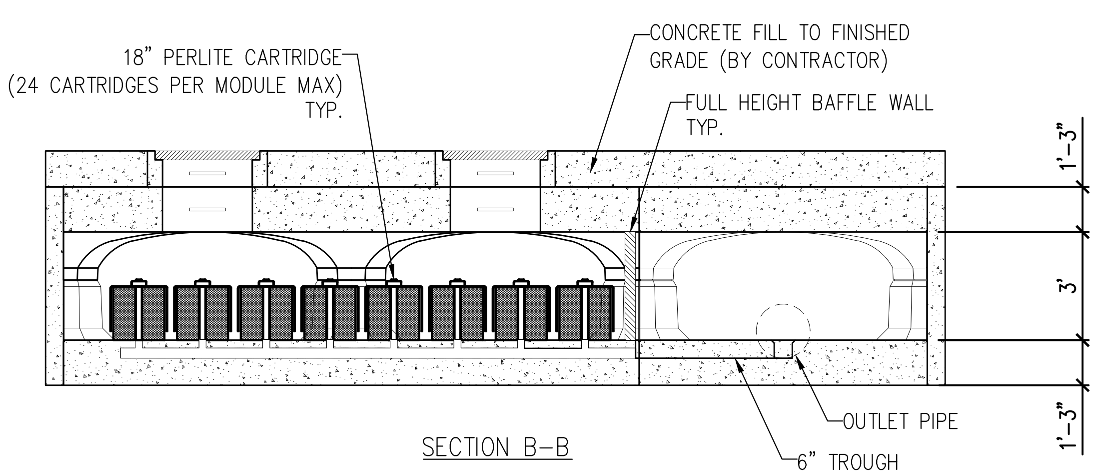


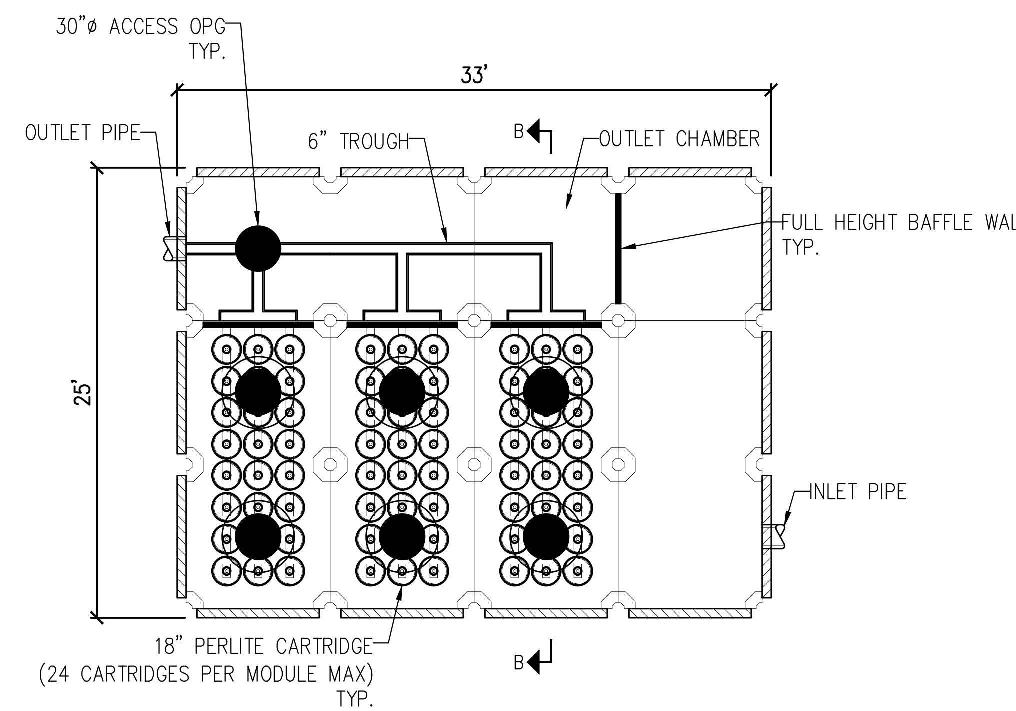
PLAN VIEW – 3-FT LO-PRO INFILTRATION



SECTION A-A



SECTION B-B



PLAN VIEW – 3-FT STORMPOD STORMFILTER

STANDARD DETAIL

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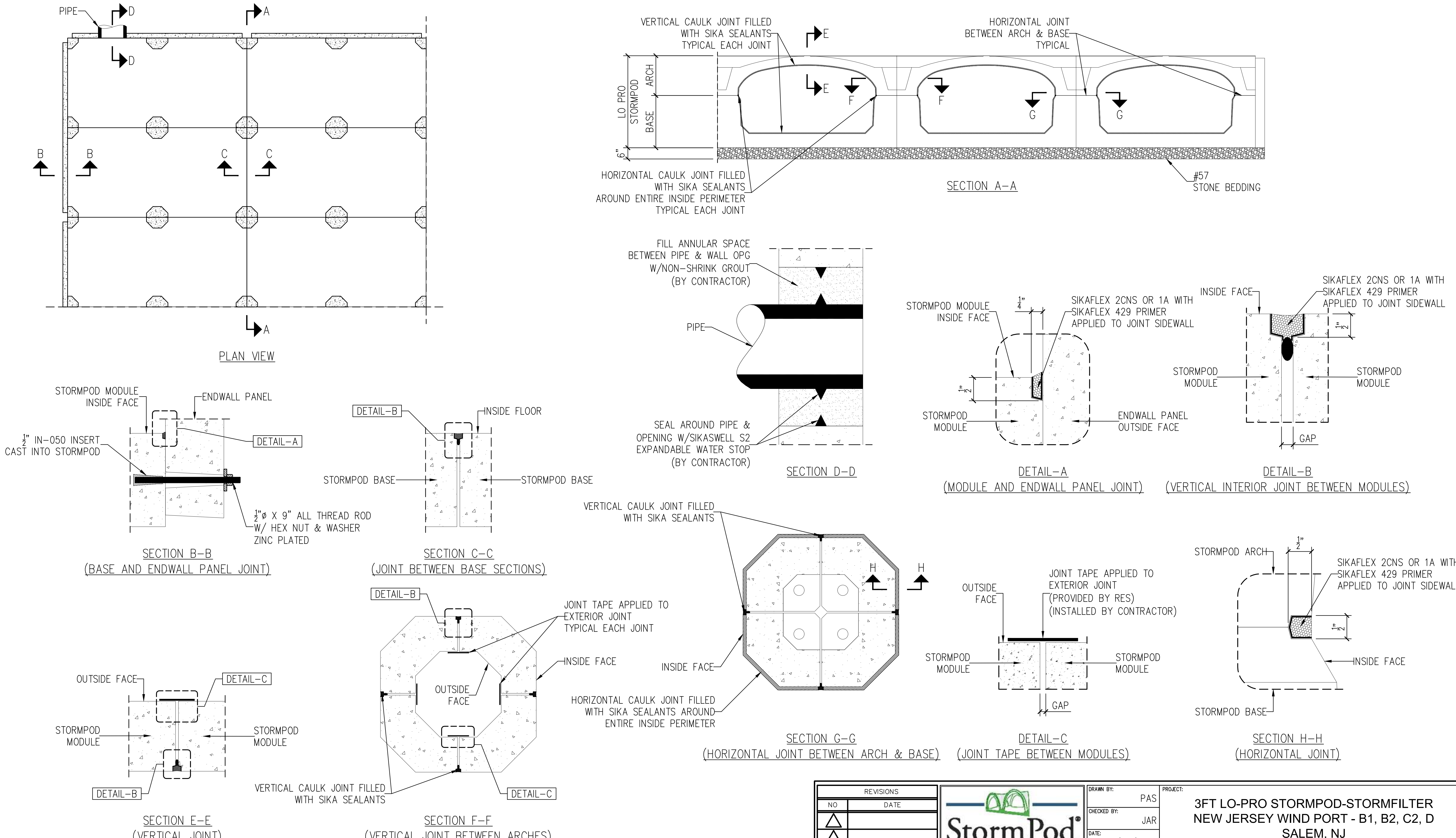
DRAWN BY:	PAS
CHECKED BY:	JAR
DATE:	01/25/2023
SCALE:	NTS
JOB NO.:	----

PROJECT:
3FT LO-PRO STORMPOD-STORMFILTER
NEW JERSEY WIND PORT - B1, B2, C2, D
SALEM, NJ

CUSTOMER:

DWG. NO. L-2

SHT.



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UNIVERSAL STORMWATER MANAGEMENT SYSTEM
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US PATENT # 9580899 B2

DRAWN BY: PAS
CHECKED BY: JAR
DATE: 01/25/2023
SCALE: NTS
JOB NO.: ----

PROJECT:
3FT LO-PRO STORMPOD-STORMFILTER
NEW JERSEY WIND PORT - B1, B2, C2, D
SALEM, NJ

CUSTOMER: ----

DWG. NO. L-3
SHT.

SPECIFICATIONS FOR THE INSTALLATION & BACKFILLING OF THE STORMPOD LO-PRO DETENTION SYSTEM

1.0 DESCRIPTION

THIS WORK CONSISTS OF CONSTRUCTING AN UNDERGROUND STORMPOD LO-PRO STORMWATER FACILITY IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON THE PLANS OR AS ESTABLISHED BY THE PROJECT ENGINEER.

2.0 EQUIPMENT/TOOLS

2.1 EQUIPMENT/TOOLS PROVIDED BY ROTONDO
- LIFTING HARDWARE (I.E. FIXTURES THAT CONNECT TO THE PRODUCT).

2.2 EQUIPMENT/TOOLS PROVIDED BY CONTRACTOR
- CRANE/EXCAVATOR
- 4-HOOK CABLE OR CHAIN FOR HANDLING PRECAST ELEMENTS IN GOOD CONDITION AND PROPER CAPACITY
- (3) 1.5-TON (MIN.) CAPACITY RATCHET LEVER CHAIN HOIST (SEE PHOTO)
- (2) 5' LONG PRY BARS
- A TRANSIT OR LASER LEVEL WITH ROD
- A CARPENTER'S LEVEL 6 FOOT MINIMUM LENGTH
- A SURVEYOR'S TAPE MEASURE 100 FOOT MINIMUM LENGTH
- WRENCH AND SOCKET SET TO TIGHTEN BOLTED CONNECTIONS WHEN REQUIRED

3.0 MATERIALS

3.1 NON-WOVEN FILTER FABRIC – NOT REQUIRED FOR LO-PRO SYSTEM

3.2 ACCESS MATERIALS
- ACCESS HATCH – A 4-FT X 4-FT H 20 DOUBLE LEAF, GALVANIZED STEEL HATCH AS MANUFACTURED BY INWESCO, INC. OR APPROVED EQUAL.
- MANHOLE FRAME & COVER – H 20 CAST-IRON MANHOLE FRAMES AND COVERS AS SUPPLIED BY CAPITOL FOUNDRY OR APPROVED EQUAL.
- LADDERS – HOT-DIPPED GALVANIZED STEEL MANHOLE LADDERS AS MANUFACTURED BY INWESCO, INC. MODEL I-3400 OR APPROVED EQUAL.
- MANHOLE STEPS – COPOLYMER POLYPROPYLENE STEEL REINFORCED MANHOLE STEPS AS SUPPLIED BY MA INDUSTRIES MODEL PS1-PF OR APPROVED EQUAL.

4.0 INSTALLATION PREPARATION

TO ENSURE CORRECT INSTALLATION OF THE PRECAST STORMPOD SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN PREPARING THE STONE BEDDING THAT GOES BENEATH THE STRUCTURE. EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.

4.1 SUBGRADE
- SUBGRADE SOILS IN THE PLANNED STRUCTURE AREA SHOULD BE EXAMINED BY THE SITE SOILS ENGINEER. IN THE EVENT THAT ANY YIELDING MATERIALS ARE ENCOUNTERED, THOSE SUBGRADE SOILS SHOULD EITHER BE THOROUGHLY DENSIFIED IN PLACE OR UNDERCUT TO FIRM GROUND AND REPLACED WITH CONTROLLED, COMPACTED FILL TO FINAL SUBGRADE ELEVATIONS.
- THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE SUBGRADE BEARING CAPACITY MEETS OR EXCEEDS THE APPLIED BEARING PRESSURES FROM THE STRUCTURE.

4.2 STONE BEDDING
- BEDDING MATERIAL SHALL BE #57 STONE.
- A 6 INCH MINIMUM LAYER OF THE SPECIFIED AGGREGATE SHALL BE PLACED AND LEVELED ON TOP OF THE PREPARED SUBGRADE UNDER THE ENTIRE STRUCTURE.
- BEDDING SHALL BE LIGHTLY AND UNIFORMLY COMPACTED.
- THE STONE BED SHALL BE LEVELED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN CHECKED WITH A TRANSIT/LASER LEVEL, THE ELEVATION SHALL NOT VARY MORE THAN 1/4 INCH (+/-) FROM THE SPECIFIED ELEVATION.

5.0 INSTALLATION OF PRECAST SYSTEM

ROTONDO ENVIRONMENTAL SOLUTIONS SHALL HAVE A QUALIFIED TECHNICIAN ON SITE DURING THE INSTALLATION PROCESS TO INSURE THAT THE PRECAST SECTIONS ARE INSTALLED PER MANUFACTURER'S REQUIREMENTS. ROTONDO SHALL PROVIDE CERTIFICATION THAT THE PRECAST CONCRETE ELEMENTS ARE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND TO MANUFACTURER'S REQUIREMENTS. ROTONDO IS NOT RESPONSIBLE FOR THE LOCATION OR ELEVATION OF THE STRUCTURE OR FOR PROVIDING CERTIFICATION FOR THE SUBGRADE OR BACKFILL PROCESS. A LICENSED SOILS ENGINEER SHALL BE RESPONSIBLE FOR THE CERTIFICATION THAT THE SUBGRADE AND STRUCTURE BEDDING AS WELL AS THE BACKFILL PROCESS AND MATERIALS MEET THE REQUIRED SPECIFICATIONS.

TO ENSURE A QUALITY ASSEMBLY OF THE PRECAST STORMPOD SYSTEM, THE INSTALLATION OF PERIMETER AND INTERIOR ELEMENTS SHOULD BE INSTALLED SIMULTANEOUSLY WHILE MONITORING ELEVATIONS, ALIGNMENT AND MINIMIZING GAPS IN JOINTS. IT IS IMPORTANT TO START AT ONE POINT AND MIGRATE ACROSS THE SYSTEM DRAWING ALL SECTIONS INWARD.

5.1 PLACEMENT OF POD ASSEMBLIES
- EACH STORMPOD ASSEMBLY CONSISTS OF AN ARCH SECTION ATTACHED TO A SINGLE PRECAST FLOOR SLAB. THE ARCH SECTION IS ATTACHED TO THE PRECAST FLOOR SLAB AT THE PRECAST FACILITY PRIOR TO DELIVERY TO THE JOBSITE.
- IDENTIFY THE CRITICAL BENCH MARK LOCATION TO BEGIN THE INSTALLATION OF PRECAST ELEMENTS. TYPICALLY, THIS LOCATION WOULD BE AT THE OUTLET OR ANOTHER CRITICAL POINT WHERE GROWTH AND ALIGNMENT ARE A CONCERN.
- TO ENSURE CORRECT INSTALLATION OF THE PRECAST STORMPOD SYSTEM, THE OUTER PERIMETER BARREL SHOULD BE MARKED USING A PRE-PLACED STRING-LINE PLACED AT THE TOP OF THE STONE BED OFFSET ALONG THE SIDE OF THE ARCH BARREL. SECURE STRING-LINE WITH WOOD STAKES PLACED AT EACH END OF THE BARREL WITH THE TOP OF THE STAKE SET TO APPROXIMATELY 3 INCHES ABOVE THE REQUIRED BED ELEVATION. FASTEN THE STRING-LINE TO THE STAKE BY STAPLING TO THE TOP OF THE STAKE.
- TO ESTABLISH PROPER EXTERIOR WALL ALIGNMENT FOR THE STRUCTURE, START INSTALLING PERIMETER POD SECTIONS IN EITHER DIRECTION UNTIL PROPER ALIGNMENT AND GROWTH HAS BEEN CONFIRMED. MEASURE FROM OFFSET STRING LINE TO MONITOR ALIGNMENT. ELEVATIONS AND LEVELNESS MUST ALSO BE MONITORED AND ADJUSTED AT ALL TIMES WHEN INSTALLING POD UNITS.


- WHEN INSTALLING THE POD UNITS, REMOVE ENOUGH STONE WHERE SECTIONS ARE DRAWN TOGETHER WHICH MAY PREVENT SECTIONS FROM TOUCHING. EACH SECTION MUST THEN BE DRAWN TOGETHER TIGHT, USING THE 1.5-TON RATCHET LEVER CHAIN HOISTS, TO MINIMIZE GAPS AND ENGAGE THE ALIGNMENT TONGUE AND GROOVES. VERIFY THE INVERT ELEVATIONS AT EACH JOINT AND FOLLOW THE LEVELING PROCEDURES IN PREVIOUS STEP.
- ONCE ACCEPTABLE, REPEAT THE PREVIOUS STEPS MIGRATING ACROSS THE SYSTEM TO ONE COMMON POINT.


- INSTALL ENDWALL PANELS BY BOLTING ONTO END OF STORMPOD MODULE.
- ONCE PRECAST ELEMENTS HAVE BEEN INSTALLED, WRAP EXTERIOR VERTICAL JOINTS WITH JOINT TAPE MATERIAL. THIS MATERIAL IS USED TO PREVENT FINES FROM PASSING THROUGH AND PROVIDE A SILT-TIGHT JOINT.


- IF THE SYSTEM IS REQUIRED TO BE WATER-TIGHT, ONCE THE PRECAST ELEMENTS HAVE BEEN INSTALLED, MAKE SURE ALL INTERIOR JOINT SURFACES ARE CLEAN AND FREE FROM DIRT/DEBRIS. STARTING WITH THE BOTTOM SECTION JOINTS, APPLY A CONTINUOUS UNIFORM BEAD OF SIKAFLEX 2CNS POLYURETHANE ELEASTOMERIC SEALANT.
- SYSTEM JOINTS TO BE SEALED AND MADE WATERTIGHT BY MANUFACTURER.



REVISIONS	
NO	DATE
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StormPod®
UNIVERSAL STORMWATER MANAGEMENT SYSTEM
by ROTONDO
www.Rotondo-ES.com
US PATENT # 9580899 B2

DRAWN BY: PAS	PROJECT: 3FT LO-PRO STORMPOD-STORMFILTER NEW JERSEY WIND PORT - B1, B2, C2, D SALEM, NJ
CHECKED BY: JAR	
DATE: 01/25/2023	
SCALE: NTS	CUSTOMER: ----
JOB NO.: ----	DWG. NO. L-4 SHT.

6.0 BACKFILL

A LICENSED SOILS ENGINEER SHALL BE RESPONSIBLE FOR THE CERTIFICATION THAT THE SUBGRADE AND STRUCTURE BEDDING AS WELL AS THE BACKFILL PROCESS AND MATERIALS MEET THE REQUIRED SPECIFICATIONS.

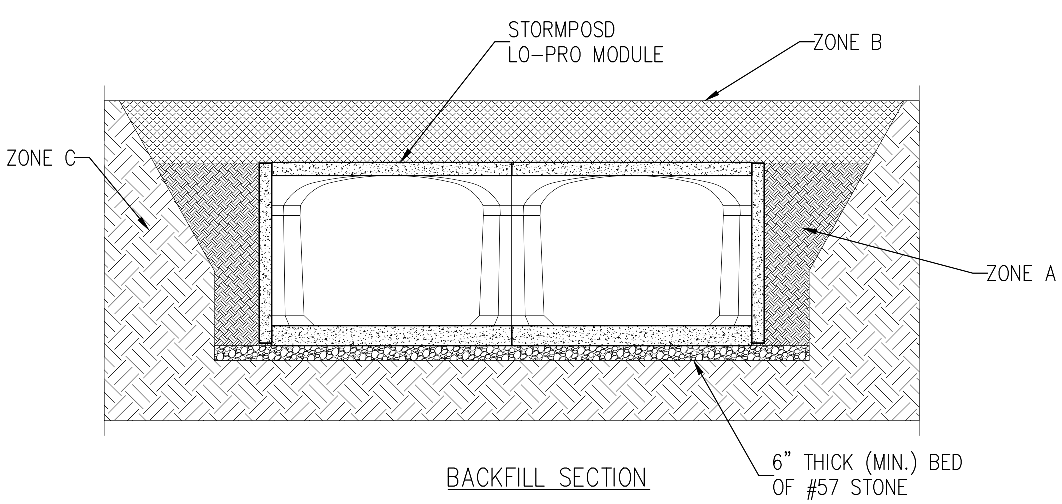
6.1 DO NOT PERFORM BACKFILLING DURING WET OR FREEZING WEATHER.

6.2 NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURAL ELEMENTS UNTIL THE BACKFILL MATERIAL HAS BEEN APPROVED BY THE SITE SOILS ENGINEER.

6.3 CONSTRUCTION VEHICLES HEAVIER THAN A CATERPILLAR D-4 ARE NOT ALLOWED OVER THE STRUCTURE WHEN BACKFILL DEPTH IS LESS THAN 2 FEET OVER THE STRUCTURE CROWN. LIGHTWEIGHT DOZERS MAY BE OPERATED OVER UNITS HAVING 2 FEET OF COMPACTED COVER, BUT HEAVY EARTH MOVING EQUIPMENT (LARGER THAN A CAT D-4 DOZER WEIGHING IN EXCESS OF 12 TONS AND HAVING TRACK PRESSURES OF 8 PSI OR GREATER) SHALL REQUIRE A MINIMUM OF 4 FEET OF COVER. IN NO CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD HL-93 BE PERMITTED OVER THE STRUCTURE UNLESS APPROVED BY ROTONDO ENVIRONMENTAL SOLUTION'S ENGINEER.

6.4 BACKFILL ZONES
- ZONE A – FILL THAT IS DIRECTLY AGAINST THE STRUCTURE AROUND THE OUTSIDE PERIMETER OF THE STRUCTURE.
- ZONE B – FILL THAT IS PLACED DIRECTLY OVER THE TOP OF THE STRUCTURE
- ZONE C – CONSTRUCTED EMBANKMENT OR OVERFILL

6.5 REQUIRED BACKFILL PROPERTIES
- ZONE A – GENERALLY, SOILS SHALL BE REASONABLY FREE OF ORGANIC MATTER, AND FREE OF STONES LARGER THAN 3-INCHES IN DIAMETER NEAR CONCRETE SURFACES.
- ZONE B – GENERALLY, SOILS SHALL BE REASONABLY FREE OF ORGANIC MATTER, AND FREE OF STONES LARGER THAN 3-INCHES IN DIAMETER NEAR CONCRETE SURFACES.
- ZONE C –SHALL BE REGULAR BACKFILL MATERIAL.
- IN-SITU SOIL – NATURAL GROUND IS TO BE SUFFICIENTLY STABLE TO ALLOW EFFECTIVE SUPPORT TO THE PRECAST CONCRETE STRUCTURE.



BACKFILL SECTION

6.6 BACKFILL SEQUENCE
- PHASE 1 – BACKFILL ZONE A TO TOP OF STRUCTURE AROUND THE ENTIRE PERIMETER OF STRUCTURE TO THE DIMENSIONS SHOWN.
- PHASE 2 – BACKFILL ZONE B ON TOP OF THE STRUCTURE TO THE DIMENSION SHOWN.

6.7 PLACING AND COMPACTING BACKFILL AROUND STRUCTURE – ZONE A
- DUMPING OF BACKFILL MATERIAL IS NOT ALLOWED ANY NEARER THAN 3 FT FROM THE SIDE OF THE STRUCTURE.
- THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 6 INCHES IN THICKNESS, LOOSE MEASUREMENT. THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL AROUND THE PERIMETER OF THE STRUCTURE MUST NOT EXCEED 2 FEET.
- EACH LAYER SHALL BE COMPACTED WITHIN A TOLERANCE OF OMC (OPTIMUM MOISTURE CONTENT) TO OMC+2 POINTS TO A DENSITY OF AT LEAST 95% OF THE THEORETICAL DENSITY.
- EACH LAYER SHALL BE COMPACTED BY ROLLING, TAMPING WITH MECHANICAL RAMMERS OR PNEUMATIC BACKFILL TAMPERS, OR HAND TAMPING WITH HEAVY METAL TAMPERS WITH A FACE OF AT LEAST 25 SQUARE INCHES. IF VIBRATORY ROLLERS ARE USED IN THE BACKFILL OPERATIONS, VIBRATORY MOTORS SHALL NOT BE ACTIVATED UNTIL AT LEAST 4 FEET OF BACKFILL HAS BEEN PLACED AND COMPACTED OVER THE TOP OF THE STRUCTURE.


6.8 PLACING AND COMPACTING BACKFILL ON TOP OF STRUCTURE – ZONE B
- DUMPING BACKFILL MATERIAL IS NOT ALLOWED ON TOP OF THE STRUCTURE. BACKFILL MATERIAL SHALL BE DUMPED NO CLOSER THAN 3 FEET FROM THE OUTSIDE PERIMETER OF THE STRUCTURE AND SPREAD ACROSS THE TOP OF THE STRUCTURE USING LIGHT EQUIPMENT SUCH AS A LIGHT DOZER OR BOBCAT.
- THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 6 INCHES THICKNESS, LOOSE MEASUREMENT.
- EACH LAYER SHALL BE COMPACTED WITHIN A TOLERANCE OF OMC (OPTIMUM MOISTURE CONTENT) TO OMC+2 POINTS TO A DENSITY OF AT LEAST 95% OF THE THEORETICAL DENSITY.
- EACH LAYER MATERIAL SHALL BE COMPACTED BY ROLLING, TAMPING WITH MECHANICAL RAMMERS OR PNEUMATIC BACKFILL TAMPERS, OR HAND TAMPING WITH HEAVY METAL TAMPERS WITH A FACE OF AT LEAST 25 SQUARE INCHES. IF VIBRATORY ROLLERS ARE USED IN THE BACKFILL OPERATIONS, VIBRATORY MOTORS SHALL NOT BE ACTIVATED UNTIL AT LEAST 4 FEET OF BACKFILL HAS BEEN PLACED AND COMPACTED OVER THE TOP OF THE STRUCTURE.


REVISIONS	
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StormPod®
UNIVERSAL STORMWATER MANAGEMENT SYSTEM
by ROTONDO
www.Rotondo-ES.com
US PATENT # 9580899 B2

DRAWN BY:	PAS
CHECKED BY:	JAR
DATE:	01/25/2023
SCALE:	NTS
JOB NO.:	----

PROJECT: 3FT LO-PRO STORMPOD-STORMFILTER
NEW JERSEY WIND PORT - B1, B2, C2, D
SALEM, NJ

CUSTOMER: ----

DWG. NO. L-5

SHT.

Appendix D –Manufacturer's Recommended Maintenance Procedures

Filterra® Maintenance Steps


1. Inspection of Filterra and surrounding area


2. Removal of tree grate and erosion control stones


3. Removal of debris, trash and mulch


4. Mulch replacement


5. Clean area around Filterra


6. Complete paperwork and record plant height and width

Contech has created a network of Certified Maintenance Providers (CCMP's) to provide maintenance on Filterra systems. To find a CCMP in your area please visit www.conteches.com/maintenance

CONTECH ENGINEERED SOLUTIONS

StormFilter Inspection and Maintenance Procedures

The Stormwater Management StormFilter®

Maintenance Guidelines

The primary purpose of the Stormwater Management StormFilter® is to filter and prevent pollutants from entering our waterways. Like any effective filtration system, periodically these pollutants must be removed to restore the StormFilter to its full efficiency and effectiveness.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance activities may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. It is a good practice to inspect the system after major storm events.

Maintenance Procedures

Although there are many effective maintenance options, we believe the following procedure to be efficient, using common equipment and existing maintenance protocols. The following two-step procedure is recommended::

1. **Inspection**
   - Inspection of the vault interior to determine the need for maintenance.
2. **Maintenance**
   - Cartridge replacement
   - Sediment removal

Inspection and Maintenance Timing

At least one scheduled inspection should take place per year with maintenance following as warranted.

First, an inspection should be done before the winter season. During the inspection the need for maintenance should be determined and, if disposal during maintenance will be required, samples of the accumulated sediments and media should be obtained.

Second, if warranted, a maintenance (replacement of the filter cartridges and removal of accumulated sediments) should be performed during periods of dry weather.

In addition to these two activities, it is important to check the condition of the StormFilter unit after major storms for potential damage caused by high flows and for high sediment accumulation that may be caused by localized erosion in the drainage area. It may be necessary to adjust the inspection/ maintenance schedule depending on the actual operating conditions encountered by the system. In general, inspection activities can be conducted at any time, and maintenance should occur, if warranted, during dryer months in late summer to early fall.

Maintenance Frequency

The primary factor for determining frequency of maintenance for the StormFilter is sediment loading.

A properly functioning system will remove solids from water by trapping particulates in the porous structure of the filter media inside the cartridges. The flow through the system will naturally decrease as more and more particulates are trapped. Eventually the flow through the cartridges will be low enough to require replacement. It may be possible to extend the usable span of the cartridges by removing sediment from upstream trapping devices on a routine as-needed basis, in order to prevent material from being re-suspended and discharged to the StormFilter treatment system.

The average maintenance lifecycle is approximately 1-5 years. Site conditions greatly influence maintenance requirements. StormFilter units located in areas with erosion or active construction may need to be inspected and maintained more often than those with fully stabilized surface conditions.

Regulatory requirements or a chemical spill can shift maintenance timing as well. The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after major storms. Ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual StormFilter system or site. It is recommended that the site owner develop a database to properly manage StormFilter inspection and maintenance programs..

Inspection Procedures

The primary goal of an inspection is to assess the condition of the cartridges relative to the level of visual sediment loading as it relates to decreased treatment capacity. It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, then typically large amounts of sediments will be present and very little flow will be discharged from the drainage pipes. If this is the case, then maintenance is warranted and the cartridges need to be replaced.

Warning: In the case of a spill, the worker should abort inspection activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct an inspection:

Important: Inspection should be performed by a person who is familiar with the operation and configuration of the StormFilter treatment unit and the unit's role, relative to detention or retention facilities onsite.

1. If applicable, set up safety equipment to protect and notify surrounding vehicle and pedestrian traffic.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the access portals to the vault and allow the system vent.
4. Without entering the vault, visually inspect the inside of the unit, and note accumulations of liquids and solids.
5. Be sure to record the level of sediment build-up on the floor of the vault, in the forebay, and on top of the cartridges. If flow is occurring, note the flow of water per drainage pipe. Record all observations. Digital pictures are valuable for historical documentation.
6. Close and fasten the access portals.
7. Remove safety equipment.
8. If appropriate, make notes about the local drainage area relative to ongoing construction, erosion problems, or high loading of other materials to the system.
9. Discuss conditions that suggest maintenance and make decision as to whether or not maintenance is needed.

Maintenance Decision Tree

The need for maintenance is typically based on results of the inspection. The following Maintenance Decision Tree should be used as a general guide. (Other factors, such as Regulatory Requirements, may need to be considered).

Please note Stormwater Management StormFilter devices installed downstream of, or integrated within, a stormwater storage facility typically have different operational parameters (i.e. draindown time). In these cases, the inspector must understand the relationship between the retention/detention facility and the treatment system by evaluating site specific civil engineering plans, or contacting the engineer of record, and make adjustments to the below guidance as necessary. Sediment deposition depths and patterns within the StormFilter are likely to be quite different compared to systems without upstream storage and therefore shouldn't be used exclusively to evaluate a need for maintenance.

1. Sediment loading on the vault floor.
   a. If >4" of accumulated sediment, maintenance is required.
2. Sediment loading on top of the cartridge.
   a. If >1/4" of accumulation, maintenance is required.
3. Submerged cartridges.
   a. If >4" of static water above cartridge bottom for more than 24 hours after end of rain event, maintenance is required. (Catch basins have standing water in the cartridge bay.)
4. Plugged media.
   a. While not required in all cases, inspection of the media within the cartridge may provide valuable additional information.
   b. If pore space between media granules is absent, maintenance is required.
5. Bypass condition.
   a. If inspection is conducted during an average rain fall event and StormFilter remains in bypass condition (water over the internal outlet baffle wall or submerged cartridges), maintenance is required.
6. Hazardous material release.
   a. If hazardous material release (automotive fluids or other) is reported, maintenance is required.
7. Pronounced scum line.
   a. If pronounced scum line (say ≥ 1/4" thick) is present above top cap, maintenance is required.

Maintenance

Depending on the configuration of the particular system, maintenance personnel will be required to enter the vault to perform the maintenance.

Important: If vault entry is required, OSHA rules for confined space entry must be followed.

Filter cartridge replacement should occur during dry weather. It may be necessary to plug the filter inlet pipe if base flows is occurring.

Replacement cartridges can be delivered to the site or customers facility. Information concerning how to obtain the replacement cartridges is available from Contech Engineered Solutions.

Warning: In the case of a spill, the maintenance personnel should abort maintenance activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct cartridge replacement and sediment removal maintenance:

1. If applicable, set up safety equipment to protect maintenance personnel and pedestrians from site hazards.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the doors (access portals) to the vault and allow the system to vent.
4. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
5. Make notes about the external and internal condition of the vault. Give particular attention to recording the level of sediment build-up on the floor of the vault, in the forebay, and on top of the internal components.
6. Using appropriate equipment offload the replacement cartridges (up to 150 lbs. each) and set aside.
7. Remove used cartridges from the vault using one of the following methods:

Method 1:

A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

   Using appropriate hoisting equipment, attach a cable from the boom, crane, or tripod to the loose cartridge. Contact Contech Engineered Solutions for suggested attachment devices.

B. Remove the used cartridges (up to 250 lbs. each) from the vault.

Important: Care must be used to avoid damaging the cartridges during removal and installation. The cost of repairing components damaged during maintenance will be the responsibility of the owner.

C. Set the used cartridge aside or load onto the hauling truck.

D. Continue steps a through c until all cartridges have been removed.

Method 2:

A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

B. Unscrew the cartridge cap.

C. Remove the cartridge hood and float.

D. At location under structure access, tip the cartridge on its side.

E. Empty the cartridge onto the vault floor. Reassemble the empty cartridge.

F. Set the empty, used cartridge aside or load onto the hauling truck.

G. Continue steps a through e until all cartridges have been removed.

8. Remove accumulated sediment from the floor of the vault and from the forebay. This can most effectively be accomplished by use of a vacuum truck.
9. Once the sediments are removed, assess the condition of the vault and the condition of the connectors.
10. Using the vacuum truck boom, crane, or tripod, lower and install the new cartridges. Once again, take care not to damage connections.
11. Close and fasten the door.
12. Remove safety equipment.
13. Finally, dispose of the accumulated materials in accordance with applicable regulations. Make arrangements to return the used **empty** cartridges to Contech Engineered Solutions.

Related Maintenance Activities - Performed on an as-needed basis

StormFilter units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the StormFilter to be successful, it is imperative that all other components be properly maintained. The maintenance/repair of upstream facilities should be carried out prior to StormFilter maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads.

Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Inspection Report

Date: ____________________ Personnel: ____________________

Location: ____________________ System Size: ____________________ Months in Service: ____________________

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other: __________

Sediment Thickness in Forebay: ____________________ Date: ____________________

Sediment Depth on Vault Floor: ____________________

Sediment Depth on Cartridge Top(s): ____________________

Structural Damage: ____________________

Estimated Flow from Drainage Pipes (if available): ____________________

Cartridges Submerged: Yes ☐ No ☐ Depth of Standing Water: ____________________

StormFilter Maintenance Activities (check off if done and give description)

☐ Trash and Debris Removal: ____________________

☐ Minor Structural Repairs: ____________________

☐ Drainage Area Report ____________________

Excessive Oil Loading: Yes ☐ No ☐ Source: ____________________

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: ____________________

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: ____________________

Items Needing Further Work: ____________________

Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals.

Other Comments:

____

____

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Review the condition reports from the previous inspection visits.

StormFilter Maintenance Report

Date: ____________________ Personnel: ____________________

Location: ____________________ System Size: ____________________

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other: __________

List Safety Procedures and Equipment Used: ____________________

____

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System Observations

Months in Service: ____________________

Oil in Forebay (if present): Yes ☐ No ☐

Sediment Depth in Forebay (if present): ____________________

Sediment Depth on Vault Floor: ____________________

Sediment Depth on Cartridge Top(s): ____________________

Structural Damage: ____________________

Drainage Area Report

Excessive Oil Loading: Yes ☐ No ☐ Source: ____________________

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: ____________________

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: ____________________

StormFilter Cartridge Replacement Maintenance Activities

Remove Trash and Debris: Yes ☐ No ☐ Details: ____________________

Replace Cartridges: Yes ☐ No ☐ Details: ____________________

Sediment Removed: Yes ☐ No ☐ Details: ____________________

Quantity of Sediment Removed (estimate?):

Minor Structural Repairs: Yes ☐ No ☐ Details: ____________________

Residuals (debris, sediment) Disposal Methods: ____________________

Notes:

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800-338-1122
www.ContechES.com

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other Contech division offerings, visit www.ContechES.com or call 800.338.1122.

Support

- Drawings and specifications are available at www.conteches.com.
- Site-specific design support is available from our engineers.

800.338.1122
www.conteches.com

Appendix E – Storm Drain System Drainage Areas and Erosion and Sediment Control Plans for Sequence of Construction

Existing Drainage Area Table	
Drainage Area	Area (acres)
Site D.1	6.27
Site D.5	0.40
Site D.4	0.69
Site D.3	2.95
Site D.2	3.30
Site B	88.28
Site C2.1	9.81
Site C2.2	0.19
Site C2.3	0.12
Site C2.4	0.73
Site C2.5	2.03

A1 C-601 DRAINAGE AREA MAP - EXISTING CONDITIONS
SCALE: 1" = 400'

400' 0' 400' 800'
SCALE: 1"=400'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

DRAINAGE AREA MAP - EXISTING CONDITIONS

Designed by: DC		Date: 2023-01-31	Rev.
Dwn by: CC	Ckd by: LC	M&N Project No. 11102-33	
Reviewed by: TJS		Drawing code:	
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)	

moffatt & nichol
180 WELLS AVENUE, SUITE 302
NEWTON, MA 02459
617-299-7330

NJEDA NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-601

A1 C-602 DRAINAGE AREA MAP - PROPOSED CONDITIONS
SCALE: 1" = 400'

DRAINAGE AREA TABLE	
PARCEL No.	AREA (AC)
B1	2.48
B2	2.48
B3	2.48
B4	1.82
B5	1.98
B6	1.98
B7	2.47
B8	2.49
B9	2.49
B10	2.49
B11	2.05
B12	1.99
B13	1.99
B14	2.65
B15	2.66
B16	2.65
B17	2.43
B18	2.12
B19	2.12
B20	2.47
B21	2.60
B22	2.58
B23	2.51
B24	2.47
B25	1.92
B26	1.89
B27	2.37
B28	1.44
B29	1.54
B30	0.88
B31	0.94
B32	2.33
B33	1.83

DRAINAGE AREA TABLE	
PARCEL No.	AREA (AC)
B34	2.11
B35	2.22
B36	2.46
B37	0.86
B38	1.55
B39	2.42
B40	2.40
B41	2.43
B42	1.92
B43	2.24
B44	1.98
B45	1.09
B46	0.29
B47	0.29
B48	0.26
B49	0.23
B50	0.31
B51	0.30
B52	0.30
B53	0.30
B54	0.31
B55	0.31
B56	0.31
B57	0.31
B58	0.31
B59A	0.87
B59B	0.91
B59C	1.77
B59D	1.14
B59E	1.22
B59F	1.28
B59G	1.28
B59H	0.27

DRAINAGE AREA TABLE	
PARCEL No.	AREA (AC)
B59I	0.15
B59J	0.10
B59K	0.15
B59L	0.24
B59M	0.18
B59N	0.12
B59O	0.18
B59P	0.24
B59Q	0.30
C60	1.19
C61	1.22
C62	2.09
C63	1.38
C64	0.69
C65	1.01
C66	1.38
C67	0.92
C68	1.42
C69	1.47
C70	1.61
D71	0.22
D72	0.24
D73	0.11
D74	0.23
D75	0.23
D76	0.23
D77	0.23
D78	0.23
D79	1.00
D80	0.24
D81	0.26
D82	0.26
D83	0.25

400' 0' 400' 800'
SCALE: 1"=400'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

Mark | Description | Date | Appr

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

DRAINAGE AREA MAP - PROPOSED CONDITIONS

Designed by: DC | Date: 2023-01-31 | Rev.
Drwn by: CC | Ckd by: LC | M&N Project No. 11102-33
Reviewed by: TJS | Drawing code:
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL | Drawing Scale: Plot scale: 1:1 (D SHEET)

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NJEDA NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-602
INDEX: 93 OF 119

File: Q:\BOS\Projects\11102-33 Sitewide Permit\20 CADD_Active_Site Wide Permit\11102-33-C-602 ; Plotted: 1/31/2023 6:53 PM by CASTILLO CRISTIAN ; Saved: 1/30/2023 3:19 PM by CCASTILLO

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

LEGEND

- MSE WALL
- SUPER SILT FENCE
- SCE
- LIMIT OF DISTURBANCE
- FP# INITIAL FILL WORKING POINT

160' 0' 160' 320'

SCALE: 1"=160'

A1 C-105 PLAN - PARCEL B1 - INITIAL FILL & ESC

SCALE: 1" = 160'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B1 - INITIAL FILL & ESC

Designed by: DC	Date: 2023-01-31	Rev.
Dwn by: CC / Ckd by: LC	M&N Project No. 11102-33	
Reviewed by: TJS	Drawing code:	
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL	Drawing Scale: Plot scale: 1:1 (D SHEET)	

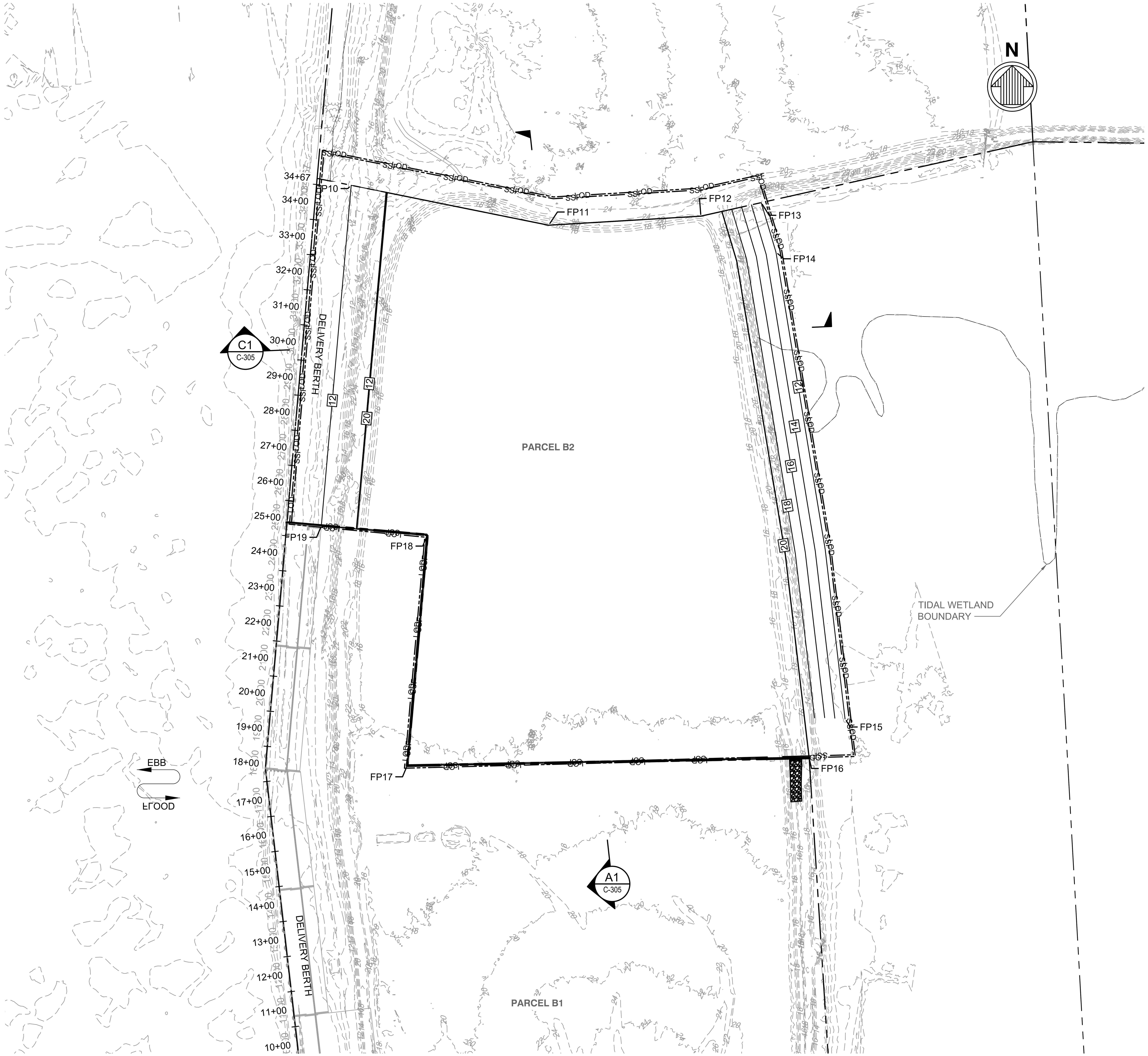
moffatt & nichol
180 WELLS AVENUE, SUITE 302
NEWTON, MA 02459
617-299-7330

NJEDA NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-105
INDEX: 14 OF 119

File: Q:\BOS\Projects\11102-33 Sitewide Permit\20 CADD_Active_Site Wide Permit\11102-33-C-105 ; Plotted: 1/31/2023 6:15 PM by CASTILLO, CRISTIAN ; Saved: 1/31/2023 10:14 AM by HRIDOUANE



LEGEND

- MSE WALL
- SSF — SUPER SILT FENCE
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- LOD — LIMIT OF DISTURBANCE
- FP# — INITIAL FILL WORKING POINT

160' 0' 160' 320'

SCALE: 1"=160'

A1 / C-110 PLAN - PARCEL B2 - INITIAL FILL & ESC
SCALE: 1" = 160'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B2 - INITIAL FILL & ESC

Designed by:	Date:	Rev.
DC	2023-01-31	
Dwn by: CC	Ckd by: LC	M&N Project No. 11102-33
Reviewed by: TJS		Drawing code:
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)

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NJEDA
NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-110
INDEX: 19 OF 119

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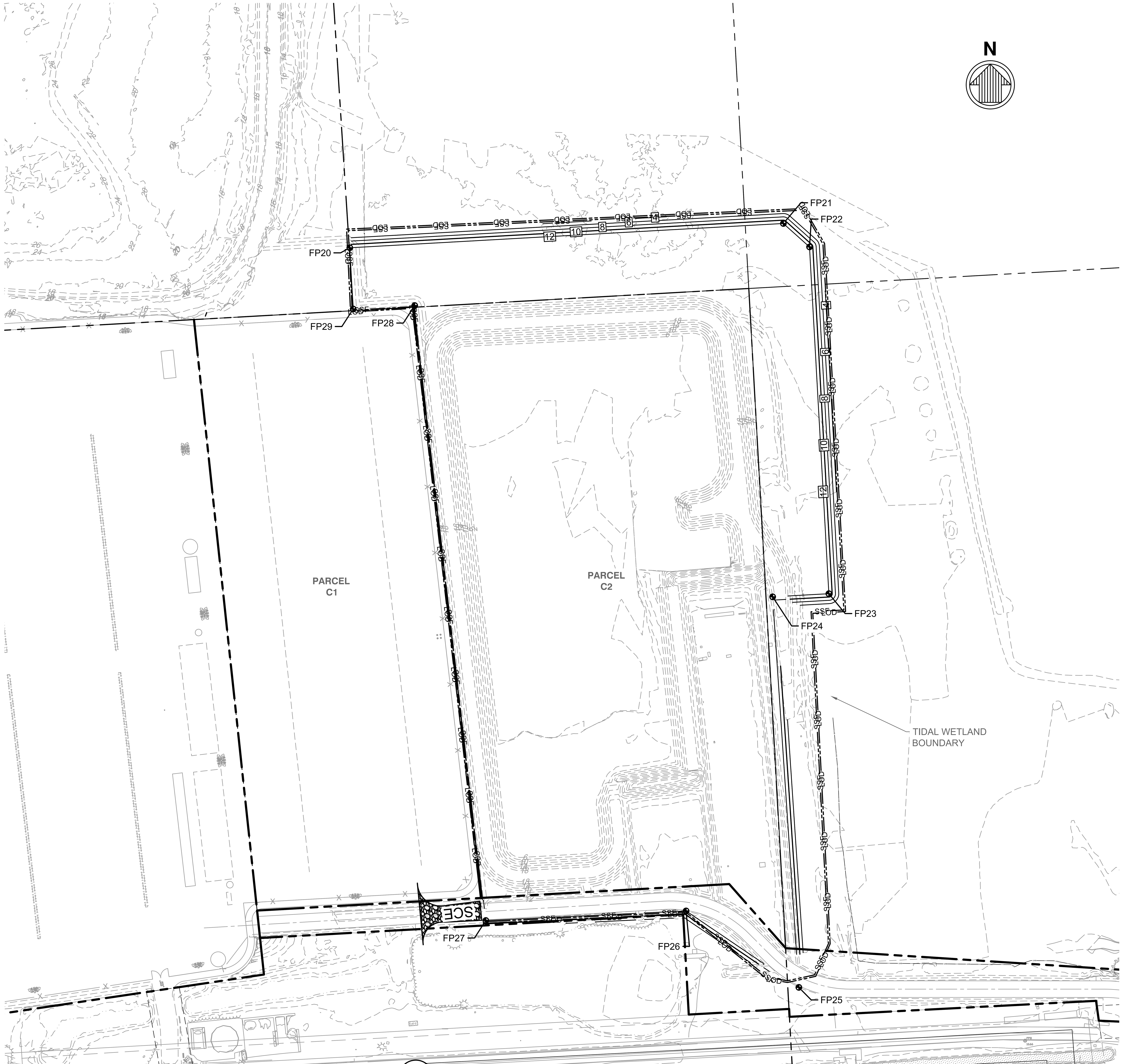

A1 C-115 PLAN - PARCEL C2 - INITIAL FILL & ESC
SCALE: 1" = 100'

LEGEND

- SSF — SUPER SILT FENCE
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- LOD — LIMIT OF DISTURBANCE
- FP# — INITIAL FILL WORKING POINT

INITIAL FILL WORKING POINT		
POINT #	NORTHING	EASTING
FP20	235473.79	199032.59
FP21	235517.79	199818.00
FP22	235475.38	199865.43
FP23	234847.57	199900.49
FP24	234841.88	199798.64
FP25	234134.79	199846.10
FP26	234273.26	199641.77
FP27	234255.91	199279.05
FP28	235369.20	199150.18
FP29	235362.97	199038.80

160' 0' 160' 320'
SCALE: 1"=160'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL C2 - INITIAL FILL & ESC

Rev.	
Date:	2023-01-31
M&N Project No.	11102-33
Drawing code:	
Drawing Scale:	
Plot scale:	1:1 (D SHEET)
Designed by:	DC
Dwn by:	CC
Ckd by:	LC
Reviewed by:	TJS
Submitted by:	SUBMITTER'S NAME MOFFATT & NICHOL

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NJEDA NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-115
INDEX: 24 OF 119

Mark | Description | Date | Appr

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CUMBERLAND SALEM CONSERVATION DISTRICT

1. ALL APPLICABLE EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE IN PLACE PRIOR TO ANY GRADING OPERATION AND / OR INSTALLATION OF PROPOSED STRUCTURES OR UTILITIES.
2. SOIL EROSION AND SEDIMENT CONTROL PRACTICES ON THIS PLAN SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY.
3. APPLICABLE EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE LEFT IN PLACE UNTIL CONSTRUCTION IS COMPLETE AND / OR THE AREA IS STABILIZED.
4. THE CONTRACTOR SHALL PERFORM ALL WORK, FURNISH ALL MATERIALS, AND INSTALL ALL MEASURES REQUIRED TO REASONABLY CONTROL SOIL EROSION RESULTING FROM CONSTRUCTION OPERATIONS AND PREVENT EXCESSIVE FLOW OF SEDIMENT FROM THE CONSTRUCTION SITE.
5. ANY DISTURBED AREA THAT IS TO BE LEFT EXPOSED FOR MORE THAN THIRTY (30) DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC SHALL IMMEDIATELY RECEIVE A TEMPORARY SEEDING AND FERTILIZATION IN ACCORDANCE WITH THE NEW JERSEY STANDARDS AND THEIR RATES SHOULD BE INCLUDED IN THE NARRATIVE. IF THE SEASON PROHIBITS TEMPORARY SEEDING, THE DISTURBED AREAS WILL BE MULCHED WITH SALT HAY OR EQUIVALENT AND ANCHORED IN ACCORDANCE WITH THE NEW JERSEY STANDARDS (I.E. PEG AND TWINE, MULCH NETTING OR LIQUID MULCH BINDER).
6. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO PROVIDE CONFIRMATION OF LIME, FERTILIZER AND SEED APPLICATION AND RATES OF APPLICATION AT THE REQUEST OF THE GLOUCESTER SOIL CONSERVATION DISTRICT.
7. ALL CRITICAL AREAS SUBJECT TO EROSION WILL RECEIVE A TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH AT A RATE OF 2 TONS PER ACRE, ACCORDING TO THE NEW JERSEY STANDARDS IMMEDIATELY FOLLOWING ROUGH GRADING.
8. THE SITE SHALL AT ALL TIMES BE GRADED AND MAINTAINED SUCH THAT ALL STORMWATER RUNOFF IS DIVERTED TO SOIL EROSION AND SEDIMENT CONTROL FACILITIES.
9. ALL SEDIMENTATION STRUCTURES WILL BE INSPECTED AND MAINTAINED ON A REGULAR BASIS AND AFTER EVERY STORM EVENT.
10. A CRUSHED STONE, TIRE CLEANING PAD WILL BE INSTALLED WHEREVER A CONSTRUCTION ACCESS EXISTS. THE STABILIZED PAD WILL BE INSTALLED ACCORDING TO THE STANDARD FOR STABILIZED CONSTRUCTION ACCESS.
11. ALL DRIVEWAYS MUST BE STABILIZED WITH 2 ½" CRUSHED STONE OR SUBBASE PRIOR TO INDIVIDUAL LOT CONSTRUCTION.
12. PAVED AREAS MUST BE KEPT CLEAN AT ALL TIMES.
13. ALL CATCH BASIN INLETS WILL BE PROTECTED ACCORDING TO THE CERTIFIED PLAN.
14. ALL STORM DRAINAGE OUTLETS WILL BE STABILIZED, AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME OPERATIONAL.
15. ALL DEWATERING OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT FILTER AREA. THE SEDIMENT FILTER SHOULD BE COMPOSED OF A SUITABLE SEDIMENT FILTER FABRIC, (SEE DETAILS). THE BASIN MUST BE DEWATERED TO NORMAL POOL WITHIN 10 DAYS OF THE DESIGN STORM.
16. NJSA 4:24-39, ET SEQ, REQUIRES THAT NO CERTIFICATE OF OCCUPANCY BE ISSUED BEFORE ALL PROVISIONS OF THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLAN HAVE BEEN COMPLIED WITH FOR PERMANENT MEASURES. ALL SITE WORK FOR THE PROJECT MUST BE COMPLETED PRIOR TO THE DISTRICT ISSUING A REPORT OF COMPLIANCE AS A PREREQUISITE TO THE ISSUANCE OF A CERTICATE OF OCCUPANCY BY THE MUNICIPALITY.
17. MULCHING IS REQUIRED ON ALL SEEDED AREAS TO INSURE AGAINST EROSION BEFORE GRASS IS ESTABLISHED TO PROMOTE EARLIER VEGETATION COVER.
18. OFFSITE SEDIMENT DISTURBANCE MAY REQUIRE ADDITIONAL CONTROL MEASURES TO BE DETERMINED BY THE EROSION CONTROL INSPECTOR.
19. A COPY OF THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLAN MUST BE MAINTAINED ON THE PROJECT SITE DURING CONSTRUCTION.
20. THE GLOUCESTER SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY LAND DISTURBANCE.
21. ANY CONVEYANCE OF THIS PROJECT PRIOR TO ITS COMPLETION WILL TRANSFER FULL RESPONSIBILITY FOR COMPLIANCE WITH THE CERTIFIED PLAN TO ANY SUBSEQUENT OWNERS.
22. IMMEDIATELY AFTER THE COMPLETION OF STRIPPING AND STOCKPILING OF TOPSOIL, THE STOCKPILE MUST BE STABILIZED ACCORDING TO THE STANDARD FOR TEMPORARY VEGETATIVE COVER. STABILIZE TOPSOIL STOCKPILE WITH STRAW MULCH FOR PROTECTION IF THE SEASON DOES NOT PERMIT THE APPLICATION AND ESTABLISHMENT OF TEMPORARY SEEDING. ALL SOIL STOCKPILES ARE NOT TO BE LOCATED WITHIN FIFTY (50) FEET OF A FLOODPLAIN, SLOPE, ROADWAY OR DRAINAGE FACILITY AND THE BASE MUST BE PROTECTED WITH A SEDIMENT BARRIER.
23. ANY CHANGES TO THE SITE PLAN WILL REQUIRE THE SUBMISSION OF A REVISED SOIL EROSION AND SEDIMENT CONTROL PLAN TO THE GLOUCESTER SOIL CONSERVATION DISTRICT. THE REVISED PLAN MUST BE IN ACCORDANCE WITH THE CURRENT NEW JERSEY STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL.
24. METHODS FOR THE MANAGEMENT OF HIGH ACID PRODUCING SOILS SHALL BE IN ACCORDANCE WITH THE STANDARDS. HIGH ACID PRODUCING SOILS ARE THOSE FOUND TO CONTAIN IRON SULFIDES OR HAVE A PH OF 4 OR LESS.
25. TEMPORARY AND PERMANENT SEEDING MEASURES MUST BE APPLIED ACCORDING TO THE NEW JERSEY STANDARDS AND MULCHED WITH SALT HAY OR EQUIVALENT AND ANCHORED IN ACCORDANCE WITH THE NEW JERSEY STANDARDS (I.E. PEG AND TWINE, MULCH NETTING OR LIQUID MULCH BINDER).
26. MAXIMUM SIDE SLOPES OF ALL EXPOSED SURFACES SHALL NOT BE CONSTRUCTED STEEPER THAN 3:1 UNLESS OTHERWISE APPROVED BY THE DISTRICT.
27. DUST IS TO BE CONTROLLED BY AN APPROVED METHOD ACCORDING TO THE NEW JERSEY. STANDARDS AND MAY INCLUDE WATERING WITH A SOLUTION OF CALCIUM CHLORIDE AND WATER.
28. ADJOINING PROPERTIES SHALL BE PROTECTED FROM EXCAVATION AND FILLING OPERATIONS ON THE PROPOSED SITES.
29. USE STAGED CONSTRUCTION METHODS TO MINIMIZE EXPOSED SURFACES, WHERE APPLICABLE.
30. ALL VEGETATIVE MATERIAL SHALL BE SELECTED IN ACCORDANCE WITH AMERICAN STANDARDS FOR NURSERY STOCK OF THE AMERICAN ASSOCIATION OF THE NURSERYMAN AND IN ACCORDANCE WITH THE NEW JERSEY STANDARDS.
31. NATURAL VEGETATION AND SPECIES SHALL BE RETAINED WHERE SPECIFIC ON THE LANDSCAPING PLAN.
32. THE SOIL EROSION INSPECTOR MAY REQUIRE ADDITIONAL SOIL EROSION MEASURES TO BE INSTALLED, AS DIRECTED BY THE DISTRICT INSPECTOR.

CONSTRUCTION SEQUENCE

EXACT TIMING FOR DEVELOPMENT OF THIS PROJECT IS NOT KNOWN AT THIS TIME. HOWEVER, IT IS ANTICIPATED THAT CONSTRUCTION WILL COMMENCE IN Q1 2024 AND WILL PROCEED IMMEDIATELY AND CONTINUOUSLY ONCE THE REQUIRED APPROVALS ARE SECURED. AFTER NOTIFYING THE SOIL CONSERVATION DISTRICT IN WRITING, 72 HOURS IN ADVANCE, ITEMS AND DURATION OF CONSTRUCTION WILL OCCUR APPROXIMATELY AS FOLLOWS:

PHASE	DURATION
1. TEMPORARY SOIL EROSION FACILITIES	IMMEDIATELY
2. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE	IMMEDIATELY
3. INSTALL SILT FENCE	IMMEDIATELY
4. SITE PREPARATION ACTIVITIES	1 MONTH
5. INITIAL SITE GRADING	1 MONTH
6. INSTALL WICK DRAINS	6 MONTHS
7. CONSTRUCT SURCHARGE	2.5 MONTHS
8. MONITOR SURCHARGE	5 MONTHS
9. REMOVE SURCHARGE	1.5 MONTHS
10. INSTALL STORM DRAINS AND UTILITIES	4 MONTHS
11. CONSTRUCT GRADED AGGREGATE PAVEMENT	2 MONTHS
12. REMOVE APPROPRIATE ESC	0.5 MONTHS

DUST CONTROL NOTE

TO CONTROL DUST FROM EXPOSED SOIL SURFACES, REDUCE ON- AND OFF-SITE DAMAGE AND HEALTH HAZARDS, AND IMPROVE TRAFFIC SAFETY, THE SITE SHALL BE SPRINKLED UNTIL THE SURFACE IS WET.

SEEDING SCHEDULE

TEMPORARY SEEDING SHALL CONSIST OF SPRING OATS APPLIED AT A RATE OF 2.0 LBS PER 1,000 S.F. OR GRAIN RYE APPLIED AT A RATE OF 2.4 LBS PER 1,000 S.F. TEMPORARY SEEDING TO BE MAINTAINED UNTIL DISTURBED AREAS ARE PERMANENTLY STABILIZED WITH PERMANENT SEEDING. IF ANY SERIOUS EROSION PROBLEMS OCCUR, THE ERODED AREAS SHALL BE REPAIRED AND STABILIZED WITH A MULCH AS INDICATED IN NOTE 6.

13. PERMANENT SEEDING SHALL CONSIST OF MIXTURE NO. 15 AS SPECIFIED IN THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY OR APPROVED EQUAL - OPTIMUM SEEDING DATES ARE BETWEEN FEBRUARY 15 TO APRIL 30 OR AUGUST 15 TO NOVEMBER 15.
    - HARD FESCUE @ 2.7#/1,000 S.F.
    - PERENNIAL RYEGRASS @ 0.7#/1,000 S.F.
    - KENTUCKY BLUEGRASS (BLEND) @ 0.9#/1,000 S.F.
14. BASIN SEEDING SHALL CONSIST OF MIXTURE NO. 11 AS SPECIFIED IN THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY OR APPROVED EQUAL - OPTIMUM SEEDING DATES ARE BETWEEN FEBRUARY 1 TO APRIL 30:
    - DEEPTONGUE @ 0.45 LBS/1,000 S.F.
    - REDTOP @ 0.05 LBS/1,000 S.F.
    - WILD RYE @ 0.35 LBS/1,000 S.F.
    - SWITCHGRASS @0.60 LBS/1,000 S.F.
15. PERMANENT SEEDING TO BE APPLIED BY HYDROSEEDING AT A RATE OF 1500 LBS. PER ACRE, SLOPED AREAS TO BE COVERED WITH MULCH AS INDICATED IN NOTE 6.
16. FERTILIZER FOR THE ESTABLISHMENT OF TEMPORARY AND PERMANENT VEGETATIVE COVER SHALL BE 10-20-20 APPLIED AT A RATE OF 11 LBS PER 1,000 S.F. OR AS DETERMINED BY SOIL TEST. LIMESTONE FOR TEMPORARY SEEDING SHALL BE APPLIED AT A RATE OF 90 LBS PER 1,000 S.F. LIMESTONE FOR PERMANENT SEEDING SHALL BE APPLIED AT A RATE OF 135 LBS. PER 1,000 S.F.
17. IF SEASON PREVENTS THE ESTABLISHMENT OF A TEMPORARY OR PERMANENT SEEDING, EXPOSED AREAS TO BE STABILIZED WITH MULCH AS INDICATED IN NOTE 6.
18. MULCH TO CONSIST OF SMALL GRAIN STRAW OR SALT HAY ANCHORED WITH A WOOD AND FIBER MULCH BINDER OR AN APPROVED EQUAL.
19. IF SEASON PREVENTS THE ESTABLISHMENT OF TEMPORARY OR PERMANENT SEEDING, EXPOSED AREA TO BE STABILIZED WITH MULCH AS INDICATED INTO NOTE 6.
20. ALL SEEDED AREAS SHALL BE MULCHED. MULCH SHALL CONSIST OF SMALL GRAIN STRAW OR SALT HAY ANCHORED WITH A WOOD AND FIBER MULCH BINDER, LIQUID MULCH BINDER OR AN APPROVED EQUAL AT A RATE OF 70-90 LBS PER 1,000 S.F.

STABILIZATION WITH MULCH ONLY STANDARDS

STABILIZING EXPOSED SOILS WITH NON-VEGETATIVE MATERIALS.

SITE PREPARATION

GRADE AS NEEDED AND FEASIBLE TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCHING ANCHORING. ALL GRADING SHOULD BE DONE IN ACCORDANCE WITH STANDARDS FOR LAND GRADING, PG. 19-1.

INSTALL NEEDED EROSION CONTROL PRACTICES OR FACILITIES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, SILT SOCKS, CHANNEL STABILIZATION MEASURES, SEDIMENT BASINS, AND WATERWAYS. SEE STANDARDS 11 THROUGH 42.

PROTECTIVE MATERIAL

UNROTTED SMALL-GRAIN STRAW, OR SALT HAY AT 2.0 TO 2.5 TONS PER ACRE IS SPREAD UNIFORMLY AT 90 TO 115 POUNDS PER 1,000 SQUARE FOOT AND ANCHORED WITH A MULCH ANCHORING TOOL, LIQUID MULCH BINDERS, OR NETTING TIE DOWN. OTHER SUITABLE MATERIALS MAY BE USED IF APPROVED BY THE SOIL CONSERVATION DISTRICT.

ASPHALT EMULSION IS RECOMMENDED AT THE RATE OF 600 TO 1,200 GALLONS PER ACRE. THIS IS SUITABLE FOR A LIMITED PERIOD OF TIME WHERE TRAVEL BY PEOPLE, ANIMALS, OR MACHINES IS NOT A PROBLEM.

SYNTHETIC OR ORGANIC SOIL STABILIZERS MAY BE USED UNDER SUITABLE CONDITIONS AND IN QUANTITIES AS RECOMMENDED BY THE MANUFACTURER.

WOOD-FIBER OR PAPER-FIBER MULCH AT THE RATE OF 1,500 POUNDS PER ACRE (OR ACCORDING TO THE MANUFACTURER'S REQUIREMENTS) MAY BE APPLIED BY A HYDROSEEDER.

MULCH NETTING, SUCH AS PAPER JUTE, EXCELSIOR, COTTON, OR PLASTIC, MAY BE USED.

WOODCHIPS APPLIED UNIFORMLY TO A MINIMUM DEPTH OF 2 INCHES MAY BE USED. WOODCHIPS WILL NOT BE USED ON AREAS WHERE FLOWING WATER COULD WASH THEM INTO AN INLET AND PLUG IT.

GRAVEL, CRUSHED STONE, OR SLAG AT THE RATE OF 9 CUBIC YARDS PER 1,000 SQ. FT. APPLIED UNIFORMLY TO A MINIMUM DEPTH OF 3 INCHES MAY BE USED. SIZE 2 OR 3 (ASTM C33) IS RECOMMENDED.

MULCH ANCHORING - SHOULD BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT OF HAY OR STRAW MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS, DEPENDING UPON THE SIZE OF THE AREA AND STEEPNESS OF SLOPES.

PEG AND TWINE - DRIVE 8 TO 10 INCH WOODEN PEGS TO WITHIN 2 TO 3 INCHES OF THE SOIL SURFACE EVERY 4 FEET IN ALL DIRECTIONS. STAKES MAY BE DRIVEN BEFORE OR AFTER APPLYING MULCH. SECURE MULCH TO SOIL SURFACE BY STRETCHING TWINE BETWEEN PEGS IN A CRISSCROSS AND A SQUARE PATTERN. SECURE TWINE AROUND EACH PEG WITH TWO OR MORE ROUND TURNS.

MULCH NETTINGS - STAPLE PAPER, COTTON OR PLASTIC NETTING OVER MULCH. USE A DEGRADABLE NETTING IN AREAS TO BE MOWED. NETTING IS USUALLY AVAILABLE IN ROLLS 4 FEET WIDE WITH TWO OR MORE ROUND TURNS.

CRIMPER MULCH ANCHORING COULTER TOOL - A TRACTOR-DRAWN IMPLEMENT ESPECIALLY DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE. THIS PRACTICE AFFORDS MAXIMUM EROSION CONTROL, BUT ITS USE IS LIMITED TO THOSE SLOPES UPON WHICH THE TRACTOR CAN OPERATE SAFELY. SOIL PENETRATION SHOULD BE ABOUT 3 TO 4 INCHES ON SLOPING LAND. THE OPERATION SHOULD BE ON THE CONTOUR.

LIQUID MULCH-BINDERS

APPLICATIONS SHOULD BE HEAVIER AT EDGES WHERE WIND CATCHES THE MULCH, IN VALLEYS, AND AT CRESTS OF BANKS. REMAINDER OF AREA SHOULD BE UNIFORM IN APPEARANCE.

USE ONE OF THE FOLLOWING:

A. EMULSIFIED ASPHALT - (SS-1, CSS-1, CMS-2, MS-2, RS-1, RS-2, CRS-1 AND CRS-2). APPLY 0.04 GAL./SQ./YD. OR 194 GAL./ACRE ON FLAT AREAS AND ON SLOPES LESS THAN 8 FEET OR MORE HIGH, USE 0.075 GAL./SQ./YD. OR 363 GAL./ACRE. THESE MATERIALS MAY BE DIFFICULT TO APPLY UNIFORMLY AND WILL DISCOLOR SURFACES.
B. ORGANIC AND VEGETABLE BASED BINDERS - NATURALLY OCCURRING, POWDER BASED HYDROPHILIC MATERIALS THAT MIXED WITH WATER FORMULATES A GEL AND WHEN APPLIED TO MULCH UNDER SATISFACTORY CURING CONDITIONS WILL FORM MEMBRANE NETWORKS OF INSOLUBLE POLYMERS. THE VEGETABLE GEL SHALL BE PHYSIOLOGICALLY HARMLESS AND NOT RESULT IN A PHYTOTOXIC EFFECT OR IMPEDE GROWTH OF TURFGRASS. VEGETABLE BASED GELS SHALL BE APPLIED AT RATES AND WEATHER CONDITIONS RECOMMENDED BY THE MANUFACTURER.
C. SYNTHETIC BINDERS - HIGH POLYMER SYNTHETIC EMULSION, MISCIBLE WITH WATER WHEN DILUTED AND FOLLOWING APPLICATION TO MUCH, DRYING AND CURING SHALL NO LONGER BE SOLUBLE OR DISPERSIBLE IN WATER. IT SHALL BE APPLIED AT RATES AND WEATHER CONDITIONS RECOMMENDED BY THE MANUFACTURER AND REMAIN TACKY UNTIL GERMINATION OF GRASS.

SITE STABILIZATION

AREA SHALL BE STABILIZED WITH EITHER ASPHALT PAVEMENT OR GRADED AGGREGATE PAVEMENT AFTER SURCHARGE IS REMOVED AND UTILITIES ARE INSTALLED.

SITE INFORMATION

LIMIT OF DISTURBANCE: PARCEL B1 ± 66.5 AC, PARCEL B2 ± 43.0 AC, PARCEL C2 ± 14.4 AC, PARCEL D ± 4.0 AC, PARCEL E ± 51.2 AC

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

EROSION & SEDIMENT CONTROL DETAILS (1 OF 3)

moffatt & nichol
180 WELLS AVENUE, SUITE 302
NEWTON, MA 02459
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NJEDA · NEW JERSEY WIND PORT

Designed by: DC	Date: 2023-01-31	Rev:
Drwn by: CC	Chkd by: LC	M&N Project No. 11102-33
Reviewed by: TJS		Drawing code:
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL		Drawing Scale: / Plot scale: 1:1 (D SHEET)

SEAL

Sheet Reference No.
CE-501
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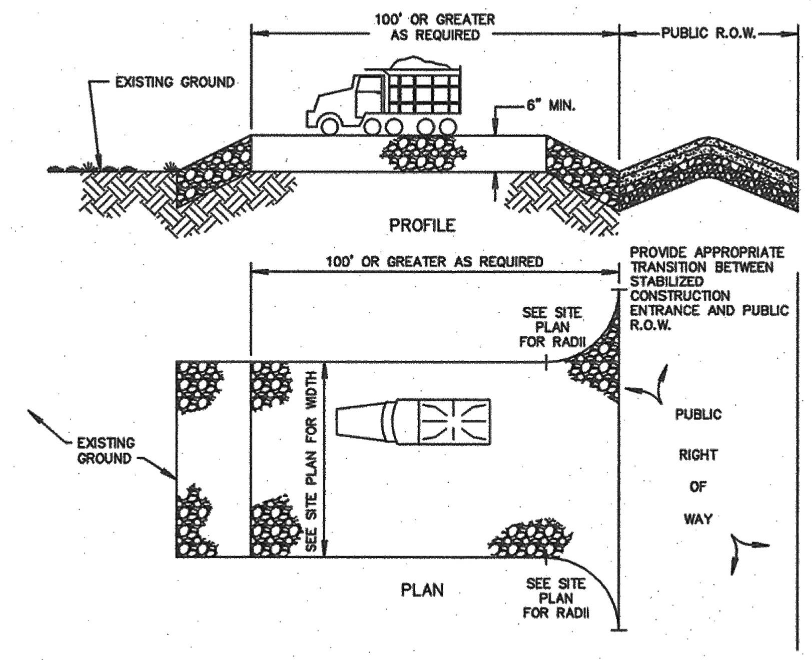


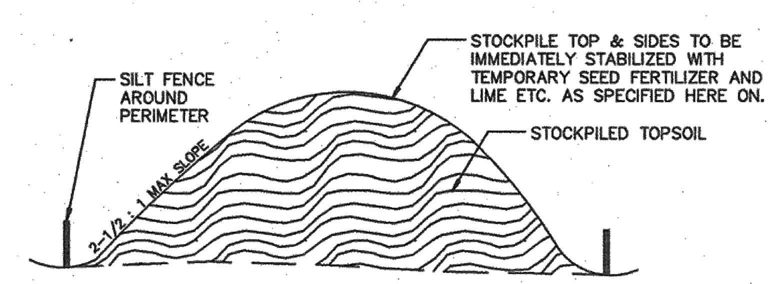
NOTES:
1. ENTIRE SURFACE WILL BE STABILIZED WITH FABC BASE COURSE AS PRESCRIBED BY LOCAL ORDINANCE OR OTHER GOVERNING AUTHORITY. THE PERCENT OF SLOPE ROADWAY WILL BE LESS THAN 5%.
2. 1"–2 1/2" CLEAN CRUSHED STONE SHALL BE USED.

MAINTENANCE:
THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO ROADWAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO ROADWAYS (PUBLIC OR PRIVATE) OR OTHER IMPERVIOUS SURFACE MUST BE REMOVED IMMEDIATELY.

WHERE ACCUMULATION OF DUST/SEDIMENT IS INADEQUATELY CLEANED OR REMOVED BY CONVENTIONAL METHODS, A POWER BROOM OR STREET SWEEPER WILL BE REQUIRED TO CLEAN PAVED OR IMPERVIOUS SURFACED. ALL OTHER ACCESS POINTS WHICH ARE NOT STABILIZED SHALL BE BLOCKED OFF.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



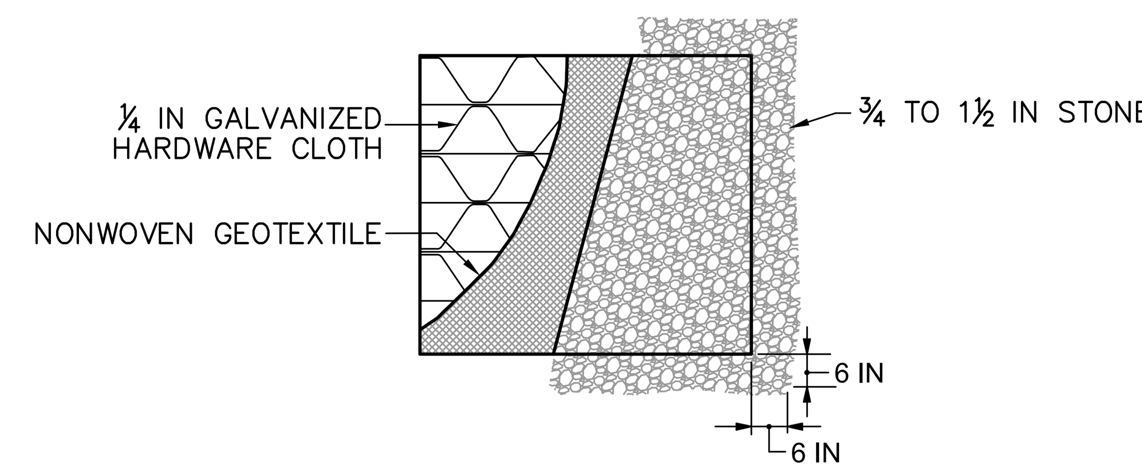
STOCKPILE AREA

NOT TO SCALE

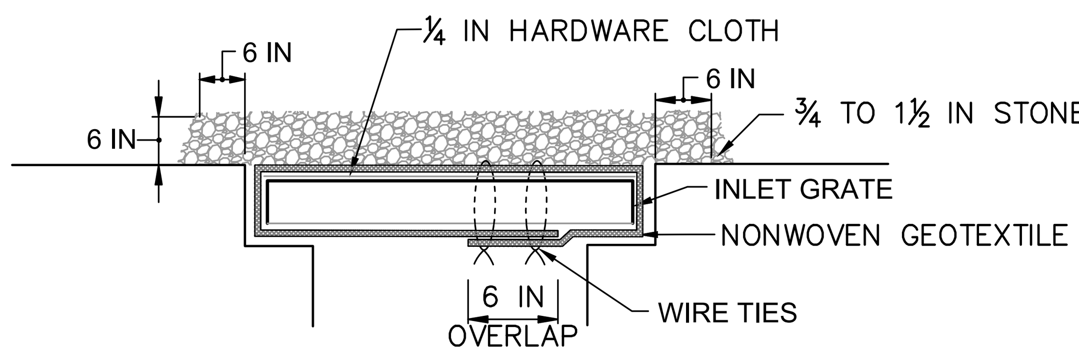
DETAIL E-9-2 AT-GRADE INLET PROTECTION

STANDARD SYMBOL AGIP

MAXIMUM DRAINAGE AREA = 1 ACRE



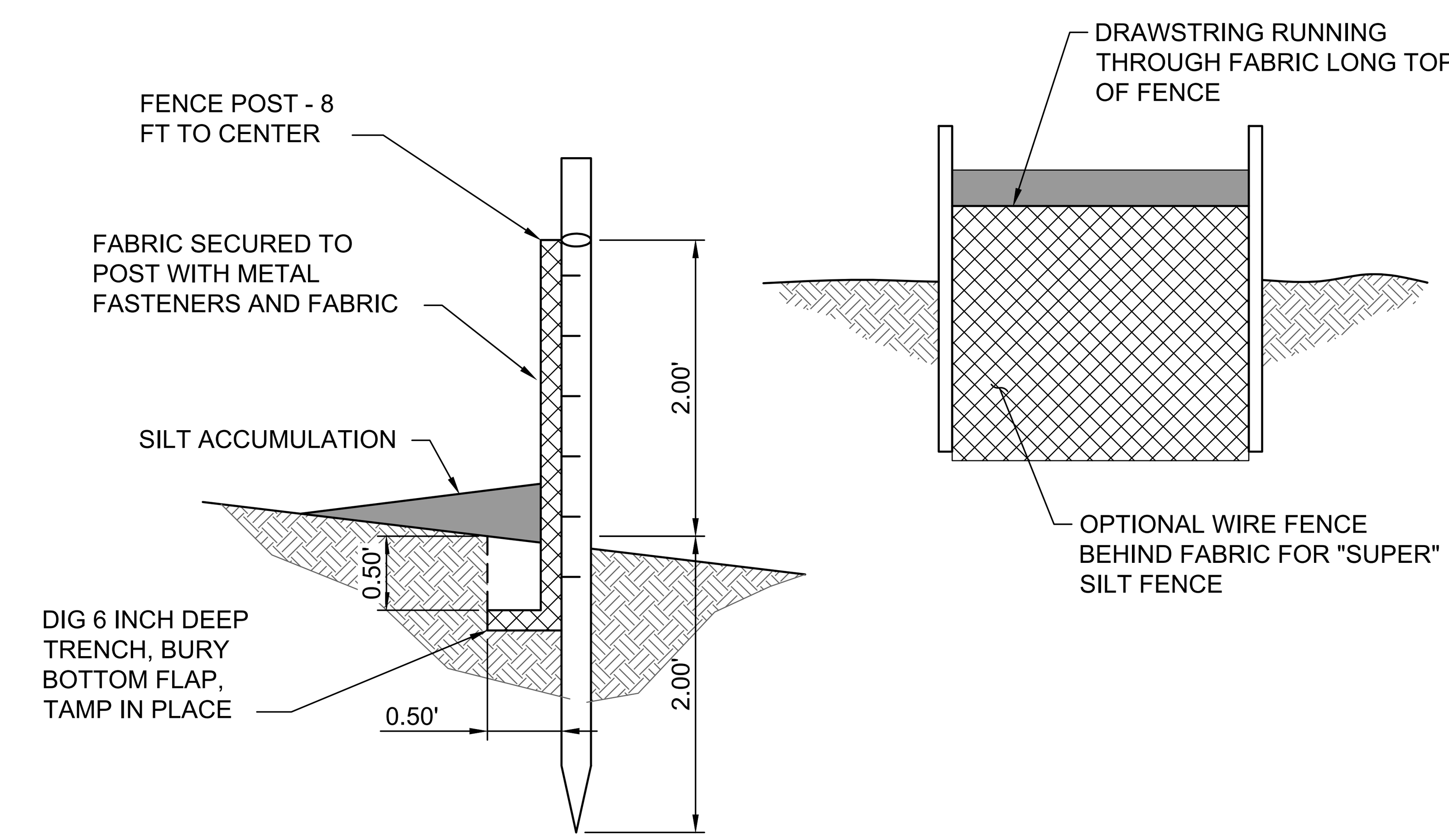
PLAN / CUT AWAY VIEW



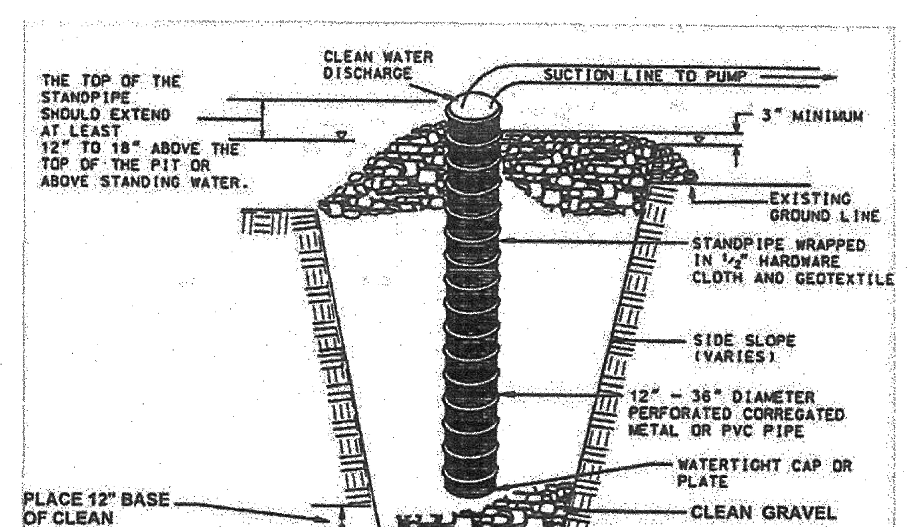
CROSS SECTION

CONSTRUCTION SPECIFICATIONS

1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.



SILT FENCE CONSTRUCTION AND INSTALLATION DETAIL



CROSS SECTION

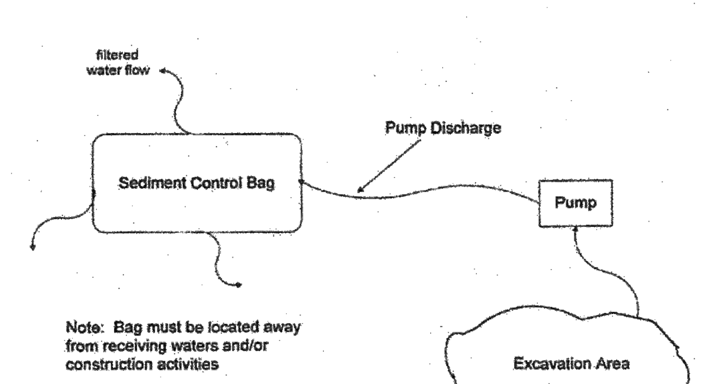
Construction Specifications

1. Pit dimensions are variable, with the minimum diameter being 2 times the standpipe diameter.

2. The standpipe should be constructed by perforating a 12" to 24" diameter corrugated or PVC pipe. Then wrapping with ½" hardware cloth and Geotextile fabric. The perforations shall be ½" x 6" slits or 1" diameter holes.

3. A base of filter material consisting of clean gravel or ASTM C 33 stone should be placed in the pit to a depth of 12". After installing the standpipe, the pit surrounding the standpipe should then be backfilled with the same filter material.

4. The standpipe should extend 12" to 18" above the lip of the pit or the riser crest elevation (basin dewatering only) and the filter material should extend 3" minimum above the anticipated standing water elevation.



Note: Bag must be located away from receiving waters and/or construction activities

Bags must be disposed of according to manufacturer's instructions. Bags may not be reused.

NOTES:
1. FOR SMALL QUANTITIES OF PONDED WATER SUCH AS MAY BE FOUND IN SHALLOW EXCAVATIONS (SMALL TRENCHES, MANHOLE INSTALLATIONS, ETC.) A SEDIMENT FILTER MAY BE CONSTRUCTED USING COMBINATIONS OF HAY BALES, SMALL CLEAN STONE AND FILTER FABRIC. THIS METHOD IS LIMITED TO SMALL QUANTITIES OF TRAPPED SURFACE WATER (PUMPING OF WELL POINTS IS EXCLUDED FROM THIS STANDARD) AND WHERE SEDIMENTS ARE NOT HIGHLY COLLOIDAL IN NATURE.

SITE DEWATERING DETAIL AND SUMP PIT

NOT TO SCALE

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

Mark	Description	Date	Appr

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

EROSION & SEDIMENT CONTROL NOTES AND DETAILS (2 OF 3)

Designed by: DC		Date: 2023-01-31	Rev.
Dwn by: CC	Ckd by: LC	M&N Project No. 11102-33	
Reviewed by: TJS		Drawing code:	
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)	

moffatt & nichol
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617-299-7330

NJEDA NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
CE-502
INDEX: 95 OF 119

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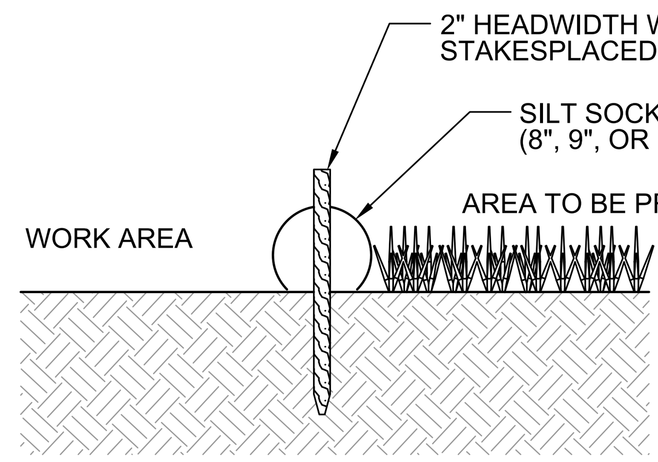
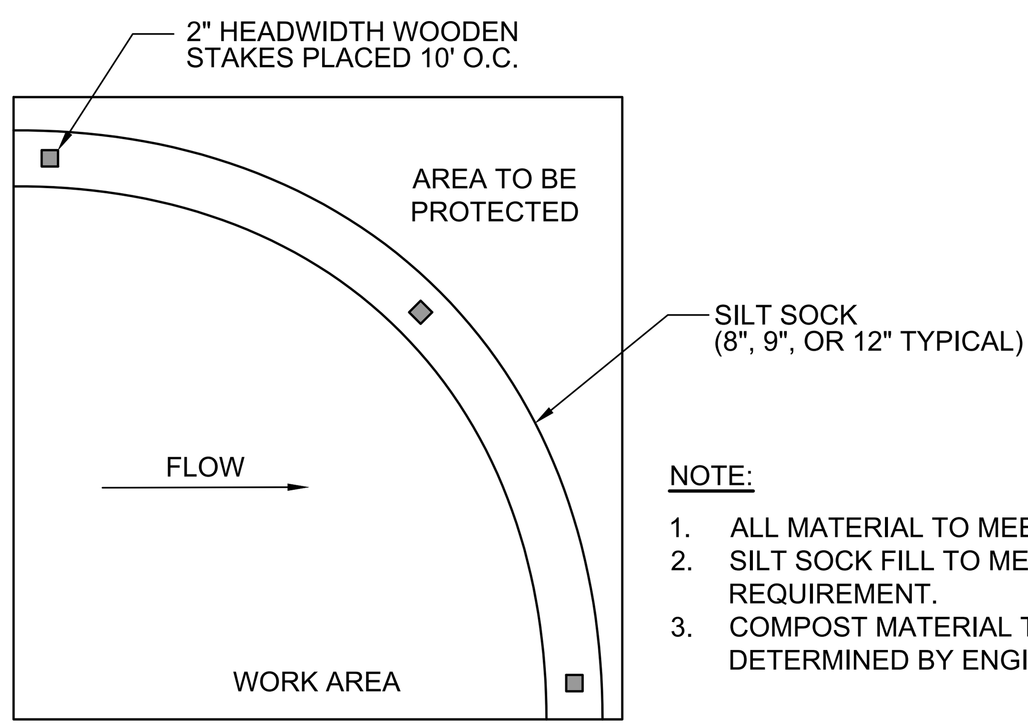
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

SILT SOCK



SECTION VIEW

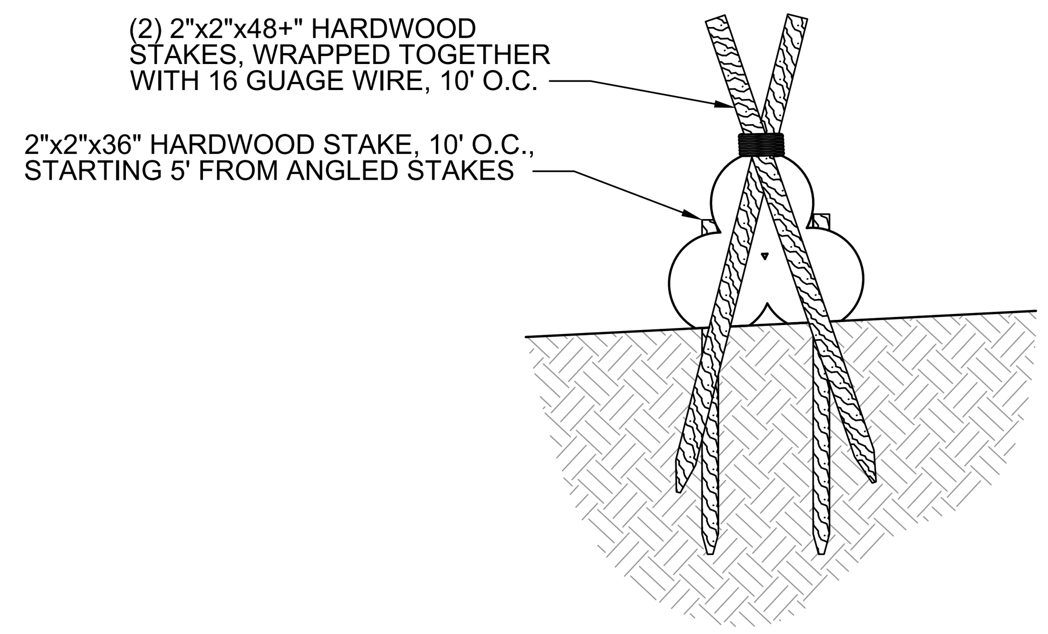


TOP VIEW

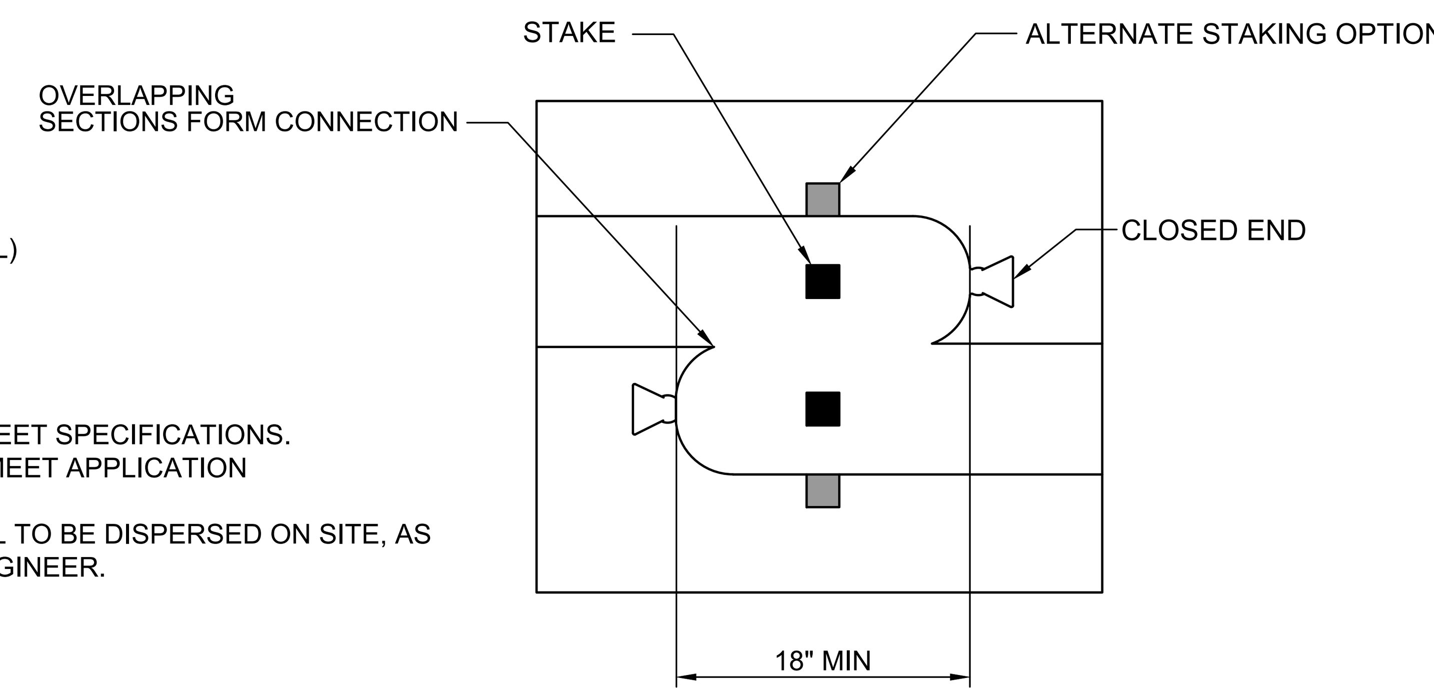
NOTE:

1. ALL MATERIAL TO MEET SPECIFICATIONS.
2. SILT SOCK FILL TO MEET APPLICATION REQUIREMENT.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

PYRAMID STAKING DETAIL

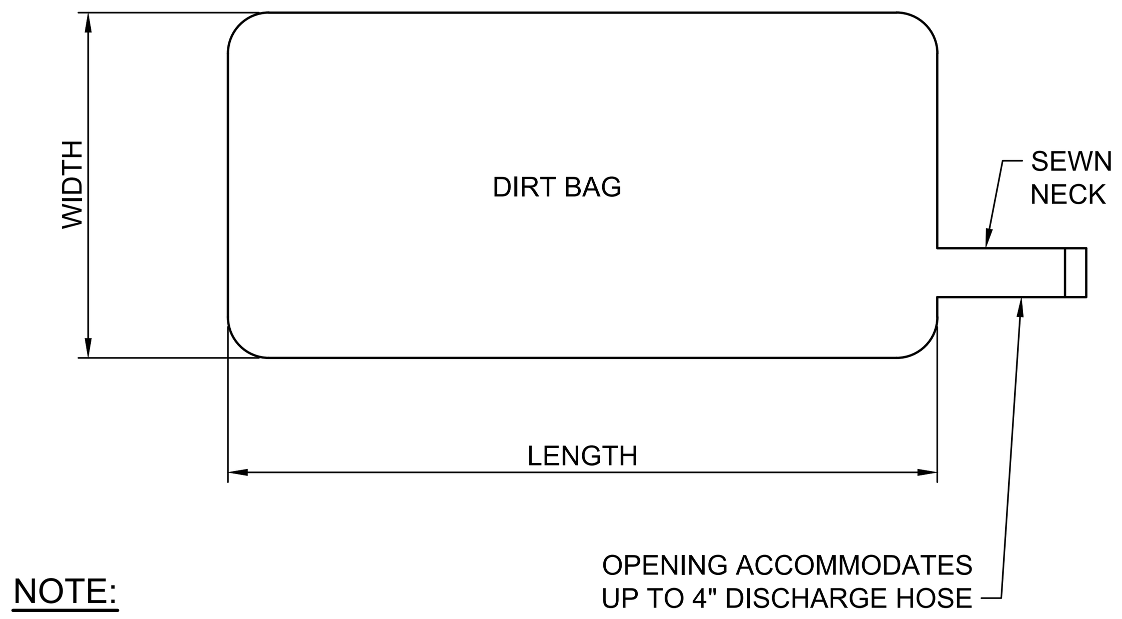


COMPOST SOCK CONNECTION/ATTACHMENT DETAIL



C1 CE-503 DETAILS - SILT SOCK LAYOUT ASSEMBLY
SCALE: 1" = 1'

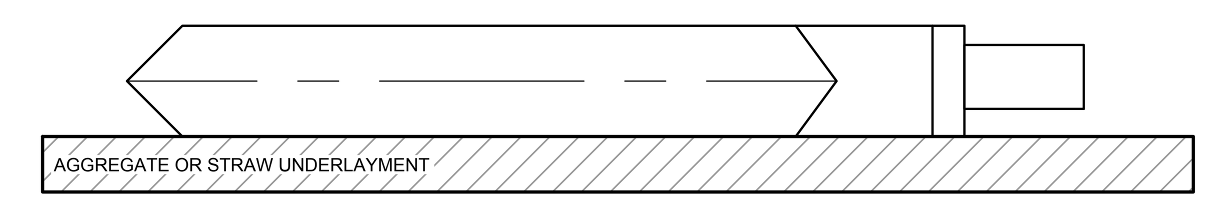
TOP VIEW



NOTE:

1. DIRTBAG TO BE PLACED ON AGGREGATE OR STRAW.
2. SEAMS MUST BE HIGH STRENGTH DOUBLE STITCHED "J" SEAMS.
3. SEAM MUST BE TESTED UNDER ASTM D-4884. ACF TEST RESULTS AVAILABLE UPON REQUEST.

CROSS SECTION



DB55 FABRIC PROPERTIES		
PROPERTY	TEST METHOD	MARV
TENSILE STRENGTH	ASTM D-4632	205 LBS
ELONGATION	ASTM D-4632	50%
CBR PUNCTURE	ASTM D-6241	525 LBS
UV RESISTANCE	ASTM D-4355	70%
AOS	ASTM D-4751	80 US SIEVE
PERMITTIVITY	ASTM D-4491	1.4 SEC-1
FLOW RATE	ASTM D-4491	90 GPM/SF

C4 CE-503 DETAIL - DIRT BAG
SCALE: 1" = 1'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

EROSION & SEDIMENT CONTROL NOTES AND DETAILS (3 OF 3)

Rev. | Date: 2023-01-31 | M&N Project No. 11102-33 | Drawing code: | Drawing Scale: 1:1 (D SHEET) | Plot scale:
Designed by: DC | Dwn by: CC | Ckd by: LC | Reviewed by: TJS | Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL

moffatt & nichol
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617-299-7330

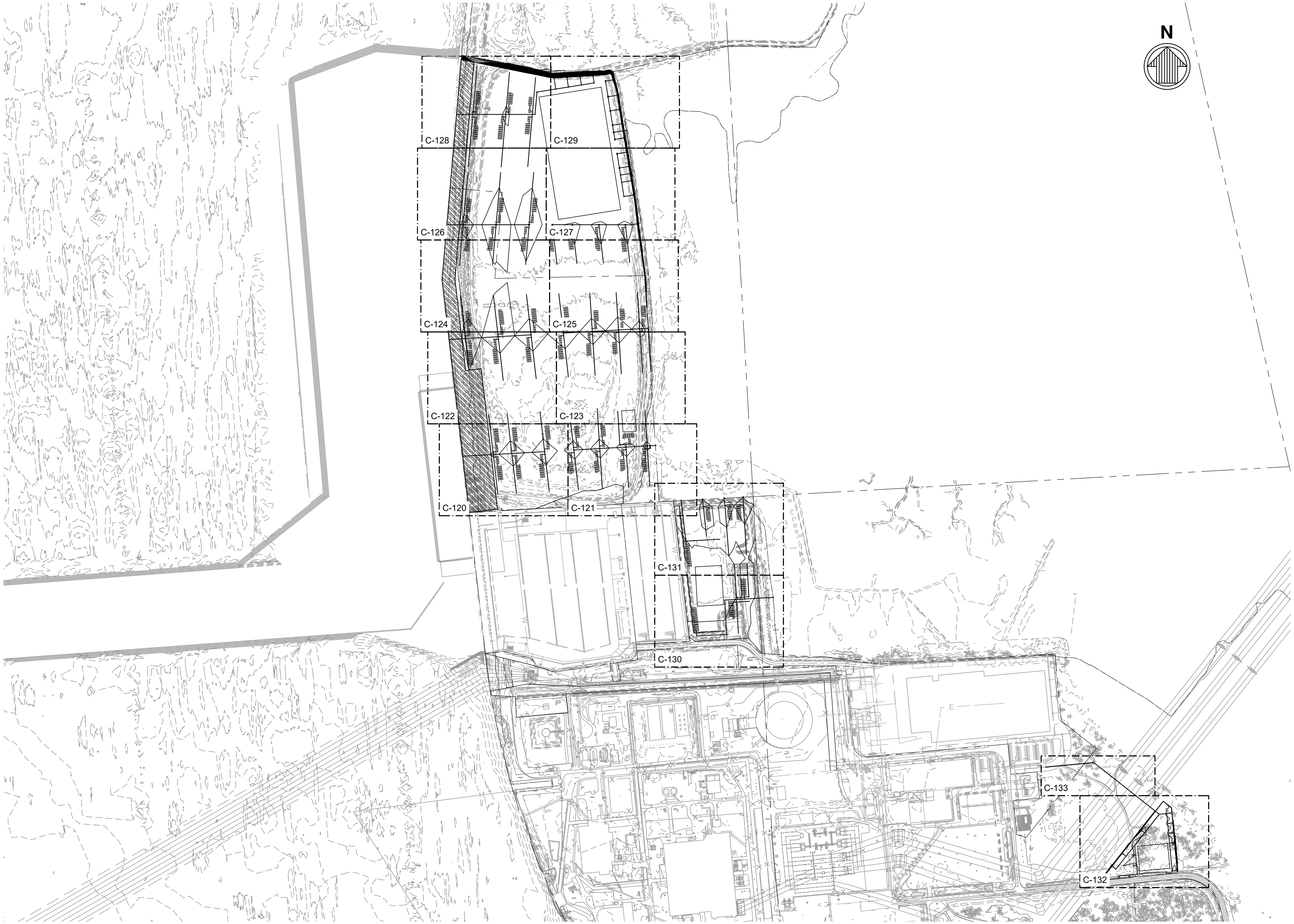
NJEDA NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
CE-503
INDEX: 96 OF 119

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Appendix F – Final Storm Drainage Site Layout



NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

A1 / C-119 PLAN - GRADING & DRAINAGE
SCALE: 1" = 400'

400' 0' 400' 800'
SCALE: 1"=400'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - GRADING & DRAINAGE

Designed by: DC		Date: 2023-01-31	Rev.
Dwn by: CC	Ckd by: LC	M&N Project No. 11102-33	
Reviewed by: TJS		Drawing code:	
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)	

moffatt & nichol
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NJEDA
NEW JERSEY WIND PORT

Mark	Description	Date	Appr

SEAL

Sheet Reference No.
C-119
INDEX: 28 OF 119

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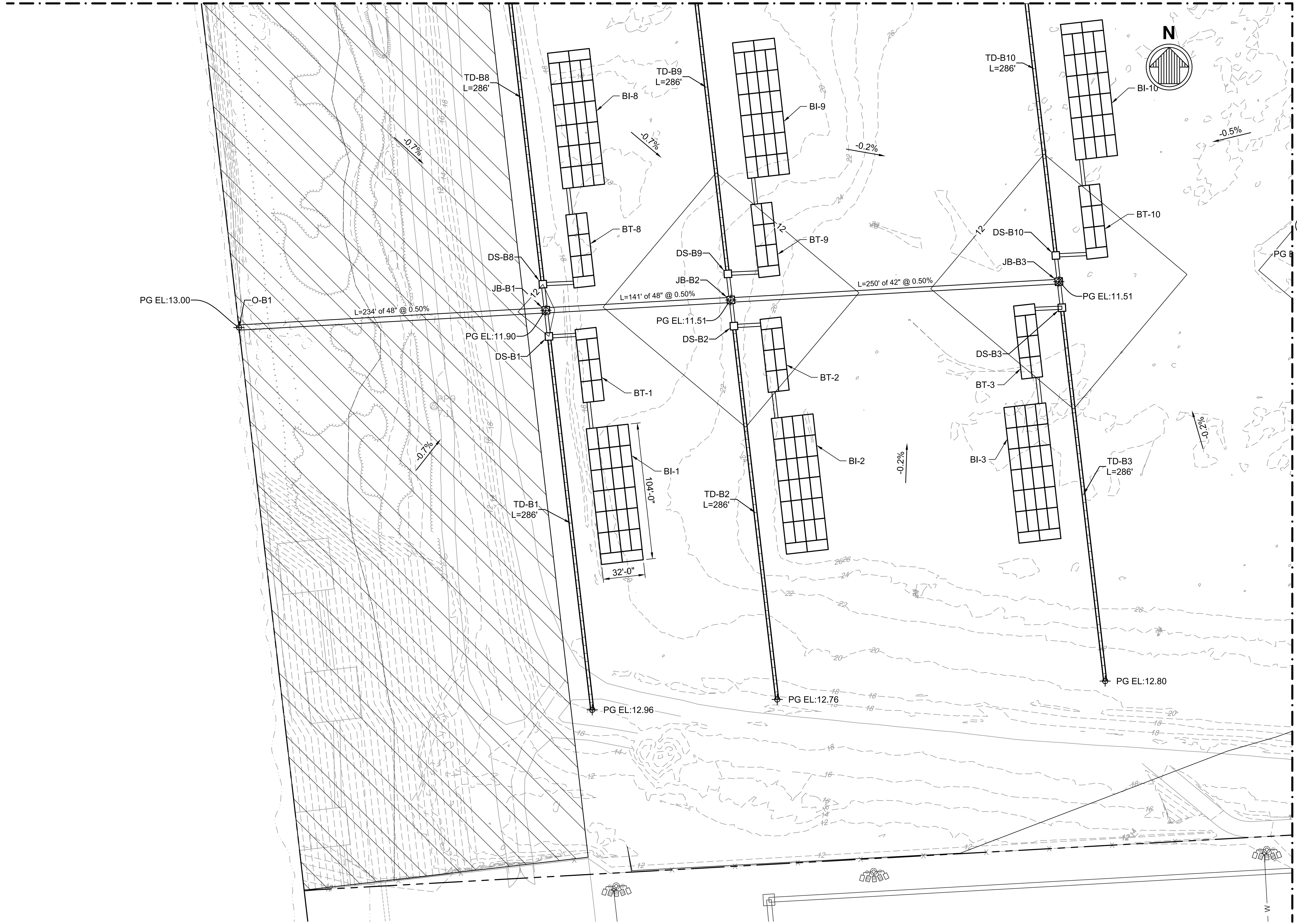
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MATCH LINE - SEE SHEET C-122



MATCH LINE - SEE SHEET C-121

A1
C-120

PLAN - PARCEL B1 - GRADING & DRAINAGE (1 OF 14)

SCALE: 1" = 40'

NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

F #	STRUCTURE TYPE / STRUCTURE NUMBER
DS	DIVERSION STRUCTURE
TD	TRENCH DRAIN
F	FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT	PARCEL ID TREATMENT STRUCTURE
BI	PARCEL ID INFILTRATION STORAGE CHAMBER

KEY PLAN

SCALE 1" = 2000'

40' 0' 40' 80'

SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

Mark	Description	Date	Appr

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B1 - GRADING & DRAINAGE (1 OF 14)

Designed by: DC		Date: 2023-01-31	Rev.
Dwn by: CC	Ckd by: LC	M&N Project No. 11102-33	
Reviewed by: TJS		Drawing code:	
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)	

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NJEDA NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-120
INDEX: 29 OF 119

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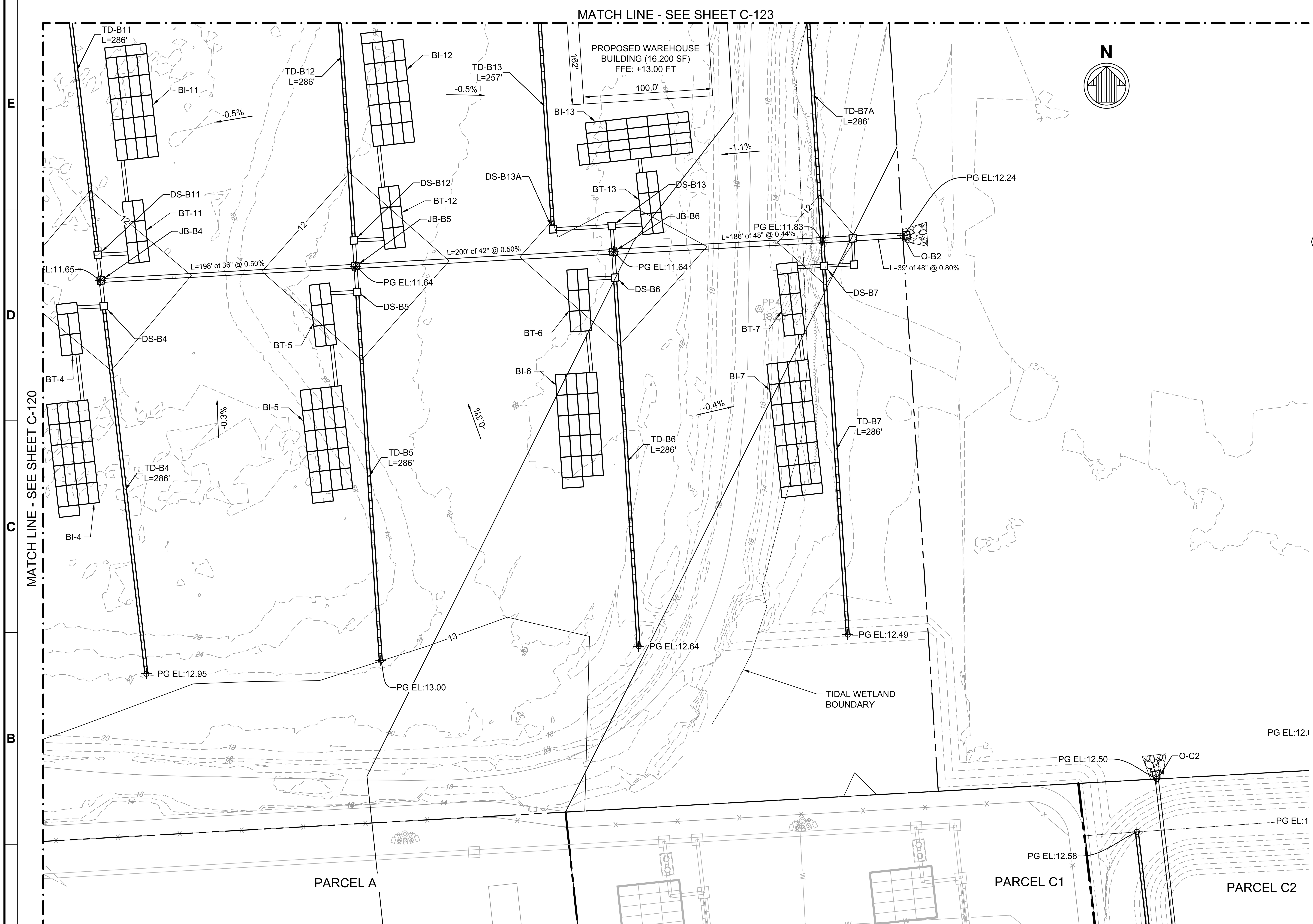
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



A1 C-121 PLAN - PARCEL B1 - GRADING & DRAINAGE (2 OF 14)
SCALE: 1" = 40'

NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

F #	STRUCTURE TYPE / STRUCTURE NUMBER
DS	DIVERSION STRUCTURE
TD	TRENCH DRAIN
F	FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT	PARCEL ID TREATMENT STRUCTURE
BI	PARCEL ID INFILTRATION STORAGE CHAMBER

KEY PLAN
SCALE 1" = 2000'

40' 0' 40' 80'
SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B1 - GRADING & DRAINAGE (2 OF 14)

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NJEDA NEW JERSEY WIND PORT

Designed by: DC | Dwn by: CC | Ckd by: LC | Reviewed by: TJS | Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL
Date: 2023-01-31 | M&N Project No. 11102-33 | Drawing code: | Drawing Scale: | Plot scale: 1:1 (D SHEET) | Rev.

SEAL

Sheet Reference No.
C-121
INDEX: 30 OF 119

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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

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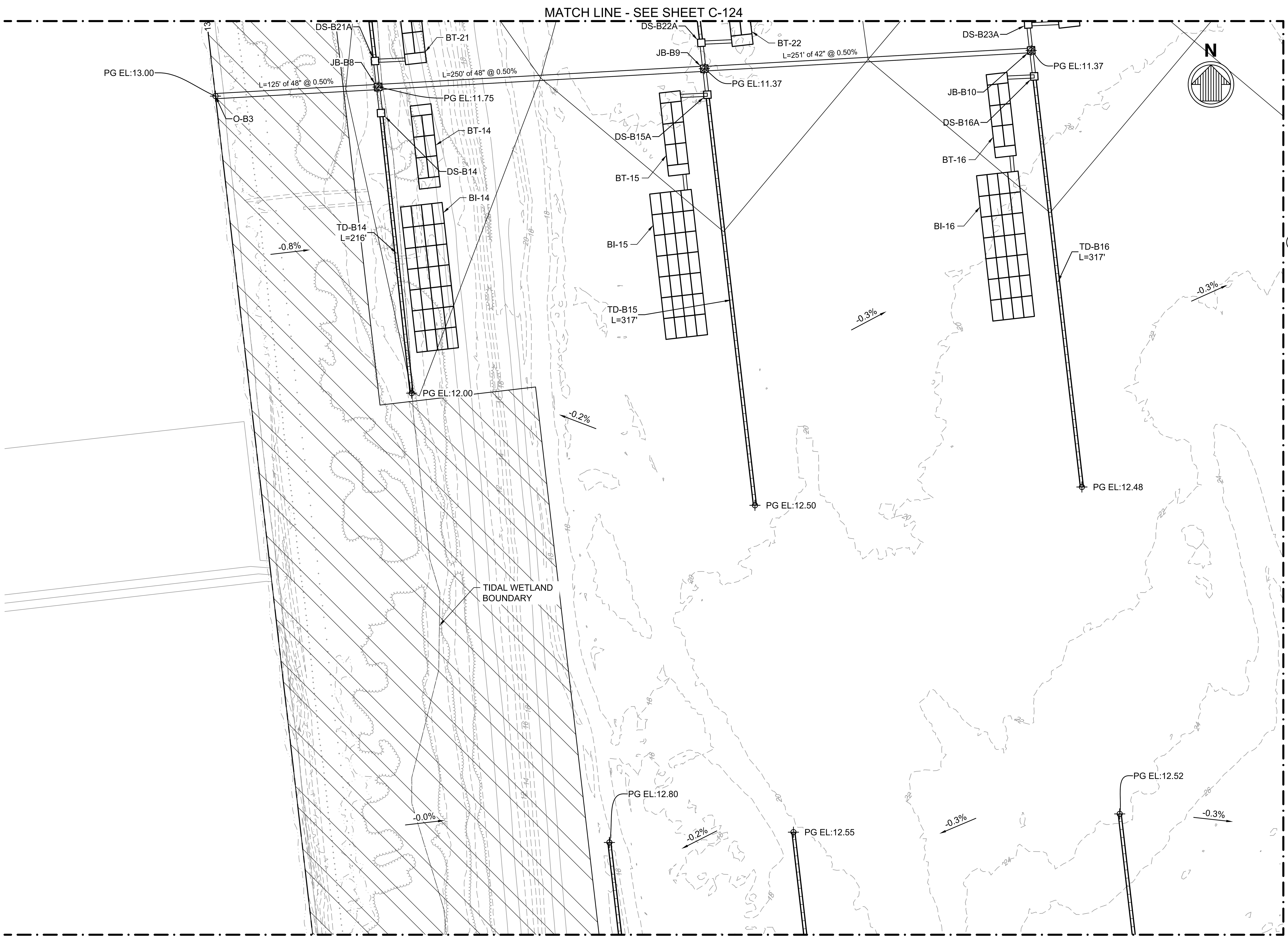

MATCH LINE - SEE SHEET C-123

MATCH LINE - SEE SHEET C-120

A1 C-122 PLAN - PARCEL B1 - GRADING & DRAINAGE (3 OF 14)

SCALE: 1" = 40'

NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

F # — STRUCTURE TYPE / STRUCTURE NUMBER

DS	DIVERSION STRUCTURE
TD	TRENCH DRAIN
F	FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT	PARCEL ID TREATMENT STRUCTURE
BI	PARCEL ID INFILTRATION STORAGE CHAMBER

KEY PLAN

SCALE 1" = 2000'

40' 0' 40' 80'

SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

Mark | Description | Date | Appr

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B1 - GRADING & DRAINAGE (3 OF 14)

Date: 2023-01-31 | Rev.
M&N Project No.: 11102-33
Drawing code:
Drawing Scale: Plot scale: 1:1 (D SHEET)
Designed by: DC
Dwn by: CC | Ckd by: LC
Reviewed by: TJS
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL

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NJEDA
NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-122
INDEX: 31 OF 119

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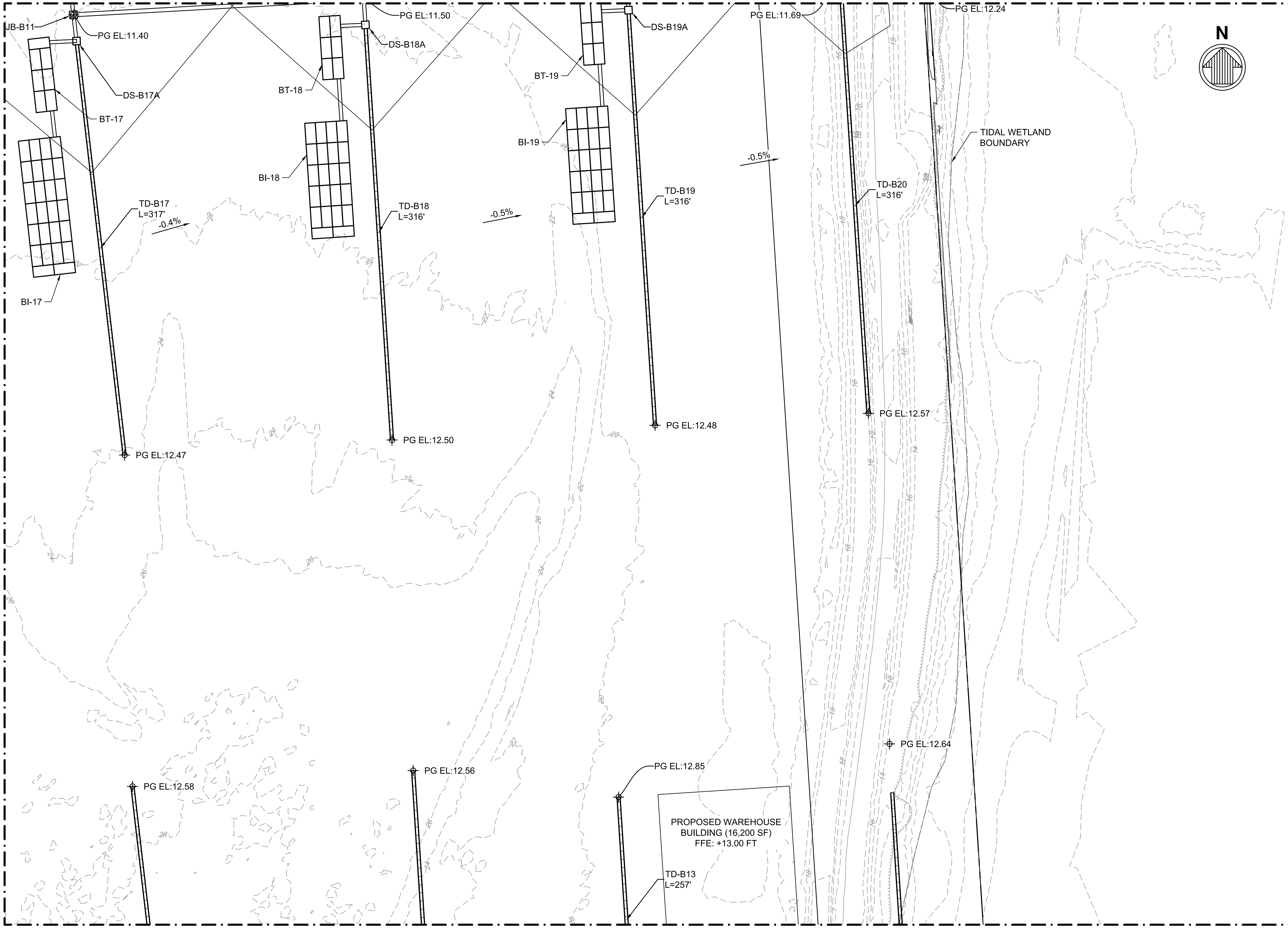
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MATCH LINE - SEE SHEET C-125



MATCH LINE - SEE SHEET C-122

MATCH LINE - SEE SHEET C-121

A1 C-123 PLAN - PARCEL B1 - GRADING & DRAINAGE (4 OF 14)

SCALE: 1" = 40'

NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

F # — STRUCTURE TYPE / STRUCTURE NUMBER

DS	DIVERSION STRUCTURE
TD	TRENCH DRAIN
F	FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT	PARCEL ID TREATMENT STRUCTURE
BI	PARCEL ID INFILTRATION STORAGE CHAMBER

KEY PLAN

SCALE 1" = 2000'

40' 0' 40' 80'

SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B1 - GRADING & DRAINAGE (4 OF 14)

Designed by: DC | Dwn by: CC | Ckd by: LC | Reviewed by: TJS | Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL

Date: 2023-01-31 | M&N Project No. 11102-33 | Drawing code: | Drawing Scale: | Plot scale: 1:1 (D SHEET) | Rev.

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NJEDA
NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-123
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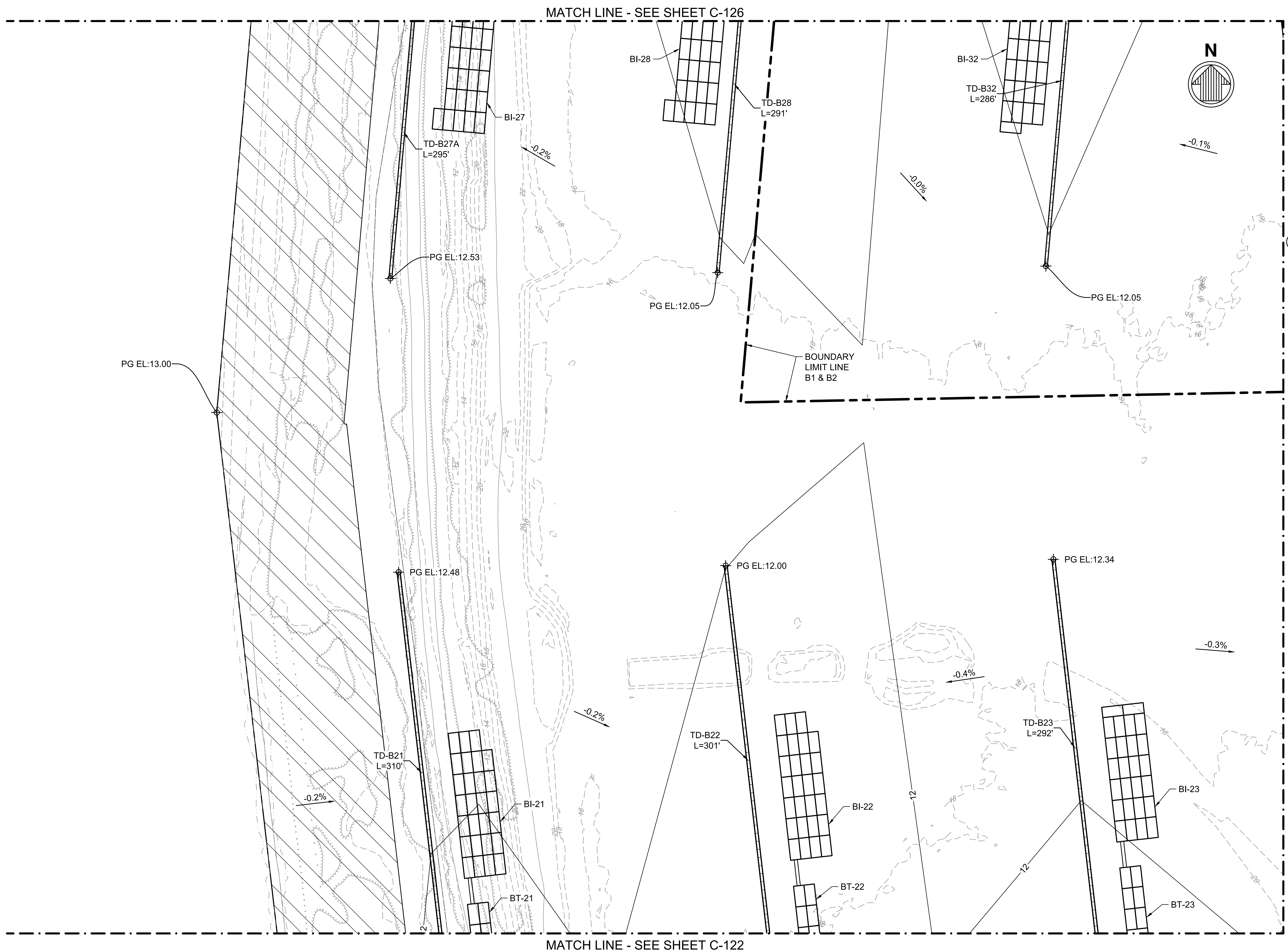

A1 C-124 PLAN - PARCEL B1 - GRADING & DRAINAGE (5 OF 14)
SCALE: 1" = 40'

NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

- STRUCTURE TYPE
- STRUCTURE NUMBER

DS	DIVERSION STRUCTURE
TD	TRENCH DRAIN
F	FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT	PARCEL ID TREATMENT STRUCTURE
BI	PARCEL ID INFILTRATION STORAGE CHAMBER

KEY PLAN
SCALE 1" = 2000'

40' 0' 40' 80'
SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B1 - GRADING & DRAINAGE (5 OF 14)

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617-299-7330

NJEDA NEW JERSEY WIND PORT

Designed by: DC	Date: 2023-01-31
Dwn by: CC	Ckd by: LC
M&N Project No. 11102-33	Rev.
Reviewed by: TJS	Drawing code:
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL	Drawing Scale: Plot scale: 1:1 (D SHEET)

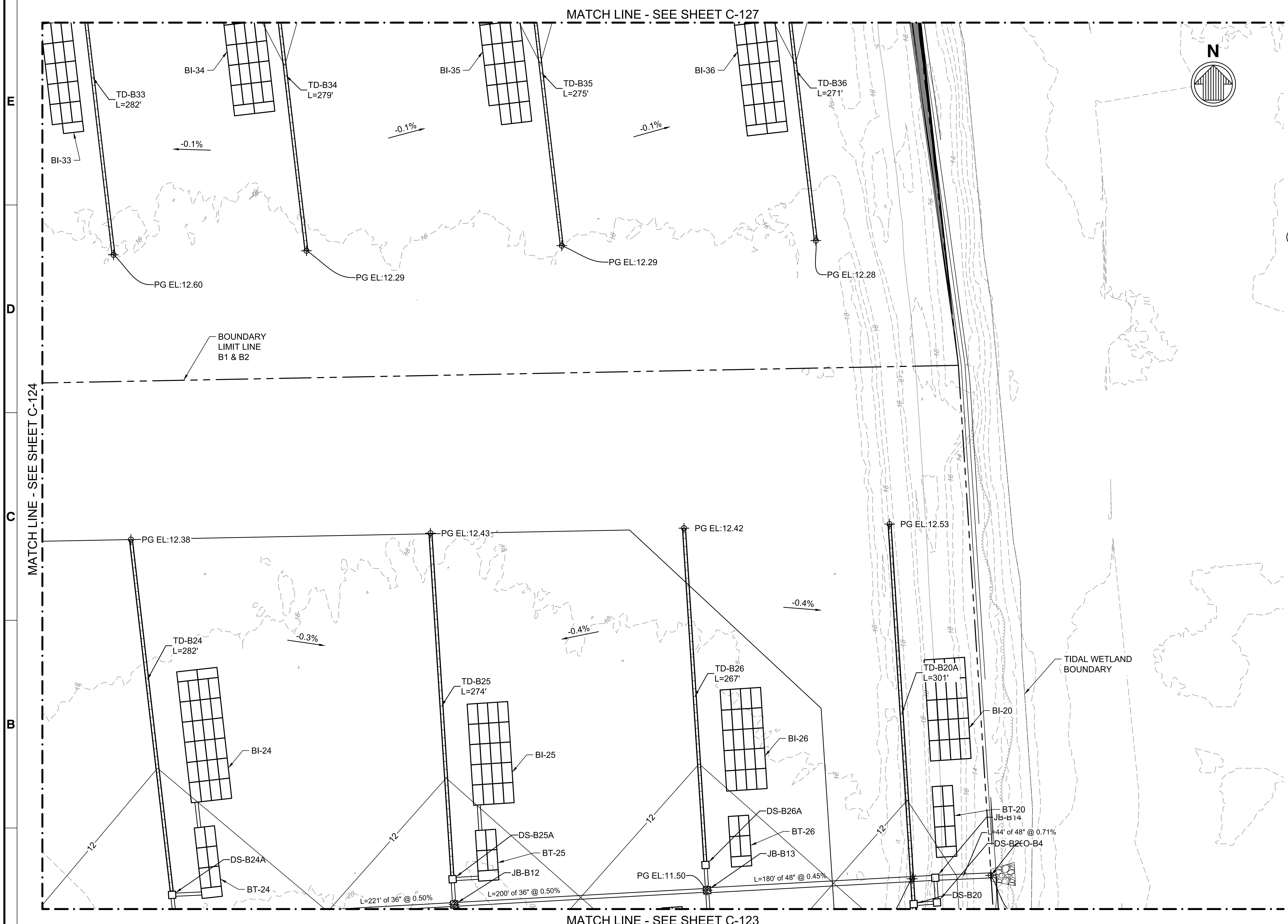
Mark	Description	Date	Appr

SEAL

Sheet Reference No.
C-124
INDEX: 33 OF 119

File: Q:\BOS\Projects\11102-33 Sitewide Permit\20 CADD_Active_Site Wide Permit\11102-33-C-124 ; Plotted: 1/31/2023 5:45 PM by CASTILLO, CRISTIAN ; Saved: 1/31/2023 3:21 PM by CCASTILLO

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



A1 C-125 PLAN - PARCEL B1 - GRADING & DRAINAGE (6 OF 14)
SCALE: 1" = 40'

NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

F / # — STRUCTURE TYPE / STRUCTURE NUMBER

DS	DIVERSION STRUCTURE
TD	TRENCH DRAIN
F	FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT	PARCEL ID TREATMENT STRUCTURE
BI	PARCEL ID INFILTRATION STORAGE CHAMBER

KEY PLAN
SCALE 1" = 2000'

40' 0' 40' 80'
SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B1 - GRADING & DRAINAGE (6 OF 14)

Rev. | Date: 2023-01-31 | M&N Project No. 11102-33 | Drawing code: | Drawing Scale: 1:1 (D SHEET) Plot scale:

Designed by: DC | Dwn by: CC | Ckd by: LC | Reviewed by: TJS | Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL

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NEWTON, MA 02459
617-299-7330

NJEDA NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-125
INDEX: 34 OF 119

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

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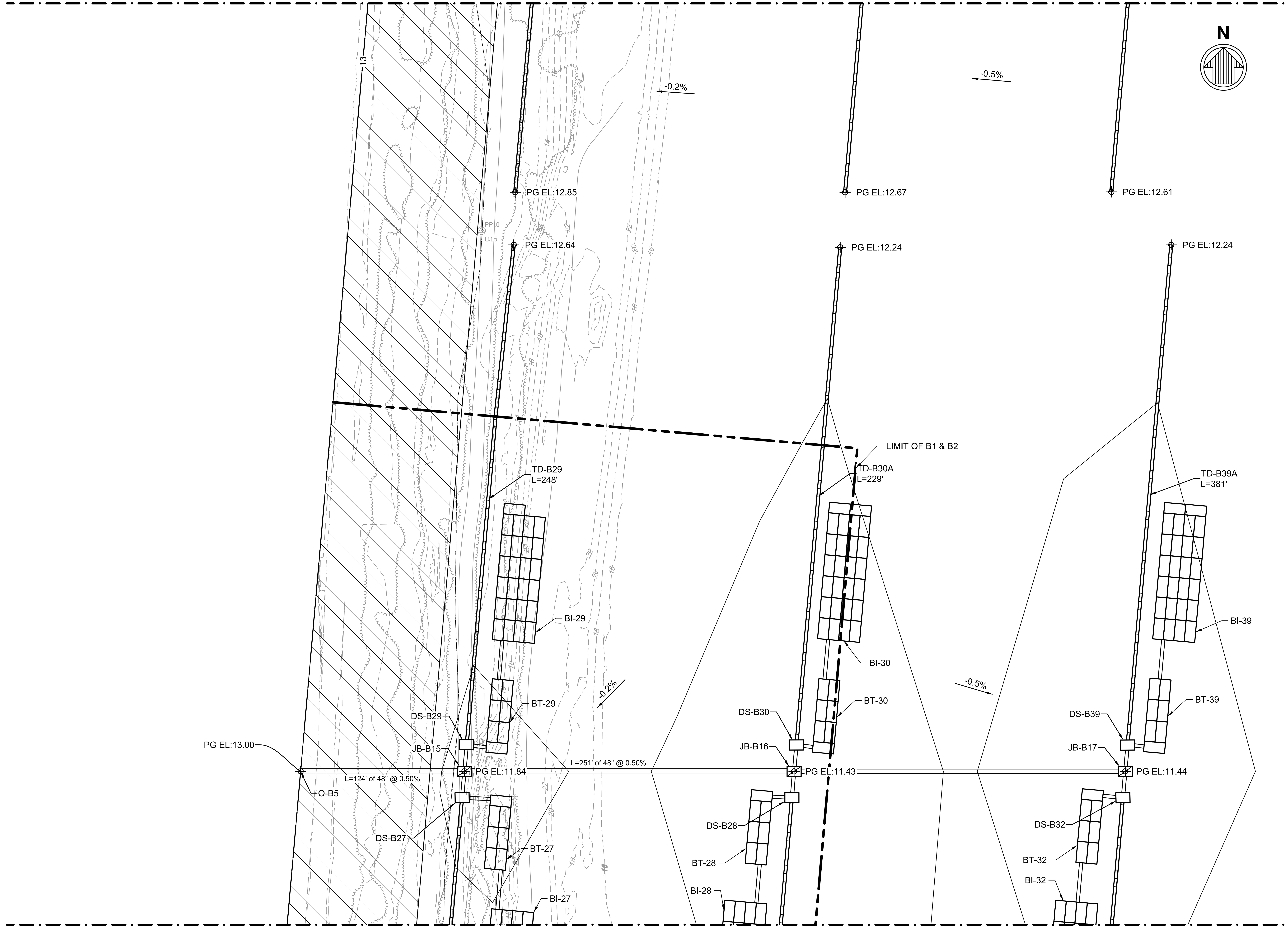
MATCH LINE - SEE SHEET C-128



MATCH LINE - SEE SHEET C-124

A1 C-126 PLAN - PARCEL B1 & B2 - GRADING & DRAINAGE (7 OF 14)
SCALE: 1" = 40'

NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

STRUCTURE TYPE
STRUCTURE NUMBER

DS	DIVERSION STRUCTURE
TD	TRENCH DRAIN
F	FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT	PARCEL ID TREATMENT STRUCTURE
BI	PARCEL ID INFILTRATION STORAGE CHAMBER

KEY PLAN
SCALE 1" = 2000'

40' 0' 40' 80'
SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B1 & B2 - GRADING & DRAINAGE (7 OF 14)

Designed by: DC | Dwn by: CC | Ckd by: LC | Reviewed by: TJS | Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL
Date: 2023-01-31 | M&N Project No. 11102-33 | Drawing code: | Drawing Scale: | Plot scale: 1:1 (D SHEET) | Rev.

moffatt & nichol
180 WELLS AVENUE, SUITE 302
NEWTON, MA 02459
617-299-7330

NJEDA NEW JERSEY WIND PORT

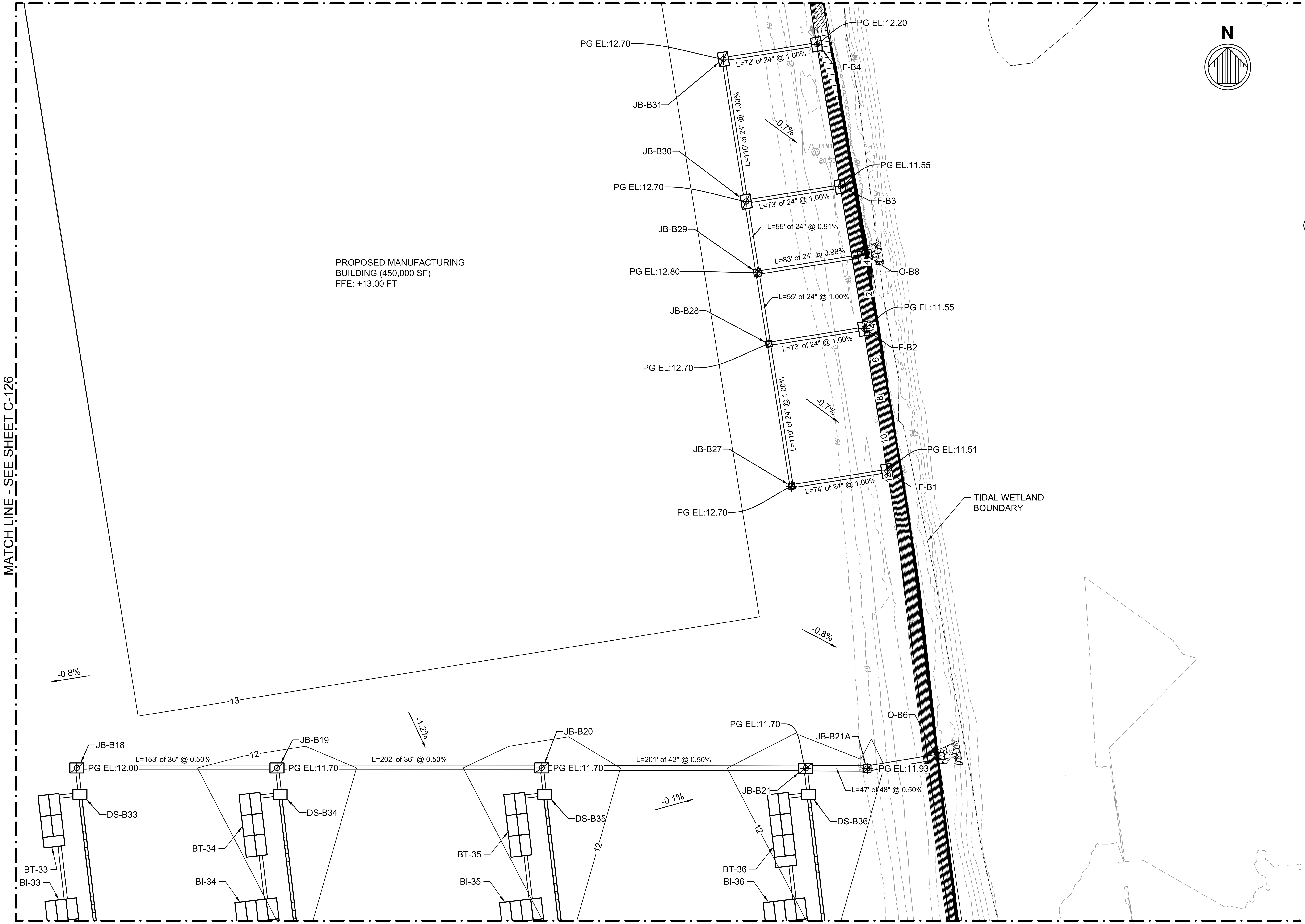
SEAL

Sheet Reference No.
C-126
INDEX: 35 OF 119

File: Q:\BOS\Projects\11102-33 Sitewide Permit\20 CADD_Active_Site Wide Permit\11102-33-C-126 ; Plotted: 1/31/2023 5:51 PM by CASTILLO, CRISTIAN ; Saved: 1/31/2023 4:03 PM by CCASTILLO

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MATCH LINE - SEE SHEET C-129



MATCH LINE - SEE SHEET C-125

A1
C-127

PLAN - PARCEL B2 - GRADING & DRAINAGE (8 OF 14)

SCALE: 1" = 40'

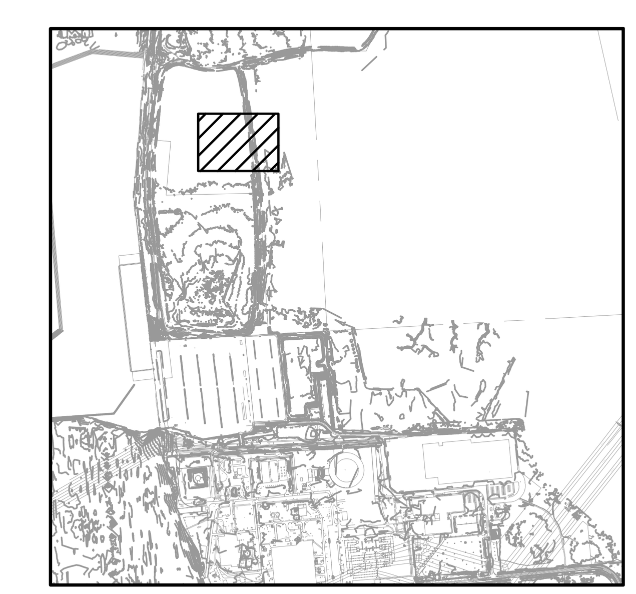
NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

F # — STRUCTURE TYPE / STRUCTURE NUMBER

DS	DIVERSION STRUCTURE
TD	TRENCH DRAIN
F	FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT	PARCEL ID TREATMENT STRUCTURE
BI	PARCEL ID INFILTRATION STORAGE CHAMBER



KEY PLAN

SCALE 1" = 2000'

40' 0' 40' 80'

SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B2 - GRADING & DRAINAGE (8 OF 14)

Rev.	
Date:	2023-01-31
M&N Project No.	11102-33
Drawing code:	
Drawing Scale:	
Plot scale:	1:1 (D SHEET)
Designed by:	DC
Ckd by:	LC
Dwn by:	CC
Reviewed by:	TJS
Submitted by:	SUBMITTER'S NAME MOFFATT & NICHOL

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NEWTON, MA 02459
617-299-7330

NJEDA
NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-127
INDEX: 36 OF 119

File: Q:\BOS\Projects\11102-33 Sitewide Permit\20 CADD_Active_Site Wide Permit\11102-33-C-127 ; Plotted: 1/31/2023 5:53 PM by CASTILLO, CRISTIAN ; Saved: 1/31/2023 3:31 PM by CCASTILLO

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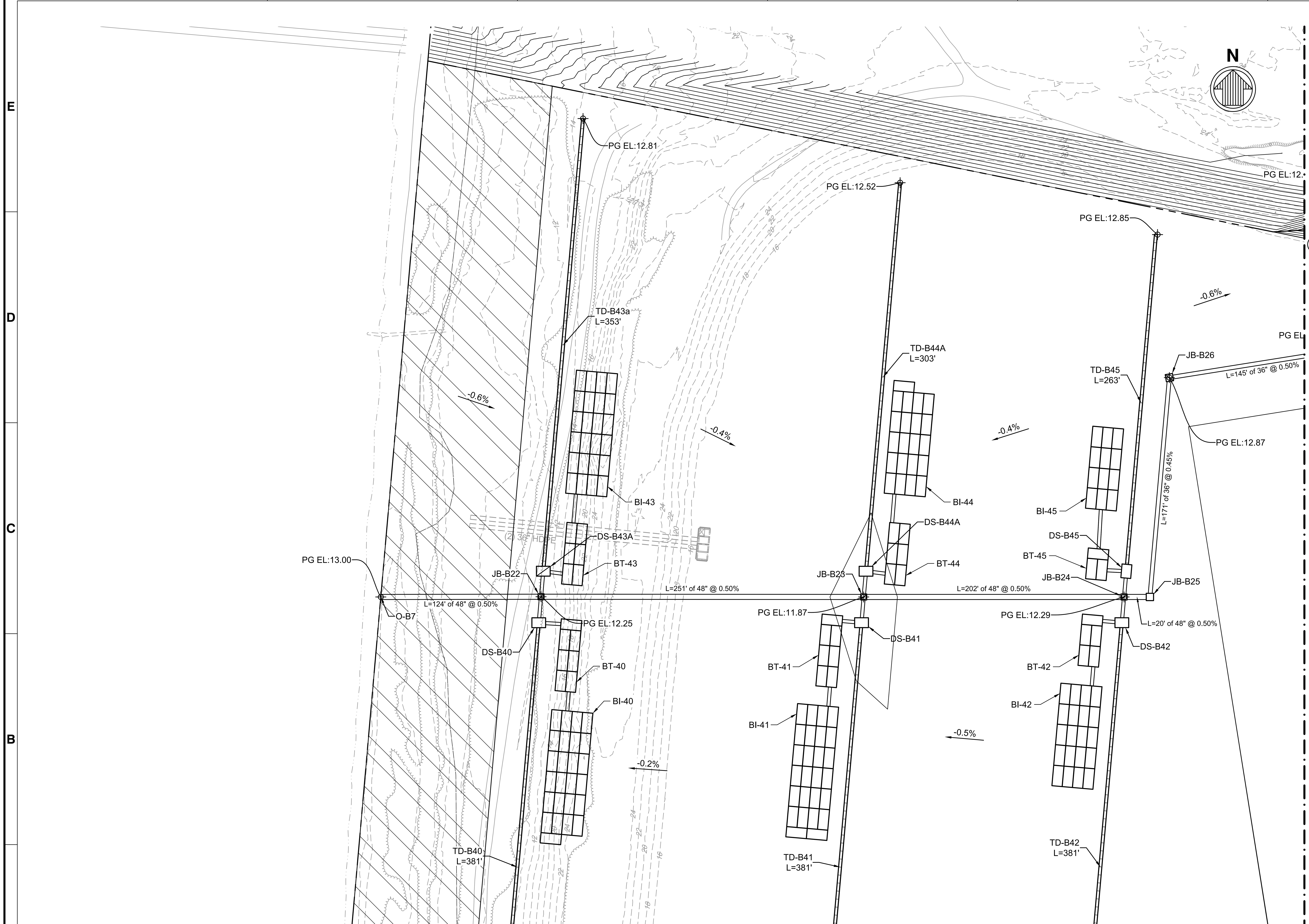


A1
C-128

PLAN - PARCEL B2 - GRADING & DRAINAGE (9 OF 14)

SCALE: 1" = 40'

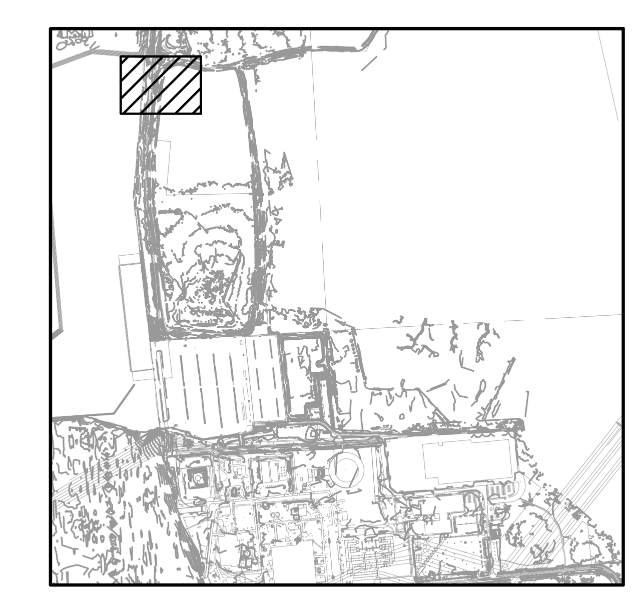
NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

F # — STRUCTURE TYPE / STRUCTURE NUMBER

DS	DIVERSION STRUCTURE
TD	TRENCH DRAIN
F	FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT	PARCEL ID TREATMENT STRUCTURE
BI	PARCEL ID INFILTRATION STORAGE CHAMBER



KEY PLAN

SCALE 1" = 2000'

40' 0' 40' 80'

SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

Mark | Description | Date | Appr

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B2 - GRADING & DRAINAGE (9 OF 14)

Rev.	Date: 2023-01-31	M&N Project No. 11102-33	
Designed by: DC	Drawing code:	Drawing Scale:	Plot scale: 1:1 (D SHEET)
Dwn by: CC	Ckd by: LC	Reviewed by: TJS	Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL

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NEWTON, MA 02459
617-299-7330

NJEDA
NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-128

INDEX: 37 OF 119

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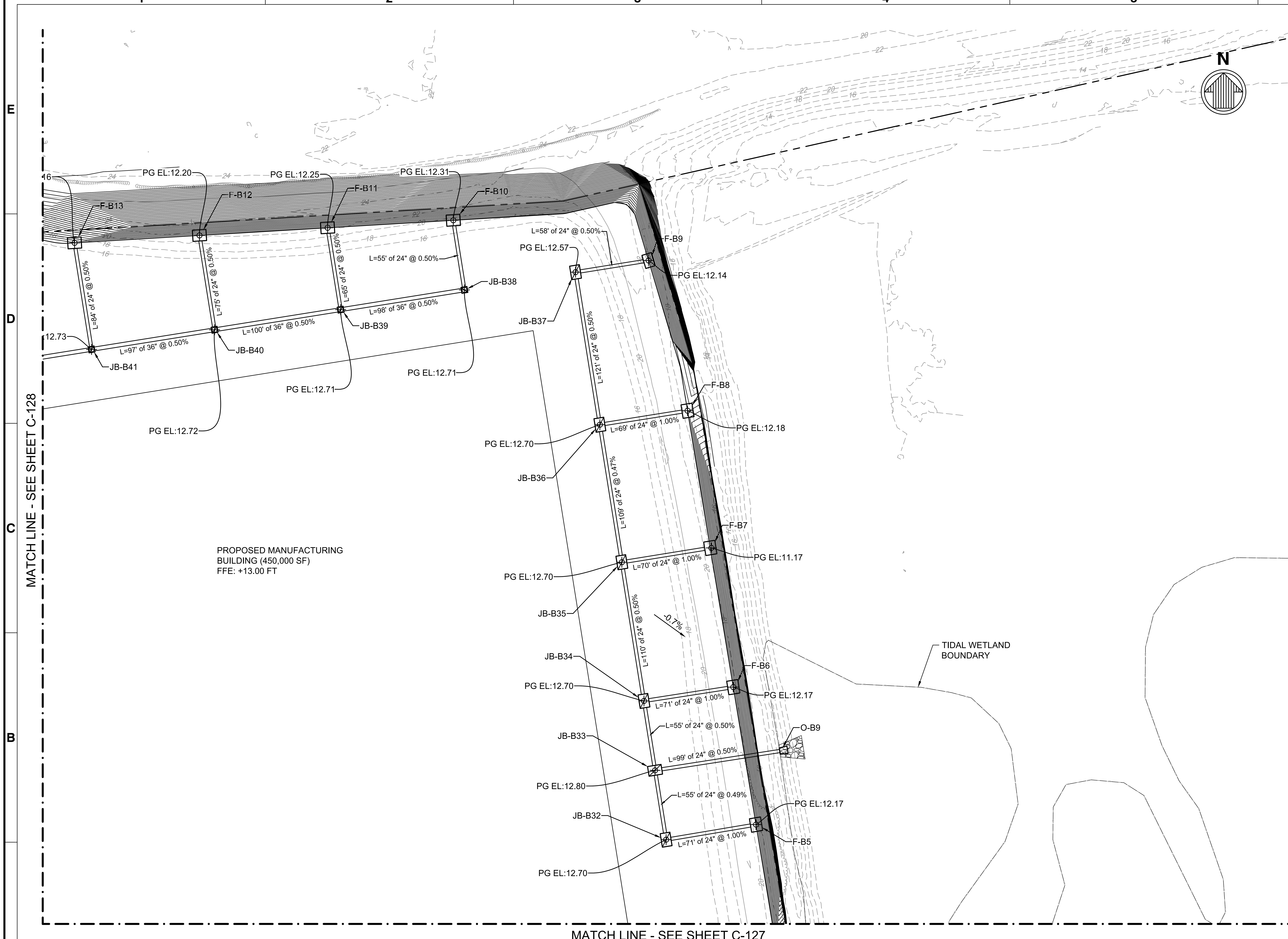


A1 C-129 PLAN - PARCEL B2 - GRADING & DRAINAGE (10 OF 14)
SCALE: 1" = 40'

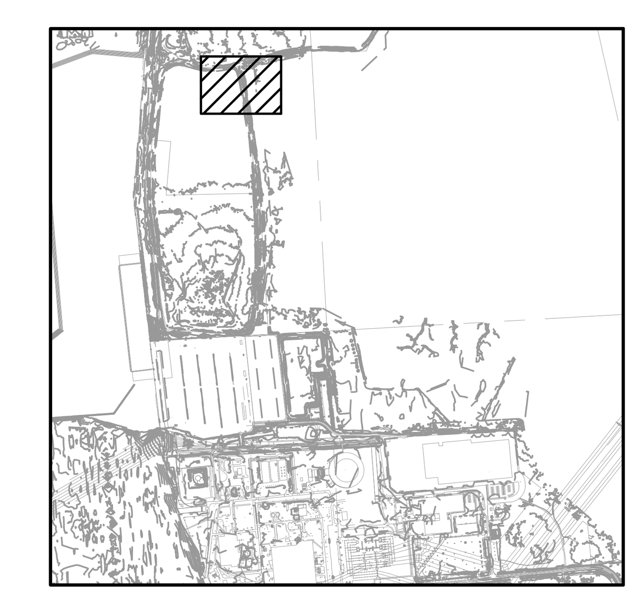
NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

F # — STRUCTURE TYPE / STRUCTURE NUMBER

DS	DIVERSION STRUCTURE
TD	TRENCH DRAIN
F	FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT	PARCEL ID TREATMENT STRUCTURE
BI	PARCEL ID INFILTRATION STORAGE CHAMBER



KEY PLAN
SCALE 1" = 2000'

40' 0' 40' 80'
SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

NEW JERSEY WIND PORT
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LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL B2 - GRADING & DRAINAGE (10 OF 14)

Designed by: DC	Date: 2023-01-31
Dwn by: CC	Ckd by: LC
M&N Project No. 11102-33	Drawing code:
Reviewed by: TJS	Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL
Drawing Scale:	Plot scale: 1:1 (D SHEET)

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NEWTON, MA 02459
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NJEDA
NEW JERSEY WIND PORT

Mark | Description | Date | Appr

SEAL

Sheet Reference No.
C-129
INDEX: 38 OF 119

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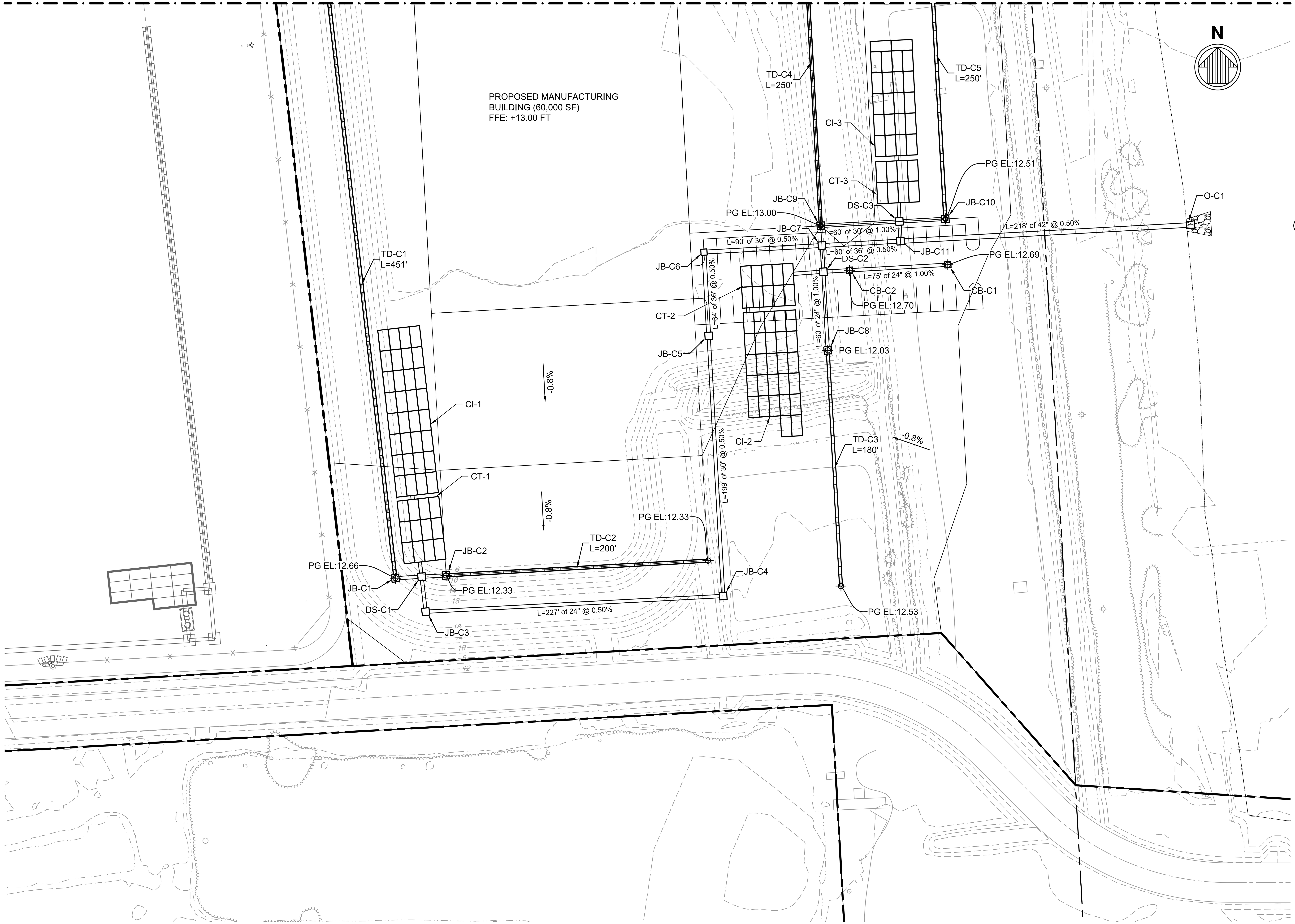
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MATCH LINE - SEE SHEET C-131



A1
C-130

PLAN - PARCEL C2 - GRADING & DRAINAGE (11 OF 14)

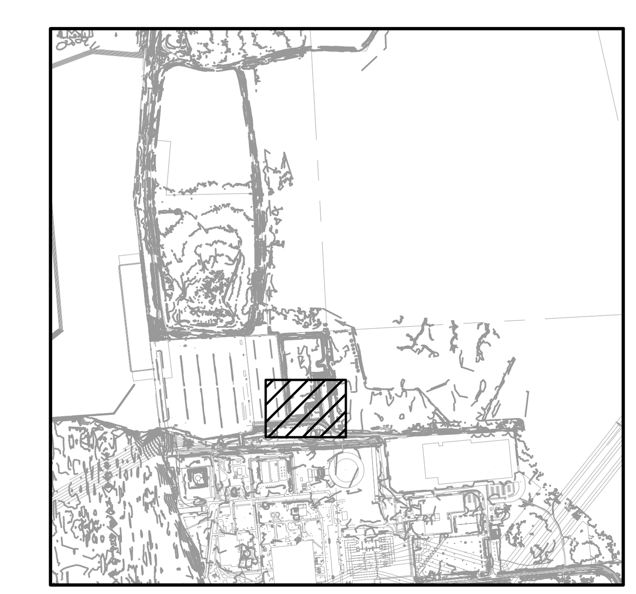
SCALE: 1" = 40'

NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

- F / # — STRUCTURE TYPE / STRUCTURE NUMBER
- DS — DIVERSION STRUCTURE
- TD — TRENCH DRAIN
- F — FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
- BT — PARCEL ID TREATMENT STRUCTURE
- BI — PARCEL ID INFILTRATION STORAGE CHAMBER



KEY PLAN

SCALE 1" = 2000'

40' 0' 40' 80'

SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL C2 - GRADING & DRAINAGE (11 OF 14)

Designed by: DC	Date: 2023-01-31	Rev.
Dwn by: CC	Ckd by: LC	M&N Project No. 11102-33
Reviewed by: TJS		Drawing code:
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)

moffatt & nichol
180 WELLS AVENUE, SUITE 302
NEWTON, MA 02459
617-299-7330

NJEDA
NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-130
INDEX: 39 OF 119

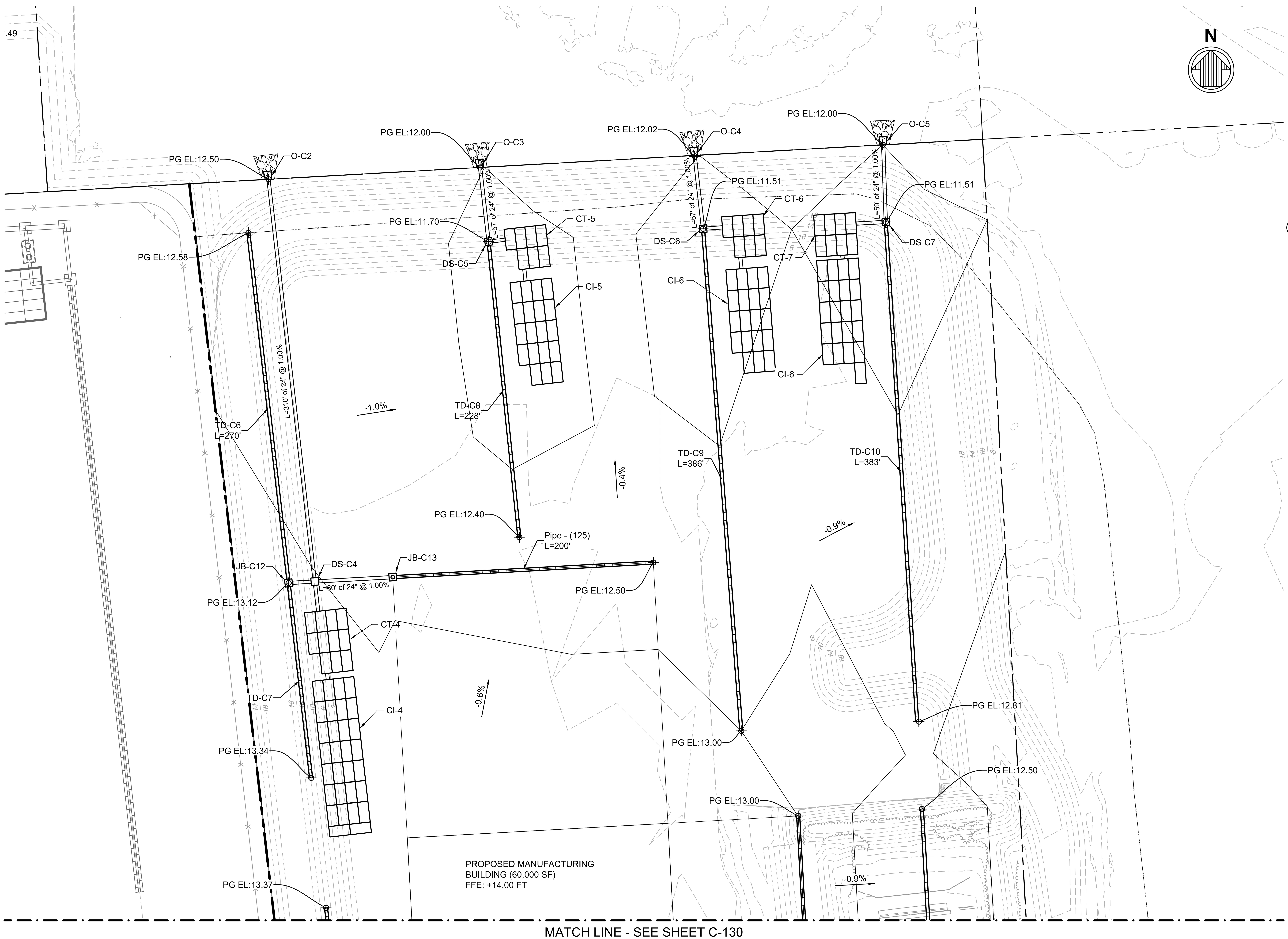
File: Q:\BOS\Projects\11102-33 Sitewide Permit\20 CADD_Active_Site Wide Permit\11102-33-C-130 ; Plotted: 1/31/2023 6:00 PM by CASTILLO, CRISTIAN ; Saved: 1/31/2023 4:04 PM by CCASTILLO

NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

- F / # — STRUCTURE TYPE / STRUCTURE NUMBER
- DS — DIVERSION STRUCTURE
- TD — TRENCH DRAIN
- F — FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
- BT — PARCEL ID TREATMENT STRUCTURE
- BI — PARCEL ID INFILTRATION STORAGE CHAMBER



A1 C-131 PLAN - PARCEL C2 - GRADING & DRAINAGE (12 OF 14)
SCALE: 1" = 40'

KEY PLAN
SCALE 1" = 2000'

40' 0' 40' 80'
SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

Mark	Description	Date	Appr

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL C2 - GRADING & DRAINAGE (12 OF 14)

Rev.	Date: 2023-01-31	M&N Project No.: 11102-33
Drawing code:	Drawing Scale:	Plot scale: 1:1 (D SHEET)
Designed by: DC	Dwn by: CC	Ckd by: LC
Reviewed by: TJS	Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL	

moffatt & nichol
180 WELLS AVENUE, SUITE 302
NEWTON, MA 02459
617-299-7330

NJEDA
NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-131
INDEX: 40 OF 119

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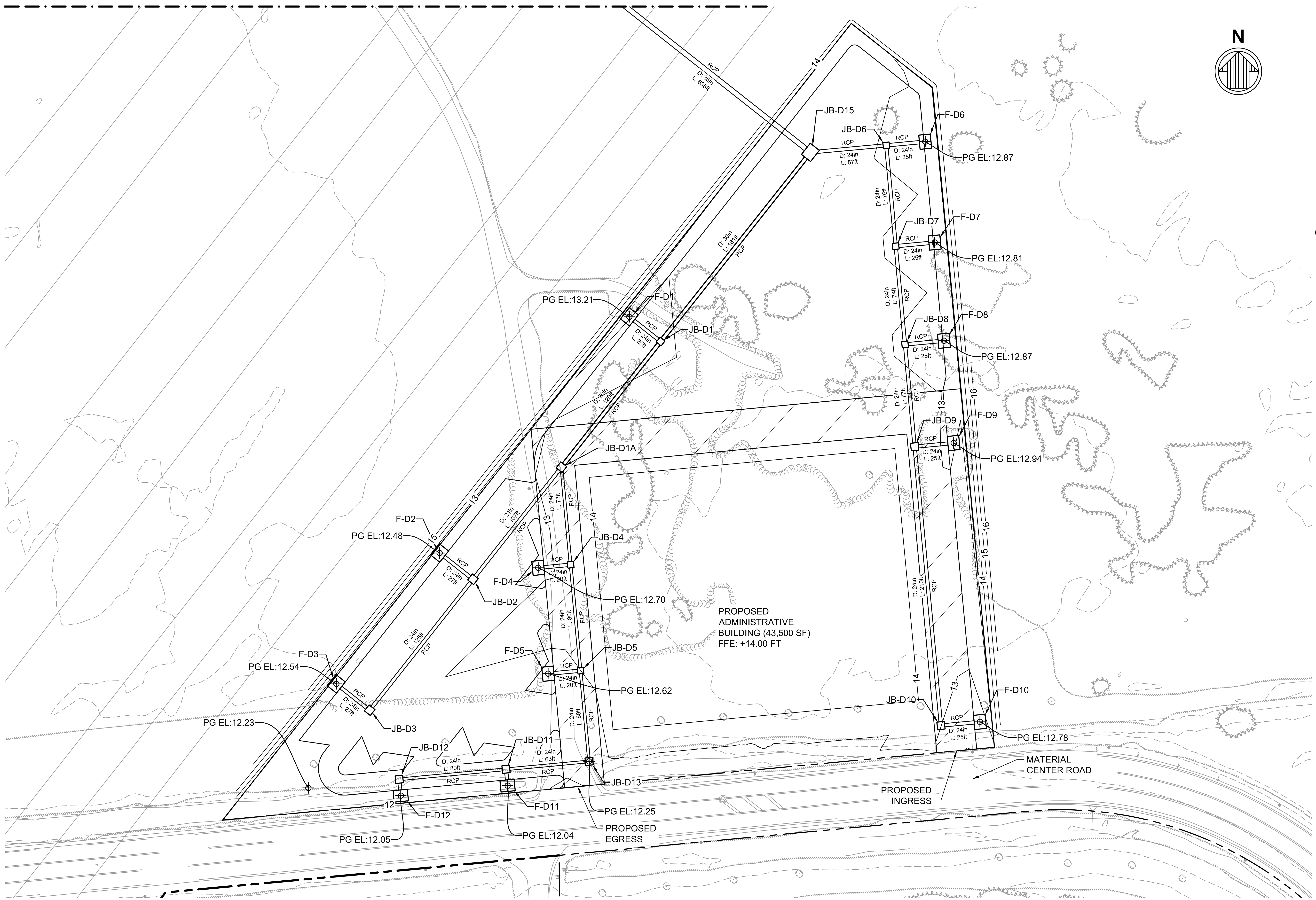
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MATCH LINE - SEE SHEET C-133



A1
C-132

PLAN - PARCEL D - GRADING & DRAINAGE (13 OF 14)

SCALE: 1" = 40'

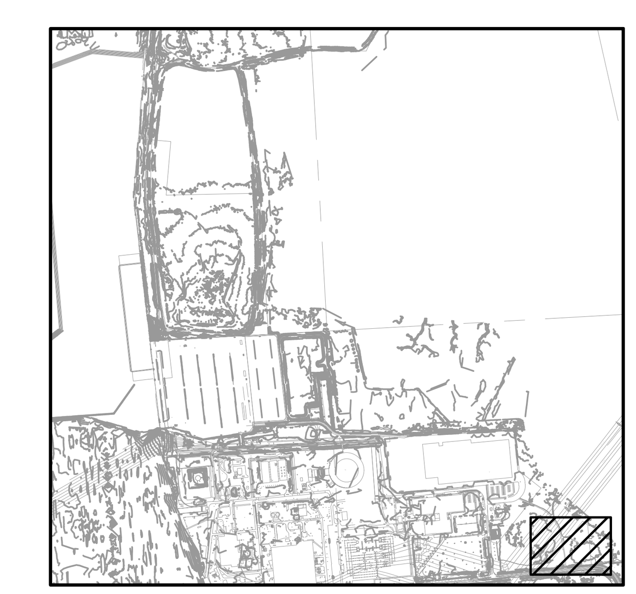
NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

F / # — STRUCTURE TYPE / STRUCTURE NUMBER

DS	DIVERSION STRUCTURE
TD	TRENCH DRAIN
F	FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT	PARCEL ID TREATMENT STRUCTURE
BI	PARCEL ID INFILTRATION STORAGE CHAMBER



KEY PLAN

SCALE 1" = 2000'

40' 0' 40' 80'

SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr.

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL D - GRADING & DRAINAGE (13 OF 14)

Date: 2023-01-31	Rev.		
M&N Project No. 11102-33			
Drawing code:			
Drawing Scale:	Plot scale: 1:1 (D SHEET)		
Designed by: DC			
Drwn by: CC	Chkd by: LC		
Reviewed by: TJS			
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL			

moffatt & nichol
180 WELLS AVENUE, SUITE 302
NEWTON, MA 02459
617-299-7330

NJEDA
NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-132
INDEX: 41 OF 119

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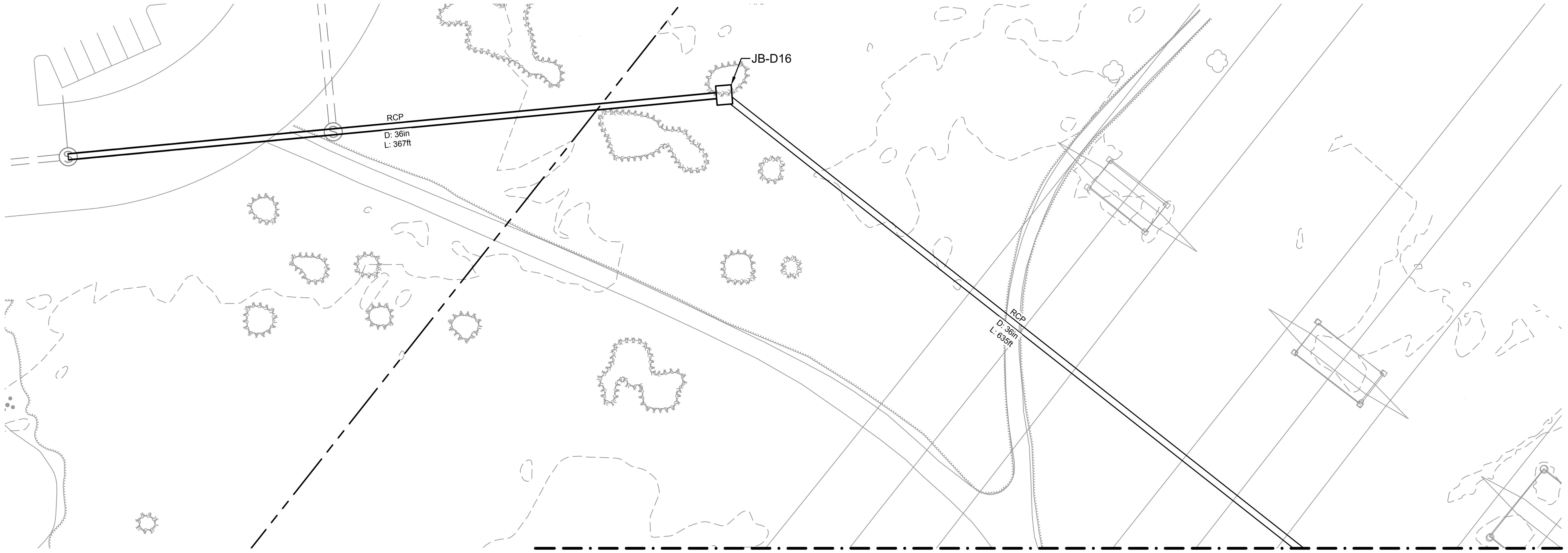

MATCH LINE - SEE SHEET C-132

A1 / C-133 PLAN - PARCEL D - GRADING & DRAINAGE (14 OF 14)
SCALE: 1" = 40'

NOTES

1. FOR GENERAL NOTES, SEE SHEET G-002.
2. FOR LEGEND AND ABBREVIATIONS, SEE SHEET G-003.
3. FOR PRETREATMENT STRUCTURE AND INFILTRATION STORAGE CHAMBER DETAILS, SEE SHEETS C-507 TO C-511.

LEGEND

F / # — STRUCTURE TYPE / STRUCTURE NUMBER

DS DIVERSION STRUCTURE
TD TRENCH DRAIN
F FILTERRA HC BIOFILTRATION UNIT (SEE SHEET C-506)
BT PARCEL ID TREATMENT STRUCTURE
BI PARCEL ID INFILTRATION STORAGE CHAMBER

KEY PLAN
SCALE 1" = 2000'

40' 0' 40' 80'
SCALE: 1"=40'

PERMITTING PACKAGE
ISSUED: 2023-01-31
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

NEW JERSEY WIND PORT
ENGINEERING FOR SITE WIDE PERMITTING
LOWER ALLOWAYS CREEK TOWNSHIP
SALEM COUNTY, NJ

PLAN - PARCEL D - GRADING & DRAINAGE (14 OF 14)

Mark	Description	Date	Appr.

Designed by: DC	Date: 2023-01-31
Dwn by: CC	Ckd by: LC
M&N Project No.	11102-33
Reviewed by: TJS	Drawing code:
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL	Drawing Scale: Plot scale: 1:1 (D SHEET)
Rev.	

moffatt & nichol
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NEWTON, MA 02459
617-299-7330

NJEDA
NEW JERSEY WIND PORT

SEAL

Sheet Reference No.
C-133
INDEX: 42 OF 119

File: Q:\BOS\Projects\11102-33 Sitewide Permit\20 CADD_Active_Site Wide Permit\11102-33-C-133 ; Plotted: 1/31/2023 6:07 PM by CASTILLO, CRISTIAN ; Saved: 1/31/2023 4:24 PM by CCASTILLO

Appendix G – Groundwater Table Impacts-Hantush Workbook

StormPod Infiltration Chamber BI-1A

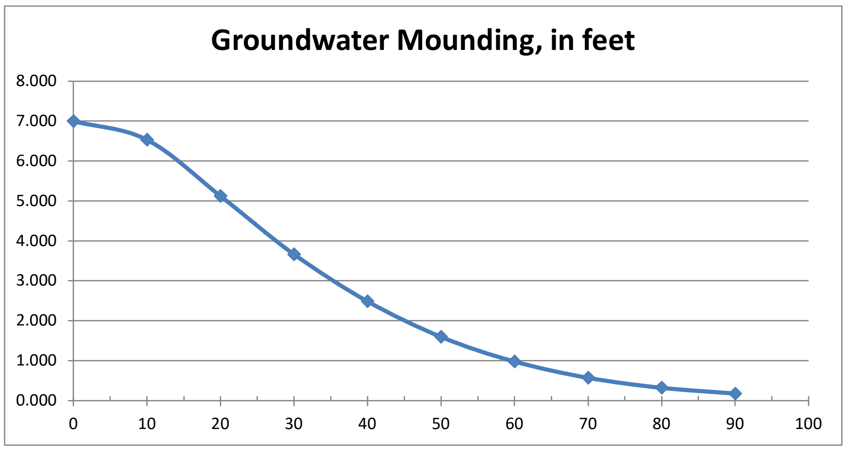
Input Values

0.50	***R***	**Recharge rate (permeability rate) (in/hr)**
0.150	**Sy**	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	**Kh**	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
16.500	**x**	**1/2 length of basin (x direction, in feet)**
52.500	**y**	**1/2 width of basin (y direction, in feet)**
64.20	**t**	**Duration of infiltration period (hours)**
10.00	**hi(0)**	**Initial thickness of saturated zone (feet)**

16.996	**h(max)**	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.996	**Δh(max)**	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.996	**0**
6.529	**10**
5.123	**20**
3.664	**30**
2.484	**40**
1.596	**50**
0.975	**60**
0.569	**70**
0.319	**80**
0.173	**90**

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

StormPod Infiltration Chamber BI-1B

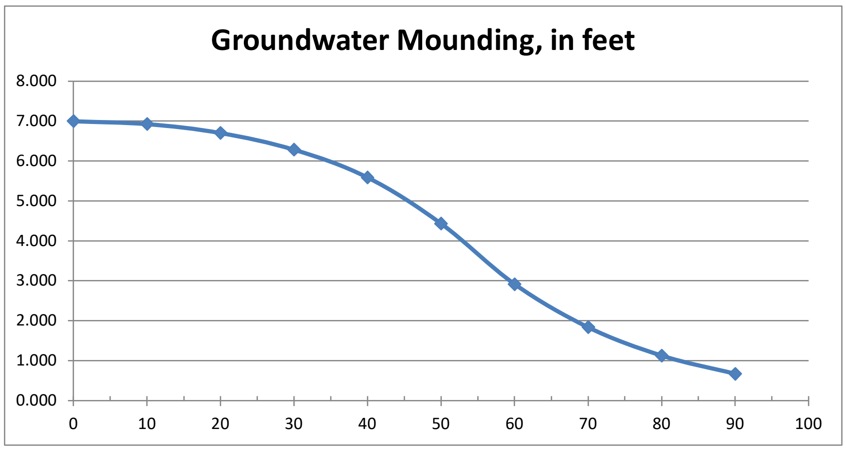
Input Values

0.50	***R***	**Recharge rate (permeability rate) (in/hr)**
0.150	**Sy**	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	**Kh**	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
52.500	**x**	**1/2 length of basin (x direction, in feet)**
16.500	**y**	**1/2 width of basin (y direction, in feet)**
64.20	**t**	**Duration of infiltration period (hours)**
10.00	**hi(0)**	**Initial thickness of saturated zone (feet)**

16.996	**h(max)**	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.996	**Δh(max)**	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	**Distance from center of basin in x direction, in feet**
6.996	**0**
6.925	**10**
6.700	**20**
6.282	**30**
5.586	**40**
4.431	**50**
2.912	**60**
1.836	**70**
1.124	**80**
0.666	**90**

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

StormPod Infiltration Chamber BI-2A

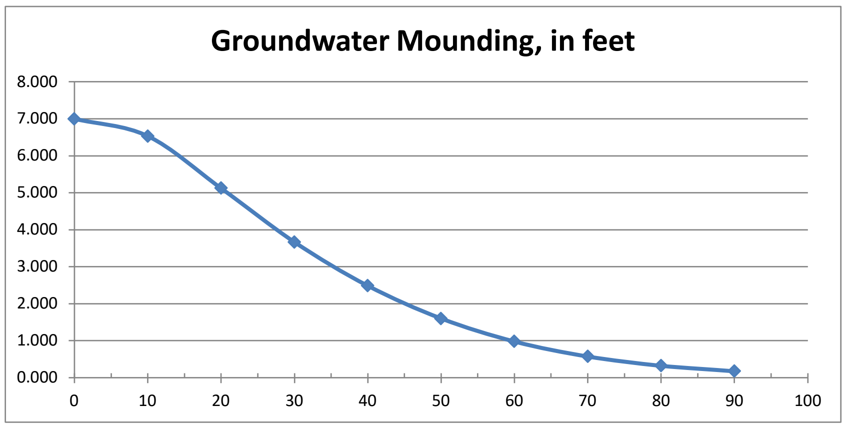
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
64.20	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.996	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.996	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.996	0
6.529	10
5.123	20
3.664	30
2.484	40
1.596	50
0.975	60
0.569	70
0.319	80
0.173	90

Re-Calculate Now



Disclaimer

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StormPod Infiltration Chamber BI-2B

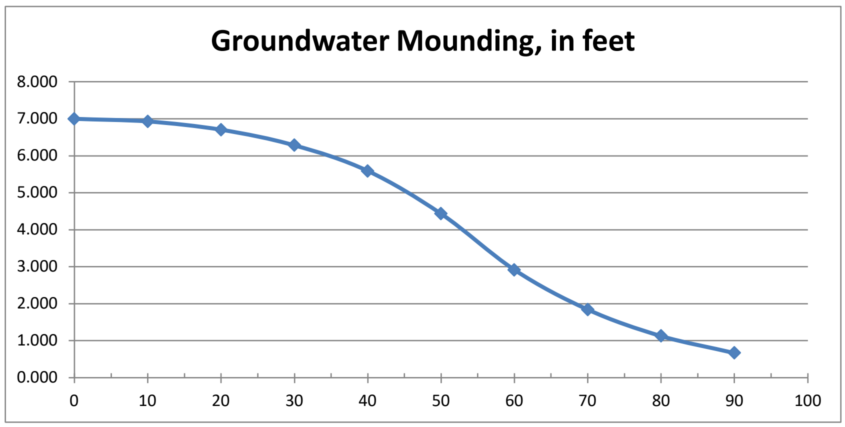
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
52.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
64.20	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.996	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.996	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.996	0
6.925	10
6.700	20
6.282	30
5.586	40
4.431	50
2.912	60
1.836	70
1.124	80
0.666	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-3A

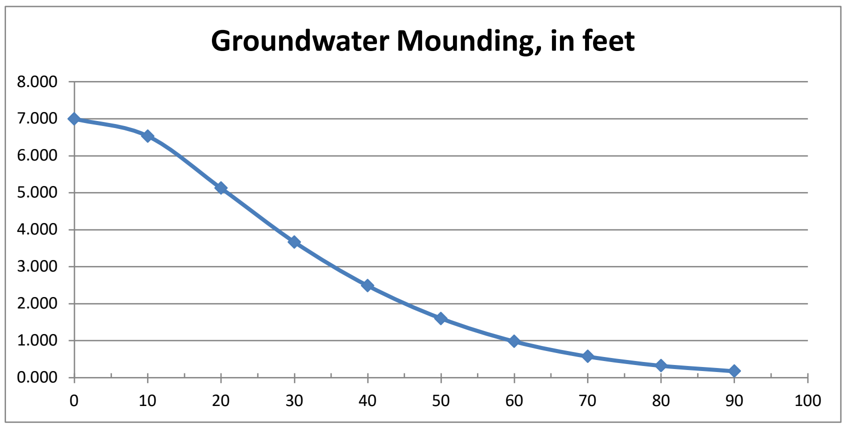
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
16.500	x	**1/2 length of basin (x direction, in feet)**
52.500	y	**1/2 width of basin (y direction, in feet)**
64.20	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

16.996	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.996	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.996	0
6.529	10
5.123	20
3.664	30
2.484	40
1.596	50
0.975	60
0.569	70
0.319	80
0.173	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-3B

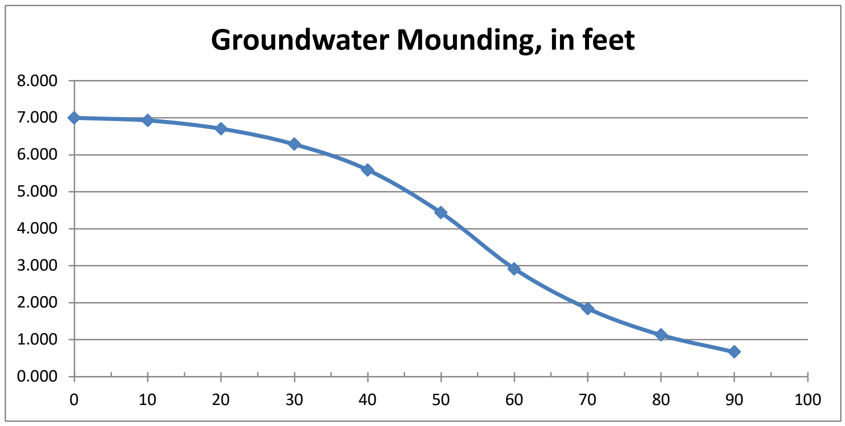
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
52.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
64.20	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.996	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.996	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.996	0
6.925	10
6.700	20
6.282	30
5.586	40
4.431	50
2.912	60
1.836	70
1.124	80
0.666	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-4A

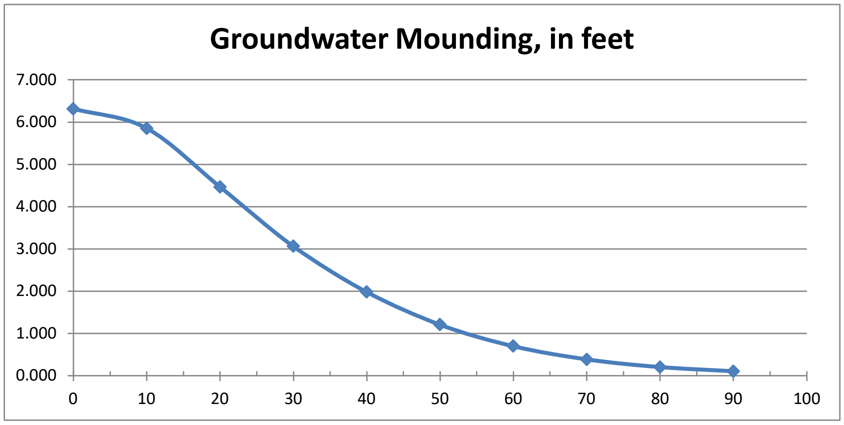
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
44.500	y	1/2 width of basin (y direction, in feet)
55.59	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.311	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.311	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.311	0
5.851	10
4.462	20
3.060	30
1.976	40
1.204	50
0.695	60
0.382	70
0.201	80
0.102	90

Re-Calculate Now



Disclaimer

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StormPod Infiltration Chamber BI-4B

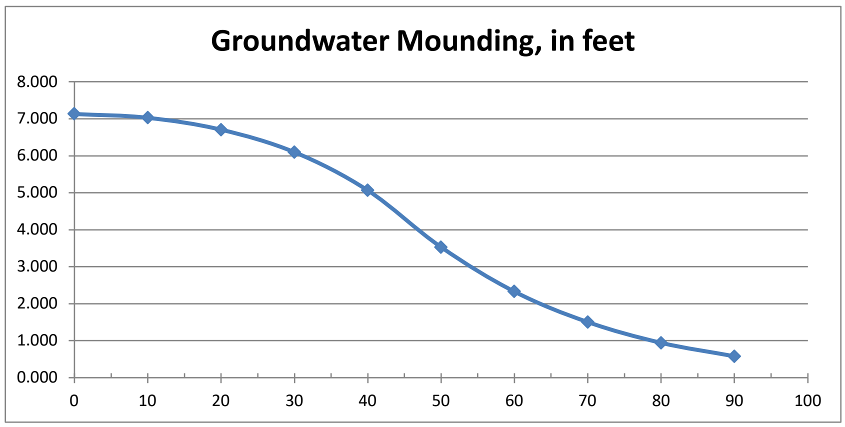
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
44.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
75.74	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.130	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.130	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.130	0
7.028	10
6.704	20
6.096	30
5.061	40
3.525	50
2.327	60
1.498	70
0.939	80
0.573	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-5A

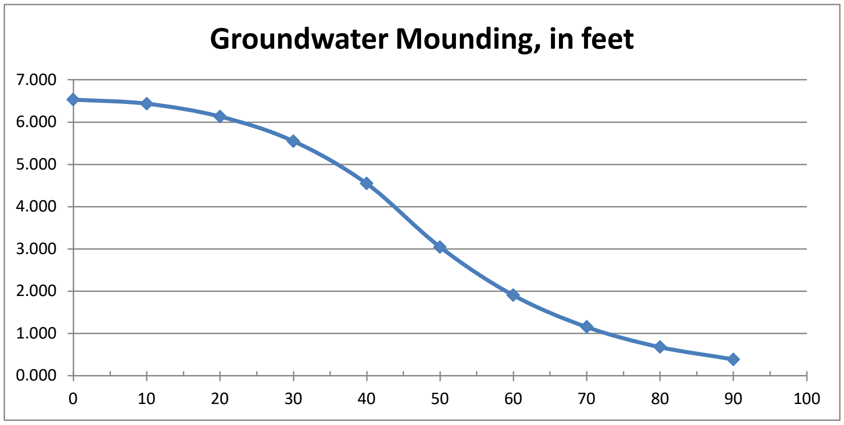
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
44.500	x	**1/2 length of basin (x direction, in feet)**
16.500	y	**1/2 width of basin (y direction, in feet)**
60.37	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

16.530	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.530	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.530	0
6.434	10
6.128	20
5.547	30
4.542	40
3.038	50
1.901	60
1.151	70
0.675	80
0.383	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-5B

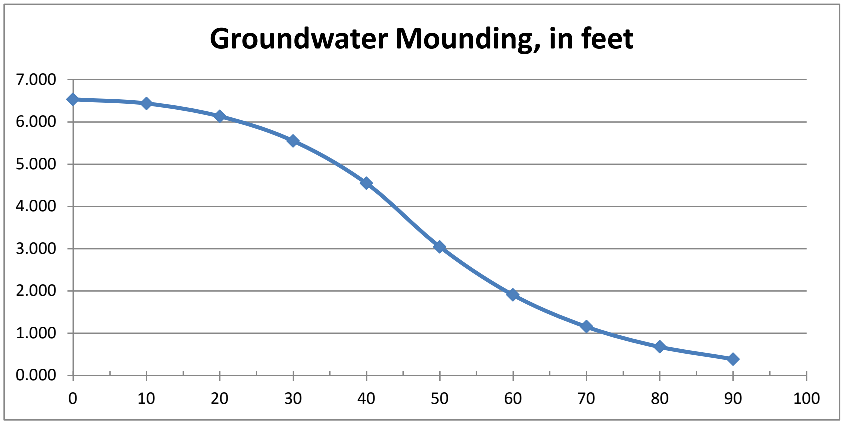
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
44.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
60.37	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.530	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.530	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.530	0
6.434	10
6.128	20
5.547	30
4.542	40
3.038	50
1.901	60
1.151	70
0.675	80
0.383	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-6A

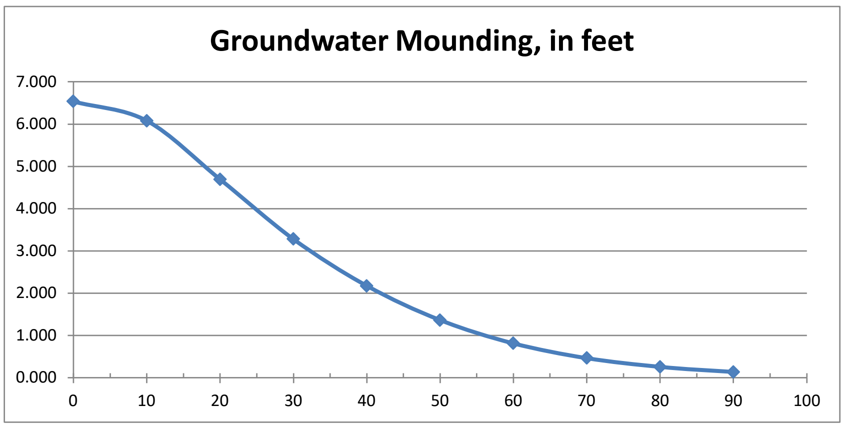
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
16.500	x	**1/2 length of basin (x direction, in feet)**
44.500	y	**1/2 width of basin (y direction, in feet)**
60.49	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

16.535	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.535	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.535	0
6.075	10
4.691	20
3.280	30
2.170	40
1.359	50
0.809	60
0.461	70
0.252	80
0.133	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-6B

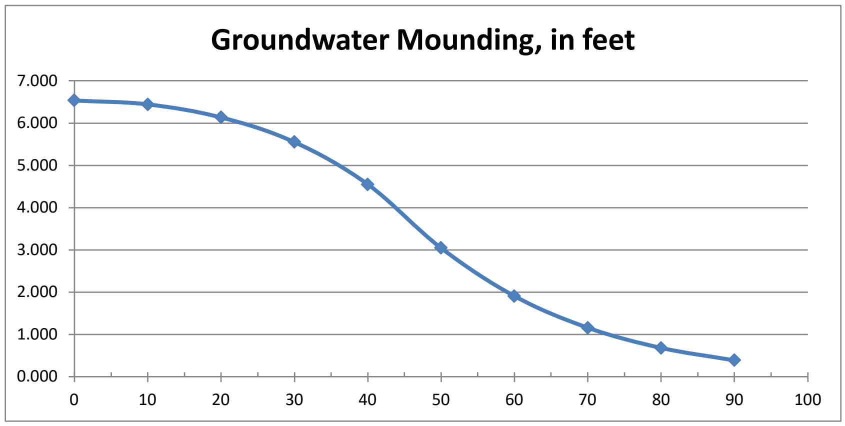
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
44.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
60.49	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.535	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.535	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.535	0
6.439	10
6.132	20
5.552	30
4.546	40
3.042	50
1.904	60
1.154	70
0.677	80
0.384	90

Re-Calculate Now



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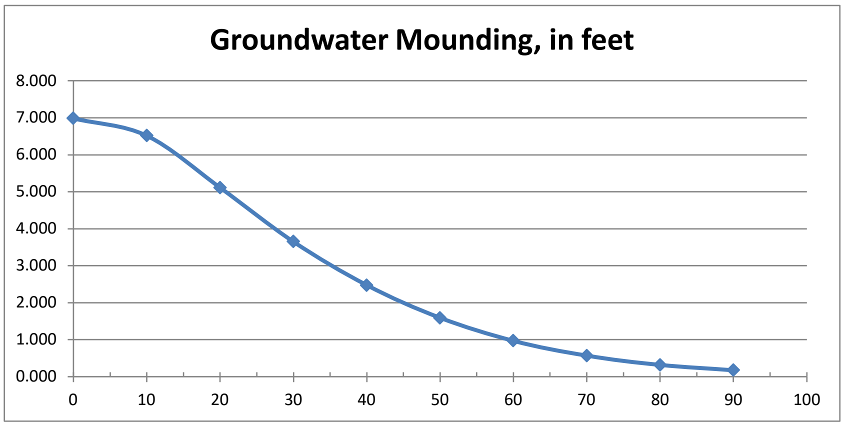
StormPod Infiltration Chamber BI-7A

Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
63.90	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)
16.982	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.982	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.982	0
6.515	10
5.108	20
3.650	30
2.471	40
1.585	50
0.967	60
0.564	70
0.316	80
0.171	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-7B

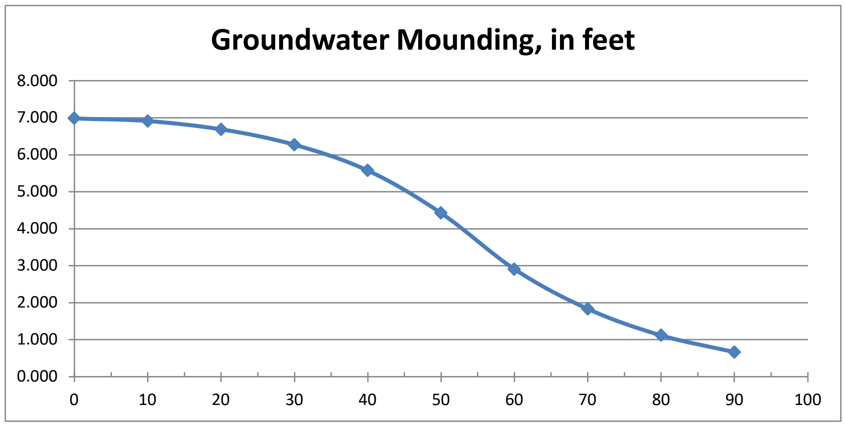
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
52.500	x	**1/2 length of basin (x direction, in feet)**
16.500	y	**1/2 width of basin (y direction, in feet)**
63.90	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

16.982	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.982	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.982	0
6.911	10
6.687	20
6.270	30
5.574	40
4.420	50
2.902	60
1.828	70
1.117	80
0.661	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-8A

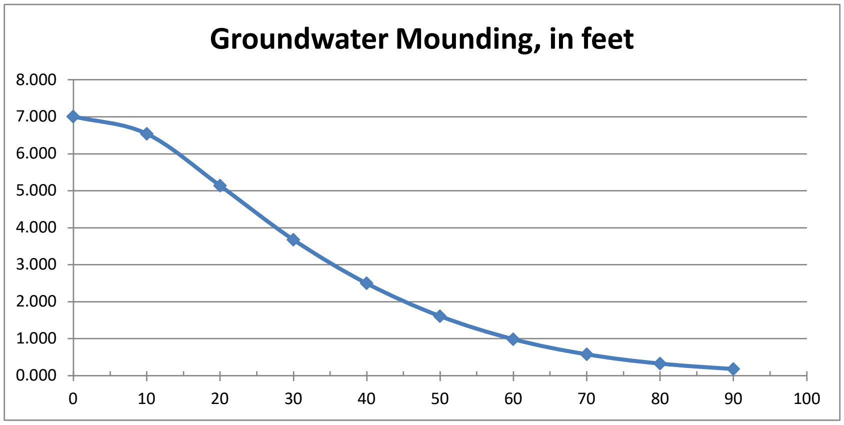
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
64.43	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.007	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.007	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.007	0
6.539	10
5.134	20
3.674	30
2.493	40
1.604	50
0.981	60
0.574	70
0.322	80
0.175	90

Re-Calculate Now



Disclaimer

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StormPod Infiltration Chamber BI-8B

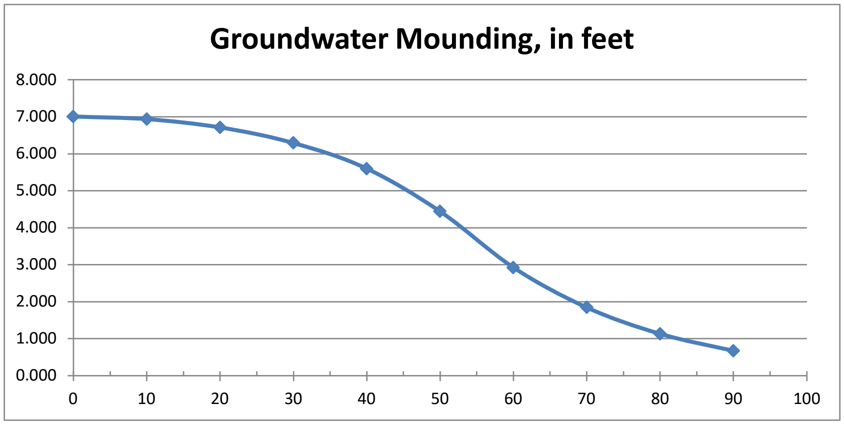
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
52.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
64.43	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.007	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.007	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.007	0
6.935	10
6.710	20
6.292	30
5.595	40
4.439	50
2.920	60
1.843	70
1.129	80
0.670	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-9A

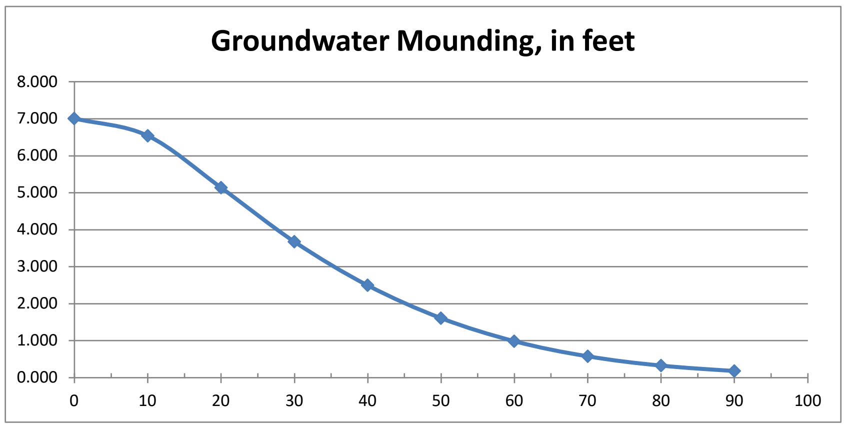
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
16.500	x	**1/2 length of basin (x direction, in feet)**
52.500	y	**1/2 width of basin (y direction, in feet)**
64.43	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

17.007	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
7.007	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.007	0
6.539	10
5.134	20
3.674	30
2.493	40
1.604	50
0.981	60
0.574	70
0.322	80
0.175	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-9B

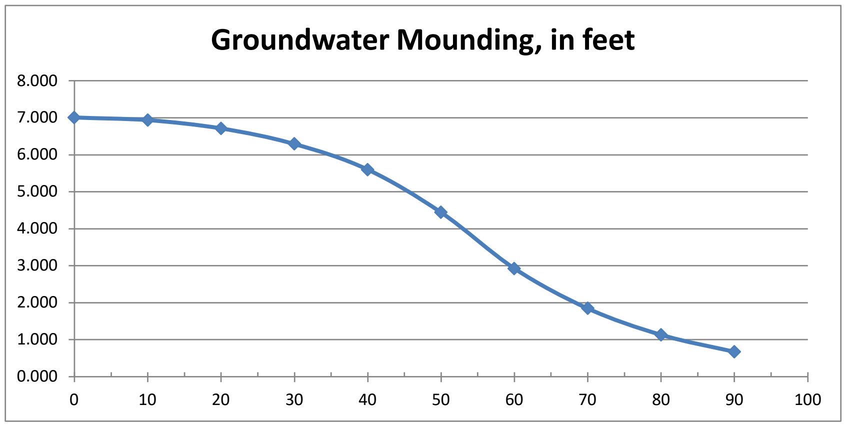
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
52.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
64.43	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.007	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.007	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.007	0
6.935	10
6.710	20
6.292	30
5.595	40
4.439	50
2.920	60
1.843	70
1.129	80
0.670	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-10A

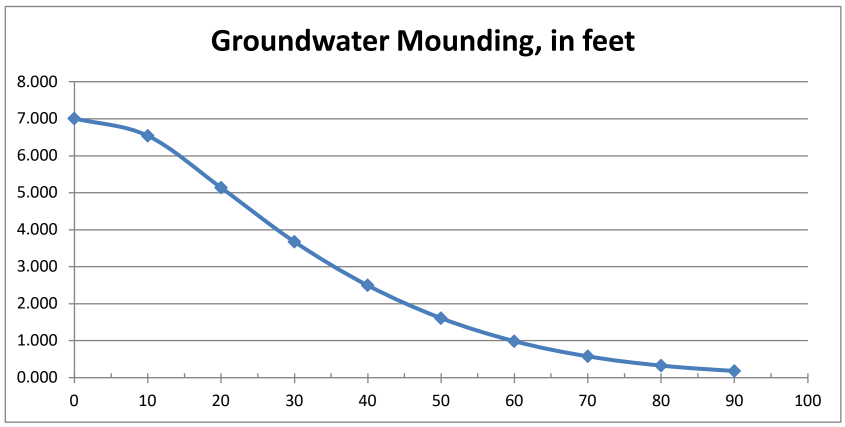
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
64.43	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.007	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.007	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.007	0
6.539	10
5.134	20
3.674	30
2.493	40
1.604	50
0.981	60
0.574	70
0.322	80
0.175	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-10B

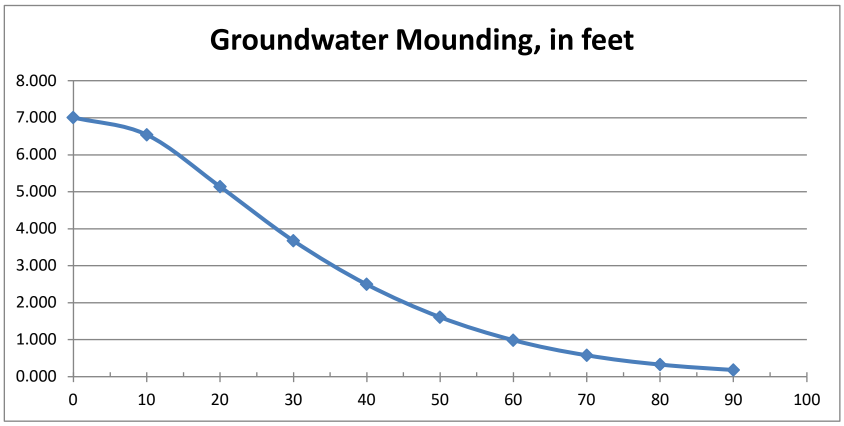
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
64.43	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.007	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.007	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.007	0
6.539	10
5.134	20
3.674	30
2.493	40
1.604	50
0.981	60
0.574	70
0.322	80
0.175	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-11A

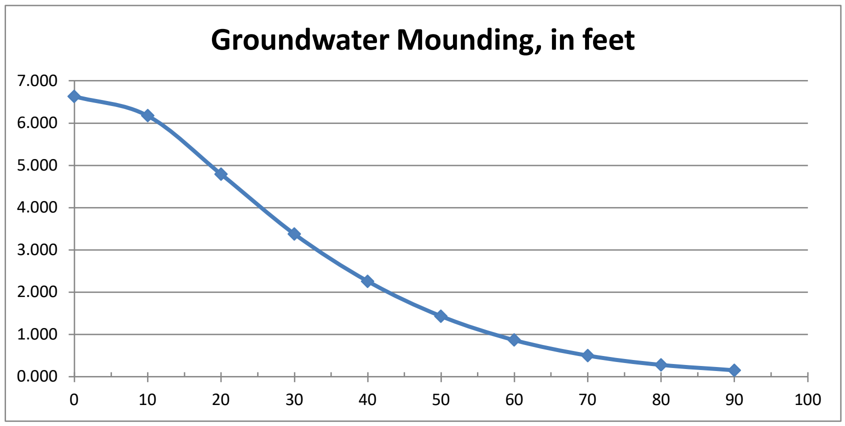
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
44.500	y	1/2 width of basin (y direction, in feet)
62.66	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.628	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.628	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.628	0
6.169	10
4.787	20
3.373	30
2.253	40
1.427	50
0.861	60
0.497	70
0.275	80
0.148	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-11B

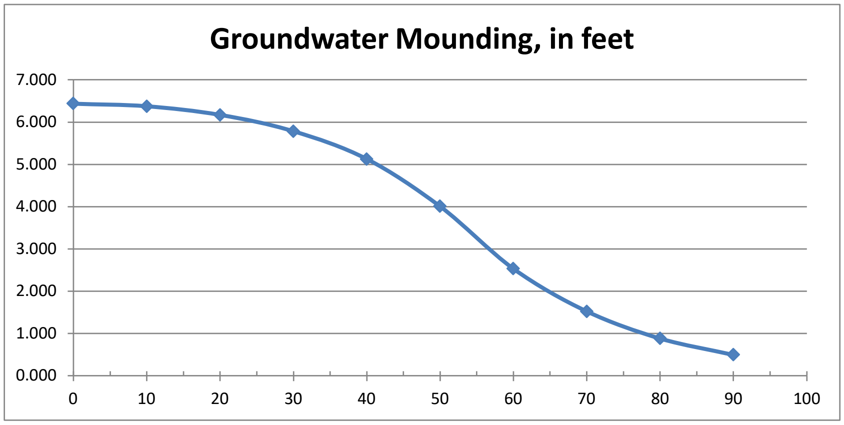
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
44.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
62.66	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.436	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.436	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.436	0
6.372	10
6.167	20
5.780	30
5.121	40
4.005	50
2.530	60
1.518	70
0.878	80
0.489	90

Re-Calculate Now



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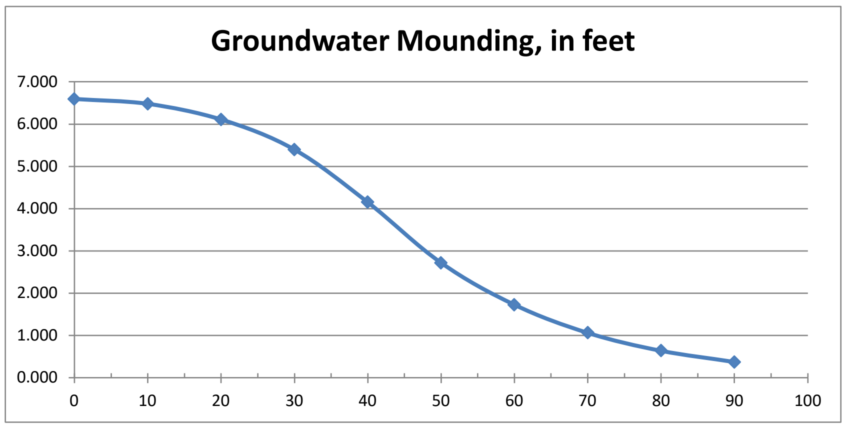
StormPod Infiltration Chamber BI-12A

Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
40.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
66.70	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)
16.592	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.592	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.592	0
6.476	10
6.105	20
5.395	30
4.149	40
2.712	50
1.721	60
1.060	70
0.634	80
0.368	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-12B

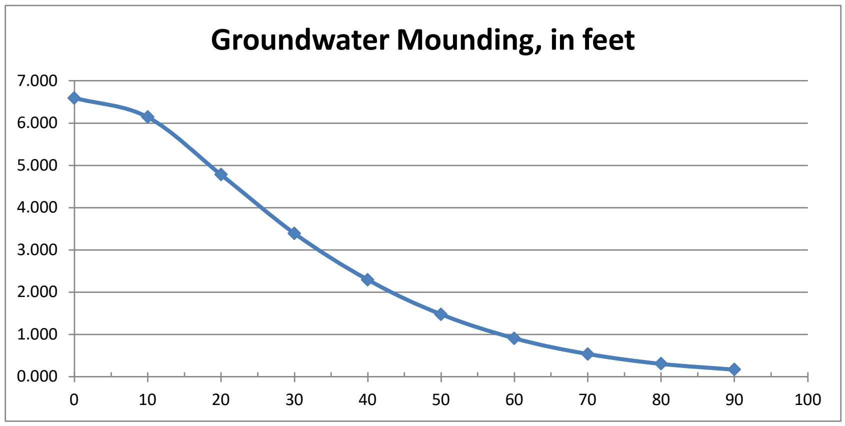
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
16.500	x	**1/2 length of basin (x direction, in feet)**
40.500	y	**1/2 width of basin (y direction, in feet)**
66.70	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

16.592	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.592	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.592	0
6.140	10
4.778	20
3.389	30
2.289	40
1.472	50
0.905	60
0.533	70
0.303	80
0.167	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-13A

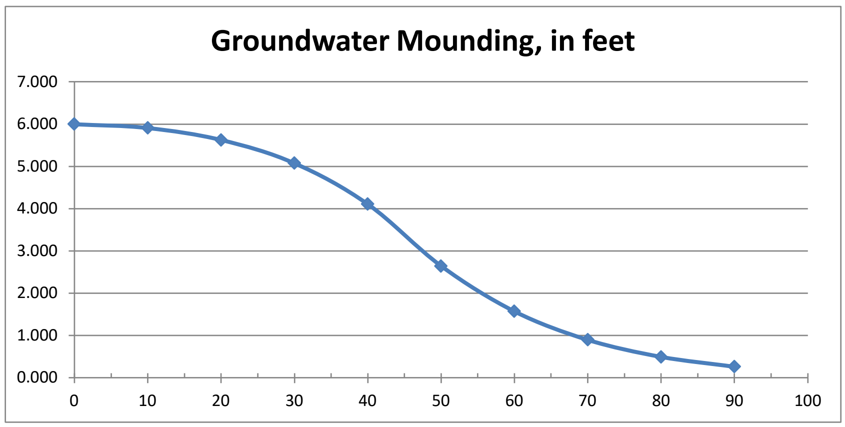
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
44.500	x	**1/2 length of basin (x direction, in feet)**
16.500	y	**1/2 width of basin (y direction, in feet)**
49.34	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

15.995	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
5.995	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.995	0
5.907	10
5.621	20
5.072	30
4.104	40
2.640	50
1.566	60
0.893	70
0.489	80
0.257	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-13B

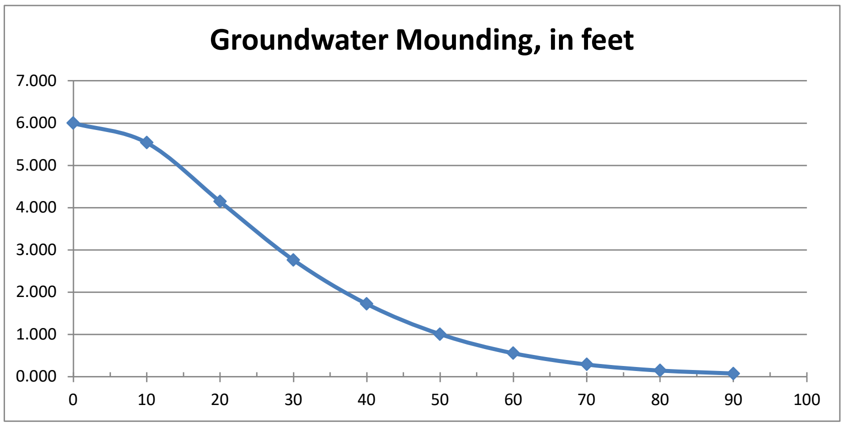
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
44.500	y	1/2 width of basin (y direction, in feet)
49.34	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.995	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.995	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.995	0
5.534	10
4.143	20
2.758	30
1.717	40
1.002	50
0.552	60
0.288	70
0.144	80
0.069	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-14A

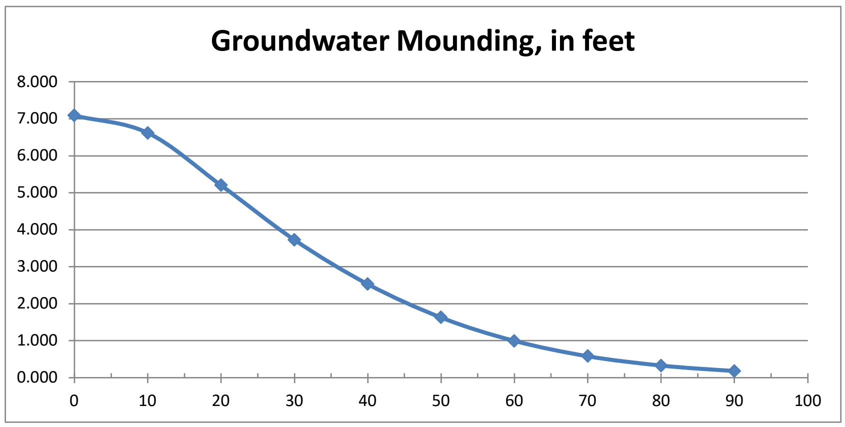
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
56.500	y	1/2 width of basin (y direction, in feet)
63.68	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.087	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.087	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.087	0
6.616	10
5.200	20
3.726	30
2.528	40
1.624	50
0.991	60
0.578	70
0.323	80
0.175	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-14B

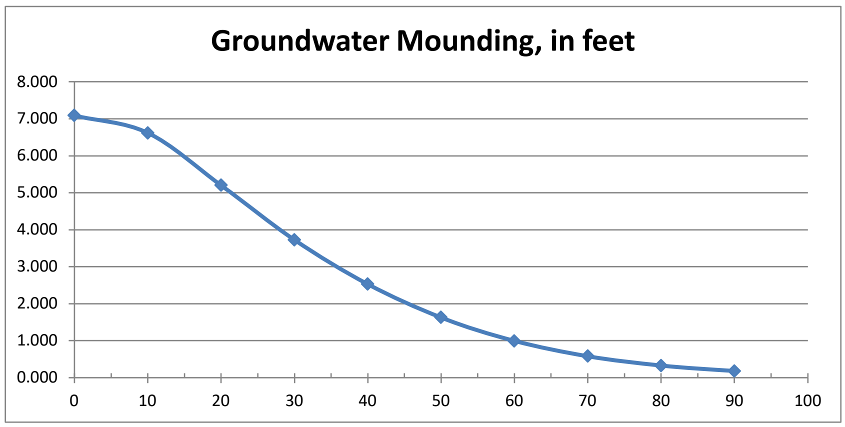
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
56.500	y	1/2 width of basin (y direction, in feet)
63.68	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.087	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.087	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.087	0
6.616	10
5.200	20
3.726	30
2.528	40
1.624	50
0.991	60
0.578	70
0.323	80
0.175	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-15A

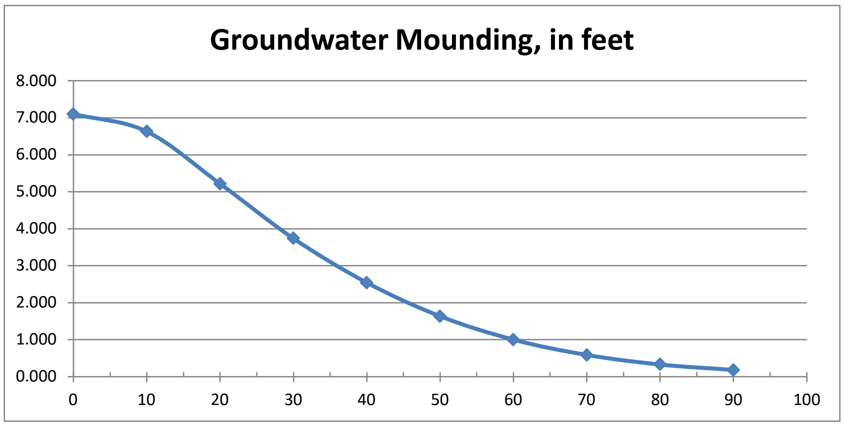
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
56.500	y	1/2 width of basin (y direction, in feet)
63.90	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.098	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.098	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.098	0
6.628	10
5.212	20
3.737	30
2.538	40
1.632	50
0.997	60
0.582	70
0.326	80
0.176	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-15B

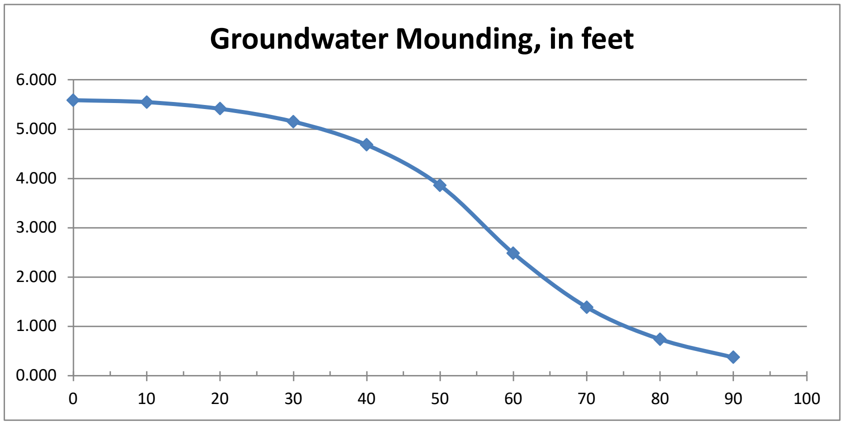
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
56.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
38.86	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.585	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.585	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.585	0
5.544	10
5.411	20
5.148	30
4.679	40
3.856	50
2.478	60
1.385	70
0.735	80
0.370	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-16A

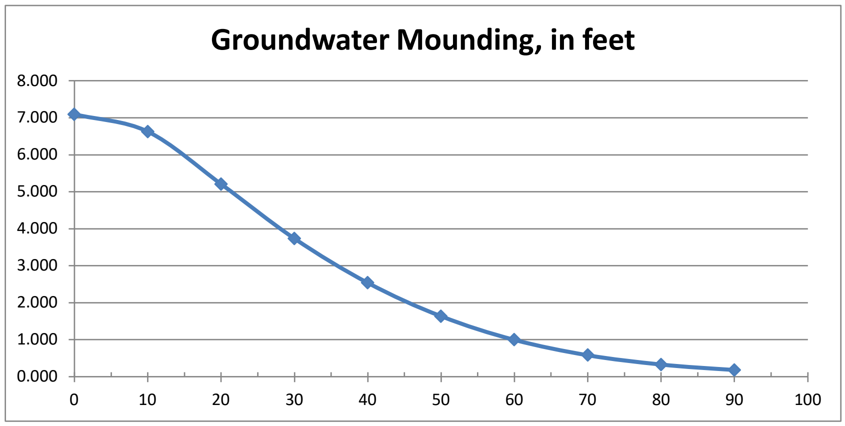
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
56.500	y	1/2 width of basin (y direction, in feet)
63.79	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.093	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.093	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.093	0
6.622	10
5.206	20
3.731	30
2.533	40
1.628	50
0.994	60
0.580	70
0.325	80
0.176	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-16B

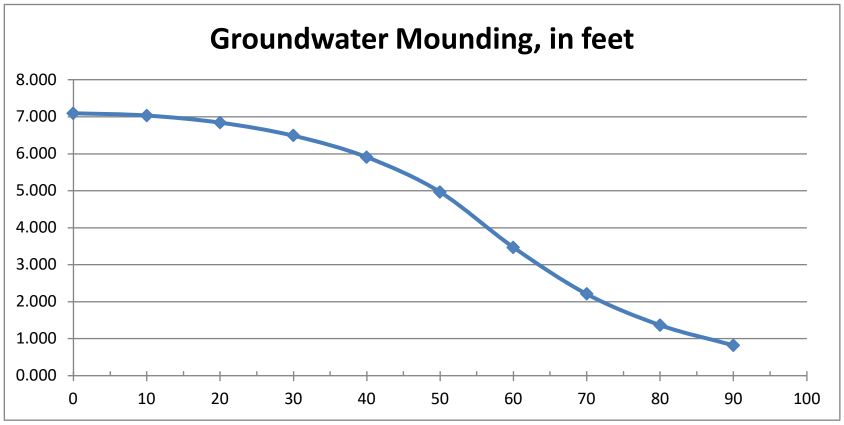
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
56.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
63.79	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.093	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.093	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.093	0
7.032	10
6.842	20
6.489	30
5.907	40
4.960	50
3.464	60
2.206	70
1.363	80
0.817	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-17A

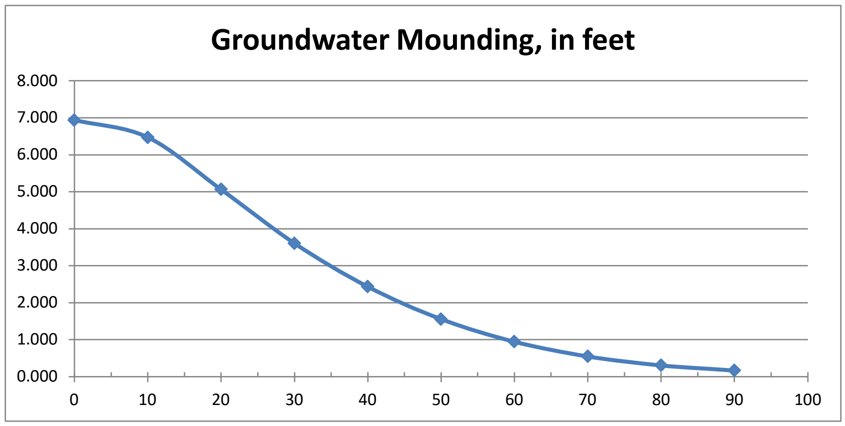
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
62.92	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.936	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.936	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.936	0
6.469	10
5.061	20
3.604	30
2.430	40
1.551	50
0.941	60
0.545	70
0.303	80
0.163	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-17B

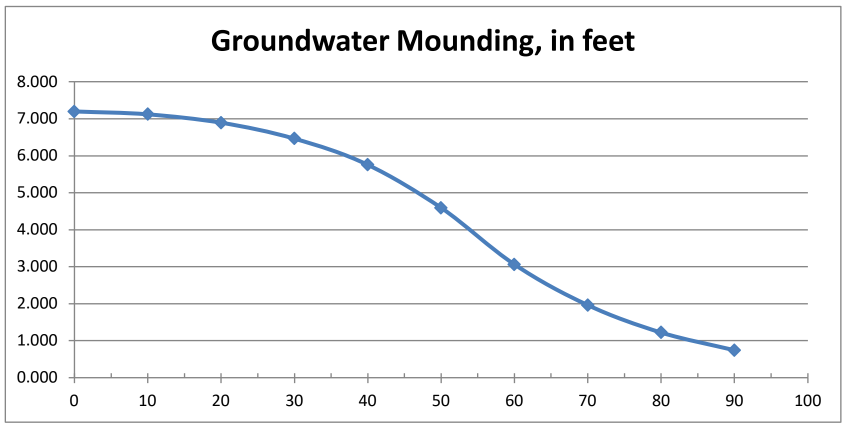
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
52.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
68.65	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.194	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.194	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.194	0
7.121	10
6.890	20
6.463	30
5.755	40
4.588	50
3.056	60
1.959	70
1.221	80
0.739	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-18A

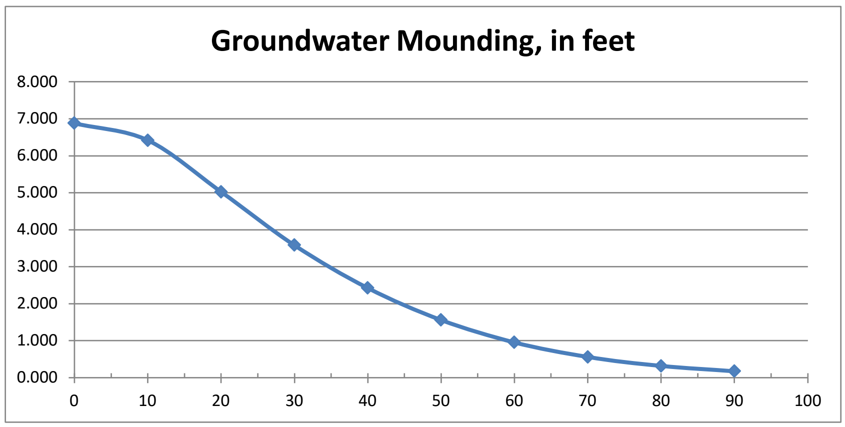
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
48.500	y	1/2 width of basin (y direction, in feet)
64.68	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.878	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.878	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.878	0
6.415	10
5.021	20
3.581	30
2.423	40
1.556	50
0.951	60
0.556	70
0.313	80
0.170	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-18B

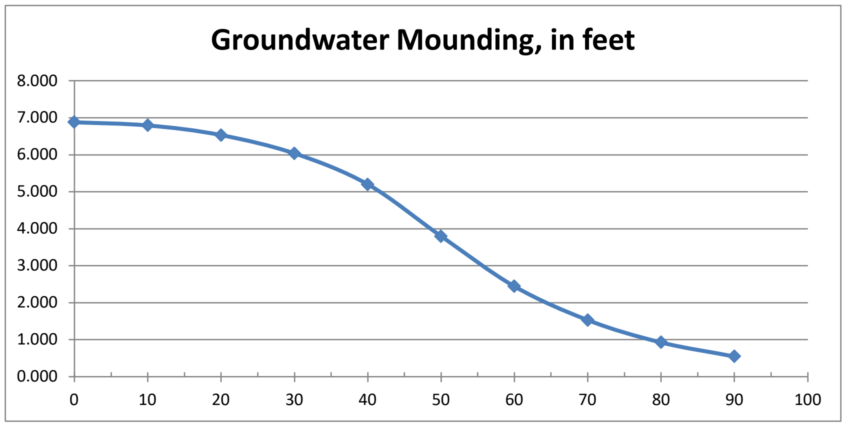
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
48.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
64.68	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.878	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.878	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.878	0
6.795	10
6.530	20
6.034	30
5.196	40
3.795	50
2.441	60
1.525	70
0.924	80
0.543	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-19A

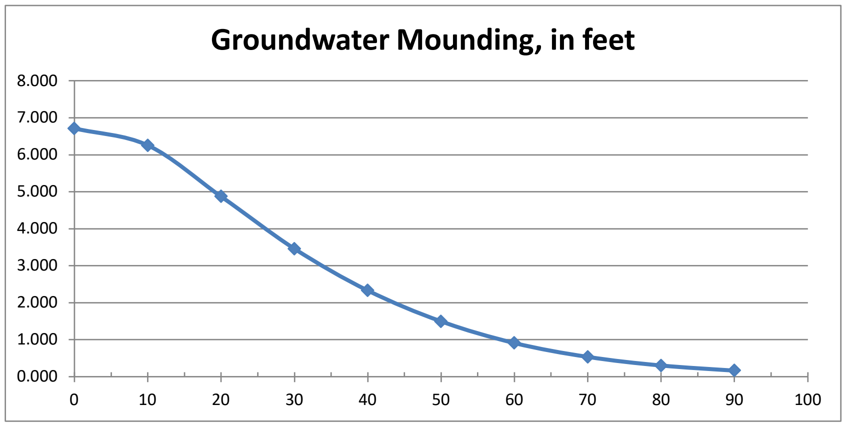
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
44.500	y	1/2 width of basin (y direction, in feet)
64.68	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.712	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.712	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.712	0
6.254	10
4.873	20
3.457	30
2.329	40
1.490	50
0.909	60
0.531	70
0.298	80
0.162	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-19B

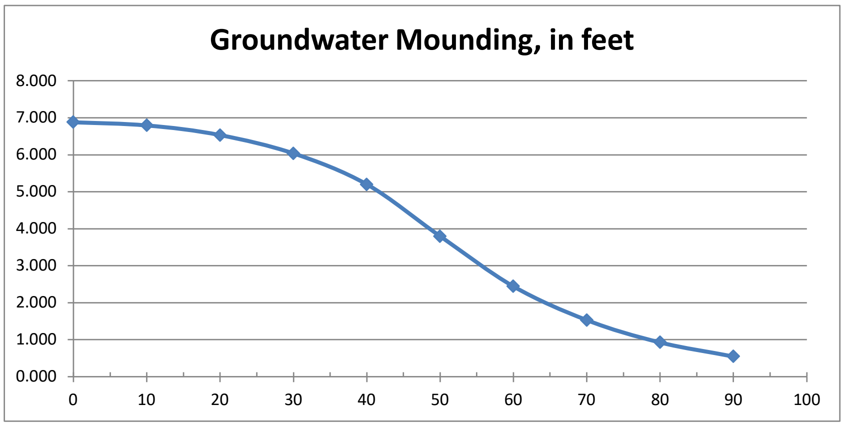
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
48.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
64.68	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.878	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.878	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.878	0
6.795	10
6.530	20
6.034	30
5.196	40
3.795	50
2.441	60
1.525	70
0.924	80
0.543	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-20A

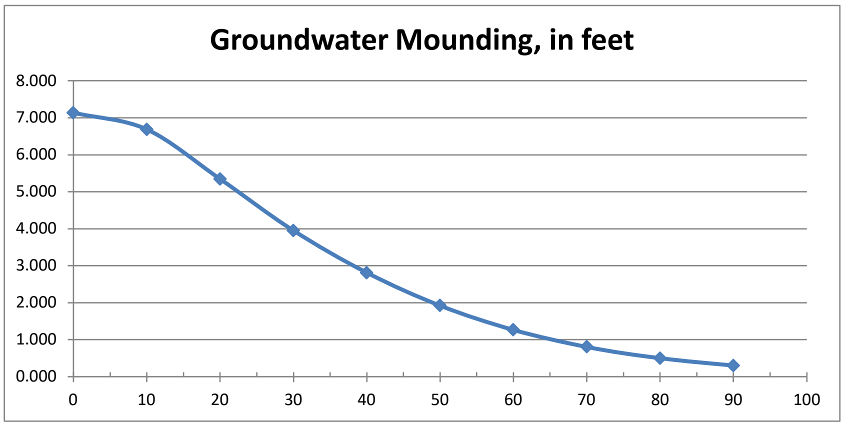
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
40.500	y	1/2 width of basin (y direction, in feet)
83.06	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.133	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.133	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.133	0
6.686	10
5.343	20
3.949	30
2.808	40
1.920	50
1.263	60
0.803	70
0.494	80
0.296	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-20B

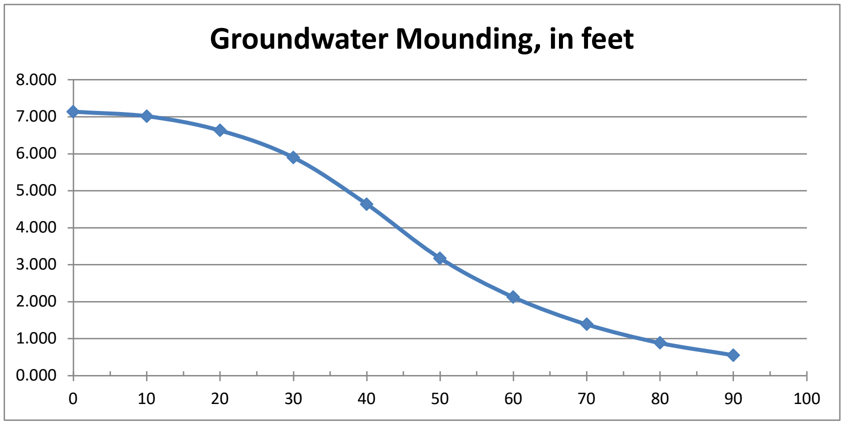
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
40.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
83.06	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.133	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.133	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.133	0
7.012	10
6.628	20
5.899	30
4.634	40
3.169	50
2.119	60
1.384	70
0.882	80
0.549	90

Re-Calculate Now



Disclaimer

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StormPod Infiltration Chamber BI-21A

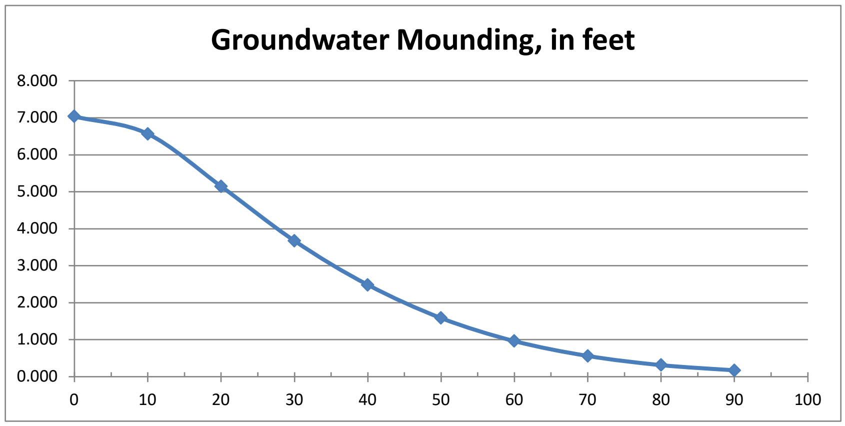
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
56.500	y	1/2 width of basin (y direction, in feet)
62.60	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.034	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.034	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.034	0
6.563	10
5.146	20
3.673	30
2.480	40
1.585	50
0.961	60
0.556	70
0.309	80
0.166	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-21B

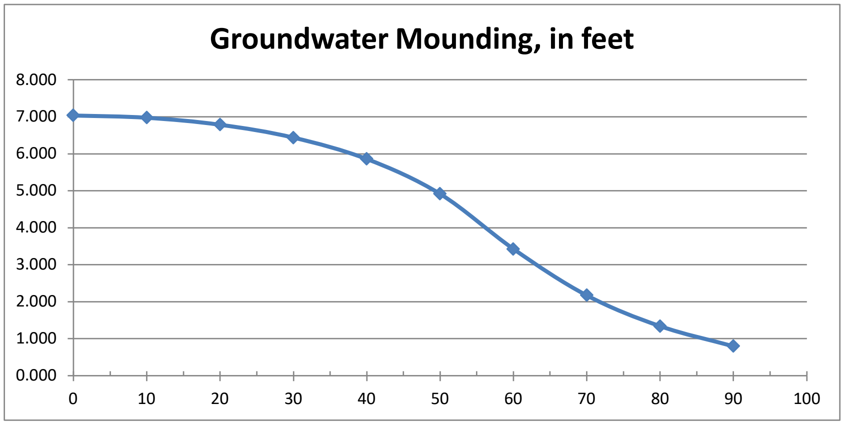
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
56.500	x	**1/2 length of basin (x direction, in feet)**
16.500	y	**1/2 width of basin (y direction, in feet)**
62.60	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

17.034	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
7.034	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.034	0
6.974	10
6.786	20
6.436	30
5.857	40
4.915	50
3.422	60
2.169	70
1.334	80
0.795	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-22A

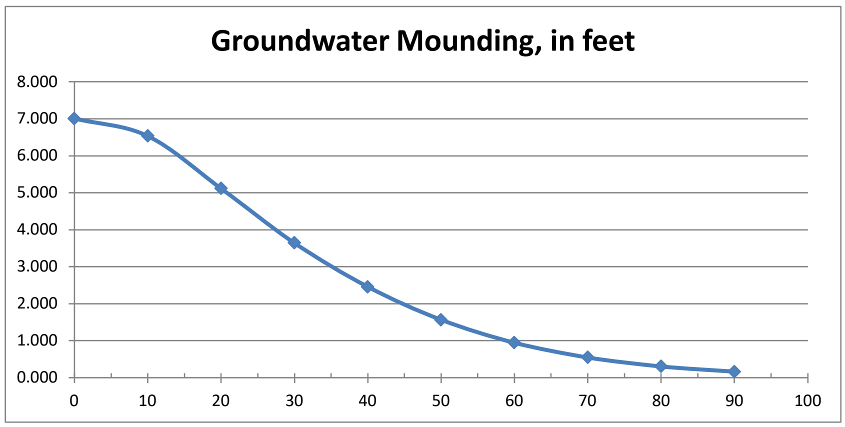
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
56.500	y	1/2 width of basin (y direction, in feet)
61.98	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.003	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.003	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.003	0
6.532	10
5.114	20
3.642	30
2.453	40
1.562	50
0.944	60
0.544	70
0.301	80
0.161	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-22B

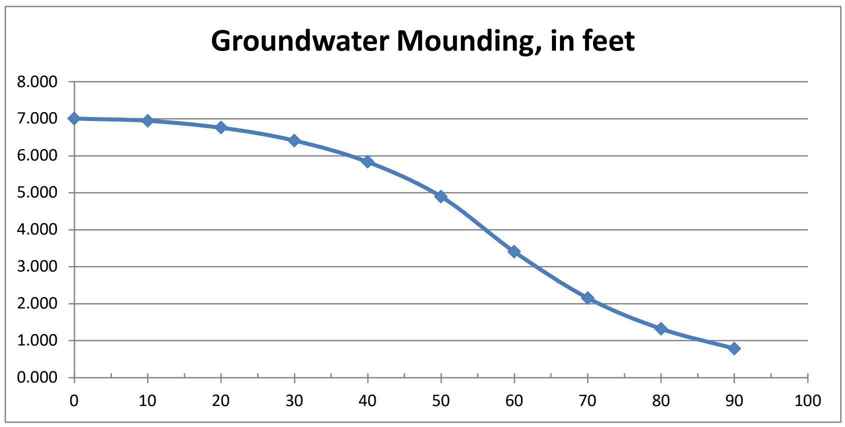
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
56.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
61.98	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.003	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.003	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.003	0
6.944	10
6.756	20
6.408	30
5.832	40
4.891	50
3.400	60
2.151	70
1.319	80
0.784	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-23A

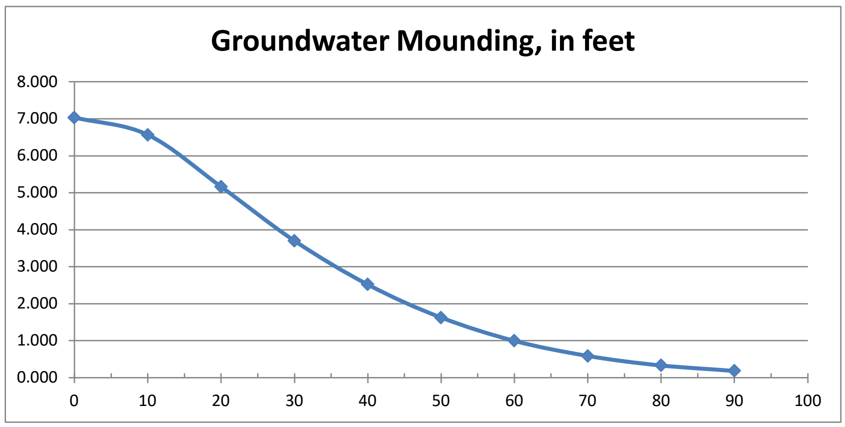
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
64.99	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.032	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.032	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.032	0
6.565	10
5.160	20
3.700	30
2.517	40
1.623	50
0.996	60
0.584	70
0.329	80
0.179	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-23B

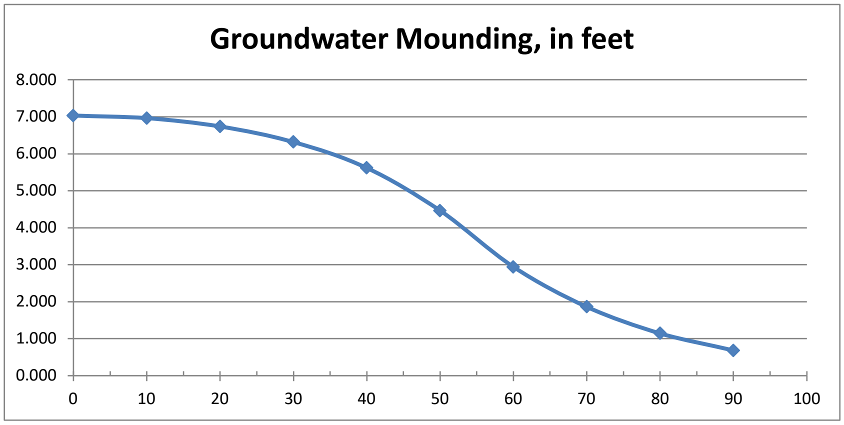
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
52.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
64.99	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.032	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.032	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.032	0
6.961	10
6.735	20
6.315	30
5.617	40
4.459	50
2.938	60
1.858	70
1.141	80
0.679	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-24A

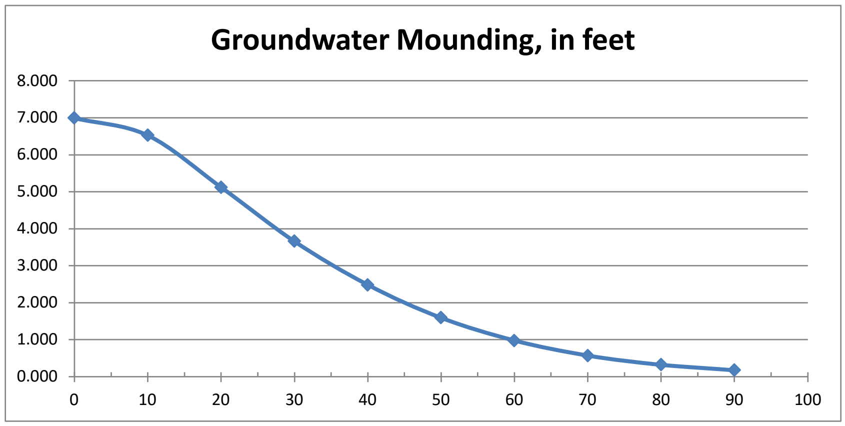
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
64.12	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.992	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.992	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.992	0
6.525	10
5.119	20
3.660	30
2.480	40
1.593	50
0.973	60
0.568	70
0.318	80
0.172	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-24B

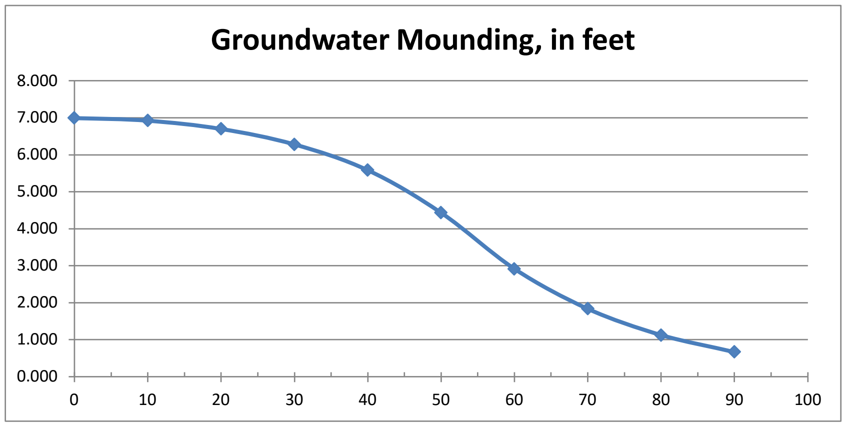
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
52.500	x	**1/2 length of basin (x direction, in feet)**
16.500	y	**1/2 width of basin (y direction, in feet)**
64.12	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

16.992	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.992	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.992	0
6.921	10
6.697	20
6.279	30
5.583	40
4.428	50
2.910	60
1.834	70
1.122	80
0.665	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-25A

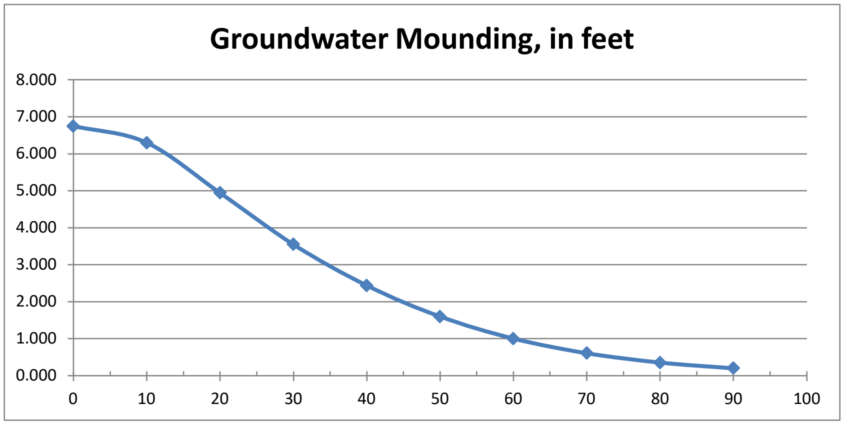
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
40.500	y	1/2 width of basin (y direction, in feet)
71.02	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.747	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.747	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.747	0
6.297	10
4.939	20
3.547	30
2.433	40
1.594	50
1.000	60
0.603	70
0.351	80
0.198	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-25B

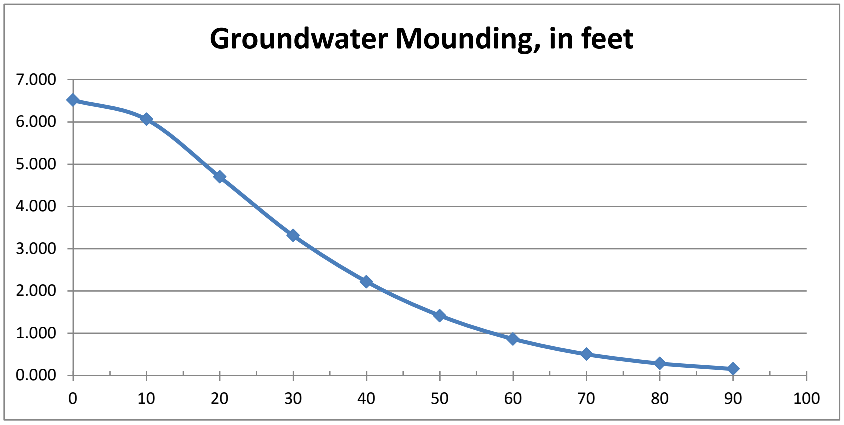
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
40.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
64.56	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.511	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.511	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.511	0
6.059	10
4.694	20
3.307	30
2.215	40
1.410	50
0.857	60
0.499	70
0.280	80
0.152	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-26A

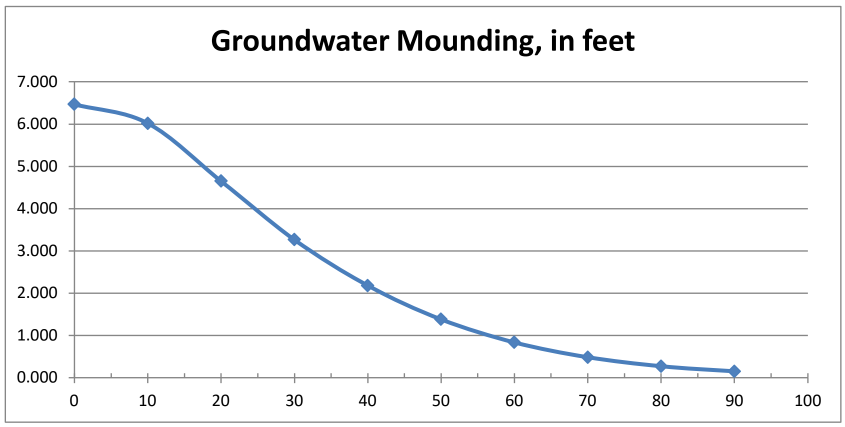
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
40.500	y	1/2 width of basin (y direction, in feet)
63.44	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.468	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.468	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.468	0
6.015	10
4.650	20
3.264	30
2.176	40
1.378	50
0.833	60
0.482	70
0.268	80
0.145	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-26B

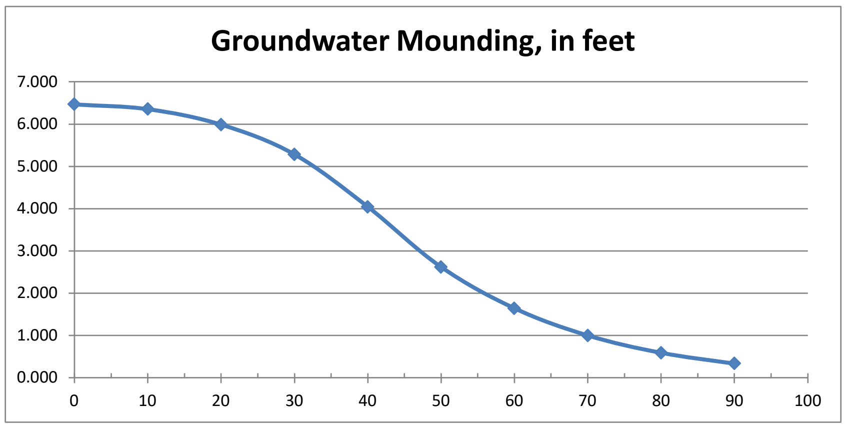
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
40.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
63.44	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.468	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.468	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.468	0
6.353	10
5.986	20
5.282	30
4.041	40
2.613	50
1.637	60
0.994	70
0.585	80
0.333	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-27A

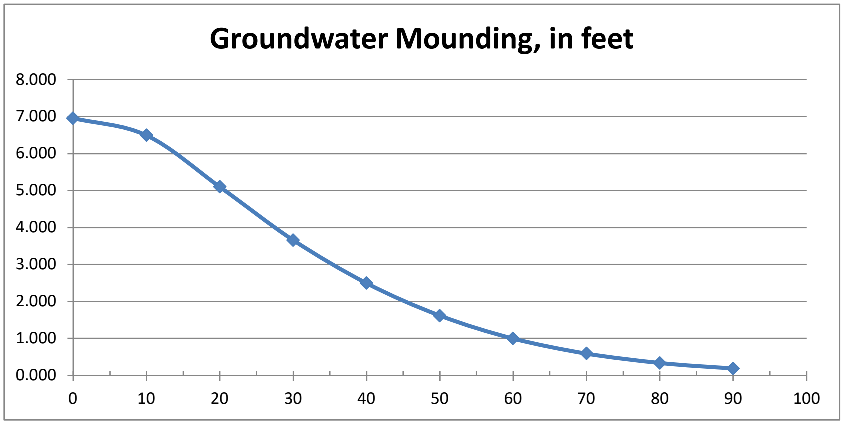
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
48.500	y	1/2 width of basin (y direction, in feet)
66.41	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.952	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.952	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.952	0
6.490	10
5.097	20
3.656	30
2.491	40
1.613	50
0.995	60
0.587	70
0.334	80
0.183	90

Re-Calculate Now



Disclaimer

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StormPod Infiltration Chamber BI-27B

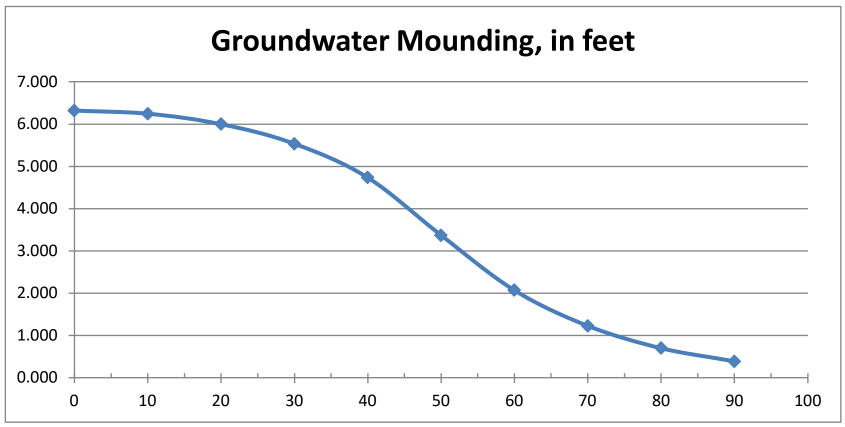
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
48.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
52.98	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.318	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.318	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.318	0
6.241	10
5.997	20
5.531	30
4.731	40
3.366	50
2.066	60
1.221	70
0.695	80
0.382	90

Re-Calculate Now



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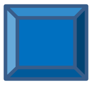
StormPod Infiltration Chamber BI-28A

Input Values

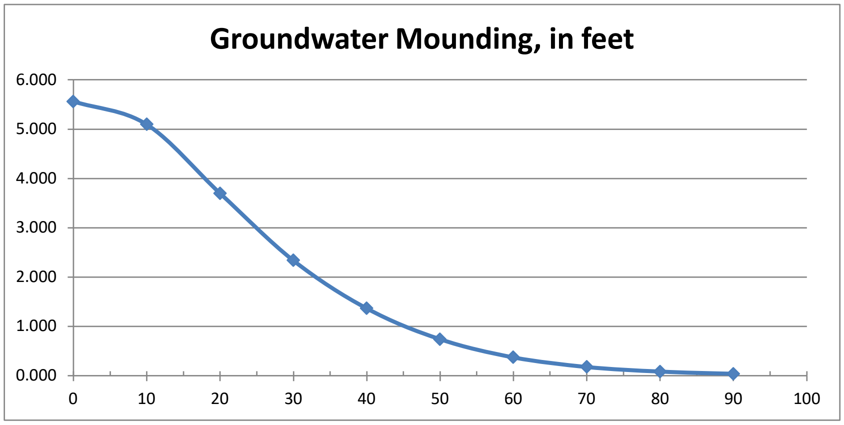
0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
48.500	y	1/2 width of basin (y direction, in feet)
40.32	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.560	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.560	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.560	0
5.095	10
3.695	20
2.335	30
1.361	40
0.735	50
0.371	60
0.176	70
0.079	80
0.035	90



Re-Calculate Now



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StormPod Infiltration Chamber BI-28B

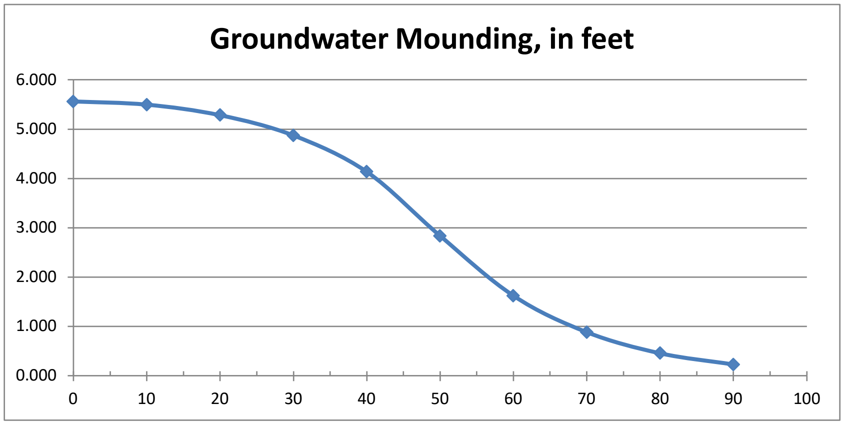
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
48.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
40.32	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.560	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.560	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.560	0
5.495	10
5.284	20
4.871	30
4.133	40
2.832	50
1.617	60
0.878	70
0.454	80
0.223	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-29A

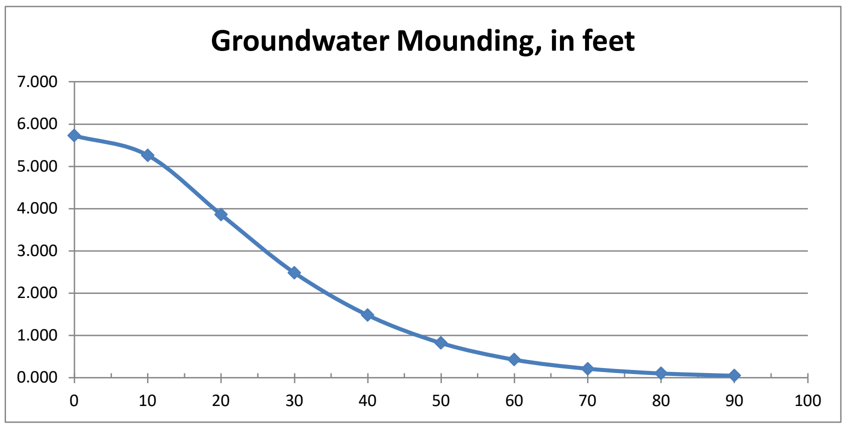
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
48.500	y	1/2 width of basin (y direction, in feet)
42.80	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.724	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.724	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.724	0
5.258	10
3.855	20
2.480	30
1.477	40
0.818	50
0.424	60
0.207	70
0.096	80
0.043	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-29B

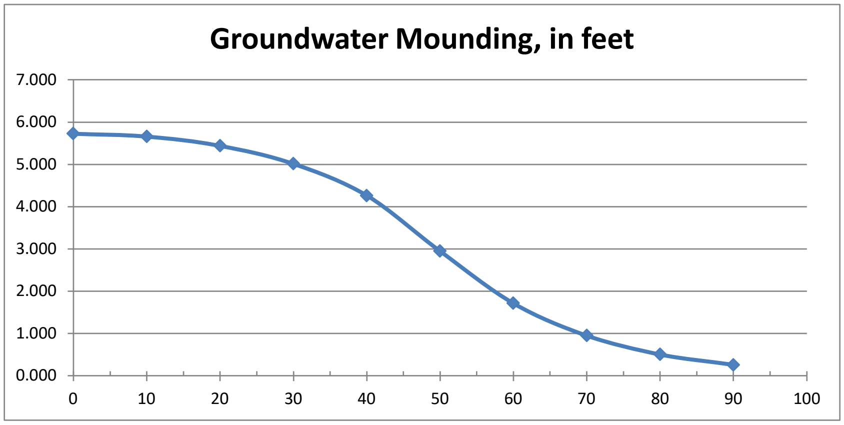
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
48.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
42.80	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.724	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.724	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.724	0
5.656	10
5.437	20
5.012	30
4.259	40
2.943	50
1.709	60
0.946	70
0.500	80
0.252	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-30A

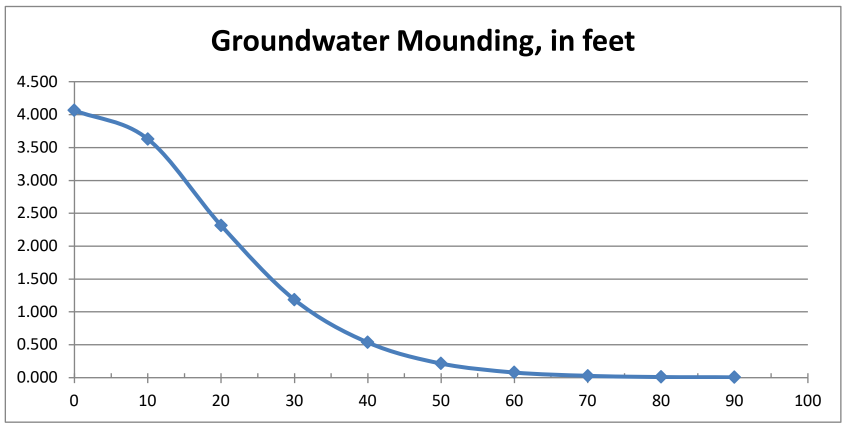
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
22.65	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

14.065	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
4.065	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
4.065	0
3.629	10
2.313	20
1.184	30
0.534	40
0.214	50
0.077	60
0.026	70
0.009	80
0.004	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-30B

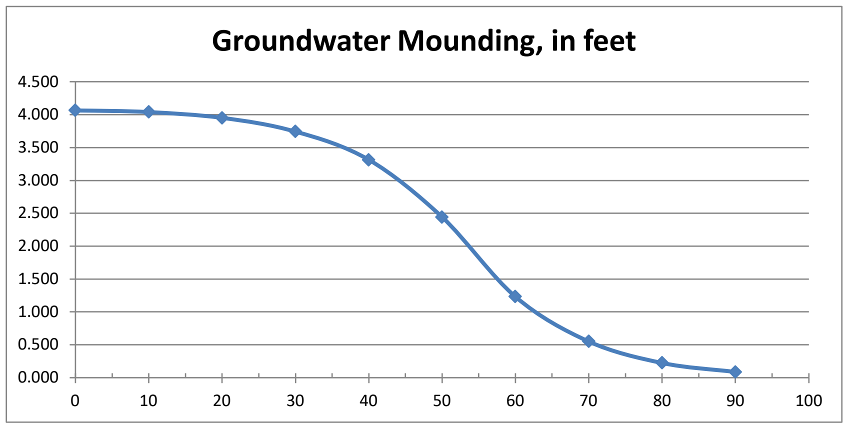
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
52.500	x	**1/2 length of basin (x direction, in feet)**
16.500	y	**1/2 width of basin (y direction, in feet)**
22.65	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

14.065	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
4.065	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
4.065	0
4.041	10
3.951	20
3.744	30
3.312	40
2.440	50
1.230	60
0.550	70
0.224	80
0.084	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-32A

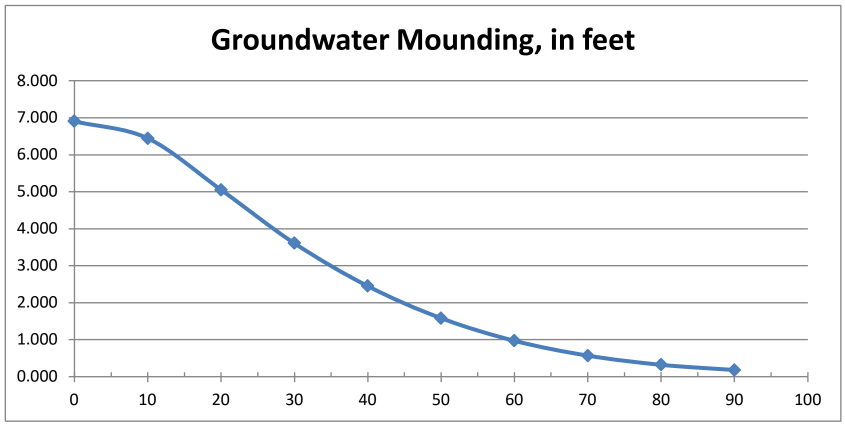
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
48.500	y	1/2 width of basin (y direction, in feet)
65.29	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.905	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.905	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.905	0
6.442	10
5.048	20
3.608	30
2.447	40
1.576	50
0.967	60
0.567	70
0.320	80
0.175	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-32B

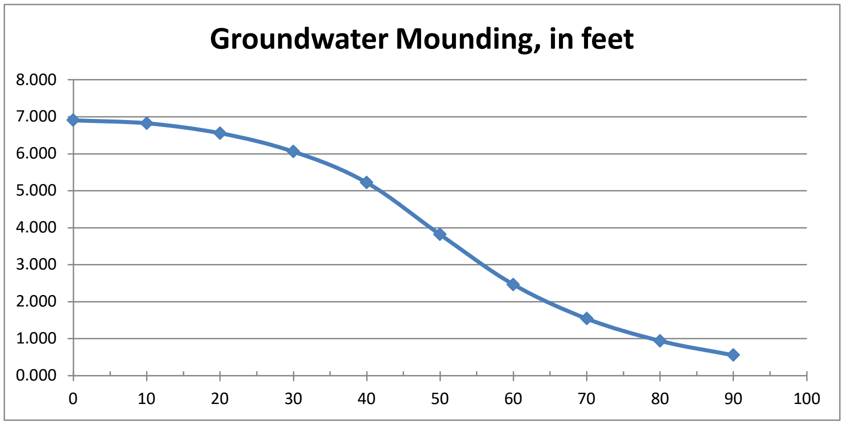
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
48.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
65.29	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.905	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.905	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.905	0
6.821	10
6.555	20
6.058	30
5.218	40
3.816	50
2.460	60
1.540	70
0.936	80
0.551	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-33A

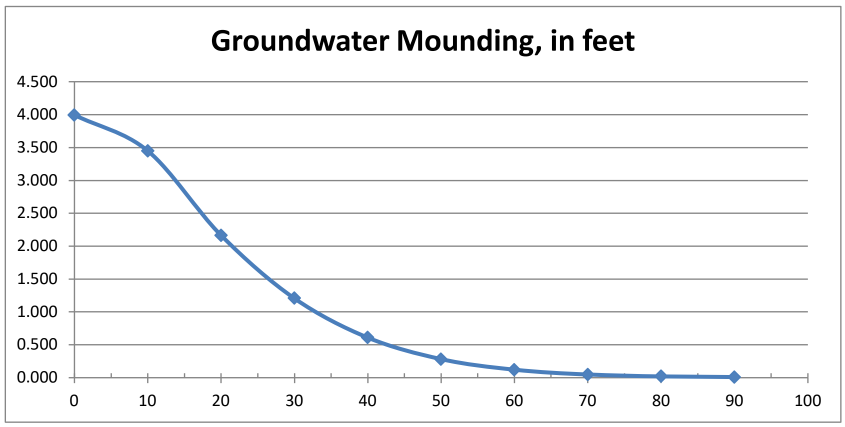
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
12.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
29.87	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.993	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.993	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
3.993	0
3.448	10
2.162	20
1.206	30
0.608	40
0.280	50
0.118	60
0.047	70
0.018	80
0.008	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-33B

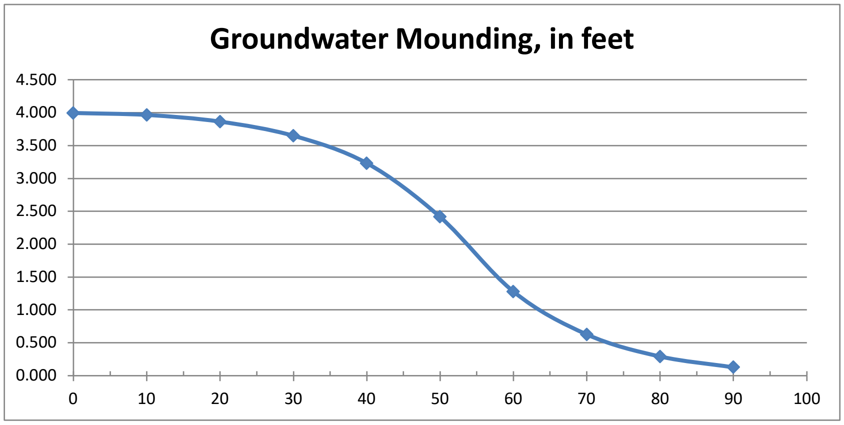
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
52.500	x	1/2 length of basin (x direction, in feet)
12.500	y	1/2 width of basin (y direction, in feet)
29.87	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.993	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.993	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
3.993	0
3.964	10
3.863	20
3.648	30
3.230	40
2.414	50
1.277	60
0.626	70
0.290	80
0.126	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-34A

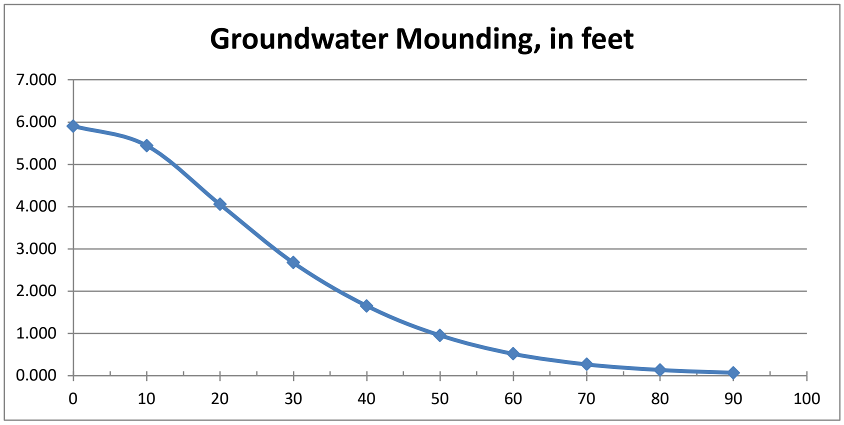
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
44.500	y	1/2 width of basin (y direction, in feet)
47.64	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.903	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.903	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.903	0
5.442	10
4.050	20
2.672	30
1.645	40
0.948	50
0.514	60
0.264	70
0.130	80
0.061	90

Re-Calculate Now



Disclaimer

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StormPod Infiltration Chamber BI-34B

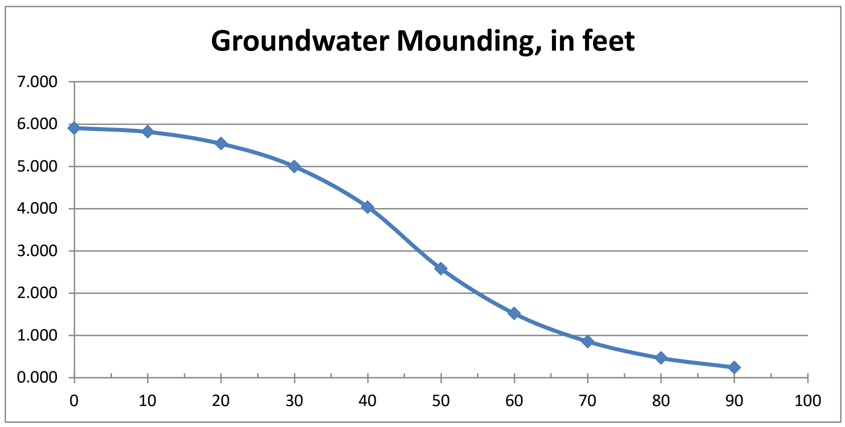
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
44.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
47.64	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.903	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.903	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.903	0
5.816	10
5.534	20
4.991	30
4.031	40
2.574	50
1.512	60
0.852	70
0.461	80
0.239	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-35A

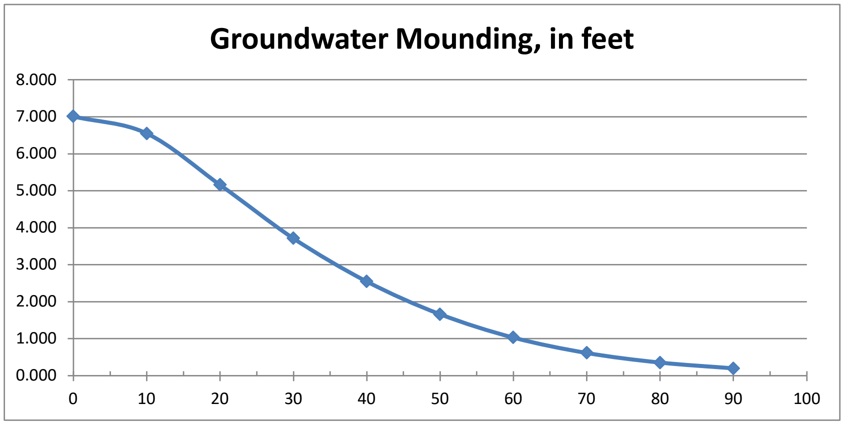
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
48.500	y	1/2 width of basin (y direction, in feet)
67.76	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.009	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.009	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.009	0
6.547	10
5.156	20
3.713	30
2.544	40
1.657	50
1.029	60
0.612	70
0.351	80
0.194	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-35B

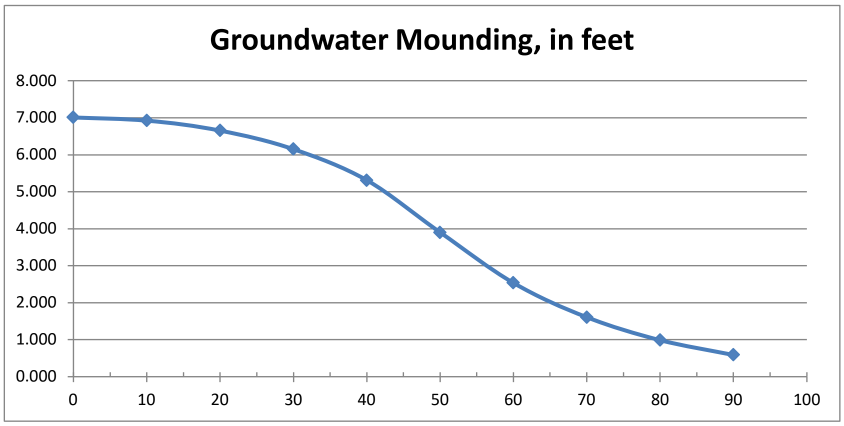
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
48.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
67.76	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

17.009	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
7.009	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
7.009	0
6.924	10
6.655	20
6.153	30
5.307	40
3.900	50
2.534	60
1.602	70
0.984	80
0.586	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-36A

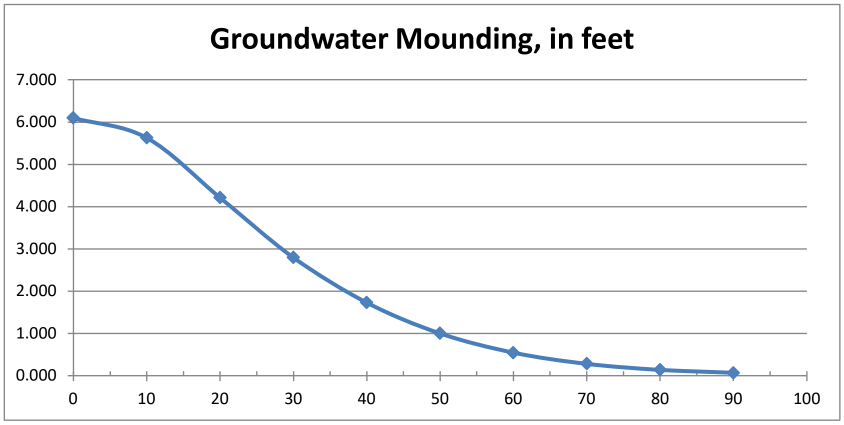
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
47.28	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.095	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.095	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.095	0
5.625	10
4.209	20
2.794	30
1.727	40
0.997	50
0.541	60
0.278	70
0.136	80
0.064	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-36B

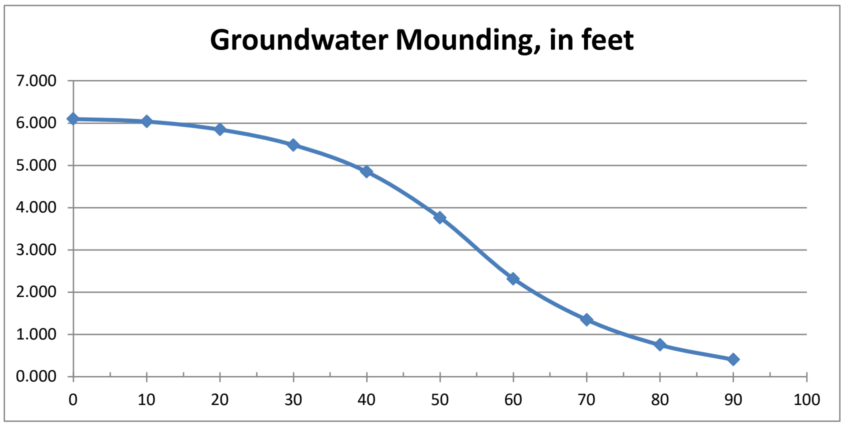
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
52.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
47.28	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.095	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.095	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.095	0
6.036	10
5.845	20
5.479	30
4.846	40
3.758	50
2.313	60
1.344	70
0.749	80
0.400	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-39A

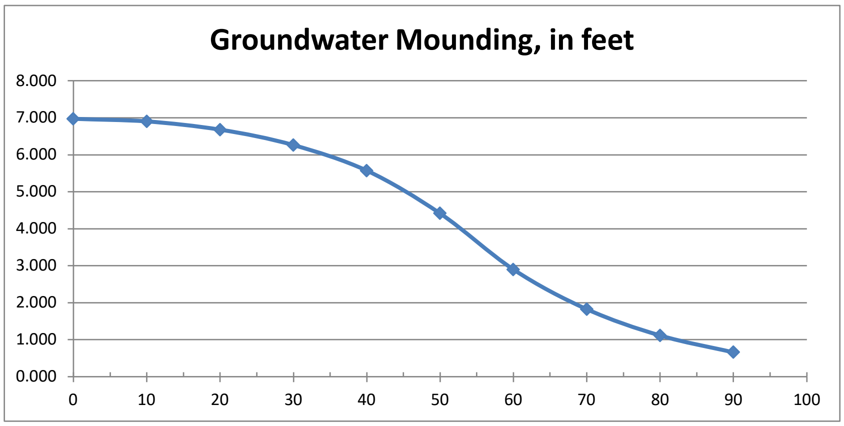
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
63.68	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.972	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.972	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.972	0
6.901	10
6.677	20
6.261	30
5.566	40
4.412	50
2.895	60
1.822	70
1.112	80
0.658	90

Re-Calculate Now



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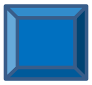
StormPod Infiltration Chamber BI-39B

Input Values

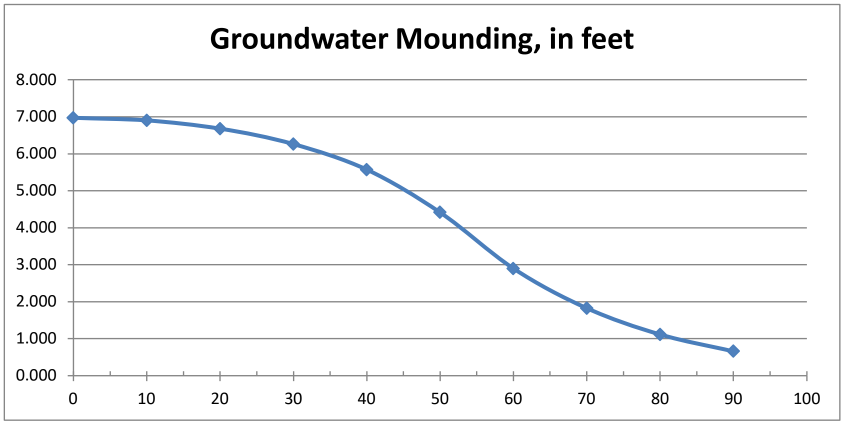
0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
52.500	x	**1/2 length of basin (x direction, in feet)**
16.500	y	**1/2 width of basin (y direction, in feet)**
63.68	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

16.972	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.972	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.972	0
6.901	10
6.677	20
6.261	30
5.566	40
4.412	50
2.895	60
1.822	70
1.112	80
0.658	90



Re-Calculate Now



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StormPod Infiltration Chamber BI-40A

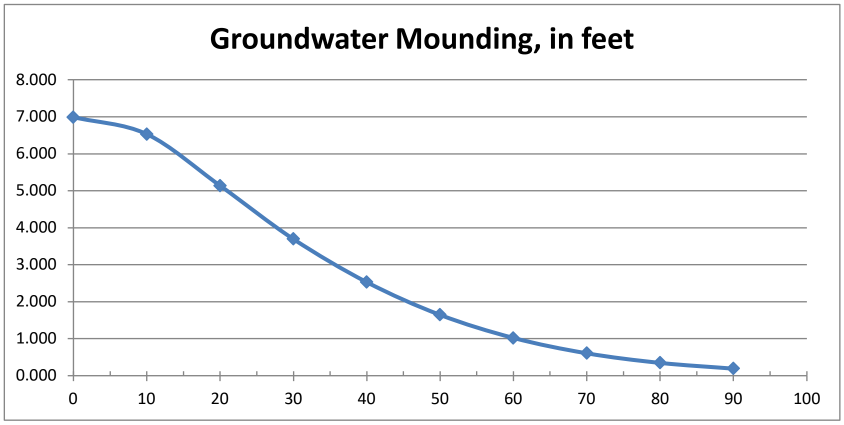
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
48.500	y	1/2 width of basin (y direction, in feet)
67.29	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.990	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.990	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.990	0
6.527	10
5.136	20
3.694	30
2.526	40
1.642	50
1.017	60
0.604	70
0.345	80
0.190	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-40B

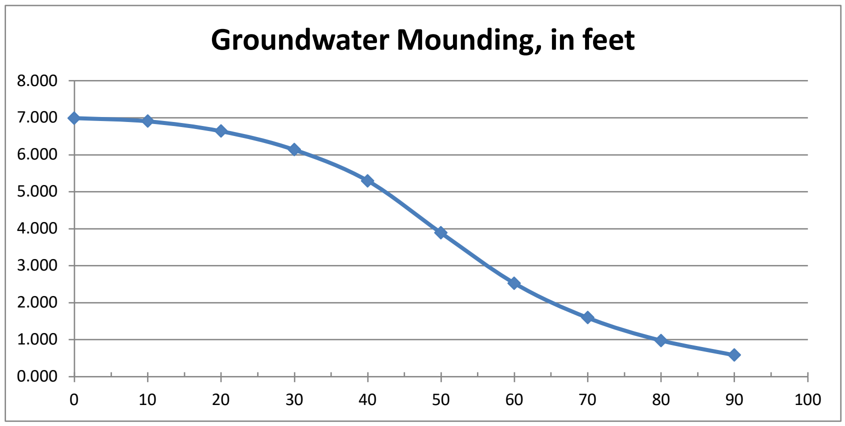
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
48.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
67.29	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.990	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.990	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.990	0
6.905	10
6.636	20
6.135	30
5.291	40
3.884	50
2.520	60
1.591	70
0.975	80
0.580	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-41A

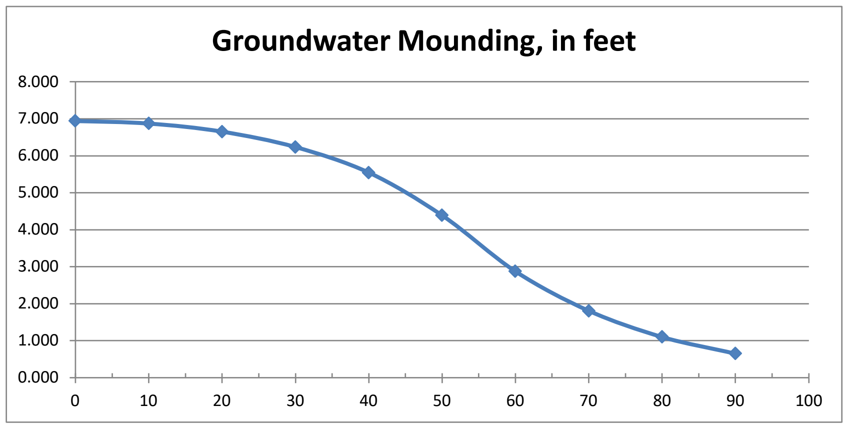
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
52.500	y	1/2 width of basin (y direction, in feet)
63.03	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.942	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.942	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.942	0
6.871	10
6.648	20
6.233	30
5.540	40
4.389	50
2.874	60
1.804	70
1.098	80
0.647	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-41B

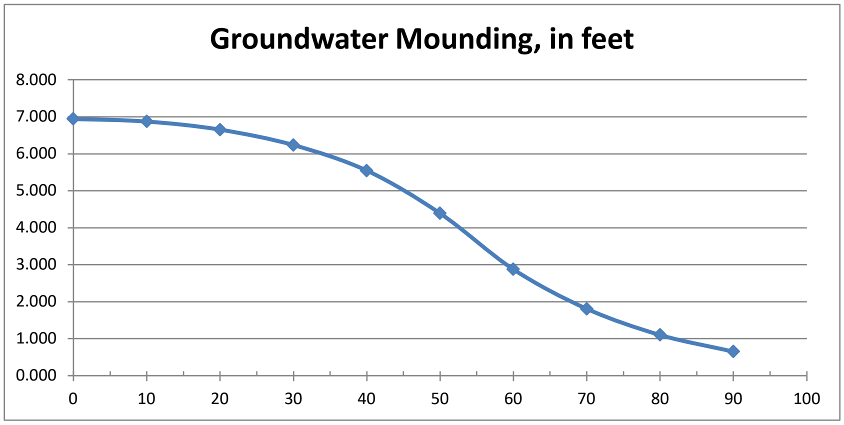
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
52.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
63.03	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.942	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.942	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.942	0
6.871	10
6.648	20
6.233	30
5.540	40
4.389	50
2.874	60
1.804	70
1.098	80
0.647	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-42A

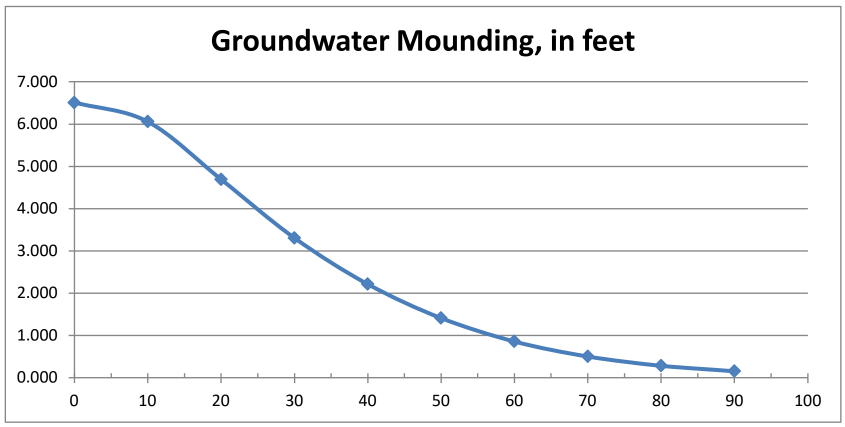
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
40.500	y	1/2 width of basin (y direction, in feet)
64.48	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.508	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.508	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.508	0
6.056	10
4.692	20
3.304	30
2.212	40
1.408	50
0.856	60
0.498	70
0.279	80
0.152	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-41B

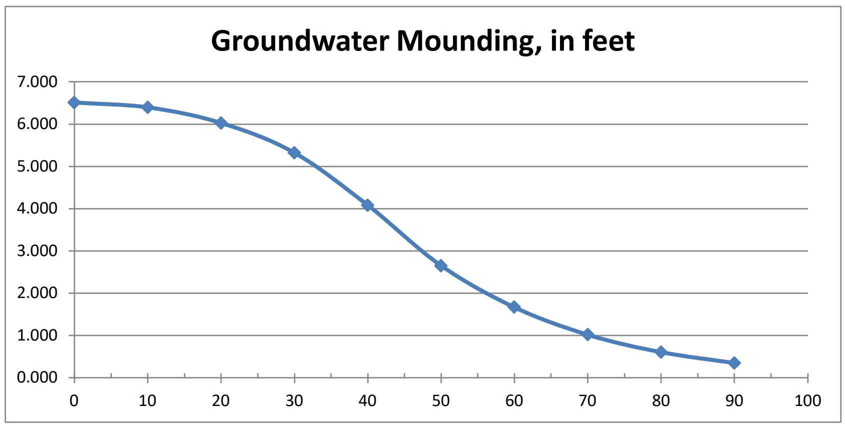
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
40.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
64.48	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.508	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.508	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.508	0
6.393	10
6.024	20
5.318	30
4.076	40
2.645	50
1.664	60
1.015	70
0.600	80
0.344	90

Re-Calculate Now



Disclaimer

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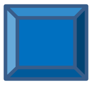
StormPod Infiltration Chamber BI-43A

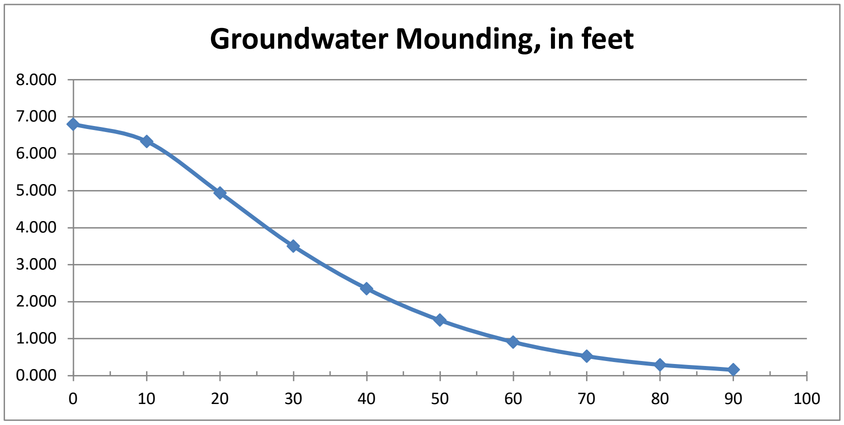
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
48.500	y	1/2 width of basin (y direction, in feet)
62.80	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)
16.795	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.795	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.795	0
6.332	10
4.936	20
3.498	30
2.348	40
1.494	50
0.904	60
0.523	70
0.290	80
0.156	90



Re-Calculate Now



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StormPod Infiltration Chamber BI-43B

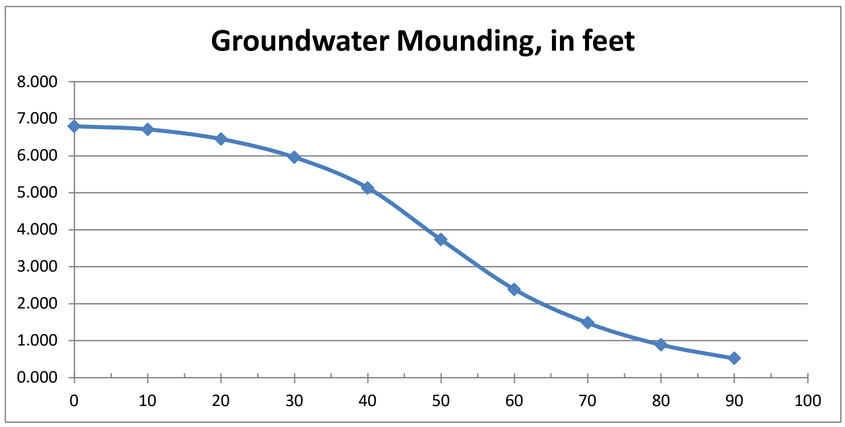
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
48.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
62.80	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.795	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.795	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.795	0
6.713	10
6.450	20
5.959	30
5.126	40
3.730	50
2.383	60
1.477	70
0.887	80
0.516	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-44A

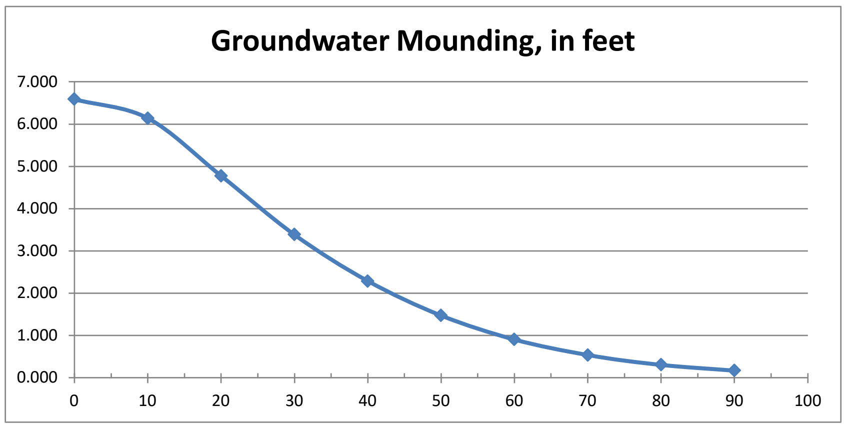
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
16.500	x	**1/2 length of basin (x direction, in feet)**
40.500	y	**1/2 width of basin (y direction, in feet)**
66.56	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

16.587	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.587	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.587	0
6.135	10
4.773	20
3.383	30
2.284	40
1.468	50
0.902	60
0.531	70
0.302	80
0.166	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-44B

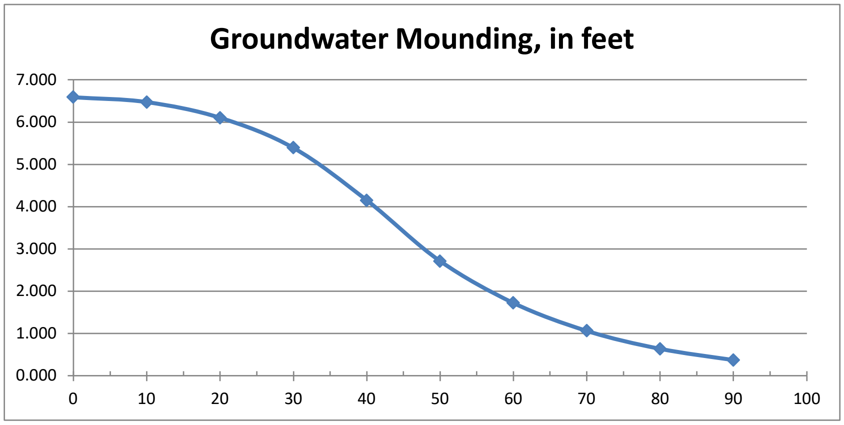
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
40.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
66.56	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.587	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.587	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.587	0
6.471	10
6.099	20
5.390	30
4.144	40
2.708	50
1.718	60
1.057	70
0.631	80
0.366	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-45A

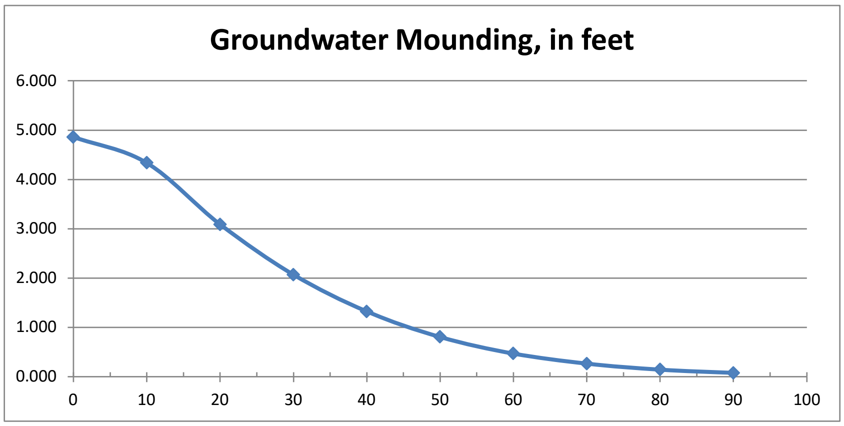
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
12.500	x	1/2 length of basin (x direction, in feet)
33.000	y	1/2 width of basin (y direction, in feet)
59.43	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

14.857	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
4.857	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
4.857	0
4.335	10
3.086	20
2.067	30
1.319	40
0.803	50
0.468	60
0.262	70
0.141	80
0.074	90

Re-Calculate Now



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StormPod Infiltration Chamber BI-45B

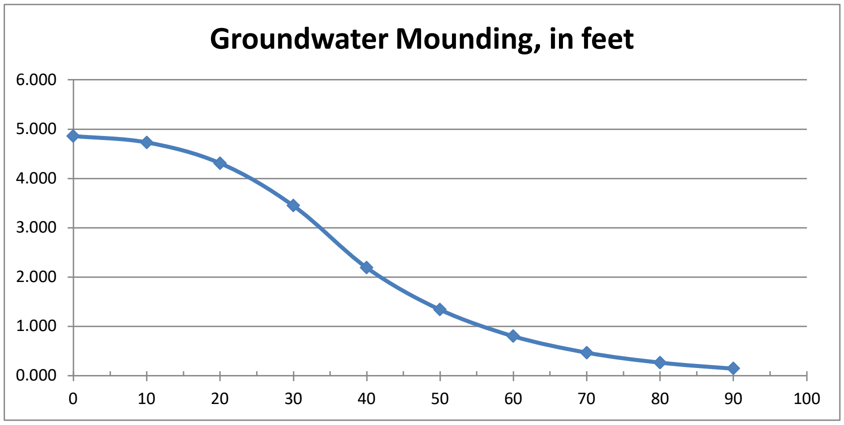
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
33.000	x	**1/2 length of basin (x direction, in feet)**
12.500	y	**1/2 width of basin (y direction, in feet)**
59.43	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

14.857	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
4.857	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
4.857	0
4.729	10
4.307	20
3.446	30
2.187	40
1.337	50
0.799	60
0.463	70
0.261	80
0.143	90

Re-Calculate Now



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StormPod Infiltration Chamber CI-1A

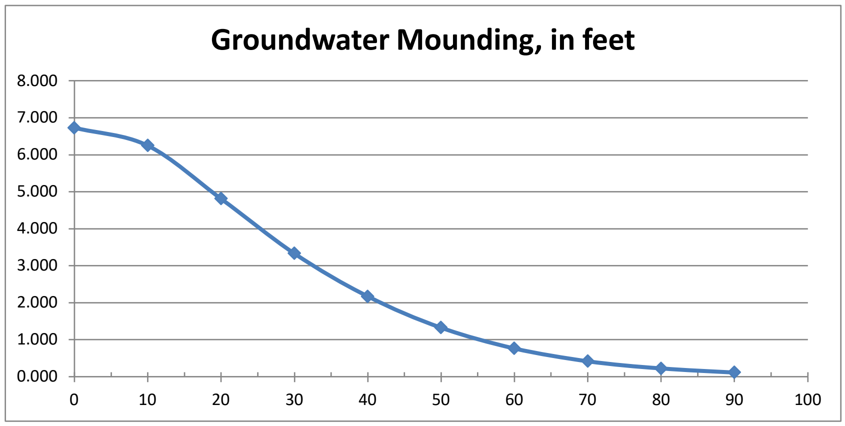
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
64.500	y	1/2 width of basin (y direction, in feet)
54.16	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.727	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.727	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.727	0
6.248	10
4.810	20
3.332	30
2.165	40
1.321	50
0.761	60
0.416	70
0.217	80
0.109	90

Re-Calculate Now



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StormPod Infiltration Chamber CI-1B

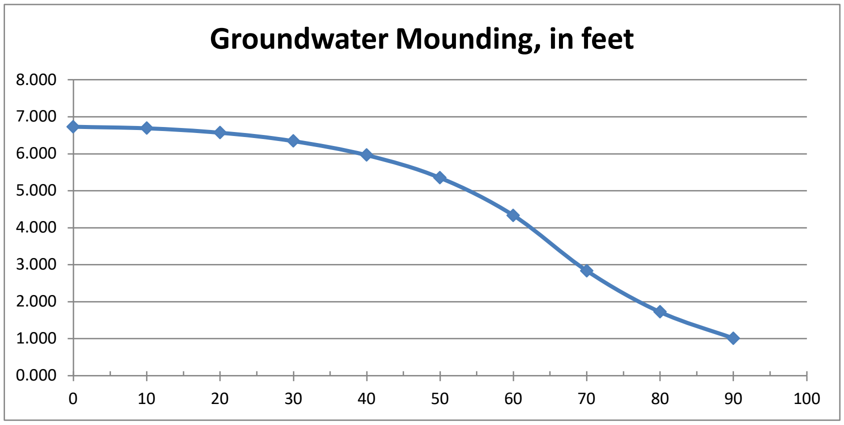
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
64.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
54.16	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.727	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.727	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.727	0
6.689	10
6.568	20
6.341	30
5.962	40
5.347	50
4.331	60
2.831	70
1.720	80
1.008	90

Re-Calculate Now



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StormPod Infiltration Chamber CI-2A

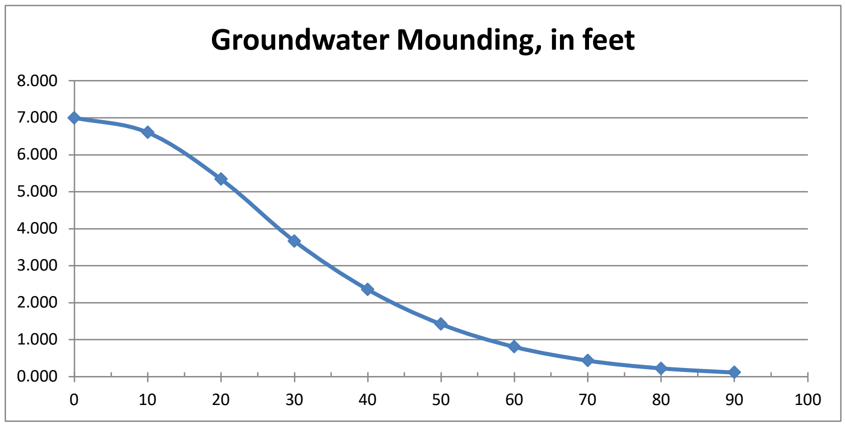
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
20.500	x	1/2 length of basin (x direction, in feet)
44.500	y	1/2 width of basin (y direction, in feet)
51.39	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.998	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.998	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.998	0
6.602	10
5.338	20
3.665	30
2.354	40
1.417	50
0.803	60
0.432	70
0.222	80
0.110	90

Re-Calculate Now



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StormPod Infiltration Chamber CI-2B

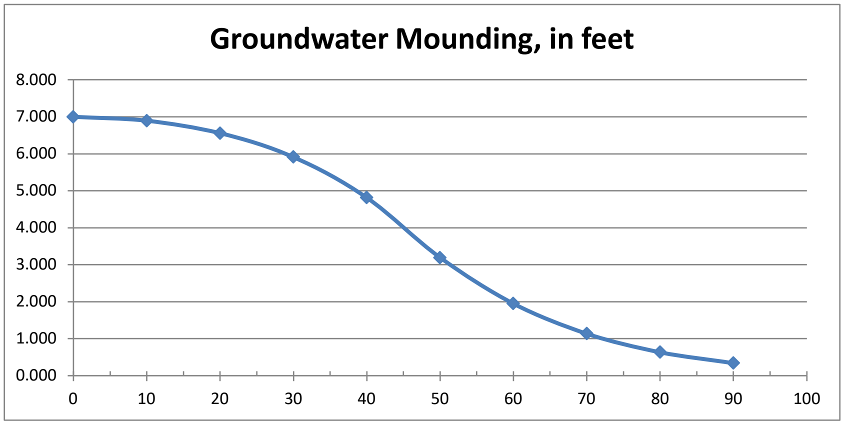
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
44.500	x	**1/2 length of basin (x direction, in feet)**
20.500	y	**1/2 width of basin (y direction, in feet)**
51.39	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

16.998	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.998	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.998	0
6.892	10
6.553	20
5.911	30
4.811	40
3.189	50
1.947	60
1.134	70
0.632	80
0.338	90

Re-Calculate Now



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StormPod Infiltration Chamber CI-3A

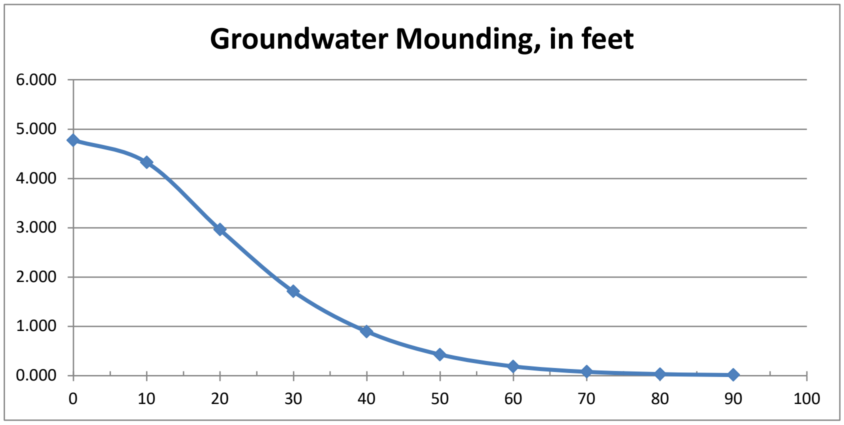
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
44.500	y	1/2 width of basin (y direction, in feet)
30.86	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

14.773	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
4.773	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
4.773	0
4.322	10
2.959	20
1.706	30
0.890	40
0.424	50
0.186	60
0.076	70
0.029	80
0.012	90

Re-Calculate Now



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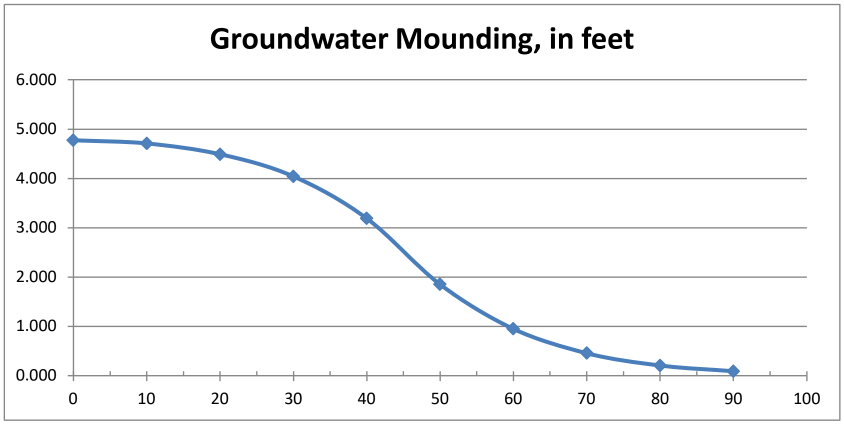
StormPod Infiltration Chamber CI-3B

Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
44.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
30.86	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)
14.773	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
4.773	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
4.773	0
4.708	10
4.488	20
4.038	30
3.187	40
1.849	50
0.948	60
0.455	70
0.204	80
0.086	90

Re-Calculate Now



Disclaimer

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StormPod Infiltration Chamber CI-4A

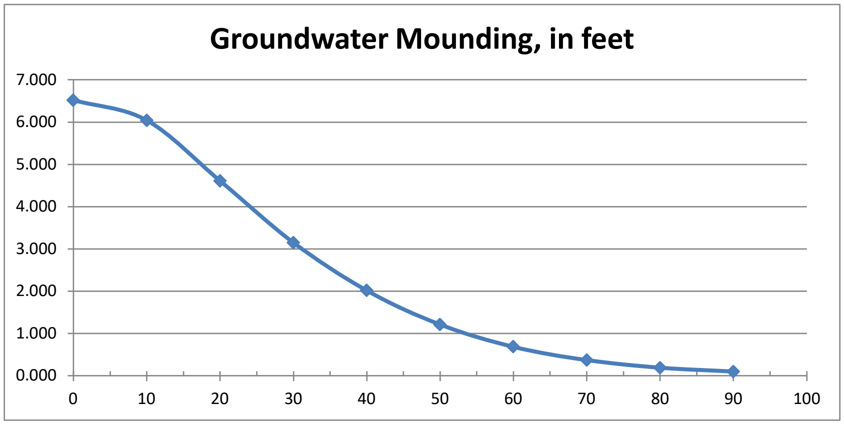
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
60.500	y	1/2 width of basin (y direction, in feet)
51.69	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

16.515	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
6.515	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.515	0
6.039	10
4.607	20
3.147	30
2.012	40
1.205	50
0.681	60
0.364	70
0.186	80
0.092	90

Re-Calculate Now



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StormPod Infiltration Chamber CI-4B

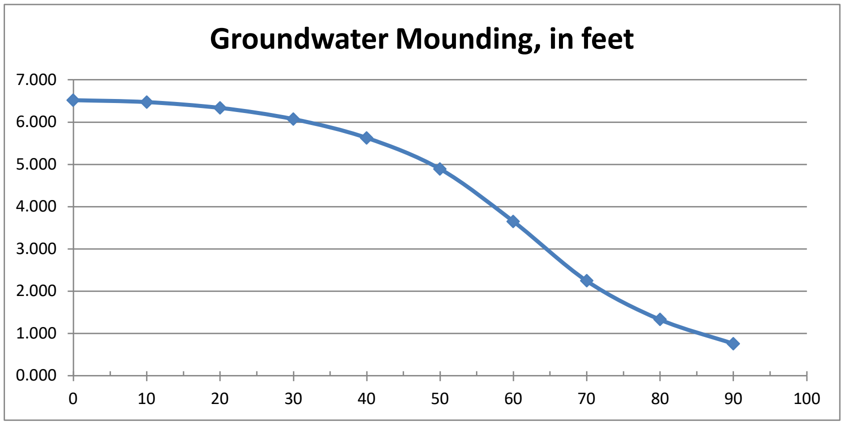
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
60.500	x	**1/2 length of basin (x direction, in feet)**
16.500	y	**1/2 width of basin (y direction, in feet)**
51.69	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

16.515	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
6.515	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
6.515	0
6.472	10
6.332	20
6.068	30
5.623	40
4.889	50
3.645	60
2.242	70
1.325	80
0.754	90

Re-Calculate Now



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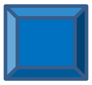
StormPod Infiltration Chamber CI-5A

Input Values

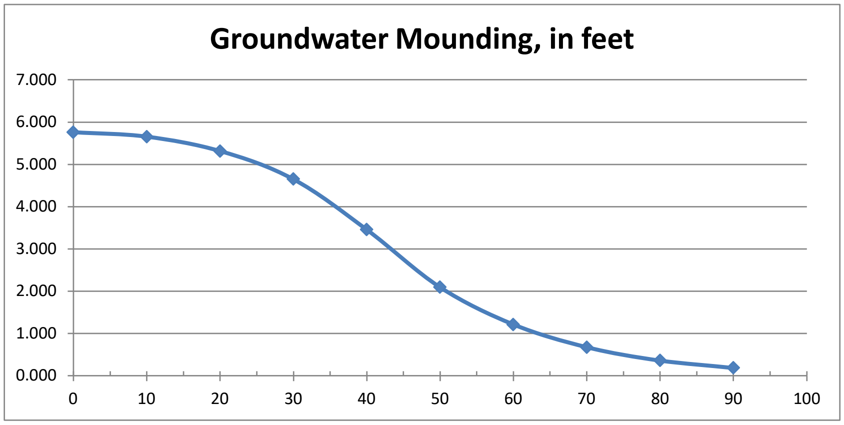
0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
40.500	y	1/2 width of basin (y direction, in feet)
47.67	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.758	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.758	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.758	0
5.653	10
5.313	20
4.649	30
3.453	40
2.088	50
1.208	60
0.670	70
0.356	80
0.182	90



Re-Calculate Now



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StormPod Infiltration Chamber CI-5B

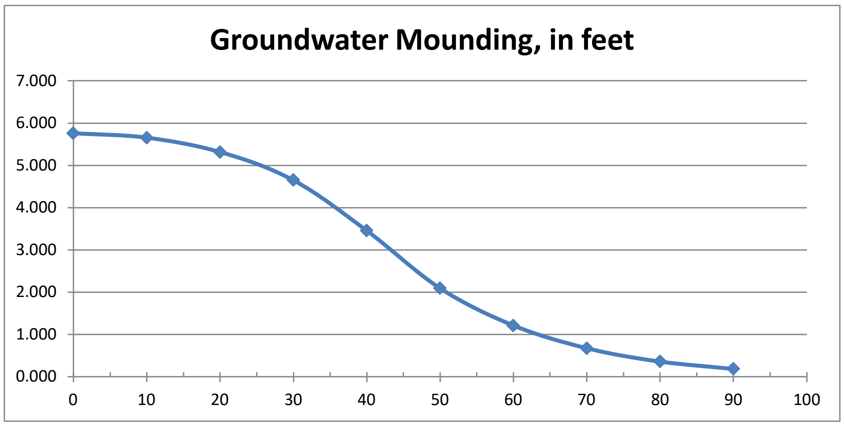
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
40.500	x	1/2 length of basin (x direction, in feet)
16.500	y	1/2 width of basin (y direction, in feet)
47.67	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.758	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.758	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.758	0
5.653	10
5.313	20
4.649	30
3.453	40
2.088	50
1.208	60
0.670	70
0.356	80
0.182	90

Re-Calculate Now



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StormPod Infiltration Chamber CI-6A

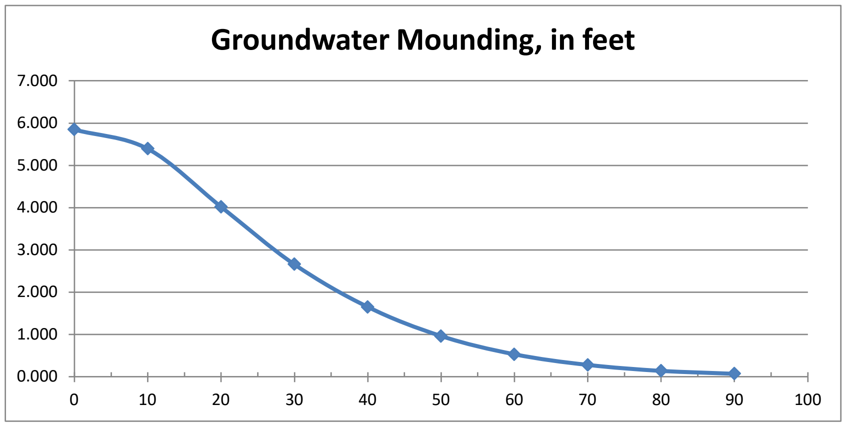
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
16.500	x	**1/2 length of basin (x direction, in feet)**
40.500	y	**1/2 width of basin (y direction, in feet)**
49.35	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

15.844	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
5.844	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.844	0
5.389	10
4.015	20
2.657	30
1.647	40
0.958	50
0.526	60
0.274	70
0.137	80
0.066	90

Re-Calculate Now



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StormPod Infiltration Chamber CI-6B

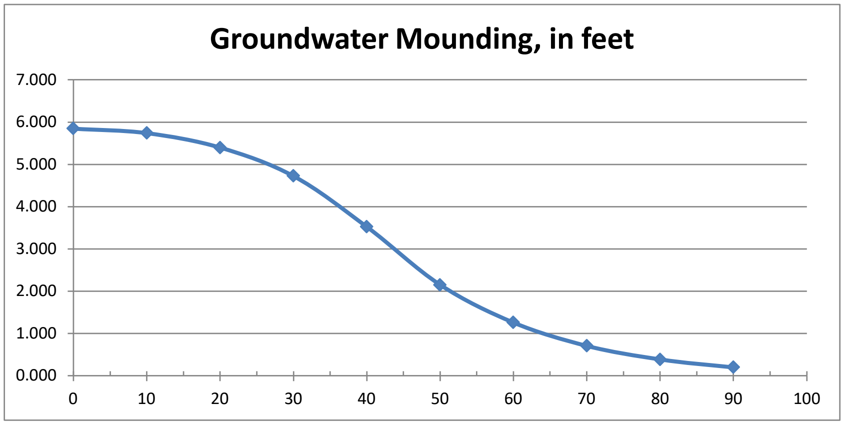
Input Values

0.50	***R***	**Recharge rate (permeability rate) (in/hr)**
0.150	**Sy**	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	**Kh**	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
40.500	**x**	**1/2 length of basin (x direction, in feet)**
16.500	**y**	**1/2 width of basin (y direction, in feet)**
49.35	**t**	**Duration of infiltration period (hours)**
10.00	**hi(0)**	**Initial thickness of saturated zone (feet)**

15.844	**h(max)**	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
5.844	**Δh(max)**	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	**Distance from center of basin in x direction, in feet**
5.844	**0**
5.738	**10**
5.394	**20**
4.724	**30**
3.522	**40**
2.148	**50**
1.255	**60**
0.704	**70**
0.379	**80**
0.197	**90**

Re-Calculate Now



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StormPod Infiltration Chamber CI-7A

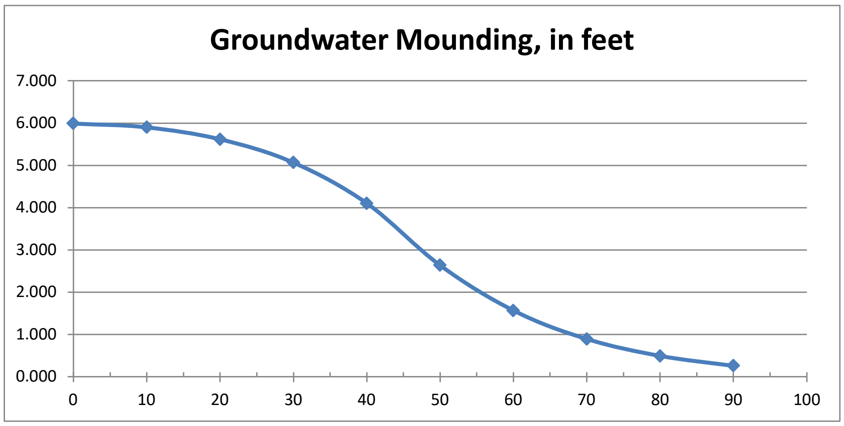
Input Values

0.50	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
16.500	x	1/2 length of basin (x direction, in feet)
44.500	y	1/2 width of basin (y direction, in feet)
49.19	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.987	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.987	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.987	0
5.899	10
5.614	20
5.065	30
4.098	40
2.634	50
1.562	60
0.889	70
0.486	80
0.255	90

Re-Calculate Now



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StormPod Infiltration Chamber CI-7B

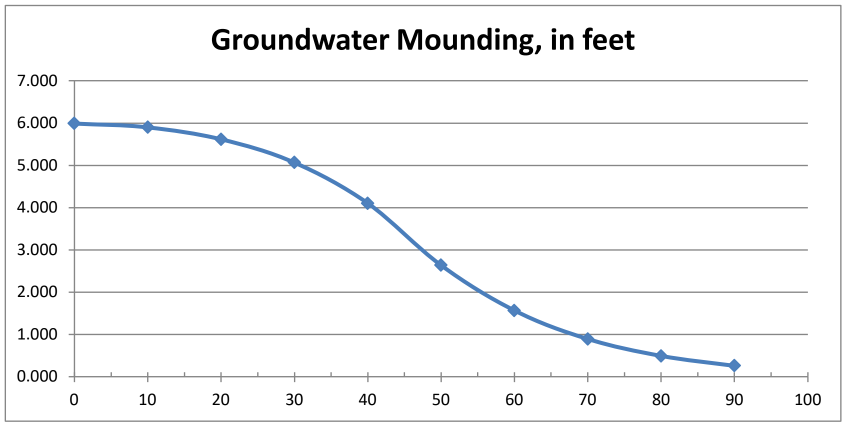
Input Values

0.50	*R*	**Recharge rate (permeability rate) (in/hr)**
0.150	Sy	**Specific yield, Sy (dimensionless)** **default value is 0.15; max value is 0.2 provided that a lab test data is submitted**
2.50	Kh	**Horizontal hydraulic conductivity (in/hr)** **Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan**
44.500	x	**1/2 length of basin (x direction, in feet)**
16.500	y	**1/2 width of basin (y direction, in feet)**
49.19	t	**Duration of infiltration period (hours)**
10.00	hi(0)	**Initial thickness of saturated zone (feet)**

15.987	h(max)	**Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
5.987	Δh(max)	**Maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.987	0
5.899	10
5.614	20
5.065	30
4.098	40
2.634	50
1.562	60
0.889	70
0.486	80
0.255	90

Re-Calculate Now



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Appendix H – NRCS Web Soil Survey:

Site Hydrologic Soil Classification

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for

Salem County, New Jersey

January 26, 2023

Preface

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

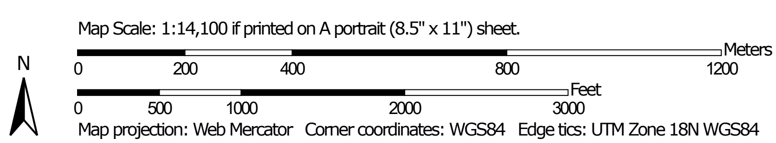
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Soil Map

75° 32' 48" W
75° 31' 17" W
39° 29' 17" N
39° 27' 44" N
453000
453300
453600
453900
454200
454500
454800
455100
4371000
4370700
4370400
4370100
4369800
4369500
4369200
4368900
4368600
4368300
WATER
UddfB
TrkAv
UR
Hope Creek Rd



Map Scale: 1:14,100 if printed on A portrait (8.5" x 11") sheet.
N
0 200 400 800 1200 Meters
0 500 1000 2000 3000 Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

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

Soils
Soil Map Unit Polygons
Soil Map Unit Lines
Soil Map Unit Points

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

Water Features
Streams and Canals

Transportation
Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background
Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

Soil Survey Area: Salem County, New Jersey
Survey Area Data: Version 19, Aug 30, 2022

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

Date(s) aerial images were photographed: Jun 5, 2022—Jul 4, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
TrkAv	Transquaking peat, 0 to 1 percent slopes, very frequently flooded, tidal	0.9	0.1%
UddfB	Udorthents, dredged fine material, 0 to 8 percent slopes	612.3	63.1%
UR	Urban land	249.0	25.7%
WATER	Water	108.3	11.2%
Totals for Area of Interest		**970.5**	**100.0%**

Map Unit Descriptions

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

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

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

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

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

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

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

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

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

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

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

Salem County, New Jersey

TrkAv—Transquaking peat, 0 to 1 percent slopes, very frequently flooded, tidal

Map Unit Setting

National map unit symbol: 2xh4d
Elevation: 0 to 30 feet
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 46 to 58 degrees F
Frost-free period: 190 to 260 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Transquaking, very frequently flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Transquaking, Very Frequently Flooded

Setting

Landform: Tidal marshes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over loamy fluviomarine deposits

Typical profile

Oise - 0 to 9 inches: peat
Oese - 9 to 46 inches: mucky peat
Oase - 46 to 65 inches: muck
Cseg - 65 to 80 inches: silty clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 22.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Minor Components

Appoquinimink, very frequently flooded

Percent of map unit: 5 percent

Landform: Tidal marshes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Broadkill, very frequently flooded

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

UddfB—Udorthents, dredged fine material, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 4k49
Elevation: 0 to 170 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, dredged fine materials, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Dredged Fine Materials

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy material transported by human activity; fine-loamy dredge spoils

Typical profile

A - 0 to 12 inches: loam
C - 12 to 80 inches: clay

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Water

Percent of map unit: 5 percent

Urban land

Percent of map unit: 5 percent
Hydric soil rating: Unranked

UR—Urban land

Map Unit Setting

National map unit symbol: 4k4c
Elevation: 0 to 170 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Udorthents

Percent of map unit: 5 percent

Landform: Low hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

WATER—Water

Map Unit Setting

National map unit symbol: 4k4d
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

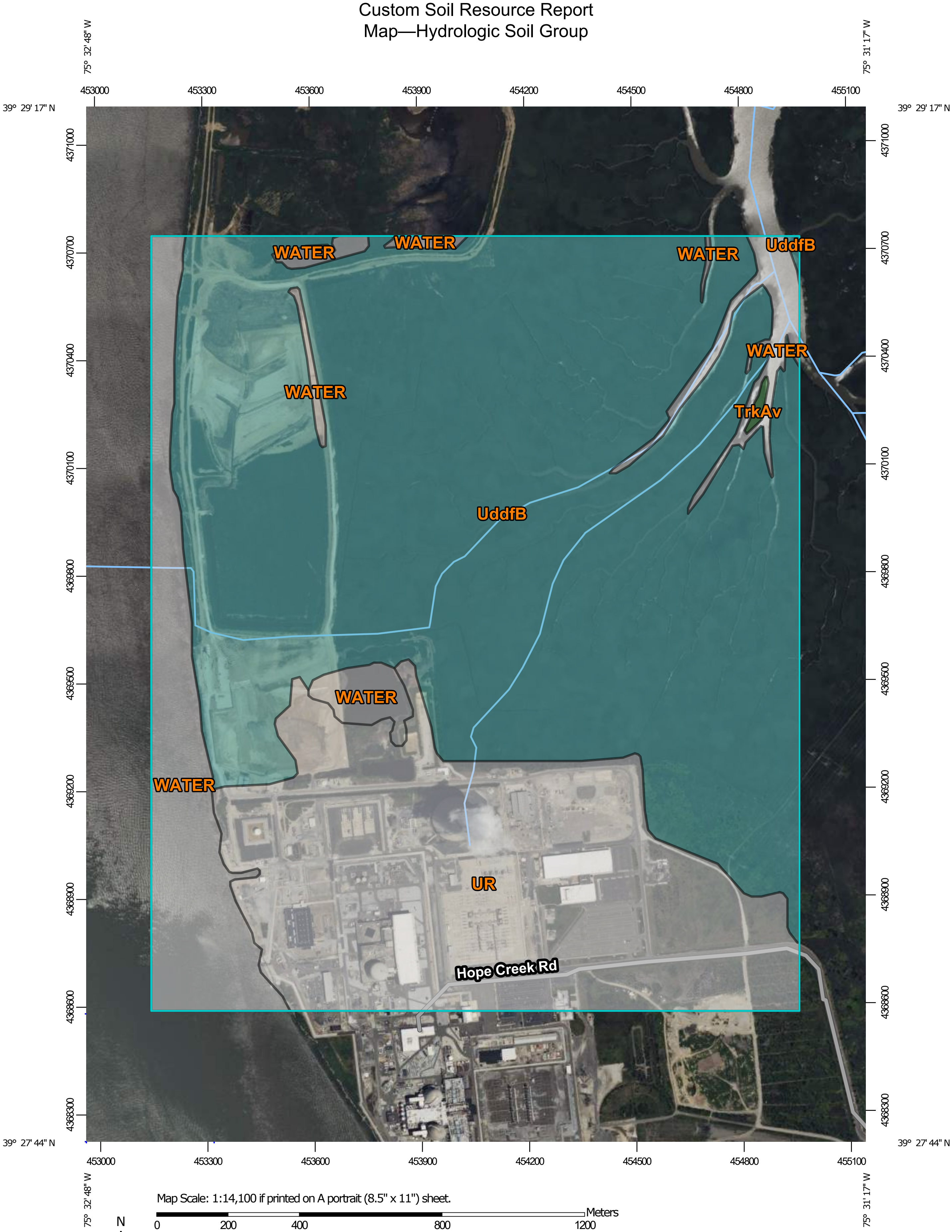
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Map—Hydrologic Soil Group



Map Scale: 1:14,100 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 200, 400, 800, 1200

Feet: 0, 500, 1000, 2000, 3000

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

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

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 19, Aug 30, 2022

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Date(s) aerial images were photographed: Jun 5, 2022—Jul 4, 2022

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Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
TrkAv	Transquaking peat, 0 to 1 percent slopes, very frequently flooded, tidal	A/D	0.9	0.1%
UddfB	Udorthents, dredged fine material, 0 to 8 percent slopes	C	612.3	63.1%
UR	Urban land		249.0	25.7%
WATER	Water		108.3	11.2%
Totals for Area of Interest			**970.5**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

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