Stantec

SANTIAM HOSPITAL
PRELIMINARY STORM REPORT

May 29, 2025

Prepared for:
Santiam Memorial Hospital

Prepared by:
Matthew Lewis, PE

Project Number:
2042699500

I hereby certify that this Drainage Report for Santiam Hospital has been prepared by me or under my direct supervision and complies with the City of Stayton’s Public Works Standards and standard engineering practice.

[Engineer’s stamp is deferred until permit submittal]

Revision	Description	Author	Date	Quality Check	Date
1.0	Preliminary Storm Report	Jonathan Sweet	5/28/2025	Matthew Lewis	5/28/2025

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Executive Summary

This report documents the stormwater management approach for the Santiam Hospital to accompany the project's land use submittal. This report is preliminary and includes a stormwater plan, calculations, and narrative which identifies the impacts that the proposed development will have on existing stormwater systems, and the stormwater infrastructure proposed to manage stormwater in a manner compliant with applicable regulations. A more complete stormwater analysis will be prepared and submitted following the land use application phase.

The proposed stormwater management approach will meet or exceed the requirements of the City of Portland and City of Stayton standards. Stormwater management will be achieved by capturing some of the project's proposed impervious area and portions of existing impervious arear that are currently untreated. Water quality will be achieved using a Modular Wetland bioretention vault, and flow control will be provided in conjunction with an underground chamber detention system.

Acronyms / Abbreviations

AC	Acre
CFS	Cubic Feet per Second
CN	Curve Number
CWS	Clean Water Services
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
LIDA	Low Impact Development Approaches
NRCS	Natural Resources Conservation Service
ROW	Right-of-Way
SBUH	Santa Barbara Urban Hydrograph
SF	Square Feet
WQ	Water Quality
WQF	Water Quality Flow
WQV	Water Quality Volume

1 Applicability

The City of Stayton (Stayton) Public Works Design Standards (PWDS) outlines the requirements of stormwater management for proposed development. The PWDS primarily references the latest edition of the City of Portland's Stormwater Management Manual (SWMM) with supplemental requirements unique to Stayton. The PWDS requires treatment of all new and replaced impervious areas.

1.1 Conveyance

As per PWDS 602.05.A, conveyance systems shall be designed to convey the peak flows of the 25-yr design storm.

1.2 Water Quality Treatment

As per PWDS 602.05.B, stormwater quality facilities shall be implemented that remove 70% or more of total suspended solids (TSS) for 90% of the average annual runoff. Vegetated infiltration facilities are preferred, except where deemed infeasible. This section does not provide any other specific criteria for water quality facility design, except for reference to SWMM for acceptable facility types.

1.3 Water Quantity Treatment

As per PWDS 602.05.C, stormwater quantity facilities shall be implemented to limit the post-developed 2-yr, 5-yr, 10-yr, 50-yr, and 100-yr peak runoff rates to its respective pre-developed flow rate. Furthermore, the post-developed 25-yr rate shall be limited to the pre-developed 10-yr rate.

2 Existing Conditions

2.1 Topography

The whole site is 7.2 acres and includes a multi-wing hospital and associated parking and circulation aisles. The high point is located on the northeast corner of the site at an elevation of 534 and the low point is located at the south end of the site at an elevation of 520. The site has a gradual slope to the southwest of approximately 5% to 6%.

2.2 Climate

The site is in Marion County approximately 60-miles inland from the Pacific Ocean. There is a gradual change in seasons with defined seasonal characteristics. Average daily temperatures range from 43°F to 63°F. Record temperatures recorded for this region of the state are -7°F and 113°F. Average annual rainfall recorded in this area is 52 inches. Average annual snowfall is approximately 0.8 inches between January and February.

2.3 Soils

The underlying soil types on-site, classified by the United States Department of Agriculture Soil Survey of Marion County, Oregon, are Nekia Silty Clay Loam, Hydrologic Soil Group (HSG) C.

2.4 Hydrology

The project area is a relatively small portion of the whole site and is currently developed as drive aisle, parking lot, sidewalk, and landscaped areas. Stormwater runoff from a portion of the project area near the emergency department entry drains south along N 10th Ave, and the remainder of the project area drains west to Hollister St. Both public conveyances drain south toward the Salem Ditch.

2.5 Basin Area

Basin area is defined by the area of proposed disturbance. An impervious Curve Number of 76 was used to model the pre-developed condition which is representative of Woods/grass in fair condition over HSG C soils.

3 Post-Developed Conditions

The project proposes the addition of a covered walkway and modifications to existing parking lot and ambulance entry. The hospital intends to expand its building in the near future, and although this expansion is not a part of the proposed project, the project's stormwater management system will be designed to provide treatment for this additional future area.

3.1 Hydrology

The proposed development will maintain existing surface drainage patterns and stormwater runoff will continue to discharge into the Salem Ditch. Portions of the project area cannot feasibly be intercepted for stormwater management, therefore the project proposes capture and treatment of an equivalent existing impervious area that is currently untreated.

3.2 Basin Areas

The project proposes a total of 24,651 SF of new and replaced impervious area. A curve number of 98 was used to model post-developed impervious areas.

Due to limited developable site area and grade challenges, stormwater management will be infeasible for portions of the proposed project area, specifically the hospital's front entry. To mitigate this untreated area, existing impervious areas that are currently untreated will be captured and routed to the proposed stormwater management system. The captured area (32,100 SF) will exceed the required treatment area (24,651 SF), thereby meeting the intent of this requirement. Additional runoff generated from this additional 7,449 SF will be considered in conveyance calculations, but will be allowed to bypass water quality and quantity systems.

4 Water Quality

The PWDS requires removal of 70% of total suspended solids (TSS) for 90% of the average annual runoff. The WQ design storm is defined in the PWDS as the peak runoff from a 1.61 inch depth, 24-hr, Type 1A storm, resulting in 0.22 CFS from the proposed project impervious area.

While PWDS prefers infiltration by vegetated facility, limited landscape area and limited infiltration capacity makes this infeasible. While the project area does include some landscape area, the hospital has plans to expand their hospital into this area in the near future, therefore the project is avoiding development of stormwater treatment infrastructure within this area.

Instead, a proprietary treatment device, Modular Wetland Linear System, is proposed. The Modular Wetland is approved for use with the City of Portland's Bureau of Environmental Services (BES). The Modular Wetland 8x8 configuration meets this treatment goal. The Modular Wetland 8x8 includes an internal bypass weir, allowing flows in excess of the WQ design storm to bypass the bioretention media.

5 Water Quantity

5.1 Methodology

Routing was conducted with HydroCAD software using the Santa Barbara Urban Hydrograph (SBUH) method. The SBUH method is based on the Curve Number (CN) approach and uses the Natural Resource Conservation Service's (NRCS) equations for computing soil absorption and precipitation excess. The SBUH method converts the incremental runoff depths into instantaneous hydrographs, which are then routed through an imaginary reservoir with a time delay equal to the basin time of concentration.

5.2 Rainfall Depths

The table below shows total precipitation depths for storm events used as a multiplier for the NRCS 24-hr, Type IA distribution. These depths are outlined in the PWDS.

Table 1 Design Storms

Recurrence Interval (years)	Precipitation Depth (in)
WQ	1.61
2-year	2.50
5-year	3.00
10-year	3.50
25-year	4.00
50-year	4.50
100-year	4.60

5.3 Flow Control

The proposed development limits peak post-developed runoff rates to peak pre-developed runoff rates as required by the PWDS, as outlined in Table 2.

Table 2 Peak Flow Matching Targets

Post-Developed Runoff Rate	Pre-Developed Runoff Target
2-year	2-year
5-year	5-year
10-year	10-year
25-year	10-year
50-year	50-year
100-year	100-year

Table 3 Peak Flows

Recurrence Interval (years)	Existing Peak Runoff (cfs)	Proposed Peak Runoff (cfs)
WQ	n/a	0.22
2-year	0.07	0.07
5-year	0.12	0.12
10-year	0.18	0.15
25-year	0.24	0.18
50-year	0.30	0.30
100-year	0.32	0.32

Flow control will be provided using a multi-orifice riser located within a 60-in manhole, see flow control structure data table below. The extended dry basin will have at least one foot of freeboard during the 25-year storm event. Stormwater will enter the flow control structure through a 24-in culvert built into the pond side slope.

Table 4 Flow Control Structure Data

	Elevation (ft)	Diameter (in)
2-yr Orifice	517.25	1.4
5-yr through 25-yr Orifice	518.99	2.0
50-yr & 100-yr Orifice	519.96	3.0
Overflow Pipe	520.32	12.0

6 Conveyance

Proposed conveyance will account for runoff from the captured area (32,100 SF), except that through the treatment train, conveyance will account for future captured area that includes future hospital expansion (52,000 SF). The conveyance will be sized to adequately convey the 25-yr storm. Detailed conveyance analysis will be provided after land use application process, during engineering review.

7 Downstream Analysis

Due to the requirements of flow control for the site, discharge to the downstream conveyance will be equal or less than the existing discharge from the site, therefore no adverse impacts will result to the downstream system as a result of the proposed development.

8 Summary

The proposed stormwater management approach will meet or exceed the requirements of the City of Portland and City of Stayton standards. Stormwater management will be achieved by capturing some of the project's proposed impervious area and portions of existing impervious arear that are currently untreated. Water quality will be achieved using a Modular Wetland bioretention vault, and flow control will be provided in conjunction with an underground chamber detention system.

TECHNICAL APPENDIX

Technical Appendix: Supporting Documents

A - Soil Resource Report – Marion County

B - TR-55 Curve Number Tables

C - Basin Delineations

D - HydroCAD Model Results

E - Conveyance Calculations (to be provided after land use)

F - Storm Plans and Details

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 Marion County Area, Oregon

Santiam Hospital

September 11, 2024

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.

Map Scale: 1:408 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 15 30 60 90

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N 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 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Marion County Area, Oregon
Survey Area Data: Version 21, Sep 8, 2023

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

Date(s) aerial images were photographed: May 28, 2020—May 29, 2020

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
NeB	Nekia silty clay loam, 2 to 7 percent slopes	0.6	100.0%
Totals for Area of Interest		**0.6**	**100.0%**

Map Unit Descriptions

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

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

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

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

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

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

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

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

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

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

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

Marion County Area, Oregon

NeB—Nekia silty clay loam, 2 to 7 percent slopes

Map Unit Setting

National map unit symbol: 24qt
Elevation: 300 to 1,000 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 190 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Nekia and similar soils: 85 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nekia

Setting

Landform: Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from tuffs and basalt

Typical profile

H1 - 0 to 9 inches: silty clay loam
H2 - 9 to 36 inches: clay
H3 - 36 to 40 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R002XC012OR - Red Hill Group
Forage suitability group: Well drained < 15% Slopes (G002XY002OR)
Other vegetative classification: Well drained < 15% Slopes (G002XY002OR)
Hydric soil rating: No

Minor Components

Aquults

Percent of map unit: 2 percent

Landform: Hills
Hydric soil rating: Yes

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Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2/]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1] Average runoff condition, and $I_a = 0.2S$.

[2] The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

[3] CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

[4] Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

[5] Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands [1/]

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2/]	Hydrologic condition [3/]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

[1] Average runoff condition, and I_a=0.2S

[2] Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

[3] Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods—grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.

2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

3 *Poor:* <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

4 Actual curve number is less than 30; use CN = 30 for runoff computations.

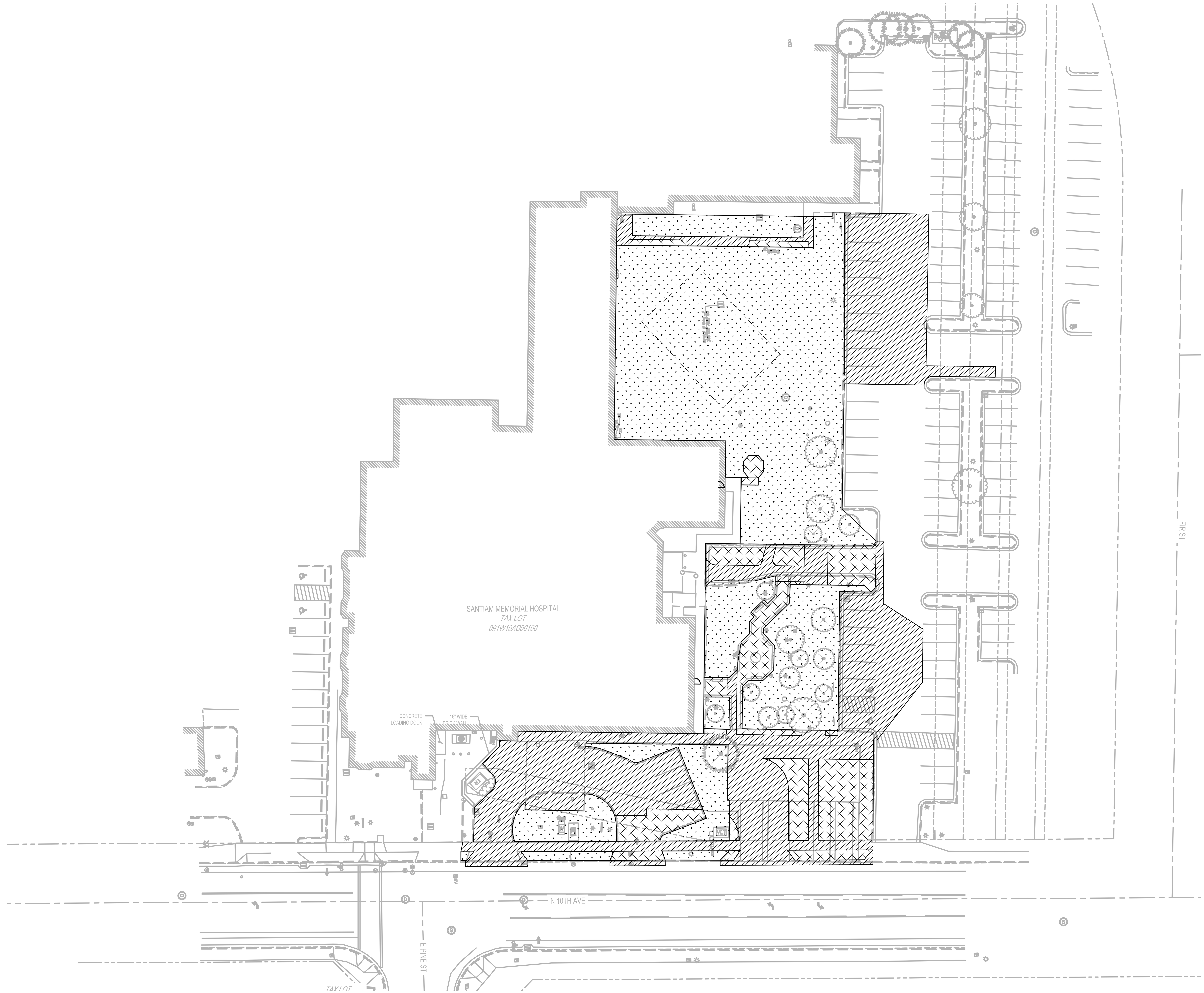
5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Table 2-2d Runoff curve numbers for arid and semiarid rangelands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition [2/]	A [3/]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

1 Average runoff condition, and I_a, = 0.2S. For range in humid regions, use table 2-2c.
2 Poor: <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: > 70% ground cover.
3 Curve numbers for group A have been developed only for desert shrub.



20' 0 10' 20' 40'
1 inch = 20' ft.

EXISTING AREAS

	MODIFIED IMPERVIOUS	13,546 SF
	REMOVED IMPERVIOUS	4,730 SF
	PERVIOUS	22,044 SF

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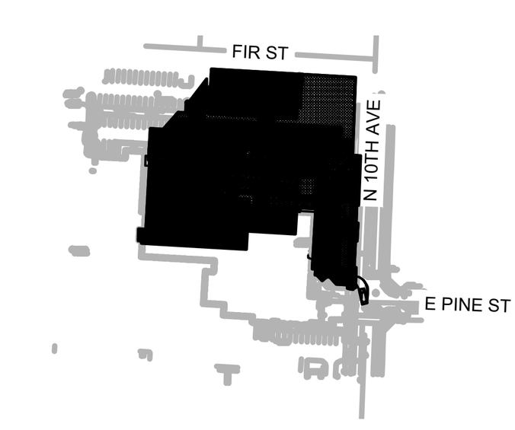

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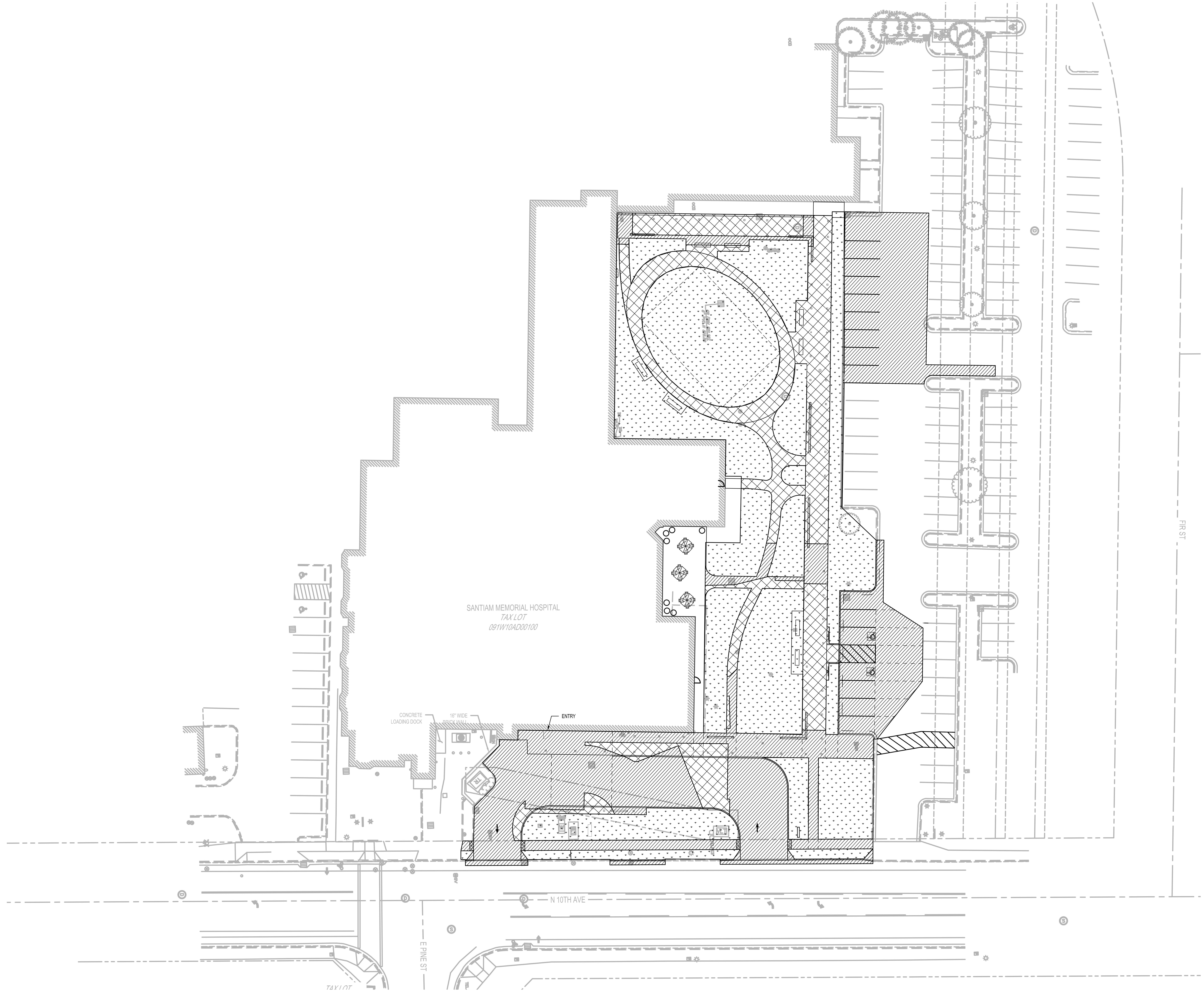

1 inch = 20' ft.

PROPOSED AREAS

	MODIFIED IMPERVIOUS	13,546 SF
	NEW IMPERVIOUS	7,992 SF
	PERVIOUS	18,731 SF

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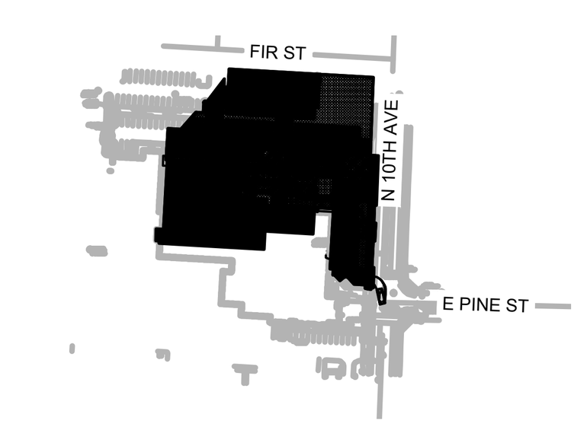

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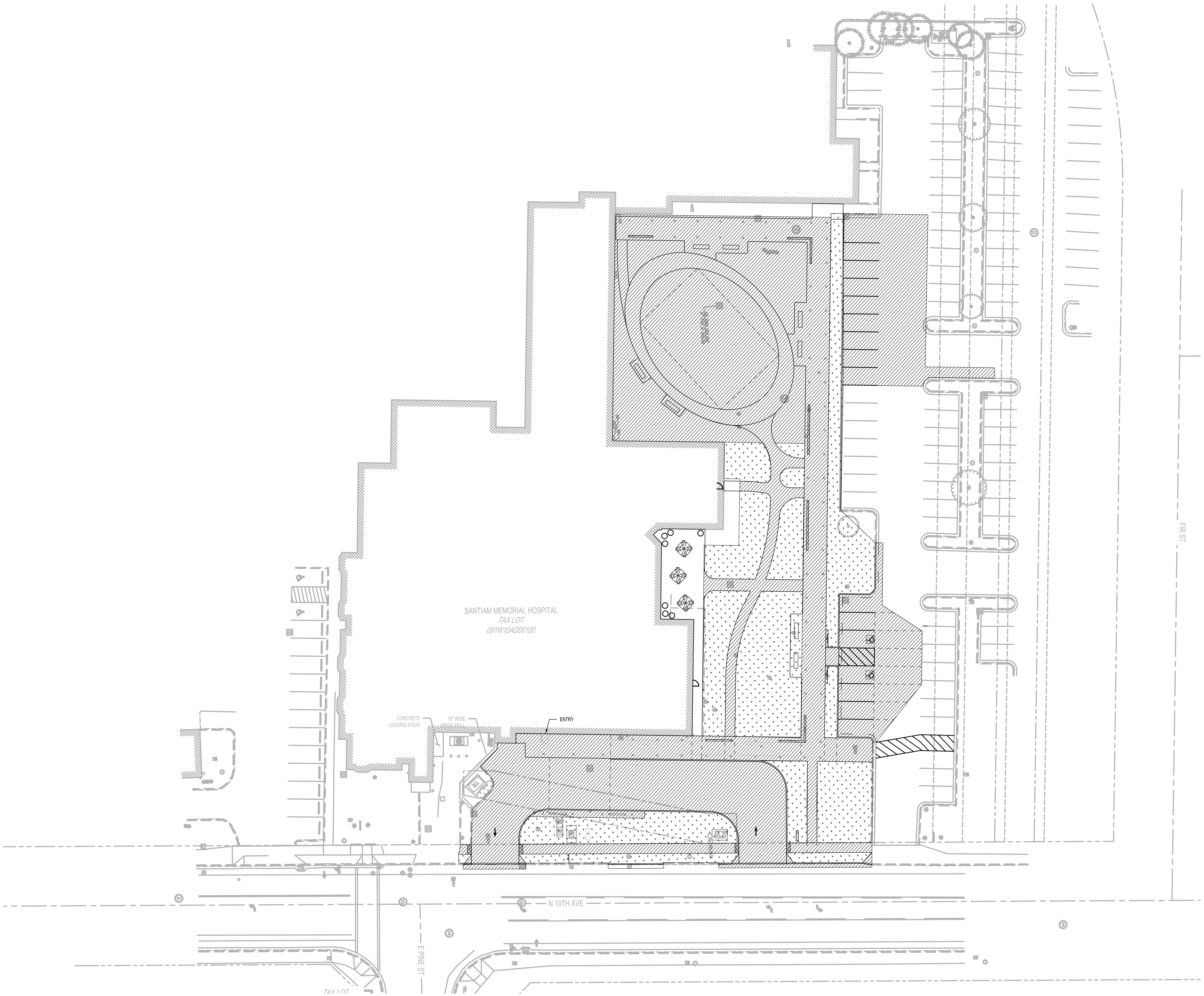

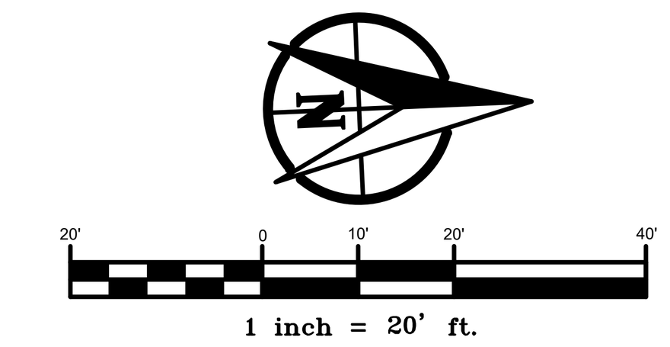

FUTURE AREAS

	IMPERVIOUS	29,015 SF
	PERVIOUS	11,254 SF

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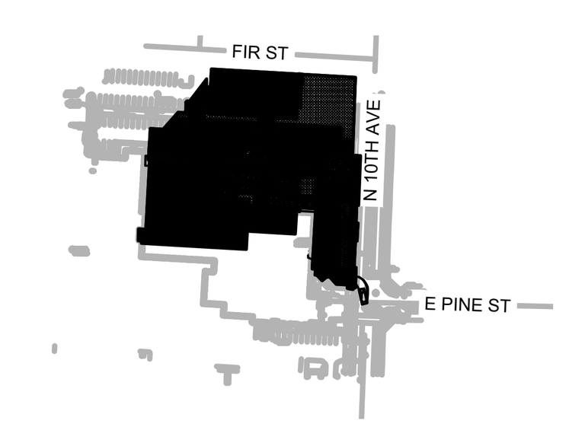

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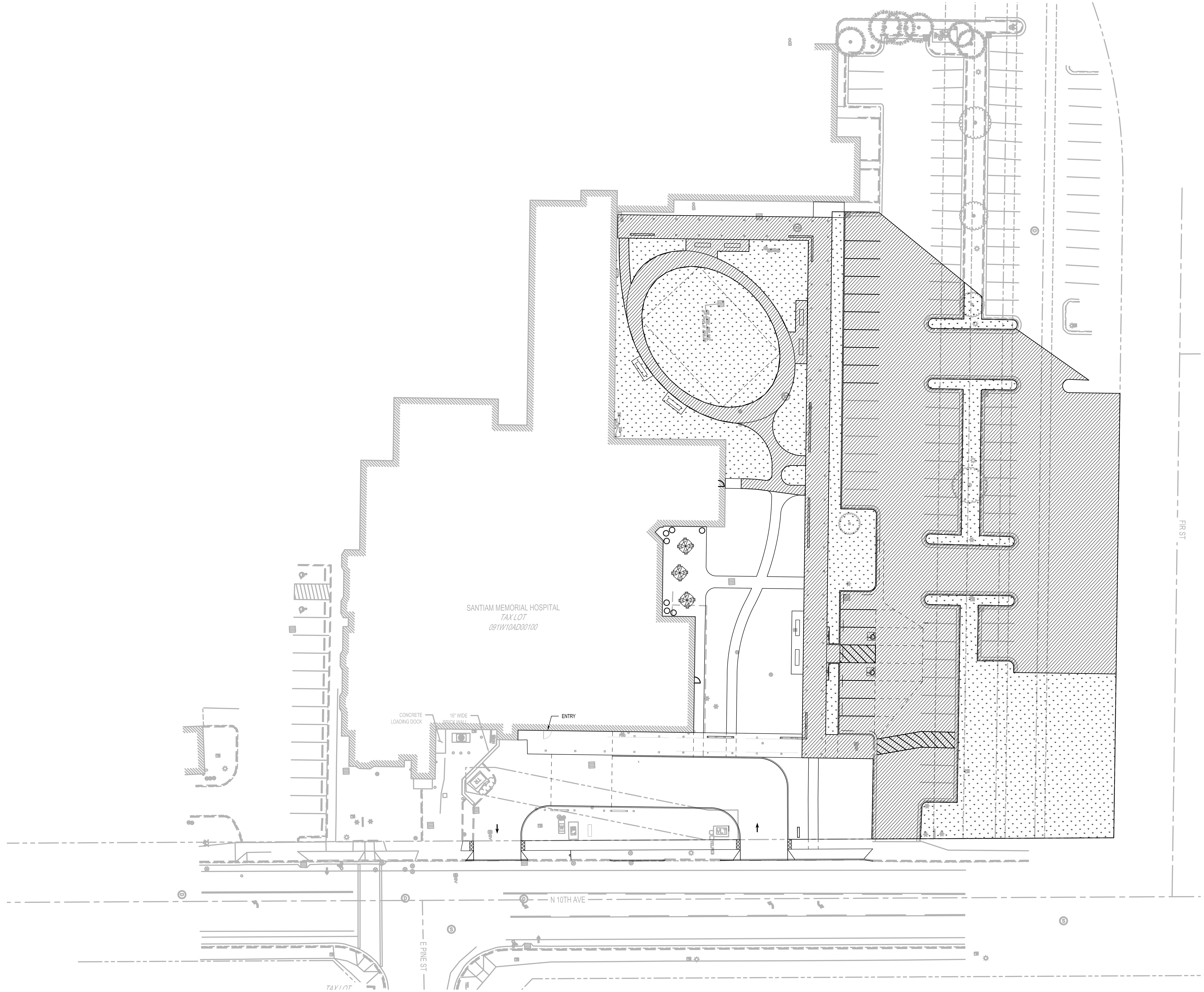

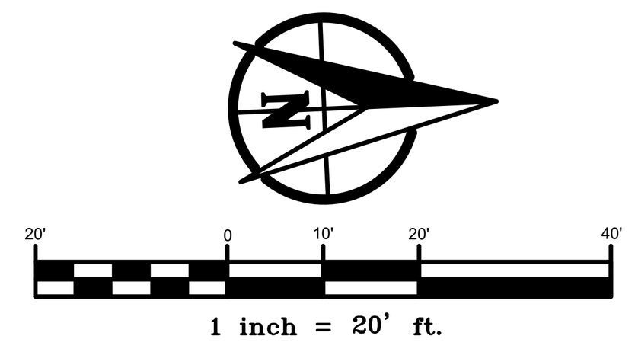

PROPOSED CAPTURE AREAS

	IMPERVIOUS	32,113 SF
	PERVIOUS	11,737 SF

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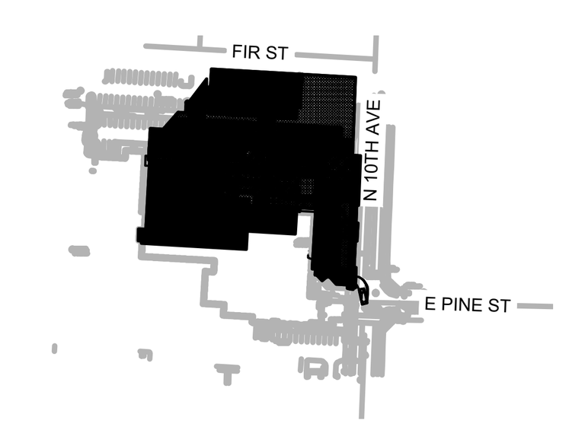

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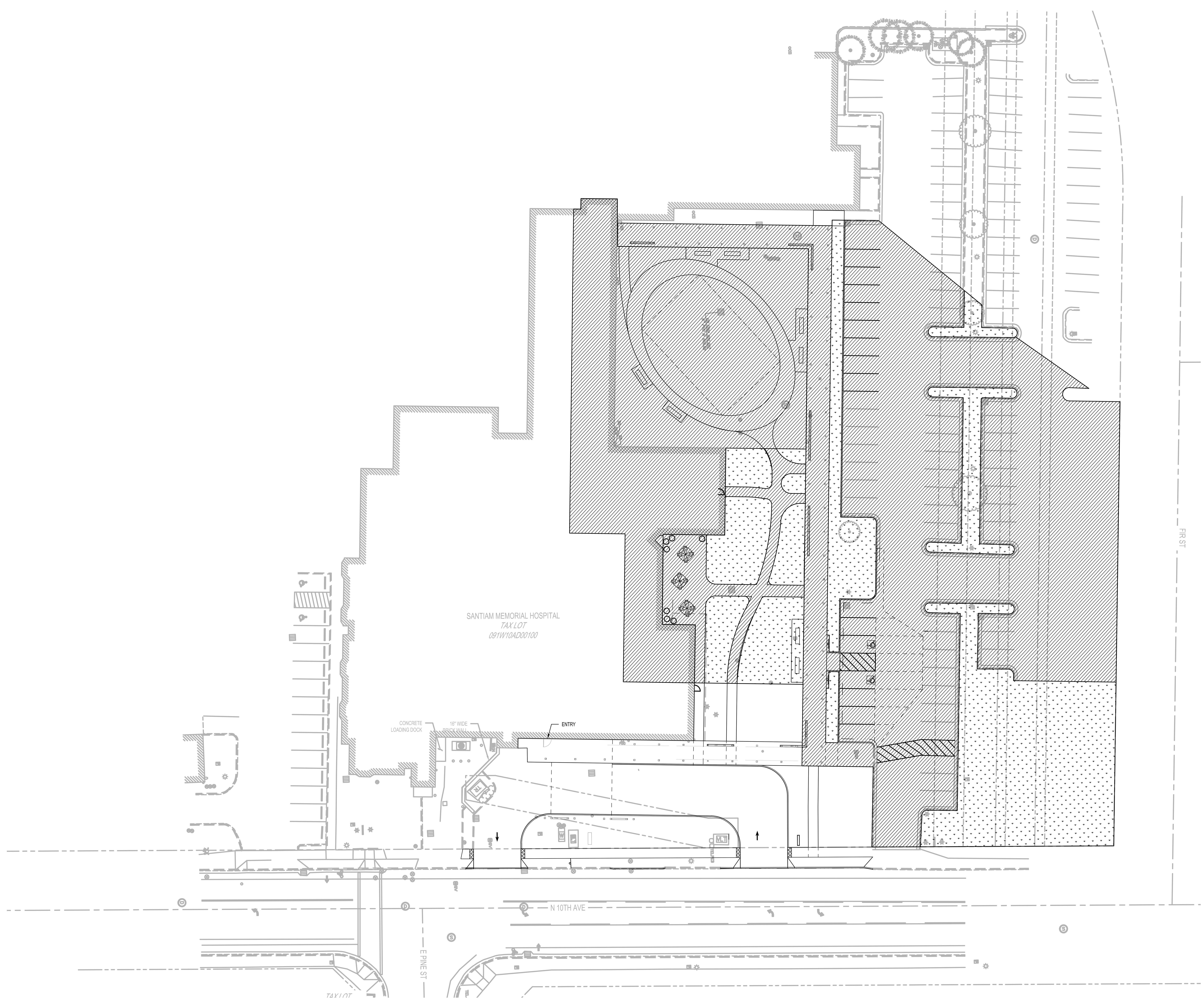

1 inch = 20' ft.

FUTURE CAPTURE AREAS

	IMPERVIOUS	52,376SF
	PERVIOUS	17,572 SF

EXISTING CONDITIONS & DEMOTION PLAN

HORIZ SCALE: 1"=20'

LOCATES (48 HOURS NOTICE REQUIRED PRIOR TO EXCAVATION)

THE CONTRACTOR MUST COMPLY WITH THE REGULATIONS OF O.R.S. 757.541 TO 757.571 IN LOCATION AND PROTECTION OF UNDERGROUND UTILITIES. OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952–001–0010 THROUGH OAR 952–001–0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.

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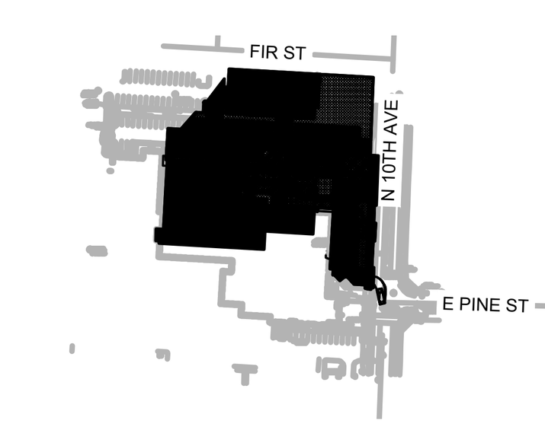

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FUTURE CAPTURED AREAS

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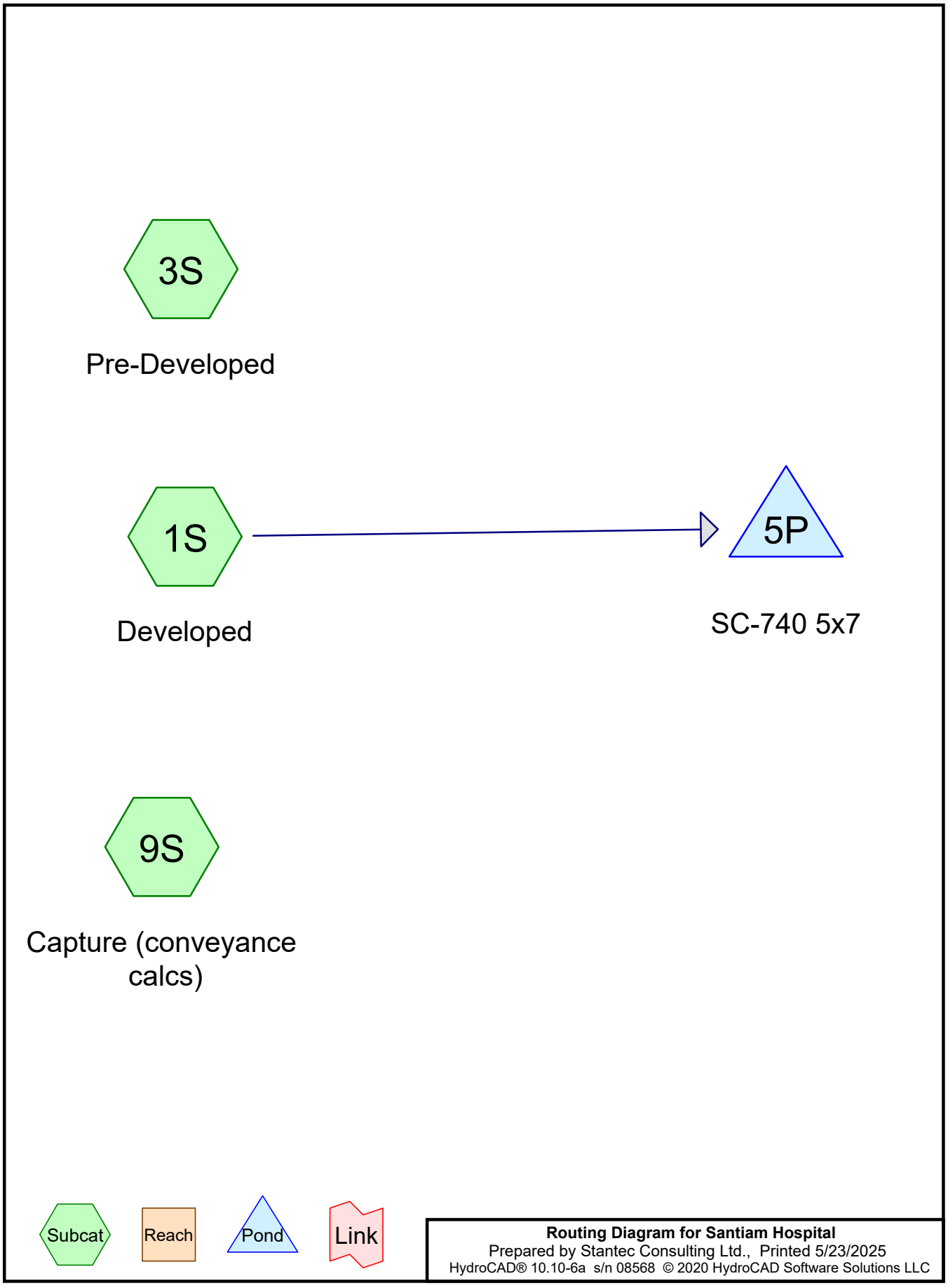


Routing Diagram for Santiam Hospital
Prepared by Stantec Consulting Ltd., Printed 5/23/2025
HydroCAD® 10.10-6a s/n 08568 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2	Type IA 24-hr		Default	24.00	1	2.50	2
2	5	Type IA 24-hr		Default	24.00	1	3.00	2
3	10	Type IA 24-hr		Default	24.00	1	3.50	2
4	25	Type IA 24-hr		Default	24.00	1	4.00	2
5	50	Type IA 24-hr		Default	24.00	1	4.50	2
6	100	Type IA 24-hr		Default	24.00	1	4.60	2
7	WQ	Type IA 24-hr		Default	24.00	1	1.61	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.814	98	(1S, 9S)
0.620	76	Woods/grass comb., Fair, HSG C (3S)
2.433	**92**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.620	HSG C	3S
0.000	HSG D	
1.814	Other	1S, 9S
2.433		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	1.814	1.814		1S, 9S
0.000	0.000	0.620	0.000	0.000	0.620	Woods/grass comb., Fair	3S
0.000	**0.000**	**0.620**	**0.000**	**1.814**	**2.433**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Developed Runoff Area=27,000 sf 100.00% Impervious Runoff Depth=2.27"
Tc=5.0 min CN=0/98 Runoff=0.36 cfs 0.117 af

Subcatchment3S: Pre-Developed Runoff Area=27,000 sf 0.00% Impervious Runoff Depth=0.69"
Tc=5.0 min CN=76/0 Runoff=0.07 cfs 0.036 af

Subcatchment9S: Capture (conveyance Runoff Area=52,000 sf 100.00% Impervious Runoff Depth=2.27"
Tc=5.0 min CN=0/98 Runoff=0.69 cfs 0.226 af

Pond 5P: SC-740 5x7 Peak Elev=1.74' Storage=0.036 af Inflow=0.36 cfs 0.117 af
Outflow=0.07 cfs 0.117 af

Total Runoff Area = 2.433 ac Runoff Volume = 0.379 af Average Runoff Depth = 1.87"
25.47% Pervious = 0.620 ac 74.53% Impervious = 1.814 ac

Summary for Subcatchment 1S: Developed

[49] Hint: Tc<2dt may require smaller dt

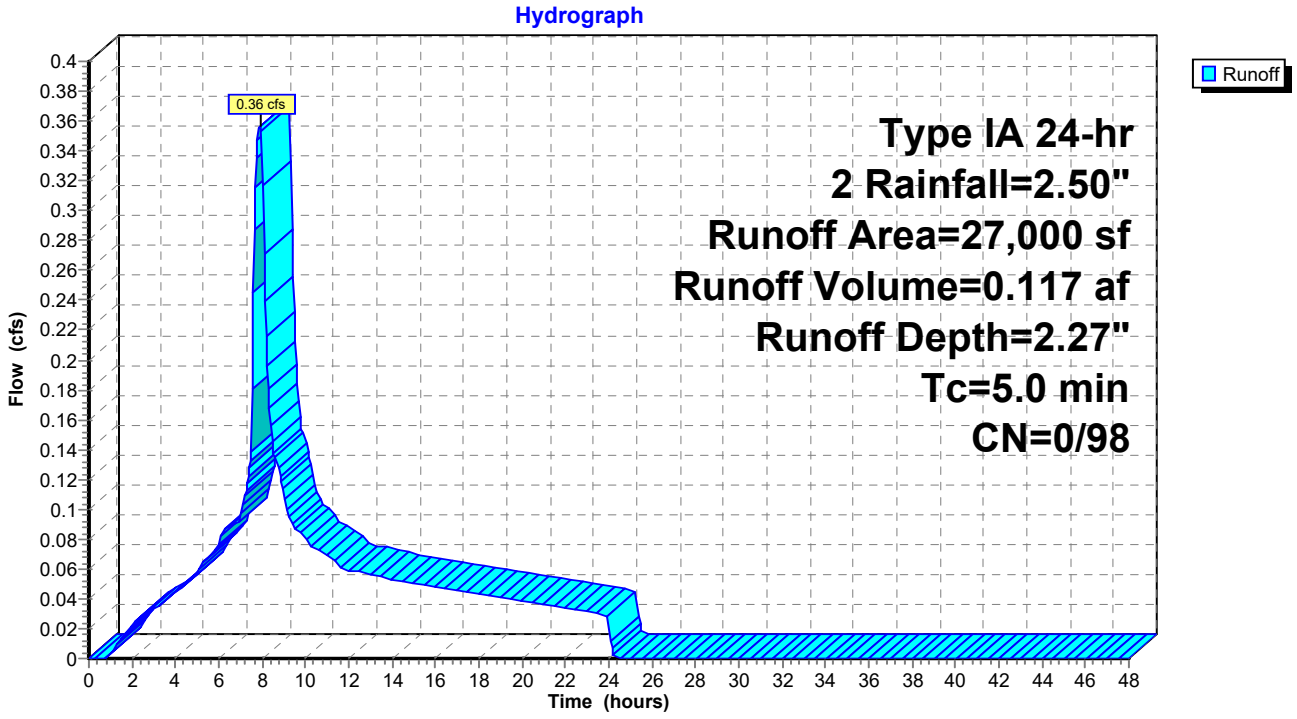
Runoff = 0.36 cfs @ 7.90 hrs, Volume= 0.117 af, Depth= 2.27"
Routed to Pond 5P : SC-740 5x7

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 Rainfall=2.50"

	Area (sf)	CN	Description
*	27,000	98	
	27,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: Developed



Summary for Subcatchment 3S: Pre-Developed

[49] Hint: Tc<2dt may require smaller dt

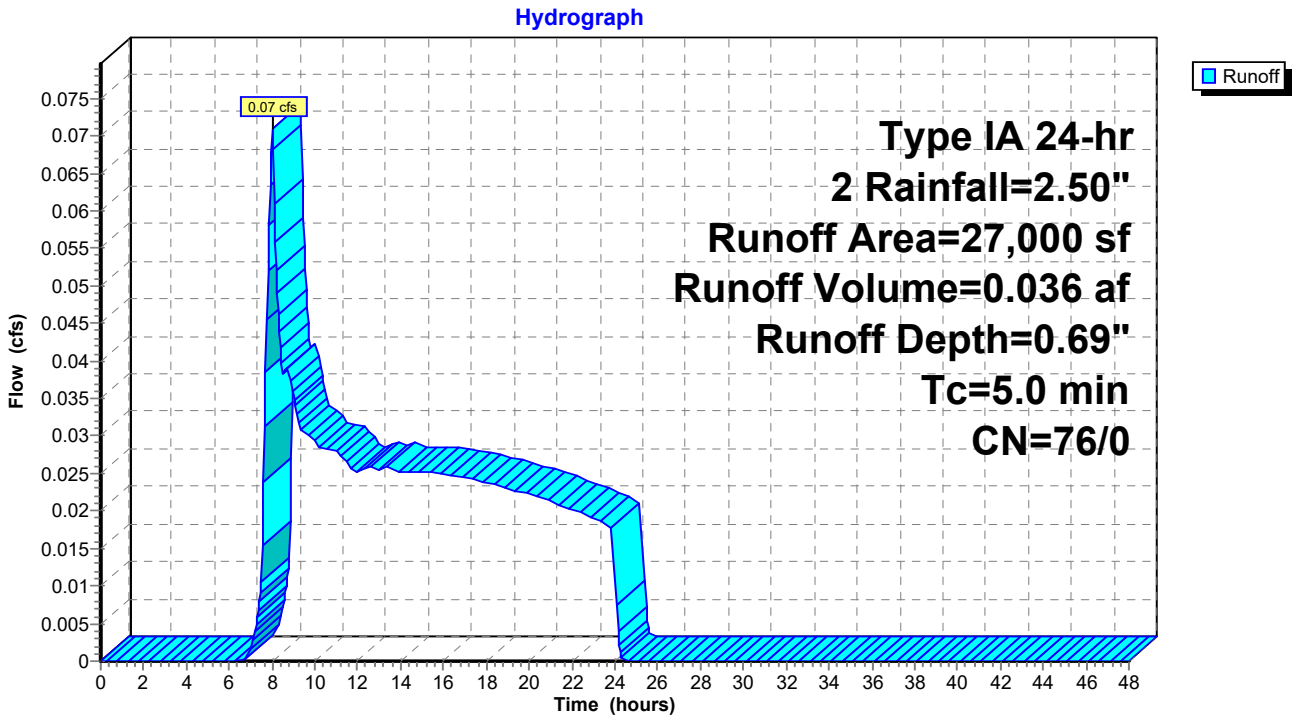
Runoff = 0.07 cfs @ 8.00 hrs, Volume= 0.036 af, Depth= 0.69"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 Rainfall=2.50"

Area (sf)	CN	Description
27,000	76	Woods/grass comb., Fair, HSG C
27,000	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 3S: Pre-Developed



Summary for Subcatchment 9S: Capture (conveyance calcs)

[49] Hint: Tc<2dt may require smaller dt

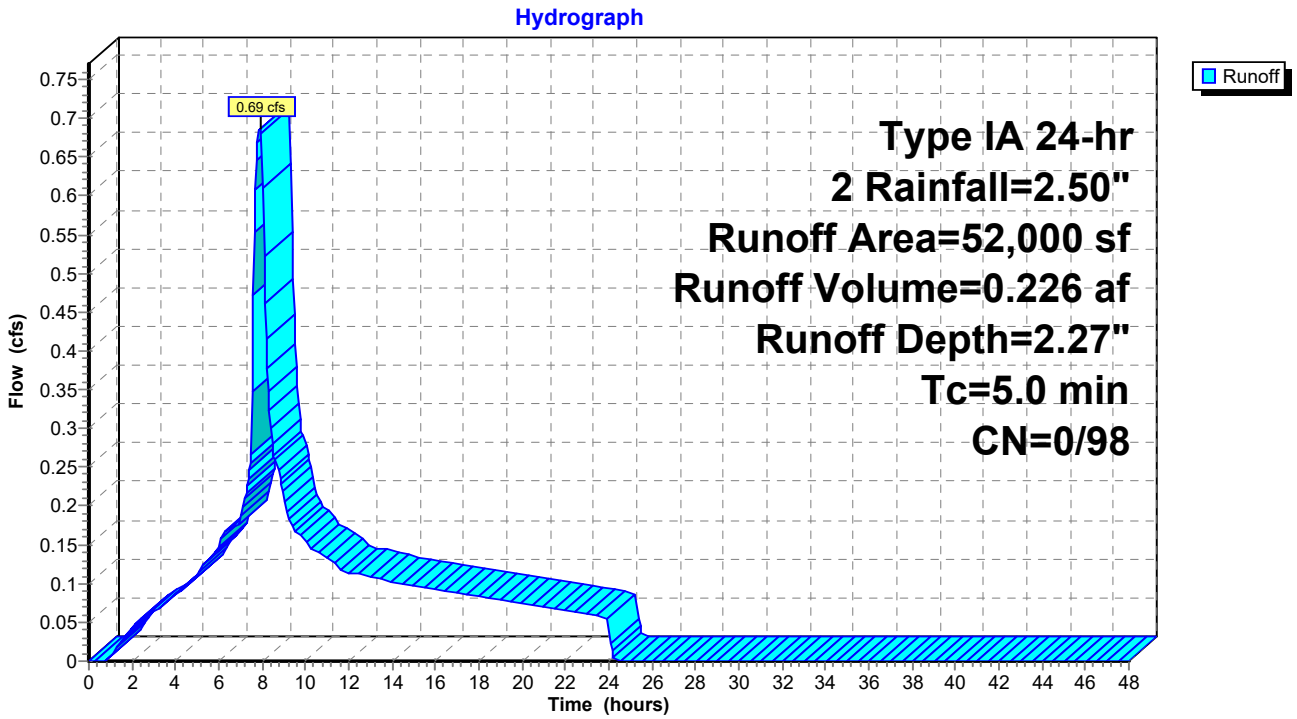
Runoff = 0.69 cfs @ 7.90 hrs, Volume= 0.226 af, Depth= 2.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 Rainfall=2.50"

	Area (sf)	CN	Description
*	52,000	98	
	52,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 9S: Capture (conveyance calcs)



Summary for Pond 5P: SC-740 5x7

Inflow Area = 0.620 ac,100.00% Impervious, Inflow Depth = 2.27" for 2 event
Inflow = 0.36 cfs @ 7.90 hrs, Volume= 0.117 af
Outflow = 0.07 cfs @ 11.10 hrs, Volume= 0.117 af, Atten= 81%, Lag= 192.3 min
Primary = 0.07 cfs @ 11.10 hrs, Volume= 0.117 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 1.74' @ 11.10 hrs Surf.Area= 0.031 ac Storage= 0.036 af

Plug-Flow detention time= 289.6 min calculated for 0.117 af (100% of inflow)
Center-of-Mass det. time= 289.2 min (963.0 - 673.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.029 af	**25.25'W x 53.46'L x 3.50'H Rock Gallery** 0.108 af Overall - 0.037 af Embedded = 0.072 af x 40.0% Voids
#2A	0.50'	0.037 af	**ADS_StormTech SC-740 +Cap** x 35 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Chambers in 5 Rows
		0.066 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**1.4" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	1.74'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	2.71'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.07 cfs @ 11.10 hrs HW=1.74' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.07 cfs @ 6.35 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: SC-740 5x7 - Chamber Wizard Rock Gallery

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

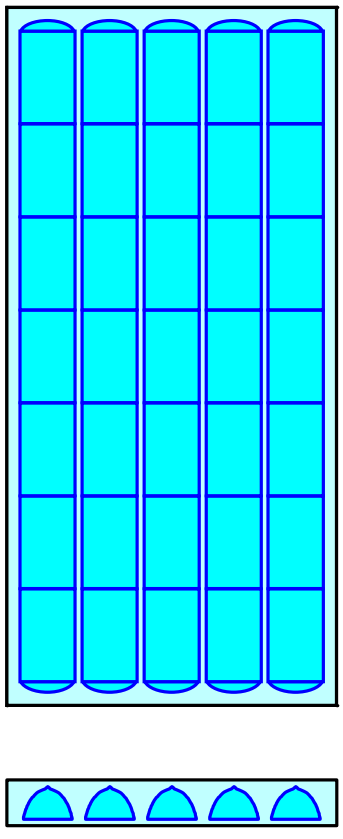
7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length +12.0" End Stone x 2 = 53.46' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

35 Chambers x 45.9 cf = 1,607.9 cf Chamber Storage

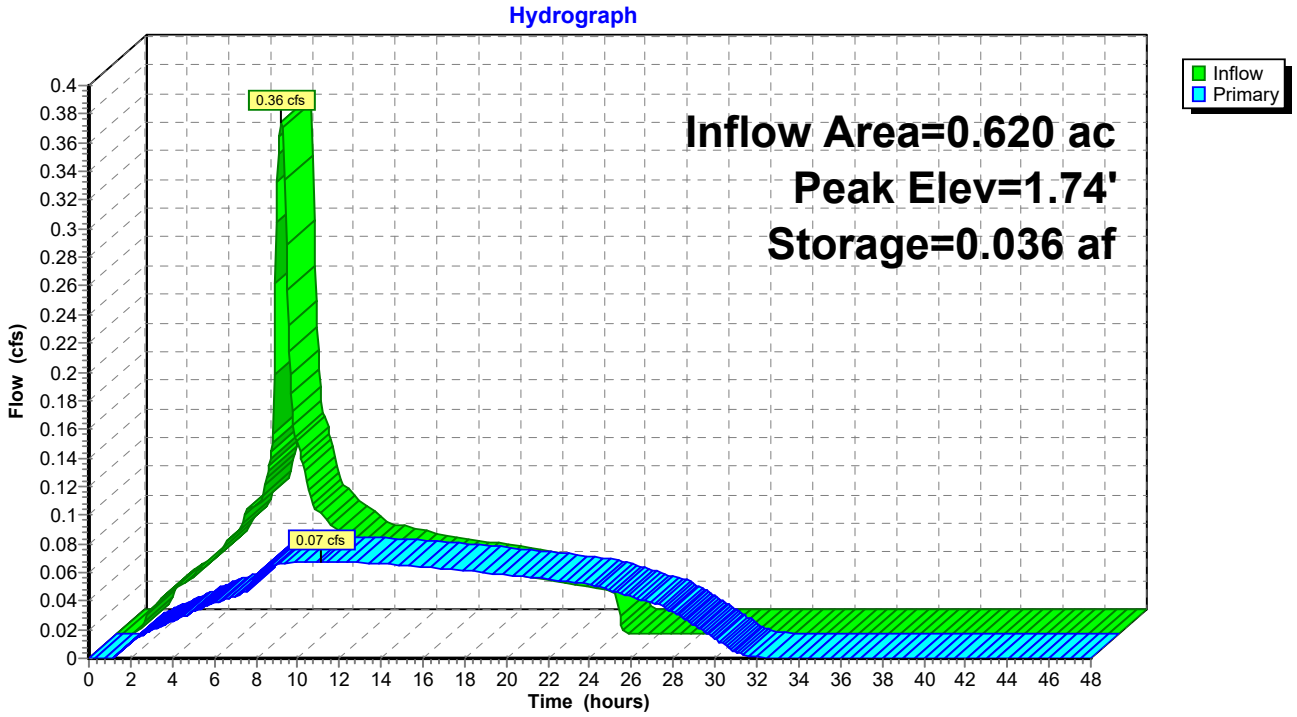
4,724.2 cf Field - 1,607.9 cf Chambers = 3,116.3 cf Stone x 40.0% Voids = 1,246.5 cf Stone Storage

Chamber Storage + Stone Storage = 2,854.4 cf = 0.066 af
Overall Storage Efficiency = 60.4%
Overall System Size = 53.46' x 25.25' x 3.50'

35 Chambers
175.0 cy Field
115.4 cy Stone



Pond 5P: SC-740 5x7



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Developed Runoff Area=27,000 sf 100.00% Impervious Runoff Depth=2.77"
Tc=5.0 min CN=0/98 Runoff=0.43 cfs 0.143 af

Subcatchment3S: Pre-Developed Runoff Area=27,000 sf 0.00% Impervious Runoff Depth=1.02"
Tc=5.0 min CN=76/0 Runoff=0.12 cfs 0.052 af

Subcatchment9S: Capture (conveyance Runoff Area=52,000 sf 100.00% Impervious Runoff Depth=2.77"
Tc=5.0 min CN=0/98 Runoff=0.83 cfs 0.275 af

Pond 5P: SC-740 5x7 Peak Elev=1.99' Storage=0.042 af Inflow=0.43 cfs 0.143 af
Outflow=0.12 cfs 0.143 af

Total Runoff Area = 2.433 ac Runoff Volume = 0.471 af Average Runoff Depth = 2.32"
25.47% Pervious = 0.620 ac 74.53% Impervious = 1.814 ac

Summary for Subcatchment 1S: Developed

[49] Hint: Tc<2dt may require smaller dt

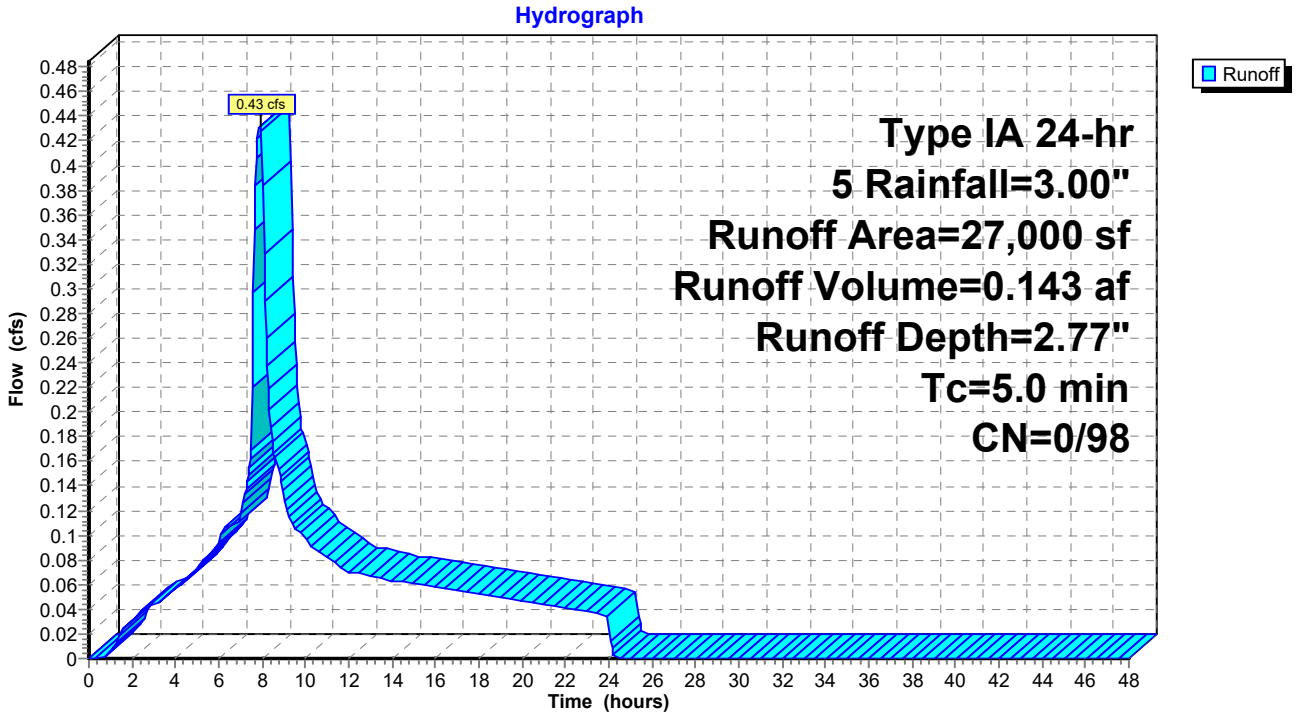
Runoff = 0.43 cfs @ 7.90 hrs, Volume= 0.143 af, Depth= 2.77"
Routed to Pond 5P : SC-740 5x7

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5 Rainfall=3.00"

	Area (sf)	CN	Description
*	27,000	98	
	27,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: Developed



Summary for Subcatchment 3S: Pre-Developed

[49] Hint: Tc<2dt may require smaller dt

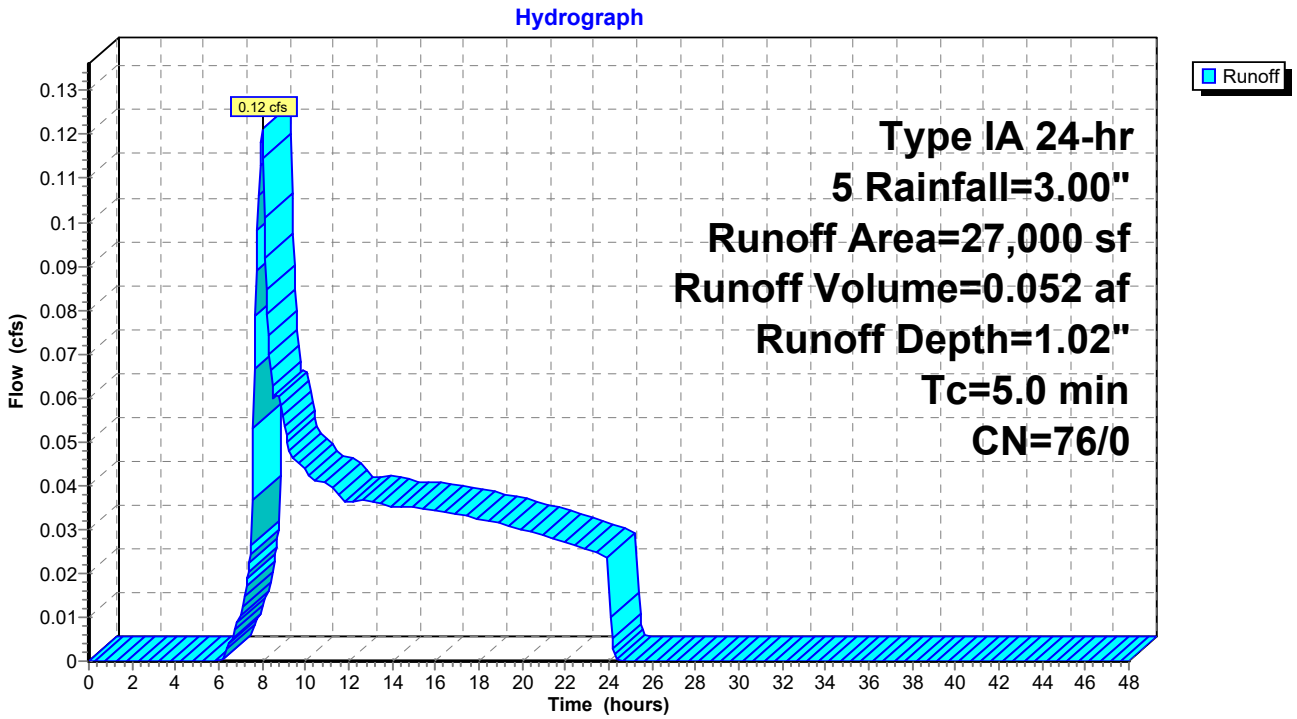
Runoff = 0.12 cfs @ 7.99 hrs, Volume= 0.052 af, Depth= 1.02"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5 Rainfall=3.00"

Area (sf)	CN	Description
27,000	76	Woods/grass comb., Fair, HSG C
27,000	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 3S: Pre-Developed



Summary for Subcatchment 9S: Capture (conveyance calcs)

[49] Hint: Tc<2dt may require smaller dt

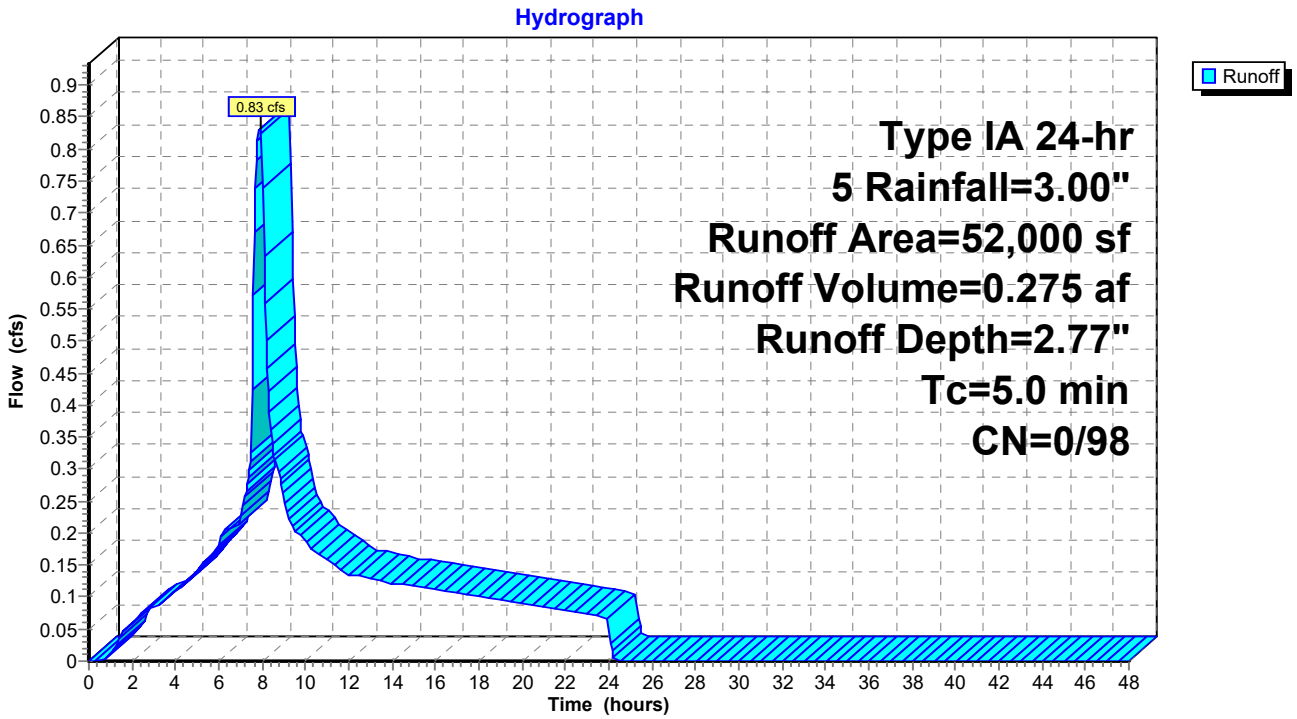
Runoff = 0.83 cfs @ 7.90 hrs, Volume= 0.275 af, Depth= 2.77"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5 Rainfall=3.00"

	Area (sf)	CN	Description
*	52,000	98	
	52,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 9S: Capture (conveyance calcs)



Summary for Pond 5P: SC-740 5x7

Inflow Area = 0.620 ac,100.00% Impervious, Inflow Depth = 2.77" for 5 event
Inflow = 0.43 cfs @ 7.90 hrs, Volume= 0.143 af
Outflow = 0.12 cfs @ 9.26 hrs, Volume= 0.143 af, Atten= 73%, Lag= 81.4 min
Primary = 0.12 cfs @ 9.26 hrs, Volume= 0.143 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 1.99' @ 9.26 hrs Surf.Area= 0.031 ac Storage= 0.042 af

Plug-Flow detention time= 289.0 min calculated for 0.143 af (100% of inflow)
Center-of-Mass det. time= 288.6 min (956.8 - 668.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.029 af	**25.25'W x 53.46'L x 3.50'H Rock Gallery** 0.108 af Overall - 0.037 af Embedded = 0.072 af x 40.0% Voids
#2A	0.50'	0.037 af	**ADS_StormTech SC-740 +Cap** x 35 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Chambers in 5 Rows
		0.066 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**1.4" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	1.74'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	2.71'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.12 cfs @ 9.26 hrs HW=1.99' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.07 cfs @ 6.80 fps)
- **2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 1.98 fps)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: SC-740 5x7 - Chamber Wizard Rock Gallery

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

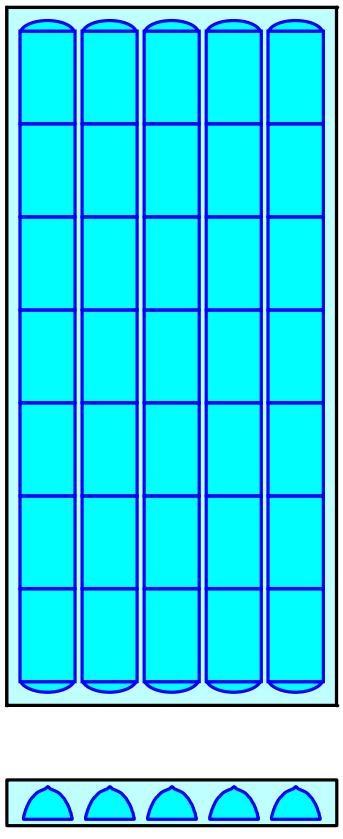
7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length +12.0" End Stone x 2 = 53.46' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

35 Chambers x 45.9 cf = 1,607.9 cf Chamber Storage

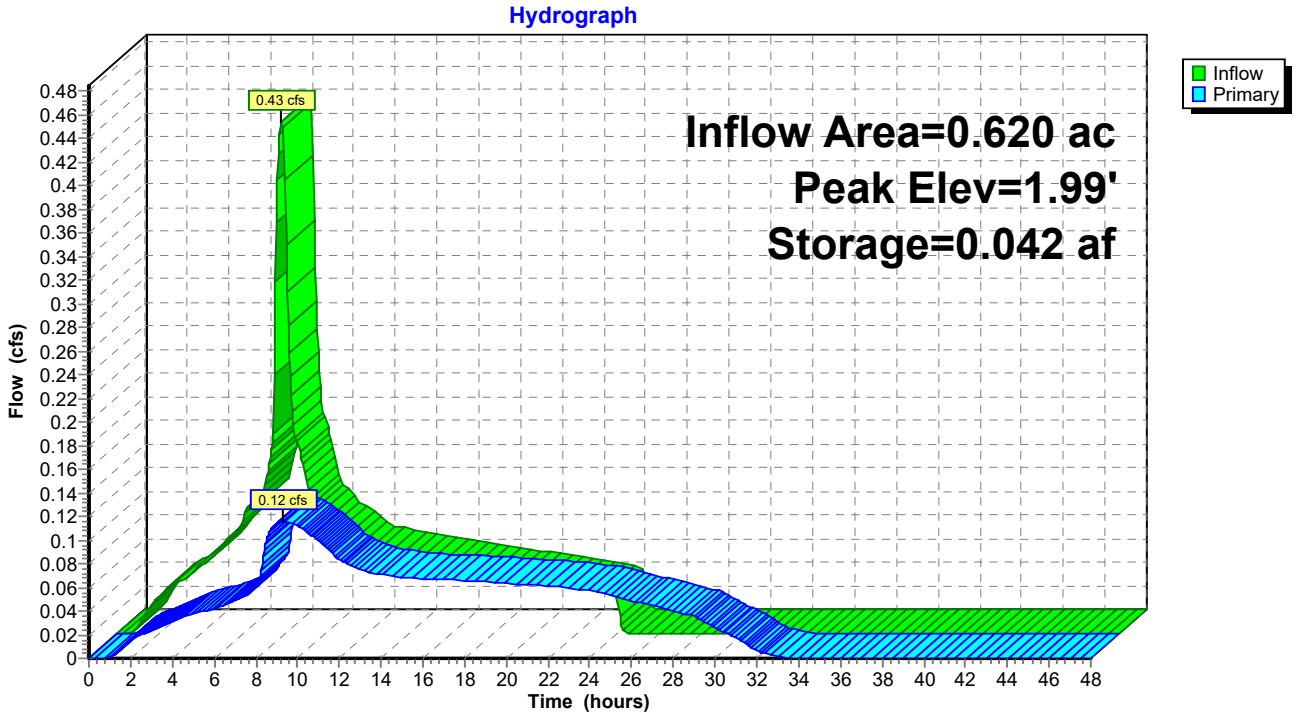
4,724.2 cf Field - 1,607.9 cf Chambers = 3,116.3 cf Stone x 40.0% Voids = 1,246.5 cf Stone Storage

Chamber Storage + Stone Storage = 2,854.4 cf = 0.066 af
Overall Storage Efficiency = 60.4%
Overall System Size = 53.46' x 25.25' x 3.50'

35 Chambers
175.0 cy Field
115.4 cy Stone



Pond 5P: SC-740 5x7



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Developed Runoff Area=27,000 sf 100.00% Impervious Runoff Depth=3.27"
Tc=5.0 min CN=0/98 Runoff=0.51 cfs 0.169 af

Subcatchment3S: Pre-Developed Runoff Area=27,000 sf 0.00% Impervious Runoff Depth=1.37"
Tc=5.0 min CN=76/0 Runoff=0.18 cfs 0.071 af

Subcatchment9S: Capture (conveyance Runoff Area=52,000 sf 100.00% Impervious Runoff Depth=3.27"
Tc=5.0 min CN=0/98 Runoff=0.98 cfs 0.325 af

Pond 5P: SC-740 5x7 Peak Elev=2.31' Storage=0.048 af Inflow=0.51 cfs 0.169 af
Outflow=0.15 cfs 0.169 af

Total Runoff Area = 2.433 ac Runoff Volume = 0.564 af Average Runoff Depth = 2.78"
25.47% Pervious = 0.620 ac 74.53% Impervious = 1.814 ac

Summary for Subcatchment 1S: Developed

[49] Hint: Tc<2dt may require smaller dt

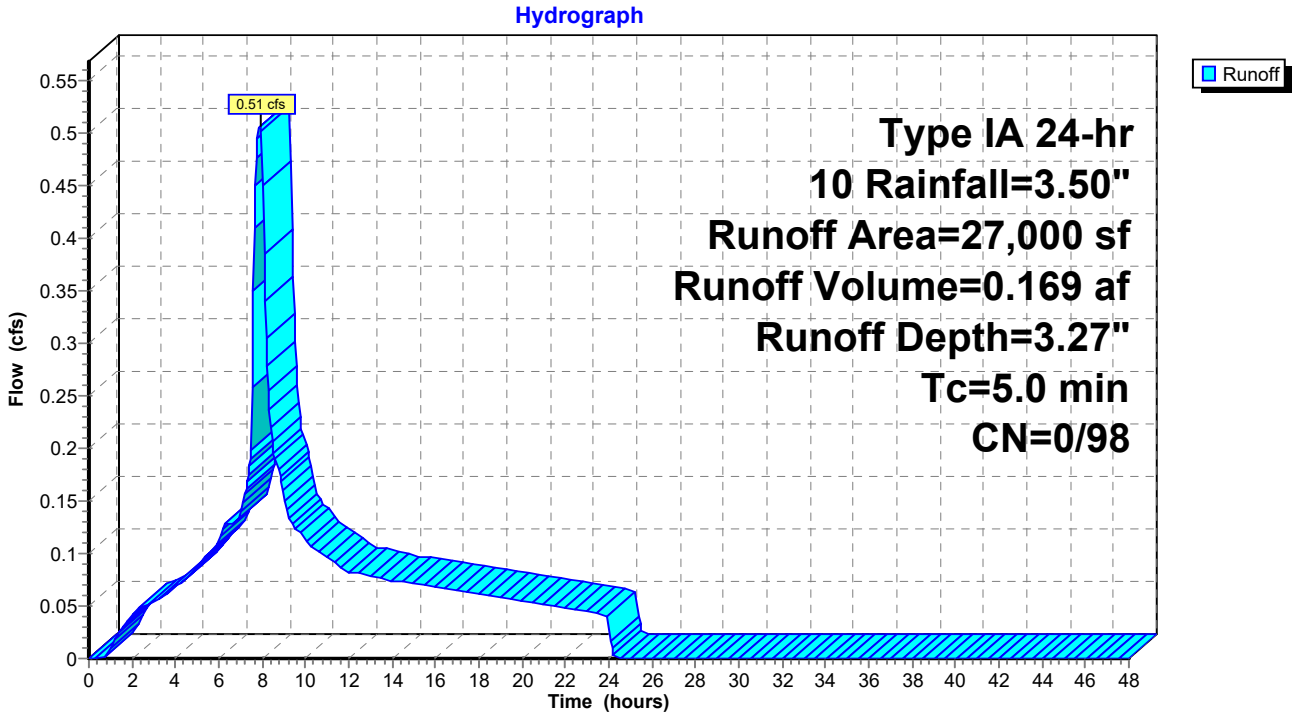
Runoff = 0.51 cfs @ 7.90 hrs, Volume= 0.169 af, Depth= 3.27"
Routed to Pond 5P : SC-740 5x7

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 Rainfall=3.50"

	Area (sf)	CN	Description
*	27,000	98	
	27,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: Developed



Summary for Subcatchment 3S: Pre-Developed

[49] Hint: Tc<2dt may require smaller dt

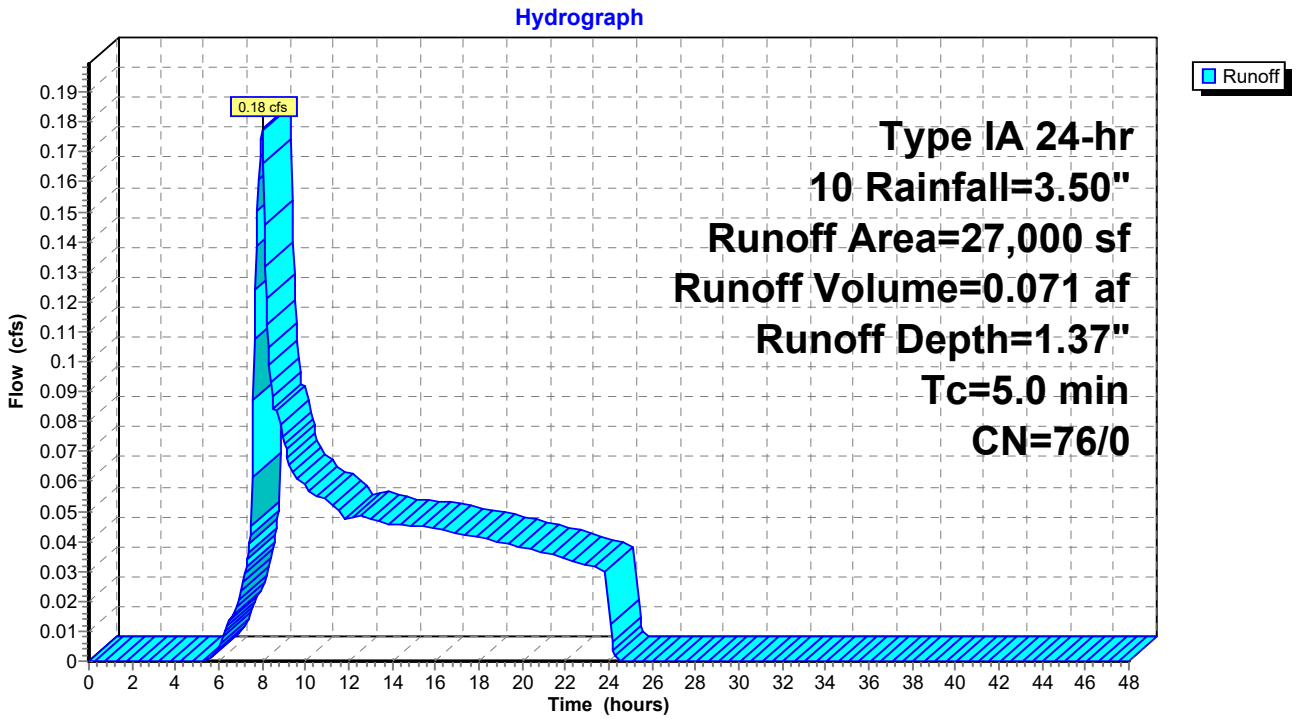
Runoff = 0.18 cfs @ 7.99 hrs, Volume= 0.071 af, Depth= 1.37"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 Rainfall=3.50"

Area (sf)	CN	Description
27,000	76	Woods/grass comb., Fair, HSG C
27,000	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 3S: Pre-Developed



Summary for Subcatchment 9S: Capture (conveyance calcs)

[49] Hint: Tc<2dt may require smaller dt

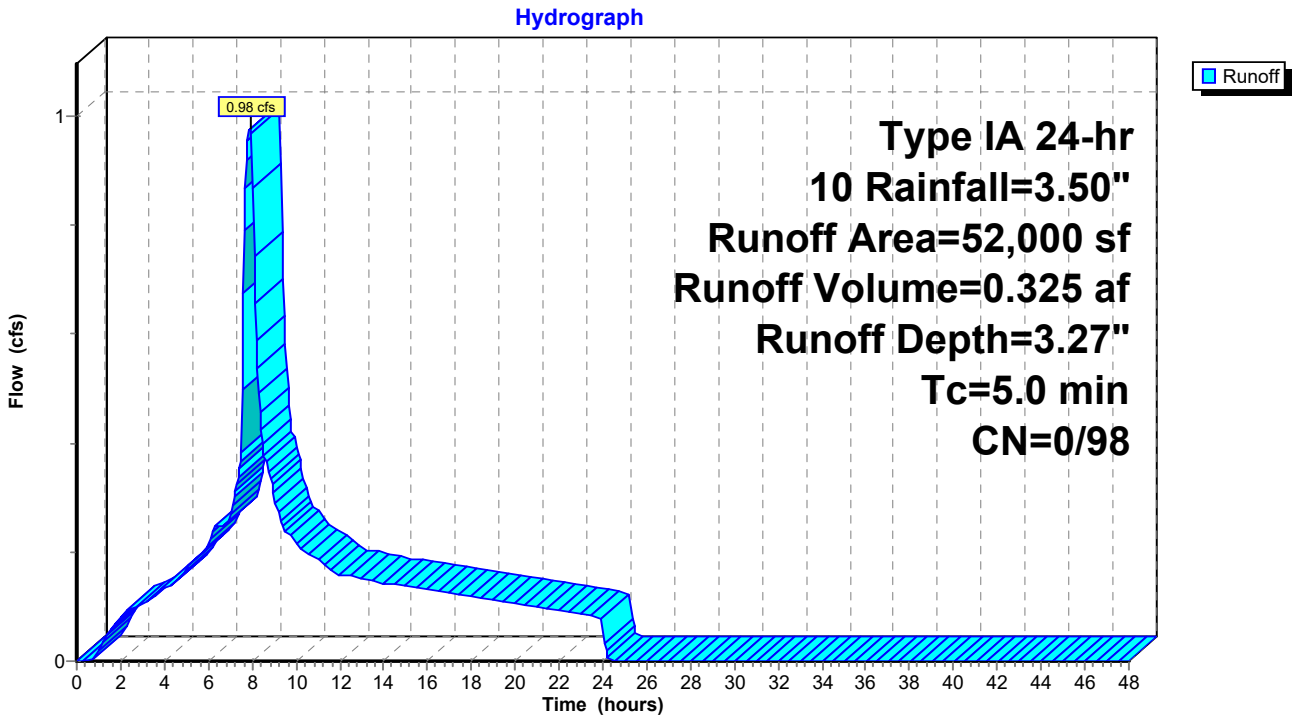
Runoff = 0.98 cfs @ 7.90 hrs, Volume= 0.325 af, Depth= 3.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 Rainfall=3.50"

	Area (sf)	CN	Description
*	52,000	98	
	52,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 9S: Capture (conveyance calcs)



Summary for Pond 5P: SC-740 5x7

Inflow Area = 0.620 ac,100.00% Impervious, Inflow Depth = 3.27" for 10 event
Inflow = 0.51 cfs @ 7.90 hrs, Volume= 0.169 af
Outflow = 0.15 cfs @ 9.07 hrs, Volume= 0.169 af, Atten= 70%, Lag= 70.1 min
Primary = 0.15 cfs @ 9.07 hrs, Volume= 0.169 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 2.31' @ 9.07 hrs Surf.Area= 0.031 ac Storage= 0.048 af

Plug-Flow detention time= 278.6 min calculated for 0.169 af (100% of inflow)
Center-of-Mass det. time= 278.9 min (943.0 - 664.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.029 af	**25.25'W x 53.46'L x 3.50'H Rock Gallery** 0.108 af Overall - 0.037 af Embedded = 0.072 af x 40.0% Voids
#2A	0.50'	0.037 af	**ADS_StormTech SC-740 +Cap** x 35 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Chambers in 5 Rows
		0.066 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**1.4" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	1.74'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	2.71'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.15 cfs @ 9.07 hrs HW=2.31' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.08 cfs @ 7.32 fps)
- **2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 3.36 fps)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: SC-740 5x7 - Chamber Wizard Rock Gallery

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

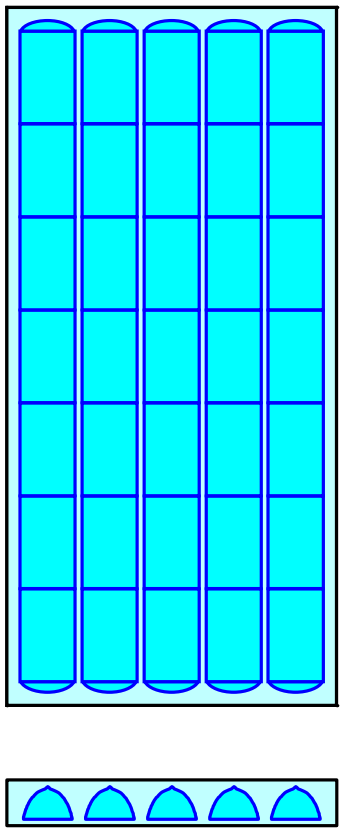
7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length +12.0" End Stone x 2 = 53.46' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

35 Chambers x 45.9 cf = 1,607.9 cf Chamber Storage

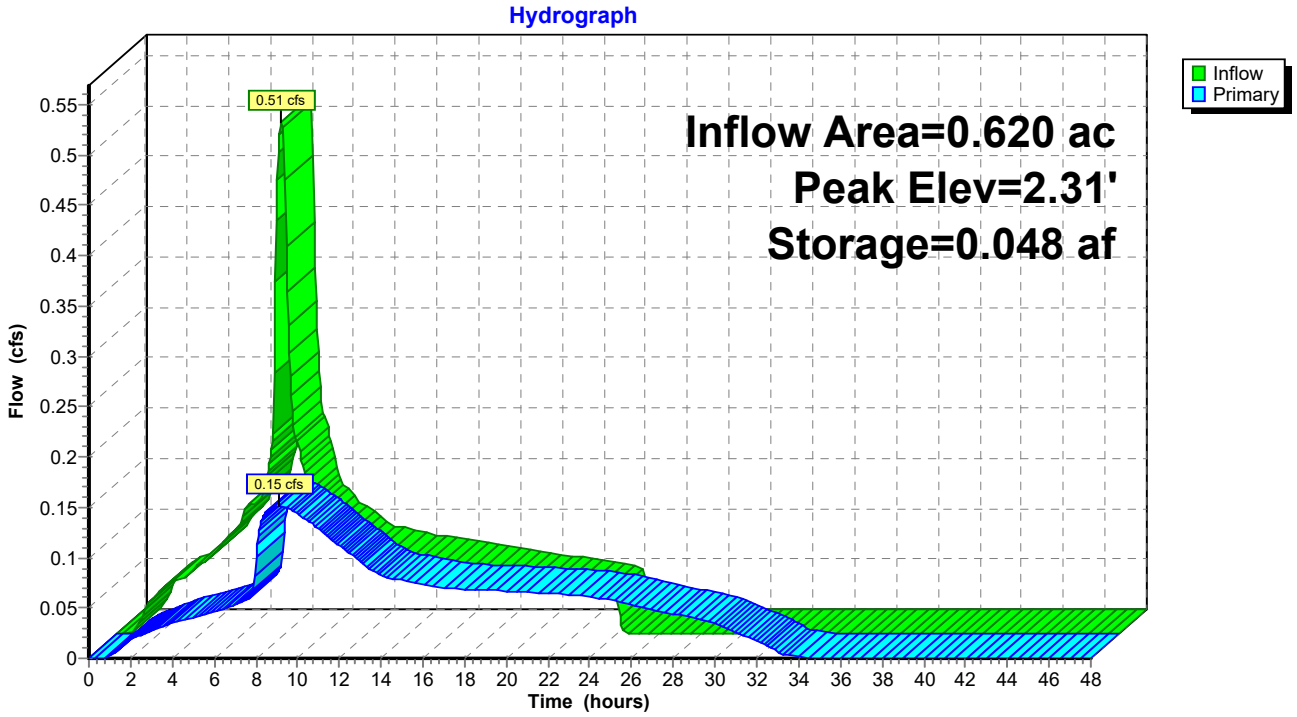
4,724.2 cf Field - 1,607.9 cf Chambers = 3,116.3 cf Stone x 40.0% Voids = 1,246.5 cf Stone Storage

Chamber Storage + Stone Storage = 2,854.4 cf = 0.066 af
Overall Storage Efficiency = 60.4%
Overall System Size = 53.46' x 25.25' x 3.50'

35 Chambers
175.0 cy Field
115.4 cy Stone



Pond 5P: SC-740 5x7



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Developed Runoff Area=27,000 sf 100.00% Impervious Runoff Depth=3.77"
Tc=5.0 min CN=0/98 Runoff=0.58 cfs 0.194 af

Subcatchment3S: Pre-Developed Runoff Area=27,000 sf 0.00% Impervious Runoff Depth=1.74"
Tc=5.0 min CN=76/0 Runoff=0.24 cfs 0.090 af

Subcatchment9S: Capture (conveyance Runoff Area=52,000 sf 100.00% Impervious Runoff Depth=3.77"
Tc=5.0 min CN=0/98 Runoff=1.12 cfs 0.375 af

Pond 5P: SC-740 5x7 Peak Elev=2.71' Storage=0.055 af Inflow=0.58 cfs 0.194 af
Outflow=0.18 cfs 0.194 af

Total Runoff Area = 2.433 ac Runoff Volume = 0.659 af Average Runoff Depth = 3.25"
25.47% Pervious = 0.620 ac 74.53% Impervious = 1.814 ac

Summary for Subcatchment 1S: Developed

[49] Hint: Tc<2dt may require smaller dt

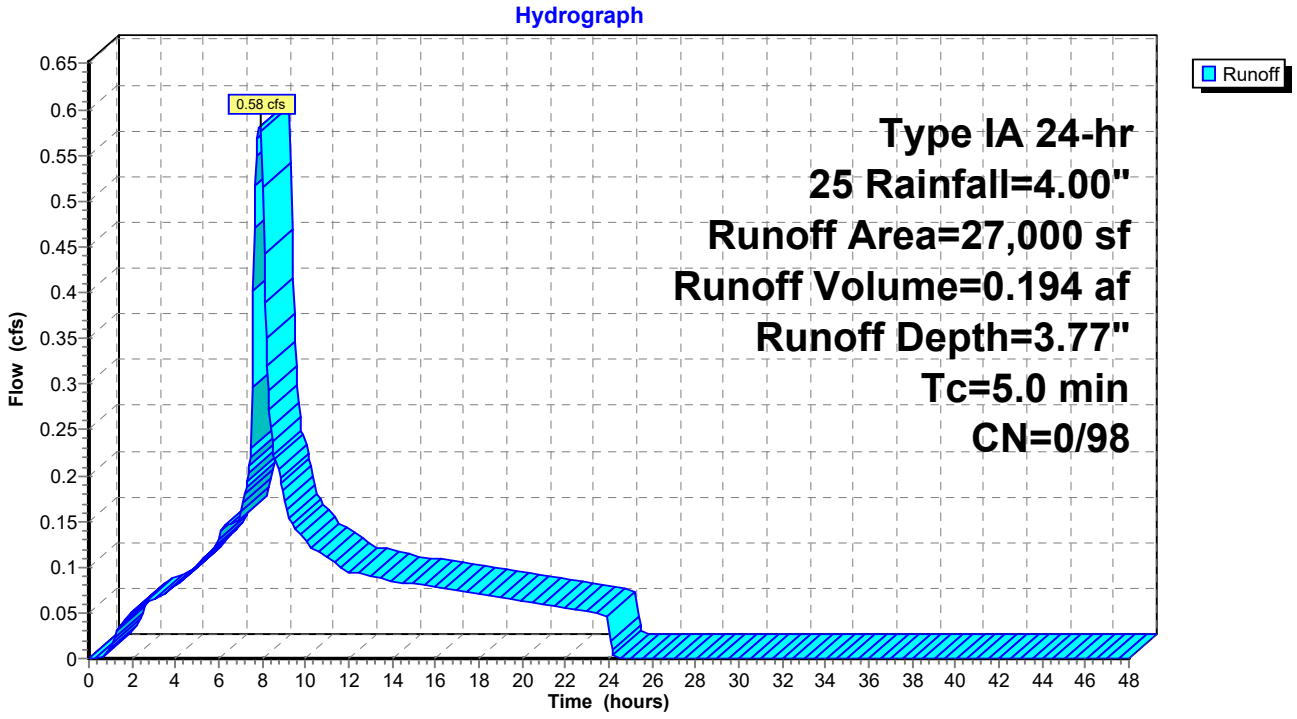
Runoff = 0.58 cfs @ 7.90 hrs, Volume= 0.194 af, Depth= 3.77"
Routed to Pond 5P : SC-740 5x7

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25 Rainfall=4.00"

	Area (sf)	CN	Description
*	27,000	98	
	27,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: Developed



Summary for Subcatchment 3S: Pre-Developed

[49] Hint: Tc<2dt may require smaller dt

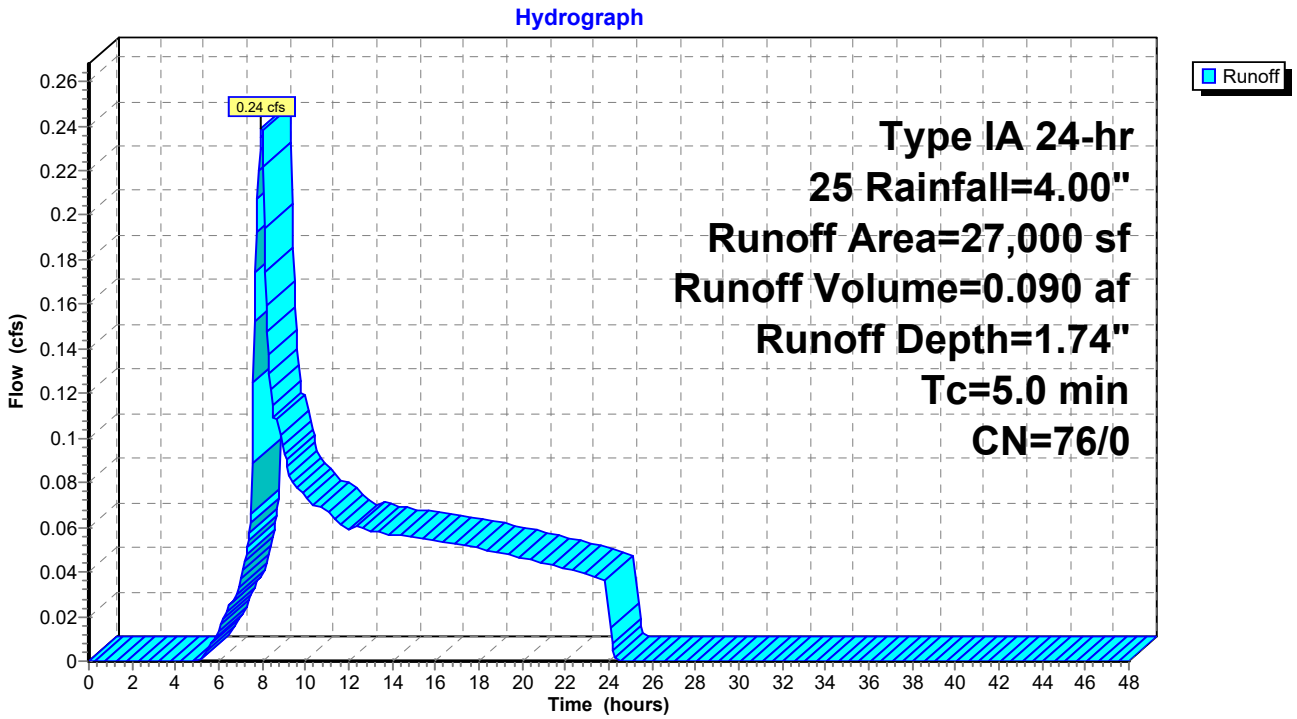
Runoff = 0.24 cfs @ 7.98 hrs, Volume= 0.090 af, Depth= 1.74"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25 Rainfall=4.00"

Area (sf)	CN	Description
27,000	76	Woods/grass comb., Fair, HSG C
27,000	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 3S: Pre-Developed



Summary for Subcatchment 9S: Capture (conveyance calcs)

[49] Hint: Tc<2dt may require smaller dt

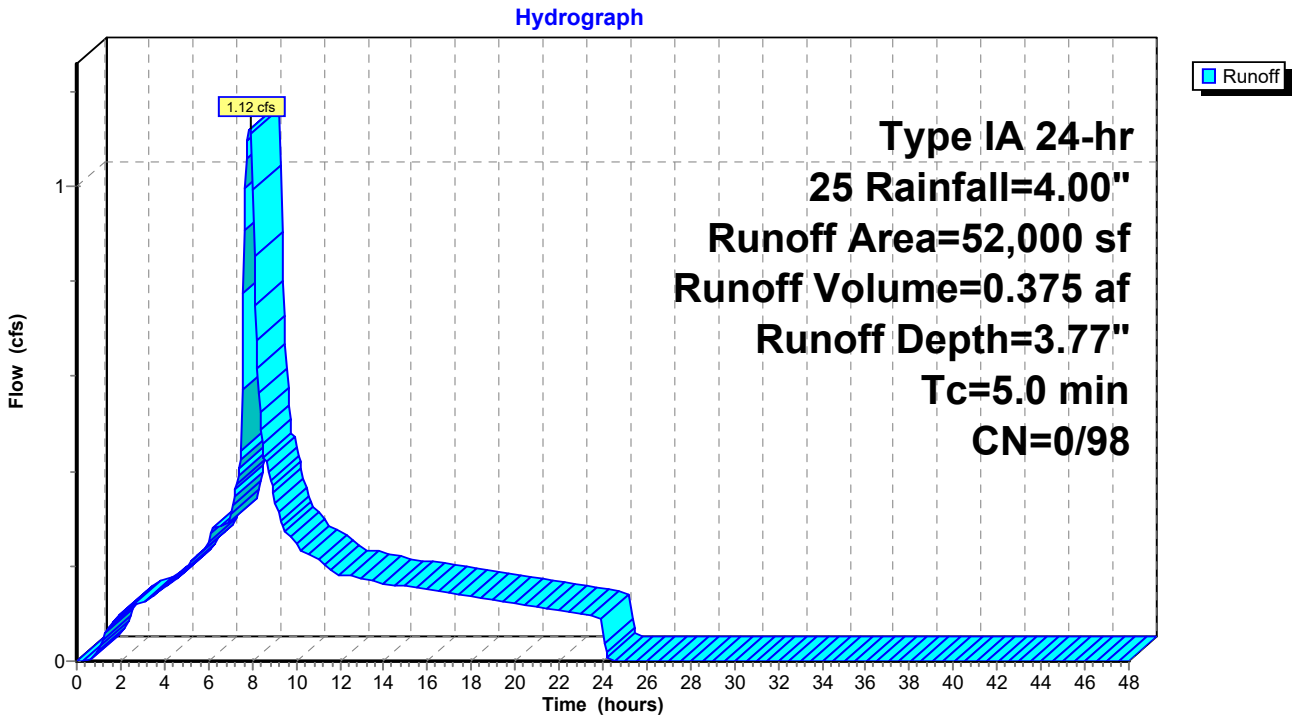
Runoff = 1.12 cfs @ 7.90 hrs, Volume= 0.375 af, Depth= 3.77"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25 Rainfall=4.00"

	Area (sf)	CN	Description
*	52,000	98	
	52,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 9S: Capture (conveyance calcs)



Summary for Pond 5P: SC-740 5x7

Inflow Area = 0.620 ac,100.00% Impervious, Inflow Depth = 3.77" for 25 event
Inflow = 0.58 cfs @ 7.90 hrs, Volume= 0.194 af
Outflow = 0.18 cfs @ 8.97 hrs, Volume= 0.194 af, Atten= 68%, Lag= 64.7 min
Primary = 0.18 cfs @ 8.97 hrs, Volume= 0.194 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 2.71' @ 8.97 hrs Surf.Area= 0.031 ac Storage= 0.055 af

Plug-Flow detention time= 268.5 min calculated for 0.194 af (100% of inflow)
Center-of-Mass det. time= 268.9 min (929.7 - 660.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.029 af	**25.25'W x 53.46'L x 3.50'H Rock Gallery** 0.108 af Overall - 0.037 af Embedded = 0.072 af x 40.0% Voids
#2A	0.50'	0.037 af	**ADS_StormTech SC-740 +Cap** x 35 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Chambers in 5 Rows
		0.066 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**1.4" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	1.74'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	2.71'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.18 cfs @ 8.97 hrs HW=2.71' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.08 cfs @ 7.93 fps)
- **2=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.54 fps)
- **3=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.11 fps)

Pond 5P: SC-740 5x7 - Chamber Wizard Rock Gallery

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

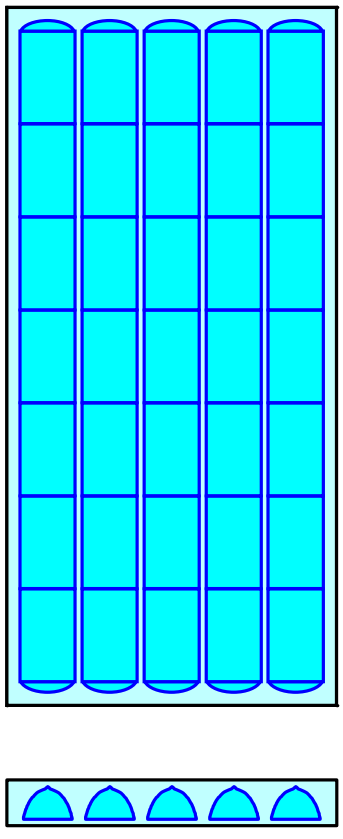
7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length +12.0" End Stone x 2 = 53.46' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

35 Chambers x 45.9 cf = 1,607.9 cf Chamber Storage

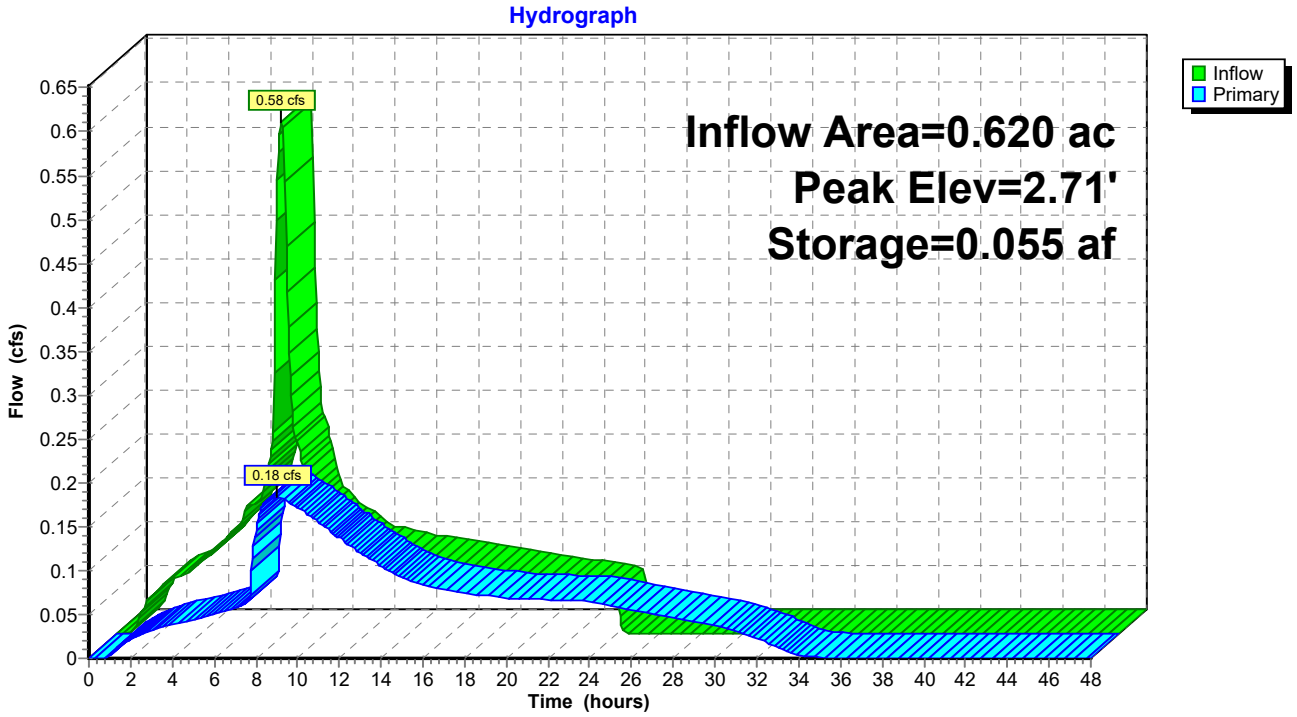
4,724.2 cf Field - 1,607.9 cf Chambers = 3,116.3 cf Stone x 40.0% Voids = 1,246.5 cf Stone Storage

Chamber Storage + Stone Storage = 2,854.4 cf = 0.066 af
Overall Storage Efficiency = 60.4%
Overall System Size = 53.46' x 25.25' x 3.50'

35 Chambers
175.0 cy Field
115.4 cy Stone



Pond 5P: SC-740 5x7



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Developed Runoff Area=27,000 sf 100.00% Impervious Runoff Depth=4.26"
Tc=5.0 min CN=0/98 Runoff=0.66 cfs 0.220 af

Subcatchment3S: Pre-Developed Runoff Area=27,000 sf 0.00% Impervious Runoff Depth=2.13"
Tc=5.0 min CN=76/0 Runoff=0.30 cfs 0.110 af

Subcatchment9S: Capture (conveyance Runoff Area=52,000 sf 100.00% Impervious Runoff Depth=4.26"
Tc=5.0 min CN=0/98 Runoff=1.27 cfs 0.424 af

Pond 5P: SC-740 5x7 Peak Elev=3.01' Storage=0.059 af Inflow=0.66 cfs 0.220 af
Outflow=0.30 cfs 0.220 af

Total Runoff Area = 2.433 ac Runoff Volume = 0.754 af Average Runoff Depth = 3.72"
25.47% Pervious = 0.620 ac 74.53% Impervious = 1.814 ac

Summary for Subcatchment 1S: Developed

[49] Hint: Tc<2dt may require smaller dt

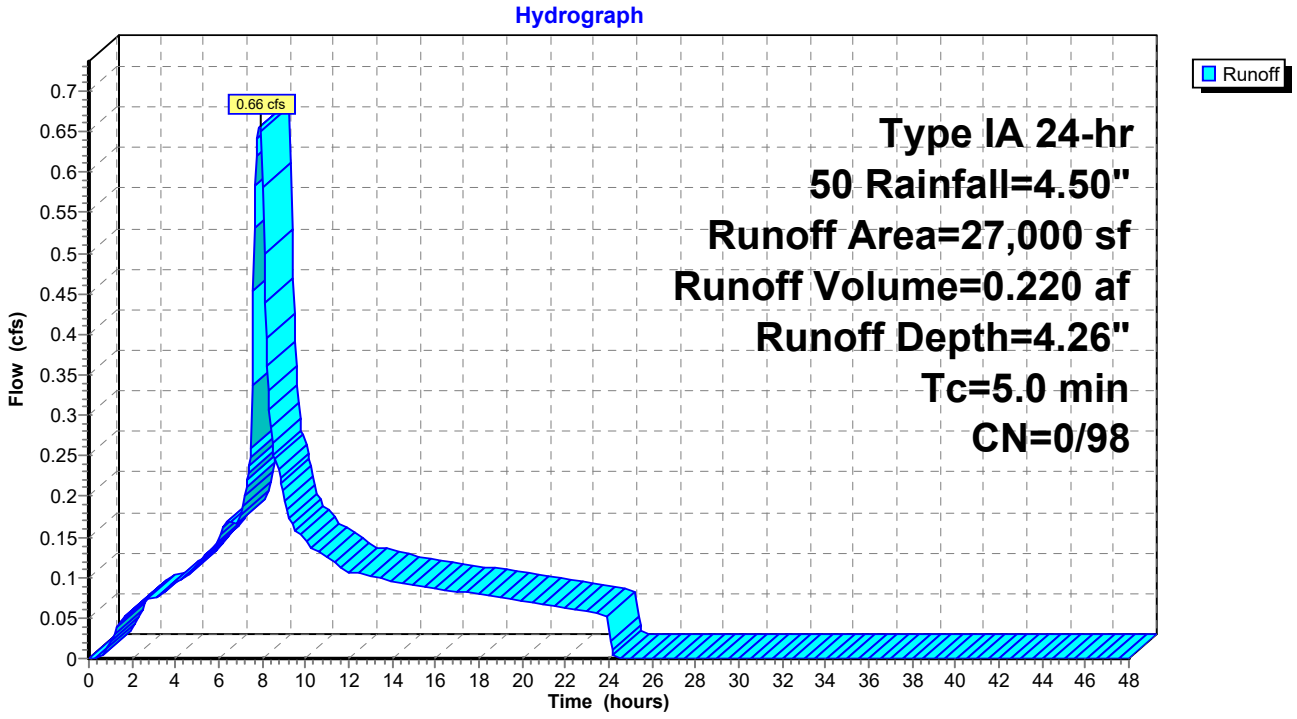
Runoff = 0.66 cfs @ 7.90 hrs, Volume= 0.220 af, Depth= 4.26"
Routed to Pond 5P : SC-740 5x7

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 Rainfall=4.50"

	Area (sf)	CN	Description
*	27,000	98	
	27,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: Developed



Summary for Subcatchment 3S: Pre-Developed

[49] Hint: Tc<2dt may require smaller dt

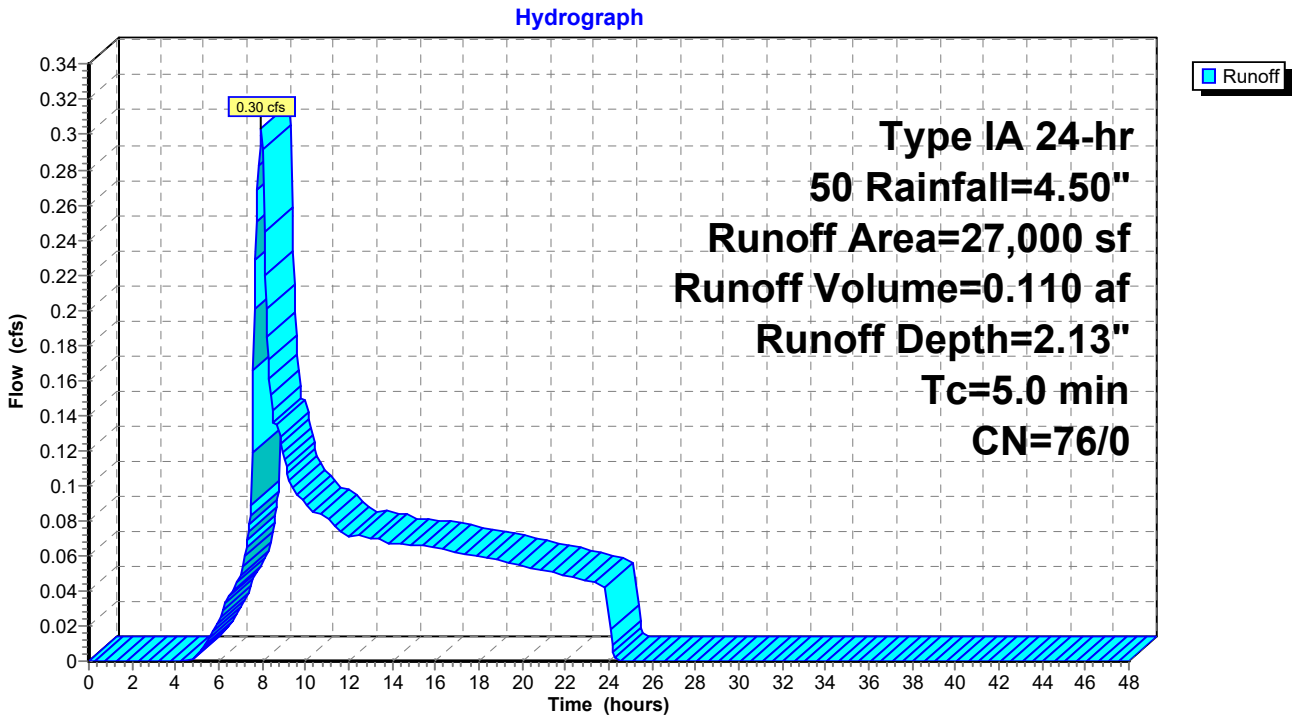
Runoff = 0.30 cfs @ 7.98 hrs, Volume= 0.110 af, Depth= 2.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 Rainfall=4.50"

Area (sf)	CN	Description
27,000	76	Woods/grass comb., Fair, HSG C
27,000	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 3S: Pre-Developed



Summary for Subcatchment 9S: Capture (conveyance calcs)

[49] Hint: Tc<2dt may require smaller dt

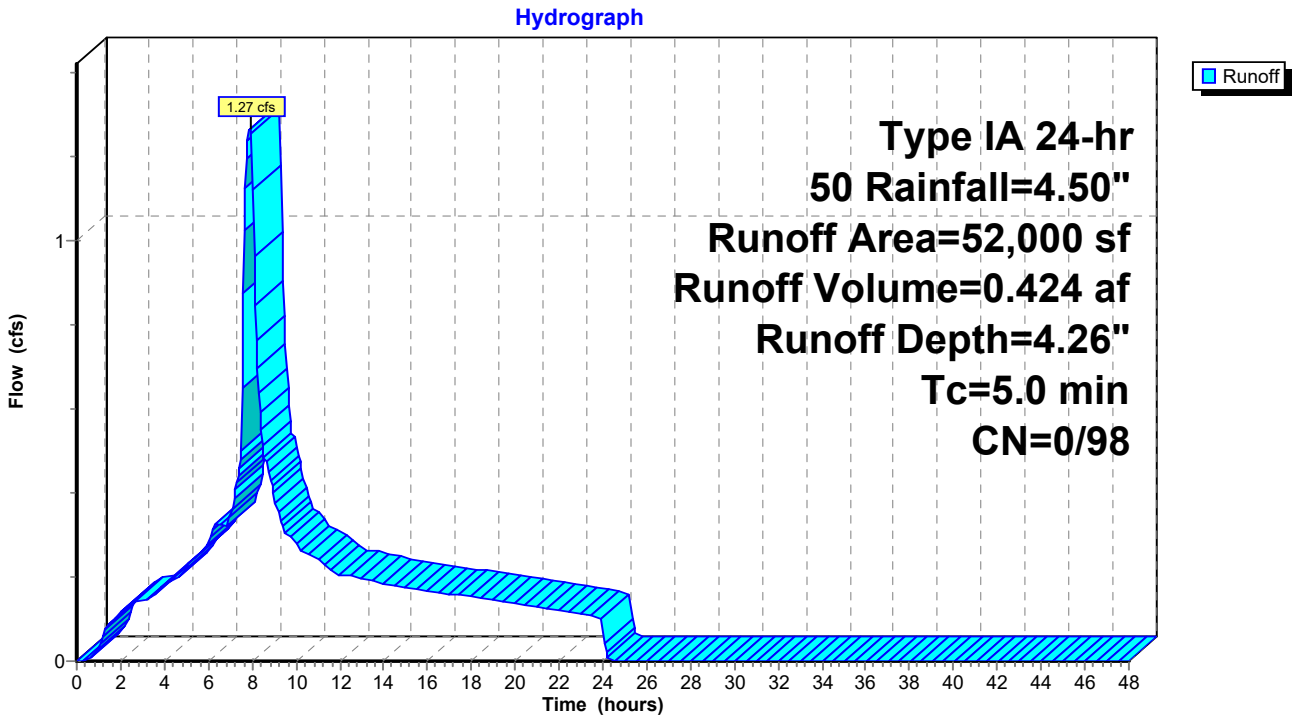
Runoff = 1.27 cfs @ 7.90 hrs, Volume= 0.424 af, Depth= 4.26"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 Rainfall=4.50"

	Area (sf)	CN	Description
*	52,000	98	
	52,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 9S: Capture (conveyance calcs)



Summary for Pond 5P: SC-740 5x7

Inflow Area = 0.620 ac,100.00% Impervious, Inflow Depth = 4.26" for 50 event
Inflow = 0.66 cfs @ 7.90 hrs, Volume= 0.220 af
Outflow = 0.30 cfs @ 8.36 hrs, Volume= 0.220 af, Atten= 54%, Lag= 28.1 min
Primary = 0.30 cfs @ 8.36 hrs, Volume= 0.220 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 3.01' @ 8.36 hrs Surf.Area= 0.031 ac Storage= 0.059 af

Plug-Flow detention time= 254.8 min calculated for 0.220 af (100% of inflow)
Center-of-Mass det. time= 254.5 min (912.6 - 658.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.029 af	**25.25'W x 53.46'L x 3.50'H Rock Gallery** 0.108 af Overall - 0.037 af Embedded = 0.072 af x 40.0% Voids
#2A	0.50'	0.037 af	**ADS_StormTech SC-740 +Cap** x 35 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Chambers in 5 Rows
		0.066 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**1.4" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	1.74'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	2.71'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.30 cfs @ 8.36 hrs HW=3.00' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.09 cfs @ 8.35 fps)
- **2=Orifice/Grate** (Orifice Controls 0.11 cfs @ 5.23 fps)
- **3=Orifice/Grate** (Orifice Controls 0.10 cfs @ 1.98 fps)

Pond 5P: SC-740 5x7 - Chamber Wizard Rock Gallery

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

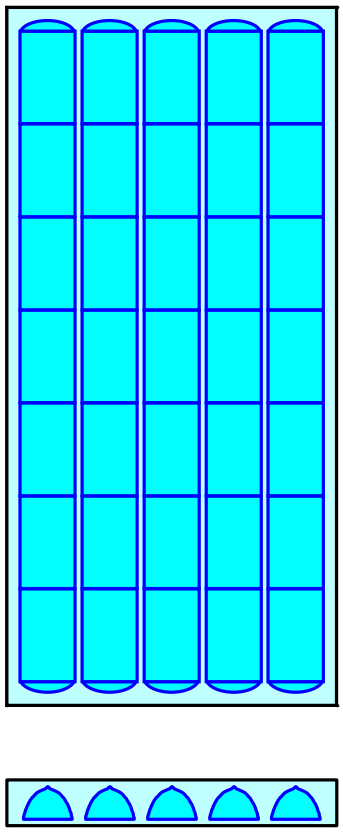
7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length +12.0" End Stone x 2 = 53.46' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

35 Chambers x 45.9 cf = 1,607.9 cf Chamber Storage

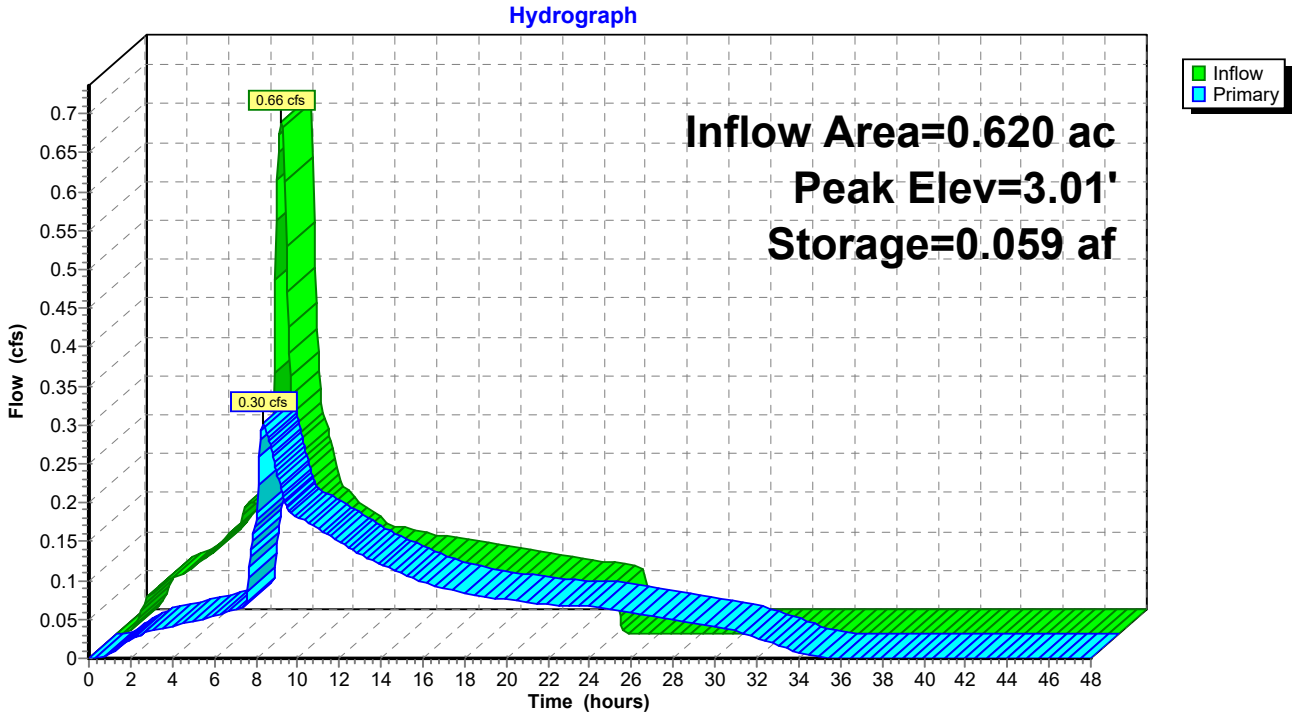
4,724.2 cf Field - 1,607.9 cf Chambers = 3,116.3 cf Stone x 40.0% Voids = 1,246.5 cf Stone Storage

Chamber Storage + Stone Storage = 2,854.4 cf = 0.066 af
Overall Storage Efficiency = 60.4%
Overall System Size = 53.46' x 25.25' x 3.50'

35 Chambers
175.0 cy Field
115.4 cy Stone



Pond 5P: SC-740 5x7



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Developed Runoff Area=27,000 sf 100.00% Impervious Runoff Depth=4.36"
Tc=5.0 min CN=0/98 Runoff=0.67 cfs 0.225 af

Subcatchment3S: Pre-Developed Runoff Area=27,000 sf 0.00% Impervious Runoff Depth=2.21"
Tc=5.0 min CN=76/0 Runoff=0.32 cfs 0.114 af

Subcatchment9S: Capture (conveyance Runoff Area=52,000 sf 100.00% Impervious Runoff Depth=4.36"
Tc=5.0 min CN=0/98 Runoff=1.30 cfs 0.434 af

Pond 5P: SC-740 5x7 Peak Elev=3.07' Storage=0.060 af Inflow=0.67 cfs 0.225 af
Outflow=0.32 cfs 0.225 af

Total Runoff Area = 2.433 ac Runoff Volume = 0.774 af Average Runoff Depth = 3.82"
25.47% Pervious = 0.620 ac 74.53% Impervious = 1.814 ac

Summary for Subcatchment 1S: Developed

[49] Hint: Tc<2dt may require smaller dt

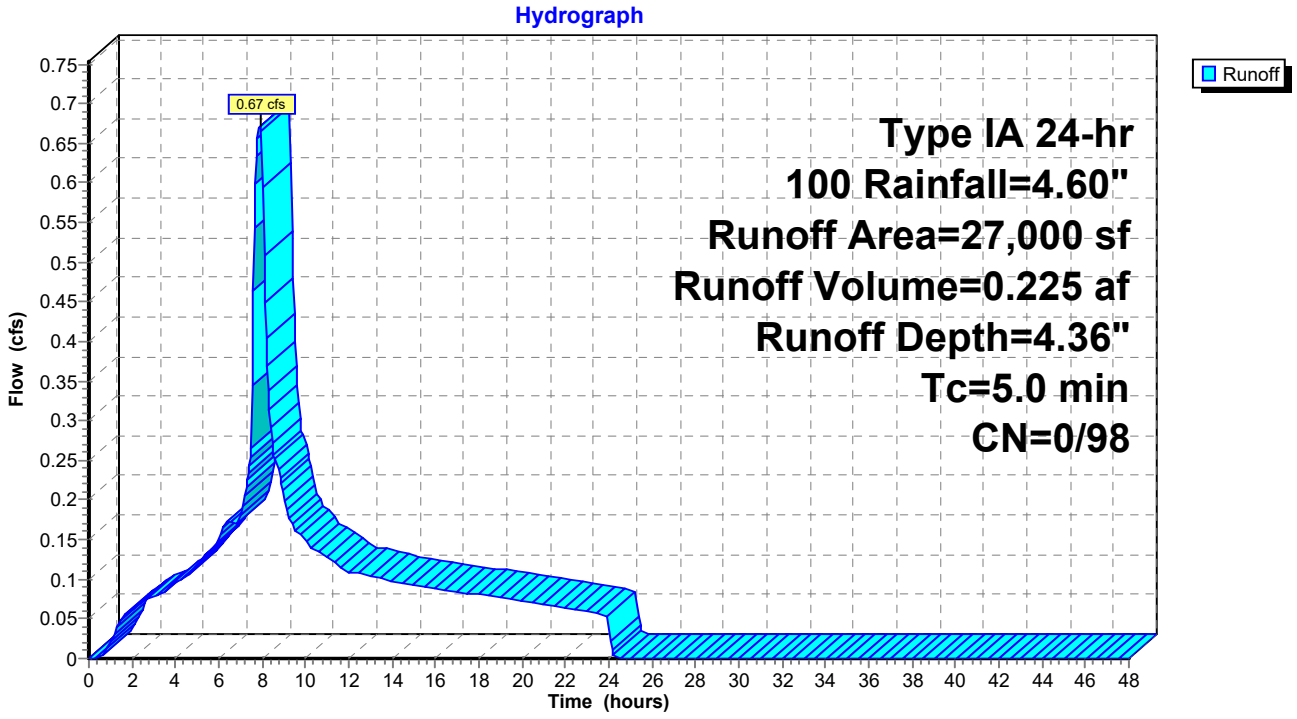
Runoff = 0.67 cfs @ 7.90 hrs, Volume= 0.225 af, Depth= 4.36"
Routed to Pond 5P : SC-740 5x7

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 Rainfall=4.60"

	Area (sf)	CN	Description
*	27,000	98	
	27,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: Developed



Summary for Subcatchment 3S: Pre-Developed

[49] Hint: Tc<2dt may require smaller dt

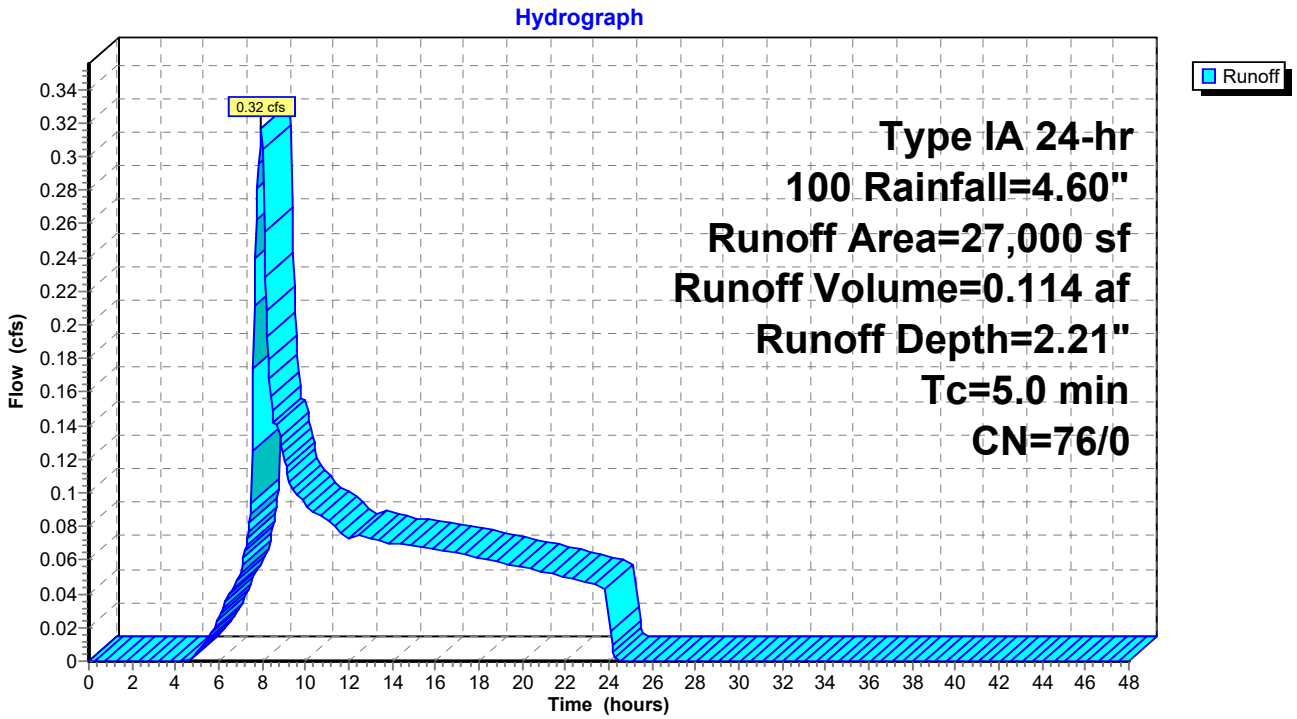
Runoff = 0.32 cfs @ 7.98 hrs, Volume= 0.114 af, Depth= 2.21"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 Rainfall=4.60"

Area (sf)	CN	Description
27,000	76	Woods/grass comb., Fair, HSG C
27,000	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 3S: Pre-Developed



Summary for Subcatchment 9S: Capture (conveyance calcs)

[49] Hint: Tc<2dt may require smaller dt

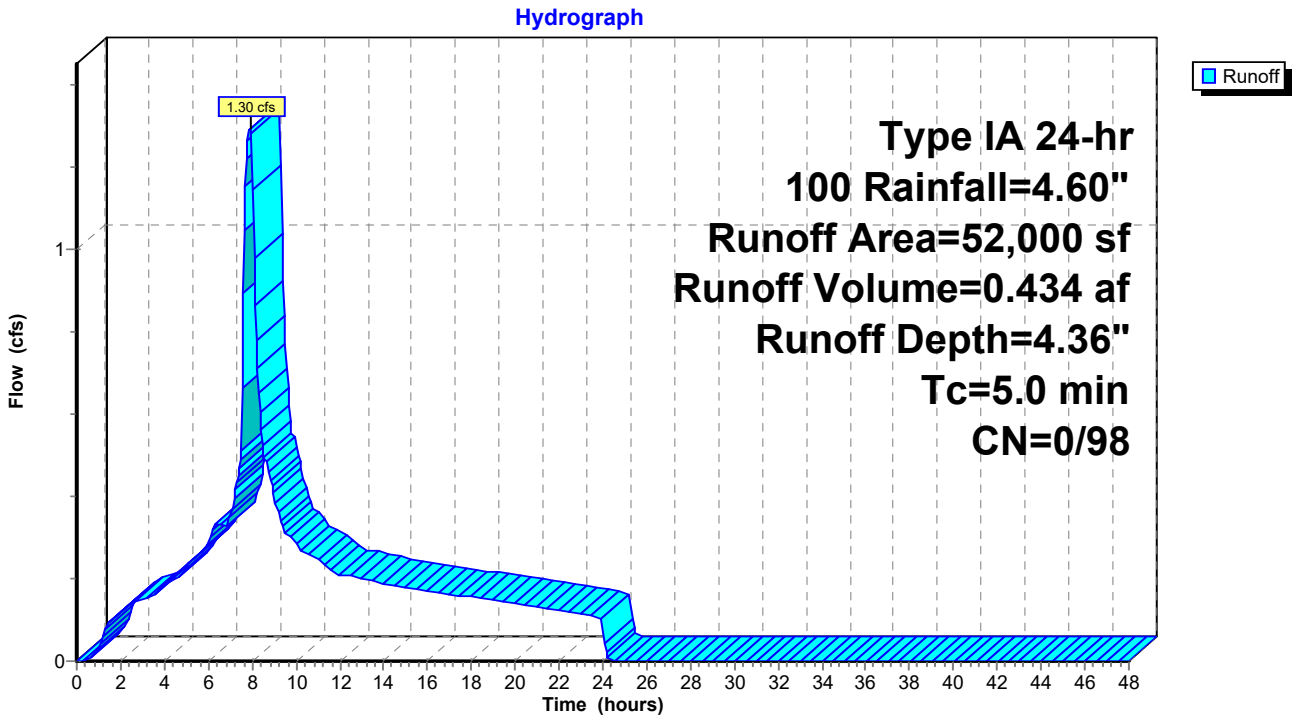
Runoff = 1.30 cfs @ 7.90 hrs, Volume= 0.434 af, Depth= 4.36"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 Rainfall=4.60"

	Area (sf)	CN	Description
*	52,000	98	
	52,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 9S: Capture (conveyance calcs)



Summary for Pond 5P: SC-740 5x7

Inflow Area = 0.620 ac,100.00% Impervious, Inflow Depth = 4.36" for 100 event
Inflow = 0.67 cfs @ 7.90 hrs, Volume= 0.225 af
Outflow = 0.32 cfs @ 8.33 hrs, Volume= 0.225 af, Atten= 52%, Lag= 26.3 min
Primary = 0.32 cfs @ 8.33 hrs, Volume= 0.225 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 3.07' @ 8.33 hrs Surf.Area= 0.031 ac Storage= 0.060 af

Plug-Flow detention time= 251.9 min calculated for 0.225 af (100% of inflow)
Center-of-Mass det. time= 251.5 min (909.2 - 657.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.029 af	**25.25'W x 53.46'L x 3.50'H Rock Gallery** 0.108 af Overall - 0.037 af Embedded = 0.072 af x 40.0% Voids
#2A	0.50'	0.037 af	**ADS_StormTech SC-740 +Cap** x 35 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Chambers in 5 Rows
		0.066 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**1.4" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	1.74'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	2.71'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.32 cfs @ 8.33 hrs HW=3.07' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.09 cfs @ 8.43 fps)
- **2=Orifice/Grate** (Orifice Controls 0.12 cfs @ 5.37 fps)
- **3=Orifice/Grate** (Orifice Controls 0.11 cfs @ 2.33 fps)

Pond 5P: SC-740 5x7 - Chamber Wizard Rock Gallery

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

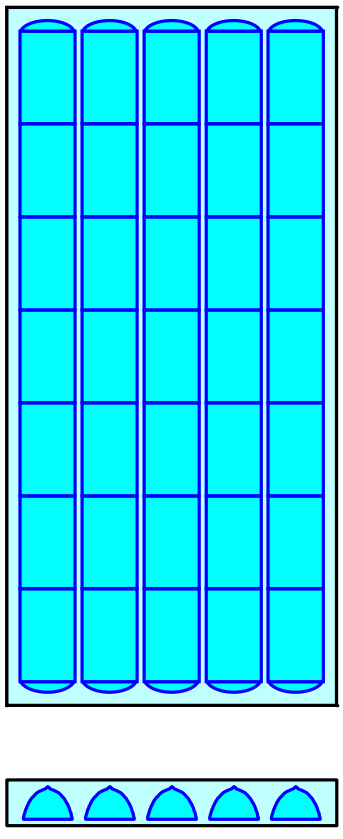
7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length +12.0" End Stone x 2 = 53.46' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

35 Chambers x 45.9 cf = 1,607.9 cf Chamber Storage

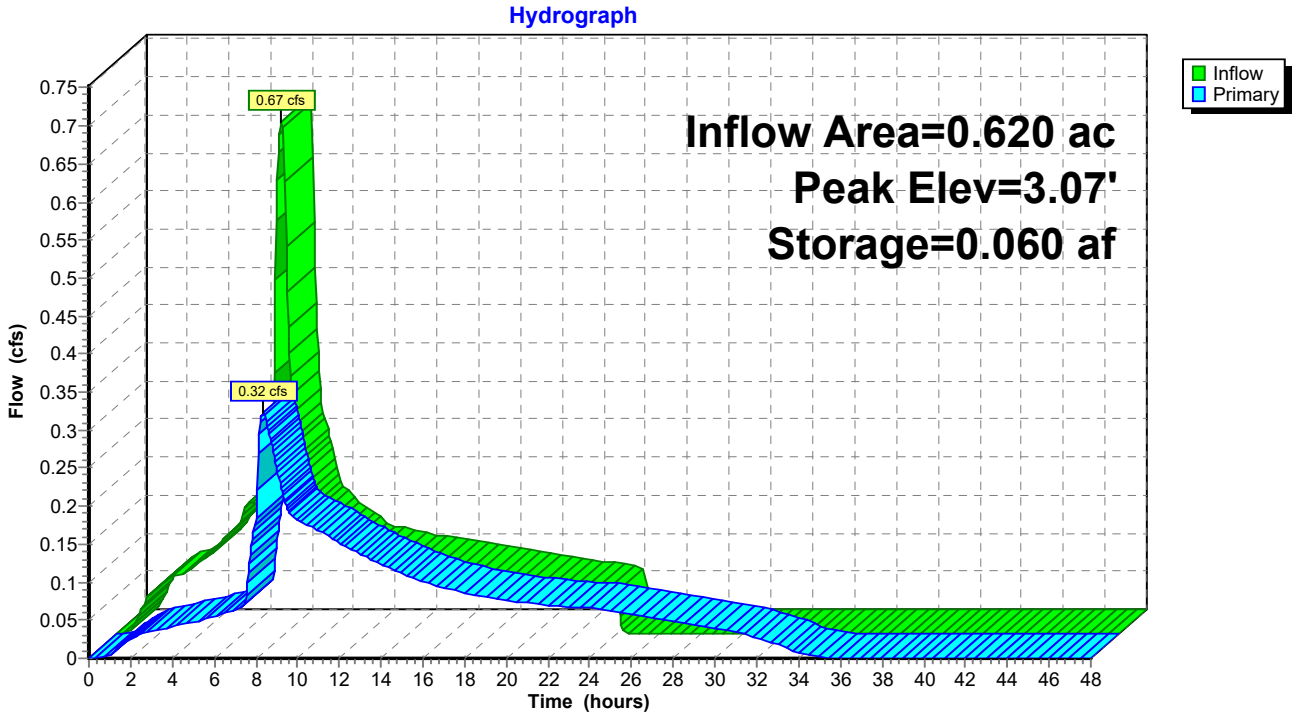
4,724.2 cf Field - 1,607.9 cf Chambers = 3,116.3 cf Stone x 40.0% Voids = 1,246.5 cf Stone Storage

Chamber Storage + Stone Storage = 2,854.4 cf = 0.066 af
Overall Storage Efficiency = 60.4%
Overall System Size = 53.46' x 25.25' x 3.50'

35 Chambers
175.0 cy Field
115.4 cy Stone



Pond 5P: SC-740 5x7



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Developed Runoff Area=27,000 sf 100.00% Impervious Runoff Depth=1.39"
Tc=5.0 min CN=0/98 Runoff=0.22 cfs 0.072 af

Subcatchment3S: Pre-Developed Runoff Area=27,000 sf 0.00% Impervious Runoff Depth=0.23"
Tc=5.0 min CN=76/0 Runoff=0.01 cfs 0.012 af

Subcatchment9S: Capture (conveyance Runoff Area=52,000 sf 100.00% Impervious Runoff Depth=1.39"
Tc=5.0 min CN=0/98 Runoff=0.43 cfs 0.138 af

Pond 5P: SC-740 5x7 Peak Elev=0.97' Storage=0.018 af Inflow=0.22 cfs 0.072 af
Outflow=0.05 cfs 0.072 af

Total Runoff Area = 2.433 ac Runoff Volume = 0.222 af Average Runoff Depth = 1.09"
25.47% Pervious = 0.620 ac 74.53% Impervious = 1.814 ac

Summary for Subcatchment 1S: Developed

[49] Hint: Tc<2dt may require smaller dt

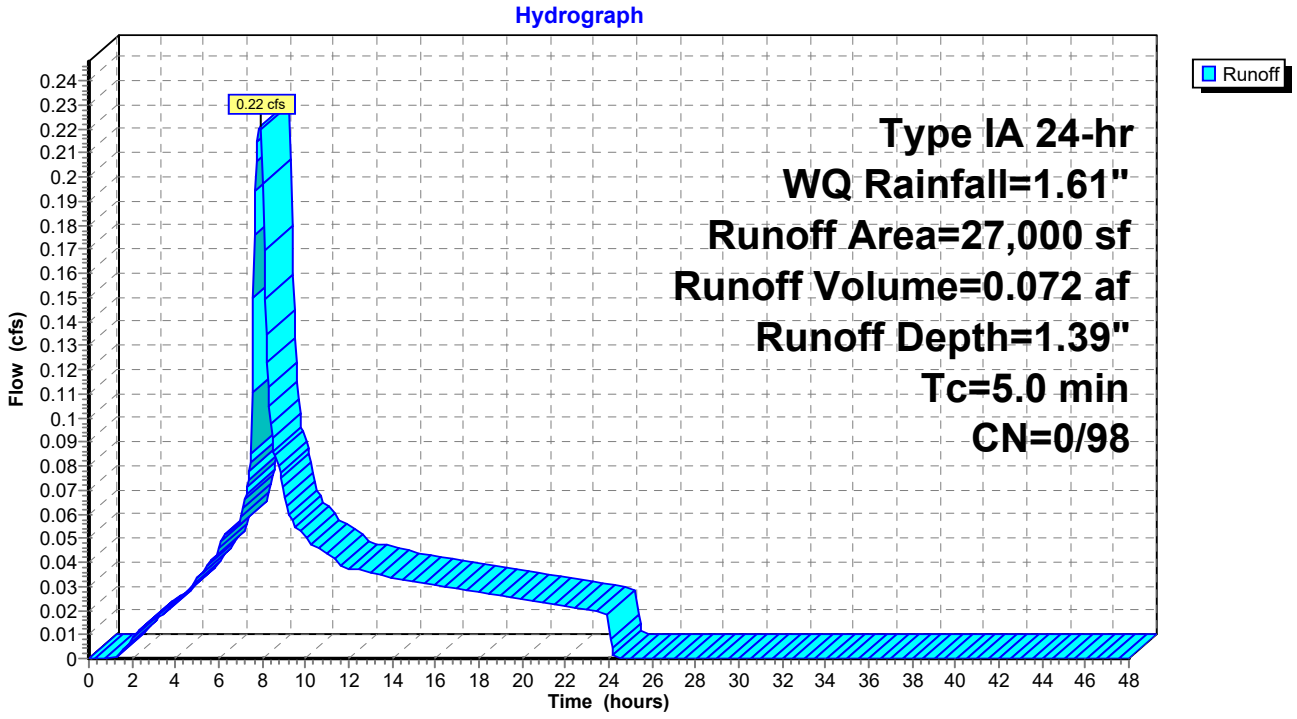
Runoff = 0.22 cfs @ 7.91 hrs, Volume= 0.072 af, Depth= 1.39"
Routed to Pond 5P : SC-740 5x7

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr WQ Rainfall=1.61"

	Area (sf)	CN	Description
*	27,000	98	
	27,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: Developed



Summary for Subcatchment 3S: Pre-Developed

[49] Hint: Tc<2dt may require smaller dt

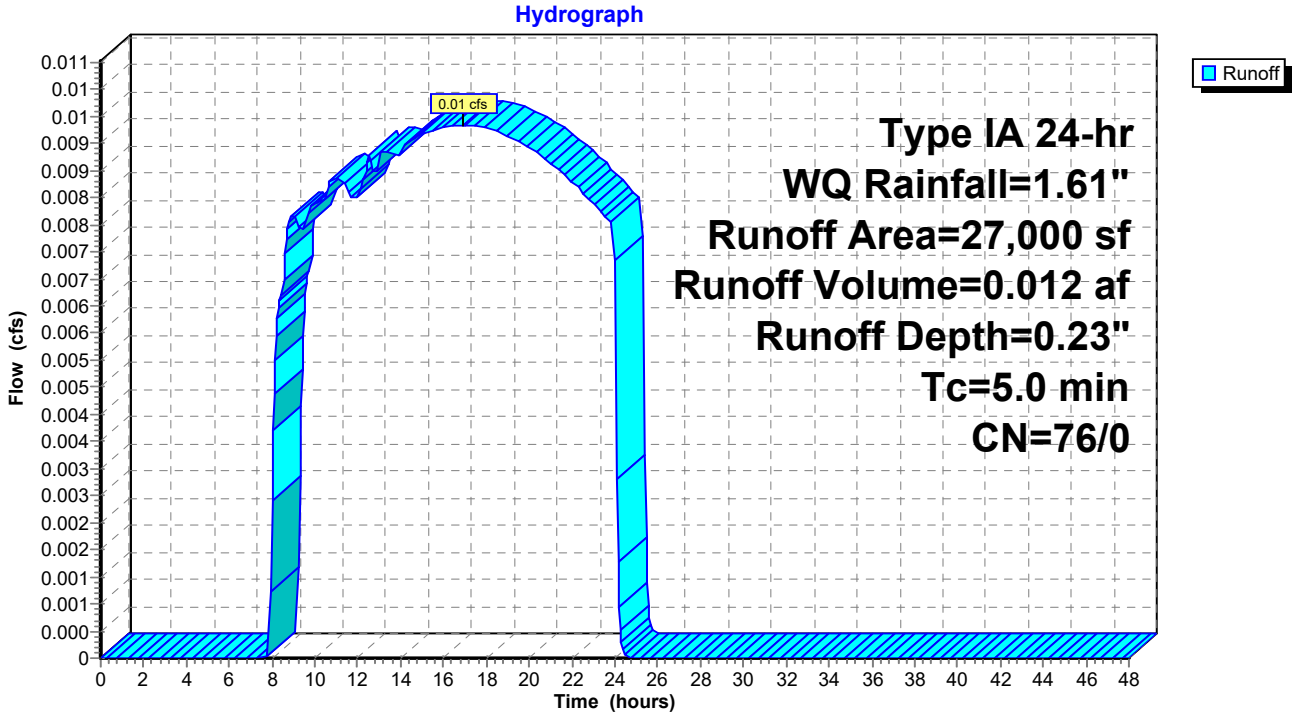
Runoff = 0.01 cfs @ 16.87 hrs, Volume= 0.012 af, Depth= 0.23"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr WQ Rainfall=1.61"

Area (sf)	CN	Description
27,000	76	Woods/grass comb., Fair, HSG C
27,000	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 3S: Pre-Developed



Summary for Subcatchment 9S: Capture (conveyance calcs)

[49] Hint: Tc<2dt may require smaller dt

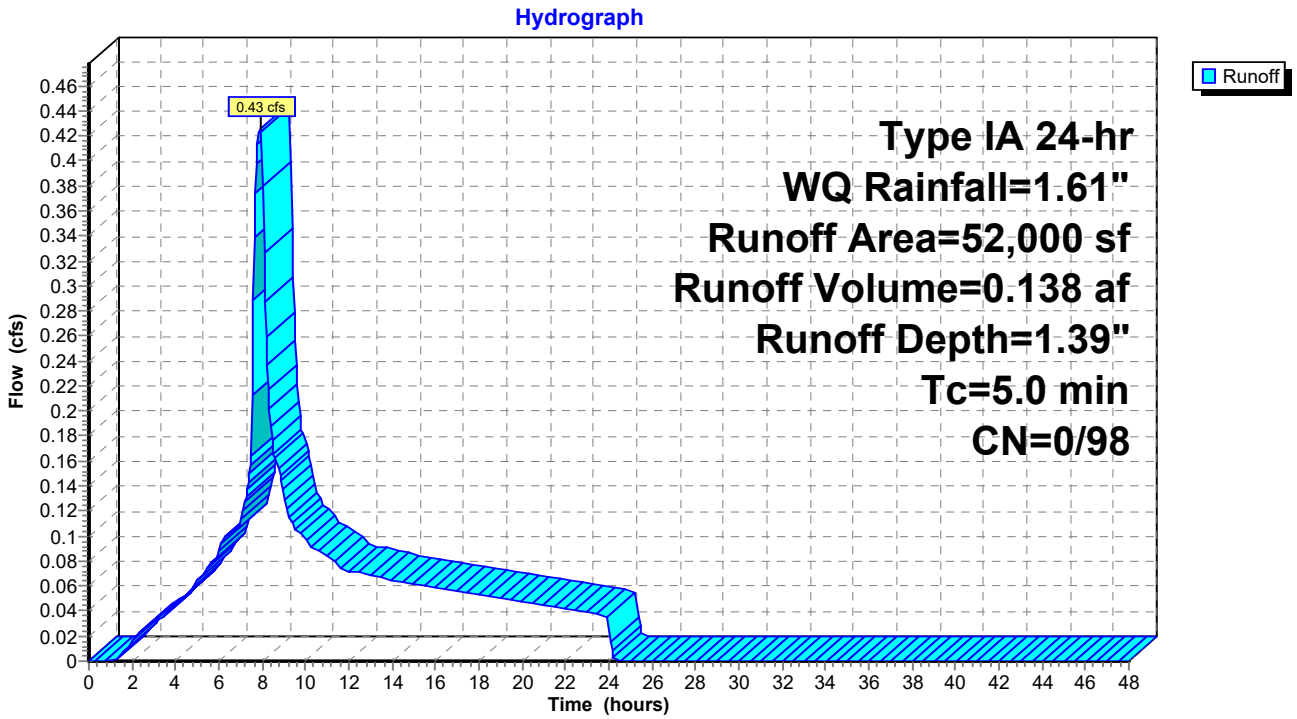
Runoff = 0.43 cfs @ 7.91 hrs, Volume= 0.138 af, Depth= 1.39"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr WQ Rainfall=1.61"

	Area (sf)	CN	Description
*	52,000	98	
	52,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 9S: Capture (conveyance calcs)



Summary for Pond 5P: SC-740 5x7

Inflow Area = 0.620 ac,100.00% Impervious, Inflow Depth = 1.39" for WQ event
Inflow = 0.22 cfs @ 7.91 hrs, Volume= 0.072 af
Outflow = 0.05 cfs @ 10.00 hrs, Volume= 0.072 af, Atten= 77%, Lag= 125.6 min
Primary = 0.05 cfs @ 10.00 hrs, Volume= 0.072 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 0.97' @ 10.00 hrs Surf.Area= 0.031 ac Storage= 0.018 af

Plug-Flow detention time= 177.3 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 176.8 min (867.1 - 690.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.029 af	**25.25'W x 53.46'L x 3.50'H Rock Gallery** 0.108 af Overall - 0.037 af Embedded = 0.072 af x 40.0% Voids
#2A	0.50'	0.037 af	**ADS_StormTech SC-740 +Cap** x 35 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Chambers in 5 Rows
		0.066 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**1.4" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	1.74'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	2.71'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.05 cfs @ 10.00 hrs HW=0.97' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.05 cfs @ 4.74 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: SC-740 5x7 - Chamber Wizard Rock Gallery

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

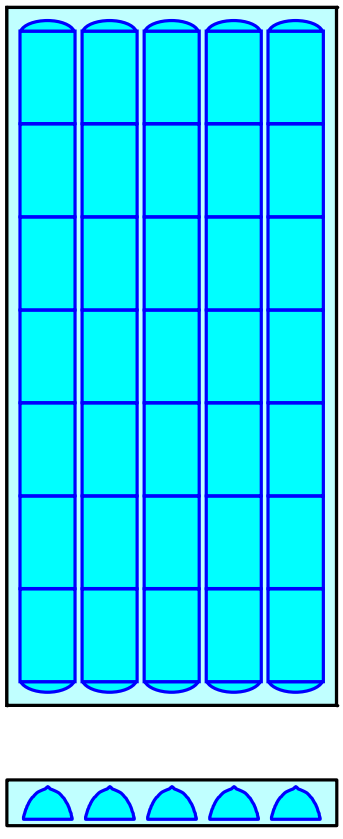
7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length +12.0" End Stone x 2 = 53.46' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

35 Chambers x 45.9 cf = 1,607.9 cf Chamber Storage

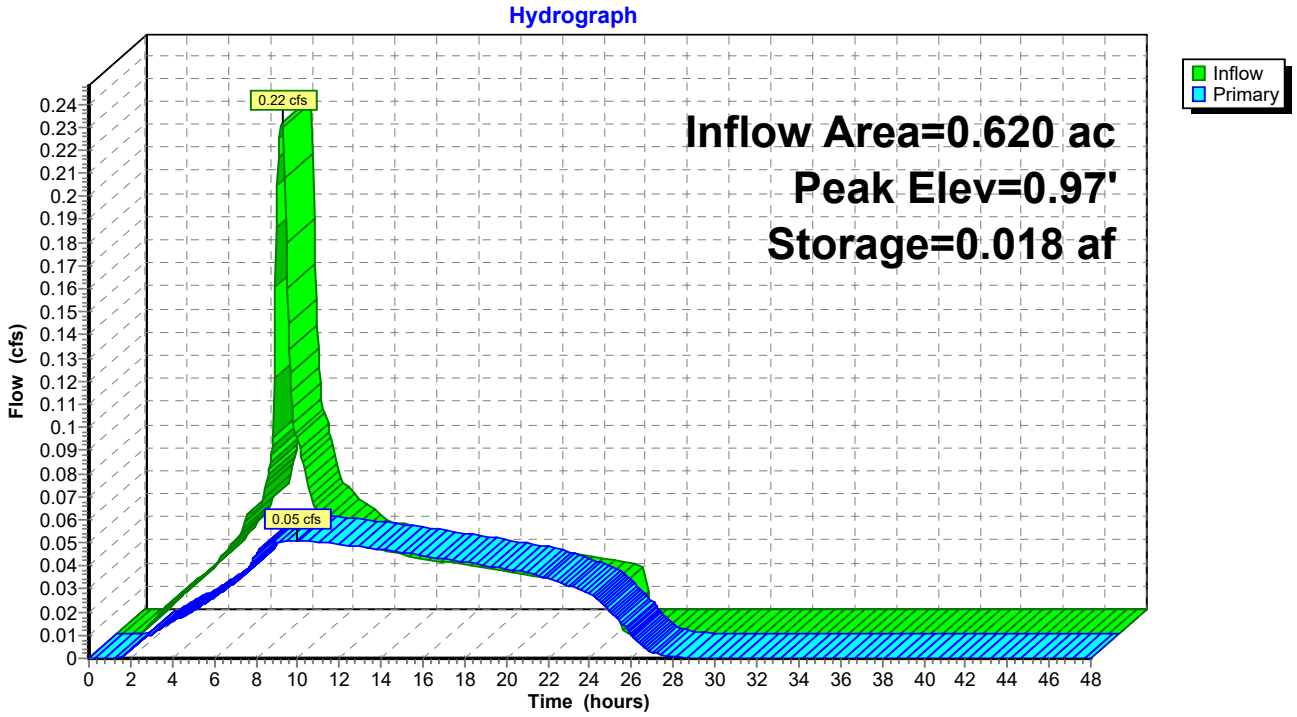
4,724.2 cf Field - 1,607.9 cf Chambers = 3,116.3 cf Stone x 40.0% Voids = 1,246.5 cf Stone Storage

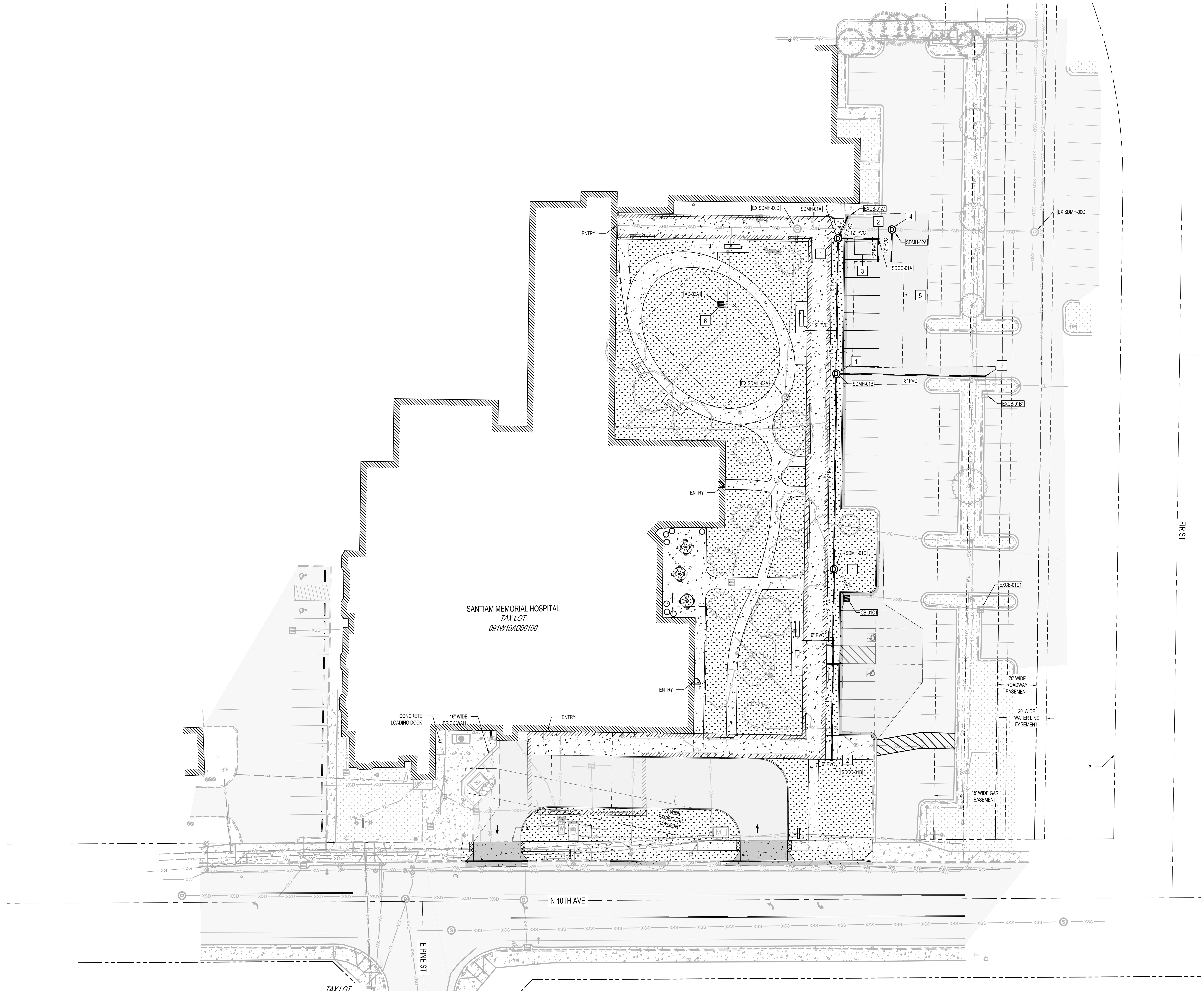
Chamber Storage + Stone Storage = 2,854.4 cf = 0.066 af
Overall Storage Efficiency = 60.4%
Overall System Size = 53.46' x 25.25' x 3.50'

35 Chambers
175.0 cy Field
115.4 cy Stone



Pond 5P: SC-740 5x7





EXISTING CONDITIONS & DEMOTION PLAN

HORIZ SCALE: 1"=20'

1 inch = 20' ft.

EXISTING LEGEND

- PL
- RIGHT OF WAY
- CL
- UTILITY EASEMENT
- POWER EASEMENT
- (E) 1' CONTOUR
- (E) 5' CONTOUR
- DEMOLITION AREA
- (E) BUILDING
- (E) AC PAVEMENT
- (E) LANDSCAPE
- (E) CONCRETE
- (E) CURB
- (E) STORM LINE
- (E) STORM MANHOLE
- (E) CATCH BASIN
- (E) SANITARY SEWER LINE
- (E) SANITARY SEWER MANHOLE
- (E) POWER JUNCTION BOX
- (E) LIGHT
- (E) WATER LINE
- (E) WATER/IRRIGATION VALVE
- (E) HYDRANT/FIRE DEPT CONNECTION
- (E) WATER/IRRIGATION METER
- (E) ELECTRIC
- (E) NATURAL GAS
- (E) NATURAL GAS METER
- (E) FIBER OPTIC LINE
- (E) TREE

PROPOSED LEGEND

- (N) STRUCTURE
- (N) ASPHALT PAVING
- (N) CONCRETE PAVEMENT
- (N) HEAVY DUTY CONCRETE PAVEMENT
- (N) LANDSCAPING (SEE L-100)
- (N) CURB
- (N) TREE (SEE L-100)
- (N) GRADE BREAK
- (N) STORMWATER LINE & MH
- (N) CATCH BASIN
- (N) STORMWATER CLEANOUT

CONSTRUCTION NOTES

P	PROTECT
1	(N) STANDARD MANHOLE PER COS DRAWING 502 ON SHEET C-500
2	(N) STANDARD CLEANOUT PER COS DRAWING 526 ON SHEET C-500
3	(N) MWS-L-8-8-V-UG STORMWATER BIOFILTRATION SYSTEM PER DETAIL ON SHEET C-502
4	(N) STORM DRAIN FLOW CONTROL MANHOLE PER COS DRAWING 622 ON SHEET C-500
5	(N) 5x7 STORMTECH SC-800 CHAMBERS
6	(N) AREA DRAIN PER COS DETAIL ON SHEET C-500

LOCATES (48 HOURS NOTICE REQUIRED PRIOR TO EXCAVATION)

THE CONTRACTOR MUST COMPLY WITH THE REGULATIONS OF O.R.S. 757.541 TO 757.571 IN LOCATION AND PROTECTION OF UNDERGROUND UTILITIES. OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952–001–0010 THROUGH OAR 952–001–0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.

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Stantec

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SANTIAM HOSPITAL EMERGENCY DEPARTMENT ENTRY
1401 North 10th Ave.
Stayton, OR 97383

MARK	DATE	DESCRIPTION

ISSUE DATE: 2025.05.30

ISSUE: LAND USE SUBMITTAL

PROJECT NO: 2042699500

DRAWN BY: BGA

CHECKED BY: MCL

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COMPOSITE UTILITY PLAN

C-400

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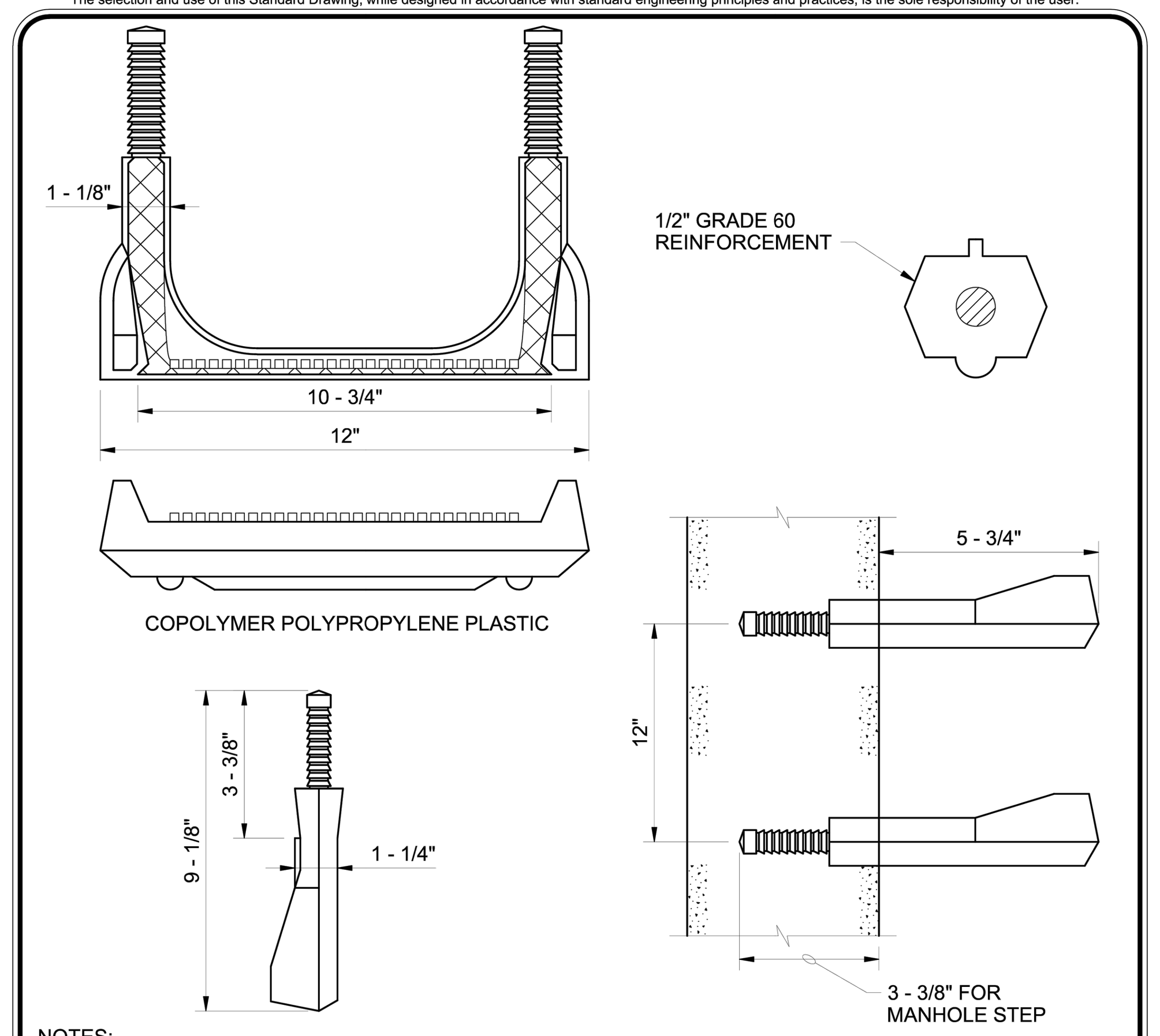

NOTES:

1. MANHOLE STEPS SHALL BE TIGHT AND FIRMLY EMBEDDED AND SHALL MEET ASTM C-497 TESTS FOR WITHSTANDING PULLING OUT. LOOSE STEPS SHALL BE CAUSE FOR REJECTION OF THAT MANHOLE SECTION OR CONE.
2. MANHOLE STEPS MUST CONFORM WITH ASTM C-478. STEEL REINFORCING BAR SHALL BE MINIMUM 1/2" GRADE 60 MEETING REQUIREMENTS OF ASTM A-615 ENCAPSULATED WITH INJECTION MOLDED COPOLYMER POLYPROPYLENE WITH SERRATED SURFACES.
3. TOP STEP SHALL BE NO GREATER THAN 24" FROM TOP OF CASTING.
4. STEPS SHALL BE ALIGNED VERTICALLY AND SPACED 12-INCHES ON CENTER.
5. ALL STEPS WITHIN A MANHOLE SHALL BE OF THE SAME DESIGN TYPE AND SIZE. MIXING OF UNMATCHED STEPS WITHIN THE SAME MANHOLE IS NOT PERMITTED.

DEPARTMENT OF PUBLIC WORKS | 2021 EDITION | REVIEWED BY: JTA / LSL 09/21 | STANDARD DRAWING TITLE: **MANHOLE STEP DETAIL** | NO SCALE | DIVISION: SANITARY | DRAWING NO. 524

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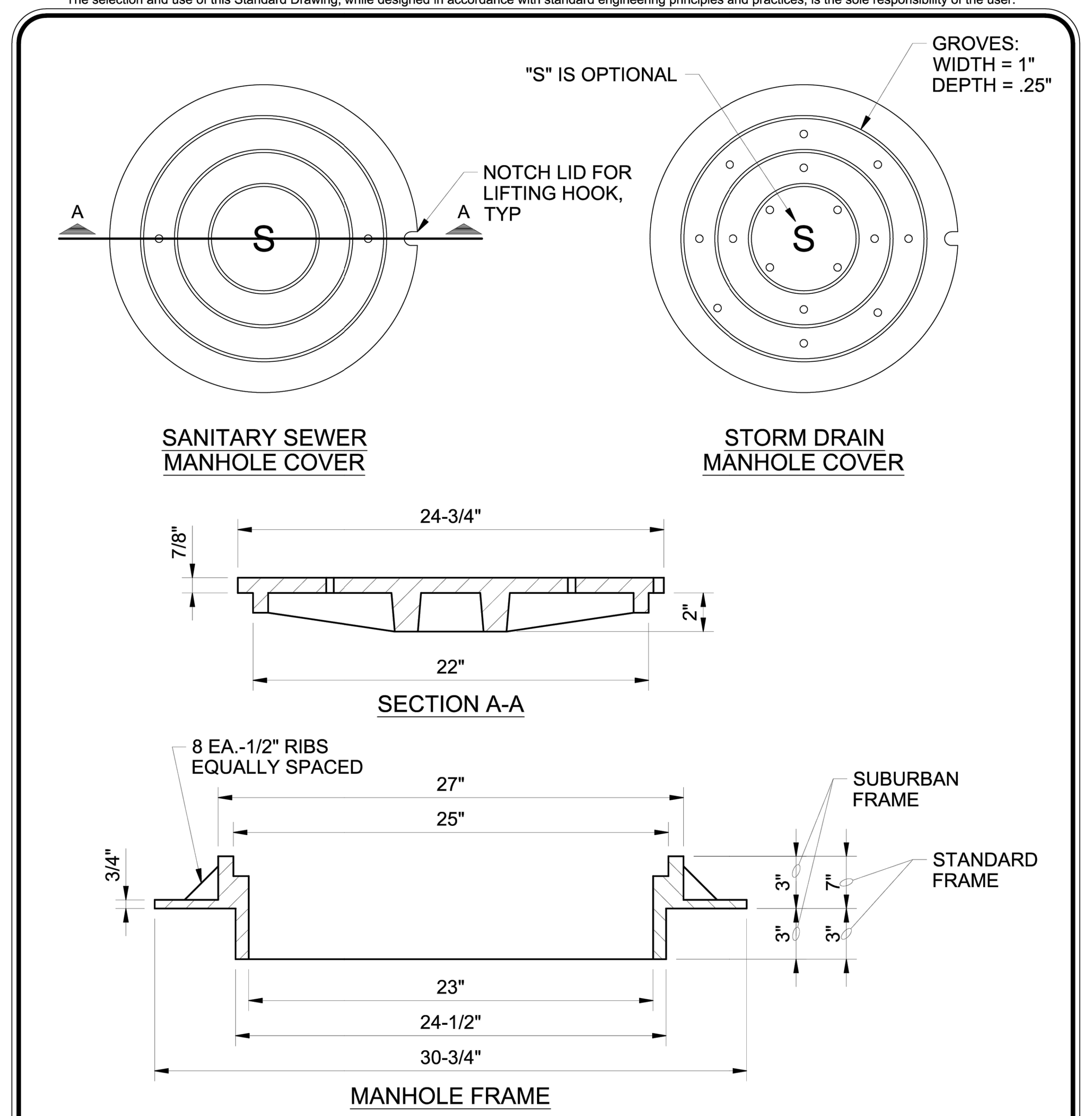


NOTES:

1. FRAME AND COVER ASSEMBLY SHALL BE GRAY CAST IRON ASTM A-48, CLASS 30.
2. FRAME AND COVER ASSEMBLY SHALL BE MACHINED FOR A TRUE BEARING ALL AROUND TO PREVENT MOVEMENT OF THE COVER WITHIN FRAME UNDER TRAFFIC LOADS.
3. SUBURBAN FRAMES SHALL NOT BE USED IN MAJOR COLLECTORS AND ARTERIAL STREETS.

DEPARTMENT OF PUBLIC WORKS | 2021 EDITION | REVIEWED BY: JTA / LSL 09/21 | STANDARD DRAWING TITLE: **MANHOLE FRAME AND COVER** | NO SCALE | DIVISION: SANITARY | DRAWING NO. 516

The selection and use of this Standard Drawing, while designed in accordance with standard engineering principles and practices, is the sole responsibility of the user.

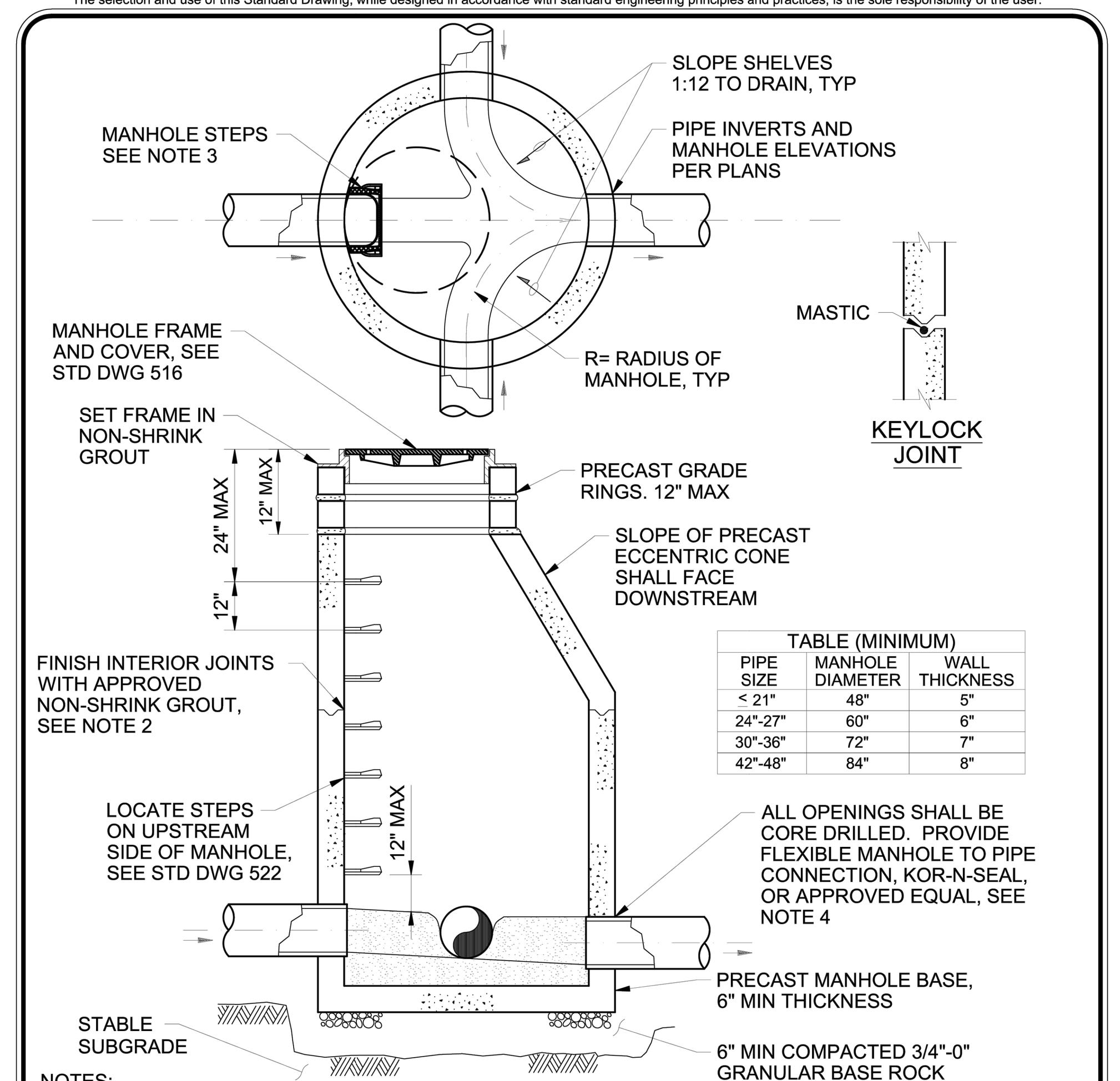


TABLE (MINIMUM)

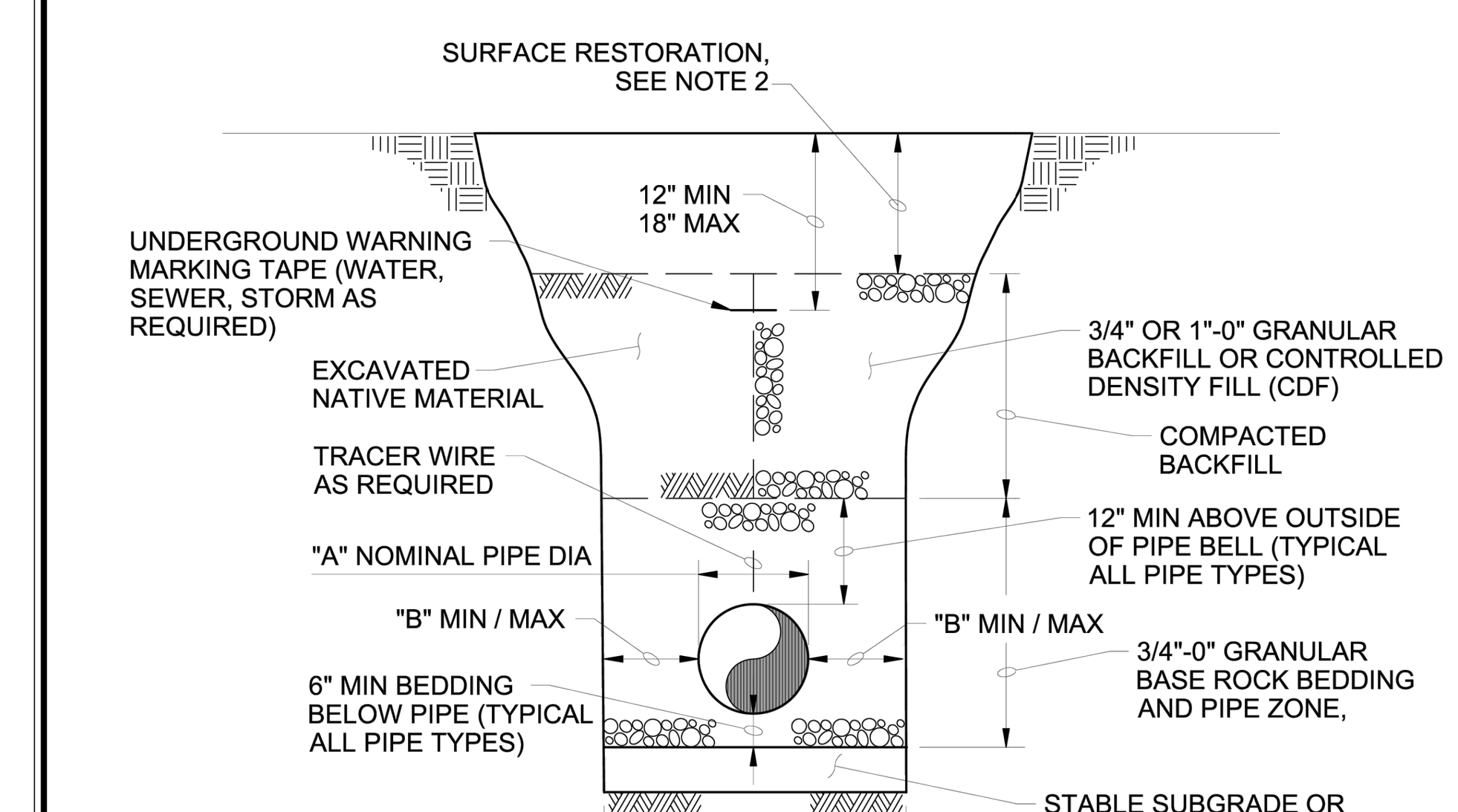
PIPE SIZE	MANHOLE DIAMETER	WALL THICKNESS
< 21"	48"	5"
24"-27"	60"	6"
30"-36"	72"	7"
42"-48"	84"	8"

NOTES:

1. CONCENTRIC CONES ARE NOT ALLOWED UNLESS SPECIFICALLY APPROVED BY THE CITY ENGINEER. ALL PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
2. WATERTIGHT CONFINED O-RING OR MASTIC JOINTS REQUIRED. NON-SHRINK GROUT INSIDE JOINTS AND WALL PENETRATIONS SMOOTH FOLLOWING MANHOLE ASSEMBLY.
3. STEPS TO BE FACTORY INSTALLED POLYPROPYLENE PLASTIC WITH 1/2" GRADE 60 REINFORCEMENT. SEE STANDARD DRAWING 524.
4. ALL RIGID CONNECTING PIPES SHALL HAVE FLEXIBLE, GASKETED, UNRESTRAINED JOINT WITHIN 18".

DEPARTMENT OF PUBLIC WORKS | 2021 EDITION | REVIEWED BY: JTA / LSL 09/21 | STANDARD DRAWING TITLE: **STANDARD MANHOLE** | NO SCALE | DIVISION: SANITARY | DRAWING NO. 502

The selection and use of this Standard Drawing, while designed in accordance with standard engineering principles and practices, is the sole responsibility of the user.



"A" NOM PIPE DIAMETER	"B" MIN / MAX CLEARANCE
<10"	10" / 18"
12" - 16"	12" / 18"
18" - 21"	16" / 24"
24" - 30"	18" / 30"
>30"	24" / 36"

NOTES:

1. SEE PLANS AND STANDARD CONSTRUCTION SPECIFICATIONS FOR TYPICAL TRENCH COMPACTION REQUIREMENTS. BEDDING AND PIPE ZONE SHALL BE COMPACTED TO A MINIMUM 90% PER AASHTO T-180.
2. FOR TYPICAL TRENCH SURFACE RESTORATION, SEE STANDARD DRAWINGS 304, 316 AND 318.
3. PIPE ZONE SHALL BE EXTENDED TO A MINIMUM 12-INCHES ABOVE OUTSIDE OF THE PIPE BELL, REGARDLESS OF THE TYPE OF PIPE MATERIAL INSTALLED. BEDDING AND PIPE ZONE MATERIAL SHALL BE COMPACTED, AS SPECIFIED, PRIOR TO BACKFILLING THE REMAINDER OF THE TRENCH.
4. PIPE BEDDING SHALL BE PLACED ON STABLE SUBGRADE. WHEN REQUIRED, OR AS DIRECTED BY CITY ENGINEER, GRANULAR TRENCH FOUNDATION STABILIZATION SHALL BE PLACED PRIOR TO PLACEMENT OF THE BEDDING. SIZE AND DEPTH ARE DEPENDENT ON EXISTING SOIL CONDITIONS.
5. FOR FLEXIBLE PIPE INSTALLATIONS, BOTTOM OF THE TRENCH SHORING SHALL BE ABOVE THE PIPE SPRINGLINE, PRIOR TO COMPACTING BEDDING AND PIPE ZONE MATERIAL UNDER THE PIPE HAUNCHES.

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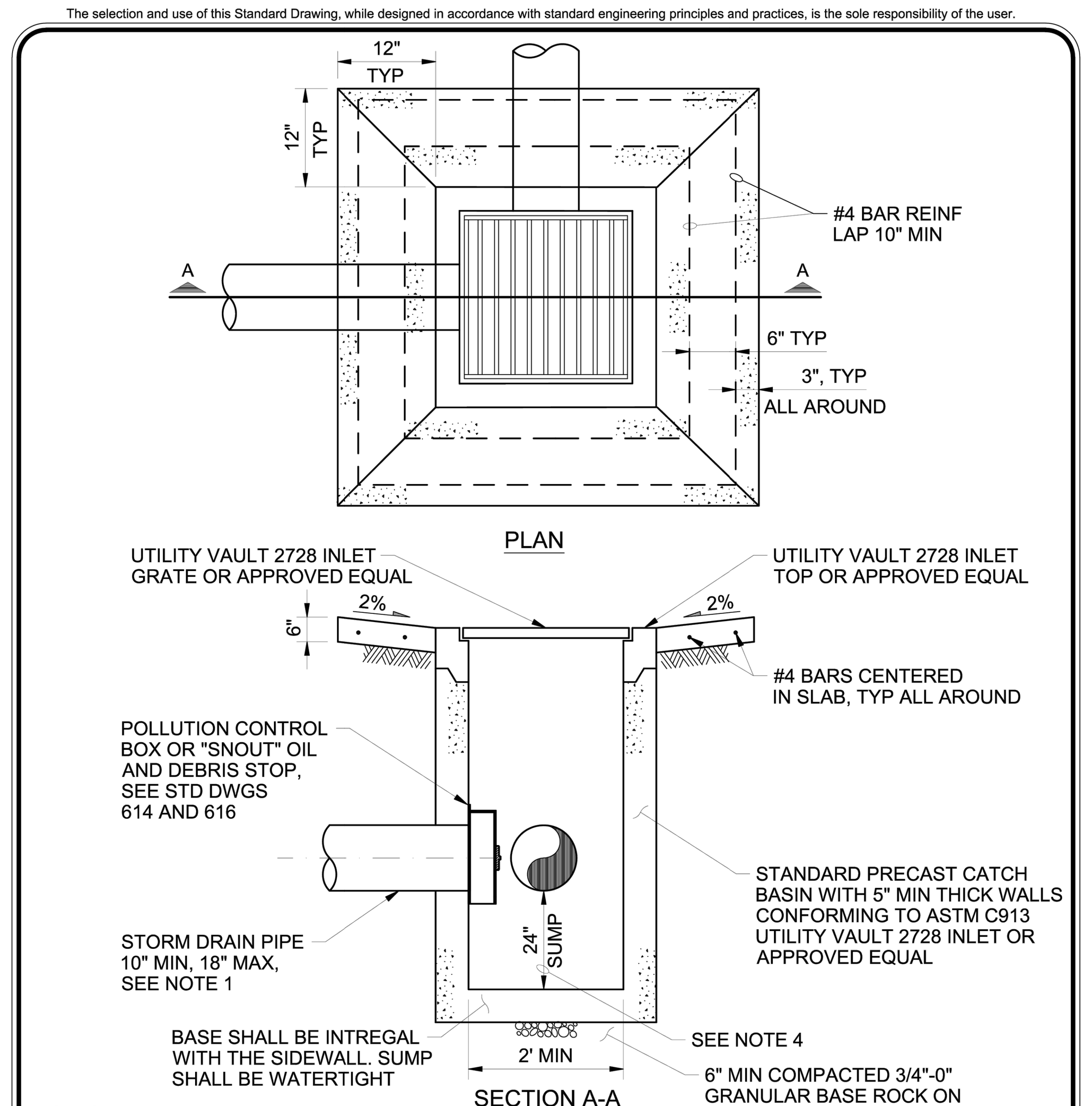
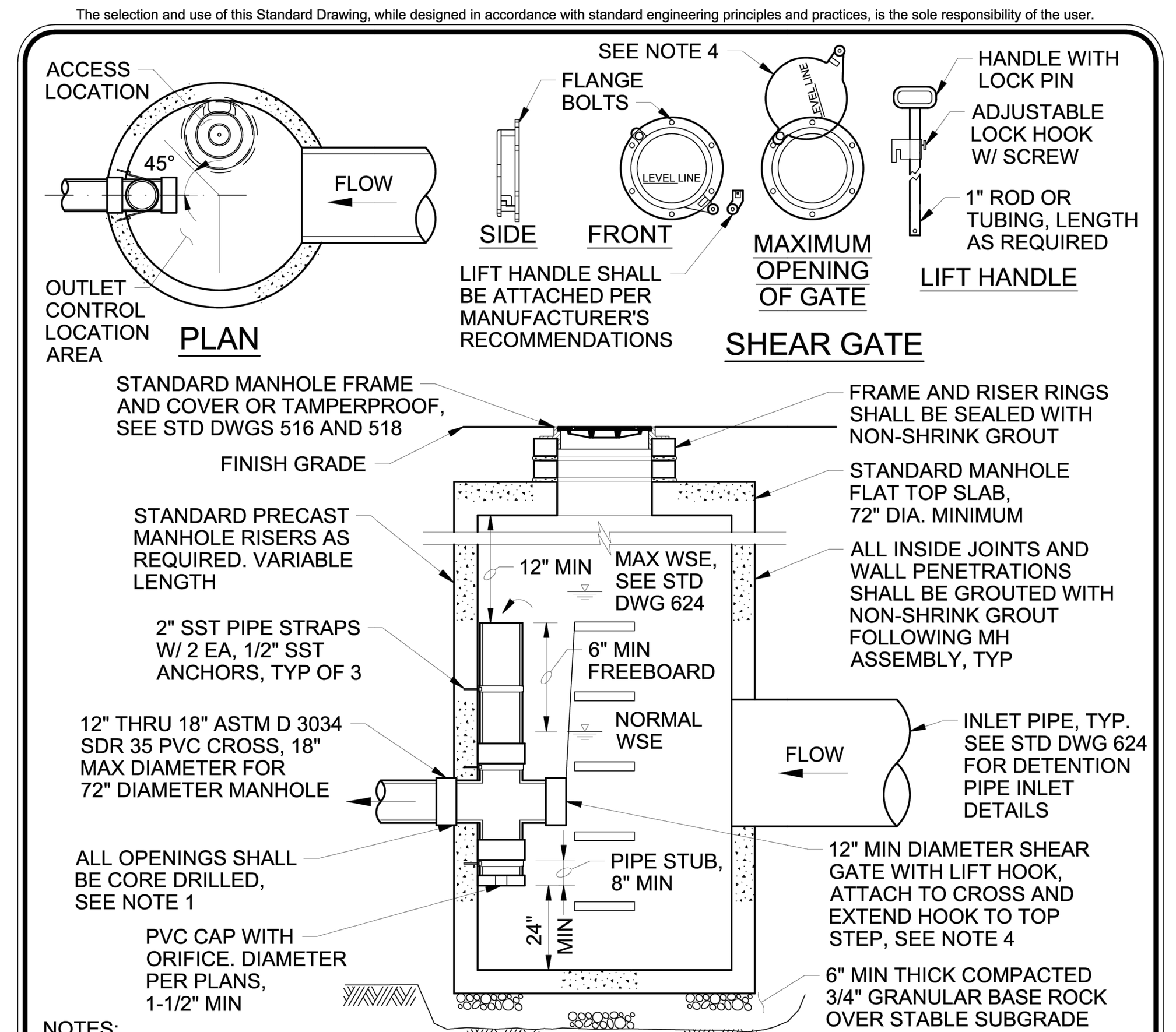


NOTES:

1. NOT FOR USE IN VEHICULAR TRAFFIC AREAS.
2. FRAME AND GRATES, WHEN CONSTRUCTED, SHALL BE FOR BICYCLE SAFETY AND SHALL BE H-20 RATED.
3. ALL REINFORCEMENT SHALL BE 3" MIN CLEAR OF NEAREST FACE OF CONCRETE.
4. ADDITIONAL SUMP DEPTH MAY BE REQUIRED BY CITY ENGINEER OR REQUIRED PER POLLUTION CONTROL BOX OR "SNOUT" OIL AND DEBRIS STOP MANUFACTURER.

DEPARTMENT OF PUBLIC WORKS | 2021 EDITION | REVIEWED BY: JTA / LSL 09/21 | STANDARD DRAWING TITLE: **AREA DRAINAGE BASIN OR FIELD INLET** | NO SCALE | DIVISION: STORM | DRAWING NO. 612

The selection and use of this Standard Drawing, while designed in accordance with standard engineering principles and practices, is the sole responsibility of the user.

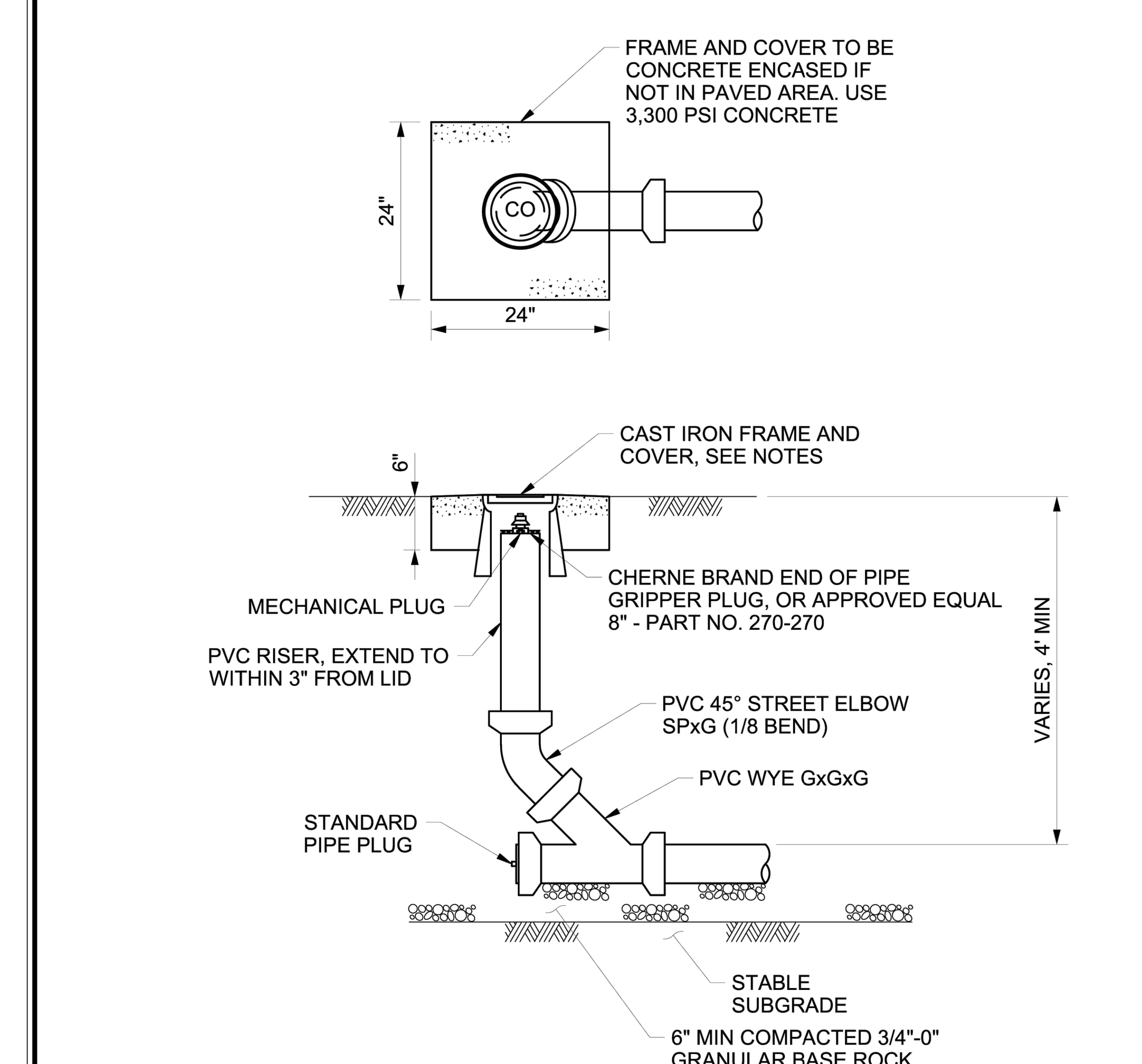


NOTES:

1. MANHOLE SHALL CONFORM TO REQUIREMENTS OF ASTM C-478. SEE STANDARD DRAWING 502 FOR STANDARD MANHOLES DETAILS. ALL OPENINGS SHALL BE CORE DRILLED. PROVIDE FLEXIBLE MANHOLE TO PIPE CONNECTION, KOR-N-SEAL OR APPROVED EQUAL.
2. PRECAST FLAT TOP MANHOLE SHALL BE MINIMUM 72" DIAMETER. MAXIMUM OUTLET PIPE SHALL BE 18" DIAMETER FOR A 72" DIAMETER MANHOLE.
3. ALL RIGID CONNECTING PIPES SHALL HAVE FLEXIBLE, GASKETED, AND UNRESTRAINED JOINT WITHIN 18".
4. SHEAR GATE AND LIFT HANDLE SHALL BE ALUMINUM ALLOY PER ASTM B-26 AND ASTM B-275, DESIGNATION ZG32A. LIFT HANDLE SHALL BE EITHER SOLID OR TUBING WITH ADJUSTABLE HOOK. A NEOPRENE RUBBER GASKET IS REQUIRED BETWEEN THE RISER MOUNTING FLANGE AND GATE FLANGE. MATING SURFACES OF LID AND BODY TO BE MACHINED FOR PROPER FIT. FLANGE MOUNTING BOLTS SHALL BE STAINLESS STEEL. ALTERNATE SHEAR GATES TO THE DESIGN SHOWN ARE ACCEPTABLE, PROVIDED THEY MEET THE MATERIAL SPECIFICATIONS. SHEAR GATE SHALL NOT OPEN BEYOND THE CLEAR OPENING BY LIMITING THE HINGE MOVEMENT, STOP TAB, OR SOME OTHER APPROVED DEVICE.

DEPARTMENT OF PUBLIC WORKS | 2021 EDITION | REVIEWED BY: JTA / LSL 09/21 | STANDARD DRAWING TITLE: **STORM DRAIN FLOW CONTROL MANHOLE** | NO SCALE | DIVISION: STORM | DRAWING NO. 622

The selection and use of this Standard Drawing, while designed in accordance with standard engineering principles and practices, is the sole responsibility of the user.



NOTES:

1. CLEANOUTS ON MAINLINES SHALL ONLY BE USED WHERE APPROVED BY THE CITY ENGINEER.
2. COVER AND FRAME ASSEMBLY SHALL BE GRAY CAST IRON ASTM A-48, CLASS 30 AND SHALL BE MACHINED TO A TRUE BEARING ALL AROUND.
3. CLEANOUT FOR ALL AREAS SHALL BE OLYMPIC FOUNDRY MODEL M1035.

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Stayton, OR 97383

MARK	DATE	DESCRIPTION

ISSUE DATE: 2025.05.30
ISSUE: LAND USE SUBMITTAL

PROJECT NO: 2042699500
DRAWN BY: BGA
CHECKED BY: MCL

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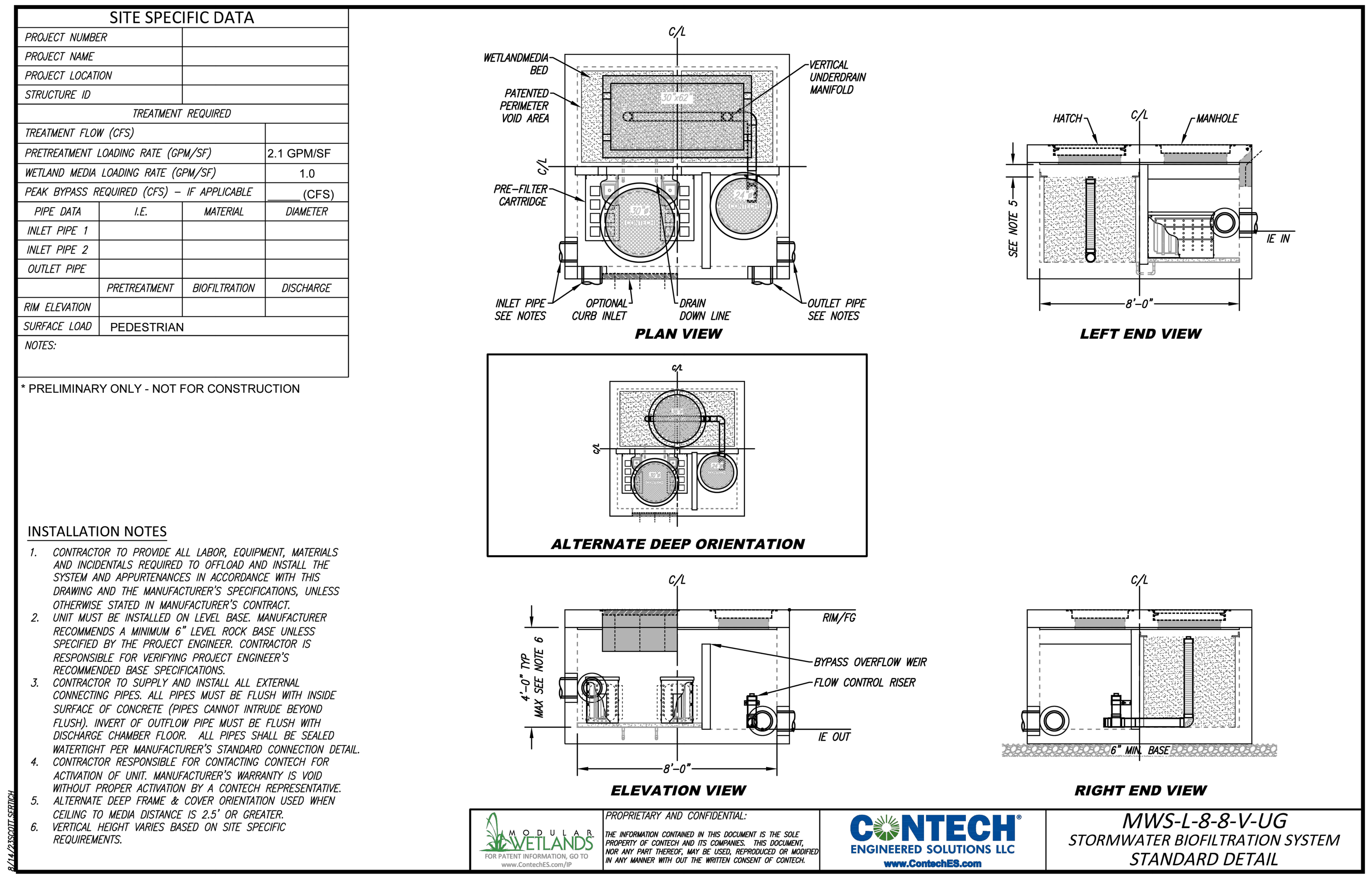
DETAILS

C-500



SITE SPECIFIC DATA
PROJECT NUMBER
PROJECT NAME
PROJECT LOCATION
STRUCTURE ID
TREATMENT REQUIRED
TREATMENT FLOW (CFS)
PRETREATMENT LOADING RATE (GPM/SF) 2.1 GPM/SF
WETLAND MEDIA LOADING RATE (GPM/SF) 1.0
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE (CFS)
PIPE DATA I.E. MATERIAL DIAMETER
INLET PIPE 1
INLET PIPE 2
OUTLET PIPE
PRETREATMENT BIOFILTRATION DISCHARGE
RIM ELEVATION
SURFACE LOAD PEDESTRIAN
NOTES:
* PRELIMINARY ONLY - NOT FOR CONSTRUCTION
INSTALLATION NOTES
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
4. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.
5. ALTERNATE DEEP FRAME & COVER ORIENTATION USED WHEN CEILING TO MEDIA DISTANCE IS 2.5' OR GREATER.
6. VERTICAL HEIGHT VARIES BASED ON SITE SPECIFIC REQUIREMENTS.
WETLANDMEDIA BED
PATENTED PERIMETER VOID AREA
PRE-FILTER CARTRIDGE
VERTICAL UNDERDRAIN MANIFOLD
INLET PIPE SEE NOTES
OPTIONAL CURB INLET
DRAIN DOWN LINE
OUTLET PIPE SEE NOTES
PLAN VIEW
HATCH
MANHOLE
IE IN
SEE NOTE 5
8'-0"
LEFT END VIEW
ALTERNATE DEEP ORIENTATION
RIM/FG
BYPASS OVERFLOW WEIR
FLOW CONTROL RISER
IE OUT
4'-0" TYP MAX SEE NOTE 6
8'-0"
ELEVATION VIEW
6" MIN. BASE
RIGHT END VIEW
MODULAR WETLANDS
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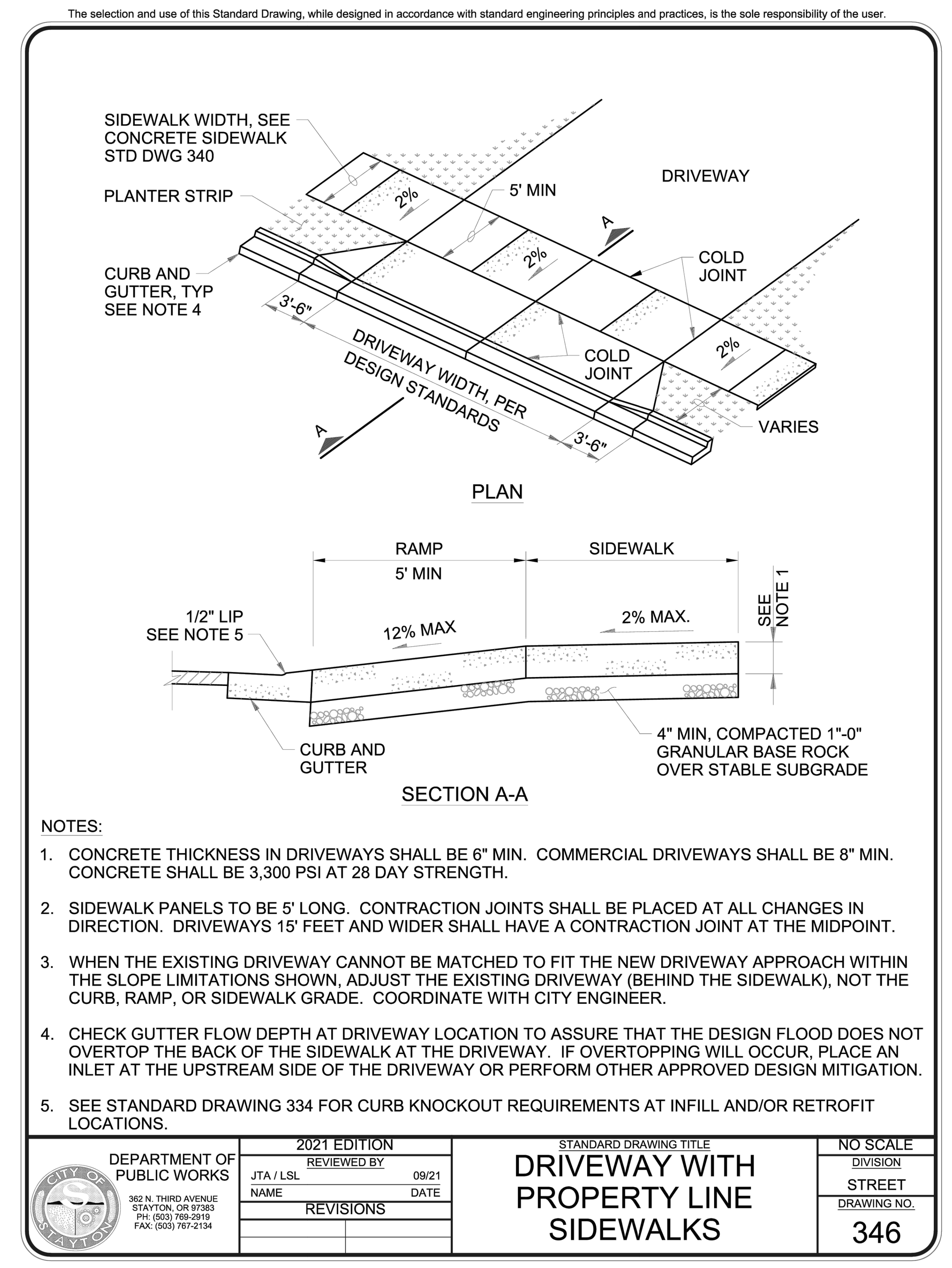
MWS-L-8-8-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL



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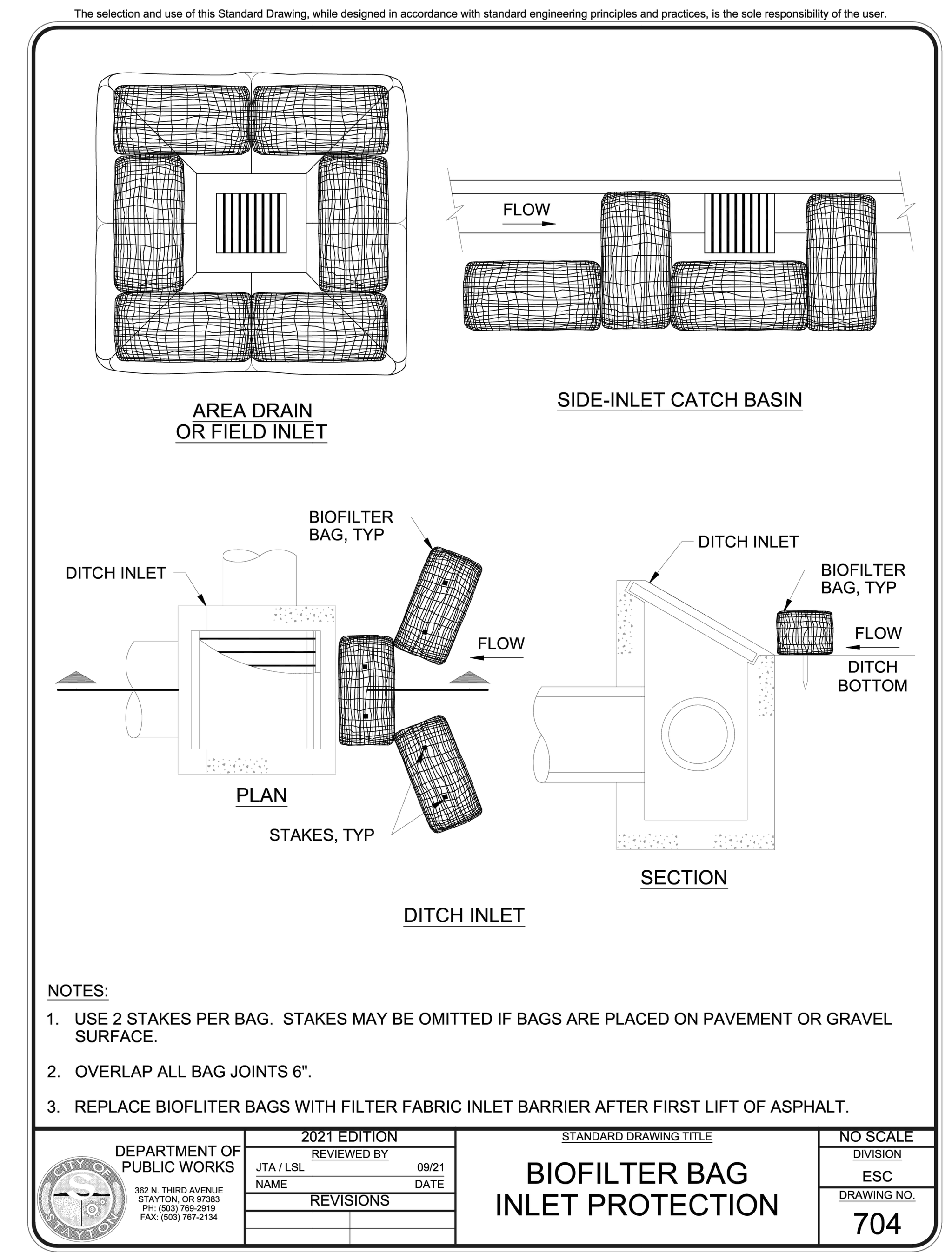
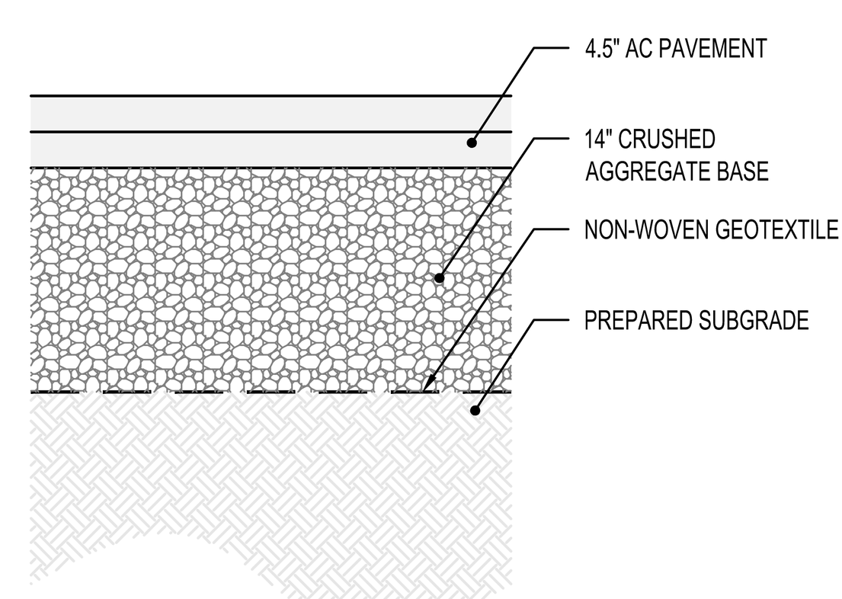
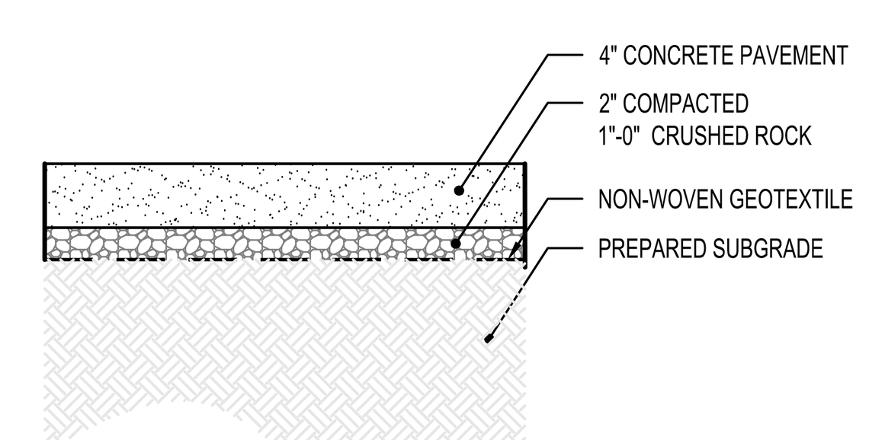
SIDEWALK WIDTH, SEE CONCRETE SIDEWALK STD DWG 340
PLANTER STRIP
CURB AND GUTTER, TYP SEE NOTE 4
5' MIN
DRIVEWAY
COLD JOINT
DRIVEWAY WIDTH, PER DESIGN STANDARDS
3'-6"
VARIES
PLAN
RAMP
SIDEWALK
5' MIN
1/2" LIP SEE NOTE 5
12% MAX
2% MAX.
SEE NOTE 1
CURB AND GUTTER
4" MIN, COMPACTED 1"-0" GRANULAR BASE ROCK OVER STABLE SUBGRADE
SECTION A-A
NOTES:
1. CONCRETE THICKNESS IN DRIVEWAYS SHALL BE 6" MIN. COMMERCIAL DRIVEWAYS SHALL BE 8" MIN. CONCRETE SHALL BE 3,300 PSI AT 28 DAY STRENGTH.
2. SIDEWALK PANELS TO BE 5' LONG. CONTRACTION JOINTS SHALL BE PLACED AT ALL CHANGES IN DIRECTION. DRIVEWAYS 15' FEET AND WIDER SHALL HAVE A CONTRACTION JOINT AT THE MIDPOINT.
3. WHEN THE EXISTING DRIVEWAY CANNOT BE MATCHED TO FIT THE NEW DRIVEWAY APPROACH WITHIN THE SLOPE LIMITATIONS SHOWN, ADJUST THE EXISTING DRIVEWAY (BEHIND THE SIDEWALK), NOT THE CURB, RAMP, OR SIDEWALK GRADE. COORDINATE WITH CITY ENGINEER.
4. CHECK GUTTER FLOW DEPTH AT DRIVEWAY LOCATION TO ASSURE THAT THE DESIGN FLOOD DOES NOT OVERTOP THE BACK OF THE SIDEWALK AT THE DRIVEWAY. IF OVERTOPPING WILL OCCUR, PLACE AN INLET AT THE UPSTREAM SIDE OF THE DRIVEWAY OR PERFORM OTHER APPROVED DESIGN MITIGATION.
5. SEE STANDARD DRAWING 334 FOR CURB KNOCKOUT REQUIREMENTS AT INFILL AND/OR RETROFIT LOCATIONS.
DEPARTMENT OF PUBLIC WORKS
2021 EDITION
REVIEWED BY
JTA / LSL 09/21
NAME DATE
REVISIONS
STANDARD DRAWING TITLE
DRIVEWAY WITH PROPERTY LINE SIDEWALKS
NO SCALE
DIVISION
STREET
DRAWING NO.
346



The selection and use of this Standard Drawing, while designed in accordance with standard engineering principles and practices, is the sole responsibility of the user.
AREA DRAIN OR FIELD INLET
FLOW
SIDE-INLET CATCH BASIN
DITCH INLET
BIOFILTER BAG, TYP
FLOW
PLAN
STAKES, TYP
DITCH INLET
DITCH INLET
BIOFILTER BAG, TYP
FLOW
DITCH BOTTOM
SECTION
NOTES:
1. USE 2 STAKES PER BAG. STAKES MAY BE OMITTED IF BAGS ARE PLACED ON PAVEMENT OR GRAVEL SURFACE.
2. OVERLAP ALL BAG JOINTS 6".
3. REPLACE BIOFILTER BAGS WITH FILTER FABRIC INLET BARRIER AFTER FIRST LIFT OF ASPHALT.
DEPARTMENT OF PUBLIC WORKS
2021 EDITION
REVIEWED BY
JTA / LSL 09/21
NAME DATE
REVISIONS
STANDARD DRAWING TITLE
BIOFILTER BAG INLET PROTECTION
NO SCALE
DIVISION
ESC
DRAWING NO.
704



1 C-200 ASPHALT CONCRETE PAVEMENT
SCALE: NTS



2 C-200 PEDESTRIAN CONCRETE PAVEMENT SECTION UNREINFORCED CONCRETE
SCALE: NTS

PAVEMENT NOTES

1. ALL AGGREGATE BASE COURSE AND LEVELING COURSE ROCK TO BE PLACED IN LIFTS WITH MAXIMUM UNCOMPACTED THICKNESS OF 12" (USING SMOOTH-DRUM VIBRATORY ROLLER) AND COMPACTED TO MINIMUM 95% OF MAX DRY DENSITY (ASTM D 1557).
2. ALL AC PAVEMENT TO BE LEVEL 2, 1/2", DENSE HMAC AND COMPACTED TO 90% OF THE MAXIMUM SPECIFIC GRAVITY OF THE MIX (AASHTO T-209) PER COUNTY OF RIVERSIDE SPECIFICATIONS 8.07 OF ORDINANCE 461. 2" MIN LIFT THICKNESS
3. SEE GEOTECHNICAL REPORT FOR EXISTING SUBSURFACE CONDITIONS AND SUBGRADE RECOMMENDATIONS.

75SN-AL
STANDARD ENCLOSURE
Colors Available
Width 9" Length 26" Height 25"

300-AL
STANDARD ENCLOSURE
Colors Available
Width 22" Length 72" Height 38"

3 C-200 BACKFLOW ENCLOSURE
SCALE: NTS

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FOR REFERENCE ONLY

SANTIAM HOSPITAL AND CLINICS
SANTIAM HOSPITAL EMERGENCY DEPARTMENT ENTRY
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Stayton, OR 97383

MARK	DATE	DESCRIPTION
ISSUE DATE:		2025.05.30
ISSUE:		LAND USE SUBMITTAL

PROJECT NO: 2042699500
DRAWN BY: BGA
CHECKED BY: MCL
COPYRIGHT MAHLUM ARCHITECTS, INC. ORIGINAL SHEET SIZE: 30"x42"

DETAILS

C-502