500 Central Avenue
Coos Bay, OR 97420

City of Coos Bay
Community Development Department

STAFF REPORT

FILE NUMBER: 187-ZON14-071

HEARING DATE: March 10, 2015

REQUEST: Applicant has applied for the following land use applications: Site Plan and Architectural Review (SPAR), and Variance.

APPROVAL CRITERIA The applicable approval criteria are found in the Coos Bay Municipal Code (CBMC) Sections 17.75, C-2; 17.145 Access Management; 17.150, Fences and Walls;17.170, Utilities and Public Facilities;17.345, Site Plan and Architectural Review;17.200 Off-Street Parking and 17.350, Variance.

STAFF REPORT PREPARED BY: Eric Day, Community Development Director

Community Development Director's Initials ____

GENERAL INFORMATION

APPLICANT/OWNER:	City of Coos Bay Contact: Jennifer Wirsing 500 Central Ave Coos Bay, OR 97420
APPLICANT'S REPRESENTATIVES:	Mark Denning, SHN Consulting Engineers & Geologists 275 Market Ave. Coos Bay, 97420
SITE LOCATION:	490 Fulton Ave, Coos Bay, OR. 97420
LEGAL DESCRIPTION:	Coos County Assessor's Map 25-13W-19DA, Tax lot 2700
SITE SIZE:	2.01 acres
ZONING:	C-2, General Commercial
COMP PLAN DESIGNATION:	Commercial
120-DAY PERIOD:	The application was deemed complete on December 17, 2014. The 120-day maximum application-processing period ends April 17, 2015.
PUBLIC NOTICE:	Public notice was mailed to affected property owners on 01/27/2014 for the Public Hearing scheduled for 03/10/2015 at Coos Bay City Hall.

KEY INFORMATION

The applicant (City of Coos Bay) has submitted a land use application requesting approval for a site plan and architectural review (SPAR) and variance for the purpose of building a wastewater treatment plant within the City of Coos Bay, OR. The proposed site is 2.01 acres and is located at 490 Fulton Ave in Coos Bay, OR. The Coos County Assessor's Map is 25-13W-19DA, tax lot 2700.

The City secured a vacant two-acre parcel for a new wastewater treatment plant (WWTP) that is designed to correct deficiencies in the currently operating No. 2 WWTP located across Empire Boulevard to the west of the new site. The new plant will also provide increased treatment capacity for future population growth among the unincorporated community of Charleston and Westside residents of the City of Coos Bay. The parcel's proximity to the existing WWTP, incoming wastewater mains and the outfall pipe to the Coos Bay channel will minimize the construction cost and difficulties of upgrading the existing wastewater collection system and treatment processes. The site's zoning is General Commercial C-2, shared with properties fronting on Empire Boulevard for six blocks to the north and two blocks to the south. The Property Development Requirements of the C-2 zone have no requirements regarding 'Lot Standards' and 'Building Coverage'. 'Building Height' and 'Yards' have no restrictions other than those imposed by the building code.

For traffic safety, the City Code requires a 500 foot separation distance between vehicular access points onto major arterials, including onto Empire Boulevard. To meet this safety requirement, the site's primary access and egress driveways have been provided from Fulton Avenue rather than from Empire Boulevard. By necessity, this placement affects the site's layout of the other facilities. At two acres, the project is larger than the surrounding residential and commercial properties. However, the new buildings and plant facilities will be spaced some distance apart with architectural fencing and landscaping to improve the facility's visual impact. The buildings and structures have received exterior design elements that are visually appealing as well as durable. The proposed buildings that make up the site include the Control, Influent Pump Station (IPS), Shop/Electrical, UV, two sequencing batch reactor (SBR) tanks, an equalization tank, and Headworks buildings

The applicant is applying for a variance to access management requirements per 17.145 CMBC. On arterial streets (South Empire Blvd.) the minimum access spacing between access points is 500 feet. The applicant states that the 500 foot requirement is not possible due to site restrictions and plant configurations. The applicant requests the variance be approved to allow for a construction/maintenance access point at the north end of the site onto Empire Blvd.

Construction is expected to commence upon permit acquisition (local, state and federal) and is expected to take approximately two (2) years to complete.

STAFF RECOMMENDATION

Staff has reviewed the applicant's proposal relative to all applicable CBMC requirements and finds that there are sufficient grounds for approval, subject to the recommended Conditions of Approval.

APPROVAL CRITERIA AND ANALYSIS

Chapter 17.75
General Commercial District (C-2)

17.75.010 Intent

The C-2 district is included in the zoning regulations to achieve the following city objectives:

(1) A general commercial district providing a broad range of commercial and other services that are easily accessible to all residential areas, will promote the economic stability and future growth of the city, and **will permit limited residential and industrial uses**.

(2) A district allowing uses and services not permitted in the central commercial zoning district. [Ord. 93 § 2.9.1, 1987].

Staff Response: The industrial nature of the facility fits within the intent of the C-2 zone.

17.75.030 Conditional Uses

The following uses are permitted in the C-2 zoning district if authorized in accordance with the provisions of Chapter 17.355 CBMC:

(3) Industrial Use Types.

(a) Manufacturing (see Chapter 17.280 CBMC). [Ord. 309, 2001; Ord. 93 § 2.9.3, 1987].

Staff Response: The applicant previously applied for and received approval from the Planning Commission for a conditional use permit (CUP) on March 15th, 2012 (ZON2012-00010) for this use. This code requirement has been satisfied.

17.75.050 Property Development Requirements

The following property development requirements shall apply to all land and structures in the C-2 district in addition to applicable standards of Division III of this title:

(1) Lot Standards. No requirements.

(2) Building Coverage. No requirements.

(3) Building Height. No restrictions other than those imposed by the building code.

(4) Yards. No requirements other than those imposed by the building code.

Staff Response: There are no spacial requirements set forth by this Title in the C-2 zone.

(5) Landscaping and Screening.

(a) All parking areas shall be landscaped in conformance with Chapter 17.200 CBMC, Off-Street Parking and Loading.

(b) All heating and air equipment shall be appropriately screened from public view. This does not apply to roof-mounted equipment.

(c) All storage and trash areas must be enclosed and screened from public view.

Staff Response: Staff finds as the applicant is proposing only eight (8) total parking spaces the landscaping requirement does not apply. However, a landscaped area is located outside the site fencing along the perimeter north of Fulton Avenue where plants will receive adequate sun exposure and where landscaping will improve the site's visual appearance to the public. Additionally, two new bio-swales are being proposed to receive portions of the site's stormwater runoff and are designed to overflow to the City storm sewer in Fulton Avenue during storm events.

Staff finds that the control building will have two exterior heat pumps located on the south side of the building. These will be screened from public view by the shrubs and plantings provided in the landscaping planned for the area along Fulton Avenue. The Shop/Electrical building will have one exterior heat pump located on the south side, screened from public view by trees and landscaping planted along the site western fence line. Storage areas and dumpsters will be located within interior of the or within various buildings, out of sight by the general public.

(6) Architectural Design Review. Architectural design review as set forth in Chapter 17.390 CBMC may be required for development in the design area defined by Chapter 17.240 CBMC. Design review approval shall be based on compliance with Chapter 17.240CBMC. [Ord. 302, 2001; Ord. 93 § 2.9.5, 1987].

Staff Response: This requirement does not apply to the proposed WWTP site as the WWTP is south of this defined area.

Chapter 17.145
Access Management

17.145.020 Legal access.
All parcels of land shall have access to a public street or alley. Vehicular access shall be provided to all parcels of land from a dedicated public street or alley and lot frontage for residential uses shall be not less than 30 feet in width, unless otherwise provided.

Staff Response: The subject property has two existing access points on the south side from Fulton Ave. The access points are shown on the Site Plan (Part One, Exhibit A) as a part of the application. The proposed use is non-residential, so the minimum lot frontage of 30-feet in width does not apply.

17.145.030 Access permit required.
Access to a public street requires an access permit in accordance with the following procedures:
(1) Permits for access to city streets shall be subject to review and approval by the department of community services based on the standards contained in this title. An access permit may be in the form of a letter to the applicant, attached to a land use decision notice as a condition of approval, or included in the building permit review.
(2) Permits for access to state highways shall be subject to review and approval by Oregon Department of Transportation (ODOT), except when ODOT has delegated this responsibility to the city. In that case, the city shall determine whether access is granted based on its adopted standards.
(3) Approval of proposed developments that require an access permit from North Bend/ODOT shall be contingent upon the city/agency issuing an access permit. The city shall impose a condition of approval that requires the developer to obtain an access permit prior to the issuance of building permits.
(4) The city or other agency with access permit jurisdiction may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic control devices, control or reserve strips, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street and highway system.
(5) An access permit is tied to the specific use, not a specific lot/parcel. A new access permit is required for any change in use or expansion of an existing use in order to determine that the access is safe and appropriate for the proposed use based on the standards contained in this title.

Staff Response: As a condition of approval the applicant will acquire any necessary additional permits from local and state agencies to secure access to the site.

17.145.040 Access options.
A development shall provide vehicular access according to one of the following methods:

(1) From a public street or alley abutting the subject lot/parcel.
(2) From a driveway connected to an adjoining property that has direct access to a public street (i.e., "shared driveway"). An access easement covering the driveway shall be recorded in this case to assure access to the closest public street for all users of the driveway.
(3) Residential Development on Arterial Streets. New residential land divisions fronting onto an arterial street shall be required to provide alleys or secondary (local or collector) streets for access to individual lots. When alleys or secondary streets cannot be constructed due to topographic or other physical constraints, access may be provided by consolidating driveways for clusters of two or more lots (e.g., includes flag lots and mid-block lanes). An on-site turnaround so vehicles are not required to back out into an arterial street must be provided.
(4) Number of Access Points. For multiple-family, commercial, industrial, and public/institutional developments, the number of access points shall be minimized to protect the function, safety and operation of the street(s). Shared access may be required in order to maintain the required access spacing, and minimize the number of access points.
(5) Shared Driveways. The number of driveways onto public streets shall be minimized by the use of shared driveways with adjoining lots/parcels where feasible. When shared driveways for nonresidential uses are required, an internal access driveway shall be stubbed to adjacent developable lots/parcels to allow for future extension and access to the shared driveway.
(6) Joint and Cross Access. New commercial development shall provide cross-access driveways and pedestrian pathways to allow circulation between sites without having to access the adjacent public street. Cross-access driveways shall be improved and stubbed to adjacent developable lots/parcels to create the opportunity for future extension. As a condition of approval, the landowner shall record an access easement to grant reciprocal access to adjacent lots/parcels.
(7) Fire Access and Parking Area Turnarounds. A fire equipment access drive shall be provided for any portion of an exterior wall of the first story of a building that is located more than 150 feet from an existing public street or approved fire equipment access drive. Parking areas shall provide adequate aisles or turnaround areas for service and delivery vehicles so that all vehicles may enter the street in a forward manner.

Staff Response: Per the application access to the site will be from Fulton Ave. The two primary property access are existing are not proposed to be modified. A variance is being applied for, as a part of this application, to allow for a third access point from South Empire Blvd. As described in the variance application, this third access would only be used for infrequent maintenance activity.

According to the applicant the 18-foot wide entrance from Fulton Ave is adequate for fire equipment access however, nothing is provided in the record to substantiate this claim. As a condition of approval the applicant shall submit a letter into the record from the Coos Bay Fire Chief stating that this is sufficient for fire access and turnaround requirements or make the necessary plan changes to accommodate the access requirements.

A reserve strip is not being required as a part of this proposal.

17.145.050 Access Spacing.

Street, alley or driveway intersections accessing onto a public street shall be separated from other street, alley, or driveway intersections according to the following (Measurement is made from the inside of curb to inside of curb):

(1) Arterial Streets. The minimum access spacing between access points shall be 500 feet.

(2) Collector Streets. The minimum access spacing between access points shall be 300 feet.

(3) Arterial/Arterial Intersections. The minimum access spacing from the intersection shall be 300 feet.

(4) Arterial/Collector Intersections. The minimum access spacing from the intersection shall be 300 feet.

(5) Collector/Collector Intersections. The minimum access spacing from the intersection shall be 150 feet, if practicable, otherwise 100 feet.

(6) On state highways, ODOT standards supersede city standards.

(7) Existing undeveloped lots or parcels cannot be denied access. The maximum access spacing possible should be provided.

(8) In cases where existing development undergoes an expansion, intensification or change of use, existing developed lots/parcels cannot be denied access to a street where there is an existing access point. The existing access point may be required to relocate in order to comply with access spacing standards or to maximize spacing to the greatest extent possible. A temporary access point may be allowed until an alternate access point, such as a shared driveway, that better meets the standard becomes available.

Staff Response: The three streets abutting the subject property are: South Empire Blvd. (Arterial) and Fulton Ave. and Marple St. (Collectors). The proposed entrance to the property is on Fulton Ave., approximately 40-feet from the Fulton/Marple Intersection. The proposed exit is on Fulton Ave., approximately 40-feet from the Empire/Fulton intersection. While these access points do not meet the criteria above, they are proposed to be located at two exiting access points to the property. As a part of this application, the applicant is applying for a variance to these standards

Chapter 17.160
Fences and Walls

17.160.020 Required Fences and Walls.
A fence or wall shall be constructed along the perimeter of all areas considered by the Council and/or commission to be dangerous to the public health and safety. The height of this wall may require a permit.

Staff Response: It is anticipated that the entire wastewater treatment plant facility would be considered to be dangerous to the public health and safety by the council and/or commission. Therefore, a 6-foot tall fence will be constructed around the entire site. See enclosed site plan for location of proposed fence.

17.160.030 Permitted Fences and Walls.
Fences and walls not greater than eight feet in height shall be permitted on or within all property lines which are not within any vision clearance area. For any fence greater than eight feet in height, a setback from the property line of one foot shall be provided for each additional foot or fraction of a foot.
Staff Response: The proposed 6-foot tall fence is within all property lines and not within the vision clearance area. The fence layout is shown in the Application, Part One, Exhibit A – Site Plan. The fence details are provided in Part One, Exhibit D – Architectural Plan Set.

Chapter 17.200
Off-Street Parking and Loading

17.200.020 General provisions.

(1) Required parking shall be available for the parking of operable vehicles of residents, customers, and employees. A required loading space shall not be used for any other purpose than the immediate loading or unloading of goods or passengers.

(2) The off-street parking and loading requirements specified in this title shall be required of any new development or use and shall not be relinquished, reduced, or altered below the requirements established unless equivalent facilities are provided and maintained elsewhere or until the use or occupancy of the building or structure is changed, affecting the computation of the required parking.

(3) When an existing structure is enlarged by increasing the floor space or by increasing seating capacity, or if the use changes, and any of these changes requires greater amounts of parking, the off-street parking requirements of this chapter for the use, in its entirety, shall be satisfied.

(4) Off-street parking and loading spaces shall meet all requirements of this title before the building for which they serve is occupied, except as permitted in CBMC 17.200.030(3).

(5) All parking spaces shall be on the same parcel of land with the main use they serve. However, parking for nonresidential structures or uses may be provided within 300 feet of the main building and in the same general type of district if there is assurance in the form of deed, lease, contract, or other similar document that the site is usable for the required parking for the duration of the use.

Staff Response: Staff finds that the public utility use is not listed in Table 17.200.040. The closest listed facility type is "warehouse and manufacturing." This use requires one space per 1000 square feet, and no less than one space per employee. The footprint of the proposed Control Building is less than 2000 square feet. Further, it is anticipated that there will be a maximum of two employees on site during a normal work day. The proposed site plan provides for seven (7) regular parking spaces plus one (1) handicapped parking space which exceeds the closest parking requirement for the proposed use. Staff also finds that all of the proposed parking spaces are located on the same parcel as the use they are intended to serve. Staff finds that that the off-street parking spaces provided in the applicant's proposal meet the requirements established by CBMC Table 17.200.040.

17.200.030 Design requirements.

(1) Access.

(a) All access to individual parking spaces on a nonresidential parcel or lot shall be from a street or alley directly to the parcel or lot itself. Parking spaces in a nonresidential lot and for multiple-family units of four or more shall be arranged so that ingress to or egress from a parking space does not require backing into a public street or over a sidewalk.

Staff Response: Staff finds that the applicant has met this standard as the access points are from are from collector and arterial streets.

(2) Dimensions.

(a) Residential Uses. A parking space for residential uses shall have a minimum width of nine feet and a minimum length of 18 feet.

(b) Nonresidential Uses. A parking space for nonresidential uses shall have a minimum width of nine feet and a minimum length of 18 feet not including access driveways and turnarounds sufficient to permit a standard automobile to be parked in and removed from the space without the necessity of moving other vehicles. The recommended dimensions of stalls and aisles are shown in Table 17.200.030.

(c) Nonresidential Uses – Compact Car. A compact car space for nonresidential uses shall have a minimum width of eight feet and a minimum length of 16 feet not including access driveways and turnarounds sufficient to permit a compact automobile to be parked in and removed from the space without the necessity of moving other vehicles.

(3) Surfacing.

(a) General.

(i) All off-street parking spaces, access, maneuvering areas, and driveways shall be graded and paved in accordance with the standards established by the engineering division and shall be maintained in good condition.

(ii) If access is gained from an improved street, that portion of the access in the public right-of-way also shall be paved.

(iii) Improvements to the parking facilities of residential uses, such as the addition of a carport or garage, shall require compliance with the surfacing requirements of the driveway and maneuvering areas if the dwelling gains access from an improved street. At a minimum, the paved access must be 10 feet in length measured from the curb face.

(iv) Exceptions to this requirement are listed in subsection (3)(b) of this section; delays are listed in subsections (3)(c) and (d) of this section.

(b) Exceptions. The following parking areas are exempt from the surfacing requirements, but are subject to improvements in subsection (3)(e) of this section:

(i) Separate or segregated parking areas for storage of business vehicles and equipment when in excess of the required parking.

(ii) Separate or segregated parking areas for employees only when in excess of the required parking.

(iii) Separate or segregated areas for the outside display of merchandise. (Example: automotive and equipment sales/rentals and construction sales and service, etc.)

(c) Delays – Unimproved Rights-of-Way. Off-street parking and loading for residential and nonresidential uses on existing unpaved streets are allowed a delay from the surfacing requirements prior to the issuance of an occupancy permit. However, the property owner must consent and present a recorded deed restriction or covenant which states that remonstrance against any future street improvement project has been waived and that the required paving will be completed within 12 months after the street is improved.
(d) Delays – Physical Problems. The immediate surfacing of parking areas may be delayed up to one year after the date of occupancy when it is determined by the city building official that soil or climatic conditions or the availability of paving material prevents immediate paving. Soil instability shall be verified in writing by a paving contractor, qualified architect or engineer. The temporary delay shall be granted in writing by the building official. This delay is subject to improvements that may be required in subsection (3)(e) of this section.
(e) Surfacing – Improvements for Exempt Surfacing.
(i) Provide gravel and/or durable, dustless surface.
(ii) Pave driveways and aprons to discourage debris from entering the street right-of-way or sidewalk. At a minimum, the paved access must be 20 feet in length measured from the curb face.
(iii) When adjacent to public sidewalks, provide a six-inch curb in accordance with standards established by the department of community services.
(iv) Provide adequate drainage to dispose of runoff.

Staff Response: Staff finds that the applicant meets the applicable standards for parking lot dimensions as stipulated by CBMC Table 17.200.030. <u>As a condition of approval, the applicant shall be required to meet all surfacing requirements as stipulated by CBMC 17.200.030(3)</u>

(4) Signing. Parking stalls shall be clearly marked to the full 18- or 16-foot length and access lanes marked with directional arrows to guide internal movements. Additional signs and markings shall be required if determined by the public works department to be necessary for traffic circulation or safety. Areas used for compact cars shall be clearly marked and handicapped parking spaces shall be designated in accordance with state standards.

Staff Response: As a condition of approval the applicant shall clearly mark parking stalls to the full 18- or 16-foot length and clearly mark access lanes with directional arrows to guide internal movements. Additional signs and markings shall be required if determined by the public works department to be necessary for traffic circulation or safety. Areas used for compact cars shall be clearly marked and handicapped parking spaces shall be designated in accordance with state standards.

(6) Drainage. Adequate drainage shall be provided to prevent ponding and to dispose of the runoff from the impervious surface of the parking area. Provisions shall be made for the on-site collection of drainage waters to eliminate sheet flow of water onto sidewalks, public rights-of-way, and abutting private property, subject to approval of the public works department.

Staff Response: Staff finds that the applicant's proposed drainage design and calculations have been provided. It appears that the drainage design has addressed the prevention of ponding and allowed for the disposal of the runoff from the impervious surface of the parking area. It further appears that the design has allowed for provisions for the on-site collection of drainage waters to eliminate sheet flow of water onto sidewalks, public rights-of-way, and abutting private property.

(7) Landscaping.

(a) Minimum Area. For all off-street parking and maneuvering areas with 10 or more spaces, a minimum of nine square feet of landscaping shall be provided for each parking space.

(b) Design Requirements.

(i) Landscaping shall consist of elements, each with a minimum area of 25 square feet and a minimum average width of three feet.

(ii) Landscaping elements must be adjacent to or within the parking lot and shall be spaced no farther than 100 feet apart.

(iii) Each element must have a major tree with a height of at least 20 feet at maturity and ground cover with a minimum height of one and one-half feet at maturity.

Staff Response: As less than ten (10) spaces are being proposed by the applicant the landscaping requirements are waived. However, the applicant is proposing to landscape several areas as a part of the application (See enclosed landscaping plan).

Chapter 17.345
Site Plan and Architectural Review

17.345.030 Application.

An applicant for a general or special development permit for a development which is subject to site plan and architectural review shall submit a plan or plans drawn to scale showing the following as applicable:

(1) Contour lines related to some established bench mark or other datum approved by the public works and development director and having a minimum interval of five feet.

(2) The location and direction of all watercourses and areas subject to flooding.

(3) Natural features, such as rock outcroppings, marshes, wooded areas, indicating those to be preserved and/or removed.

(4) Location of all structures and improvements.

(5) Property lines of the subject site.

(6) Location and size of any areas to be conveyed, dedicated, or reserved as common open spaces, recreational areas, and similar uses.

(7) Existing and proposed vehicular and pedestrian circulation system including bike paths, off-street parking areas, service loading areas, and major points of access to public rights-of-way.

(8) Location and type of irrigation.

(9) Existing and proposed utility systems, including sanitary sewer, storm sewer, drainageways, water and fire hydrants.

(10) General location of and type of trees to be retained on site having a trunk diameter of six inches or more at a point of 24 inches above natural grade.

(11) Precise location or pattern and spacing of all proposed plant materials by size and common name, acceptable alternatives, expected mature appearance, estimated time of maturity, and the purpose intended to be achieved by the landscaping.

(12) Other elements and material type used in site treatment such as fences, walls, paving materials, planter boxes, screening, and ground control.

(13) Architectural drawings or sketches, drawn to scale, showing all elevations and exterior materials of the proposed structures and other improvements and floor plans.

(14) Proposed exterior lighting showing type, height, and area of illumination.

(15) Size, location, material, and illumination of signs.

(16) Time schedule for completion.

Staff Response: Staff finds that the applicant has submitted the required components of this chapter. A timeline for construction has also been included as a part of this application. The applicant is proposing a construction period of July 2015 through July 2017.

17.345.050 Decision.

No general development permits shall be issued for new construction or major remodeling until the plans have been reviewed and approved by the commission. The site plan and architectural review

process shall be used to establish how, not whether, a development may occur, and shall not affect dwelling unit densities, although conditions may be imposed which are necessary for a development to achieve the minimum requirements of this title. The planning commission may approve, or conditionally approve, the proposed site plan after addressing the following criteria:

(1) The location, size, shape, height, spatial and visual impacts and arrangements of the uses and structures are compatible with the site and surroundings.

Staff Response: Staff finds that the applicant has proposed to construct a wastewater treatment plant on a vacant two-acre parcel that is designed to correct deficiencies in the currently operating No. 2 WWTP located across Empire Boulevard to the west of the new site. The new plant will also provide increased treatment capacity for future population growth in the areas it serves. The parcel's proximity to the existing WWTP, incoming wastewater mains and the outfall pipe to the Coos Bay channel will minimize the construction cost and difficulties of upgrading the existing wastewater collection system and treatment processes.

The site's zoning is General Commercial C-2, shared with properties fronting on Empire Boulevard for six blocks to the north and two blocks to the south. The Property Development Requirements of the C-2 zone have no requirements regarding 'Lot Standards' and 'Building Coverage'. 'Building Height' and 'Yards' have no restrictions other than those imposed by the building code.

At two acres, the project is larger than the surrounding residential and commercial properties. However, the new buildings and plant facilities will be spaced some distance apart with architectural fencing and landscaping to improve the facility's visual impact. The plant's buildings and structures are architecturally designed in fit within the architectural character of the neighborhood. The City Council has also held several meetings on the visual appearance of the buildings modified the design.

For safety and security, the perimeter of the site will be enclosed with an attractive six-foot black architectural aluminum fence with three cross-bars spanning the fence posts, with secured entry and egress for both vehicles and personnel.

The landscape plan has been prepared to create visual interest and appeal to improve the site's compatibility with residential properties north and east of the site boundary. The site's perimeter has been designed with bioswales and landscaping. The site's existing mixed conifers near the Fulton Avenue/Marple St. intersection (the southeastern corner of the project site) are to remain. The site will be further shielded from view by residential properties east of Fulton Avenue by the placement of Austrian pine 'Arnold Sentinel' along the top of bank along Fulton Avenue. These trees will mature at twenty feet high by seven feet wide in ten years. American beach grass, Ceanothus, and Kinnikinnick will also be planted for landscape appeal and to prevent invasive weed species from taking hold.

(2) The public and private sewerage and water facilities provided by the development are adequate in location, size, design, and timing of construction to serve the residents or establishments. These facilities meet city standards and relevant policies of the comprehensive plan and provide adequate fire protection.

Staff Response: Staff finds that the public and private sewerage to be provided by this development are adequate in location, size, design, and timing of construction to serve residents and establishments intended to occupy the subject property. The City also concludes from the evidence that the facilities to serve this property will be constructed to meet city standards and relevant policies of the comprehensive plan and doing so will ensure appropriate levels of public sanitary sewer service and public water service pursuant to the CBMC.

The proposed site design includes a fire hydrant in the public street right-of-way on the north side of Fulton Avenue to provide adequate fire protection to the entire site including the control, maintenance and headworks buildings.

(3) The grading and contouring of the site, and how site surface drainage and/or on-site surface water storage facilities are constructed to ensure that there is no adverse effect on neighboring properties, public right-of-way, or the public storm drainage system; and that the site development work will take place in accordance with city policies and practices.

Staff Response: Staff finds that the applicant's proposed drainage design and calculations have been included in part four of the application. The facility incorporates provisions for onsite and off-site surface drainage. There are grading and contouring features resulting in both surface drainage and onsite surface water storage. Also, the site is at a lower elevation than neighboring properties which will result in not causing in drainage problems to surrounding properties.

The proposed grading of onsite paved areas will direct rainwater from the Headworks building rooftop and pavement surfaces with potential for contaminants toward drainage facilities that will transport stormwater to the influent pump station at the new plant, where it will be mixed with, and handled as, raw wastewater, and treated and disinfected prior to effluent discharge to the bay.

Rainwater from Control and IPS/Shop/Electrical building roofs will be captured in two bioswales that will allow gradual infiltration of storm water to minimize storm runoff impacts to public right-of-ways, the public storm drainage system, and Coos Bay. During rainfall events greater than the 100 year recurrence interval, the bioswales are designed to overflow to a new catch basin to be constructed at the low point of Fulton Avenue. Neighboring properties are at a higher elevation, and would not be impacted by the site's stormwater runoff.

Site development work will take place in accordance with City policies and practices; these will be specified and discussed during the pre-construction meeting with the selected contractor(s). Further, after the City's approval of the final civil plans, the applicant's

representative will submit a '1200C - Construction Stormwater General Permit' application and 'Erosion and Sedimentation Control Plan' (ESCP) to the Oregon Department of Environmental Quality for review and approval. The ESCP will be implemented before the start of construction.

(4) Based on anticipated vehicular and pedestrian traffic generation, adequate rights-of-way and improvements to streets, pedestrian ways, bikeways, and other ways are provided to promote safety, reduce congestion, and provide emergency equipment access.

Staff Response: Staff finds that after construction, the WWTP is not expected to generate an increase in vehicular traffic. The new facility will be more efficient than the existing plant, generating fewer vehicle trips including discontinuance of sludge hauling. It is anticipated that a maximum of two employees will be onsite during a normal work day. Employees will report to work at WWTP Plant No. 1, then take a City vehicle to travel to Plant No. 2, complete tasks as assigned, and return to Plant No. 1 afterwards. Employee trips to WWTP No. 2 will not be made by bicycle or on foot.

During plant construction, vehicles and heavy equipment will access the site from the Fulton Avenue entrance and the existing north plant entrance from Empire Boulevard at the culvert location. The public streets and rights-of-way are adequate for this purpose. The site will be surrounded by six-foot black industrial aluminum fencing designed to limit access and protect the facility during non-work hours. All driveways will have locking gates to limit access during normal working hours and prevent access on nights and weekends except by authorized personnel.

Construction plans include the installation of a new sidewalk, curb and gutter on the north side of Fulton Avenue. Two 'One-way Only' site access driveways clearly marked 'Entrance' and 'Exit' will be provided from Fulton Avenue, east and west of the Control building respectively. The driveways' length will allow off-street vehicle parking in front of the access gates, minimizing interactions with other vehicular traffic, bicyclists and pedestrians.

An application for a variance from the required 500 foot distance between access points onto an arterial street has been submitted to permit a north plant entrance from Empire Boulevard at the location of the buried waterway culvert. If approved, the variance will allow very infrequent access by maintenance vehicles required for plant operation. The site perimeter fencing will include a manually-operated double vehicle gate and a man-gate at this location. The thirty-foot asphalt concrete driveway will provide sufficient space for off-street vehicle parking in front of the access gates, minimizing interactions with vehicular traffic, bicyclists and pedestrians.

Site emergency access would be provided through either the two driveways from Fulton Avenue or the proposed north access from Ocean Boulevard.
Although not a part of this project, a plan by the Oregon Department of Transportation (ODOT) will construct new curbs, gutters, sidewalks and pavement as part of pedestrian and bikeway improvements to Empire Boulevard, including the site's frontage along

Empire Boulevard. ODOT plans to complete the improvements within the next two years. Adequate right-of-way width is available for this construction.

(5) There are adequate off-street parking and loading facilities provided in a safe, well-designed, and efficient manner.

Staff Response: Staff finds that the submitted parking informational materials in the application shows that the project complies with required parking spaces. Within the plant's fenced perimeter, the proposed WWTP design provides off-street parking in front of the Control building.

The parking area is designed to accommodate employee traffic and semi-trucks and trailers hauling liquids and bio-solids. Consequently, the paved area provides for large truck and car turning movements by providing a large amount of open space between site buildings and facilities. The open areas of the site are to be paved with asphalt concrete except where a graveled perimeter will be placed around the north, east and west sides of the SBR basins.

(6) Adequate dedication or reservation of real property for public use, as well as for easements and right of entry for construction, maintenance, and future expansion of public facilities are addressed.

Staff Response: Staff finds that the City of Coos Bay owns the property on which the WWTP No. 2 upgrade is planned. The City will not need to record water and wastewater easements or dedicate additional property for public use.

The new site electrical service to be provided by Pacific Power and Light will be connected via a new power pole, three-phase transformer and drop located on the southwest corner of the site, outside the perimeter fence. The street's public right-of-way in this location will allow for placement of the electrical service within the right-of-way. It is not foreseen that the electric utility will need an easement for the site's electric supply.

The site's proposed design includes a future expansion area for an additional sequencing batch reactor (SBR) basin and equalization basin. An expansion area has been reserved between the proposed SBR basins and the public right-of-way on South Marple Street. Future construction will require that the new basin walls function as retaining walls due to the site's uphill slope to the east. If population growth requires that the wastewater treatment plant be expanded, the area for the future expansion of the public facility will be available within the proposed WWTP site.

(7) The structural design, location, size, and materials used for buildings, walls, fences, berms, traffic islands, median areas, and signs serve their intended purposes.

Staff Response: Staff finds that the intended purpose of the WWTP project facilities have been designed of split faced concrete block with sheet metal roofing systems, and quality building materials for long life span and long-term service to the public. The buildings have

been sited to maximize horizontal clearance for optimal visibility and safety when vehicles and employees access the site.

The site perimeter will be fenced to meet the requirements of Chapter 17.260, using six-foot black industrial ornamental aluminum fencing located inside the property boundary. The plant upgrade project will not create a need for new berms, traffic islands or median areas on Marple Street, Fulton Avenue or Empire Boulevard.

A painted metal facility identification sign is planned for the southwest corner of the site at the intersection of Fulton Avenue and Empire Boulevard. A sign application will be required from the City before the sign is placed on site.

(8) Other property development requirements of the zoning district are satisfied.

Staff Response: Staff finds that all other known property development requirements have been satisfied at his time.

17.345.060 Conditions.

The planning commission may impose other reasonable conditions deemed to be necessary if it is determined the development may have an impact on the site or surrounding property. These conditions shall be stated in terms that are specific and measurable so the applicant is fully aware of the intent and justification of the condition and how and when implementation is to be accomplished. These conditions may include but not be limited to those listed in Chapter 17.355 CBMC and below:

(1) Refine the landscaping plan to specify the size, type by common name, and spacing of trees, shrubbery, ground cover, and other plantings and where this landscaping shall occur. Include, as part of the landscaped plan, clearances from specified trees, rocks, water ponds or watercourses, or other natural features. Require that the landscape plan be prepared by a licensed landscape architect, contractor, or nursery proprietor.

(2) Obtain city engineer's approval of a grading, drainage, erosion control, and ground stabilization plan for the collection and transmission of storm or ground water.

(3) Establish vehicle and pedestrian access facilities, including sidewalks.

(4) Limit the height of a building that is proposed to be constructed over 35 feet or increase a building setback up to an additional 20 feet.

(5) In the case of commercial or industrial development, provide access by a frontage road having limited and controlled access onto an arterial street by means of traffic signals, traffic control islands, or other means that will preserve the traffic-carrying capacity and safety of the arterial street and that will avoid the cumulative effect of individual access points directly onto the arterial street.

(6) In the case of a development that is not required to provide a frontage road, provide access to a street that intersects an arterial street instead of taking access directly from the arterial street.

(7) Special studies, investigations, or reports to verify that any aspect of the development will not create hazardous conditions for persons or property, for such impacts as geologic or soils conditions, noise, traffic, or landscaping.
(8) Modify the design to provide energy conservation and protect solar or wind access.

Staff Response: Staff herein incorporates the conditions of approval that are found in this staff report.

Chapter 17.350
Variance

17.350.030 Hearing.

A public hearing is required before granting a variance and shall be conducted in accordance with all provisions of Chapter 17.300CBMC.

Staff Response: Staff finds that a public hearing has been scheduled for March 10th, 2015 with the Coos Bay Planning Commission with the intent of gathering testimony on this application.

17.350.040 Decision.

The planning commission may approve, conditionally approve, or deny a permit for a variance from the property development requirements of this title only after adopting findings or statements of fact which substantiate any two of the following conclusions:

(1) There are physical, exceptional, extraordinary circumstances or conditions applicable to the property involved which do not apply generally to other property in the same district.

Staff Response: Staff finds that the applicant is applying for a variance to 17.145.050 (1) CBMC (Access Management) which states that the minimum access spacing between access points shall be 500 feet. The applicant is proposing to include a delivery access point at the north end of the site on Empire Blvd. A variance from the 500 foot distance is needed because the distance from Fulton Avenue north to the proposed access point at the dirt driveway is approximately 390 feet, less than the minimum 500 feet. Strict application of the 500-foot minimum access spacing between access points would prevent a vehicle entrance to the site from Empire Boulevard, and allow access only from Fulton Avenue. Access from Marple Street has not been proposed due to the steep bank between the plant site and the surroundings homes.

(2) Strict application of the provisions of this title will constitute an unnecessary hardship or practical difficulty; provided, that the hardship or difficulty was not created by the applicant or an owner of the property.

Staff Response: Staff believes that a strict application would prevent an access to Empire Boulevard to accomplish the important tasks of WWTP construction, operation and emergency access by only allowing site access from Fulton Avenue. The proposed access

point is necessary to allow construction of the sequencing batch reactor, the equalization basin and the UV disinfection system, as access to the north half of the site is limited from the Fulton Avenue entrance.

Post-construction, the Empire Boulevard entrance will be necessary to allow very infrequent maintenance and emergency vehicle access to the facilities for plant operations and emergency response. Without an access point from Empire Boulevard, there is limited access to the north half of the site. The undeveloped parcel's north-south orientation and 440-foot frontage on Empire Boulevard creating the need for an access point.

(3) The variance will not negatively affect abutting property or improvement in the district, nor create a safety hazard.

Staff Response: Staff finds that there would be a temporary negative effect upon properties along Empire Boulevard and directly across from the proposed access point as construction traffic would enter and leave the site during the construction period. This would require greater care by drivers entering Empire Boulevard. However, the construction traffic will be of limited duration, and future use of the proposed access point would be solely for very infrequent trips by delivery and plant maintenance vehicles needing access to facilities on the north half of the plant through a normally locked gate. Once construction at the new plant is complete, it is anticipated that the proposed entrance on Empire Boulevard would not be used more than once per month.

CONDITIONS OF APPROVAL

Staff recommends approval of the proposed project subject to the following conditions of approval:

General Conditions

1. The project will be undertaken and completed consistent with the plans submitted, except as altered by conditions attached to the approvals.
2. It shall be the sole responsibility of the applicant to coordinate and receive approvals from the appropriate state and federal resource agencies prior to commencement of construction. If a deviation from this original SPAR application is required as a result of the resource agency's assessment and coordination, the applicant shall resubmit any changes for approval. This may result in an additional application(s).
3. The applicant shall obtain a letter from the Coos Bay Fire Chief stipulating that on-site fire protection facilities and access points as proposed to be provided are in accordance with City of Coos Bay current regulations for such developments.
4. No permits shall be issued for this project on the site until all review fees have been paid by the applicant.
5. All grading, sewer, storm drain, and traffic design shall be in conformance with June 2009 Design Standards.
6. Emergency access to all buildings within the proposal will need to be shown on final engineering drawings.
7. As a condition of approval, the applicant shall be required to meet all surfacing requirements as stipulated by CBMC 17.200.030(3)

City of Coos Bay

Community Development · 500 Central Avenue · Coos Bay, Oregon 97420
Telephone 541.269.1181 · Fax 541.269.8916 · coosbay.org

LAND USE DEVELOPMENT REVIEW APPLICATION

For Office Use Only	
STAFF CONTACT	PROJECT NO(S).

Type of Review (Please check all that apply):

☐ Annexation	*CBMC 17.385*	☐ Home Occupation	*CBMC 17.260*	☐ Subdivision	*CBMC 17.335*
☐ Appeal and Review	*CBMC 17.305*	☐ Legislative/Text Amendment	*CBMC 17.380*	☐ Temporary Use	*Resolution 83-17*
☐ Architectural Design Review	*CBMC 17.390*	☐ Lot Line Adjustment	*CBMC 17.325*	☐ Vacation	*CBMC 17.375*
☐ Conditional Use	*CBMC 17.355*	☐ Partition	*CBMC 17.330*	☒ Variance	*CBMC 17.350*
☐ Cultural Resources	*CBMC 17.365*	☐ Planned Unit Development	*CBMC 17.270*	☐ Zone Change	*CBMC 17.360*
☐ Estuarine Use/Activities	*CBMC 17.205*	☒ Site Plan and Architectural Review	*CBMC 17.345*	☐ Other_____	

Pre-Application applications require a different application form available on the City website or at City Hall.

Site Location/Address:	Assessor's Map No./Tax Lot(s): **T25S R13W S19DA TL2700**
490 FULTON AVENUE, COOS BAY OR 97420	Zoning: **C2 GENERAL COMMERCIAL**
	Total Land Area: **2.01 ACRES**

Detailed Description of Proposal: The purpose of this capital construction project is to correct deficiencies identified in the existing WWTP No. 2 wastewater treatment system and to meet Oregon Department of Environmental Quality (DEQ) requirements. Improved collection, water quality treatment and disinfection systems are needed to meet DEQ regulatory and redundancy requirements , as well as to meet current peak flows and future flow conditions for projected population growth. The aging facility contains several components that have exceeded their useful life and are in need of replacement. While currently meeting DEQ requirements, the existing facilities may not have the capacity to continue to meet flow and discharge requirements if upgrades are not performed. In addition to improving wastewater treatment, the project will increase process capacity for the west side of the City and the Charleston Sanitary District, and reduce the environmental footprint of the current treatment system. The proposed site design includes operations, maintenance and headworks buildings and sequencing batch reactor basins and ultraviolet disinfection chamber.

Applicant/Owner Name: (please print) **ROGER CRADDOCK, CITY OF COOS BAY** Phone: **541-269-1181**

Address: **500 CENTRAL AVENUE** Email: **rcraddock@coosbay.org**

City State Zip: **COOS BAY, OREGON 97420**

Applicant's Representative: MARK DENNING,
SHN CONSULTING ENGINEERS & GEOLOGISTS, INC. Phone: **541 266-9890**

Email: **mdenning@shn-engr.com**

Address: **275 MARKET STREET, COOS BAY, OR 97420**

1. Provide evidence that you are the owner or purchaser of the property or have the written permission of owner(s) to make an application for architectural design review. In either case, include a copy of the deed for the subject property.
2. Attach (a) a certified list of names and addresses of all owners of property within 250 feet of the exterior boundaries of the subject property according to the latest adopted County tax role and (b) an assessor's map showing all lots and parcels of land within that area.
3. Address the Decision Criteria or Goals/Standards outlined in the Coos Bay Municipal Code chapter(s) related to your request.
4. Additional information: Date construction is expected to begin; estimated completion date of the total project and of individual segments; and anticipated future development.
5. Ten (10) complete hard-copy sets (single sided) of application materials must be submitted with this application. One (1) complete set of digital application materials must also be submitted electronically or on CD in Word format. Additional copies may be required as directed by the Coos Bay Director of Community Development.

The undersigned property owner(s) hereby authorizes the filing of this application, and authorizes on site review by authorized staff. I hereby agree to comply with all code requirements applicable to my application. Acceptance of this application does not infer a complete submittal. All amendments to the Coos Bay Development Code and to other regulations adopted after the application is approved shall be enforced where applicable. Approved applications and subsequent development is not vested under the provisions in place at the time of the initial application.

J. Mark Denning 11/21/14 Jim Hossley 21 Nov 14

Applicant's signature Date Owner's signature *(required)* Date

Jim Hossley for Roger Craddock

Coos Bay Wastewater Treatment Plant No. 2 Upgrade

Chapter 17.345, SITE PLAN AND ARCHITECTURAL REVIEW

TABLE OF CONTENTS

PART ONE CHAPTER 17.345.030 - REQUIRED APPLICATION ELEMENTS

The applicant's representative has prepared the following drawings for submittal to the City in support of this development application. Please refer to referenced drawing for the required application element.

Refer to Drawing	**Required Application Elements as given in CBMC Chapter 17.345.030**
Exhibit B	(1) Contour lines related to some established bench mark or other datum approved by the public works and development director, having a minimum interval of five feet.
Exhibit A	(2) The location and direction of all watercourses and areas subject to flooding.
Exhibit A & C	(3) Natural features, such as rock outcroppings, marshes, wooded areas, indicating those to be preserved and/or removed.
Exhibit A	(4) Location of all structures and improvements.
Exhibit A	(5) Property lines of the subject site.
n/a	(6) Location and size of any areas to be conveyed, dedicated, or reserved as common open spaces, recreational areas, and similar uses.
Exhibit A	(7) Existing and proposed vehicular and pedestrian circulation system including bike paths, off-street parking areas, service loading areas, and major points of access to public rights-of-way.
Exhibit C	(8) Location and type of irrigation.
Exhibit A	(9) Existing and proposed utility systems, including sanitary sewer, storm sewer, drainageways, water and fire hydrants.
Exhibit C	(10) General location of and type of trees to be retained on site having a trunk diameter of six inches or more at a point of 24 inches above natural grade.
Exhibit C	(11) Precise location or pattern and spacing of all proposed plant materials by size and common name, acceptable alternatives, expected mature appearance, estimated time of maturity, and the purpose intended to be achieved by the landscaping.
Exhibit C	(12) Other elements and material type used in site treatment such as fences, walls, paving materials, planter boxes, screening, and ground control.

Exhibit D	(13) Architectural drawings or sketches drawn to scale, showing all elevations and exterior materials of the proposed structures and other improvements and floor plans.
See Note 1 below	(14) Proposed exterior lighting showing type, height, and area of illumination[1].
Exhibit A	(15) Size, location, material, and illumination of signs.
See Note 2 below	(16) Time schedule for completion[2].

PART TWO CHAPTER 17.345.050 - DECISION CRITERIA

This section of text answers the eight criteria with which the Planning Commission will evaluate the project application as given in Chapter 17.345.050.

NO.	Criteria
1	Compatibility
2	Public Utilities
3	Grading and Drainage
4	Traffic Elements
5	Parking and Loading
6	Future Space and Easement Needs
7	Structural Elements
8	Other Requirements

PART THREE ILLUMINATION PLAN and DRAWINGS

PART FOUR STORM WATER REPORT and DRAWINGS

PART FIVE VARIANCE APPLICATION

APPENDICES

A	Proof of ownership
B	Authorized Agent Consent Form
C	List of Property Owners within Site's 500 foot Radius

[1] Refer to Part Three, Illumination Plan and Drawings

[2] April, 2015 - Commence Construction, April, 2017 - Complete Construction

PART ONE

CHAPTER 17.345.030
REQUIRED APPLICATION ELEMENTS

EXHIBIT A

SITE PLAN

MARPLE STREET

TBM EL 31.01
MAG NAIL
N:1404.22
E:1370.39

TBM EL 19.22
2 1/2" ALUMINUM CAP
N:1168.74
E:1285.58

ONE 13" DOUGLAS FIR, ONE 12" SHOREPINE, & ONE 3" CEDAR TO REMAIN

PROPERTY LINE

FUTURE EQUALIZATION BASIN

FUTURE BASIN

FENCE

FULTON AVENUE

GRAVEL

AUTO SWING GATE

PED GATE

SEQUENCING BATCH REACTORS

WAS PUMPS

EQUALIZATION BASIN

EXISTING OPEN STREAM CHANNEL

VEHICULAR TRAVEL

HEADWORKS

AC PAVEMENT

CONTROL BUILDING

PARKING

NEW SIDEWALK

ODOR CONTROL

BIOSWALE

AUTO SLIDER GATE

GENERATOR

ULTRAVIOLET DISINFECTION

INFLUENT PUMP STATION

SHOP / ELECTRICAL BUILDING

NEW TRANSFORMER

EXISTING SIDEWALK

CITY OF COOS BAY
ODOT

MANUAL SWING GATE

CONSTRUCTION/ MAINTENANCE ACCESS

EXISTING CULVERT

NEW POWER POLE

EXISTING FIRE HYDRANT

EMPIRE BOULEVARD

FUTURE SIDEWALK AND ROADWAY REALIGNMENT/RECONSTRUCTION BY ODOT

LEGEND

- GRAVEL
- AC PAVEMENT
- CONCRETE PEDESTRIAN WALKWAY
- CATCH BASIN
- FENCE LINE
- MANHOLE

PLAN
1"=20'

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CH2MHILL

SHN
CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	DATE	REVISION	BY

DSGN	DPG	DR	DPG	CHK	JMD	APVD	

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
CIVIL
SITE PLAN
EXHIBIT A

SHEET 06-C-2000
SEQ
DATE 09/2014
PROJ. NO. 490515

EXHIBIT B

GRADING PLAN

MARPLE STREET

FULTON AVENUE

EMPIRE BOULEVARD

ORIGINAL SLOPE – NO GRADING

GRADED BANK, TYP.

ROCK DRAINAGE DITCH

CURB

TBM ELEV. 19.22
2½" ALUMINUM CAP
SURVEY DATUM: NAVD 88

EQUALIZATION BASIN

SEQUENCING BATCH REACTORS

HEADWORKS
FF 17.0'

TRENCH DRAIN

CONTROL BUILDING
FF 16.5'

ODOR CONTROL
FF 16.5'

BIOSWALE

A.C. PAVEMENT

ULTRAVIOLET DISINFECTION

INFLUENT PUMP STATION

GENERATOR
FF 15.5'

SHOP/ELECTRIC BUILDING
FF 16.0'

GRAVEL

ENTRANCE SIGN

BIOSWALE

LEGEND

- GRAVEL
- AC PAVEMENT
- CONCRETE PEDESTRIAN WALKWAY
- CATCH BASIN
- FENCE LINE
- MANHOLE

PLAN
1"=20'

NOTES:

1. ONSITE STORMWATER TO BE DIRECTED TO INFLUENT PUMP STATION VIA CATCH BASINS AND STORM DRAINS.
2. CONTROL BUILDING AND SHOP/ELECTRICAL BUILDING ROOF DRAINS TO BE DIRECTED TO BIOSWALES.

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SHN
CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	DATE	REVISION	BY

DSGN DPG
DR NER
CHK JMD
APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
CML
SITE GRADING PLAN
EXHIBIT B

SHEET 06-C-2016
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DATE 09/2014
PROJ. NO. 490515

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EXHIBIT C

LANDSCAPE PLAN

MARPLE STREET

FULTON AVENUE

EQUALIZATION BASIN

SEQUENCING BATCH REACTORS

HEADWORKS

CONTROL BUILDING

BIOSWALE

ULTRAVIOLET DISINFECTION

INFLUENT PUMP STATION

SHOP/ ELECTRICAL BUILDING

AREAS TO BE PRESERVED

EXISTING CULVERT

EMPIRE BOULEVARD

PLAN
1"=20'

NOTES:

A. The concept behind the landscape design is twofold:

(1) By creating bioswales for roof drains, all stormwater is retained on site.
(2) Plant selection recognizes seasonal cycles of very wet winters and droughty summers with salty, desiccating north winds. The proposed species will tolerate site conditions of soils, slope and drainage while competing and suppressing invasion by other unwanted plant colonies.

B. No permanent irrigation system is proposed. Once established, the selected plants and trees are expected to thrive under the local climate conditions.

Potable water spigots will be provided where indicated in the event that temporary irrigation is required to help the plants establish. If the construction schedule allows, the plantings will be done in the fall, thus decreasing the likelihood that irrigation will be required.

C. Expected time of maturity is three to five years.

LEGEND

- GRAVEL
- AC PAVEMENT
- CONCRETE PEDESTRIAN WALKWAY
- CATCH BASIN
- FENCE LINE
- MANHOLE
- HOSE BIB

1		AUSTRIAN PINE, "OREGON GREEN"	5		AMERICAN BEACH GRASS	8		BIOSWALE PLANTING MIX: RED OSIER DOGWOOD ("ASANTI"), SLOUGH SEDGE, COMMON RUSH, JAPANESE IRIS
2		AUSTRIAN PINE, "ARNOLD SENTINAL"	6		CEANOTHUS, "POINT REYES"			
3		EXISTING MIXED CONIFERS TO BE PRESERVED	7		KINNIKINNICK			
4		JAPANESE WHITE PINE, "FUKAZUMI"						

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CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	REVISION	BY	DATE

DSGN DPG
DR NER
CHK JMD
APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
CIVIL
LANDSCAPE PLAN
EXHIBIT C

SHEET 06-C-2019
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DATE 09/2014
PROJ. NO. 490515

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1 AUSTRIAN PINE,
'OREGON GREEN'
10'–12' HIGH BY 8'–10' WIDE
SPACING 30' O.C.
18'–20' IN 10 YRS

2 AUSTRIAN PINE,
'ARNOLD SENTINEL'
20' HIGH BY 7' WIDE
SPACING 10' O.C.

3 EXISTING MIXED CONIFERS

4 JAPANESE WHITE PINE,
'FUKAZUMI'
8' HIGH BY 15' WIDE

5 AMERICAN BEACH GRASS
3' HIGH
SPACING 4' O.C.

6 CEANOTHUS,
'POINT REYES'
1.5' HIGH BY 10' WIDE
SPACING 4' O.C.

7 KINNIKINNICK
1' HIGH BY 8' WIDE
SPACING 4' O.C.

8 RED OSIER DOGWOOD,
'ISANTI'
5' HIGH BY 5' WIDE

9 SLOUGH SEDGE

10 COMMON RUSH

11 JAPANESE IRIS

LANDSCAPING PLANT LIST - EXPECTED MATURE SIZE AND APPEARANCE

1		AUSTRIAN PINE, 'OREGON GREEN'	5		AMERICAN BEACH GRASS	8		BIOSWALE PLANTING MIX: RED OSIER DOGWOOD 'ASANTI', SLOUGH SEDGE, COMMON RUSH, JAPANESE IRIS
2		AUSTRIAN PINE, 'ARNOLD SENTINEL'	6		CEANOTHUS, 'POINT REYES'	9		
3		EXISTING MIXED CONIFERS TO BE PRESERVED	7		KINNIKINNICK	10		
4		JAPANESE WHITE PINE, 'FUKAZUMI'				11		

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NO.	DATE	REVISION	BY

DSGN
DR
CHK
APVD

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE

LANDSCAPE PLANT EXAMPLES
EXHIBIT C

SHEET
SEQ
DATE 09/2014
PROJ. NO. 490515

EXHIBIT D

ARCHITECTURAL PLAN SET

RENDERING FROM INTERSECTION OF EMPIRE BOULEVARD AND FULTON AVENUE – LOOKING NORTHEAST

LANDSCAPING AT FULL MATURITY

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CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	REVISION	BY	DATE

DESIGN
DR
CHK
APVD

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE

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DATE 09/2014
PROJ. NO. 490515

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RENDERING FROM EMPIRE BOULEVARD – LOOKING SOUTHEAST

LANDSCAPING AT FULL MATURITY

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SAY
CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	REVISION	BY	DATE

DSGN
DR
CHK
APVD

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE

SHEET

SEQ

DATE 09/2014

PROJ. NO. 490515

SAVED: 11/6/2014 3:00 PM NREID, PLOTTED: 11/6/2014 4:03 PM NICK REID
\\COOSBAYSVR1\Projects\2014\614018-WWTP2-Final\200-Dsgn-Dev-Phas\Dwgs\SPAR Dwgs\SPAR-RENDERING.dwg

RENDERING FROM MARPLE STREET – LOOKING NORTHWEST

LANDSCAPING AT FULL MATURITY

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

SAM

CH2MHILL.

CONSULTING ENGINEERS & GEOLOGISTS, INC.

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DR
CHK
APVD

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE

SHEET

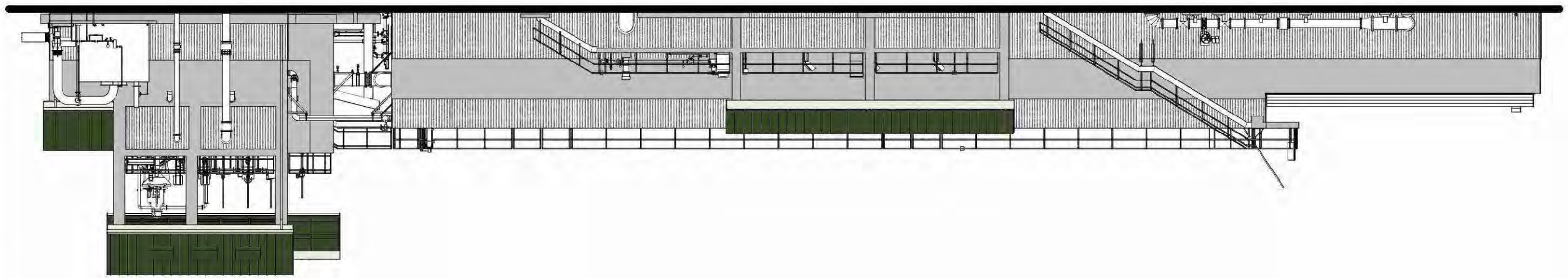
SEQ

DATE 09/2014

PROJ. NO. 490515

SAVED: 11/24/2014 10:24 AM NREID, PLOTTED: 11/24/2014 10:25 AM NICK REID
\\COOSBAY3VR1\Projects\2014\614018-WWTP2-Final\200-Dsgn-Dev-Phas\Dwgs\SPAR Dwgs\SPAR-RENDERING.dwg

ELEVATION VIEW OF SBR - LOOKING EAST



SAVED: 11/6/2014 3:00 PM NREID, PLOTTED: 11/6/2014 4:02 PM NICK REID
\\COOSBAY35\611\Projects\2014\614018-WWTP2-Final\200-Dsgn-Dev-Phase1\Dwgs\SPAR Dwgs\SPAR-REVDERING.dwg

PROJ. NO.	490515
DATE	09/2014
SER	
SHEET	

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE

DSGN	
DR	
CHK	
APV'D	

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VERIFY SCALES

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0 1"
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SAVED: 11/6/2014 3:00 PM NREID, PLOTTED: 11/17/2014 11:52 AM NICK REID
\\COOS84\JOBS\811\Projects\2014\614018-WWTP2-Final\200-Dsgn-Dev-Phase\Dwgs\SPAR Dwgs\SPAR-RENDERING.dwg

ELEVATION VIEW OF CONTROL BUILDING - LOOKING SOUTH

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE

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DR	
CHK	
APVD	

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CH2MHILL.

VERIFY SCALES
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0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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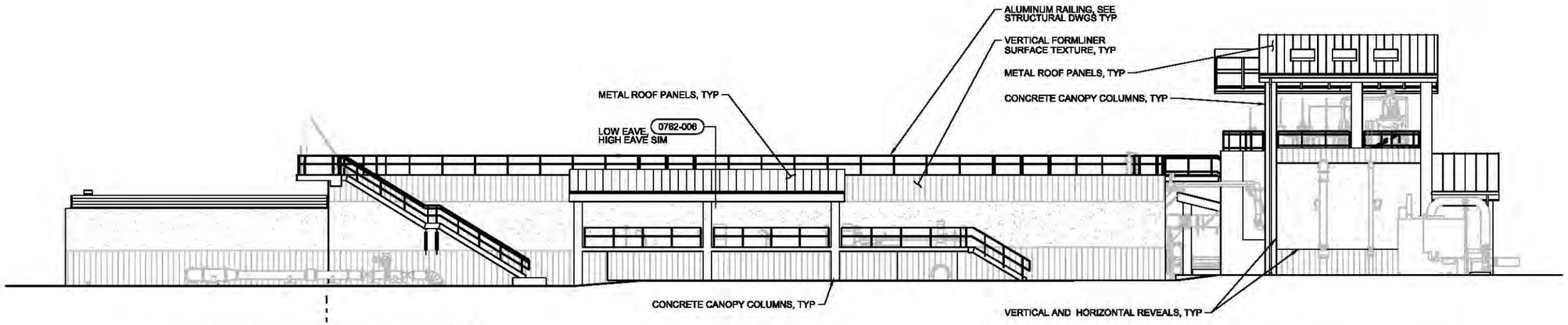
SEQ

DATE 09/2014

PROJ. NO. 490515



NOTE:

1. SEE FACILITY 20 HEADWORKS DRAWINGS FOR COMPLETE INFORMATION.

WEST ELEVATION

3/32"=1'-0"

SEQUENTIAL BATCH REACTOR

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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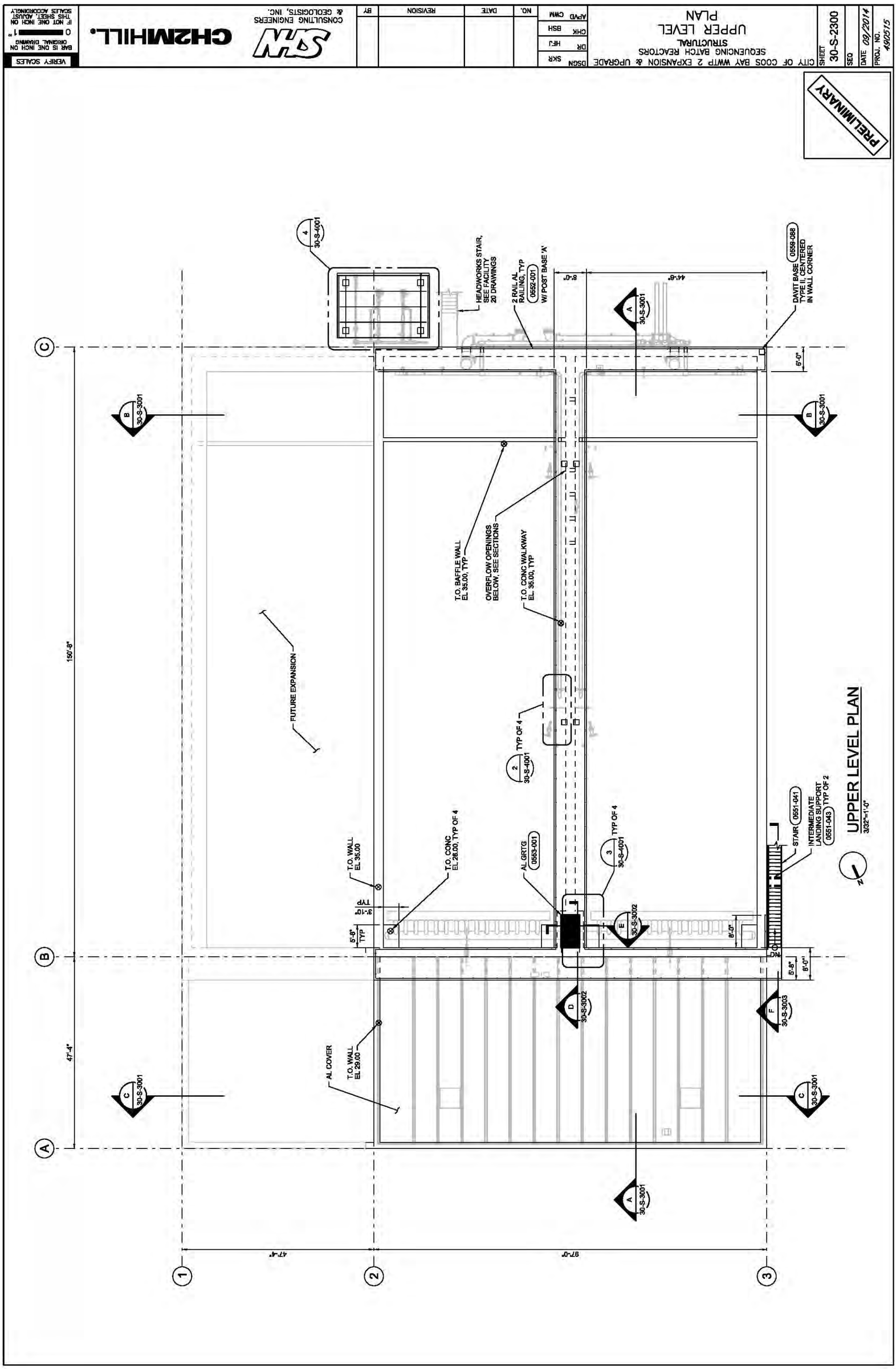
CHK
APVD CWM

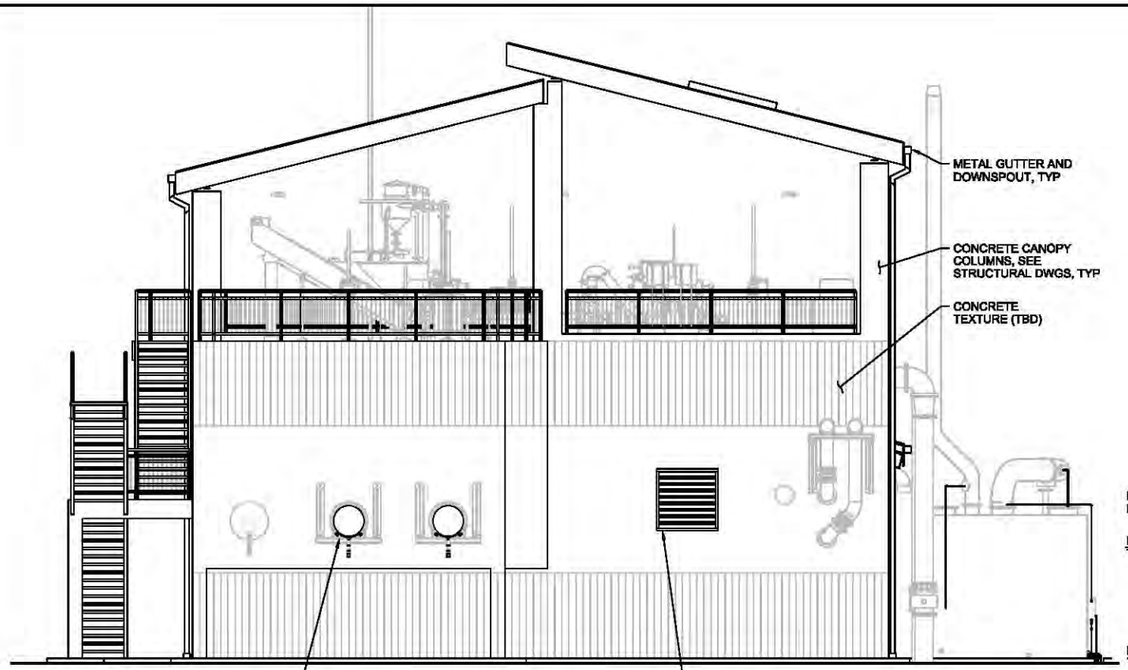
CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
SEQUENCING BATCH REACTORS
ARCHITECTURAL
WEST ELEVATION

SHEET
30-A-3000
SEQ
DATE 11/2014
PROJ. NO.
490515

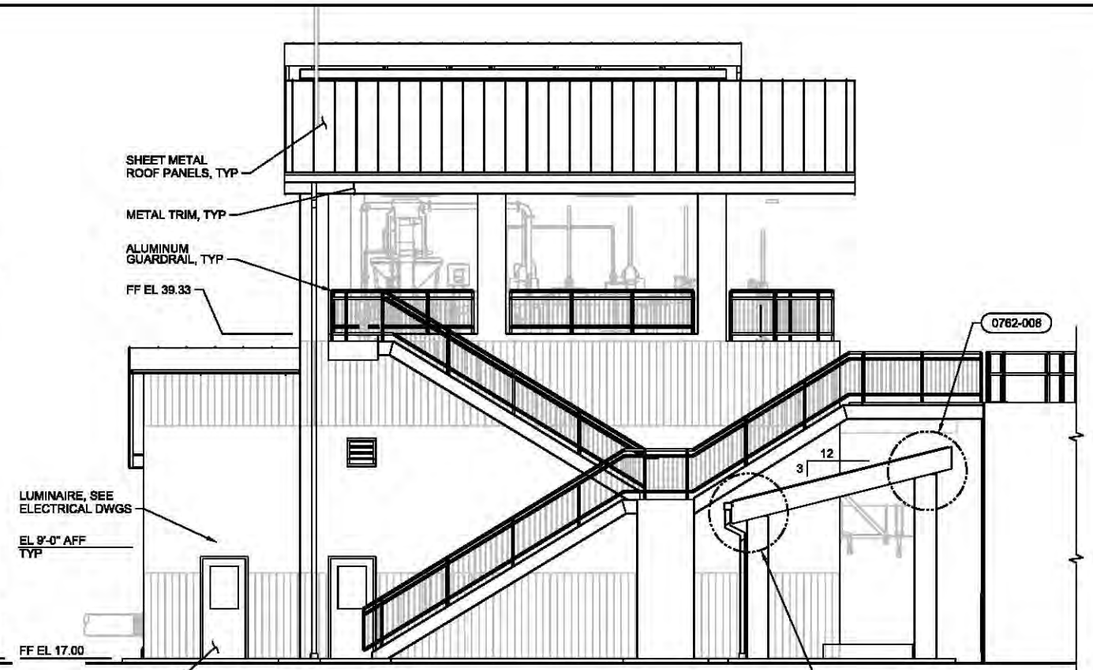
30-A-3000_469556.dgn



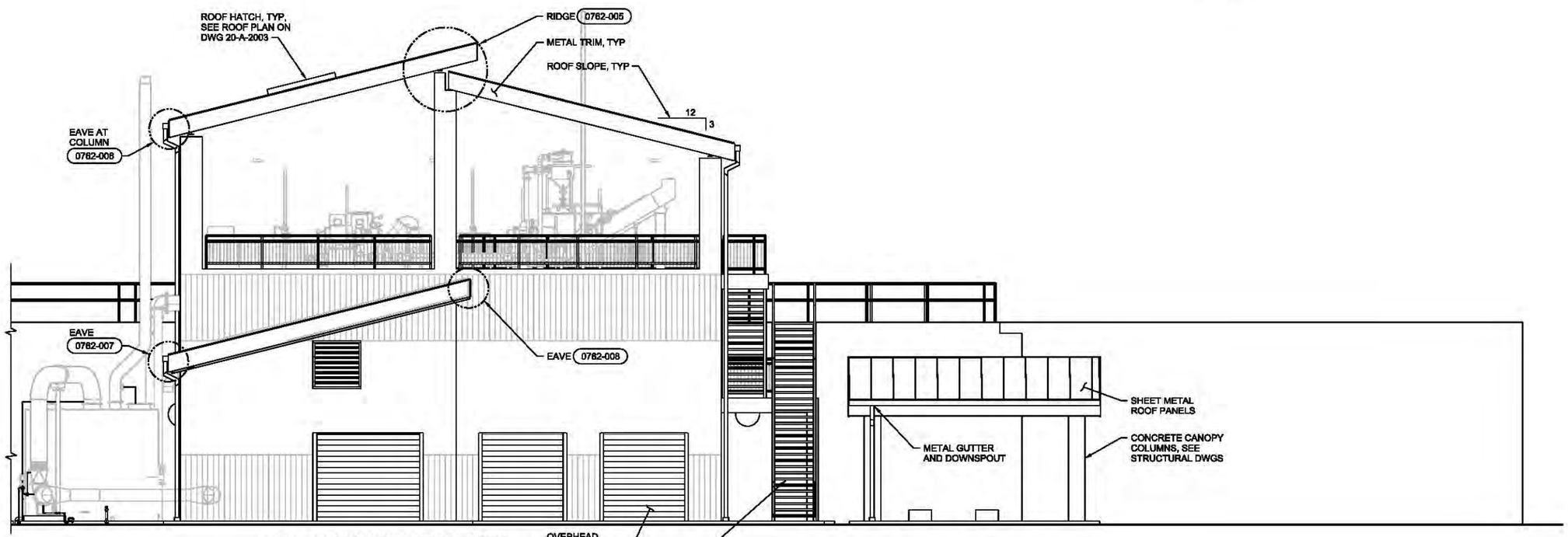
SEQUENTIAL BATCH REACTOR



1 NORTH ELEVATION
3/16"=1'-0"
20-A-2001
20-A-2002



2 EAST ELEVATION
3/16"=1'-0"
20-A-2001
20-A-2002



3 SOUTH ELEVATION
3/16"=1'-0"
20-A-2001
20-A-2002

HEADWORKS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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CHK GBK
APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
HEADWORKS
ARCHITECTURAL
ELEVATIONS

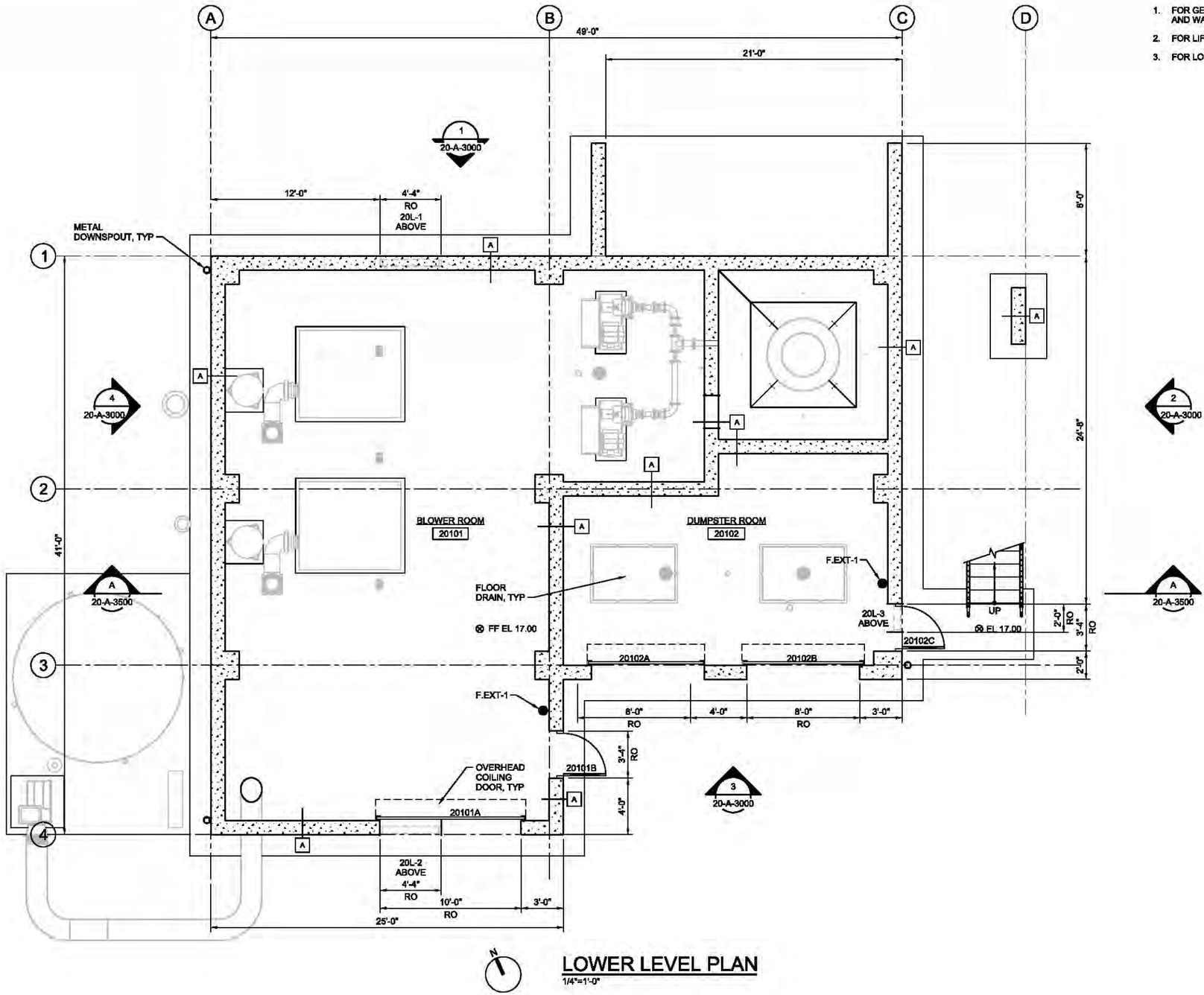
SHEET 20-A-3000
SEQ
DATE 11/2014
PROJ. NO. 490515

20-A-3000_469556.dgn

HEADWORKS

NOTES:

1. FOR GENERAL ARCHITECTURAL NOTES, SYMBOLS, LEGEND AND WALL TYPES, SEE SHEET 01-G-0014.
2. FOR LIFE SAFETY PLANS AND CODE DATA, SEE SHEET 01-G-0015.
3. FOR LOUVER LOCATIONS, SEE SHEET 20-A-3000.



LOWER LEVEL PLAN

1/4"=1'-0"

PRELIMINARY

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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CHK GBK
APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
HEADWORKS
ARCHITECTURAL
GROUND LEVEL PLAN

SHEET 20-A-2001
SEQ
DATE 09/2014
PROJ. NO. 490515

20-A-2001_489556.dgn

ULTRAVIOLET DISINFECTION SYSTEM

A SECTION
3/8"=1'-0"

40-S-2200
40-S-2300
40-S-2400

PRELIMINARY

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

CH2MHILL.
SHN
CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	DATE	REVISION	BY

DSGN SKR
DR HFJ
CHK BSH
APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
ULTRAVIOLET DISINFECTION
STRUCTURAL
SECTION

SHEET 40-S-3001
SEQ
DATE 09/2014
PROJ. NO. 490515

ULTRAVIOLET DISINFECTIONS SYSTEM

B SECTION
3/8"=1'-0"

40-S-2200
40-S-2300
40-S-2400

PRELIMINARY

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

CH2MHILL.

SAY
CONSULTING ENGINEERS & GEOLOGISTS, INC.

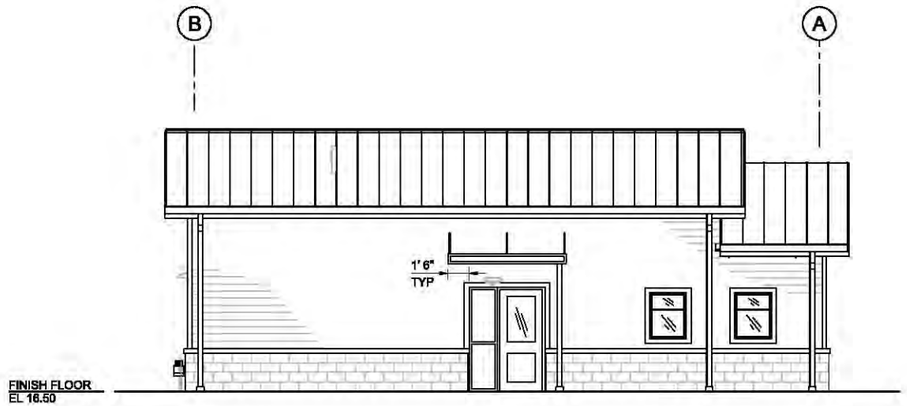
NO.	DATE	REVISION	BY

DSGN SKR
DR HFJ
CHK BSH
APVD CWM

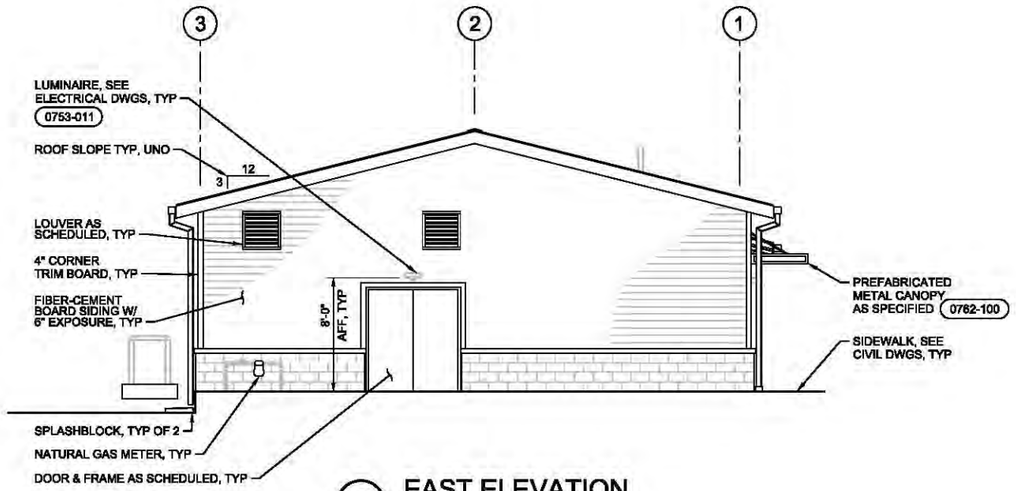
CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
ULTRAVIOLET DISINFECTION
STRUCTURAL
SECTION

SHEET 40-S-3002
SEQ
DATE 09/2014
PROJ. NO. 490515

CONTROL BUILDING

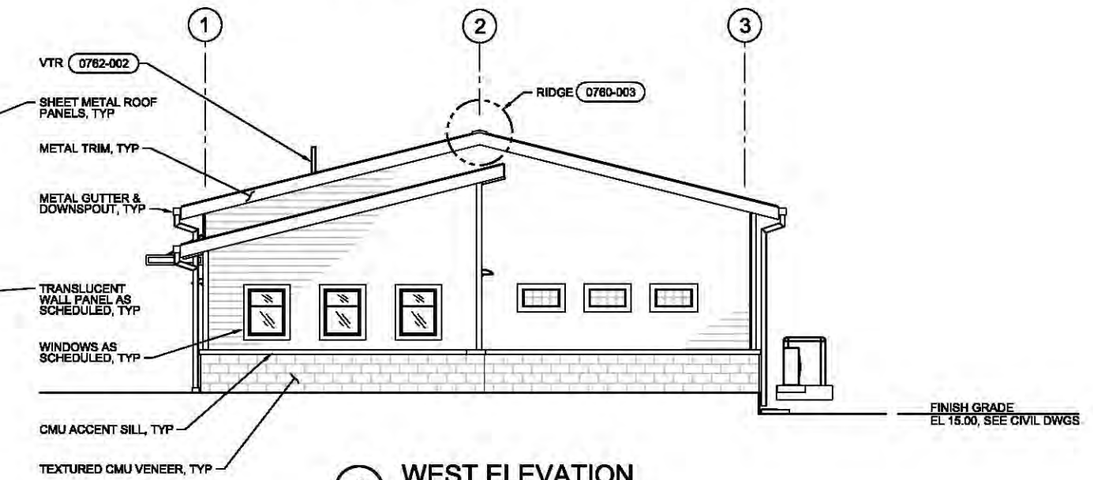


1 NORTH ELEVATION
3/16"=1'-0"
60-A-2000



2 EAST ELEVATION
3/16"=1'-0"
60-A-2000

3 SOUTH ELEVATION
3/16"=1'-0"
60-A-2000



4 WEST ELEVATION
3/16"=1'-0"
60-A-2000

PRELIMINARY

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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NO.	DATE	REVISION	BY

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CHK
APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
CONTROL BUILDING
ARCHITECTURAL
ELEVATIONS

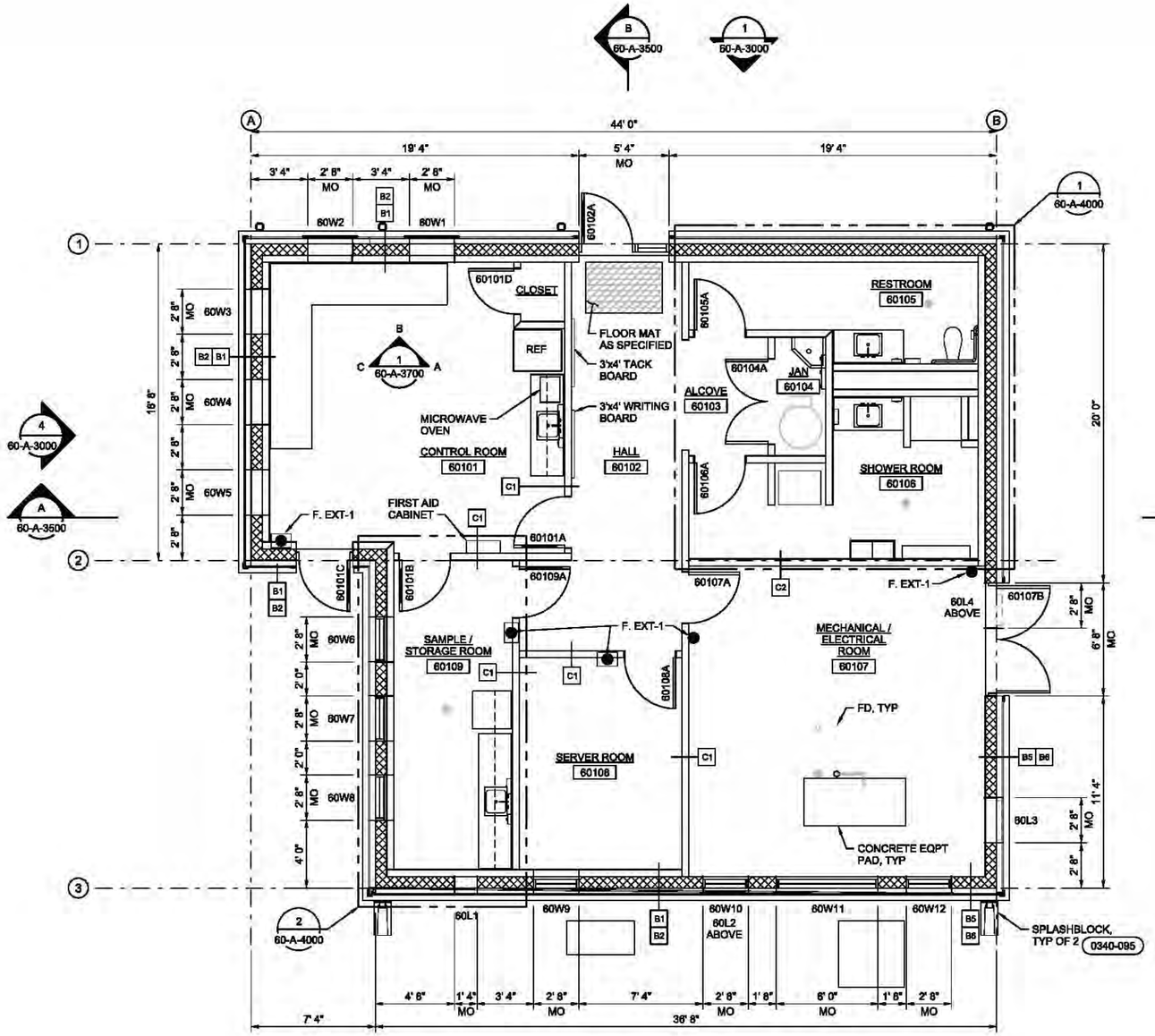
SHEET 60-A-3000
SEQ
DATE 09/2014
PROJ. NO. 490515

60-A-3000_469556.dgn

CONTROL BUILDING

NOTES:

1. FOR ARCHITECTURAL NOTES, LEGEND, SYMBOLS AND WALL TYPES, SEE SHEET 01-G-0014.
2. FOR LIFE SAFETY PLAN AND CODE DATA, SEE SHEET 01-G-0016.



FLOOR PLAN

1/4"=1'-0"

PRELIMINARY

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	DATE	REVISION	BY

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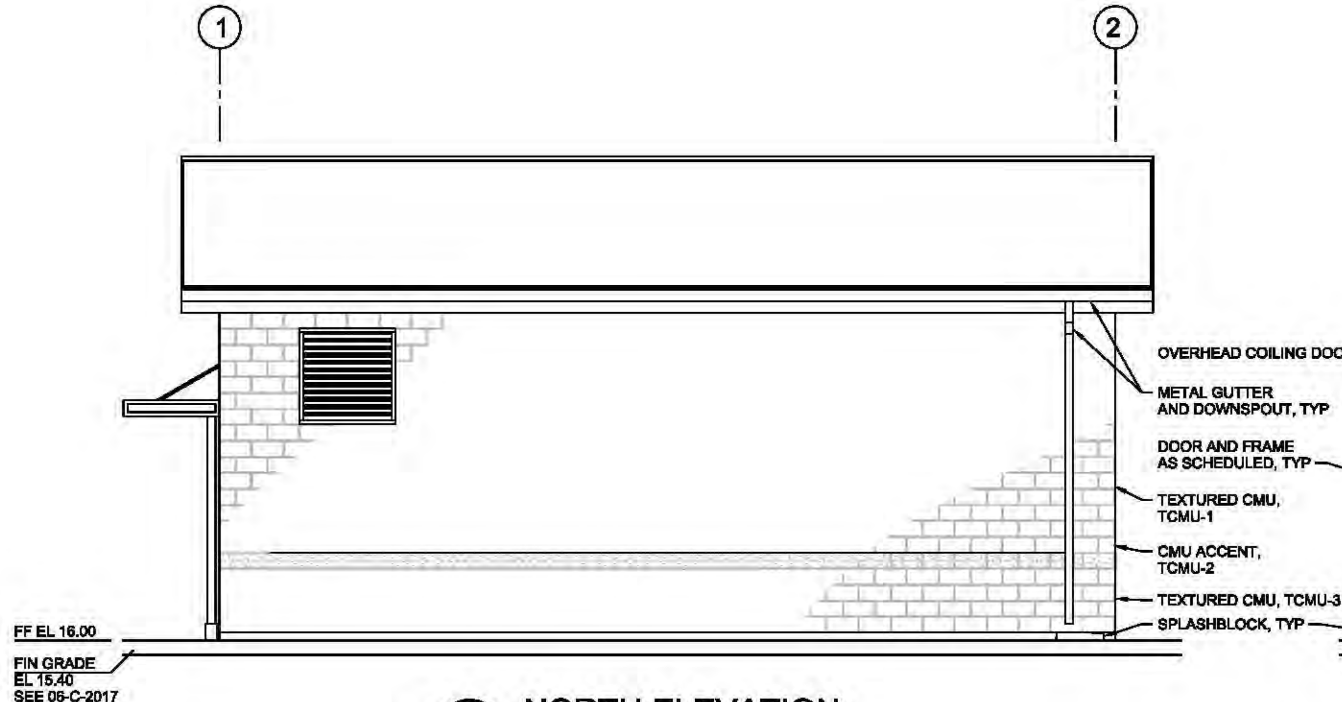
DR WBL
CHK
APVD CWM

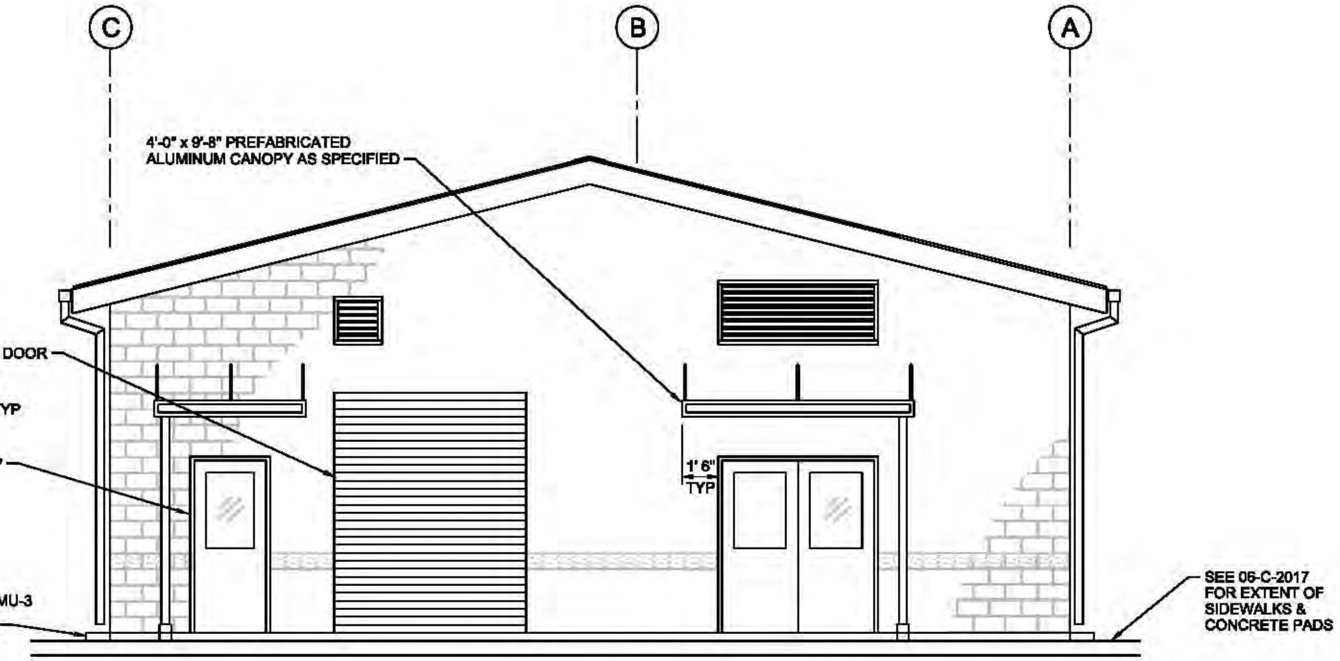
CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
CONTROL BUILDING
ARCHITECTURAL
FLOOR PLAN

SHEET 60-A-2000
SEQ
DATE 09/2014
PROJ. NO. 490515

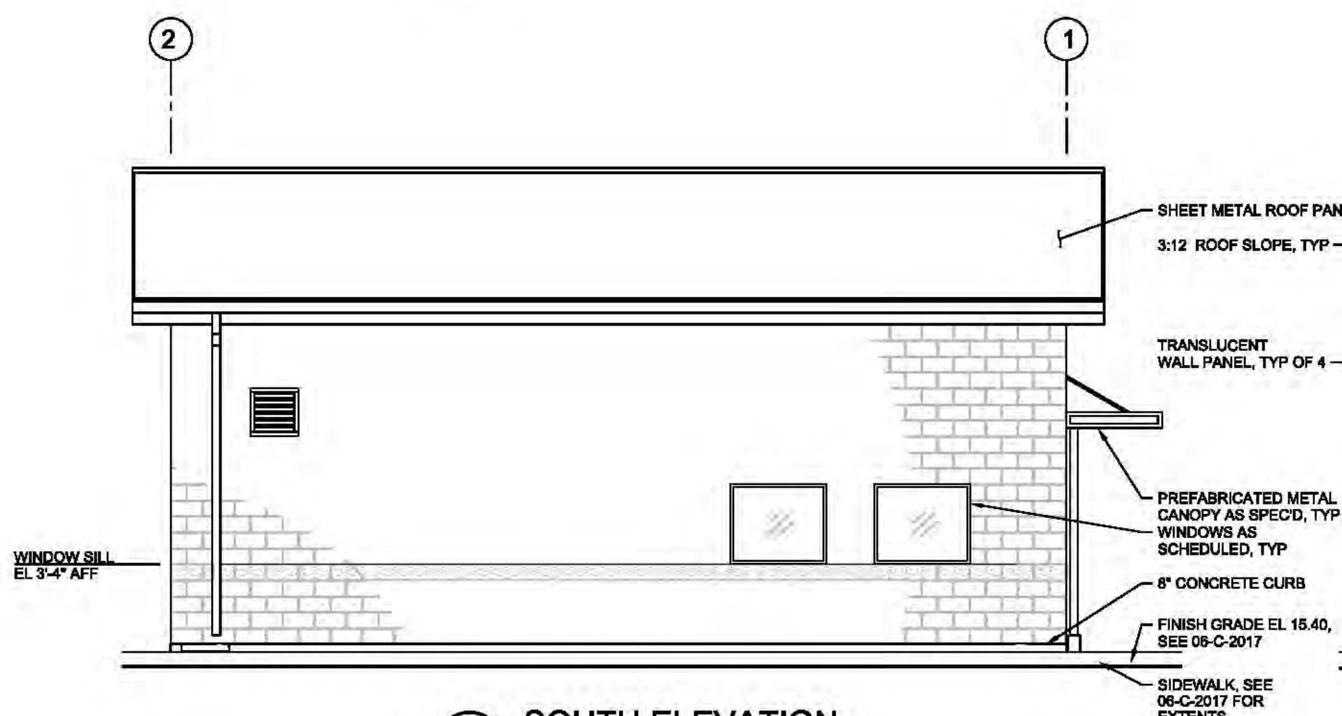
60-A-2000_469556.dgn



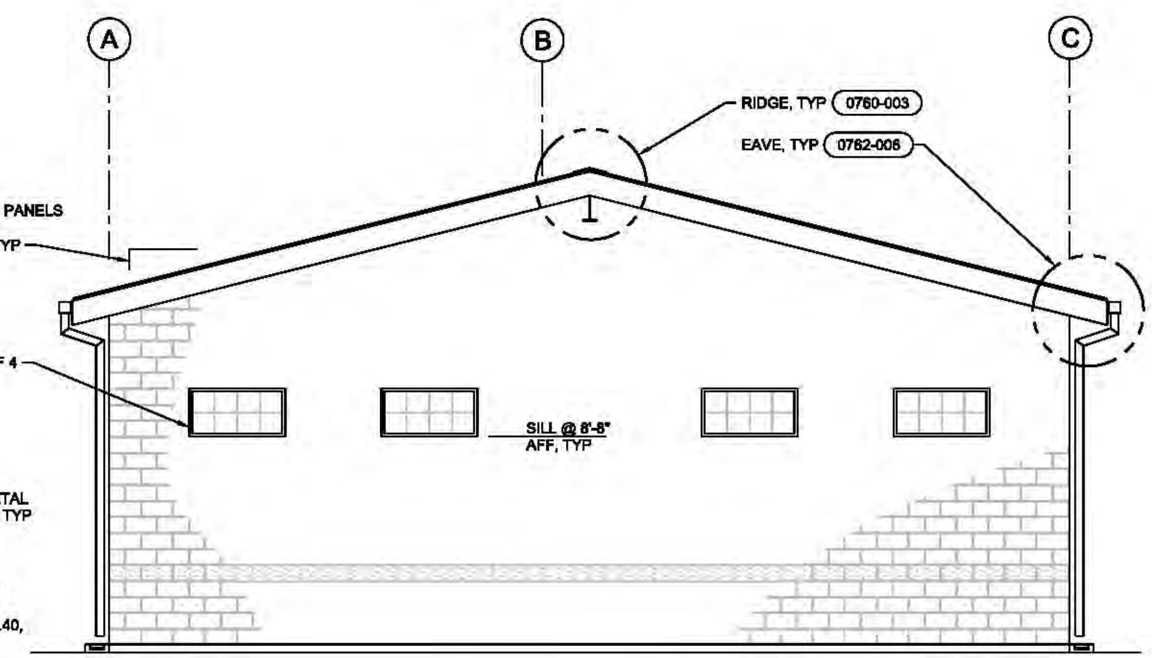
1 **NORTH ELEVATION**
1/4"=1'-0"
80-A-2000



2 **EAST ELEVATION**
1/4"=1'-0"
80-A-2000



3 **SOUTH ELEVATION**
1/4"=1'-0"
80-A-2000



4 **WEST ELEVATION**
1/4"=1'-0"
80-A-2000

ELECTRICAL/SHOP BUILDING

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

CH2MHILL.

SHN CONSULTING ENGINEERS & GEOLOGISTS, INC.

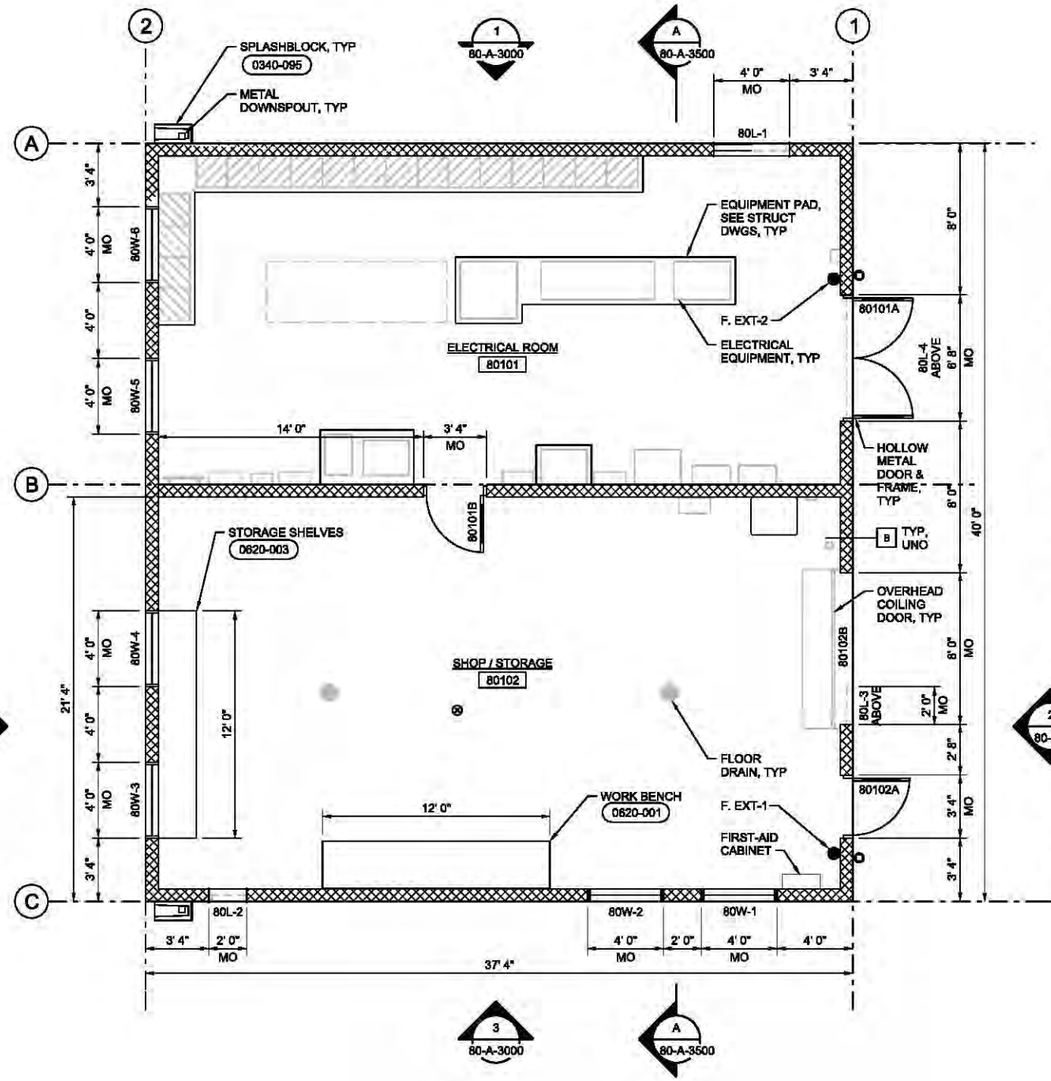
NO.	DATE	REVISION	BY

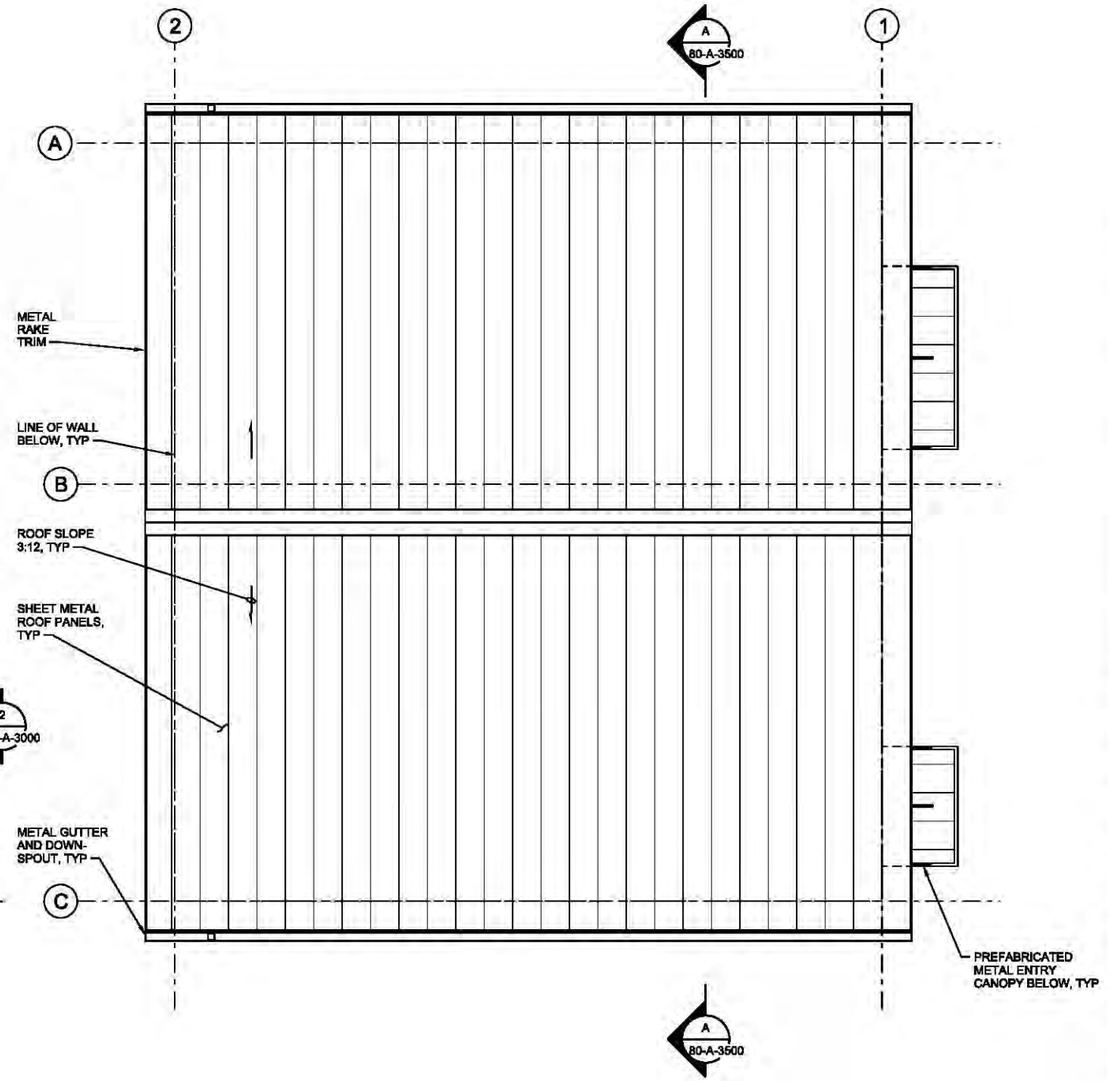
DSGN RPT
DR SDB
CHK
APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
SHOP / ELECTRICAL BUILDING
ARCHITECTURAL
ELEVATIONS

PRELIMINARY

SHEET 80-A-3000
SEQ
DATE 09/2014
PROJ. NO. 490515





NOTE:

1. SEE CIVIL DWGS FOR EXTENT OF SIDEWALKS AROUND BUILDING.

N

FLOOR PLAN

1/4"=1'-0"

N

ROOF PLAN

1/4"=1'-0"

ELECTRICAL/SHOP BUILDING

PRELIMINARY

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

CH2MHILL

SLY CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	DATE	REVISION	BY

DSGN RPT
DR SDB
CHK
APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
SHOP / ELECTRICAL BUILDING
ARCHITECTURAL
FLOOR AND ROOF PLANS

SHEET 80-A-2000
SEQ
DATE 09/2014
PROJ. NO. 490515

80-A-2000_489556.dgn

EQUALIZATION BASIN

BATCH REACTORS

ELEC/SHOP BUILDING

HEADWORKS

CONTROL BUILDING

~29

~35

~59

~35

~34

~35

~29

~34

27.1 x

30.1 x

34.5 x

33.7 x

31.6 x

26.1 x

12.7 x

30.7 x

30.2 x

S MARPLE ST

S EMPIRE BLVD

S WALL ST

S WASSON ST

FULTON AVE

N

W E

S

1 inch = 80 feet

Legend

- WWTP2 STRUCTURES (PROPOSED)
- WWTP2 SITE (PROPOSED)
- ≈ APPROX. HIGHEST ELEVATION OF STRUCTURE
- X SPOT ELEVATION OF GROUND

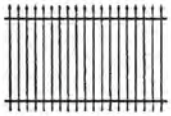
ECHELON II®

AMERISTAR® FENCE PRODUCTS

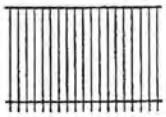
1-888-333-3422
FAX: 1-877-926-3747

PANELS

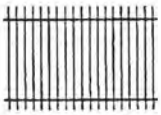
2-Rail Classic



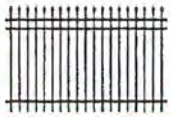
2-Rail Majestic



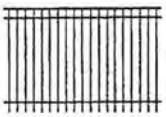
2-Rail Genesis



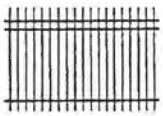
3-Rail Classic



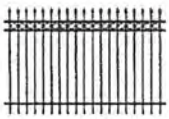
3-Rail Majestic



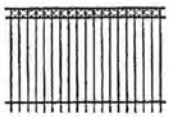
3-Rail Genesis



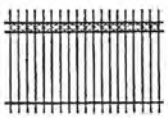
3-Rail Classic with Rings



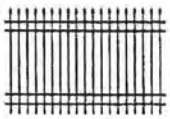
3-Rail Majestic with Rings



3-Rail Genesis with Rings

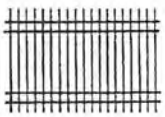


4-Rail Classic

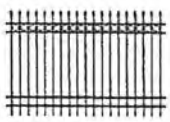


4-Rail Majestic

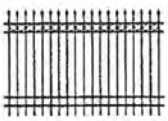
4-Rail Genesis



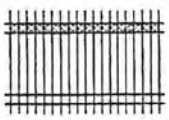
4-Rail Classic with Rings



4-Rail Majestic with Rings



4-Rail Genesis with Rings



STYLE SELECTION = * X = COLOR SELECTION
CLASSIC = C B = BLACK
MAJESTIC = M N = BRONZE
GENESIS = G W = WHITE
S = DESERT SAND

Rail Quantity	Nominal Panel Width	Nominal Panel Height	Item Number	Catalog Price (Black)	Catalog Price (Color)	Panel Weight
2-Rail	8' Wide	4'	2A * X 20468			37
		5'	2A * X 20588			42
		6'	2A * X 20708			48
	6' Wide	4'	2A * X 20466			27
		5'	2A * X 20586			30
		6'	2A * X 20706			35

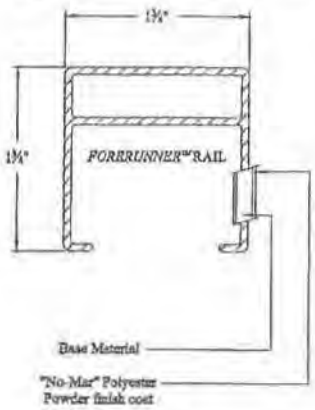
Effective: 01/01/13

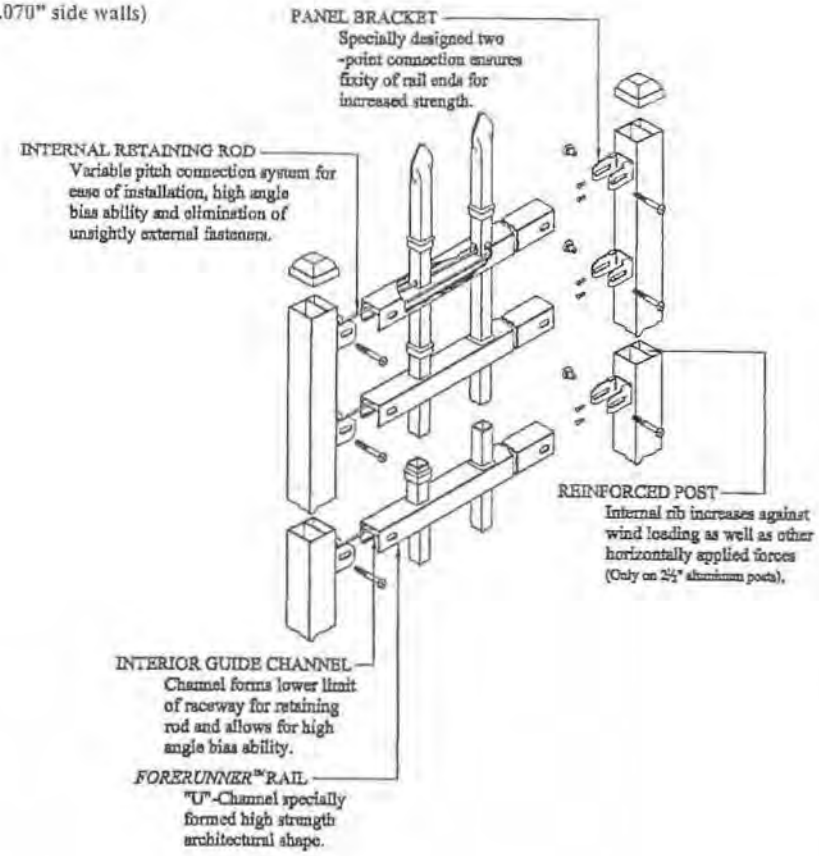
Echelon II®

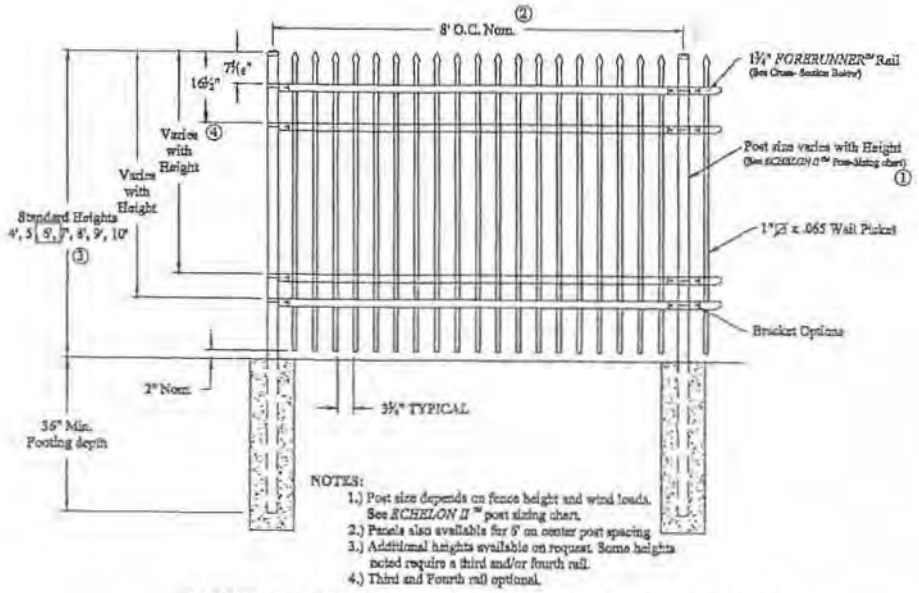
INDUSTRIAL ORNAMENTAL ALUMINUM FENCE

Echelon II Rail: 1-3/4" x 1-3/4" (.070" top wall / .070" side walls)
Echelon II Picket: 1" x 1" x .065"

PATENT PENDING







NOTES:
1.) Post size depends on fence height and wind loads. See ECHELON II™ post sizing chart.
2.) Panels also available for 8' on center post spacing
3.) Additional heights available on request. Some heights noted require a third and/or fourth rail.
4.) Third and Fourth rail optional.

NOTE: PANELS DO NOT COME PRE-ASSEMBLED.

PART TWO

CHAPTER 17.345.050
DECISION CRITERIA

PART TWO - Chapter 17.345.050 DECISION

No general development permits shall be issued for new construction or major remodeling until the plans have been reviewed and approved by the Planning Commission. The site plan and architectural review process shall be used to establish how, not whether, a development may occur, and shall not affect dwelling unit densities, although conditions may be imposed which are necessary for a development to achieve the minimum requirements of this title. The Planning Commission may approve, or conditionally approve, the proposed site plan after addressing the following criteria:

Criterion No. 1.
The location, size, shape, height, spatial and visual impacts and arrangements of the uses and structures are compatible with the site and surroundings.

Findings:
The City has secured a vacant two-acre parcel of adequate size for a new wastewater treatment plant (WWTP) that is designed to correct deficiencies in the currently operating No. 2 WWTP located across Empire Boulevard to the west of the new site. The new plant will also provide increased treatment capacity for future population growth among the unincorporated community of Charleston and Westside residents of the City of Coos Bay. The parcel's proximity to the existing WWTP, incoming wastewater mains and the outfall pipe to the Coos Bay channel will minimize the construction cost and difficulties of upgrading the existing wastewater collection system and treatment processes.

The site's zoning is General Commercial C-2, shared with properties fronting on Empire Boulevard for six blocks to the north and two blocks to the south. The Property Development Requirements of the C-2 zone have no requirements regarding 'Lot Standards' and 'Building Coverage'. 'Building Height' and 'Yards' have no restrictions other than those imposed by the building code.

For traffic safety, the City Code requires a 500 foot separation distance between vehicular access points onto major arterials, including onto Empire Boulevard. To meet this safety requirement, the site's primary access and egress driveways have been provided from Fulton Avenue rather than from Empire Boulevard. By necessity, this placement affects the site's layout of the other facilities.

At two acres, the project is larger than the surrounding residential and commercial properties. However, the new buildings and plant facilities will be spaced some distance apart with architectural fencing and landscaping to improve the facility's visual impact. The buildings and structures have received exterior design elements that are visually appealing as well as durable.

The Control, Influent Pump Station (IPS), Shop/Electrical, UV and Headworks buildings will have a green sheet metal roofing system with parchment-colored fascia. These roofs will be built with a three-twelve pitch. The Control and the Shop/Electrical buildings and UV facility cover have single ridgelines, while the Headworks building has an offset ridge line.

Located between the entrance and exit driveways from Fulton Avenue, the Control building has been designed as 44 feet in length, 38 feet in width, and 18 feet in height. Parallel to Empire Boulevard, the Shop/Electrical building has been designed as 40 feet in length, 37 feet in width and 22 feet in height. The Headworks building in the `south interior has been designed as 49 feet

in length, 41 feet in width and 43 feet in height. The site's north interior will hold the Sequencing Batch Reactors (SBRs) and Equalization Basin, contiguous concrete structures. By necessity, these are the largest structures in the facility. Together the two structures measure 197 feet in length north to south and 97 feet in width east to west. The SBRs are 150 feet in length and 20 feet in height. The Equalization Basin measures 47 feet in length and 14 feet in height.

The Control building exterior has been designed using a base three-foot height of square light brown-gray textured concrete masonry unit (CMU) wainscot veneer, topped with a narrow textured dark gray CMU accent sill, and light brown-gray rectangular split-face CMU to finish the exterior wall. The building will have two personnel entry/exit doors, twelve windows, and a sloped-roof front porch over the north entry.

The Shop/Electrical building exterior has been designed using a base three-foot height of square light brown-gray CMU wainscot topped with a narrow textured dark gray CMU accent sill, and light brown-gray rectangular split face CMU field to finish the exterior wall. The design includes two double personnel entry/exit doors, one coil door for vehicle access, and six translucent wall panel windows.

The Headworks building will be constructed of formed concrete. It will receive a vertical formliner surface texture from ground level to a height of six feet. Above that height, the concrete wall will receive a medium sandblast finish to a second six-foot-high panel of the same vertical formliner surface texture. The upper deck, an open processing area, will be surrounded by a three and a half foot, three-rail aluminum fence with a bronze anodized finish, and covered by a green sheet metal roof. The design includes two personnel entry/exit doors and three coil doors for vehicle access.

The formed concrete Equalization Basin and SBR structures have also been designed using vertical formliner surface texture to a height of six feet. Above that height, a concrete wall with a medium sandblast finish rises to a second six-foot-high panel of the same vertical formliner surface texture. A three and a half foot, three-rail aluminum fence with a bronze anodized finish surrounds the SBR's open deck, while the Equalization Basin will receive a flat aluminum cover to minimize algae growth.

For safety and security, the perimeter of the site will be enclosed with an attractive six-foot black architectural aluminum fence with three cross-bars spanning the fence posts, with secured entry and egress for both vehicles and personnel.

The landscape plan has been prepared to create visual interest and appeal to improve the site's compatibility with residential properties north and east of the site boundary. The site's perimeter has been attractively designed with bioswales and landscaping. The site's existing mixed conifers along the west side of Fulton Avenue are to remain. The site will be further shielded from view by residential properties east of Fulton Avenue by the placement of Austrian pine 'Arnold Sentinel' along the top of bank along Fulton Avenue. These trees will mature at twenty feet high by seven feet wide in ten years. American beach grass, Ceanothus, and Kinnikinnick will also be planted for landscape appeal and to prevent invasive weed species from taking hold.

Criterion No. 2
The public and private sewerage and water facilities provided by the development are adequate in location, size, design, and timing of construction to serve the residents or establishments. These facilities meet City standards and relevant policies of the comprehensive plan and provide adequate fire protection.

Findings:
The WWTP is normally staffed only during the day. It is anticipated that a maximum of two employees will normally be on site at any one time. The proposed design specifies that the Control building will be provided with a public water connection for employee use in the lunch room, restrooms and shower. Public water will also be provided to the Shop/Electrical building and Headworks building for hose bibs. A 'Grade 3' water supply from the plant's disinfected effluent piping will be connected to the headworks and Shop/Electrical buildings for use as wash-down water to minimize the use of potable water when recycled water can be utilized.

The proposed site design includes a fire hydrant in the public street right-of-way on the north side of Fulton Avenue to provide adequate fire protection to the entire site including the control, maintenance and Headworks buildings. Each building will be equipped with the appropriate fire extinguishers, smoke detectors and alarms.

Wastewater from the three site buildings will have no outside connection to the City's public sewer but will drain instead to the incoming wastewater pump station wetwell. All sewer and water service connections have been designed to meet design specifications in location, size and quality, and all will be installed and tested during plant construction.

Criterion No. 3
The grading and contouring of the site and how site surface drainage and/or on-site surface water storage facilities are constructed to insure that there is no adverse effect on neighboring properties, public right of way, or the public storm drainage system; and that the site development work will take place in accordance with City policies and practices.

Findings:
The facility incorporates provisions for onsite and off-site surface drainage. There are grading and contouring features resulting in both surface drainage and onsite surface water storage, covered in the following discussion. Also, the site is at a lower elevation than neighboring properties which will protect those properties from site drainage.

At present, the site has a varying uphill slope to the east, with a fifteen foot elevation differential between the lowest interior point and the Marple Street elevation. Site grading will raise the site's overall elevation by roughly one and a half feet, and the rise towards Marple Street will be graded to a bank with a uniform 2 foot horizontal to 1 foot vertical (2:1) slope. This will increase the plant site's proportion of level ground, and will allow for possible future construction of a second SBR and Equalization Basin to serve future population growth.

An existing year-round waterway flows east to west just north of the site's property boundary. At the northwest property corner, the waterway turns south, crosses the property line and passes through a buried sixty-foot long culvert parallel to Empire Boulevard. An existing dirt driveway to the site's north interior crosses the culvert at this location. At a distance of 180 feet from the north

property line, the waterway turns west to pass through a culvert under Empire Boulevard before discharging to Coos Bay. To provide access to the northern site interior for plant maintenance, the design proposes an access driveway from Empire Boulevard for very infrequent truck use for maintenance at the location of the existing dirt driveway atop the culvert, thereby avoiding any disturbance to the waterway. Site drainage will not enter the waterway as grading will direct surface runoff to bioswales or to trench drains that lead to the Headworks intake wetwell.

Gravel will be used to surface the peripheral areas north and east of the Equalization Basin and SBRs. Rainwater will percolate through the gravel surface before becoming groundwater. Graveled surfaces south and west of the SBRs will be graded towards the site's interior where runoff will be directed into trench drains or catch basins leading to the influent pump station.

The proposed grading of onsite paved areas will direct rainwater from the Headworks building rooftop and pavement surfaces with potential for contaminants toward drainage facilities that will transport stormwater to the influent pump station at the new plant, where it will be mixed with and handled as raw wastewater, and treated and disinfected prior to effluent discharge to the bay.

Rainwater from Control and IPS/Shop/Electrical building roofs will be captured in two bioswales that will allow gradual infiltration of storm water to minimize storm runoff impacts to public right-of-ways, the public storm drainage system, and Coos Bay. During rainfall events greater than the 100 year recurrence interval, the bioswales are designed to overflow to a new catch basin to be constructed at the low point of Fulton Avenue. Neighboring properties are at a higher elevation, and would not be impacted by the site's stormwater runoff.

Site development work will take place in accordance with City policies and practices; these will be specified and discussed during the pre-construction meeting with the selected contractor(s). Further, after the City's approval of the final civil plans, the applicant's representative will submit a '1200C - Construction Stormwater General Permit' application and 'Erosion and Sedimentation Control Plan' (ESCP) to the Oregon Department of Environmental Quality for review and approval. The ESCP will be implemented before the start of construction.

Criterion No. 4
Based on anticipated vehicular and pedestrian traffic generation, adequate rights of way and improvements to streets, pedestrian ways, bikeways, and other ways are provided to promote safety, reduce congestion, and provide emergency equipment access.

Findings:
City Code requires a 500 foot separation distance between vehicular access points onto major arterials, including South Empire Boulevard. To meet this safety requirement, the site's primary access and egress driveways have been provided from Fulton Avenue rather than from South Empire Boulevard.

After construction, the WWTP is not expected to generate an increase in vehicular traffic. The new facility will discontinue sludge hauling activities, and will be more efficient than the existing plant, generating fewer vehicle trips. It is anticipated that a maximum of two employees will be onsite during a normal work day. Employees will report to work at WWTP Plant No. 1, then take a City

vehicle to travel to Plant No. 2, complete tasks as assigned, and return to Plant No. 1 afterwards. Employee trips to WWTP No. 2 will not be made by bicycle or on foot.

During plant construction, vehicles and heavy equipment will access the site from the Fulton Avenue entrance and the existing north plant entrance from Empire Boulevard at the culvert location. The public streets and rights-of-way are adequate for this purpose. The site will be surrounded by six-foot black industrial aluminum fencing designed to limit access and protect the facility during non-work hours. All driveways will have locking gates to limit access during normal working hours and prevent access on nights and weekends except by authorized personnel.

Construction plans include the installation of a new sidewalk, curb and gutter on the north side of Fulton Avenue. Two 'One-way Only' site access driveways clearly marked 'Entrance' and 'Exit' will be provided from Fulton Avenue, east and west of the Control building respectively. The driveways' length will allow off-street vehicle parking in front of the access gates, minimizing interactions with other vehicular traffic, bicyclists and pedestrians.

An application for a variance from the required 500 foot distance between access points onto an arterial street has been submitted to permit a north plant entrance from Empire Boulevard at the location of the buried waterway culvert. If approved, the variance will allow very infrequent access by maintenance vehicles required for plant operation. The site perimeter fencing will include a manually-operated double vehicle gate and a man-gate at this location. The thirty-foot asphalt concrete driveway will provide sufficient space for off-street vehicle parking in front of the access gates, minimizing interactions with vehicular traffic, bicyclists and pedestrians. There are currently no curbs or gutters along Ocean Boulevard at this location.

Site emergency access would be provided through either the two driveways from Fulton Avenue or the proposed north access from Ocean Boulevard.

Although not a part of this project, a plan by the Oregon Department of Transportation (ODOT) will construct new curbs, gutters, sidewalks and pavement as part of pedestrian and bikeway improvements to Empire Boulevard, including the site's frontage along Empire Boulevard. ODOT plans to complete the improvements within the next two years. Adequate right-of-way width is available for this construction.

Criterion No. 5
There are adequate off-street parking and loading facilities provided in a safe, well designed, and efficient manner.

Findings:
Within the plant's fenced perimeter, the proposed WWTP design provides off-street parking in front of the Control building where employees will most frequently utilize the office, laboratory, lunch room and restrooms. This employee parking area is safely separated from street traffic, and is efficiently located close to the Fulton Avenue entrance on the north side of the Control building. There will be five standard nine by eighteen-foot spaces, and one handicap space in front of the concrete curb and sidewalk directly in front of the Control building. The design provides site landscaping along the more visible, sunny Fulton Avenue side of the Control building instead of

the less visible parking lot side of the Control building, where plantings would be in shade for much of the year.

The parking area is designed to accommodate employee traffic and semi trucks and trailers hauling liquids and biosolids. Consequently, the paved area provides for large truck and car turning movements by providing a large amount of open space between site buildings and facilities. The open areas of the site are to be paved with asphalt concrete except where a graveled perimeter will be placed around the north, east and west sides of the SBR basins.

As noted in Criterion No. 4 Findings, both the access driveway from Fulton Avenue and the maintenance access driveway from Empire Boulevard will be of sufficient length to allow off-street parking of vehicles while the driver exits the vehicle to open the gate. This will minimize staff and delivery vehicle interactions with other vehicular traffic, bicyclists and pedestrians.

Criterion No. 6
Adequate dedication or reservation of real property for public use, as well as easements and right of entry for construction, maintenance, and future expansion of public facilities are addressed.

Findings:
The City of Coos Bay owns the property on which the WWTP No. 2 upgrade is planned. The City will not need to record water and wastewater easements or dedicate additional property for public use. The facility is designed to provide treatment for the current and future wastewater flows, and has been designed to accommodate modest population growth.

The new site electrical service to be provided by Pacific Power and Light will be connected via a new power pole, three-phase transformer and drop located on the southwest corner of the site, outside the perimeter fence. The street's public right-of-way in this location will allow for placement of the electrical service within the right-of-way. It is not foreseen that the electric utility will need an easement for the site's electric supply.

The site's proposed design includes a future expansion area for an additional sequencing batch reactor (SBR) basin and equalization basin. An expansion area has been reserved between the proposed SBR basins and the public right-of-way on South Marple Street. Future construction will require that the new basin walls function as retaining walls due to the site's uphill slope to the east. If population growth requires that the wastewater treatment plant be expanded, the area for the future expansion of the public facility will be available within the proposed WWTP site.

Criterion No. 7
The structural design, location, size and materials used for buildings, walls, fences, berms, traffic islands, median areas, and signs serve their intended purposes.

Findings:
The WWTP facilities have been designed of split faced concrete block with sheet metal roofing systems, and quality building materials for long life span and long term service to the public. The buildings have been sited to maximize horizontal clearance for optimal visibility and safety when vehicles and employees access the site.

The site perimeter will be fenced to meet the requirements of Chapter 17.260, using six-foot black industrial ornamental aluminum fencing located inside the property boundary. Fencing along the site's east boundary will be at the bottom of the slope from Marple Street, approximately 36 feet west of the property line. Fencing along the north boundary at the east side will be 15 feet from the perimeter of the equalization basins, and 15 feet south of the existing waterway. Fencing along Empire Boulevard will be located east of the property boundary and existing waterway. Fencing at the location of the Fulton Avenue – Empire Boulevard intersection will be placed well back from the street, thereby providing excellent driver visibility. Double keypad entry automatic gates will be placed across the entrance and exit driveways from Fulton Avenue. A manually operated double gate at the proposed north entrance will provide infrequent truck access. Three padlocked personnel access gate would complete the site perimeter fencing.

The plant upgrade project will not create a need for new berms, traffic islands or median areas on Marple Street, Fulton Avenue or Empire Boulevard.

A painted metal facility identification sign is planned for the southwest corner of the site at the intersection of Fulton Avenue and Empire Boulevard.

Criterion No. 8
Other property development requirements of the zoning district are satisfied.

Findings:

17.75.050 Property **Development Requirements (of the General Commercial C-2 District).**
(1) Lot Standards. No requirements.
(2) Building Coverage. No requirements.
(3) Building Height. No restrictions other than those imposed by the building code.
(4) Yards. No requirements other than those imposed by the building code.
(5) Landscaping and Screening

(a) *All parking areas shall be landscaped in conformance with Chapter 17.200 CBMC, Off-Street Parking and Loading.*

The six-space parking area at the north entrance of the Control building does not have a landscaped border along the sidewalk provided. However, a landscaped area is located outside the site fencing along the perimeter north of Fulton Avenue where plants will receive adequate sun exposure and where landscaping will improve the site's visual appearance to the public. Two new bioswales receiving portions of the site's stormwater runoff are designed to overflow to the City storm sewer in Fulton Avenue during storm events.

(b) *All heating and air conditioning equipment shall be appropriately screened from public view. This does not apply to roof-mounted equipment.*

The Control building will have two exterior heat pumps located on the south side of the building. These will be screened from public view by the shrubs and plantings provided in the landscaping planned for the area along Fulton Avenue. The Shop / Electrical building will have one exterior heat pump located on the south side, screened from public view by trees and landscaping planted along the site western fence line.

(c) *All storage and trash areas must be enclosed and screened from public view.*

This requirement is met as storage areas and dumpsters will be located within the site interior or within buildings, out of sight by the general public.

17.75.050 (6) Architectural Design Review

Architectural design review as set forth in Chapter 17.390 CBMC may be required for development in the design area defined by Chapter 17.240 CBMC. Design review approval shall be based on compliance with Chapter 17.240.

This requirement does not apply to the subject WWTP site development project, as the defined 'Design Area' defined by Chapter 17.240, Empire Waterfront Settlement Design Review, includes only those Empire District properties fronting onto Newmark Avenue between Ocean Boulevard and Empire Boulevard. The new WWTP site is south of this defined area.

PART THREE

ILLUMINATION PLAN AND DRAWINGS

PART THREE - ILLUMINATION PLAN

The Wastewater Treatment Plant construction will include new fixtures for exterior and process lighting. This illumination plan will discuss fixture type, height, area of illumination, any use of timers or motion detectors, and whether the fixtures are operated by switch or photocell. No use of motion sensors or timers is planned.

Lighting of exterior areas around the Control, Headworks and Maintenance buildings will be provided by photocell lighting from dusk to dawn, illuminating the yard area and the plant's Fulton Avenue entrance and exit driveways. Process lighting for the sequencing batch reactor (SBR) basins and the ultraviolet disinfection (UV) basins will be provided by manual switch-operated light fixtures. All are powered by LED bulbs.

The intensity of the lighting fixtures is given in foot-candles at grade level, with one foot-candle (fc) being equal to one lumen per square foot, or the amount of light from a candle that is cast upon the inside of a sphere at a distance of one foot from the candle. Please refer to the attached drawings for the following discussion.

Four types of lighting fixtures will provide exterior lighting: the C1, S1, S2 and S3 fixtures. The yard lighting will be provided by two types of photocell fixtures, each having an 'On/Off' switch in the electrical room to turn the lights off if desired. The S1 fixture is a sixteen foot pole-mounted lamp that will provide lighting of the large pavement area between the Control, Headworks and Shop/Electric buildings, the access and egress driveways from Fulton Avenue and the proposed access driveway from Empire Boulevard. The lamps are 40 LEDS 4100K at 89 watts, and each will provide 2 fc of illumination at grade. The S3 fixture is wall-mounted to a building's exterior wall surface and uses a 10LEDS 4000K lamp with an input of 20 watts. A total of eight lamps will be used for the exterior of the Control, Maintenance and Headworks Buildings, each providing 1.5 fc at grade.

Process lighting will be provided by two types of fixtures that are operated by manual switch. The C1 fixture uses a LED 4000K lamp. Seven of these fixtures will be suspended in the UV disinfection channel and one will light the Headworks' wastewater channel. Each lamp uses 66 watts. The fc value at the location of the Headworks lamp will be 4fc in the immediate vicinity, decreasing to 2fc at a distance of 20 feet. At the UV channel, there would be 10fc at the UV channel. Moving away from the UV basin towards the SBR basin, this value decreases to 8fc within 5 feet, to 4fc within 22 feet, to 2fc within 30 feet and to 0.5fc at a distance of 36 feet. Moving away from the UV basin toward the site's west boundary along Empire Boulevard, the 10fc at the UV channel will decrease to 8fc at a distance of 10 feet from the UV channel, to 4fc at 12 feet, and to 2fc at 14 feet.

The second process lighting fixture is the S2 fixture, mounted on a ten-foot pole over the SBR basins. There will be a total of 13 fixtures, each with a 35 input wattage and a 20LEDS 4100K lamp. Each fixture will provide 4fc directly below at grade, decreasing to 2fc at a distance of 10 feet, to 1fc at 15 feet, to 0.75 at 18 feet, and to 0.5 at 25 feet.

At the influent pump station and the Headworks there are strobe lights and horns that will automatically alarm to alert personnel to the detection of hazardous gas. These will rarely be used.

All of the interior lighting will be on switches except for emergency loss of power in which case certain indoor lights will illuminate to allow personnel to exit the building.

The following drawings are attached:

Site Electrical Plans, including detail site plans of the buildings with exterior lighting,
Luminaire Schedule,
All Lighting, Switched and Photocell, and
Photocell Controlled Lighting.

The Site Electrical Plans show the location of the four types of exterior lighting fixtures. The Luminaire Schedule gives details on the specification and application of all exterior and interior lighting fixtures. The Photocell Controlled Lighting drawing gives the foot candle intensity of exterior lights that will come on at dusk and stay on until daybreak. The All Lighting, Switched and Photocell drawing shows the foot candle intensity of all planned exterior lighting.

LUMINAIRE SCHEDULE

TYPE	VOLTAGE	INPUT WATTS	DESCRIPTION	MANUFACTURER AND CATALOG NO.	LAMPS	MOUNTING
A1	120	62	2'X2' RECESSED TROFFER, FIVE-COMPONENT PARTS. POWDER-PAINTED STEEL COMPONENTS, PREWIRED	LITHONIA: 2RT5R 24T5HO MVOLT GEB95 LP841	2-T5 28W 4100K	RECESSED
A2	120	62	2'X2' RECESSED TROFFER, FIVE-COMPONENT PARTS. POWDER-PAINTED STEEL COMPONENTS, PREWIRED. EMERGENCY BATTERY PACK.	LITHONIA: 2RT5R 24T5HO MVOLT GEB95 LP841 EL14	2-T5 28W 4100K	RECESSED
C1	120	66	4' LED LINEAR FIXTURE. IP 66 AND UL 1598/A RATED GASKETED ENCLOSURE. CLEAR POLYCARBONATE LENS.	DIALIGHT: LTM3N4M2P	LED 4000K	SUSPENDED
C2	120	85	4' LED LINEAR FIXTURE. IP 66 AND UL 1598/A RATED GASKETED ENCLOSURE. CLEAR POLYCARBONATE LENS. BATTERY BACKUP LUMINAIRE	DIALIGHT: LSM3N4MEP	LED 4000K	SUSPENDED
C3	120	66	4' LED LINEAR FIXTURE. CLASS 1 DIV II. IP 66 AND UL 1598/A RATED GASKETED ENCLOSURE. CLEAR POLYCARBONATE LENS.	DIALIGHT: LTD3N4M2P	LED 4000K	SUSPENDED
C4	120	39	LINEAR LED LUMINAIRE. IMPACT-RESISTANT POLYCARBONATE HOUSING and CLEAR POLYCARBONATE LENSE. CLOSED -CELL GASKET. 20-GAUGE STEEL CHANNEL AND CHANNEL COVER.	LITHONIA: VAP 39LED ASY (BSL722 FOR BATTERY BACK-UP)	1 ENGINE LED 4100K	SUSPENDED
D1	120	52	HEAVY GAUGE DIE FORMED GALVANIZE STEEL MOUNTING FRAME. ALUMINUM CLEAR SEMI-SPECULAR UPPER REFLECTORS. ELECTRONIC BALLAST. TRT 4-PIN LAMPS.	LITHONIA: 6HF 2/26DTT F602 MVOLT	2-26W TRT 4100K	RECESSED
D2	120	26	HEAVY GAUGE DIE FORMED GALVANIZE STEEL MOUNTING FRAME. ALUMINUM CLEAR SEMI-SPECULAR UPPER REFLECTORS. ELECTRONIC BALLAST. TRT 4-PIN LAMPS. WET AREA RATED.	LITHONIA: 6HF 1/26 F6LS4 MVOLT (EL FOR BATTERY BACK-UP)	1-26W TRT 4100K	RECESSED
D3	120	52	HEAVY GAUGE DIE FORMED GALVANIZE STEEL MOUNTING FRAME. ALUMINUM CLEAR SEMI-SPECULAR UPPER REFLECTORS. ELECTRONIC BALLAST. TRT 4-PIN LAMPS. EMERGENCY BATTERY PACK WITH INTEGRAL SWITCH TEST.	LITHONIA: 6HF 2/26DTT F602 MVOLT EL	2-26W TRT 4100K	RECESSED
E1	120	2.8	ULTRA-SLIM. COMPACT HOUSING. FINE-GRAIN BRUSHED ALUMINUM FACEPLATE WITH MATTE BLACK ELECTROSTATIC POLYMERIC TRIM. BATTERY AND ELECTRONICS LOCATED INSIDE OF HOUSING. LETTERS ARE 6" HIGH WITH 3/4" STROKE WITH 100FT VIEWING DISTANCE.	LITHONIA: LE CSA	N/A	UNIVERSAL MOUNTED
F1	120	41	GROUND MOUNTED LED FLOOD LUMINAIRE, SINGLE DIE-CAST ALUMINUM HOUSING WITH INTEGRAL HEAT SINK. HOUSING COMPLETELY SEALED, COATED BY A ZINC-INFUSED TGIC THERMOSET POWDER COAT WITH TWO COB ENGINES. INTEGRAL PHOTOCELL.	LITHONIA DSXF1 LED 2 530 40K WFL 120 IS PE SF DBLXD	LED 4000K	GROUND
G1	120	15	WALL MOUNTED, CORROSION RESISTANT METAL FIXTURE, UL LISTED FOR WET AND OUTDOOR INSTALLATIONS, STEADY-ON HALOGEN, GREEN	EDWARDS-SIGNAL 101-SINHG-N5	LED 4000K	WALL MOUNTED
G2	120	15	WALL MOUNTED, CORROSION RESISTANT METAL FIXTURE, UL LISTED FOR WET AND OUTDOOR INSTALLATIONS, FLASHING HALOGEN, RED	EDWARDS-SIGNAL 101-FINHR-N5	LED 4000K	WALL MOUNTED
S1	120	89	16' POLE MOUNTED LED AREA LUMINAIRE, SINGLE DIECAST ALUMINUM HOUSING WITH INTEGRAL HEAT SINK. ENCLOSURE IS COATED WITH ZINC INFUSED TGIC THERMOSET POWDER COAT AND IP66 ENGINES. ACRYLIC LENS.	LITHONIA: DSX1 LED 40C 700 40K T4M MVOLT RPA DNATXD	40 LEDS 4100K	POLE
S2	120	35	10' POLE MOUNTED LED AREA LUMINAIRE, SINGLE DIECAST ALUMINUM HOUSING WITH INTEGRAL HEAT SINK. ENCLOSURE IS COATED WITH ZINC INFUSED TGIC THERMOSET POWDER COAT AND IP66 ENGINES. ACRYLIC LENS.	LITHONIA: DSX0 LED 20C 530 40k T1S MVOLT RPA	20 LEDS 4100K	POLE
S3	120	20	TWO PIECE DIECAST ALUMINUM HOUSING WITH INTEGRAL HEAT SINK. ENCLOSURE COMPLETELY SEALED AGAINST MOISTURE,IP65. EMERGENCY BATTERY BACKUP.	LITHONIA: DSXW1 LED 10C 530 40K T4M MVOLT ELCW	10 LEDS 4000K	WALL MOUNTED
S4	120	89	TYPE S1 WITH A T4M DISTRIBUTION. 12' MOUNTED LED LUMINAIRE.	LITHONIA: DSX1 LED 40C 700 40K T4M MVOLT RPA DNATXD	40 LEDS 4100K	POLE
T1	120	32	4' FLUORESCENT LINEAR FIXTURE. THERMALLY PROTECTED, CLASS P, UL LISTED AND CSA VERTIFIED. LOUVERS ARE FORMED FROM COLD-ROLLED 20 GAUGE STEEL, ABESTOS-FREE WITH A FIVE-STAGE IRON-PHOSPHATE PRETREATMENT FOR PAIN ADHESION AND RUST RESISTANCE.	LITHONIA MS8 2 32W SBL WD 120 GEB10IS	2-32W T8 4100K	SUSPENDED
T2	120	32	4' FLUORESCENT LINEAR FIXTURE. THERMALLY PROTECTED, CLASS P, UL LISTED AND CSA VERTIFIED. LOUVERS ARE FORMED FROM COLD-ROLLED 20 GAUGE STEEL, ABESTOS-FREE WITH A FIVE-STAGE IRON-PHOSPHATE PRETREATMENT FOR PAIN ADHESION AND RUST RESISTANCE. BATTERY BACKUP LUMINAIRE.	LITHONIA MS8 2 32W SBL WD 120 GEB10IS (EL FOR BATTERY BACKUP)	2-32W T8 4100K	SUSPENDED

PRELIMINARY

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CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	DATE	REVISION	BY

DSGN JAC
DR JG
CHK RSH
APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
ELECTRICAL

LUMINAIRE SCHEDULE

SHEET 90-E-6021
SEQ
DATE 09/2014
PROJ. NO. 490515

90-E-6021_469556.dgn

30
SEQUENCING BATCH REACTORS SEE 30-EP-2000 AND 30-EP-2001

20
HEADWORKS SEE DRAWING 20-EP-2000

70
ODOR CONTROL

60
CONTROL BUILDING SEE 60-E-2001

10
INFLUENT PUMP STATION SEE 10-E-2000

80
SHOP/ELECTRICAL BUILDING SEE 80-EP-2001

GENERATOR SEE 80-EP-2001

TO WAS PUMP STATION

UV FACILITY SEE DRAWING 40-EP-2000

A 06-E-3001
B 06-E-3001
C 06-E-3001
D 06-E-3001
E 06-E-3001
F 06-E-3001
G 06-E-3001
H 06-E-3001

(28) S1

2605-202 ,TYP.

[CE-5]

NOTE 1
PACIFIC POWER UTILITY POLE

NOTE 2

NOTE 3

F1 (28) TREATMENT PLANT SIGN
SIGN LIGHT

DB
OH
MH

NOTES:

1. ROUTE 3-2" EMPTY CONDUITS BETWEEN POWER POLE AND UTILITY TRANSFORMER FOR PRIMARY POWER CONDUCTORS BY PACIFIC POWER.
2. INSTALL CONCRETE VAULT FOR THE UTILITY TRANSFORMER AND UTILITY METER PER PACIFIC POWER'S ELECTRICAL SERVICE REQUIREMENTS.
3. ROUTE TELECOMMUNICATIONS CONDUIT TO NEAREST CABLE OR TELEPHONE COMMUNICATIONS BOX. SEE NETWORK AND COMMUNICATIONS CABLE BLOCK DIAGRAM FOR FURTHER REQUIREMENTS.

OVERALL SITE PLAN

1"=20'

PRELIMINARY

VERIFY SCALES
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APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
SITE
ELECTRICAL
OVERALL SITE PLAN

SHEET 06-E-2000
SEQ
DATE 09/2014
PROJ. NO. 490515

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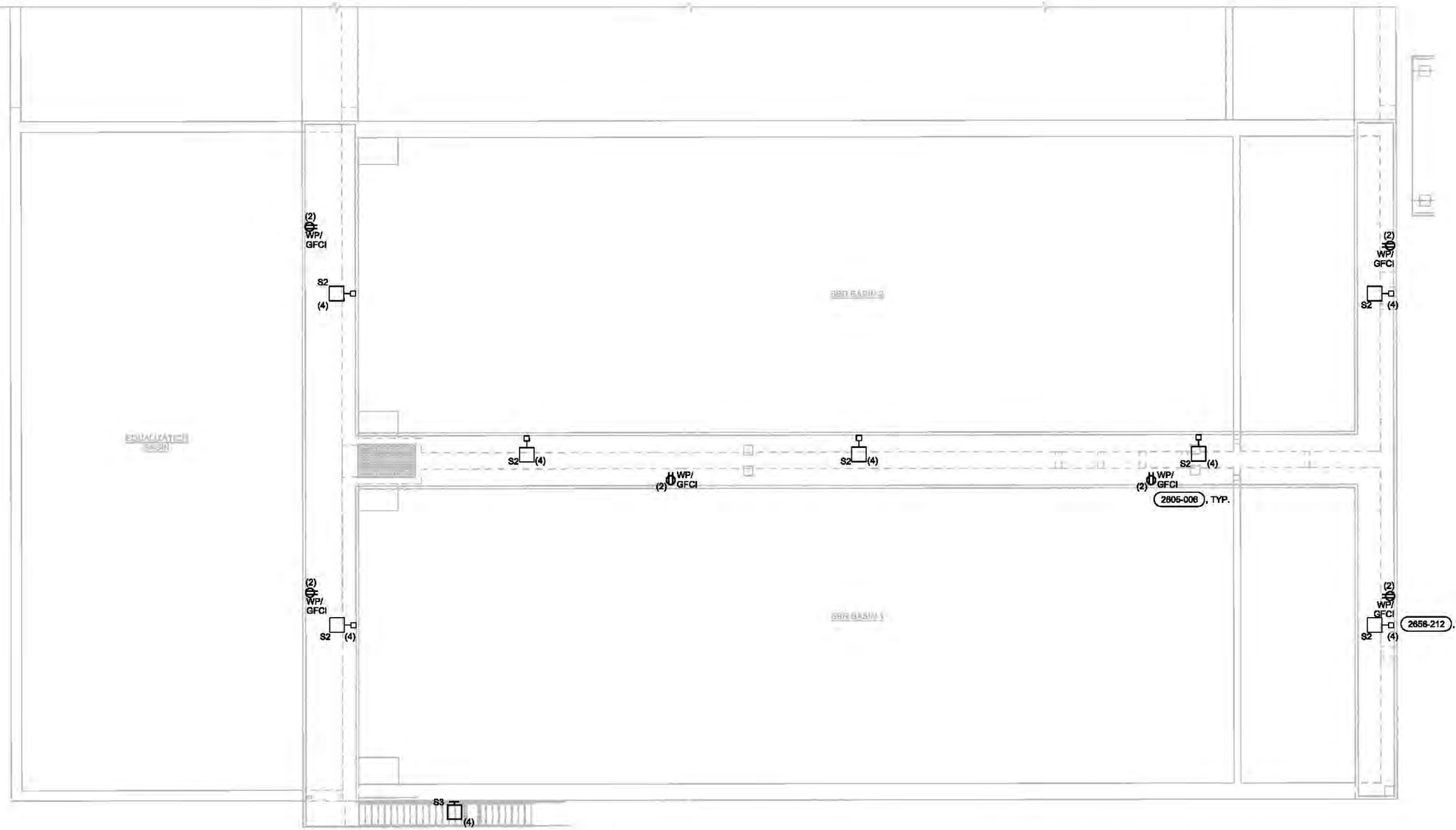

FOR LIGHTS IN THIS AREA REFERENCE DWG 40-EF-2000

NOTES:

1. LIGHTING IN THIS AREA IS POWERED BY PANEL E80LP0200.
2. NUMBERS SHOWN IN PARANTHESES, (N), ADJACENT TO LIGHTS AND RECEPTACLES DENOTE CIRCUIT NUMBERS IN FACILITY PANELBOARDS. REFER TO PANELBOARD SCHEDULES FOR CORRECT PANEL. PROVIDE #12 CONDUCTORS FOR 20A OR 15A CIRCUITS LESS THAN 75 FEET. PROVIDE #10 CONDUCTORS FOR CIRCUITS GREATER THAN 75 FEET.
3. COMBINE RECEPTACLE AND LIGHTING CIRCUITS IN A CONDUIT TO MINIMIZE THE AMOUNT OF CONDUIT. CIRCUITS COMBINED INTO A SINGLE CONDUIT SHALL BE SIZED FOR NEC DERATING AND CONDUIT FILL REQUIREMENTS.
4. ROUTE EXTERIOR LUMINAIRES VIA EXTERIOR LIGHTING CONTROL SWITCH AND PHOTO CELL.
5. CONNECT EMERGENCY BALLASTS WITH UNSWITCHED CONDUCTORS. NORMAL BALLASTS, EVEN FOR EMERGENCY FIXTURES, SHALL BE CONTROLLED WITH ROOM SWITCH.

UPPER LEVEL FLOOR PLAN

1/8"=1'-0"

PRELIMINARY

VERIFY SCALES
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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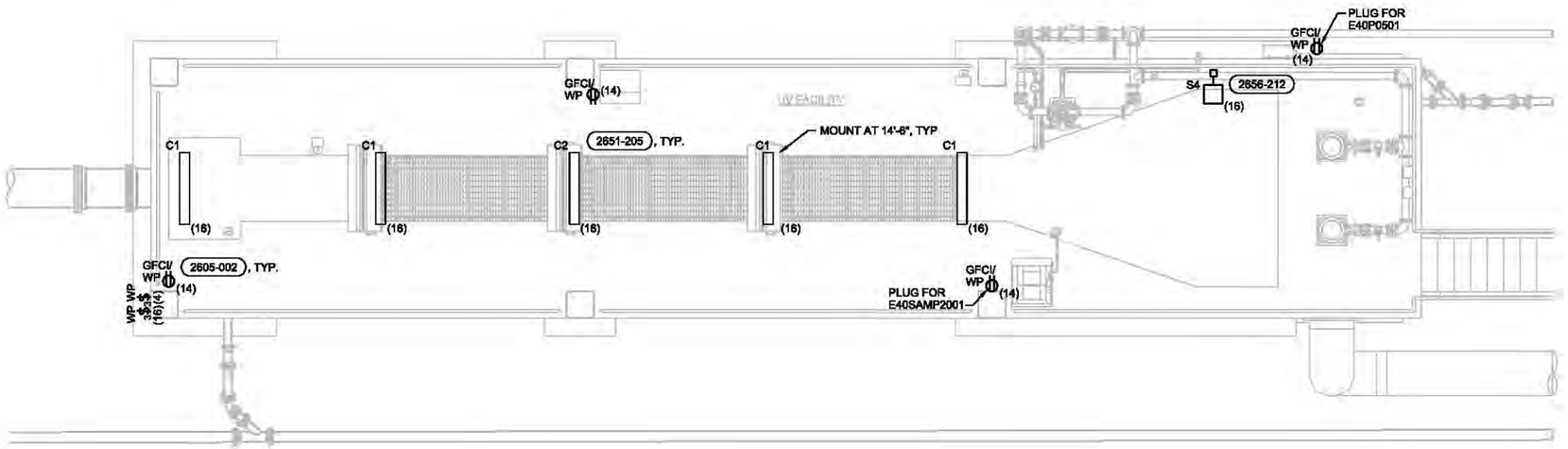
CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
SEQUENCING BATCH REACTORS
ELECTRICAL

UPPER LEVEL FACILITY PLAN

SHEET 30-EF-2001
SEQ
DATE 09/2014
PROJ. NO. 490515



FLOOR PLAN

1/4"=1'-0"

N

NOTES:

1. NUMBERS SHOWN IN PARANTHESIS, (N), ADJACENT TO LIGHTS AND RECEPTACLES DENOTE CIRCUIT NUMBERS IN FACILITY PANELBOARDS. REFER TO PANELBOARD SCHEDULES FOR CORRECT PANEL. PROVIDE #12 CONDUCTORS FOR 20A OR 15A CIRCUITS LESS THAN 75 FEET. PROVIDE #10 CONDUCTORS FOR CIRCUITS GREATER THAN 75 FEET.
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3. ROUTE EXTERIOR LUMINAIRES VIA EXTERIOR LIGHTING CONTROL SWITCH AND PHOTO CELL.
4. CONNECT EMERGENCY BALLASTS WITH UNSWITCHED CONDUCTORS. NORMAL BALLASTS, EVEN FOR EMERGENCY FIXTURES, SHALL BE CONTROLLED WITH ROOM SWITCH.

PRELIMINARY

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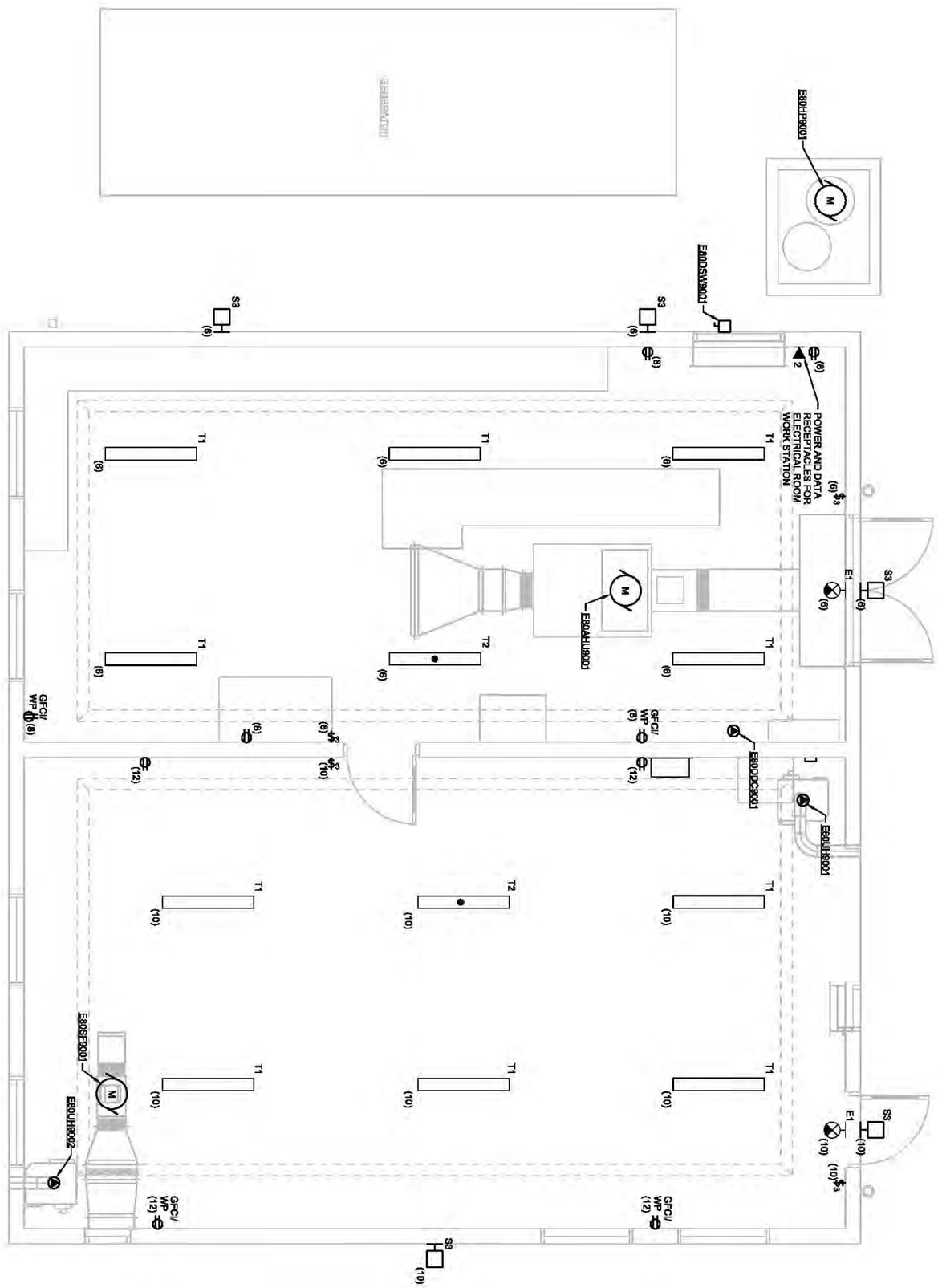
CHK RSH
APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
ULTRAVIOLET DISINFECTION
ELECTRICAL
FACILITY PLAN

SHEET 40-EF-2000
SEQ
DATE 09/2014
PROJ. NO. 490515



GROUND FLOOR FACILITY PLAN

3/8"=1'-0"

PRELIMINARY

PROJ. NO. 490515	DATE 09/2014	SEQ	SHEET 80-EF-2001	CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE SHOP/ELECTRICAL BUILDING ELECTRICAL FACILITY FLOOR PLAN	DSGN JAC DR JG CHK RSH APVD CWM	NO.	DATE	REVISION	BY

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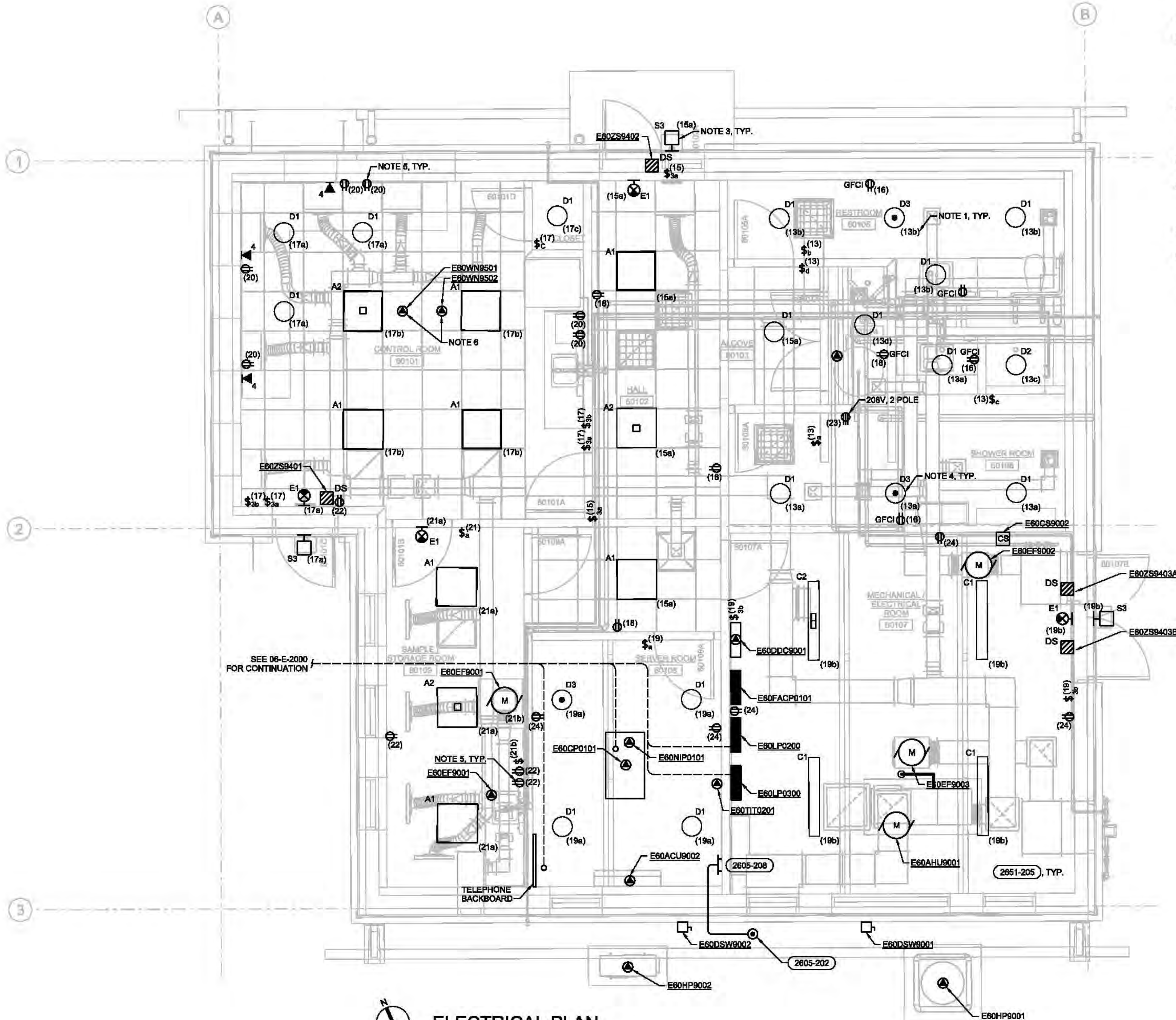

ELECTRICAL PLAN

3/8"=1'-0"

NOTES:

1. NUMBERS SHOWN IN PARANTHESES, (N), ADJACENT TO LIGHTS AND RECEPTACLES DENOTE CIRCUIT NUMBERS IN FACILITY PANELBOARDS. REFER TO PANELBOARD SCHEDULES FOR CORRECT PANEL. PROVIDE #12 CONDUCTORS FOR 20A OR 15A CIRCUITS LESS THAN 75 FEET. PROVIDE #10 CONDUCTORS FOR CIRCUITS GREATER THAN 75 FEET.
2. COMBINE RECEPTACLE AND LIGHTING CIRCUITS IN A CONDUIT TO MINIMIZE THE AMOUNT OF CONDUIT. CIRCUITS COMBINED INTO A SINGLE CONDUIT SHALL BE SIZED FOR NEC DERATING AND CONDUIT FILL REQUIREMENTS.
3. ROUTE EXTERIOR LUMINAIRES VIA EXTERIOR LIGHTING CONTROL SWITCH AND PHOTO CELL.
4. CONNECT EMERGENCY BALLASTS WITH UNSWITCHED CONDUCTORS. NORMAL BALLASTS, EVEN FOR EMERGENCY FIXTURES, SHALL BE CONTROLLED WITH ROOM SWITCH.
5. MOUNT BOTTOM OF RECEPTACLES A MINIMUM OF 4" ABOVE CONTROL AND SAMPLE ROOM DESKS.
6. LOCATION OF WIRELESS NETWORK IS APPROXIMATE. FINAL LOCATION OF TRANSMITTERS SHALL BE BASED ON THE NETWORK COMMUNICATION SYSTEMS SURVEY IN SPECIFICATION SECTION 40 95 80.

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CHK RSH
APVD CWM

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
CONTROL BUILDING
ELECTRICAL
FLOOR PLAN

PRELIMINARY

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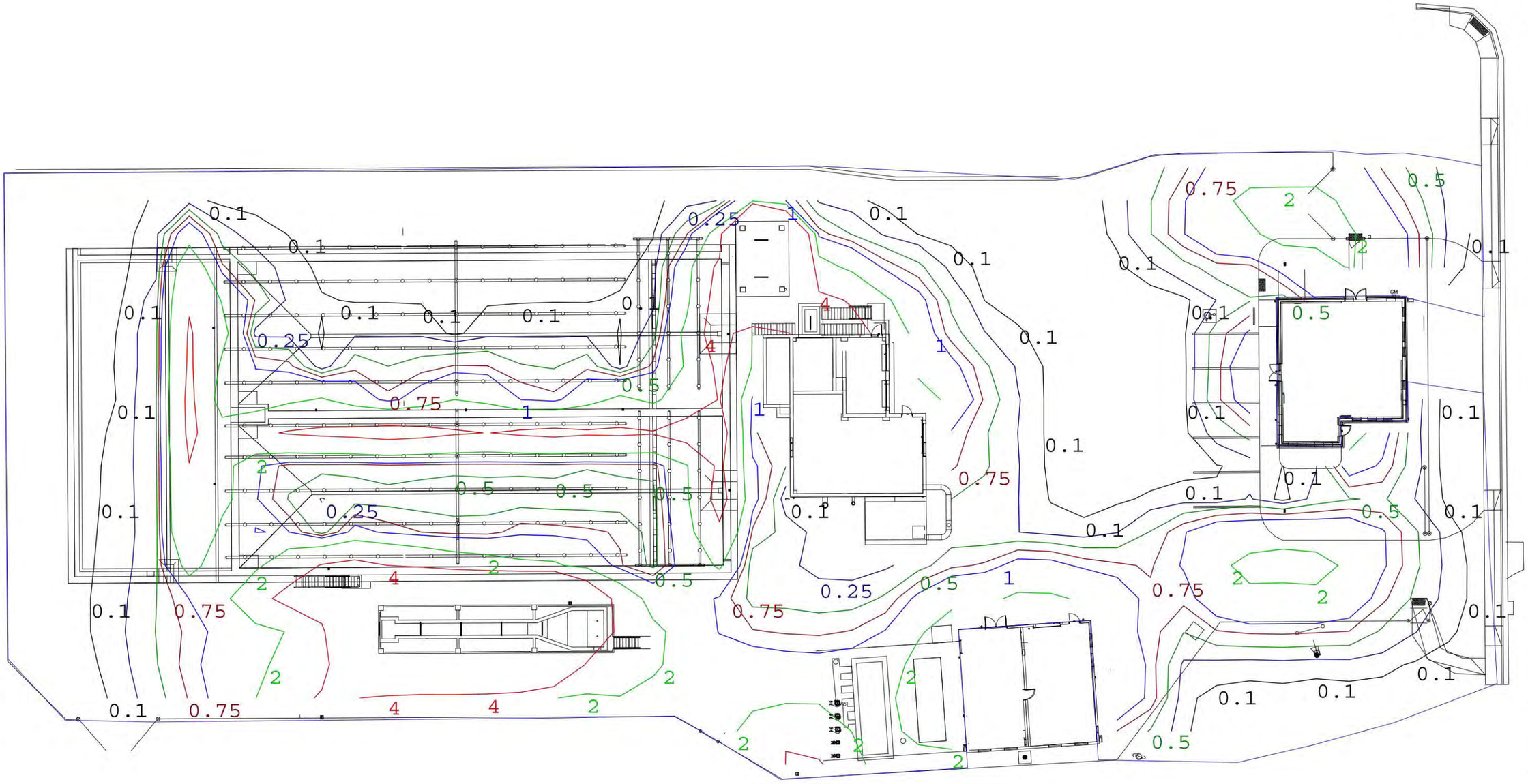

NOTE:

Numbers indicate foot-candle values at grade along the contour line that the label matches in color.

ALL LIGHTING, SWITCHED AND PHOTOCELL

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REVISION | BY | DATE | NO.

DSGN
DR
CHK
APVD

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE

ELECTRICAL
LIGHTING

SHEET
SEQ
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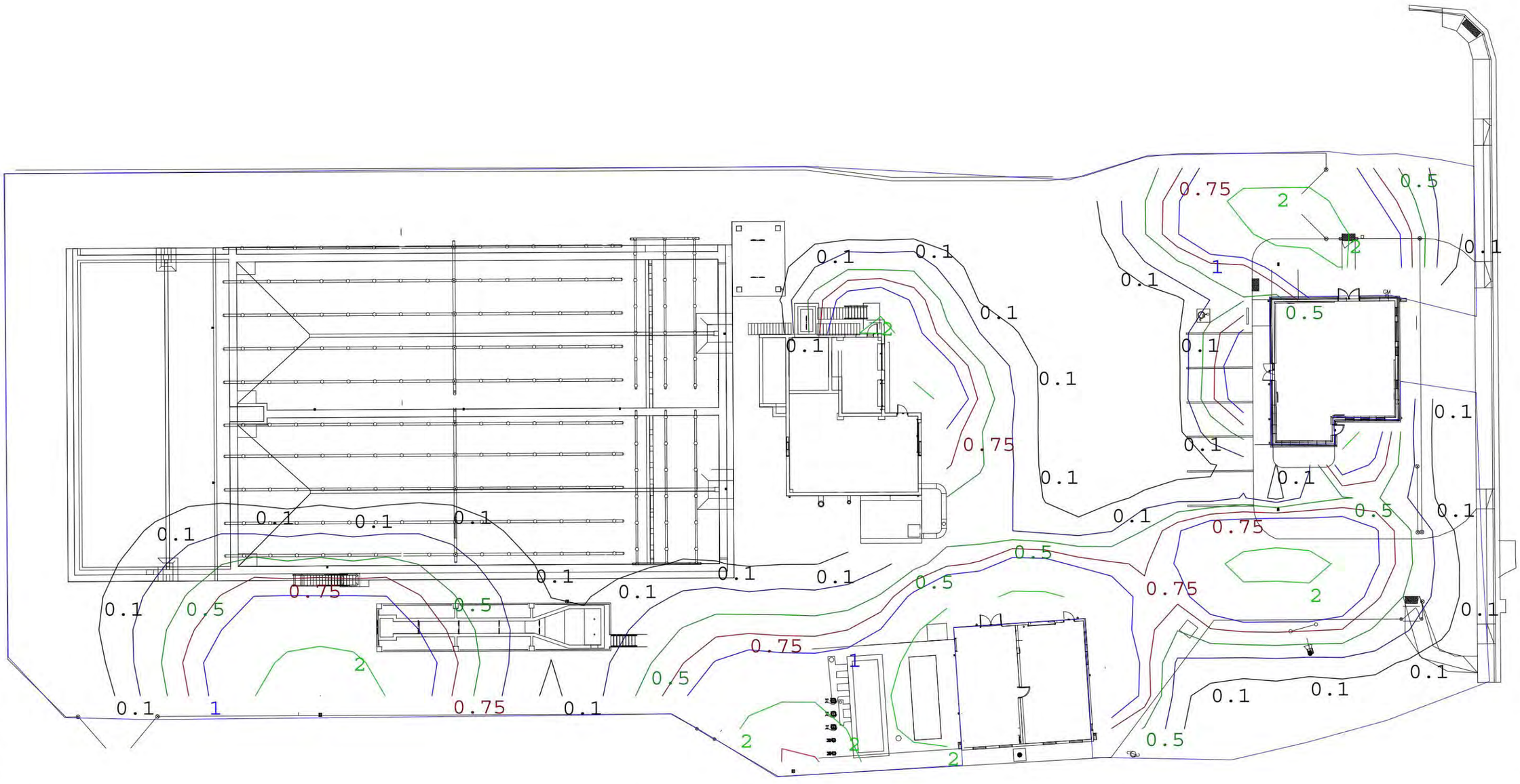

NOTE:
Numbers indicate foot-candle values at grade along the contour line that the label matches in color.

PHOTOCELL CONTROLLED LIGHTING

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CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	DATE	REVISION	BY

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
ELECTRICAL
PHOTOCELL CONTROLLED LIGHTING

DSGN
DR
CHK
APVD

SHEET
SEQ
DATE 09/2014
PROJ. NO. 490515

PART FOUR

STORM WATER REPORT AND DRAWINGS

Stormwater Drainage Plan

Wastewater Treatment Plant No. 2
Expansion and Upgrade Project

Prepared for:

City of Coos Bay

Consulting Engineers & Geologists, Inc.

275 Market Avenue
Coos Bay, OR 97420-2219
541/266-9890

November 2014

614018.200

Reference: 614018.200

Stormwater Drainage Plan

Wastewater Treatment Plant No. 2
Expansion and Upgrade Project

Prepared for:

City of Coos Bay
500 Central Avenue
Coos Bay, OR 97420

Prepared by:

Consulting Engineers & Geologists, Inc.
275 Market Avenue
Coos Bay, OR 97420-2228
541-266-9890

November 2014

QA/QC: ___

Table of Contents

List of Illustrations

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Purpose

The purpose of this report is to provide the City of Coos Bay with a stormwater drainage plan for the development of a new site for the Wastewater Treatment Plant No. 2 (WWTP-2) on the NE corner of Fulton Avenue and Empire Boulevard in Coos Bay, Oregon. The analysis and report are in conformance with Section 17.345.050 (3) of the Coos Bay Municipal Code, and in compliance with the Development Provisions for Public and Private Infrastructure, Part 2 – Design Standards, Section 3.0, Storm Drainage and Detention.

This report provides the pre-development and post development runoff flow rates and volumes and impact of stormwater runoff to existing stormwater facilities.

Pursuant to Development Provisions Part 2, Section 3.9, 'Criteria for Requiring Onsite Detention', item C, the National Marine Fisheries Service has requested that all stormwater up to the two-year storm event be treated for water quality purposes. The proposed rain gardens have been designed for water quality purposes to treat water by infiltration through an imported amended soil mixture of sand, mulch, and loam. These amended soils will provide the detention, filtration, and organic matter required to treat potential contaminants and hydrocarbons generated from operations and improvements on site, and prevent the flow of these contaminants to groundwater flowing toward nearby waters of the state.

The proposed plan is to provide containment and treatment for all stormwater generated from new impervious surfaces, either through the WWTP facility or through onsite rain gardens. The proposed grading and drainage has been designed to capture and treat as much stormwater on site as possible. The one exception to this is the steep driveways adjacent to Fulton Avenue that cannot be contained on site, due to the existing and proposed slopes inherent with the site. Less than 2% of the improved area will flow directly to public storm conveyance systems leading to downstream waterways. In addition, this report provides the flow rate and volumes of runoff for a full spectrum of storm events that will contribute to the flows at the Influent Pump Station (IPS) and the WWTP.

This report is prepared for planning level review. Stormwater construction details and an erosion and sediment control plan will be submitted with the final construction plans.

Existing Site Description

The existing site drainage area consists of 2.16 acres of land, which includes the 2.10-acre lot plus 0.24 acres of street right-of-way that slopes toward the site for treatment, less 0.18 acres that drain off-site, including a small drainage creek along the northwest corner of the site. The existing site is sparsely vegetated with a few concrete slabs remaining from a previous residence near the south property line and a small gravel area near S. Empire Boulevard.

The majority of the site is gently sloping from the northeast to the southwest, with steeper slopes along the eastern edge fronting S. Marple Street and along Fulton Avenue. There is one small low point on the southern central portion of the lot, and a portion of the existing runoff infiltrates at this low point. Only the portion of the site directly adjacent to the creek slopes toward the creek; the remaining site area all drains toward the intersection of S. Empire Boulevard and Fulton Avenue, and the low point

overflows that direction as well. Attached is an existing site conditions map that shows the existing ground contours and the location of the creek, and existing street drainage systems (Appendix E).

Project Description

The proposed project is a wastewater treatment plant, and as such, stormwater generated on-site will have the potential to transport contaminants. Therefore, the drainage system has been designed such that any stormwater that has the potential to come into contact with contaminants will be contained on-site and treated through the WTTP, rather than through other treatment systems that, under storm conditions, could overflow to public lands or to adjacent waterways. It should be noted that the contaminants generated on-site are potentially a greater concern than ordinary site developments, and this method of treatment, although not standard, is warranted for protection of both the public and the environment.

The site improvements consist of sewer treatment basins open to the atmosphere, together with rooftops and hard surface areas that will drain to the Influent Pump Station (IPS) for treatment in the WWTP, and other rooftops and hard surface areas that will drain toward landscaping with rain gardens for treatment and infiltration into the ground.

Rain gardens will serve small impervious areas such as rooftops and paved surfaces away from the potential to come in contact with plant generated contaminants. The rain gardens will be able to infiltrate the 25-year design storm, and a 100-year storm will infiltrate with no need to provide overflow piping to offsite storm systems.

The steep slopes along the eastern side of the property will be landscaped, and will include a rock drainage ditch along the base of the slope. The rock drainage ditch will also receive water from the graveled area adjacent to the east wall of the Sequencing Batch Reactor (SBR). The ditch will provide additional infiltration on-site, and excess water from heavy storms, with the potential for contaminants from the area around the SBR, will flow directly to a catch basin at the low point. This minor flow volume will be transported through storm pipe systems, around the headworks, to the IPS, for treatment in the WTTP.

The overall design will accommodate a 100-year storm event without inundation of proposed or existing buildings. The onsite rain gardens will infiltrate up to 100-year storms with no overflow off-site. Should a storm pipe or basin be plugged the contained water will overflow to the rain garden areas before flooding the IPS/Generator pad or flooding the shop or electrical rooms.

Calculation Methodology

The calculation methodology was evaluated by both the specifics of the City of Coos Bay Development Provisions, and the merits of the various methodology available.

<u>Merits of the Methodology:</u>

HydroCAD Software Solutions was used for the hydraulic model of the storm system. This software has the capability of utilizing the Rational Method, Soils Conservation Service – Unit Hydrograph Method (SCS-UH) and the Santa Barbara Unit Hydrograph Method (SBUH), however since

hydrographs produced by the Rational method do not reflect the total storm runoff volume (or intensity variation over time), this runoff method is generally not recommended for the design and analysis of volume sensitive rain gardens, or detention facilities, or in this case where the volume going to the WWTP is of greater concern than the instantaneous flow. Although the rational method is the most conservative method to use for sizing pipe or conveyance systems, this site design is not concerned with pipe size, or conveyance systems, but volume sensitive treatment facilities. Whenever possible the SCS-UH or SBUH runoff method is preferable in order to produce a complete inflow hydrograph as required for accurate volume based results. Therefore, the SCS-UH was used together with the Type 1A distribution for rainfall, pursuant to the SCS TR-20 methodology. Curve numbers for each area were derived from the weighted average of the runoff coefficients provided by the USDA NRCS, Soils Web Survey, and based on the type of soil encountered for the landscape and rain garden areas.

In addition, the rational method is not allowed by code for a development area over 5,000 SF, or with an adjacent stream,

City of Coos Bay Development Provisions:

SHN followed the City of Coos Bay Part 2 - Design Standards, Section 3.3.2, Drainage Study Types, and Section 3.3.3 Hydraulic Calculations for selection of the proper methodology as follows:

Drainage Study Type:

Study types include Type A – Small Site Study, Type B – Mid-Level Development Study, and Type C – Full Drainage Development Study

Pursuant to section 3.3.2 A. 3. The proposed development area is greater than one acre and we assumed 'development area' would be areas where the permeability of existing surfaces is reduced. The site is divided into five catchment areas, and the largest of these has a development area of 1.24 acres, therefore study type B or C must be used.

Section 3.3.2 A. 4. The Study area is adjacent to a stream on the north and northwest corner of the site, therefore study type B or C must be used.

Section 3.3.2 C. 4. The site creates 5,000 square feet or more of new impervious area in two out of three sub- catchment areas, therefore, 'Study Type C. Full Drainage Development Study' must be used.

Methodology:
Section 3.3.3. C. 1. Use the Unit Hydrograph Method. Use SCS Type 1A distribution for rainfall.

Calculations:
Section 3.3.3. C. 1. Unit Hydrograph method and SCS Type 1A distribution for rainfall.

Section 3.3.3 A. 2. Two-year storm event frequency for flow rates up to 5 cfs.

Section 3.3.3. B. 4. 25-year storm event for detention facilities where necessary to meet downstream capacity issues.

Section 3.4.1. B. An overall design that will accommodate a 100-year storm event without inundation of proposed or existing buildings.

The evaluation has been performed for 2, 25 and 100-year storm as required by the code however, additional results of 5, 10, 50 and 100-year storm events, have been provided for information purposes. It is anticipated that the stormwater flows passing through the IPS and WWTP are desired in order to account for these in the treatment stream. These anticipated flows generated by the model for various storm events can be used to check the model with actual flows measured through the WWTP. Also with this information, the rain gardens can be monitored, and the response to storms evaluated to confirm and verify assumptions used in the model.

The values generated by the SCS-UH method have been compared to values from the SBUH method, which produced similar results. A software-generated report of the modeling for each drainage area is attached as (Appendix A).

The soil classifications used are from the USDA NRCS Web Soil Survey and the locations for three different soil groups are shown on the attached Map and Soil Descriptions (Appendix B). Soil class 1B is Bandon sandy loam, located in the northern 76% of the site, and it is identified as hydrologic soil group C. Soil class 8C, Bullards sandy loam, covers 16% of the site on the south end, and is classified as hydrologic soil group B. Soil class 28 is Heceta fine sand, which covers 7% of the site, can be classed from A-D, and our analysis used a conservative soil group C for this area.

For analysis, the site was divided up into six drainage areas. Three of the drainage areas will infiltrate and/or treat stormwater on site, one drainage area is the open SBR basins, and another is all the surfaces that will run to the IPS for treatment through the plant. A 6th drainage area includes small areas that will drain offsite without treatment, together with new impervious surfaces within the public right of way that will contribute to the existing City of Coos Bay storm system in Fulton Avenue.

The following narratives describe each drainage area and a summary of the analysis for each. Additional information for each drainage area is provided in the software-generated stormwater reports located in Appendix A. The drainage areas are shown on the attached Stormwater Drainage Area Map (Appendix C).

Existing Site Runoff

The existing site is bordered on the upstream side by Marple Avenue with a curb to prevent runoff from upland areas. The existing runoff was calculated as the 2.187-acre drainage area impacted by the project. This includes 2.149 acres is being treated on site, and 0.037 acres of onsite or new impervious offsite, that will flow untreated to existing offsite storm systems. The streambanks on the north and northwest sides of the site, and a small area on the SE corner of Fulton and Marple are excluded from this calculation.
Using an average runoff number of 79, with a time of concentration of 5 minutes, the stormwater overflow from 2, 25 and 100-year storms is calculated to be 0.78, 1.77, and 2.30 CFS respectively. The majority of this flow runs off site in a southwesterly direction to the intersection of S. Empire Boulevard and Fulton Avenue. Some of this area may be captured in the small low point toward the south end of the parcel, and infiltrate through the ground at that point, but this small area has not been delineated and has not been subtracted from the above calculations.

Drainage Area 1

Drainage Area 1 includes the steep landscaped slope between S. Marple Street and the gravel surface on the east side of the SBR #2. The soil type for this area is categorized by the Soil Conservation Service (SCS) as Bandon Sandy Loam, and hydrologic soil group C. A weighted curve number (CN) of 75 was used for the runoff on the vegetated but steep slope. The site is small with short runoff distances therefore a time of concentration of 5 minutes was used for the calculations.

The drainage area runoff calculations for Drainage Area 1are summarized in the following table:

Table 1
Subcatchment 1S - Drainage Area 1

Data Input Summary	Area		Weighted CN	Time of concentration Tc (min)		
	Sq. Ft.	Acres				
	24,366	.559	75	5		
Data Output Summary						
	2 Yr	**5 Yr**	**10Yr**	**25 Yr**	**50 Yr**	**100 Yr**
Rainfall (in)	3.50	4.50	4.70	5.50	6.00	6.50
Max. Depth (in)	1.30	2.05	2.20	2.86	3.28	3.71
Runoff in (cfs)	0.15	0.26	0.29	0.38	0.45	0.51
Storm Volume (af)	0.061	0.095	0.103	0.133	0.153	0.173

The capacity of the group C soil to transmit water is moderately high to high, from 0.6 to 2-inches per hour. In order to take advantage of the transmissivity of the soil, and further reduce runoff to the IPS, and treatment plant, an infiltration ditch will be placed at the toe of this slope. The infiltration ditch will capture the runoff from the steep slope and gravel surfaces behind the SBR, and detain, store and infiltrate stormwater into the ground. The infiltration ditch will be located at the toe of the landscaped slope, and just inside the project fence.

The bottom of the infiltration ditch will be set at an elevation of 15.0 and filled with open graded rock wrapped in a geotextile fabric. The top of rock will follow the adjacent curb grade on the southern end of the ditch, and the adjacent gravel road grade on the north end. A catch basin in the middle of the 400 foot long ditch will transport overflow through storm pipes to the IPS for treatment through the plant. A conservative exfiltration flow rate of 1.0-inch per hour was selected for analysis of the rock drainage ditch, along with a groundwater elevation estimated at an elevation of 12.0', or three feet below the bottom of the ditch. A section detail of the ditch with dimensions and fabric between the rock and existing soils is provided in (Appendix F.)

The flow rates and volumes for the Infiltration Ditch are summarized in the following table.

Table 2 Pond 1P – Infiltration Ditch						
Data Input Summary	Surface Area (area)	Infiltration Rate (in/hr)	Bottom Elevation	Outlet Elevation	Groundwater Elevation	
	0.028	1.0	15	16.70	12.0	
Data Output Summary						
	2 Yr	**5 Yr**	**10Yr**	**25 Yr**	**50 Yr**	**100 Yr**
Rainfall (in)	3.5	4.5	4.7	5.5	6.0	6.5
Peak Elevation (ft)	16.04	16.72	16.72	16.76	16.77	16.78
Stored (af)	0.009	0.016	0.016	0.016	0.016	0.016
Inflow (cfs)	0.15	0.26	0.29	0.38	0.45	0.51
Storm Volume (af)	0.061	0.095	0.103	0.133	0.153	0.173
Discarded Flow (cfs)	0.04	0.05	0.05	0.05	0.05	0.05
Discarded Volume (af)	0.056	0.073	0.074	0.076	0.077	0.078
Primary (overflow rate) (cfs)	-	0.05	0.07	0.31	0.40	0.46
Primary (overflow volume) (af)	-	0.009	0.015	0.041	0.06	0.079

During a 25-year design storm a small amount of stormwater (0.31 cfs) (139 gpm)will overflow at the low point into a catch basin near the SE corner of SBR #2 where it will flow through a 12-inch storm pipe to the IPS for treatment in the WWTP.

Drainage Area 2

This drainage area includes the paved areas on site, the headworks building roof, the gravel areas on the north and west side of the SBR's, the paved driveway connection to S. Empire Boulevard, the IPS and generator pads, that all slope toward catch basins that lead to the IPS for treatment in the plant. Graveled areas around the SBR will be constructed with an inverted crown to direct overland flow toward pavement where catch basins will intercept the water for piping to the IPS.

The results of the analysis indicate that flows will reach 1.03 CFS at the peak of a 25-year 24-hour storm delivering 0.334-Acre Feet of water to the WWTP. All storm events will be contained on site in this drainage area. The grading is designed such that any potential overflow caused by storm systems failure to reach the IPS, or any IPS failure would ultimately spill over into the landscaping and flow toward Raingarden 2 in the SW corner of the site.

The runoff calculations for Drainage Area 2, and the combination of Drainage Area 2 and Infiltration Ditch-1P, are summarized in the following table:

Table 3 Subcatchment 2S, Drainage Area 2						
Data Input Summary	**Area**		**Weighted CN**	**Time of concentration Tc (min)**		
	Sq. Ft.	**Acres**				
	34,735	0.798	96	5		
Data Output Summary						
	2 Yr	**5 Yr**	**10Yr**	**25 Yr**	**50 Yr**	**100 Yr**
Rainfall (in)	3.5	4.5	4.7	5.5	6.0	6.5
Max. Depth (in)	3.04	4.03	4.23	5.02	5.52	6.02
Runoff in (cfs)	0.63	0.83	0.87	1.03	1.13	1.23
Storm Volume (af)	0.202	0.268	0.281	0.334	0.367	0.400
Combined 2S and Overflow from 1P = Total Flow to IPS						
Runoff in (cfs)	0.63	0.88	0.94	1.34	1.53	1.69
Storm Volume (af)	0.202	0.277	0.296	0.375	0.427	0.479

The storm drain pipes will be designed with a minimum grade of 2% slope. At this grade a 12-inch storm pipe will carry the required 25 year flow rate of 1.34 cfs with ease. A 12-inch pipe is a standard minimum size for stormwater between catch basins, and will be used for the storm pipe system leading to the IPS. Individual roof drains and floor drains will use 4-inch pipe connecting to the catch basins. At the runoff rate of a 100 year storm and a 2% slope in the 12-inch pipe the pipe will be flowing at less than 1/3 of capacity into the IPS.

Drainage Area 3

Drainage Area 3 includes the open SBR basins. The basins are unprotected from the weather, and any rainfall will be captured immediately in the treatment stream of the plant. Therefore, a runoff curve number of 100 was used for this area.

The runoff calculations from the Drainage Area 3 are summarized in the following table:

Table 4 Subcatchment 3S – Drainage Area 3						
Data Input Summary	**Area**		**Weighted CN**	**Tc (min)**		
	Sq. Ft.	**Acres**				
	19,206	0.441	100	5		
Data Output Summary						
	2 Yr	**5 Yr**	**10Yr**	**25 Yr**	**50 Yr**	**100 Yr**
Rainfall (in)	3.5	4.5	4.7	5.5	6.0	6.5
Depth (in)	3.5	4.50	4.70	5.49	5.99	6.49
Runoff in (cfs)	0.370	0.48	0.50	0.59	0.64	0.70
Storm Volume (af)	0.128	0.165	0.173	0.202	0.220	0.239

Drainage Area 4

Drainage Area 4 includes the control building roof, sidewalk on the east side and southwest corner of the office building, pavement on the east driveway entrance, and the landscaped area along the south, west and east perimeter of the control building. The curb between the east entrance pavement and the landscaped area around the control building, will be provided with a curb break, to allow the stormwater to pass through the curb, and into the rain garden, with a beaver tail to minimize soil erosion. This runoff will be directed overland in a shallow swale, to the rain garden on the west side of the building, for infiltration into the ground. The roof runoff will be captured in gutters, with roof drains directed to the landscaped area, and the same rain garden on the west end of the building.

The runoff calculations from the Drainage Area 4 are summarized in the following table:

Table 5
Subcatchment 4S – Drainage Area 4

Data Input Summary		**Area**		**Weighted**	
		Sq. Ft.	**Acres**	**CN**	**Tc (min)**
		5648	0.130	84	5
Data Output Summary					
	2yr	**5 yr**	**10 yr**	**25 yr**	**50 yr**	**100 yr**
Rainfall (in)	3.50	4.50	4.70	5.50	6.00	6.50
Depth (in)	1.93	2.81	2.99	3.73	4.19	4.66
Runoff in (cfs)	0.06	0.09	0.10	0.13	0.14	0.16
Storm Volume (af)	0.021	0.030	0.032	0.040	0.045	0.050

All runoff from drainage area 4 will flow to a rain garden located west of the office building. A catch basin will be placed in the raingarden with an overflow and pipe to the raingarden on the southwest corner of the site.

The raingardens will be over excavated to a depth of 18-inches below finished grade, and replaced with amended soil for improved treatment of stormwater as it infiltrates into the ground. The soils under these areas is characterized as Bullards sandy loam with infiltration rates of 0.6 to 2-inches an hour. The amended soils will enhance this infiltration rate to some degree, but the intent of the soil amendments is to provide the organic materials for treatment of hydrocarbons as previously stated. A section detail of the raingardens is provided in (Appendix F.)

The flow and overflow rates and volumes for Pond 4P Raingarden 1, are summarized in the following table:

Table 6
Pond 4P – Raingarden 1

Data Input Summary	Surface Area (Acres)	Infiltration Rate (in/hr)	Bottom Elevation	Outlet Elevation	Groundwater Elevation
	0.003	1	14	14.8	8 .0

Table 6, Continued						
Data Output Summary						
	2 Yr	**5 Yr**	**10Yr**	**25 Yr**	**50 Yr**	**100 Yr**
Rainfall (in)	3.5	4.5	4.7	5.5	6	6.5
Peak Water Elevation (ft)	14.82	14.83	14.83	14.84	14.84	14.84
Stored in rain garden (af)	0.001	0.001	0.001	0.001	0.001	0.001
Inflow (cfs)	0.06	0.09	0.1	0.13	0.14	0.16
Storm Volume (af)	0.021	0.03	0.032	0.04	0.045	0.05
Discarded Flow (cfs)	-	-	-	-	-	-
Discarded Volume (af)	0.004	0.005	0.005	0.005	0.005	0.005
Primary (overflow rate) (cfs)	0.06	0.09	0.1	0.12	0.14	0.15
Primary (overflow volume) (af)	0.015	0.025	0.027	0.034	0.039	0.044

This Raingarden 1 was modeled with an assumed but conservative infiltration rate of 1-inch per hour. Modeling of the system shows Raingarden 1 will treat and infiltrate only a small portion of the stormwater in a 25-year storm. Overflow from this raingarden will be captured in a catch basin and piped to the downstream raingarden. Stormwater in a 25-year storm will reach a depth 0.84-feet, or 0.04 feet (1/2-inch) over the catch basin grate in the pond. The 25-year storm will have an overflow rate of .12 cfs (54 gpm) going to Raingarden 2.

Drainage Area 5

Drainage Area 5 includes the maintenance building roof, the paved area south of the maintenance building, the sidewalk on the west side of the Control building, and the landscaped area in the southwest corner of the site, which all shed west and south to the SW corner of the site. A rain garden will be placed in the low point of the landscaped area to infiltrate the stormwater from drainage area 5. Gutters and downspouts will convey water from the roof, and curb breaks will direct water to the landscaped area.

The flow rates and volumes for Drainage Area 5 are summarized in the following table:

Table 7 Subcatchment 5S – Drainage Area 5						
Data Input Summary		**Area**		**Weighted**	**Tc (min)**	
		Sq. Ft.	**Acres**	**CN**		
		10,612	0.244	73	5	
Data Output Summary						
	2 yr	**5 yr**	**10 yr**	**25 yr**	**50 yr**	**100 yr**
Rainfall (in)	3.50	4.50	4.70	5.50	6.00	6.50
Depth (in)	1.30	2.05	2.20	2.86	3.28	3.71
Runoff in (cfs)	0.06	0.10	0.11	0.15	0.18	0.20
Storm Volume (af)	0.024	0.038	0.041	0.053	0.061	0.069

Raingarden 2 serving area 5, will infiltrate the 100-year storm event with no overflow to the public system and without inundation of proposed or existing buildings. This raingarden will also receive amended soils to improve infiltration and insure the vegetative matter is available immediately for treatment of the stormwater.

The flow and overflow rates and volumes for Pond 5P Raingarden 2, are summarized in the following table:

Table 8
Pond 5P – Raingarden 2

Data Input Summary	Surface Area (af)	Infiltration Rate (in/hr)	Bottom Elevation	Outlet Elevation	Groundwater Elevation	
	0.064	1.0	10.00	12.00	8 .0	
Data Output Summary						
	2 Yr	**5 Yr**	**10Yr**	**25 Yr**	**50 Yr**	**100 Yr**
Rainfall (in)	3.50	4.50	4.70	5.50	6.00	6.50
Peak Water Elevation (ft)	10.43	10.80	10.87	11.15	11.31	11.46
Stored in rain garden (af)	0.008	0.017	0.019	0.028	0.034	0.040
Inflow (cfs)	0.12	0.19	0.21	0.27	0.32	0.36
Storm Volume (af)	0.039	0.063	0.067	0.087	0.100	0.113
Discarded Flow (cfs)	0.03	0.04	0.04	0.05	0.05	0.06
Discarded Volume (af)	0.035	0.049	0.052	0.064	0.072	0.079
Primary (overflow rate) (cfs)	-	-	-	-	-	-
Primary (overflow volume) (af)	-	-	-	-	-	-

With the bottom of this rain garden at elevation 10.0′ and the rim at 12.2′, the 25-year storm will reach a depth of 1.15-feet or ½ full. The 100-year storm will reach a maximum depth of 1.46-feet. Although the calculations show no stormwater overflow, an overflow catch basin with grate placed 6-inches below the rim and over 0.2 feet above the 100 year peak elevation, will provide a factor of safety for the design.

Drainage Area 6

This area includes small driveway and onsite landscape areas that slope toward Fulton Avenue. These areas lie within or adjacent to the public right-of-way with no practical way to capture the stormwater on-site. Of the 2.21-acre site, only this 1701 Sq. Ft. area will flow to the public storm system. The flows are calculated to be 0.03 cfs and 0.05 cfs in 2-year and 25-year storms respectively.

Table 9
Subcatchment 6S – Drainage Area 6

Data Input Summary		**Area**		**Weighted**	
		Sq. Ft.	**Acres**	**CN**	**Tc (min)**
		1,623	0.037	95	5

Table 9, Continued						
Data Output Summary						
	2yr	**5 yr**	**10 yr**	**25 yr**	**50 yr**	**100 yr**
Rainfall (in)	3.50	4.50	4.70	5.50	6.00	6.50
Depth (in)	2.94	3.92	4.12	4.91	5.41	5.90
Runoff in (cfs)	0.03	0.04	0.04	0.05	0.05	0.06
Storm Volume (af)	0.009	0.012	0.013	0.015	0.017	0.018

Impact to Existing Downstream Storm Systems

All drainage areas leading to onsite storm systems for treatment will be contained onsite up to the 25 year and 100-year storm events. Only the 0.037-acre area with 0.06 cfs flowing offsite without treatment will continue flowing to the existing storm system. The difference in pre-development flow rate (2.30 cfs), and post development (0.06 cfs) is equal to 2.24 cfs (1,005 GPM)

2.30 cfs - 0.06 cfs = 2.24 cfs reduction in flow

The existing storm systems will benefit from these reduced drainage flows off this site.

The slopes directly adjacent to the stream that slope toward the stream will not be altered or impacted by the project and therefore the site improvements will not impact existing overland flow directly to the stream.

Summary

In conclusion, the runoff from the proposed improvements will reduce runoff to the existing storm systems by roughly 2.24 CFS. All stormwater being treated onsite will either be disposed of onsite or be discharged offsite after treatment through the WWTP outfall, with no overflow to existing public storm systems. All stormwater generated on site with the potential to come into contact with WWTP contaminants will be contained and treated on site through the new WWTP. All stormwater generated on site, without potential for contact with WWTP contaminants, will be contained, treated, and infiltrated on site with raingardens.

The rain gardens will be provided with an amended soil, with sufficient organics to break down any hydrocarbons, or other contaminants, prior to infiltration through the ground to the groundwater table.

Should the ground not infiltrate as well as anticipated, or the local groundwater rise higher than estimated for this analysis, an overflow catch basin and pipe will discharge any overflow water to the public storm system through a catch basin in Fulton Avenue.

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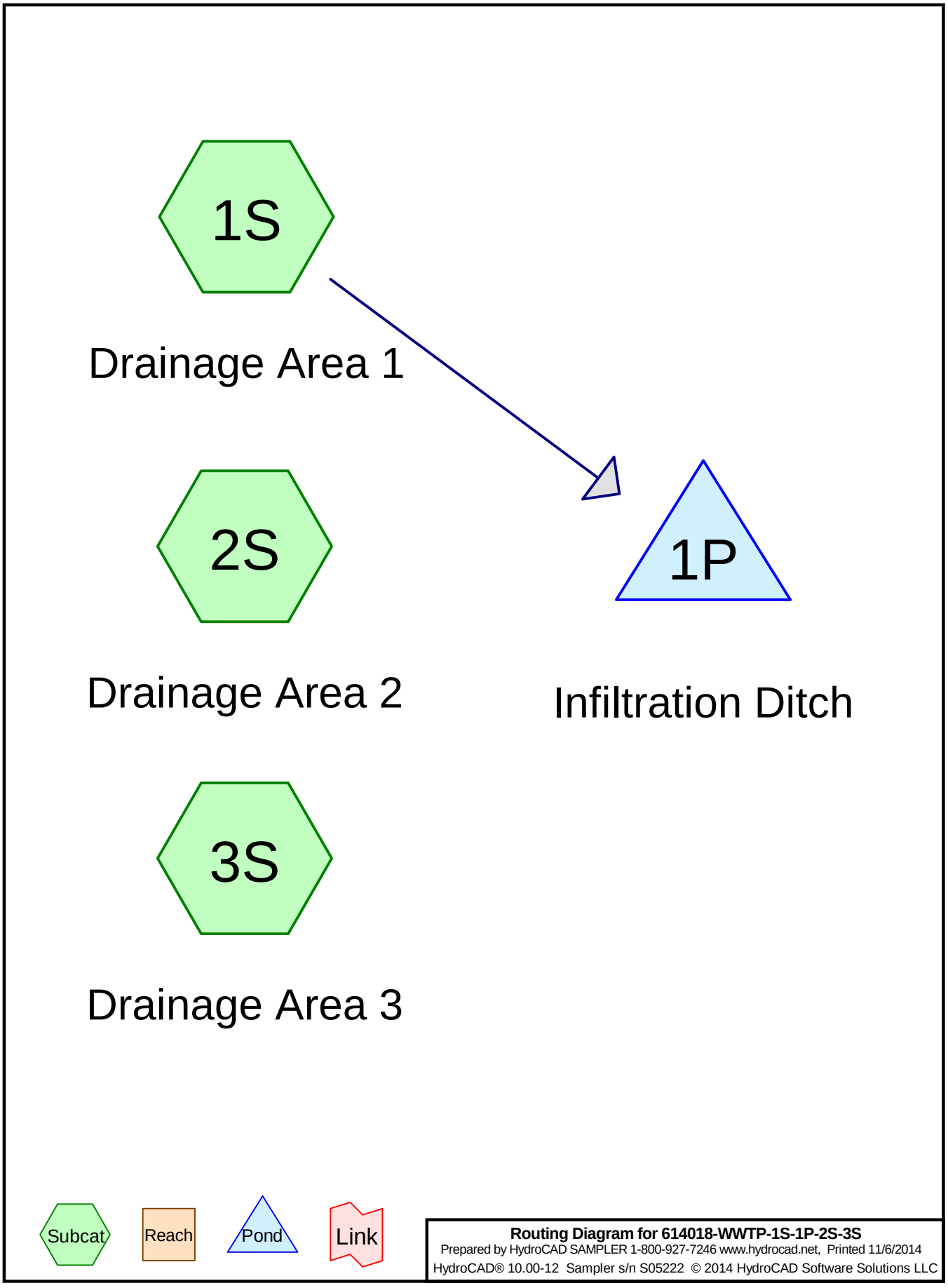
Appendix A

Software Generated Hydrocad Report



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.484	74	>75% Grass cover, Good, HSG C (1S)
0.208	85	Gravel Area (1S, 2S)
0.665	98	Pavement, buildings (2S)
0.441	100	SBR - Open Surface (3S)
1.798	**91**	**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1 Runoff Area=0.559 ac 0.00% Impervious Runoff Depth>1.30"
Tc=5.0 min CN=75 Runoff=0.15 cfs 0.061 af

Subcatchment 2S: Drainage Area 2 Runoff Area=0.798 ac 83.33% Impervious Runoff Depth>3.04"
Tc=5.0 min CN=96 Runoff=0.63 cfs 0.202 af

Subcatchment 3S: Drainage Area 3 Runoff Area=0.441 ac 100.00% Impervious Runoff Depth>3.50"
Tc=5.0 min CN=100 Runoff=0.37 cfs 0.128 af

Pond 1P: Infiltration Ditch Peak Elev=16.04' Storage=0.009 af Inflow=0.15 cfs 0.061 af
Discarded=0.04 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.056 af

Total Runoff Area = 1.798 ac Runoff Volume = 0.391 af Average Runoff Depth = 2.61"
38.49% Pervious = 0.692 ac 61.51% Impervious = 1.106 ac

Summary for Subcatchment 1S: Drainage Area 1

Landscaped area on steep slope east side of parcel. Gravel area on east side of SBR #2. Area drains to rock drainage ditch and overflows to IPS during heavy storms.

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

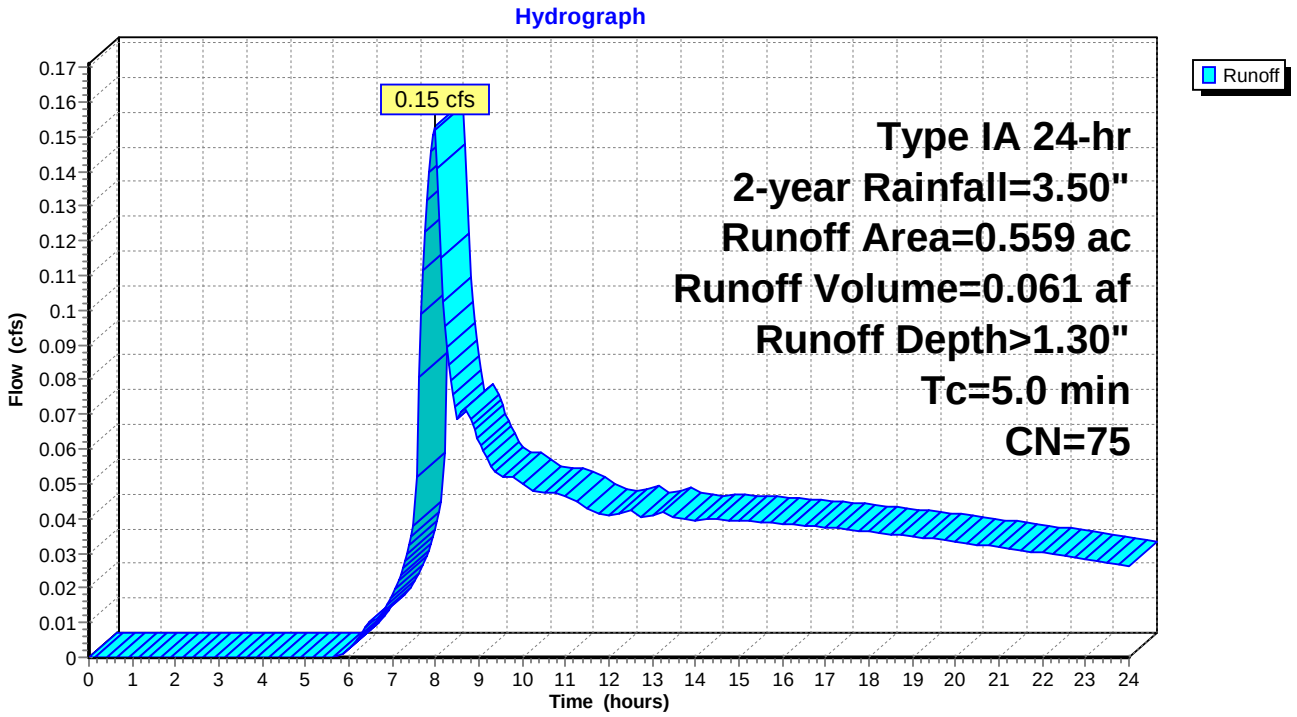
Runoff = 0.15 cfs @ 7.98 hrs, Volume= 0.061 af, Depth> 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-year Rainfall=3.50"

	Area (ac)	CN	Description
	0.484	74	>75% Grass cover, Good, HSG C
*	0.075	85	Gravel Area
	0.559	75	Weighted Average
	0.559	75	100.00% Pervious Area

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

Subcatchment 1S: Drainage Area 1



Summary for Subcatchment 2S: Drainage Area 2

Pavement, gravel and roof surface runoff captured in catch basins and flowing to IPS.

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

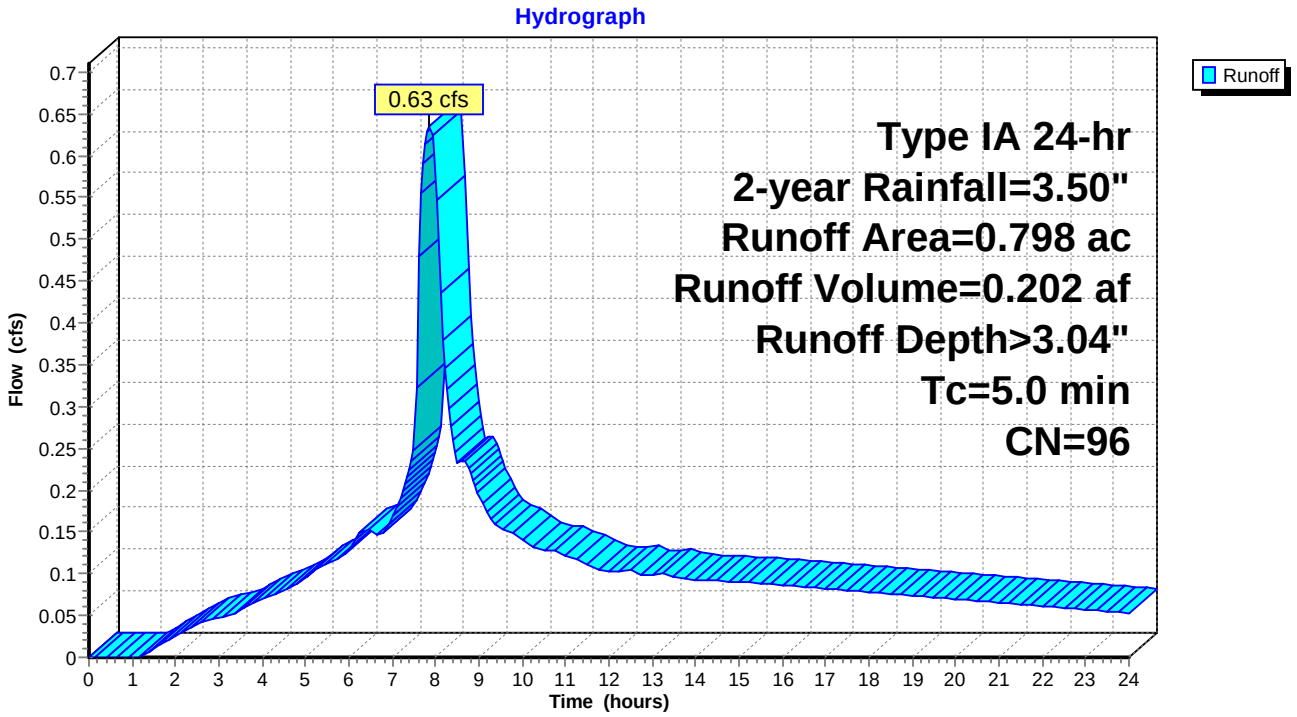
Runoff = 0.63 cfs @ 7.87 hrs, Volume= 0.202 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-year Rainfall=3.50"

	Area (ac)	CN	Description
*	0.133	85	Gravel Area
*	0.665	98	Pavement, buildings
	0.798	96	Weighted Average
	0.133	85	16.67% Pervious Area
	0.665	98	83.33% Impervious Area

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

Subcatchment 2S: Drainage Area 2



Summary for Subcatchment 3S: Drainage Area 3

Rainfall captured in open basin of SBR's.

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

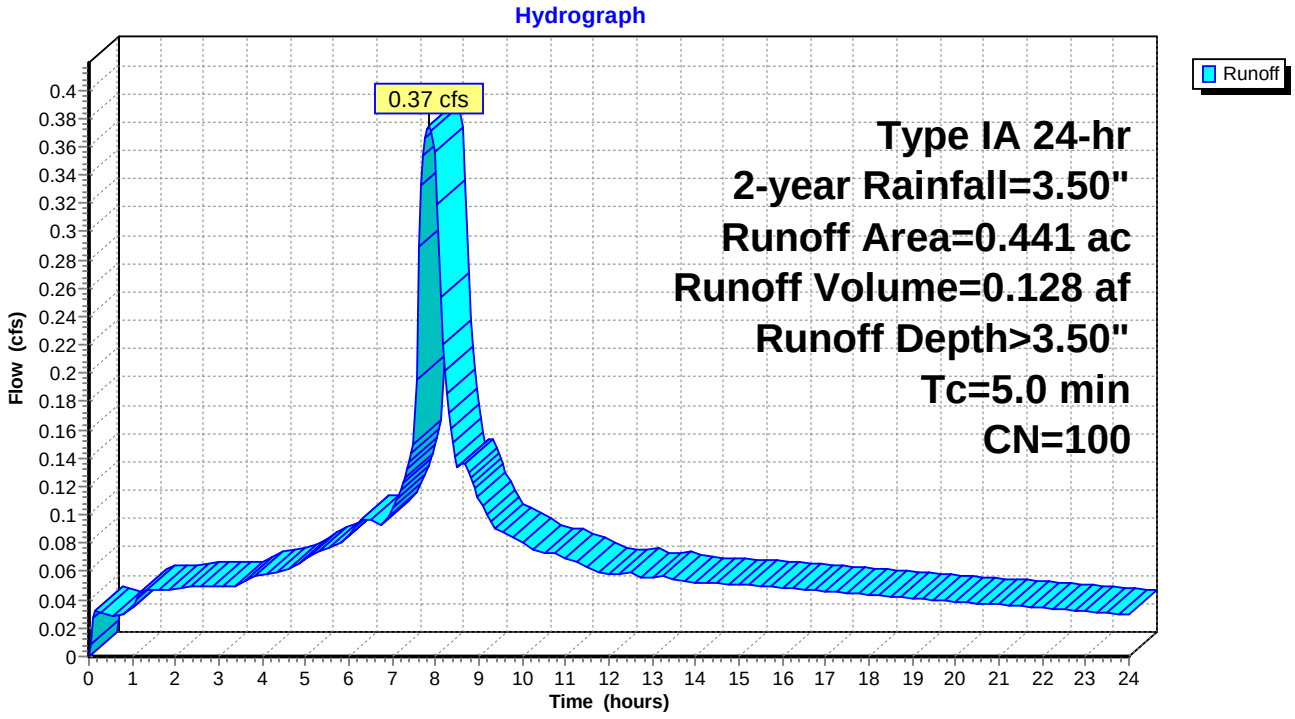
Runoff = 0.37 cfs @ 7.85 hrs, Volume= 0.128 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-year Rainfall=3.50"

	Area (ac)	CN	Description
*	0.441	100	SBR - Open Surface
	0.441	100	100.00% Impervious Area

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

Subcatchment 3S: Drainage Area 3



Summary for Pond 1P: Infiltration Ditch

Infiltration ditch follows toe of slope infiltrates/stores/treats stormwater on site, catch basin at low point captures overflow. Storm pipe transports overflow to Influent Pump Station.

Inflow Area = 0.559 ac, 0.00% Impervious, Inflow Depth > 1.30" for 2-year event
Inflow = 0.15 cfs @ 7.98 hrs, Volume= 0.061 af
Outflow = 0.04 cfs @ 11.62 hrs, Volume= 0.056 af, Atten= 73%, Lag= 218.3 min
Discarded = 0.04 cfs @ 11.62 hrs, Volume= 0.056 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 16.04' @ 11.62 hrs Surf.Area= 0.031 ac Storage= 0.009 af

Plug-Flow detention time= 130.5 min calculated for 0.056 af (92% of inflow)
Center-of-Mass det. time= 83.7 min (926.2 - 842.5)

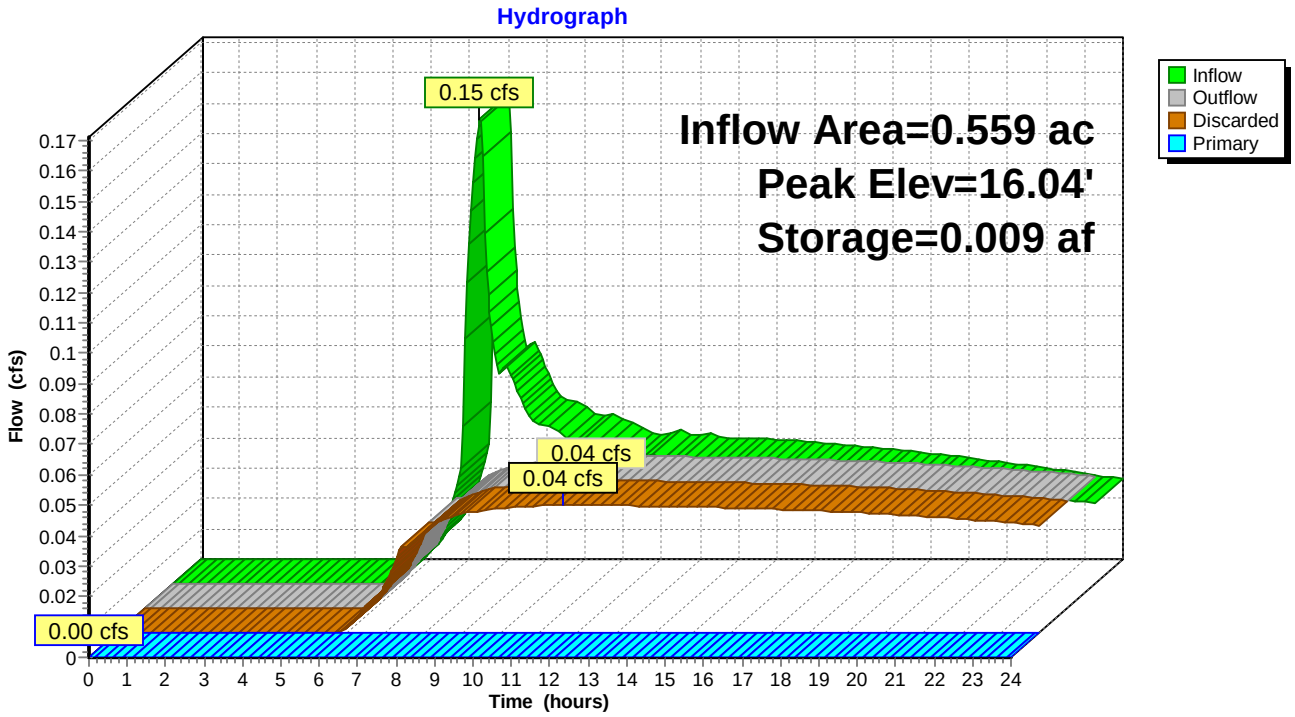
Volume	Invert	Avail.Storage	Storage Description
#1	15.00'	0.019 af	**3.00'W x 400.00'L x 2.00'H Prismatoid Z=0.2** 0.063 af Overall x 30.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 12.00'
#2	Primary	16.70'	**18.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 11.62 hrs HW=16.04' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 1P: Infiltration Ditch



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1 Runoff Area=0.559 ac 0.00% Impervious Runoff Depth>2.05"
Tc=5.0 min CN=75 Runoff=0.26 cfs 0.095 af

Subcatchment 2S: Drainage Area 2 Runoff Area=0.798 ac 83.33% Impervious Runoff Depth>4.03"
Tc=5.0 min CN=96 Runoff=0.83 cfs 0.268 af

Subcatchment 3S: Drainage Area 3 Runoff Area=0.441 ac 100.00% Impervious Runoff Depth>4.50"
Tc=5.0 min CN=100 Runoff=0.48 cfs 0.165 af

Pond 1P: Infiltration Ditch Peak Elev=16.72' Storage=0.016 af Inflow=0.26 cfs 0.095 af
Discarded=0.05 cfs 0.073 af Primary=0.05 cfs 0.009 af Outflow=0.10 cfs 0.082 af

Total Runoff Area = 1.798 ac Runoff Volume = 0.529 af Average Runoff Depth = 3.53"
38.49% Pervious = 0.692 ac 61.51% Impervious = 1.106 ac

Summary for Subcatchment 1S: Drainage Area 1

Landscaped area on steep slope east side of parcel. Gravel area on east side of SBR #2. Area drains to rock drainage ditch and overflows to IPS during heavy storms.

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

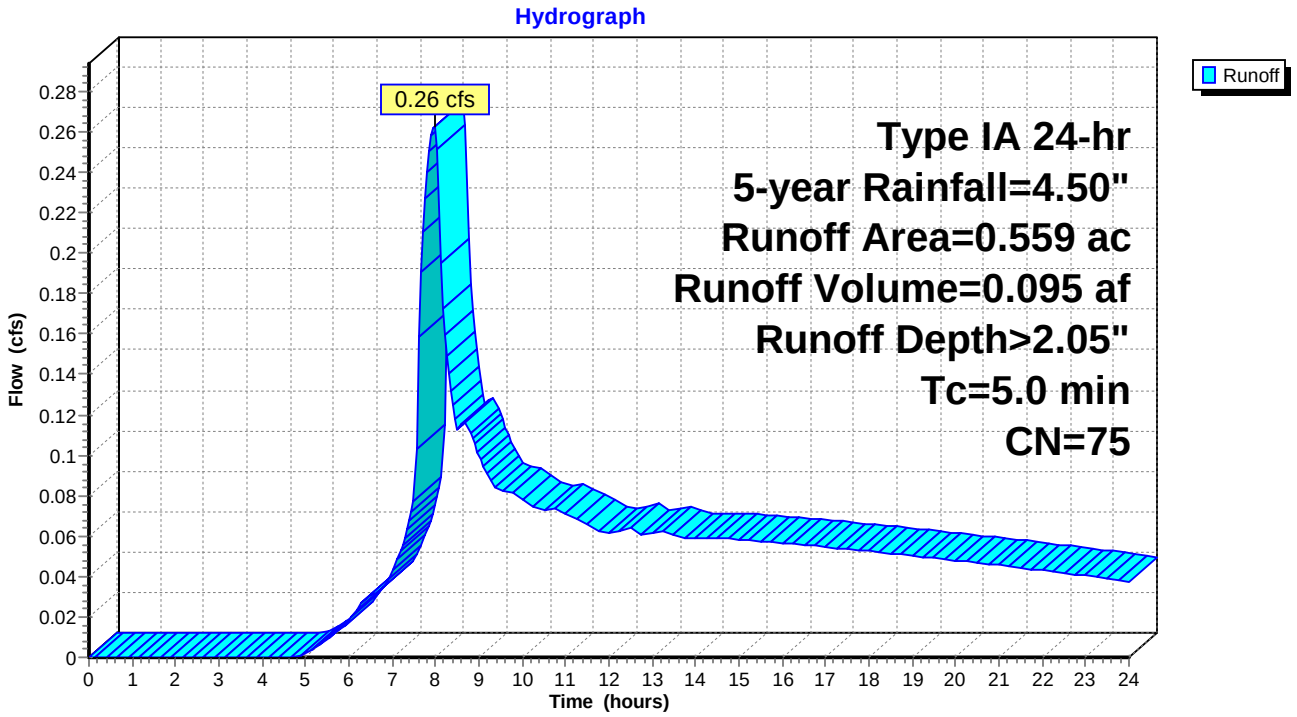
Runoff = 0.26 cfs @ 7.97 hrs, Volume= 0.095 af, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5-year Rainfall=4.50"

	Area (ac)	CN	Description
	0.484	74	>75% Grass cover, Good, HSG C
*	0.075	85	Gravel Area
	0.559	75	Weighted Average
	0.559	75	100.00% Pervious Area

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

Subcatchment 1S: Drainage Area 1



Summary for Subcatchment 2S: Drainage Area 2

Pavement, gravel and roof surface runoff captured in catch basins and flowing to IPS.

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

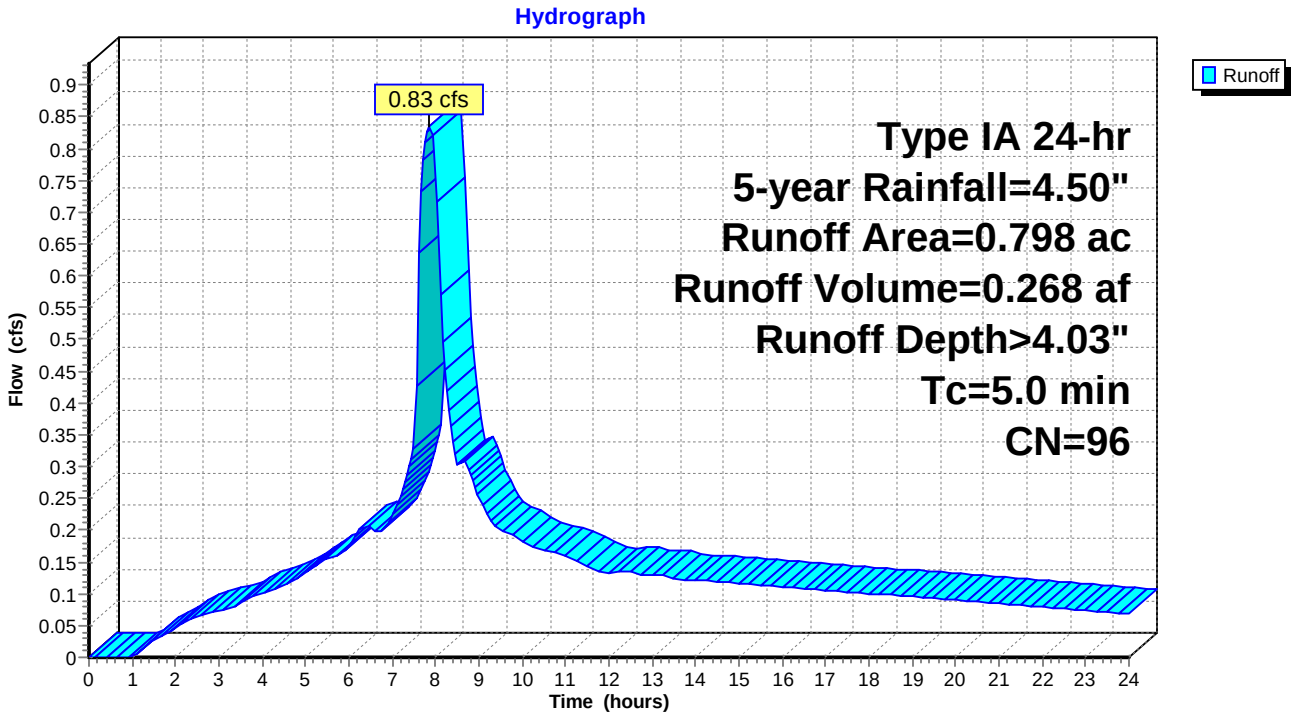
Runoff = 0.83 cfs @ 7.86 hrs, Volume= 0.268 af, Depth> 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5-year Rainfall=4.50"

	Area (ac)	CN	Description
*	0.133	85	Gravel Area
*	0.665	98	Pavement, buildings
	0.798	96	Weighted Average
	0.133	85	16.67% Pervious Area
	0.665	98	83.33% Impervious Area

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

Subcatchment 2S: Drainage Area 2



Summary for Subcatchment 3S: Drainage Area 3

Rainfall captured in open basin of SBR's.

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

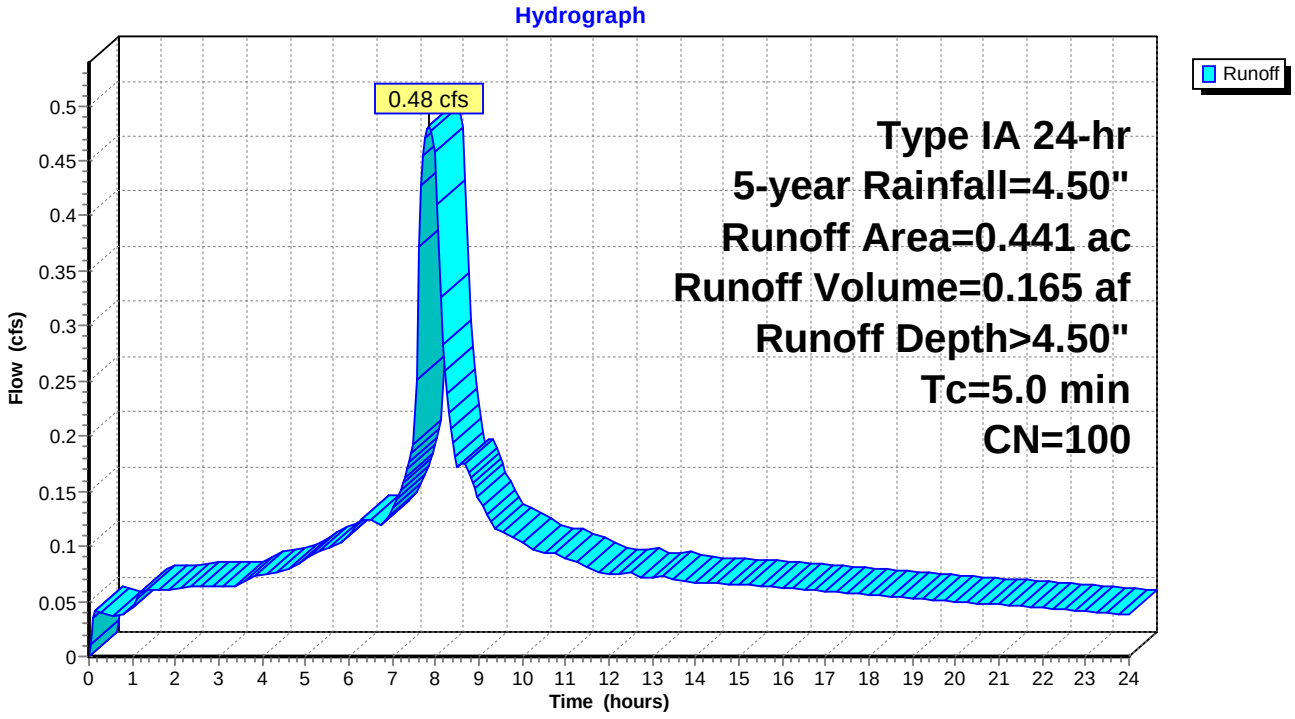
Runoff = 0.48 cfs @ 7.85 hrs, Volume= 0.165 af, Depth> 4.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5-year Rainfall=4.50"

	Area (ac)	CN	Description
*	0.441	100	SBR - Open Surface
	0.441	100	100.00% Impervious Area

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

Subcatchment 3S: Drainage Area 3



Summary for Pond 1P: Infiltration Ditch

Infiltration ditch follows toe of slope infiltrates/stores/treats stormwater on site, catch basin at low point captures overflow. Storm pipe transports overflow to Influent Pump Station.

Inflow Area = 0.559 ac, 0.00% Impervious, Inflow Depth > 2.05" for 5-year event
Inflow = 0.26 cfs @ 7.97 hrs, Volume= 0.095 af
Outflow = 0.10 cfs @ 9.06 hrs, Volume= 0.082 af, Atten= 63%, Lag= 64.9 min
Discarded = 0.05 cfs @ 9.06 hrs, Volume= 0.073 af
Primary = 0.05 cfs @ 9.06 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 16.72' @ 9.06 hrs Surf.Area= 0.034 ac Storage= 0.016 af

Plug-Flow detention time= 161.7 min calculated for 0.082 af (86% of inflow)
Center-of-Mass det. time= 79.7 min (892.9 - 813.2)

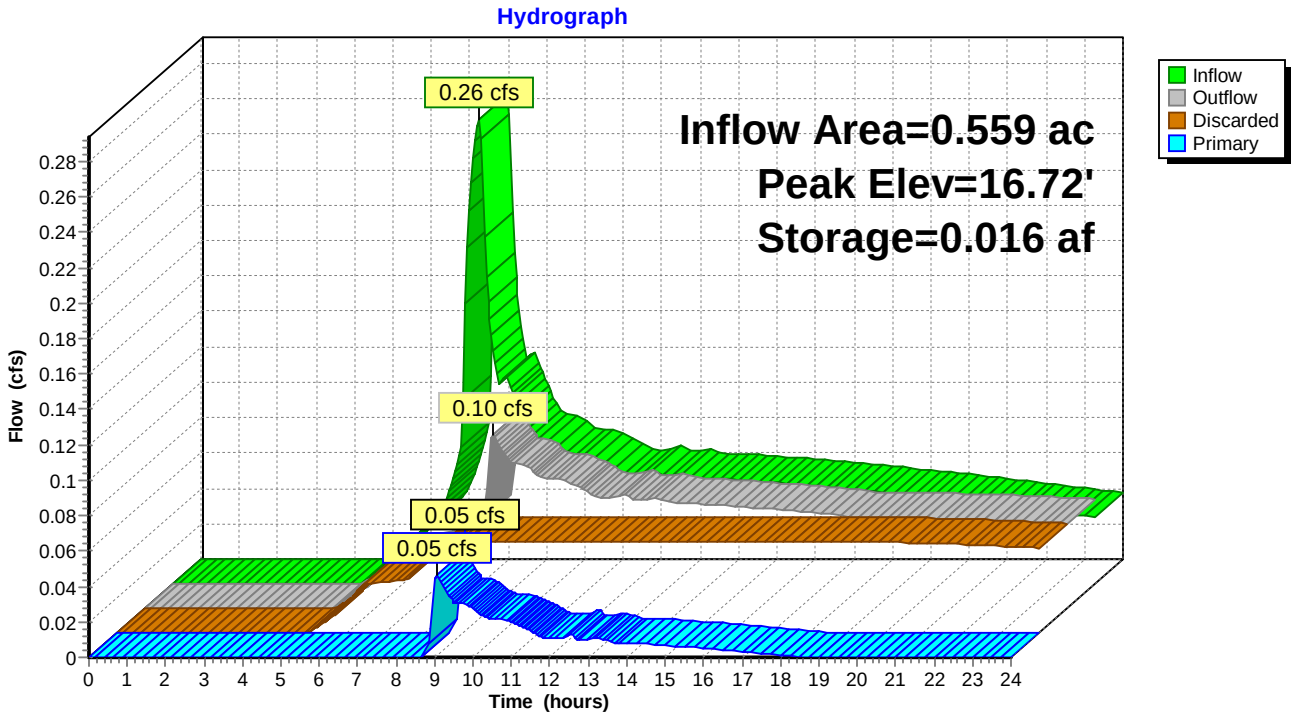
Volume	Invert	Avail.Storage	Storage Description
#1	15.00'	0.019 af	**3.00'W x 400.00'L x 2.00'H Prismatoid Z=0.2** 0.063 af Overall x 30.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 12.00'
#2	Primary	16.70'	**18.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 9.06 hrs HW=16.72' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.04 cfs @ 9.06 hrs HW=16.72' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.04 cfs @ 0.42 fps)

Pond 1P: Infiltration Ditch



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1 Runoff Area=0.559 ac 0.00% Impervious Runoff Depth>2.20"
Tc=5.0 min CN=75 Runoff=0.29 cfs 0.103 af

Subcatchment 2S: Drainage Area 2 Runoff Area=0.798 ac 83.33% Impervious Runoff Depth>4.23"
Tc=5.0 min CN=96 Runoff=0.87 cfs 0.281 af

Subcatchment 3S: Drainage Area 3 Runoff Area=0.441 ac 100.00% Impervious Runoff Depth>4.70"
Tc=5.0 min CN=100 Runoff=0.50 cfs 0.173 af

Pond 1P: Infiltration Ditch Peak Elev=16.72' Storage=0.016 af Inflow=0.29 cfs 0.103 af
Discarded=0.05 cfs 0.074 af Primary=0.07 cfs 0.015 af Outflow=0.13 cfs 0.089 af

Total Runoff Area = 1.798 ac Runoff Volume = 0.557 af Average Runoff Depth = 3.71"
38.49% Pervious = 0.692 ac 61.51% Impervious = 1.106 ac

Summary for Subcatchment 1S: Drainage Area 1

Landscaped area on steep slope east side of parcel. Gravel area on east side of SBR #2. Area drains to rock drainage ditch and overflows to IPS during heavy storms.

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

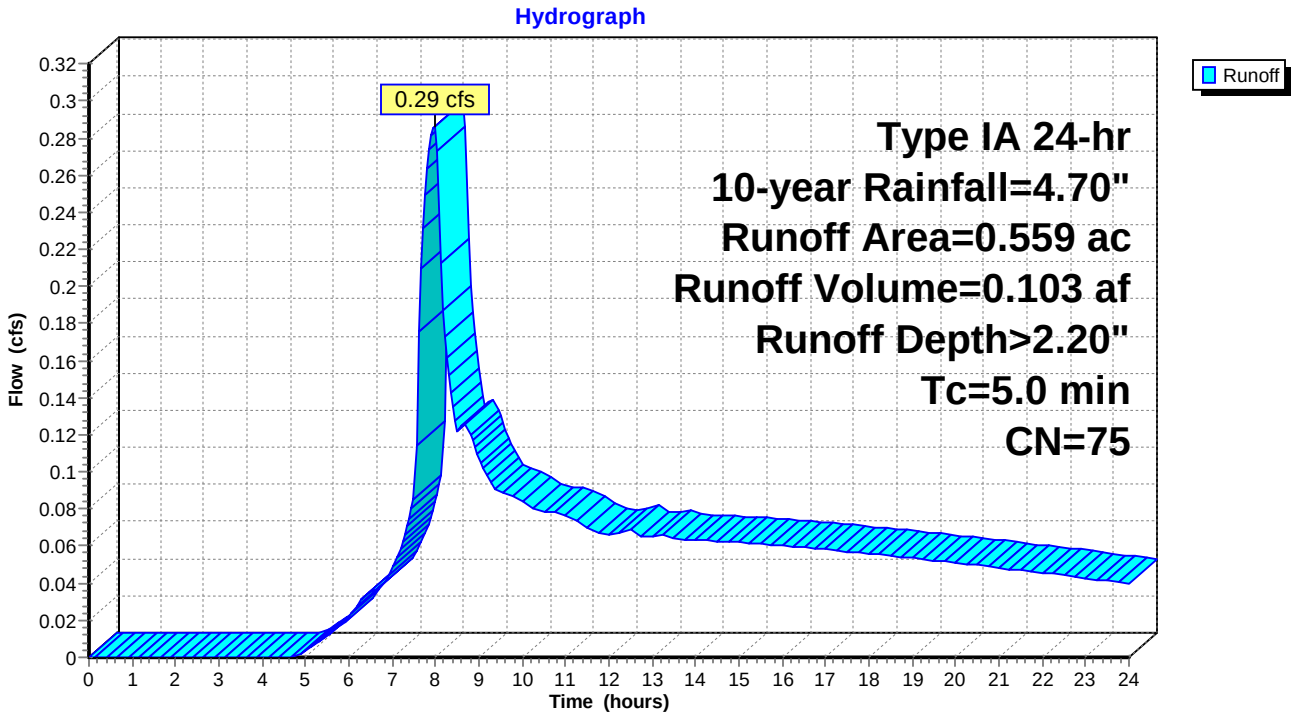
Runoff = 0.29 cfs @ 7.97 hrs, Volume= 0.103 af, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-year Rainfall=4.70"

	Area (ac)	CN	Description
	0.484	74	>75% Grass cover, Good, HSG C
*	0.075	85	Gravel Area
	0.559	75	Weighted Average
	0.559	75	100.00% Pervious Area

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

Subcatchment 1S: Drainage Area 1



Summary for Subcatchment 2S: Drainage Area 2

Pavement, gravel and roof surface runoff captured in catch basins and flowing to IPS.

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

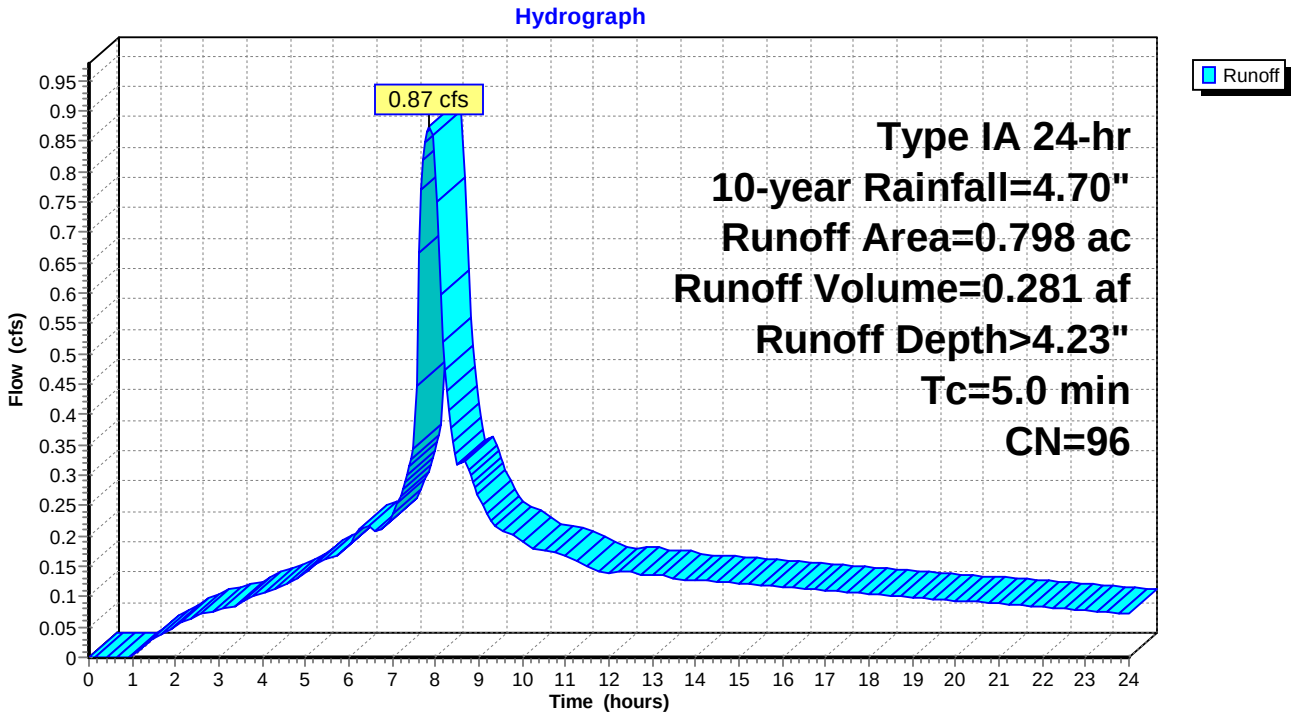
Runoff = 0.87 cfs @ 7.86 hrs, Volume= 0.281 af, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-year Rainfall=4.70"

	Area (ac)	CN	Description
*	0.133	85	Gravel Area
*	0.665	98	Pavement, buildings
	0.798	96	Weighted Average
	0.133	85	16.67% Pervious Area
	0.665	98	83.33% Impervious Area

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

Subcatchment 2S: Drainage Area 2



Summary for Subcatchment 3S: Drainage Area 3

Rainfall captured in open basin of SBR's.

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

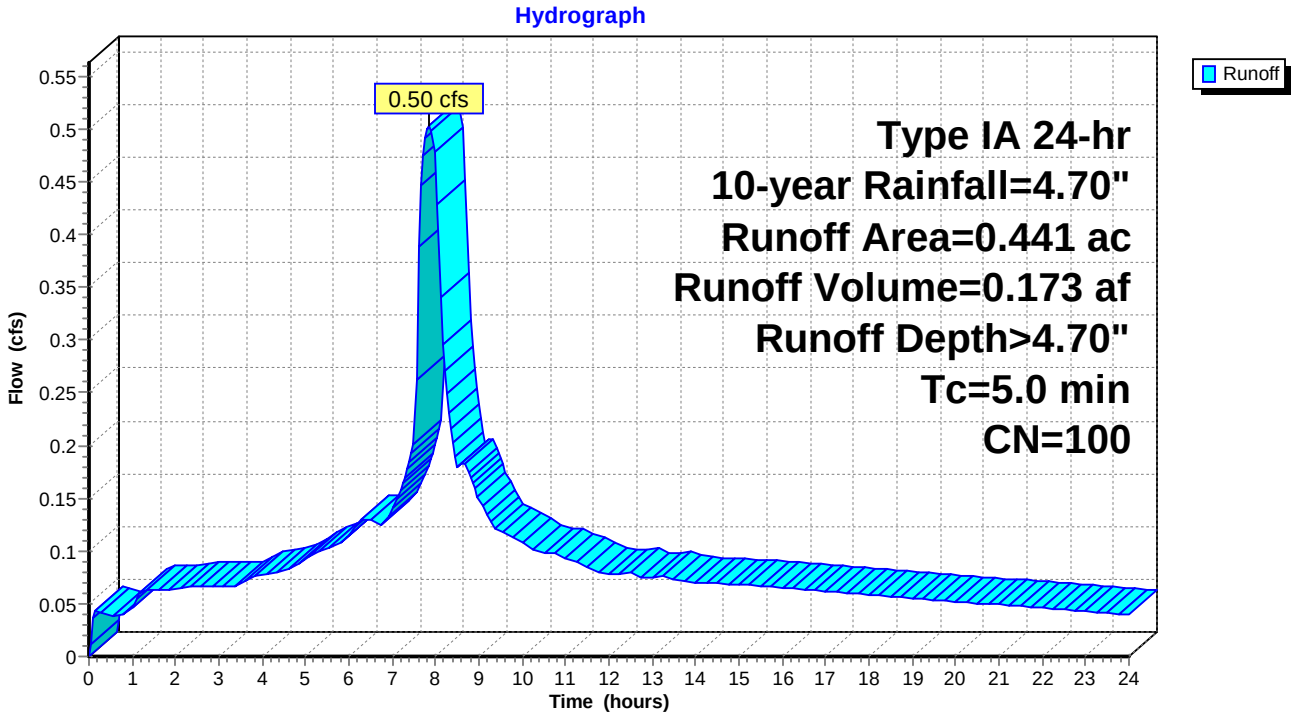
Runoff = 0.50 cfs @ 7.85 hrs, Volume= 0.173 af, Depth> 4.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-year Rainfall=4.70"

	Area (ac)	CN	Description
*	0.441	100	SBR - Open Surface
	0.441	100	100.00% Impervious Area

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

Subcatchment 3S: Drainage Area 3



Summary for Pond 1P: Infiltration Ditch

Infiltration ditch follows toe of slope infiltrates/stores/treats stormwater on site, catch basin at low point captures overflow. Storm pipe transports overflow to Influent Pump Station.

Inflow Area = 0.559 ac, 0.00% Impervious, Inflow Depth > 2.20" for 10-year event
Inflow = 0.29 cfs @ 7.97 hrs, Volume= 0.103 af
Outflow = 0.13 cfs @ 8.71 hrs, Volume= 0.089 af, Atten= 56%, Lag= 44.2 min
Discarded = 0.05 cfs @ 8.71 hrs, Volume= 0.074 af
Primary = 0.07 cfs @ 8.71 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 16.72' @ 8.71 hrs Surf.Area= 0.034 ac Storage= 0.016 af

Plug-Flow detention time= 151.6 min calculated for 0.089 af (86% of inflow)
Center-of-Mass det. time= 70.4 min (879.0 - 808.6)

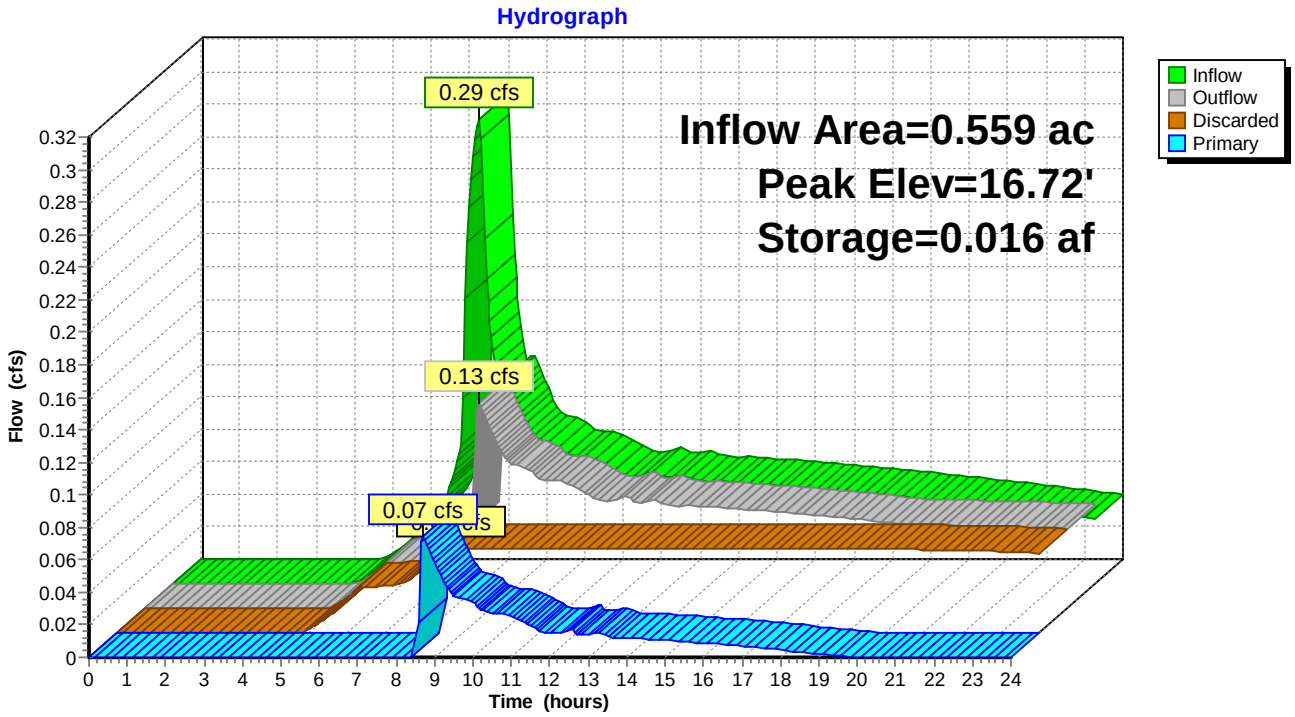
Volume	Invert	Avail.Storage	Storage Description
#1	15.00'	0.019 af	**3.00'W x 400.00'L x 2.00'H Prismatoid Z=0.2** 0.063 af Overall x 30.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 12.00'
#2	Primary	16.70'	**18.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 8.71 hrs HW=16.72' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.07 cfs @ 8.71 hrs HW=16.72' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.07 cfs @ 0.50 fps)

Pond 1P: Infiltration Ditch



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1 Runoff Area=0.559 ac 0.00% Impervious Runoff Depth>2.86"
Tc=5.0 min CN=75 Runoff=0.38 cfs 0.133 af

Subcatchment 2S: Drainage Area 2 Runoff Area=0.798 ac 83.33% Impervious Runoff Depth>5.02"
Tc=5.0 min CN=96 Runoff=1.03 cfs 0.334 af

Subcatchment 3S: Drainage Area 3 Runoff Area=0.441 ac 100.00% Impervious Runoff Depth>5.49"
Tc=5.0 min CN=100 Runoff=0.59 cfs 0.202 af

Pond 1P: Infiltration Ditch Peak Elev=16.76' Storage=0.016 af Inflow=0.38 cfs 0.133 af
Discarded=0.05 cfs 0.076 af Primary=0.31 cfs 0.041 af Outflow=0.36 cfs 0.117 af

Total Runoff Area = 1.798 ac Runoff Volume = 0.669 af Average Runoff Depth = 4.47"
38.49% Pervious = 0.692 ac 61.51% Impervious = 1.106 ac

Summary for Subcatchment 1S: Drainage Area 1

Landscaped area on steep slope east side of parcel. Gravel area on east side of SBR #2. Area drains to rock drainage ditch and overflows to IPS during heavy storms.

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

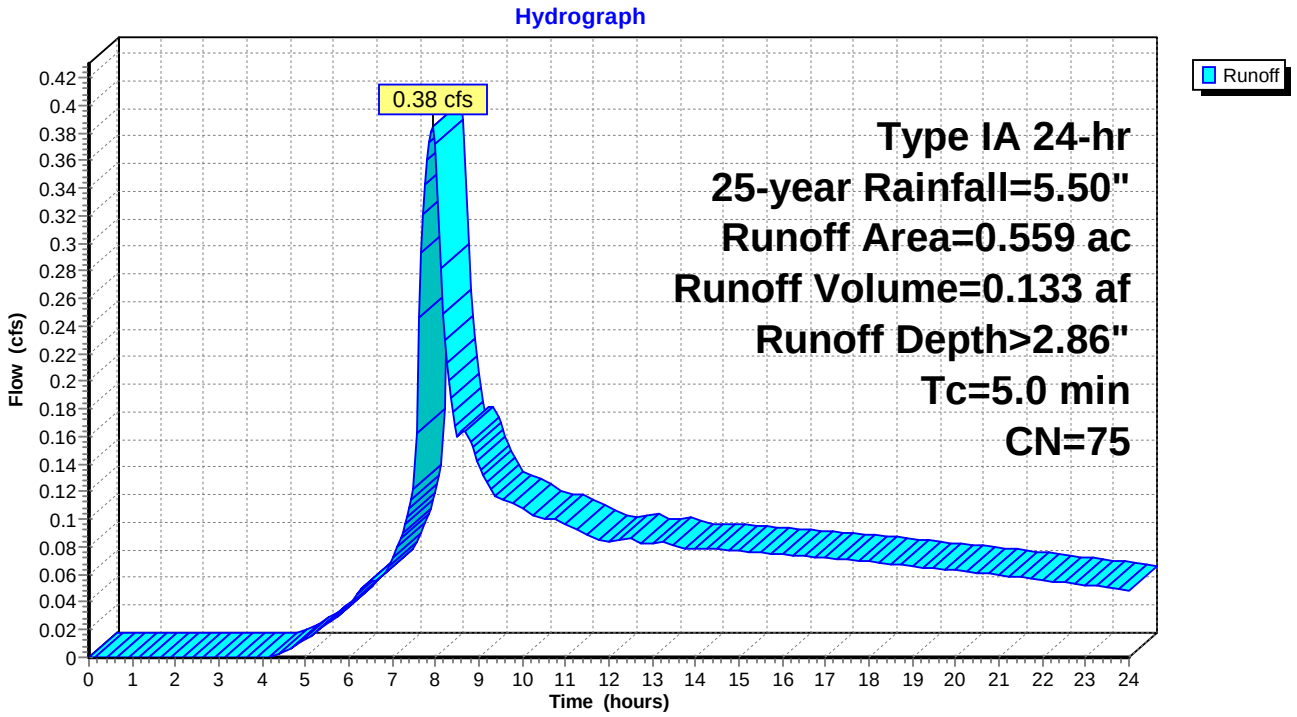
Runoff = 0.38 cfs @ 7.95 hrs, Volume= 0.133 af, Depth> 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-year Rainfall=5.50"

	Area (ac)	CN	Description
	0.484	74	>75% Grass cover, Good, HSG C
*	0.075	85	Gravel Area
	0.559	75	Weighted Average
	0.559	75	100.00% Pervious Area

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

Subcatchment 1S: Drainage Area 1



Summary for Subcatchment 2S: Drainage Area 2

Pavement, gravel and roof surface runoff captured in catch basins and flowing to IPS.

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

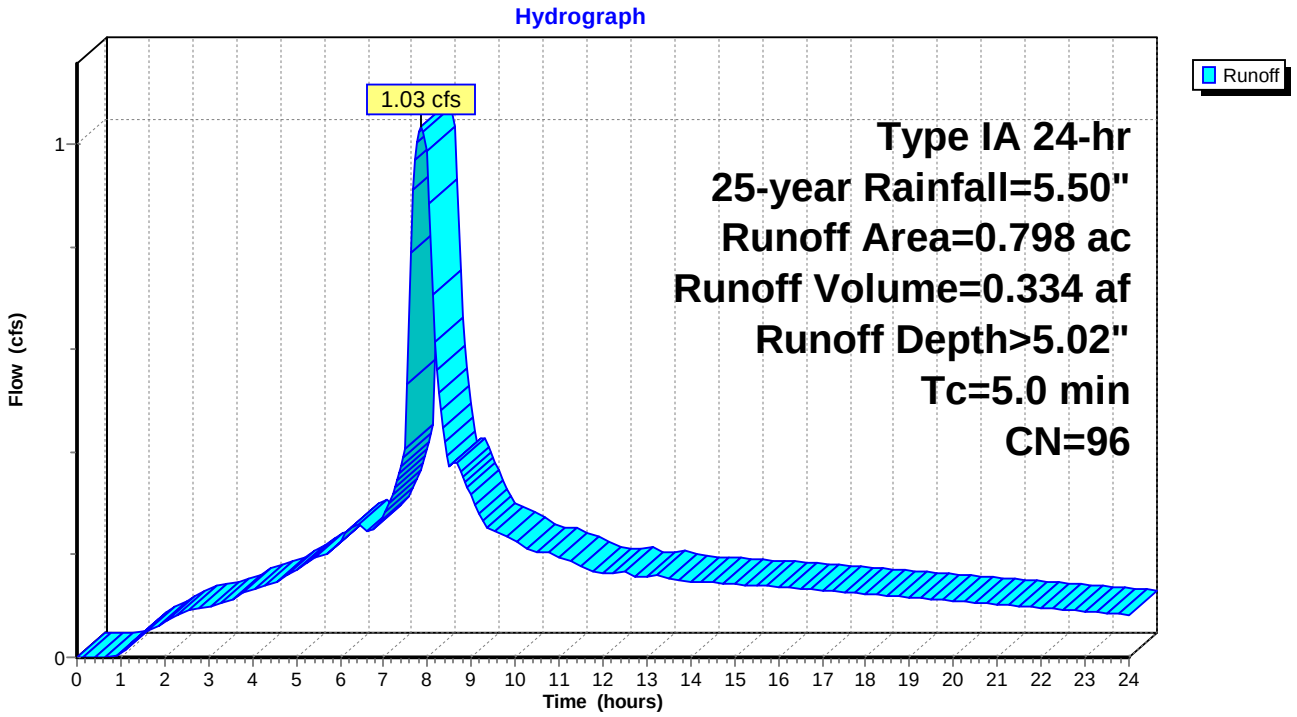
Runoff = 1.03 cfs @ 7.86 hrs, Volume= 0.334 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-year Rainfall=5.50"

	Area (ac)	CN	Description
*	0.133	85	Gravel Area
*	0.665	98	Pavement, buildings
	0.798	96	Weighted Average
	0.133	85	16.67% Pervious Area
	0.665	98	83.33% Impervious Area

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

Subcatchment 2S: Drainage Area 2



Summary for Subcatchment 3S: Drainage Area 3

Rainfall captured in open basin of SBR's.

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

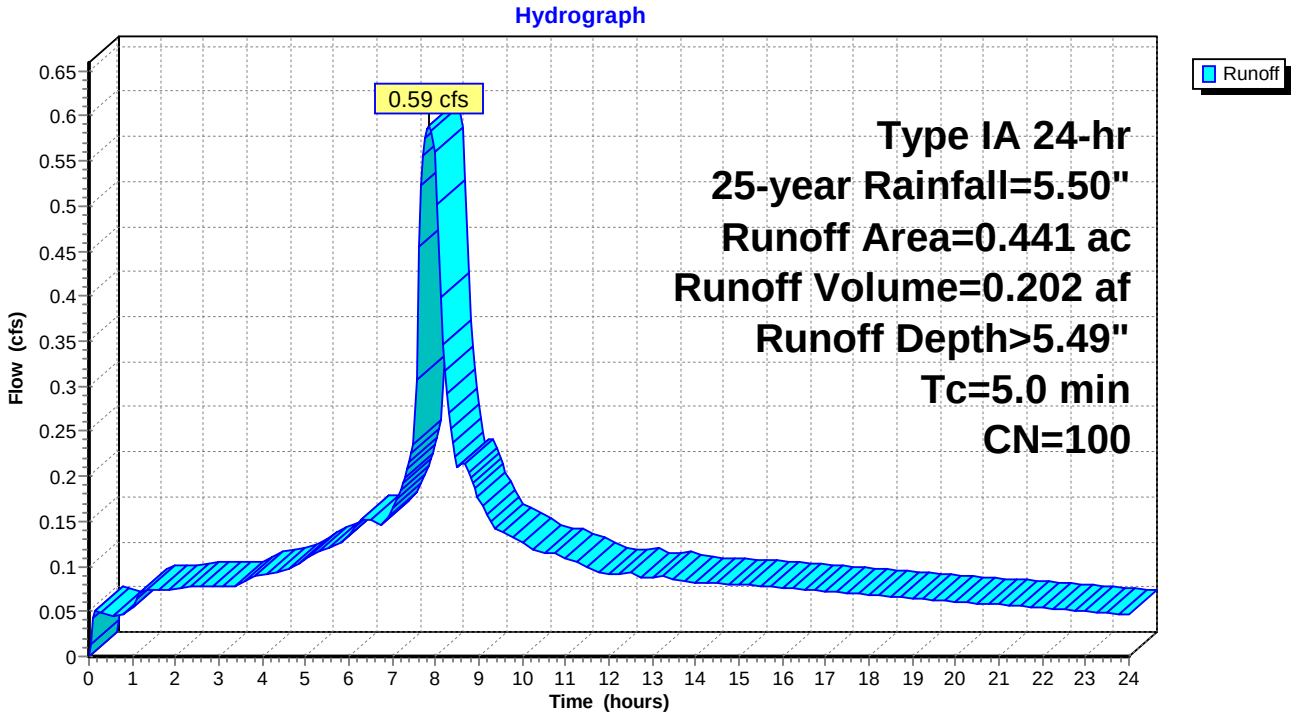
Runoff = 0.59 cfs @ 7.85 hrs, Volume= 0.202 af, Depth> 5.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-year Rainfall=5.50"

	Area (ac)	CN	Description
*	0.441	100	SBR - Open Surface
	0.441	100	100.00% Impervious Area

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

Subcatchment 3S: Drainage Area 3



Summary for Pond 1P: Infiltration Ditch

Infiltration ditch follows toe of slope infiltrates/stores/treats stormwater on site, catch basin at low point captures overflow. Storm pipe transports overflow to Influent Pump Station.

Inflow Area = 0.559 ac, 0.00% Impervious, Inflow Depth > 2.86" for 25-year event
Inflow = 0.38 cfs @ 7.95 hrs, Volume= 0.133 af
Outflow = 0.36 cfs @ 8.07 hrs, Volume= 0.117 af, Atten= 5%, Lag= 6.8 min
Discarded = 0.05 cfs @ 8.07 hrs, Volume= 0.076 af
Primary = 0.31 cfs @ 8.07 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 16.76' @ 8.07 hrs Surf.Area= 0.034 ac Storage= 0.016 af

Plug-Flow detention time= 119.3 min calculated for 0.117 af (88% of inflow)
Center-of-Mass det. time= 47.2 min (839.8 - 792.7)

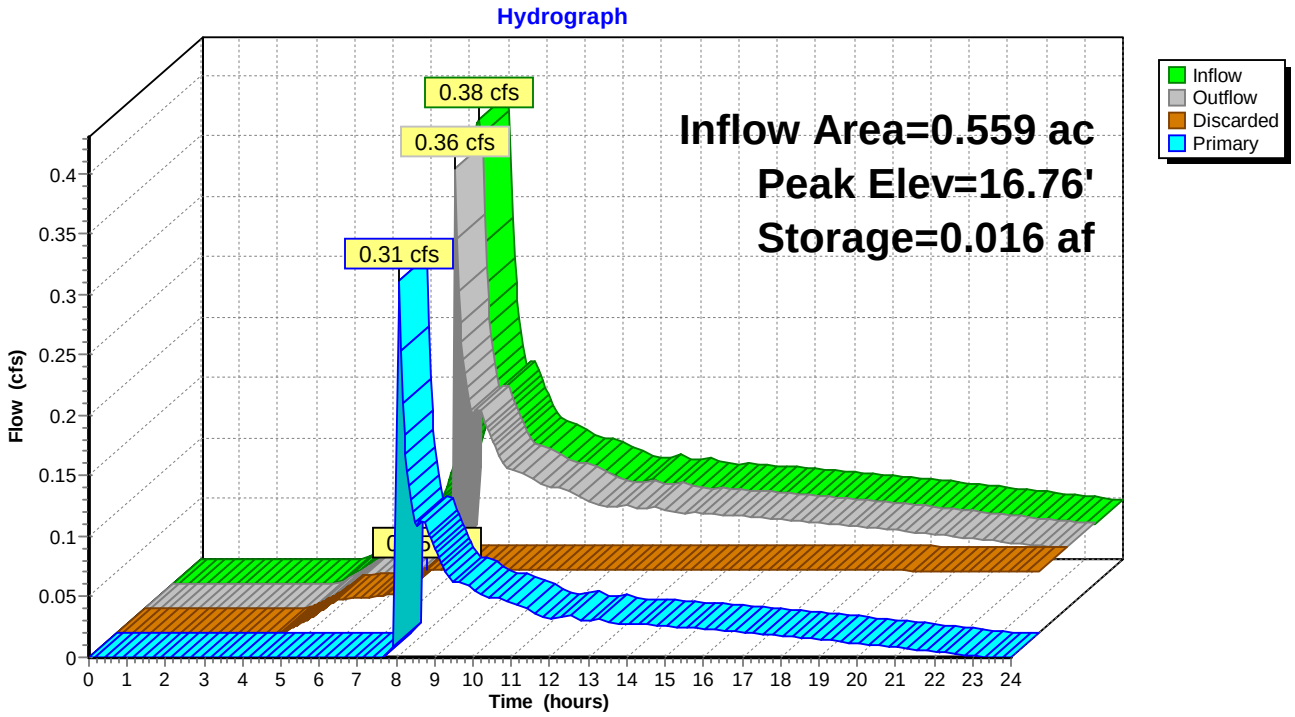
Volume	Invert	Avail.Storage	Storage Description
#1	15.00'	0.019 af	**3.00'W x 400.00'L x 2.00'H Prismatoid Z=0.2** 0.063 af Overall x 30.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 12.00'
#2	Primary	16.70'	**18.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 8.07 hrs HW=16.76' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.28 cfs @ 8.07 hrs HW=16.76' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.28 cfs @ 0.79 fps)

Pond 1P: Infiltration Ditch



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1 Runoff Area=0.559 ac 0.00% Impervious Runoff Depth>3.28"
Tc=5.0 min CN=75 Runoff=0.45 cfs 0.153 af

Subcatchment 2S: Drainage Area 2 Runoff Area=0.798 ac 83.33% Impervious Runoff Depth>5.52"
Tc=5.0 min CN=96 Runoff=1.13 cfs 0.367 af

Subcatchment 3S: Drainage Area 3 Runoff Area=0.441 ac 100.00% Impervious Runoff Depth>5.99"
Tc=5.0 min CN=100 Runoff=0.64 cfs 0.220 af

Pond 1P: Infiltration Ditch Peak Elev=16.77' Storage=0.016 af Inflow=0.45 cfs 0.153 af
Discarded=0.05 cfs 0.077 af Primary=0.40 cfs 0.060 af Outflow=0.46 cfs 0.137 af

Total Runoff Area = 1.798 ac Runoff Volume = 0.740 af Average Runoff Depth = 4.94"
38.49% Pervious = 0.692 ac 61.51% Impervious = 1.106 ac

Summary for Subcatchment 1S: Drainage Area 1

Landscaped area on steep slope east side of parcel. Gravel area on east side of SBR #2. Area drains to rock drainage ditch and overflows to IPS during heavy storms.

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

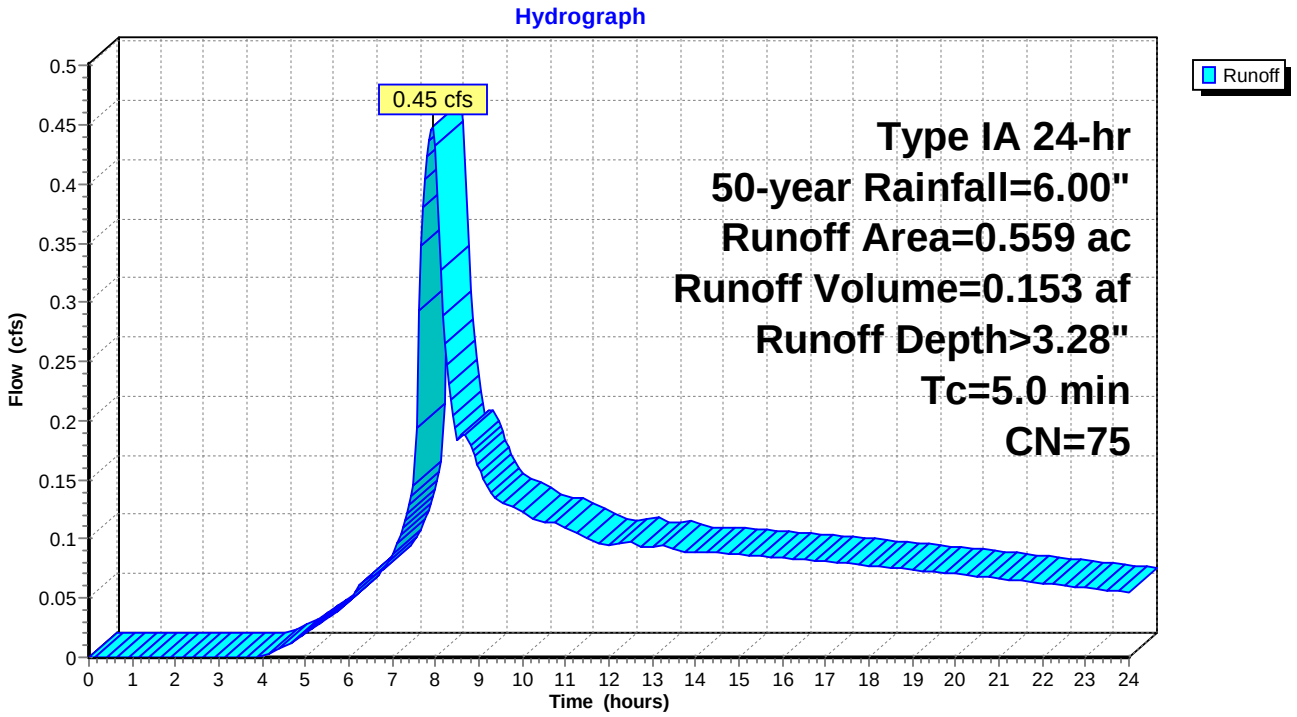
Runoff = 0.45 cfs @ 7.95 hrs, Volume= 0.153 af, Depth> 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50-year Rainfall=6.00"

	Area (ac)	CN	Description
	0.484	74	>75% Grass cover, Good, HSG C
*	0.075	85	Gravel Area
	0.559	75	Weighted Average
	0.559	75	100.00% Pervious Area

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

Subcatchment 1S: Drainage Area 1



Summary for Subcatchment 2S: Drainage Area 2

Pavement, gravel and roof surface runoff captured in catch basins and flowing to IPS.

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

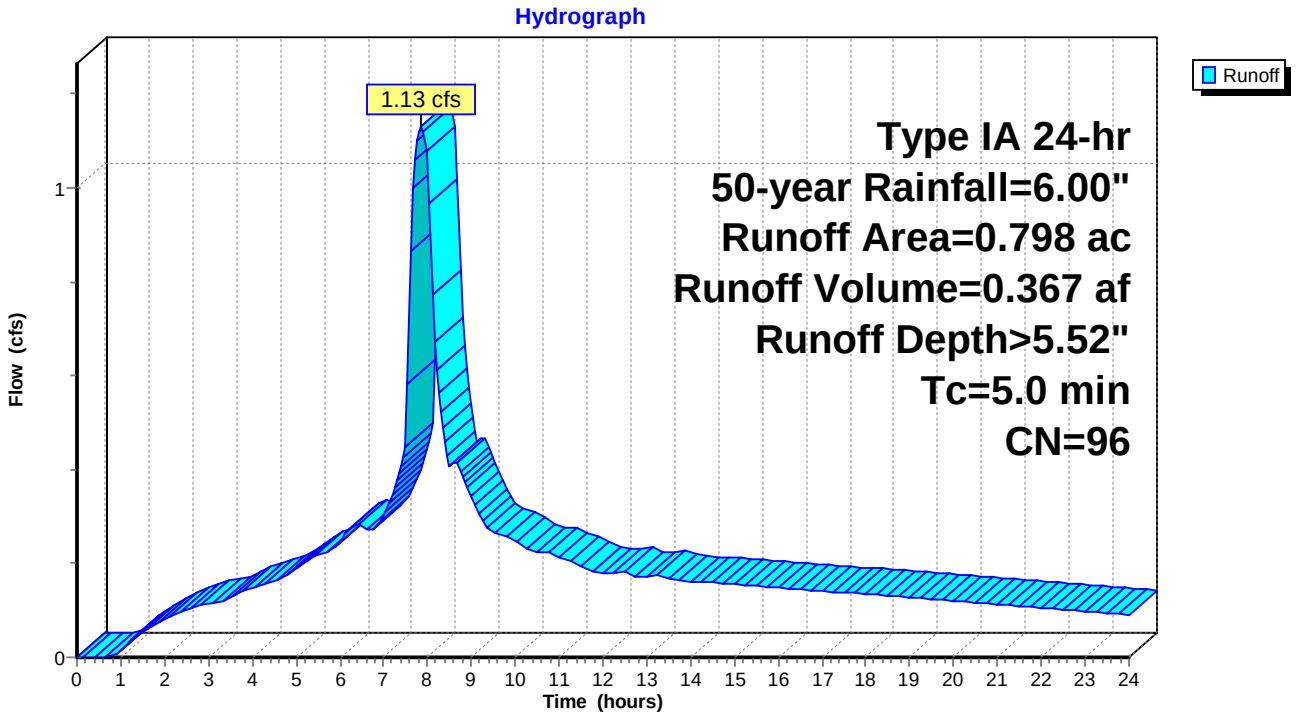
Runoff = 1.13 cfs @ 7.86 hrs, Volume= 0.367 af, Depth> 5.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50-year Rainfall=6.00"

	Area (ac)	CN	Description
*	0.133	85	Gravel Area
*	0.665	98	Pavement, buildings
	0.798	96	Weighted Average
	0.133	85	16.67% Pervious Area
	0.665	98	83.33% Impervious Area

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

Subcatchment 2S: Drainage Area 2



Summary for Subcatchment 3S: Drainage Area 3

Rainfall captured in open basin of SBR's.

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

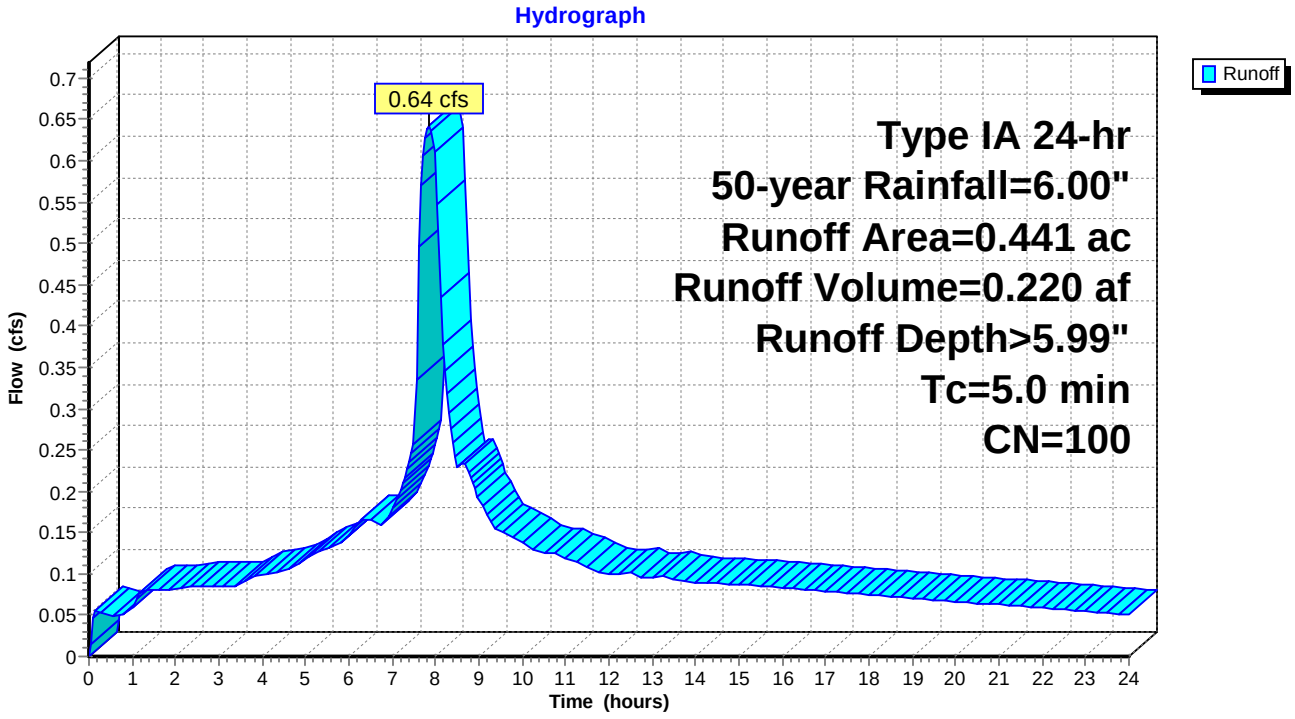
Runoff = 0.64 cfs @ 7.85 hrs, Volume= 0.220 af, Depth> 5.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50-year Rainfall=6.00"

	Area (ac)	CN	Description
*	0.441	100	SBR - Open Surface
	0.441	100	100.00% Impervious Area

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

Subcatchment 3S: Drainage Area 3



Summary for Pond 1P: Infiltration Ditch

Infiltration ditch follows toe of slope infiltrates/stores/treats stormwater on site, catch basin at low point captures overflow. Storm pipe transports overflow to Influent Pump Station.

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.559 ac, 0.00% Impervious, Inflow Depth > 3.28" for 50-year event
Inflow = 0.45 cfs @ 7.95 hrs, Volume= 0.153 af
Outflow = 0.46 cfs @ 7.97 hrs, Volume= 0.137 af, Atten= 0%, Lag= 1.7 min
Discarded = 0.05 cfs @ 7.95 hrs, Volume= 0.077 af
Primary = 0.40 cfs @ 7.97 hrs, Volume= 0.060 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 16.77' @ 7.95 hrs Surf.Area= 0.034 ac Storage= 0.016 af

Plug-Flow detention time= 103.7 min calculated for 0.137 af (90% of inflow)
Center-of-Mass det. time= 40.2 min (824.6 - 784.4)

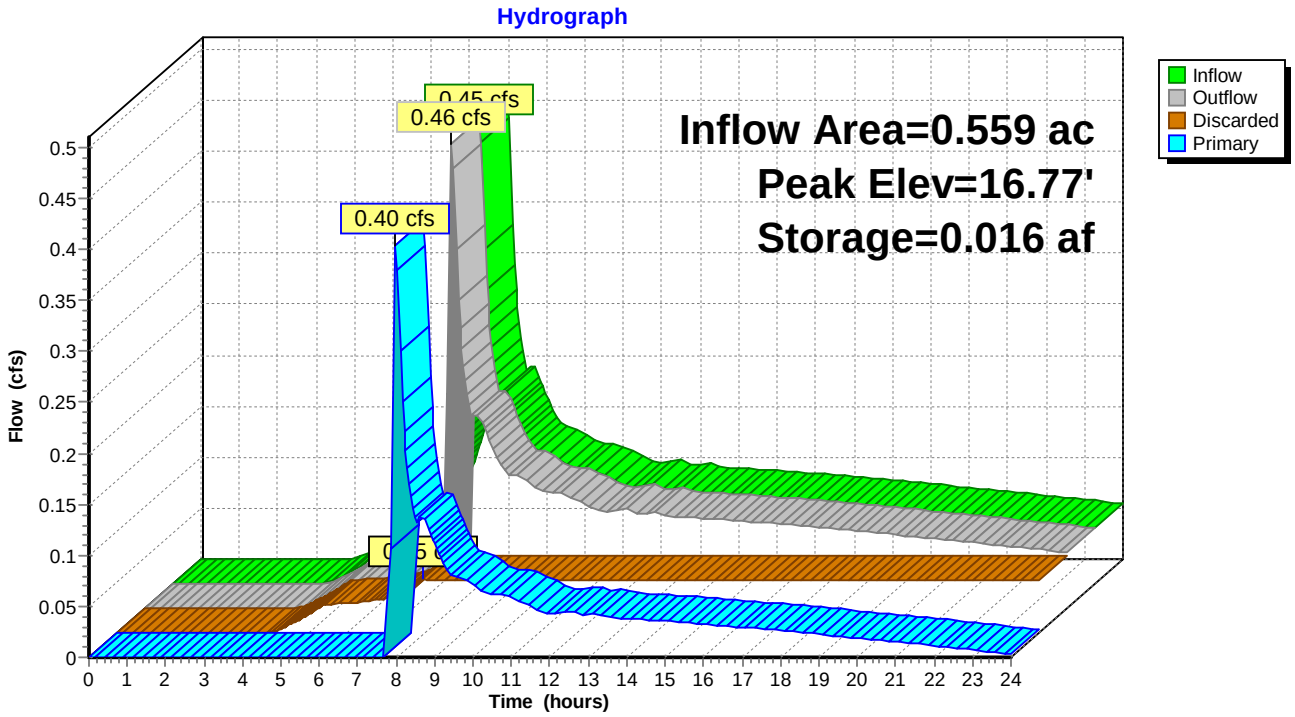
Volume	Invert	Avail.Storage	Storage Description
#1	15.00'	0.019 af	**3.00'W x 400.00'L x 2.00'H Prismatoid Z=0.2** 0.063 af Overall x 30.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 12.00'
#2	Primary	16.70'	**18.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 7.95 hrs HW=16.77' (Free Discharge)
1=Exfiltration (Controls 0.05 cfs)

Primary OutFlow Max=0.39 cfs @ 7.97 hrs HW=16.77' (Free Discharge)
2=Orifice/Grate (Weir Controls 0.39 cfs @ 0.89 fps)

Pond 1P: Infiltration Ditch



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1 Runoff Area=0.559 ac 0.00% Impervious Runoff Depth>3.71"
Tc=5.0 min CN=75 Runoff=0.51 cfs 0.173 af

Subcatchment 2S: Drainage Area 2 Runoff Area=0.798 ac 83.33% Impervious Runoff Depth>6.02"
Tc=5.0 min CN=96 Runoff=1.23 cfs 0.400 af

Subcatchment 3S: Drainage Area 3 Runoff Area=0.441 ac 100.00% Impervious Runoff Depth>6.49"
Tc=5.0 min CN=100 Runoff=0.70 cfs 0.239 af

Pond 1P: Infiltration Ditch Peak Elev=16.78' Storage=0.016 af Inflow=0.51 cfs 0.173 af
Discarded=0.05 cfs 0.078 af Primary=0.46 cfs 0.079 af Outflow=0.51 cfs 0.157 af

Total Runoff Area = 1.798 ac Runoff Volume = 0.812 af Average Runoff Depth = 5.42"
38.49% Pervious = 0.692 ac 61.51% Impervious = 1.106 ac

Summary for Subcatchment 1S: Drainage Area 1

Landscaped area on steep slope east side of parcel. Gravel area on east side of SBR #2. Area drains to rock drainage ditch and overflows to IPS during heavy storms.

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

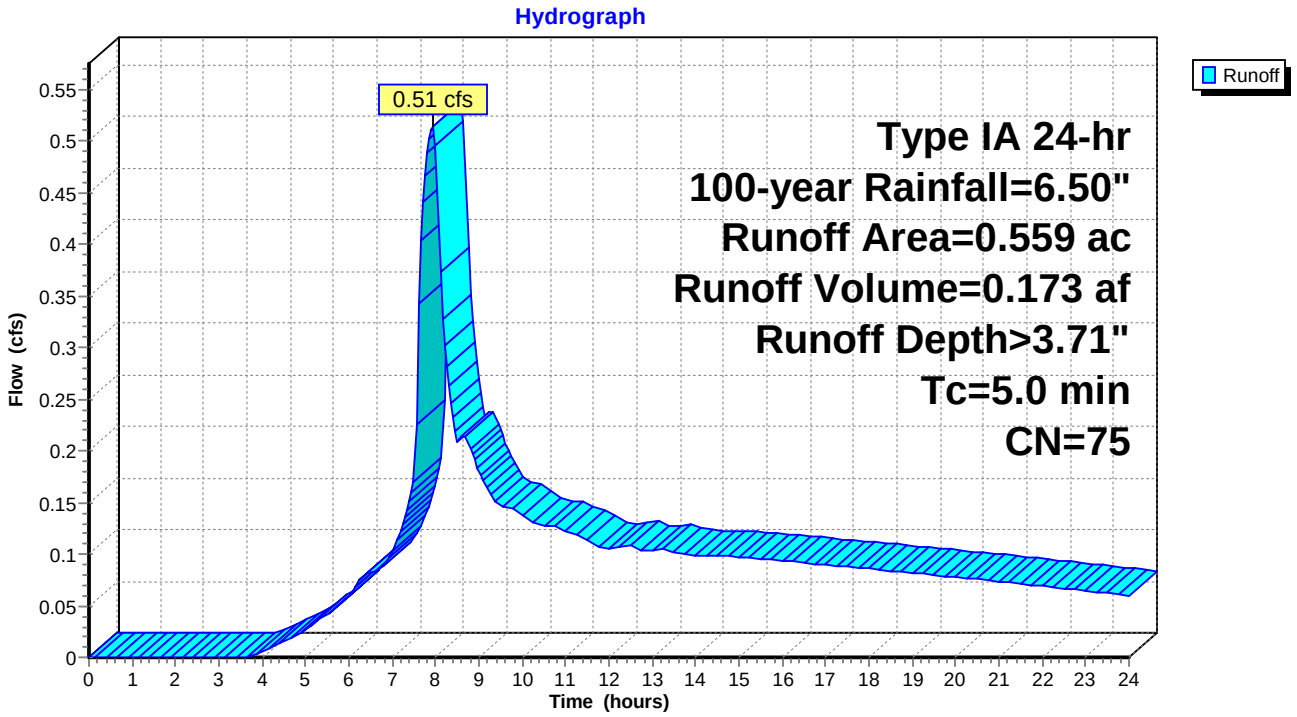
Runoff = 0.51 cfs @ 7.94 hrs, Volume= 0.173 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-year Rainfall=6.50"

	Area (ac)	CN	Description
	0.484	74	>75% Grass cover, Good, HSG C
*	0.075	85	Gravel Area
	0.559	75	Weighted Average
	0.559	75	100.00% Pervious Area

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

Subcatchment 1S: Drainage Area 1



Summary for Subcatchment 2S: Drainage Area 2

Pavement, gravel and roof surface runoff captured in catch basins and flowing to IPS.

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

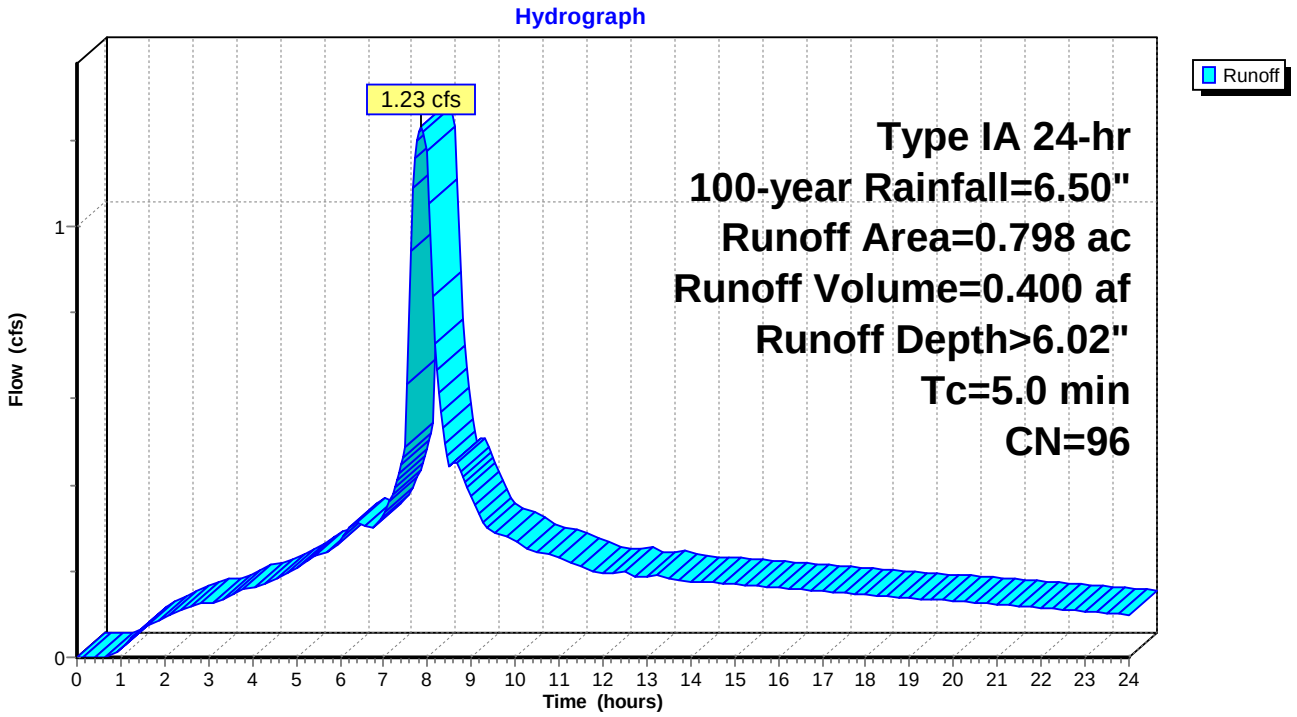
Runoff = 1.23 cfs @ 7.86 hrs, Volume= 0.400 af, Depth> 6.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-year Rainfall=6.50"

	Area (ac)	CN	Description
*	0.133	85	Gravel Area
*	0.665	98	Pavement, buildings
	0.798	96	Weighted Average
	0.133	85	16.67% Pervious Area
	0.665	98	83.33% Impervious Area

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

Subcatchment 2S: Drainage Area 2



Summary for Subcatchment 3S: Drainage Area 3

Rainfall captured in open basin of SBR's.

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

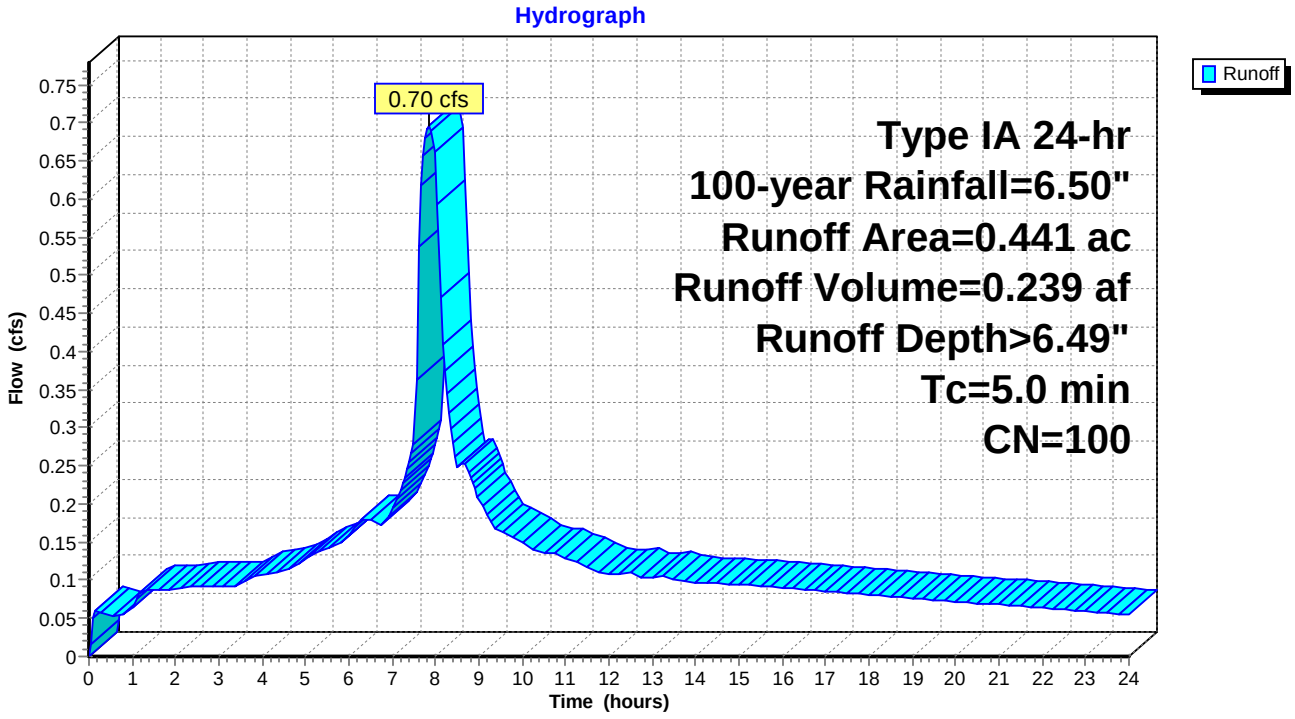
Runoff = 0.70 cfs @ 7.85 hrs, Volume= 0.239 af, Depth> 6.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-year Rainfall=6.50"

	Area (ac)	CN	Description
*	0.441	100	SBR - Open Surface
	0.441	100	100.00% Impervious Area

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

Subcatchment 3S: Drainage Area 3



Summary for Pond 1P: Infiltration Ditch

Infiltration ditch follows toe of slope infiltrates/stores/treats stormwater on site, catch basin at low point captures overflow. Storm pipe transports overflow to Influent Pump Station.

Inflow Area = 0.559 ac, 0.00% Impervious, Inflow Depth > 3.71" for 100-year event
Inflow = 0.51 cfs @ 7.94 hrs, Volume= 0.173 af
Outflow = 0.51 cfs @ 7.95 hrs, Volume= 0.157 af, Atten= 0%, Lag= 0.8 min
Discarded = 0.05 cfs @ 7.95 hrs, Volume= 0.078 af
Primary = 0.46 cfs @ 7.95 hrs, Volume= 0.079 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 16.78' @ 7.95 hrs Surf.Area= 0.034 ac Storage= 0.016 af

Plug-Flow detention time= 93.2 min calculated for 0.157 af (91% of inflow)
Center-of-Mass det. time= 35.9 min (813.0 - 777.1)

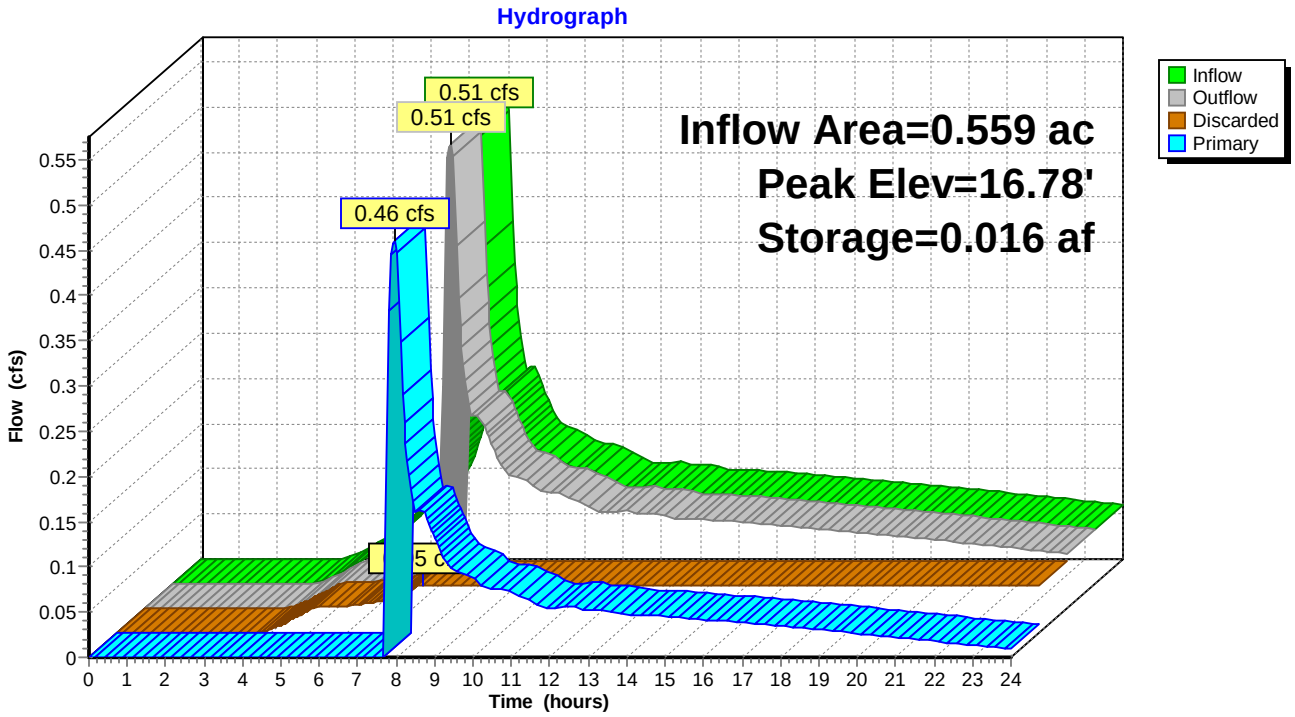
Volume	Invert	Avail.Storage	Storage Description
#1	15.00'	0.019 af	**3.00'W x 400.00'L x 2.00'H Prismatoid Z=0.2** 0.063 af Overall x 30.0% Voids

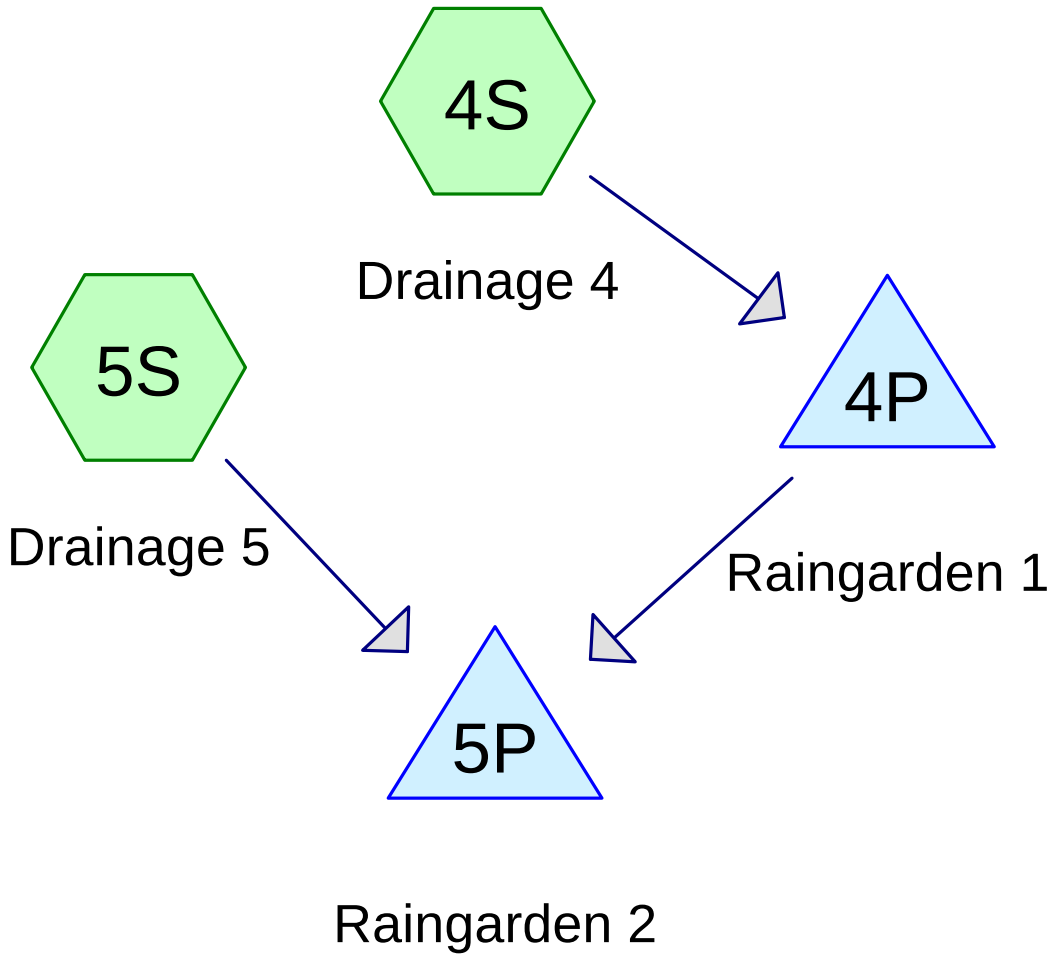
Device	Routing	Invert	Outlet Devices
#1	Discarded	15.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 12.00'
#2	Primary	16.70'	**18.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 7.95 hrs HW=16.78' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.46 cfs @ 7.95 hrs HW=16.78' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.46 cfs @ 0.94 fps)

Pond 1P: Infiltration Ditch





Subcat Reach Pond Link

Routing Diagram for 614018-WWTP2-4S-4P-5S-5P-Oct

Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net, Printed 11/5/2014

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.184	61	Landscaping (4S, 5S)
0.168	98	Pavement, buildings (4S, 5S)
0.352	**79**	**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: Drainage 4 Runoff Area=0.130 ac 62.31% Impervious Runoff Depth>1.93"
Tc=5.0 min CN=84 Runoff=0.06 cfs 0.021 af

Subcatchment 5S: Drainage 5 Runoff Area=0.222 ac 39.19% Impervious Runoff Depth>1.30"
Tc=5.0 min CN=75 Runoff=0.06 cfs 0.024 af

Pond 4P: Raingarden 1 Peak Elev=14.82' Storage=0.001 af Inflow=0.06 cfs 0.021 af
Discarded=0.00 cfs 0.004 af Primary=0.06 cfs 0.015 af Outflow=0.06 cfs 0.020 af

Pond 5P: Raingarden 2 Peak Elev=10.43' Storage=0.008 af Inflow=0.12 cfs 0.039 af
Discarded=0.03 cfs 0.035 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.035 af

Total Runoff Area = 0.352 ac Runoff Volume = 0.045 af Average Runoff Depth = 1.53"
52.27% Pervious = 0.184 ac 47.73% Impervious = 0.168 ac

Summary for Subcatchment 4S: Drainage 4

Office roof, sidewalk, landscaping, & pavement, draining to raingarden in landscaping. Portion of landscape located in right-of-way behind back of walk retained on site.

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

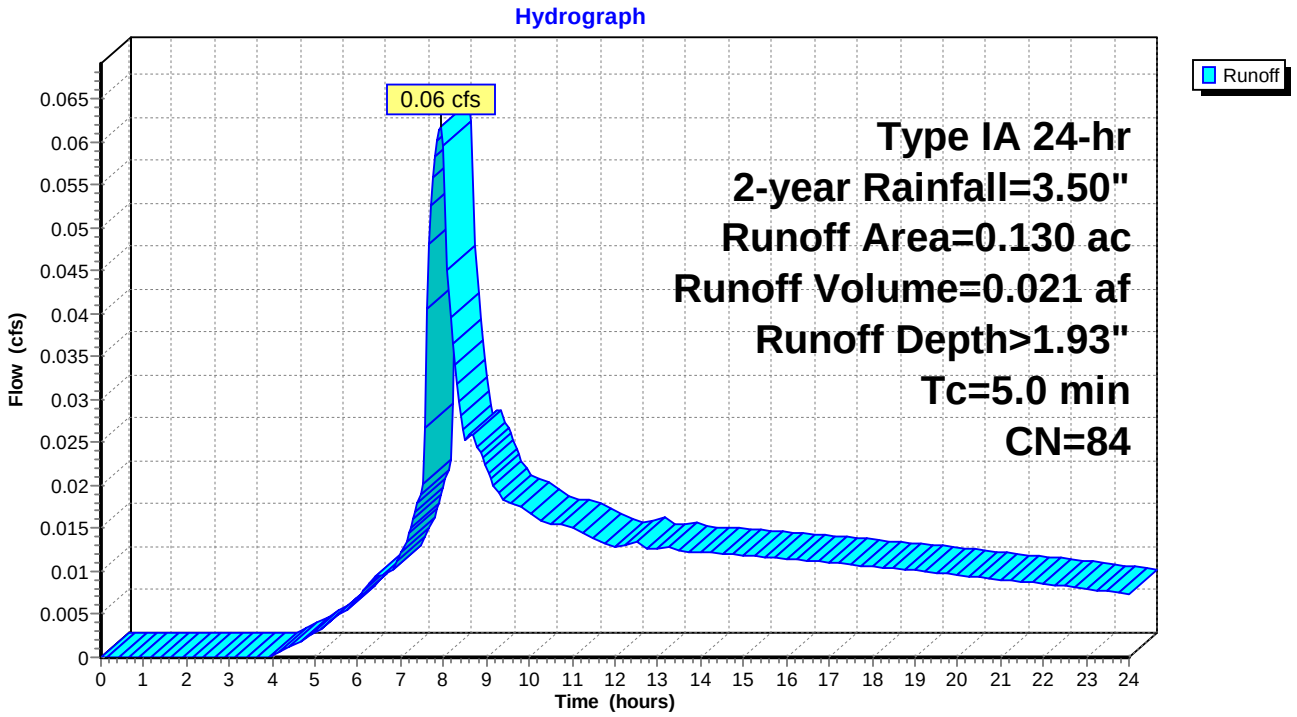
Runoff = 0.06 cfs @ 7.94 hrs, Volume= 0.021 af, Depth> 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-year Rainfall=3.50"

	Area (ac)	CN	Description
*	0.081	98	Pavement, buildings
*	0.049	61	Landscaping
	0.130	84	Weighted Average
	0.049	61	37.69% Pervious Area
	0.081	98	62.31% Impervious Area

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

Subcatchment 4S: Drainage 4



Summary for Subcatchment 5S: Drainage 5

Shop roof, driveway and landscape areas.

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

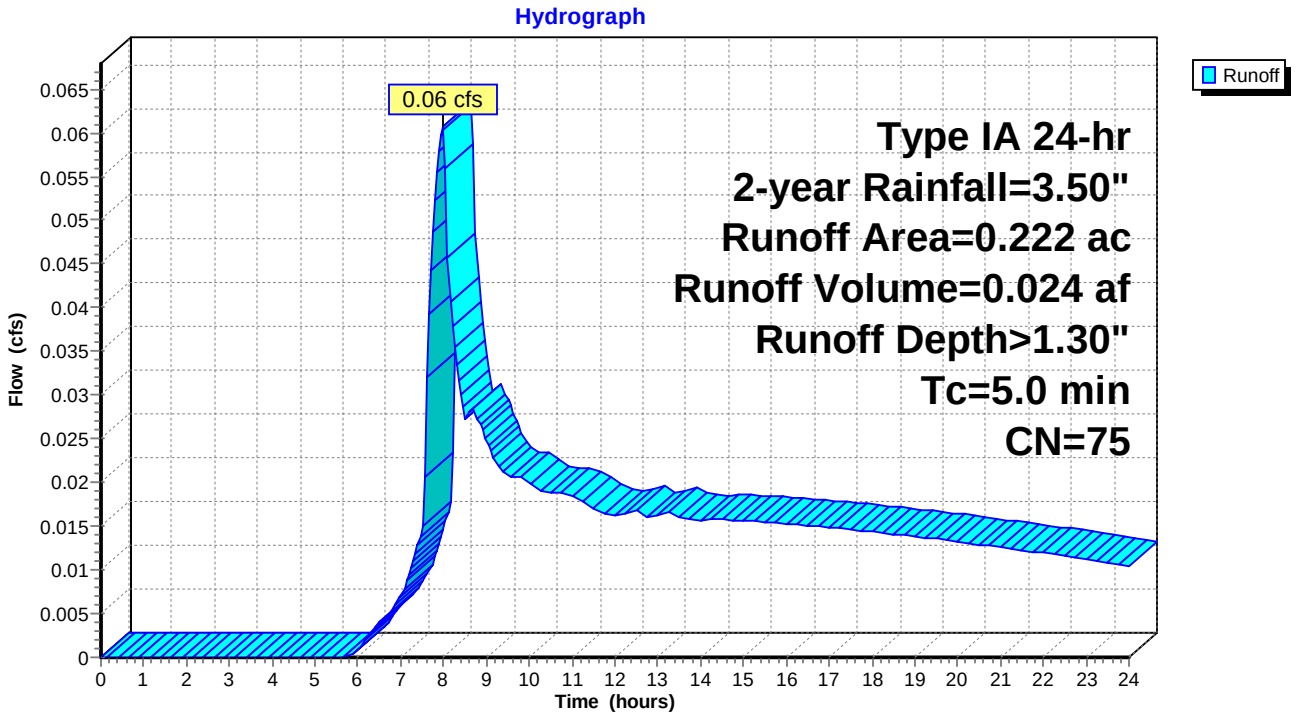
Runoff = 0.06 cfs @ 7.98 hrs, Volume= 0.024 af, Depth> 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-year Rainfall=3.50"

	Area (ac)	CN	Description
*	0.087	98	Pavement, buildings
*	0.135	61	Landscaping
	0.222	75	Weighted Average
	0.135	61	60.81% Pervious Area
	0.087	98	39.19% Impervious Area

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

Subcatchment 5S: Drainage 5



Summary for Pond 4P: Raingarden 1

Rrain garden in landscaping west of office. Collects from east driveway office roof and surfaces around the control bldg. Will be connected to overflow pipe to downstreem raingarden,

.

Inflow Area = 0.130 ac, 62.31% Impervious, Inflow Depth > 1.93" for 2-year event
Inflow = 0.06 cfs @ 7.94 hrs, Volume= 0.021 af
Outflow = 0.06 cfs @ 7.95 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.00 cfs @ 7.95 hrs, Volume= 0.004 af
Primary = 0.06 cfs @ 7.95 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 14.82' @ 7.95 hrs Surf.Area= 0.003 ac Storage= 0.001 af

Plug-Flow detention time= 62.2 min calculated for 0.020 af (94% of inflow)
Center-of-Mass det. time= 25.3 min (807.8 - 782.5)

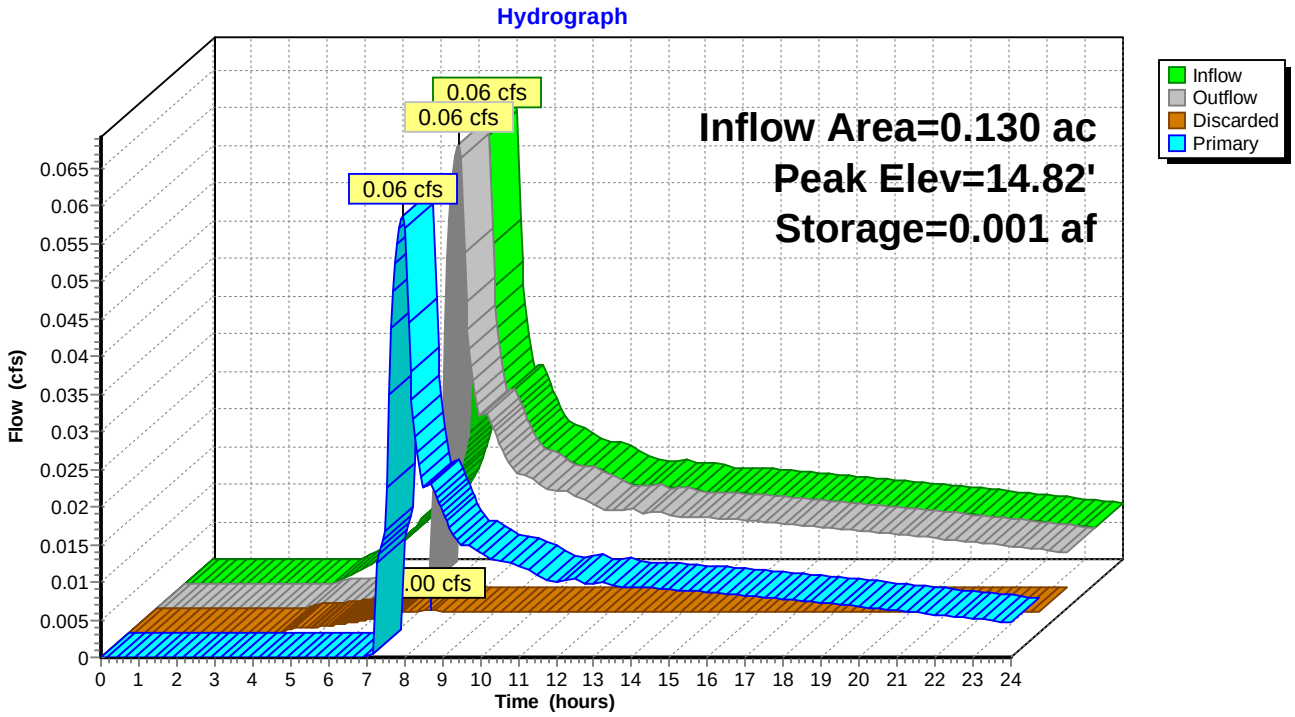
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	0.002 af	**2.00'W x 12.00'L x 1.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	14.80'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.00 cfs @ 7.95 hrs HW=14.82' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.06 cfs @ 7.95 hrs HW=14.82' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.06 cfs @ 0.49 fps)

Pond 4P: Raingarden 1



Summary for Pond 5P: Raingarden 2

Raingarden located in lanscaped area on SW corner of parcel.

Inflow Area = 0.352 ac, 47.73% Impervious, Inflow Depth > 1.34" for 2-year event
Inflow = 0.12 cfs @ 7.98 hrs, Volume= 0.039 af
Outflow = 0.03 cfs @ 12.64 hrs, Volume= 0.035 af, Atten= 78%, Lag= 279.8 min
Discarded = 0.03 cfs @ 12.64 hrs, Volume= 0.035 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 10.43' @ 12.64 hrs Surf.Area= 0.022 ac Storage= 0.008 af

Plug-Flow detention time= 185.5 min calculated for 0.035 af (88% of inflow)
Center-of-Mass det. time= 114.1 min (934.0 - 820.0)

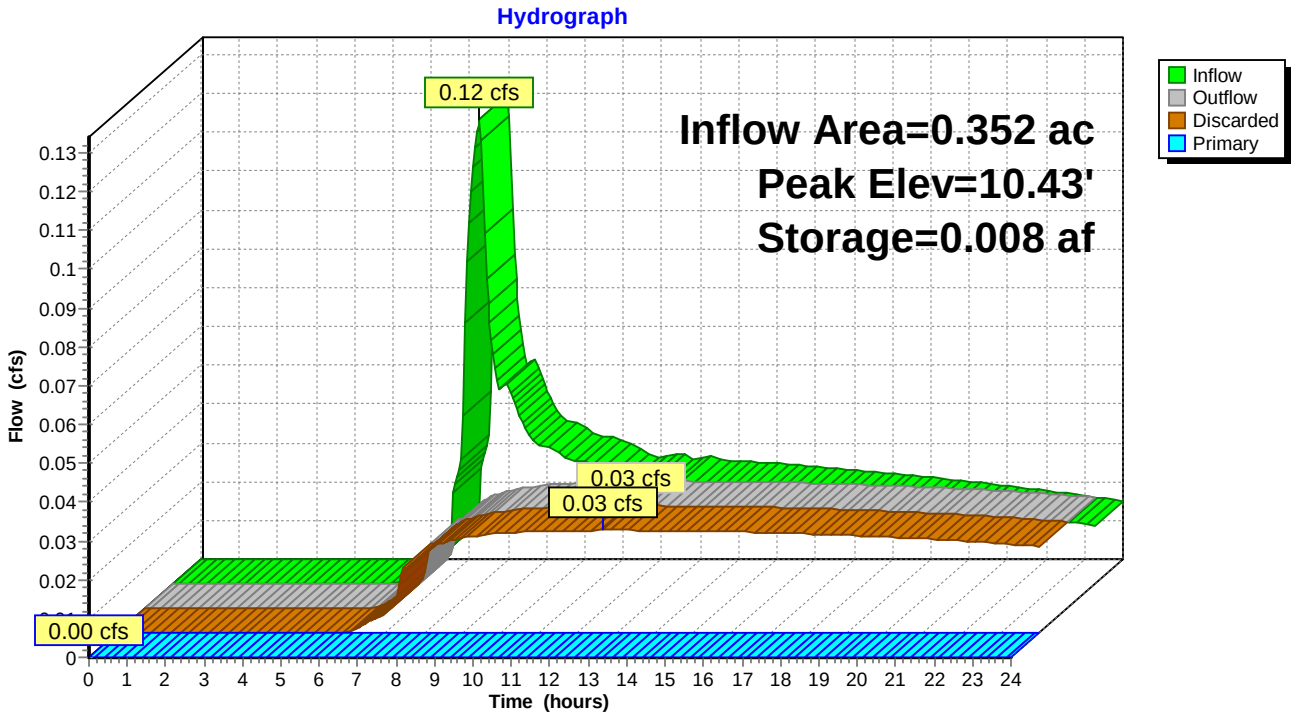
Volume	Invert	Avail.Storage	Storage Description
#1	10.00'	0.069 af	**14.00'W x 50.00'L x 2.10'H Prismatoid Z=4.5**

Device	Routing	Invert	Outlet Devices
#1	Discarded	10.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	12.00'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 12.64 hrs HW=10.43' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Raingarden 2



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: Drainage 4 Runoff Area=0.130 ac 62.31% Impervious Runoff Depth>2.81"
Tc=5.0 min CN=84 Runoff=0.09 cfs 0.030 af

Subcatchment 5S: Drainage 5 Runoff Area=0.222 ac 39.19% Impervious Runoff Depth>2.05"
Tc=5.0 min CN=75 Runoff=0.10 cfs 0.038 af

Pond 4P: Raingarden 1 Peak Elev=14.83' Storage=0.001 af Inflow=0.09 cfs 0.030 af
Discarded=0.00 cfs 0.005 af Primary=0.09 cfs 0.025 af Outflow=0.09 cfs 0.029 af

Pond 5P: Raingarden 2 Peak Elev=10.80' Storage=0.017 af Inflow=0.19 cfs 0.063 af
Discarded=0.04 cfs 0.049 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.049 af

Total Runoff Area = 0.352 ac Runoff Volume = 0.068 af Average Runoff Depth = 2.33"
52.27% Pervious = 0.184 ac 47.73% Impervious = 0.168 ac

Summary for Subcatchment 4S: Drainage 4

Office roof, sidewalk, landscaping, & pavement, draining to raingarden in landscaping. Portion of landscape located in right-of-way behind back of walk retained on site.

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

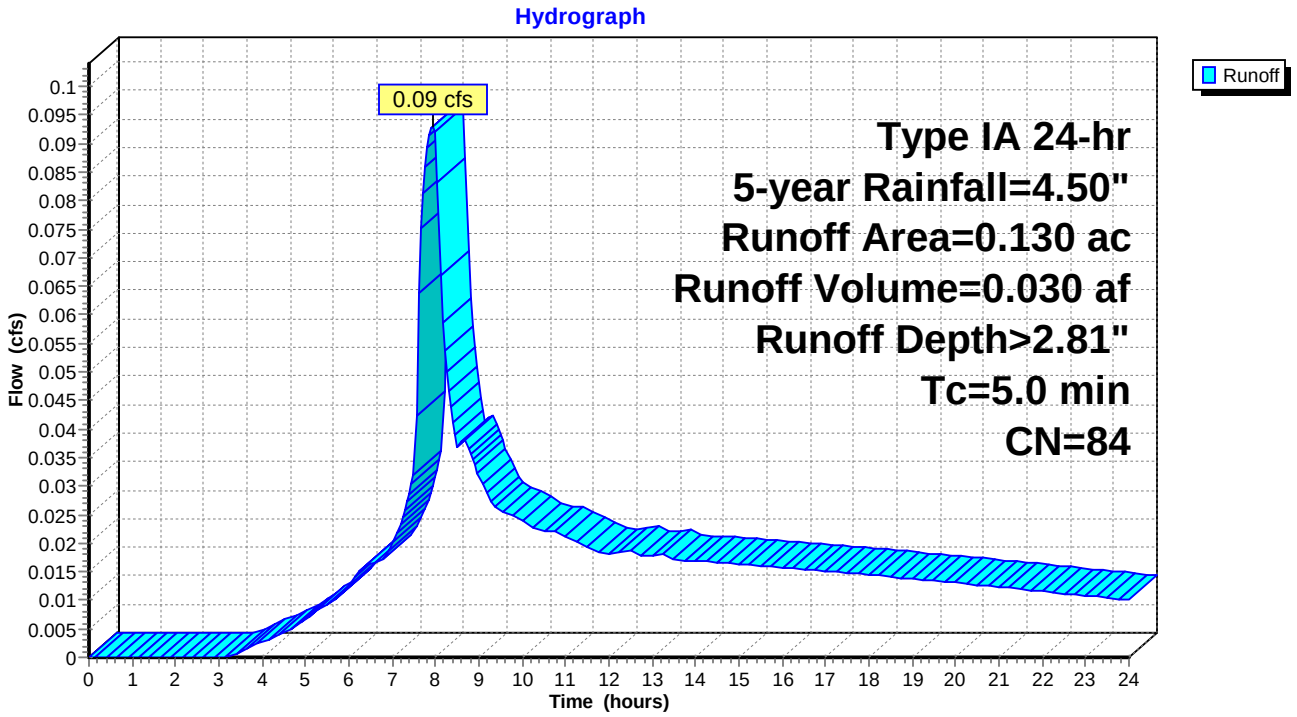
Runoff = 0.09 cfs @ 7.93 hrs, Volume= 0.030 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5-year Rainfall=4.50"

	Area (ac)	CN	Description
*	0.081	98	Pavement, buildings
*	0.049	61	Landscaping
	0.130	84	Weighted Average
	0.049	61	37.69% Pervious Area
	0.081	98	62.31% Impervious Area

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

Subcatchment 4S: Drainage 4



Summary for Subcatchment 5S: Drainage 5

Shop roof, driveway and landscape areas.

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

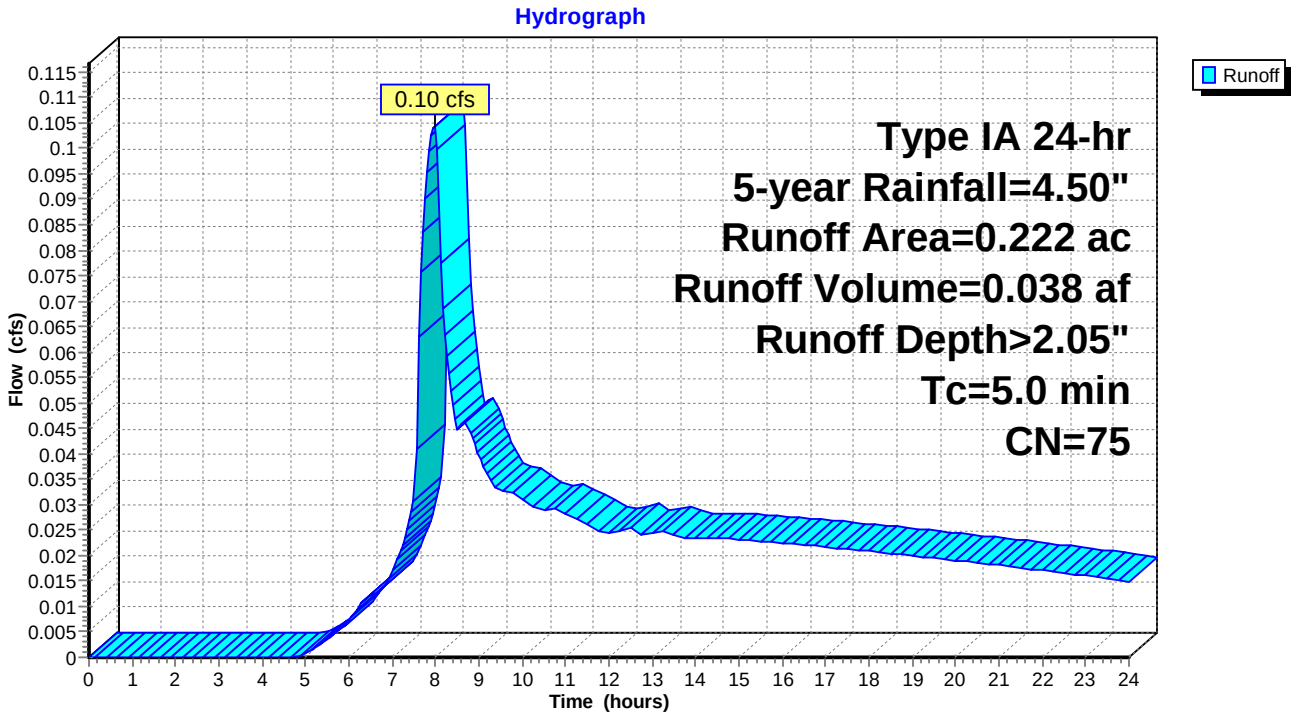
Runoff = 0.10 cfs @ 7.97 hrs, Volume= 0.038 af, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5-year Rainfall=4.50"

	Area (ac)	CN	Description
*	0.087	98	Pavement, buildings
*	0.135	61	Landscaping
	0.222	75	Weighted Average
	0.135	61	60.81% Pervious Area
	0.087	98	39.19% Impervious Area

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

Subcatchment 5S: Drainage 5



Summary for Pond 4P: Raingarden 1

Rrain garden in landscaping west of office. Collects from east driveway office roof and surfaces around the control bldg. Will be connected to overflow pipe to downstreem raingarden,

.

Inflow Area = 0.130 ac, 62.31% Impervious, Inflow Depth > 2.81" for 5-year event
Inflow = 0.09 cfs @ 7.93 hrs, Volume= 0.030 af
Outflow = 0.09 cfs @ 7.93 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.00 cfs @ 7.93 hrs, Volume= 0.005 af
Primary = 0.09 cfs @ 7.93 hrs, Volume= 0.025 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 14.83' @ 7.93 hrs Surf.Area= 0.003 ac Storage= 0.001 af

Plug-Flow detention time= 45.1 min calculated for 0.029 af (96% of inflow)
Center-of-Mass det. time= 18.6 min (779.4 - 760.8)

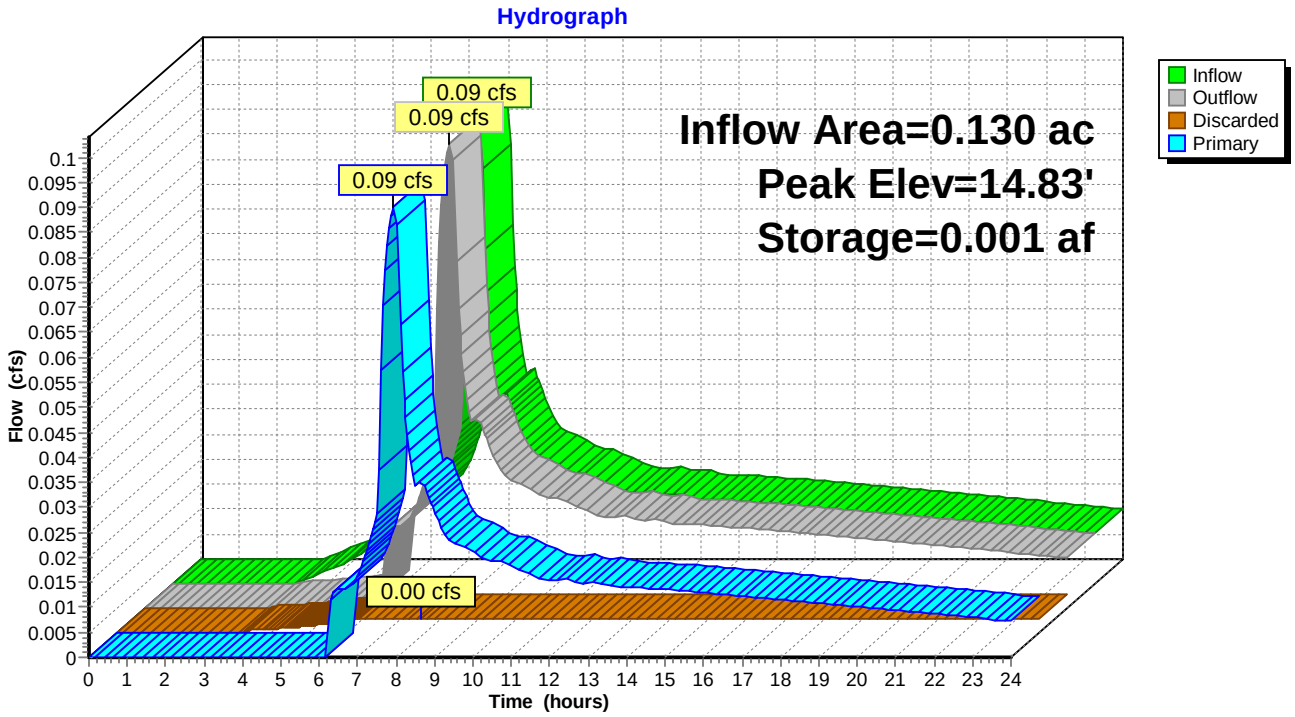
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	0.002 af	**2.00'W x 12.00'L x 1.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	14.80'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.00 cfs @ 7.93 hrs HW=14.83' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.09 cfs @ 7.93 hrs HW=14.83' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.09 cfs @ 0.56 fps)

Pond 4P: Raingarden 1



Summary for Pond 5P: Raingarden 2

Raingarden located in lanscaped area on SW corner of parcel.

Inflow Area = 0.352 ac, 47.73% Impervious, Inflow Depth > 2.13" for 5-year event
Inflow = 0.19 cfs @ 7.96 hrs, Volume= 0.063 af
Outflow = 0.04 cfs @ 15.10 hrs, Volume= 0.049 af, Atten= 81%, Lag= 428.7 min
Discarded = 0.04 cfs @ 15.10 hrs, Volume= 0.049 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 10.80' @ 15.10 hrs Surf.Area= 0.028 ac Storage= 0.017 af

Plug-Flow detention time= 262.4 min calculated for 0.049 af (78% of inflow)
Center-of-Mass det. time= 136.9 min (930.7 - 793.8)

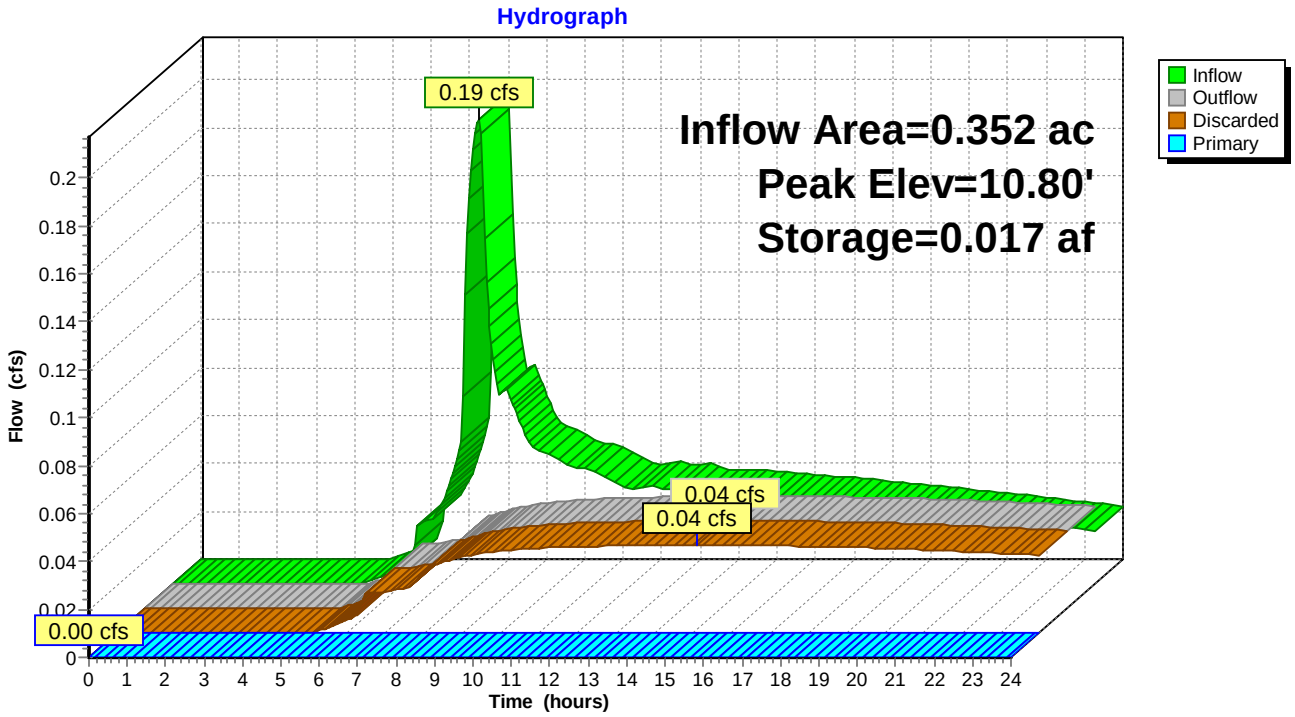
Volume	Invert	Avail.Storage	Storage Description
#1	10.00'	0.069 af	**14.00'W x 50.00'L x 2.10'H Prismatoid Z=4.5**

Device	Routing	Invert	Outlet Devices
#1	Discarded	10.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	12.00'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 15.10 hrs HW=10.80' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Raingarden 2



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: Drainage 4 Runoff Area=0.130 ac 62.31% Impervious Runoff Depth>2.99"
Tc=5.0 min CN=84 Runoff=0.10 cfs 0.032 af

Subcatchment 5S: Drainage 5 Runoff Area=0.222 ac 39.19% Impervious Runoff Depth>2.20"
Tc=5.0 min CN=75 Runoff=0.11 cfs 0.041 af

Pond 4P: Raingarden 1 Peak Elev=14.83' Storage=0.001 af Inflow=0.10 cfs 0.032 af
Discarded=0.00 cfs 0.005 af Primary=0.10 cfs 0.027 af Outflow=0.10 cfs 0.031 af

Pond 5P: Raingarden 2 Peak Elev=10.87' Storage=0.019 af Inflow=0.21 cfs 0.067 af
Discarded=0.04 cfs 0.052 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.052 af

Total Runoff Area = 0.352 ac Runoff Volume = 0.073 af Average Runoff Depth = 2.50"
52.27% Pervious = 0.184 ac 47.73% Impervious = 0.168 ac

Summary for Subcatchment 4S: Drainage 4

Office roof, sidewalk, landscaping, & pavement, draining to raingarden in landscaping. Portion of landscape located in right-of-way behind back of walk retained on site.

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

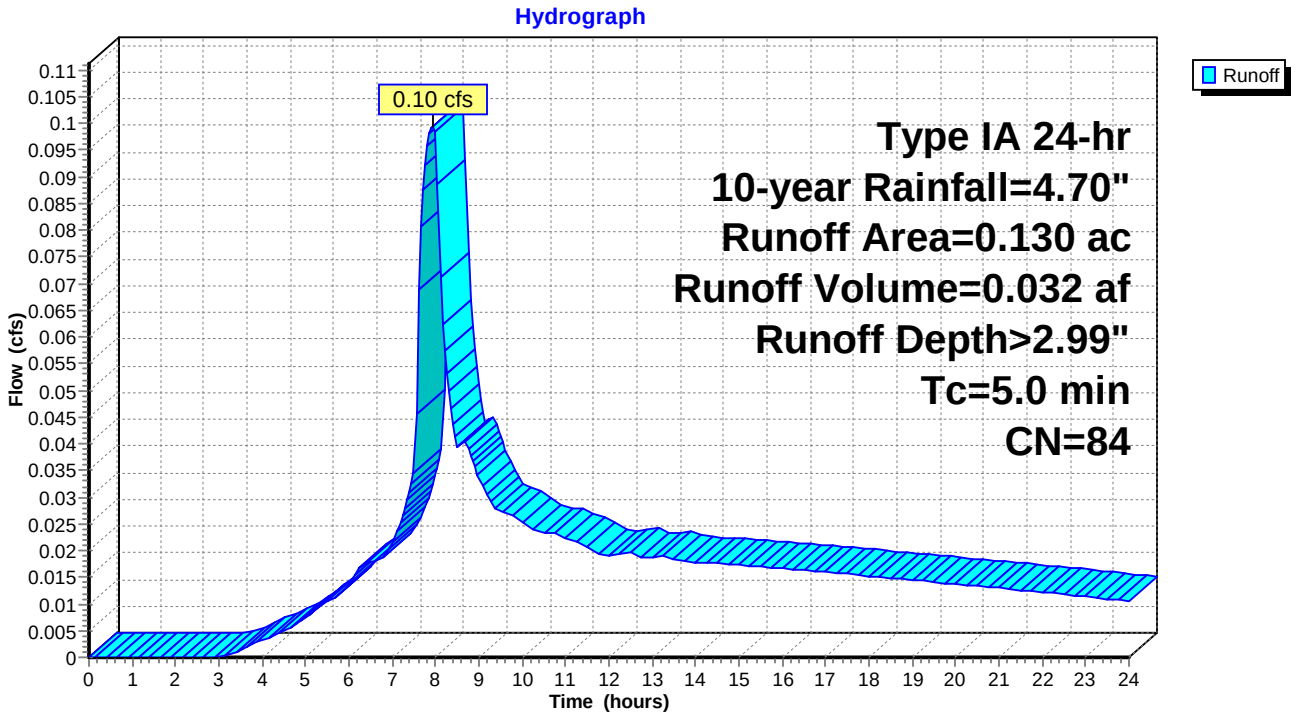
Runoff = 0.10 cfs @ 7.92 hrs, Volume= 0.032 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-year Rainfall=4.70"

	Area (ac)	CN	Description
*	0.081	98	Pavement, buildings
*	0.049	61	Landscaping
	0.130	84	Weighted Average
	0.049	61	37.69% Pervious Area
	0.081	98	62.31% Impervious Area

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

Subcatchment 4S: Drainage 4



Summary for Subcatchment 5S: Drainage 5

Shop roof, driveway and landscape areas.

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

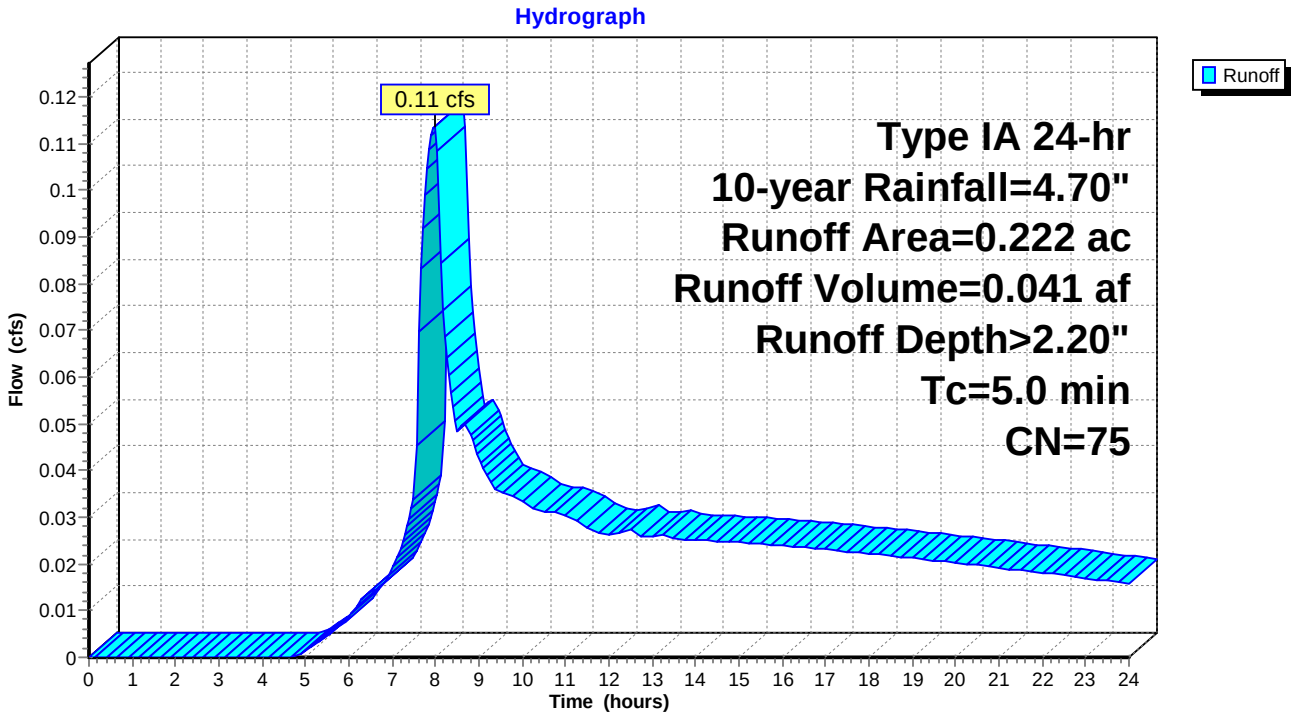
Runoff = 0.11 cfs @ 7.97 hrs, Volume= 0.041 af, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-year Rainfall=4.70"

	Area (ac)	CN	Description
*	0.087	98	Pavement, buildings
*	0.135	61	Landscaping
	0.222	75	Weighted Average
	0.135	61	60.81% Pervious Area
	0.087	98	39.19% Impervious Area

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

Subcatchment 5S: Drainage 5



Summary for Pond 4P: Raingarden 1

Rrain garden in landscaping west of office. Collects from east driveway office roof and surfaces around the control bldg. Will be connected to overflow pipe to downstreem raingarden,

.

Inflow Area = 0.130 ac, 62.31% Impervious, Inflow Depth > 2.99" for 10-year event
Inflow = 0.10 cfs @ 7.92 hrs, Volume= 0.032 af
Outflow = 0.10 cfs @ 7.93 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.00 cfs @ 7.93 hrs, Volume= 0.005 af
Primary = 0.10 cfs @ 7.93 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 14.83' @ 7.93 hrs Surf.Area= 0.003 ac Storage= 0.001 af

Plug-Flow detention time= 42.7 min calculated for 0.031 af (96% of inflow)
Center-of-Mass det. time= 17.7 min (775.0 - 757.3)

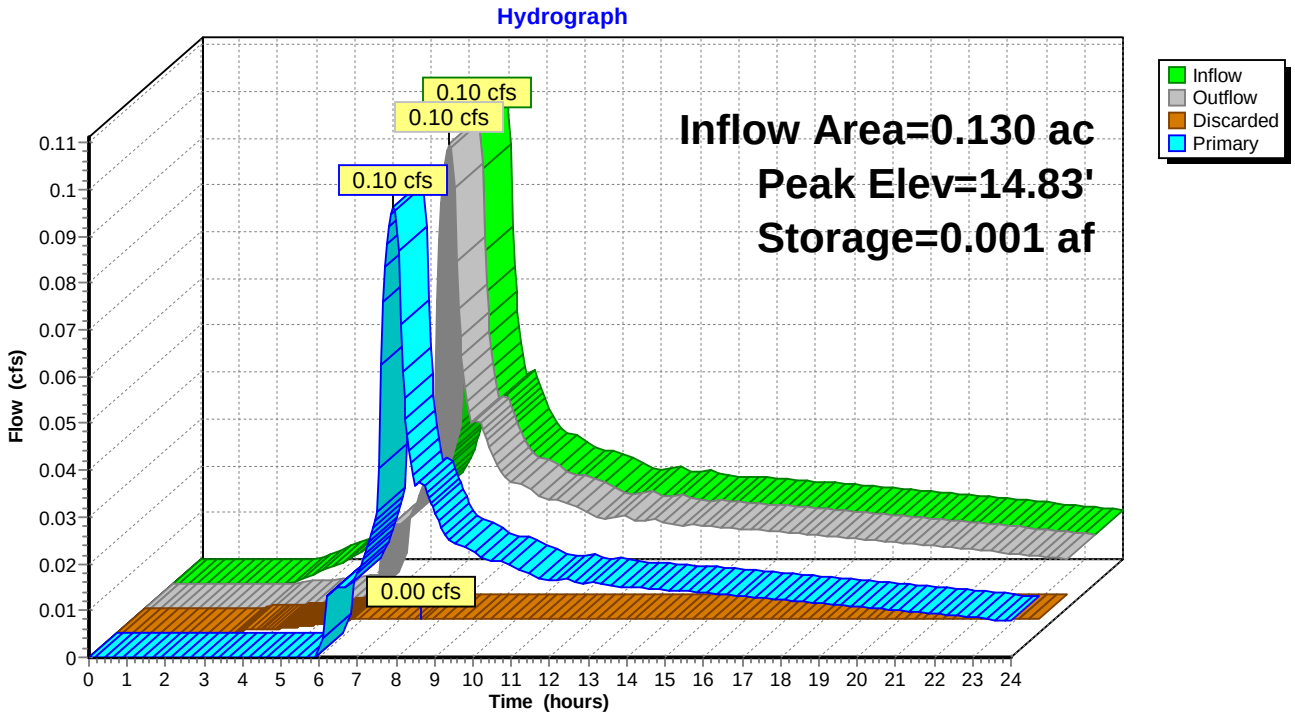
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	0.002 af	**2.00'W x 12.00'L x 1.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	14.80'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.00 cfs @ 7.93 hrs HW=14.83' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.10 cfs @ 7.93 hrs HW=14.83' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.10 cfs @ 0.58 fps)

Pond 4P: Raingarden 1



Summary for Pond 5P: Raingarden 2

Raingarden located in lanscaped area on SW corner of parcel.

Inflow Area = 0.352 ac, 47.73% Impervious, Inflow Depth > 2.30" for 10-year event
Inflow = 0.21 cfs @ 7.95 hrs, Volume= 0.067 af
Outflow = 0.04 cfs @ 15.31 hrs, Volume= 0.052 af, Atten= 82%, Lag= 441.6 min
Discarded = 0.04 cfs @ 15.31 hrs, Volume= 0.052 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 10.87' @ 15.31 hrs Surf.Area= 0.029 ac Storage= 0.019 af

Plug-Flow detention time= 273.2 min calculated for 0.052 af (77% of inflow)
Center-of-Mass det. time= 140.6 min (930.2 - 789.6)

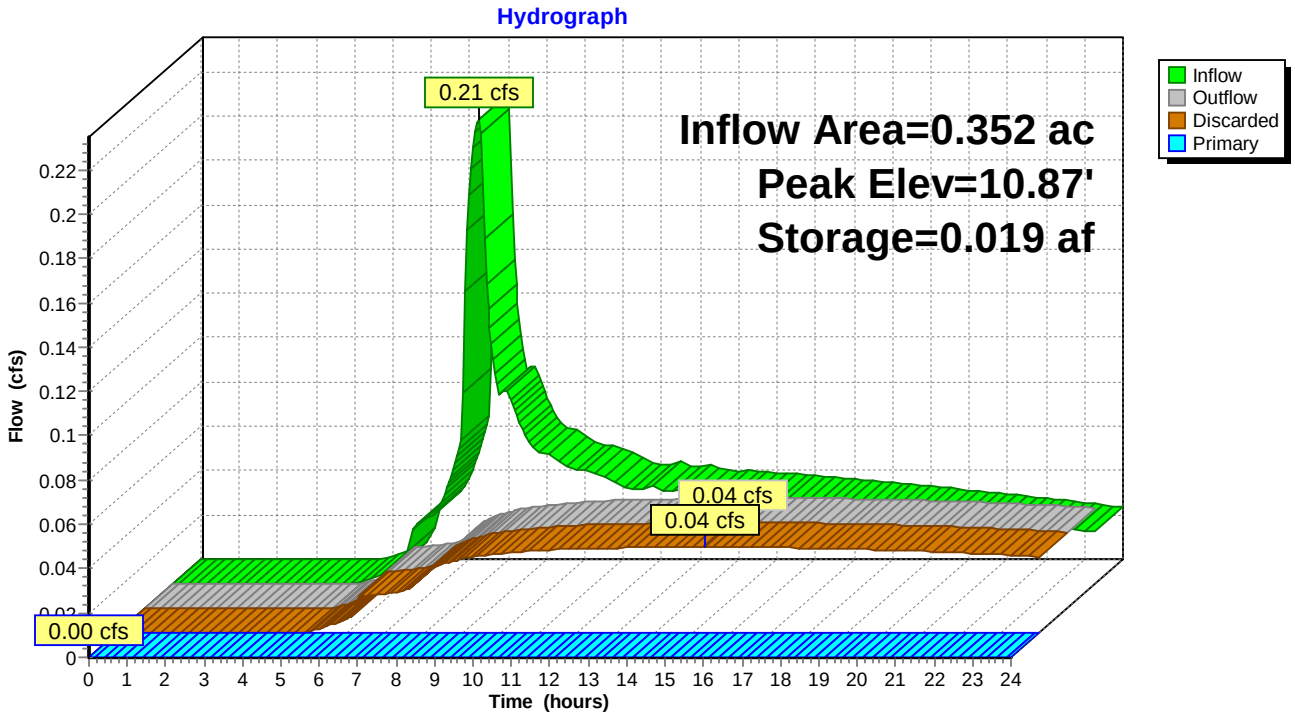
Volume	Invert	Avail.Storage	Storage Description
#1	10.00'	0.069 af	**14.00'W x 50.00'L x 2.10'H Prismatoid Z=4.5**

Device	Routing	Invert	Outlet Devices
#1	Discarded	10.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	12.00'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 15.31 hrs HW=10.87' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Raingarden 2



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: Drainage 4 Runoff Area=0.130 ac 62.31% Impervious Runoff Depth>3.73"
Tc=5.0 min CN=84 Runoff=0.13 cfs 0.040 af

Subcatchment 5S: Drainage 5 Runoff Area=0.222 ac 39.19% Impervious Runoff Depth>2.86"
Tc=5.0 min CN=75 Runoff=0.15 cfs 0.053 af

Pond 4P: Raingarden 1 Peak Elev=14.84' Storage=0.001 af Inflow=0.13 cfs 0.040 af
Discarded=0.00 cfs 0.005 af Primary=0.12 cfs 0.034 af Outflow=0.13 cfs 0.039 af

Pond 5P: Raingarden 2 Peak Elev=11.15' Storage=0.028 af Inflow=0.27 cfs 0.087 af
Discarded=0.05 cfs 0.064 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.064 af

Total Runoff Area = 0.352 ac Runoff Volume = 0.093 af Average Runoff Depth = 3.18"
52.27% Pervious = 0.184 ac 47.73% Impervious = 0.168 ac

Summary for Subcatchment 4S: Drainage 4

Office roof, sidewalk, landscaping, & pavement, draining to raingarden in landscaping. Portion of landscape located in right-of-way behind back of walk retained on site.

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

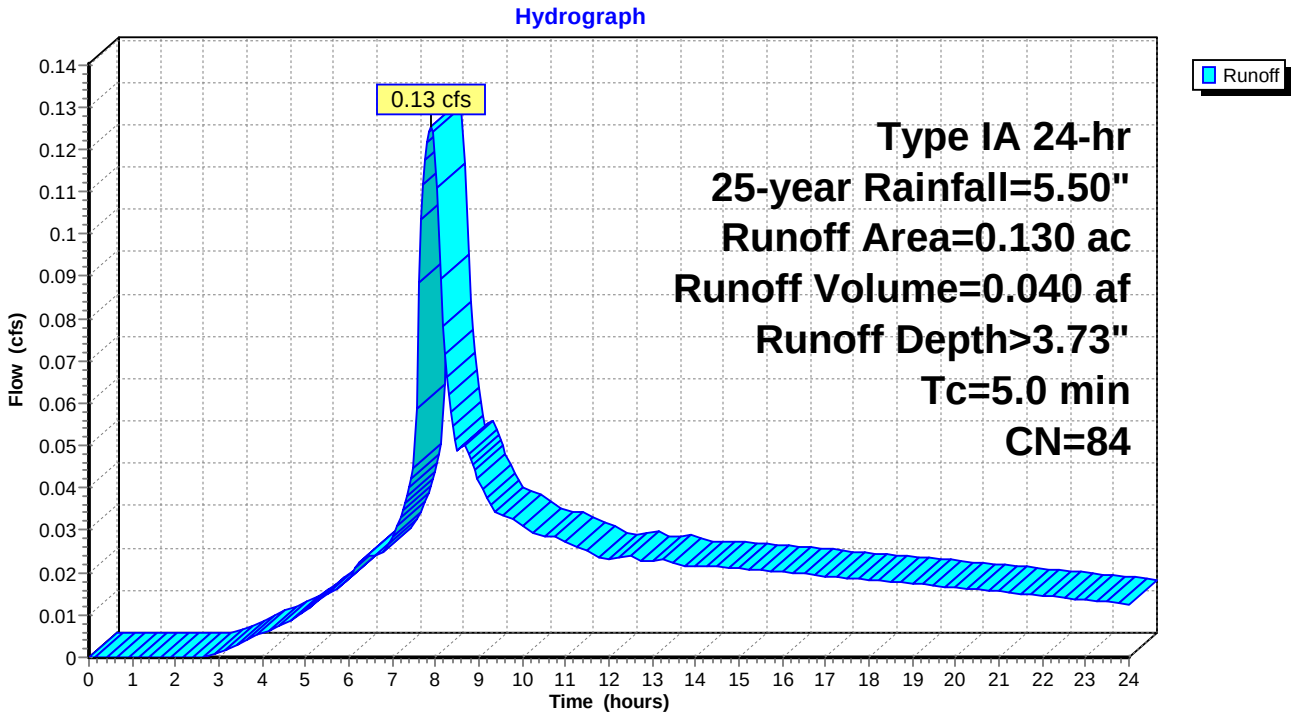
Runoff = 0.13 cfs @ 7.91 hrs, Volume= 0.040 af, Depth> 3.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-year Rainfall=5.50"

	Area (ac)	CN	Description
*	0.081	98	Pavement, buildings
*	0.049	61	Landscaping
	0.130	84	Weighted Average
	0.049	61	37.69% Pervious Area
	0.081	98	62.31% Impervious Area

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

Subcatchment 4S: Drainage 4



Summary for Subcatchment 5S: Drainage 5

Shop roof, driveway and landscape areas.

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

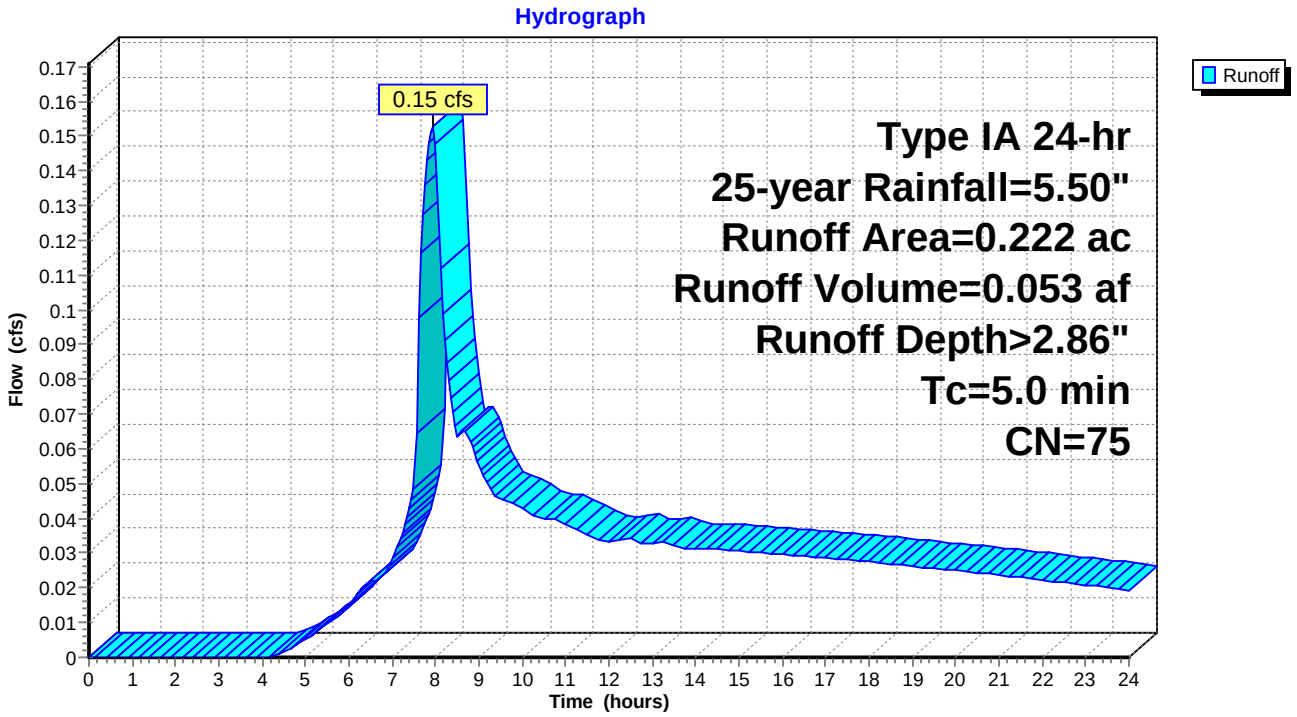
Runoff = 0.15 cfs @ 7.95 hrs, Volume= 0.053 af, Depth> 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-year Rainfall=5.50"

	Area (ac)	CN	Description
*	0.087	98	Pavement, buildings
*	0.135	61	Landscaping
	0.222	75	Weighted Average
	0.135	61	60.81% Pervious Area
	0.087	98	39.19% Impervious Area

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

Subcatchment 5S: Drainage 5



Summary for Pond 4P: Raingarden 1

Rrain garden in landscaping west of office. Collects from east driveway office roof and surfaces around the control bldg. Will be connected to overflow pipe to downstreem raingarden,

.

Inflow Area = 0.130 ac, 62.31% Impervious, Inflow Depth > 3.73" for 25-year event
Inflow = 0.13 cfs @ 7.91 hrs, Volume= 0.040 af
Outflow = 0.13 cfs @ 7.92 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.00 cfs @ 7.92 hrs, Volume= 0.005 af
Primary = 0.12 cfs @ 7.92 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 14.84' @ 7.92 hrs Surf.Area= 0.003 ac Storage= 0.001 af

Plug-Flow detention time= 35.4 min calculated for 0.039 af (97% of inflow)
Center-of-Mass det. time= 14.9 min (760.1 - 745.3)

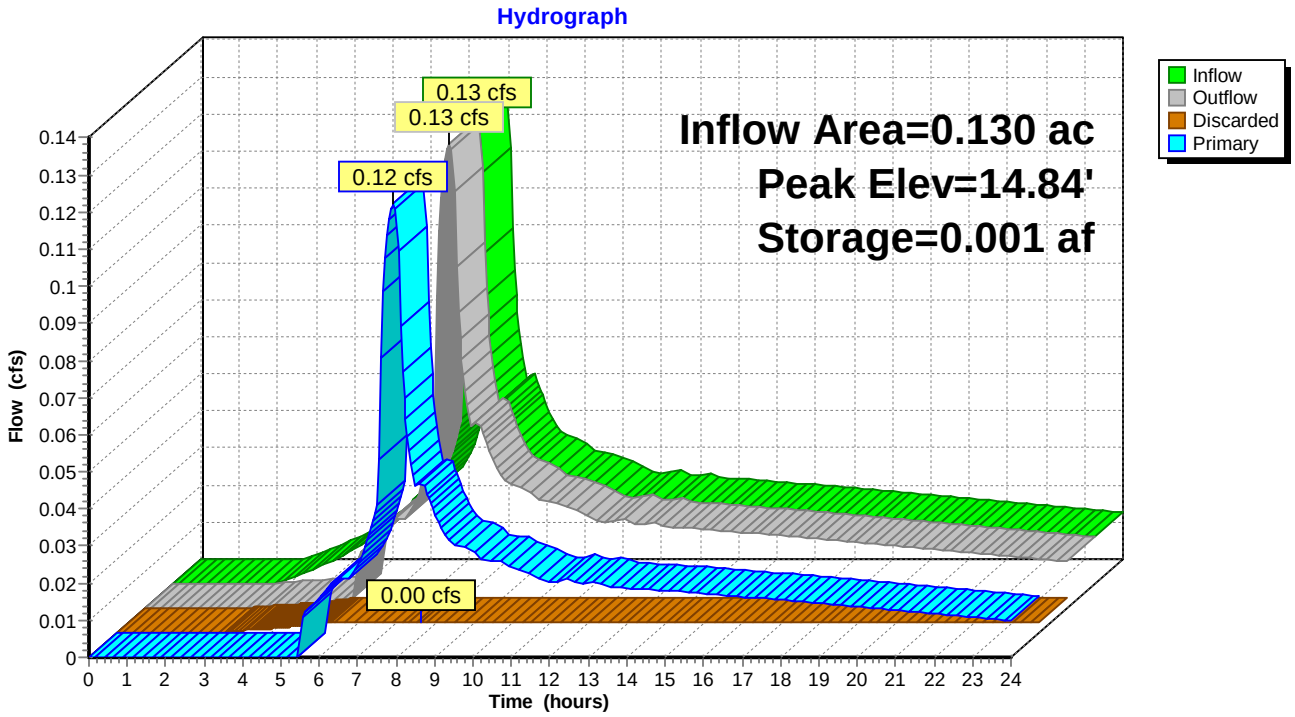
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	0.002 af	**2.00'W x 12.00'L x 1.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	14.80'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.00 cfs @ 7.92 hrs HW=14.84' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 7.92 hrs HW=14.84' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.12 cfs @ 0.62 fps)

Pond 4P: Raingarden 1



Summary for Pond 5P: Raingarden 2

Raingarden located in lanscaped area on SW corner of parcel.

Inflow Area = 0.352 ac, 47.73% Impervious, Inflow Depth > 2.97" for 25-year event
Inflow = 0.27 cfs @ 7.94 hrs, Volume= 0.087 af
Outflow = 0.05 cfs @ 15.85 hrs, Volume= 0.064 af, Atten= 83%, Lag= 474.7 min
Discarded = 0.05 cfs @ 15.85 hrs, Volume= 0.064 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 11.15' @ 15.85 hrs Surf.Area= 0.034 ac Storage= 0.028 af

Plug-Flow detention time= 307.5 min calculated for 0.064 af (73% of inflow)
Center-of-Mass det. time= 152.9 min (928.2 - 775.3)

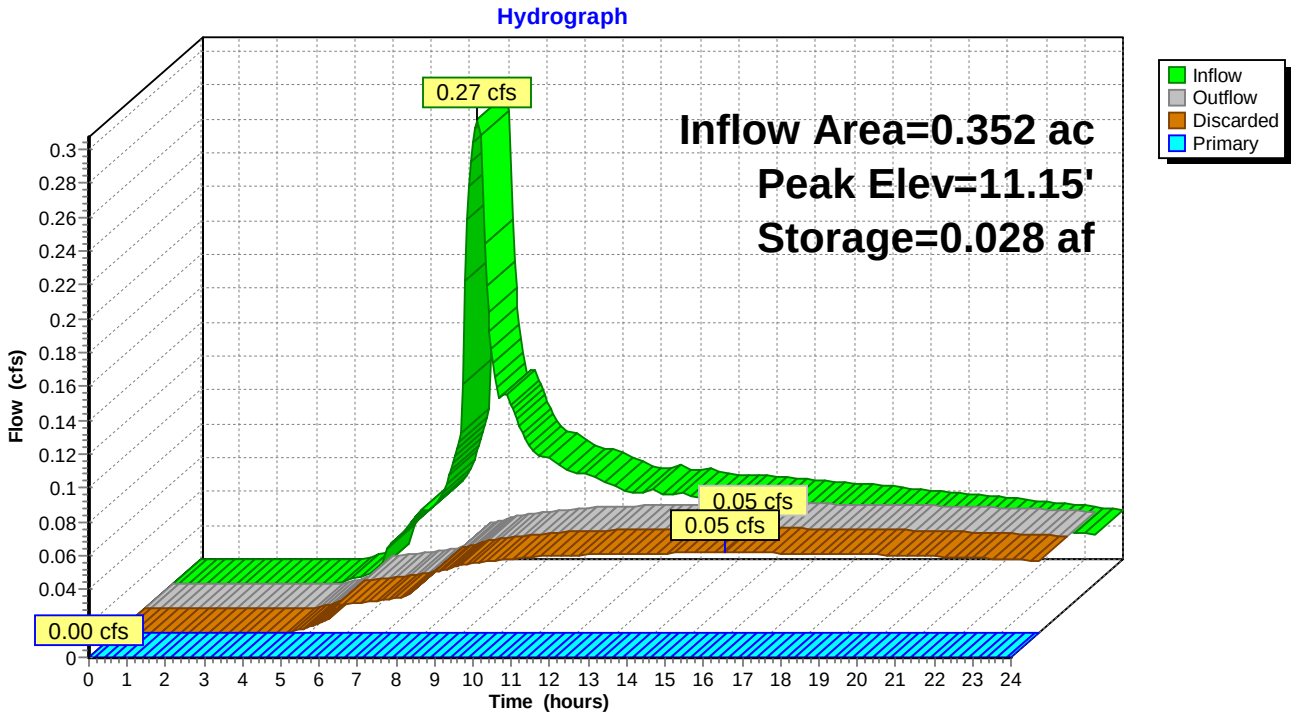
Volume	Invert	Avail.Storage	Storage Description
#1	10.00'	0.069 af	**14.00'W x 50.00'L x 2.10'H Prismatoid Z=4.5**

Device	Routing	Invert	Outlet Devices
#1	Discarded	10.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	12.00'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 15.85 hrs HW=11.15' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Raingarden 2



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: Drainage 4 Runoff Area=0.130 ac 62.31% Impervious Runoff Depth>4.19"
Tc=5.0 min CN=84 Runoff=0.14 cfs 0.045 af

Subcatchment 5S: Drainage 5 Runoff Area=0.222 ac 39.19% Impervious Runoff Depth>3.28"
Tc=5.0 min CN=75 Runoff=0.18 cfs 0.061 af

Pond 4P: Raingarden 1 Peak Elev=14.84' Storage=0.001 af Inflow=0.14 cfs 0.045 af
Discarded=0.00 cfs 0.005 af Primary=0.14 cfs 0.039 af Outflow=0.14 cfs 0.044 af

Pond 5P: Raingarden 2 Peak Elev=11.31' Storage=0.034 af Inflow=0.32 cfs 0.100 af
Discarded=0.05 cfs 0.072 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.072 af

Total Runoff Area = 0.352 ac Runoff Volume = 0.106 af Average Runoff Depth = 3.61"
52.27% Pervious = 0.184 ac 47.73% Impervious = 0.168 ac

Summary for Subcatchment 4S: Drainage 4

Office roof, sidewalk, landscaping, & pavement, draining to raingarden in landscaping. Portion of landscape located in right-of-way behind back of walk retained on site.

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

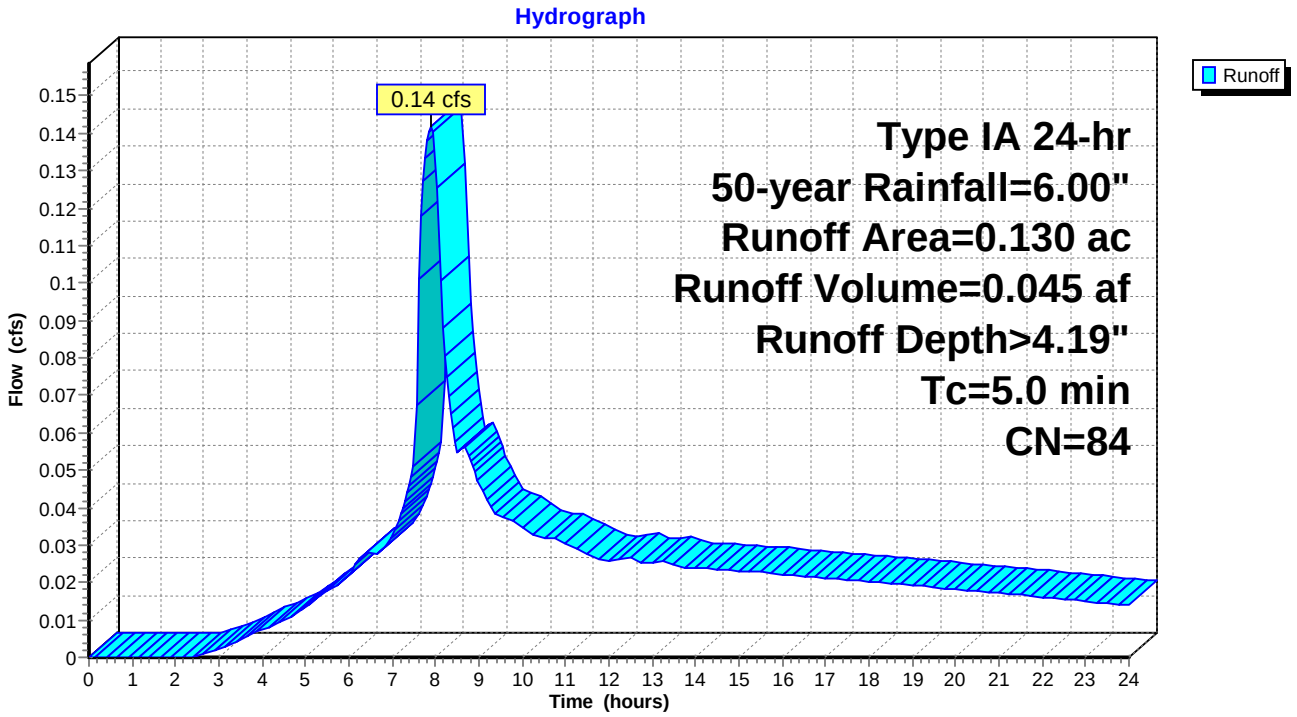
Runoff = 0.14 cfs @ 7.91 hrs, Volume= 0.045 af, Depth> 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50-year Rainfall=6.00"

	Area (ac)	CN	Description
*	0.081	98	Pavement, buildings
*	0.049	61	Landscaping
	0.130	84	Weighted Average
	0.049	61	37.69% Pervious Area
	0.081	98	62.31% Impervious Area

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

Subcatchment 4S: Drainage 4



Summary for Subcatchment 5S: Drainage 5

Shop roof, driveway and landscape areas.

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

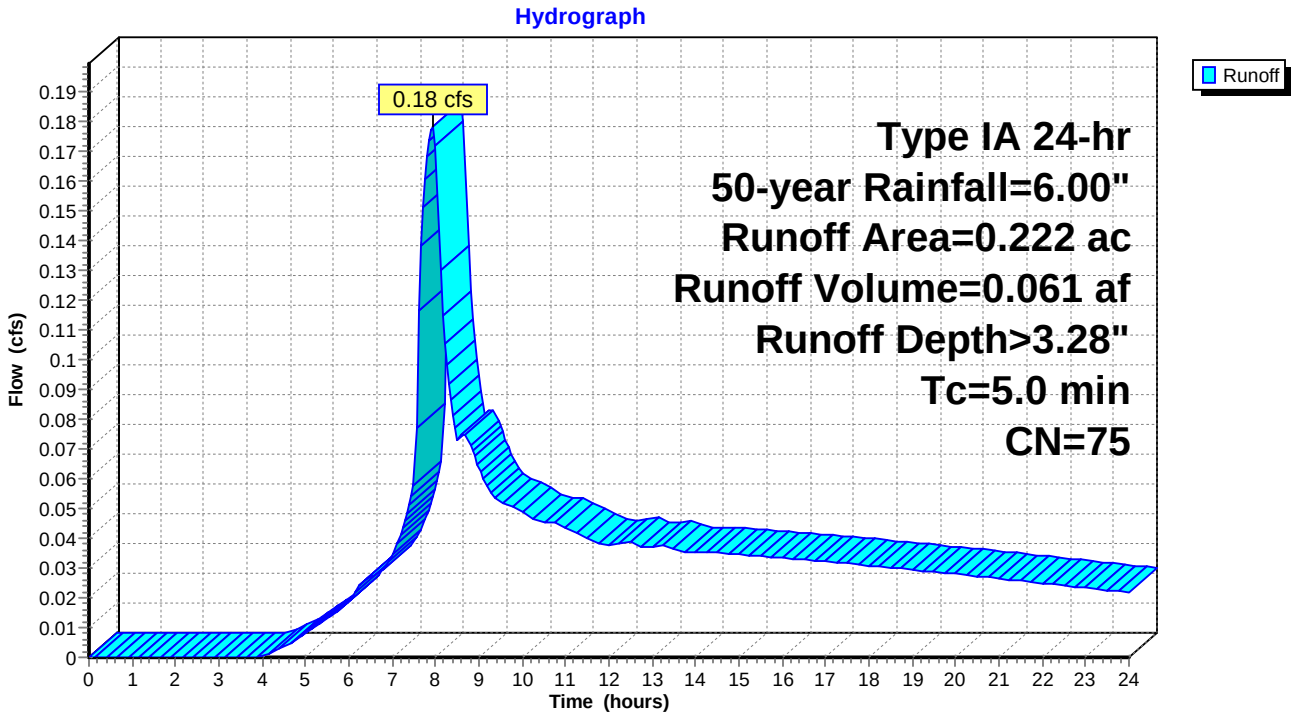
Runoff = 0.18 cfs @ 7.95 hrs, Volume= 0.061 af, Depth> 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50-year Rainfall=6.00"

	Area (ac)	CN	Description
*	0.087	98	Pavement, buildings
*	0.135	61	Landscaping
	0.222	75	Weighted Average
	0.135	61	60.81% Pervious Area
	0.087	98	39.19% Impervious Area

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

Subcatchment 5S: Drainage 5



Summary for Pond 4P: Raingarden 1

Rrain garden in landscaping west of office. Collects from east driveway office roof and surfaces around the control bldg. Will be connected to overflow pipe to downstreem raingarden,

.

Inflow Area = 0.130 ac, 62.31% Impervious, Inflow Depth > 4.19" for 50-year event
Inflow = 0.14 cfs @ 7.91 hrs, Volume= 0.045 af
Outflow = 0.14 cfs @ 7.91 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.00 cfs @ 7.91 hrs, Volume= 0.005 af
Primary = 0.14 cfs @ 7.91 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 14.84' @ 7.91 hrs Surf.Area= 0.003 ac Storage= 0.001 af

Plug-Flow detention time= 32.2 min calculated for 0.044 af (97% of inflow)
Center-of-Mass det. time= 13.6 min (752.6 - 739.0)

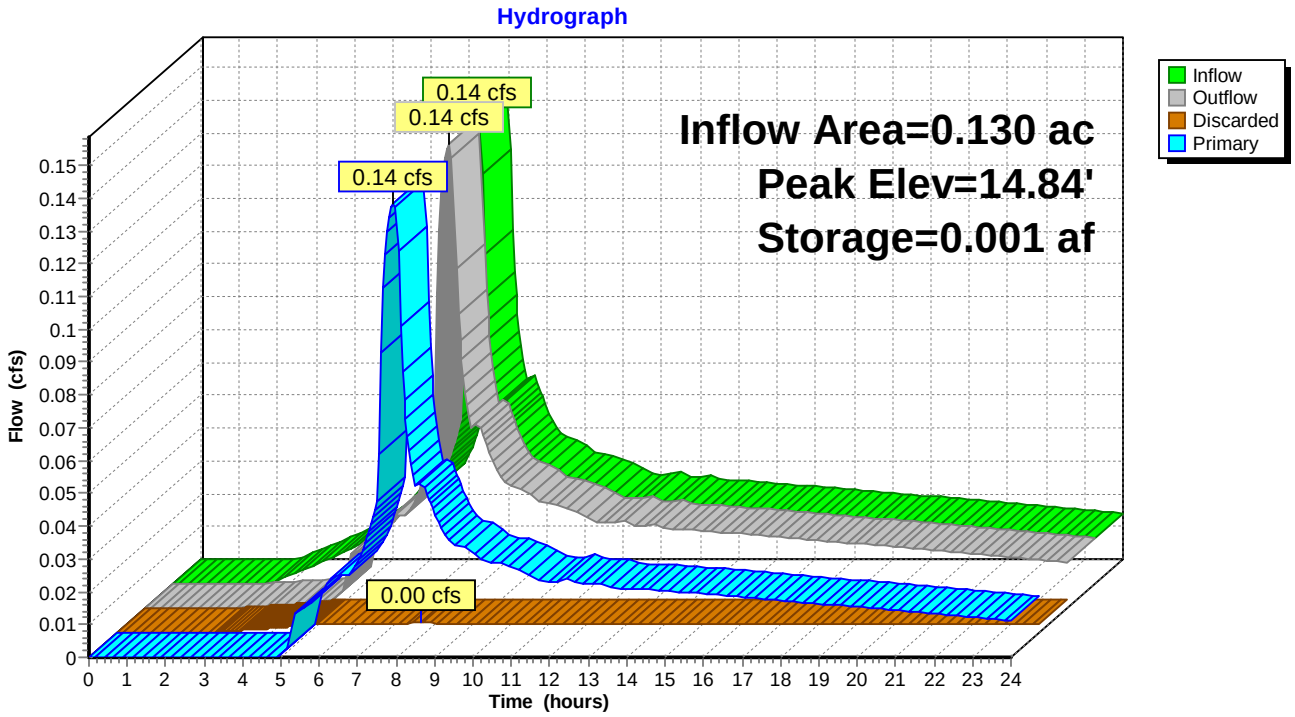
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	0.002 af	**2.00'W x 12.00'L x 1.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	14.80'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.00 cfs @ 7.91 hrs HW=14.84' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.14 cfs @ 7.91 hrs HW=14.84' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.14 cfs @ 0.65 fps)

Pond 4P: Raingarden 1



Summary for Pond 5P: Raingarden 2

Raingarden located in lanscaped area on SW corner of parcel.

Inflow Area = 0.352 ac, 47.73% Impervious, Inflow Depth > 3.41" for 50-year event
Inflow = 0.32 cfs @ 7.93 hrs, Volume= 0.100 af
Outflow = 0.05 cfs @ 16.05 hrs, Volume= 0.072 af, Atten= 83%, Lag= 487.1 min
Discarded = 0.05 cfs @ 16.05 hrs, Volume= 0.072 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 11.31' @ 16.05 hrs Surf.Area= 0.037 ac Storage= 0.034 af

Plug-Flow detention time= 324.1 min calculated for 0.071 af (71% of inflow)
Center-of-Mass det. time= 159.2 min (927.1 - 767.9)

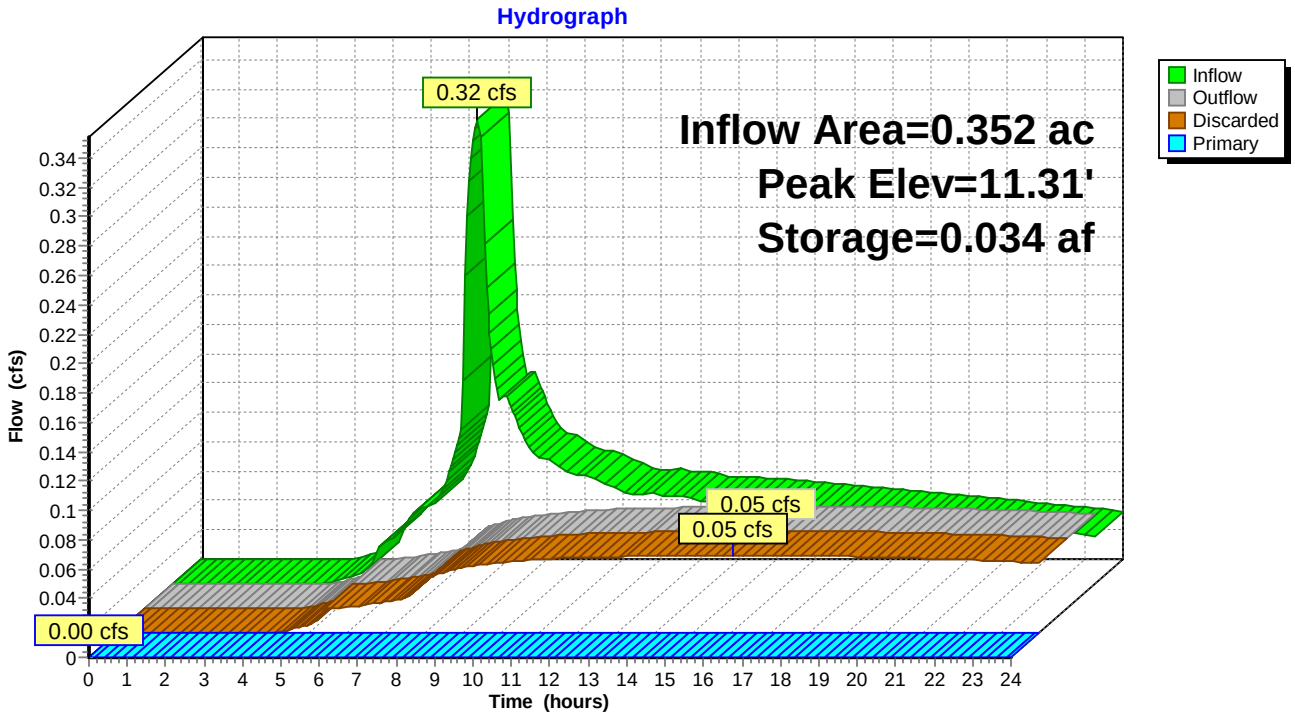
Volume	Invert	Avail.Storage	Storage Description
#1	10.00'	0.069 af	**14.00'W x 50.00'L x 2.10'H Prismatoid Z=4.5**

Device	Routing	Invert	Outlet Devices
#1	Discarded	10.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	12.00'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 16.05 hrs HW=11.31' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Raingarden 2



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: Drainage 4 Runoff Area=0.130 ac 62.31% Impervious Runoff Depth>4.66"
Tc=5.0 min CN=84 Runoff=0.16 cfs 0.050 af

Subcatchment 5S: Drainage 5 Runoff Area=0.222 ac 39.19% Impervious Runoff Depth>3.71"
Tc=5.0 min CN=75 Runoff=0.20 cfs 0.069 af

Pond 4P: Raingarden 1 Peak Elev=14.84' Storage=0.001 af Inflow=0.16 cfs 0.050 af
Discarded=0.00 cfs 0.005 af Primary=0.15 cfs 0.044 af Outflow=0.16 cfs 0.049 af

Pond 5P: Raingarden 2 Peak Elev=11.46' Storage=0.040 af Inflow=0.36 cfs 0.113 af
Discarded=0.06 cfs 0.079 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.079 af

Total Runoff Area = 0.352 ac Runoff Volume = 0.119 af Average Runoff Depth = 4.06"
52.27% Pervious = 0.184 ac 47.73% Impervious = 0.168 ac

Summary for Subcatchment 4S: Drainage 4

Office roof, sidewalk, landscaping, & pavement, draining to raingarden in landscaping. Portion of landscape located in right-of-way behind back of walk retained on site.

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

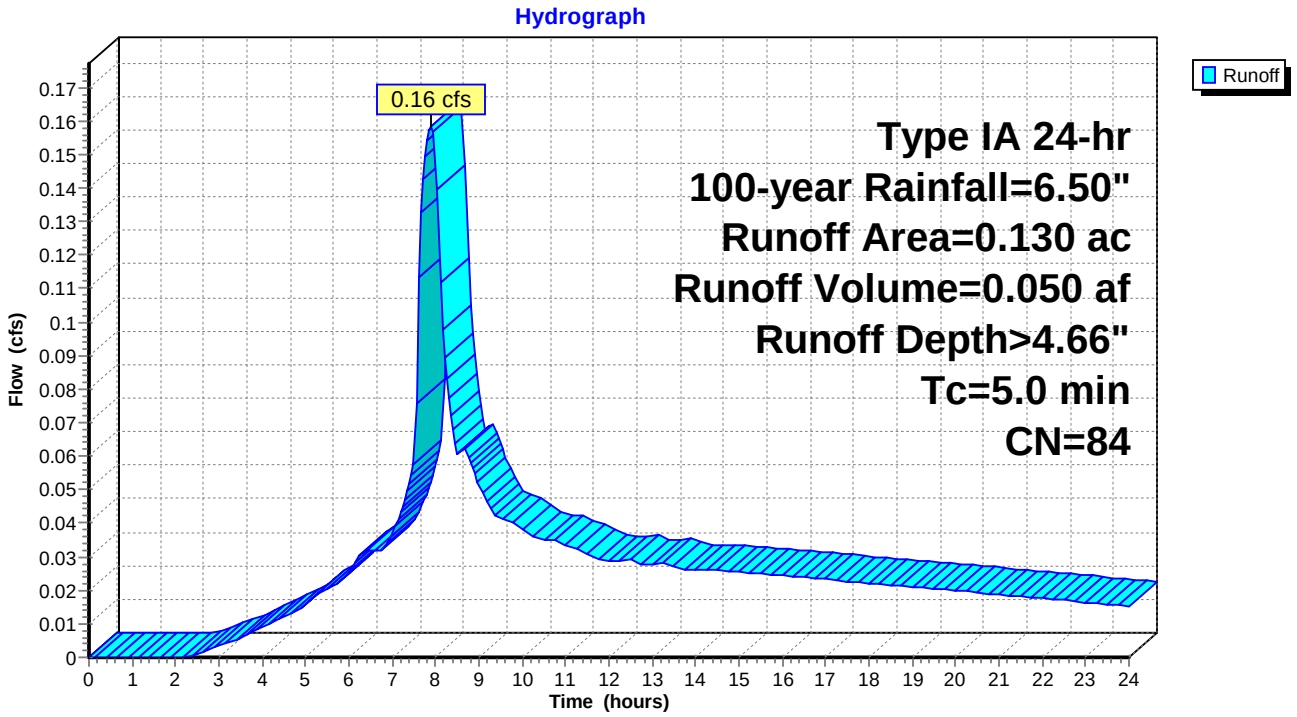
Runoff = 0.16 cfs @ 7.90 hrs, Volume= 0.050 af, Depth> 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-year Rainfall=6.50"

	Area (ac)	CN	Description
*	0.081	98	Pavement, buildings
*	0.049	61	Landscaping
	0.130	84	Weighted Average
	0.049	61	37.69% Pervious Area
	0.081	98	62.31% Impervious Area

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

Subcatchment 4S: Drainage 4



Summary for Subcatchment 5S: Drainage 5

Shop roof, driveway and landscape areas.

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

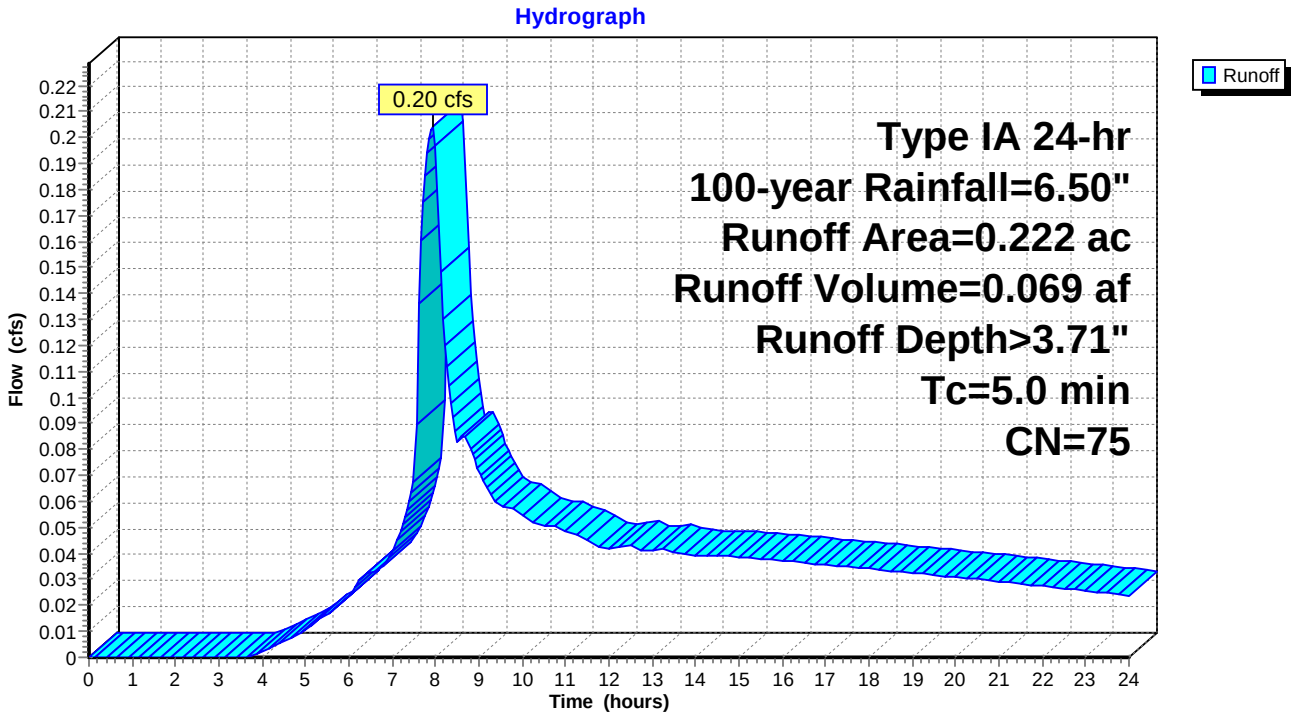
Runoff = 0.20 cfs @ 7.94 hrs, Volume= 0.069 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-year Rainfall=6.50"

	Area (ac)	CN	Description
*	0.087	98	Pavement, buildings
*	0.135	61	Landscaping
	0.222	75	Weighted Average
	0.135	61	60.81% Pervious Area
	0.087	98	39.19% Impervious Area

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

Subcatchment 5S: Drainage 5



Summary for Pond 4P: Raingarden 1

Rrain garden in landscaping west of office. Collects from east driveway office roof and surfaces around the control bldg. Will be connected to overflow pipe to downstreem raingarden,

.

Inflow Area = 0.130 ac, 62.31% Impervious, Inflow Depth > 4.66" for 100-year event
Inflow = 0.16 cfs @ 7.90 hrs, Volume= 0.050 af
Outflow = 0.16 cfs @ 7.91 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.00 cfs @ 7.91 hrs, Volume= 0.005 af
Primary = 0.15 cfs @ 7.91 hrs, Volume= 0.044 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 14.84' @ 7.91 hrs Surf.Area= 0.003 ac Storage= 0.001 af

Plug-Flow detention time= 29.2 min calculated for 0.049 af (98% of inflow)
Center-of-Mass det. time= 12.4 min (745.9 - 733.5)

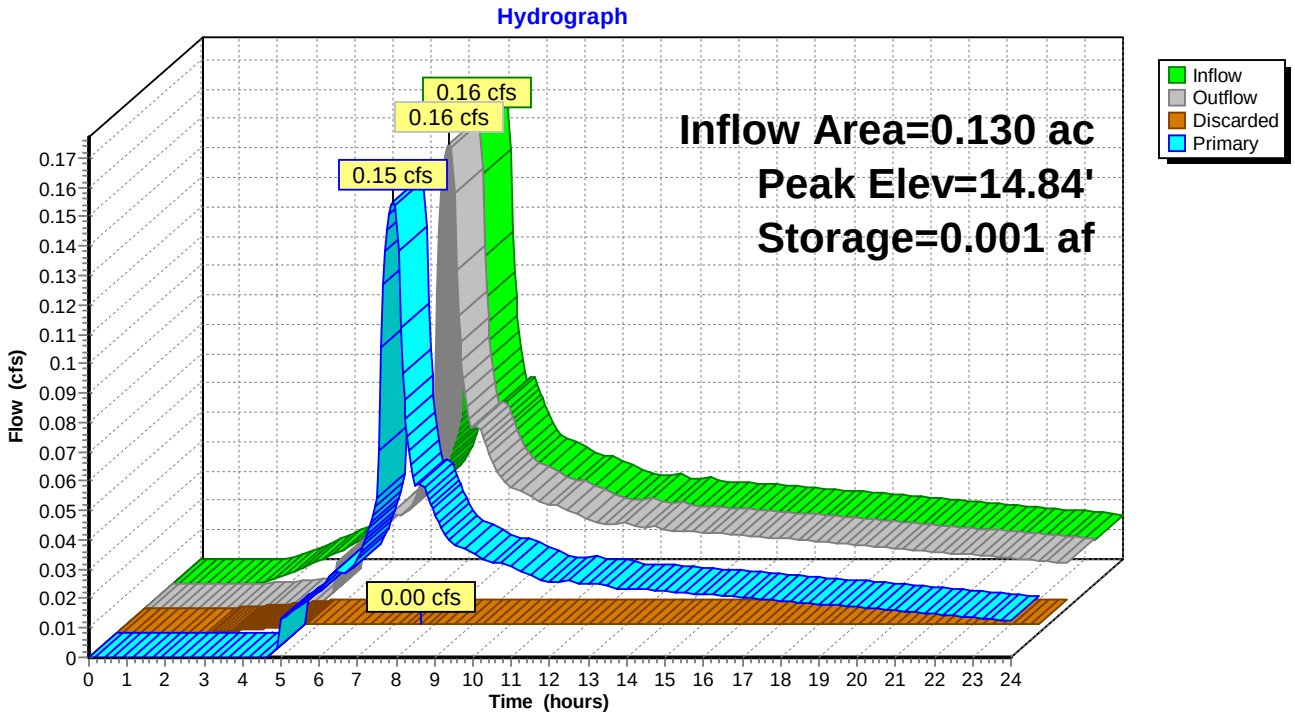
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	0.002 af	**2.00'W x 12.00'L x 1.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	14.80'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.00 cfs @ 7.91 hrs HW=14.84' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 7.91 hrs HW=14.84' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.15 cfs @ 0.68 fps)

Pond 4P: Raingarden 1



Summary for Pond 5P: Raingarden 2

Raingarden located in lanscaped area on SW corner of parcel.

Inflow Area = 0.352 ac, 47.73% Impervious, Inflow Depth > 3.85" for 100-year event
Inflow = 0.36 cfs @ 7.93 hrs, Volume= 0.113 af
Outflow = 0.06 cfs @ 16.20 hrs, Volume= 0.079 af, Atten= 84%, Lag= 496.6 min
Discarded = 0.06 cfs @ 16.20 hrs, Volume= 0.079 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 11.46' @ 16.20 hrs Surf.Area= 0.039 ac Storage= 0.040 af

Plug-Flow detention time= 338.1 min calculated for 0.079 af (70% of inflow)
Center-of-Mass det. time= 164.8 min (926.1 - 761.3)

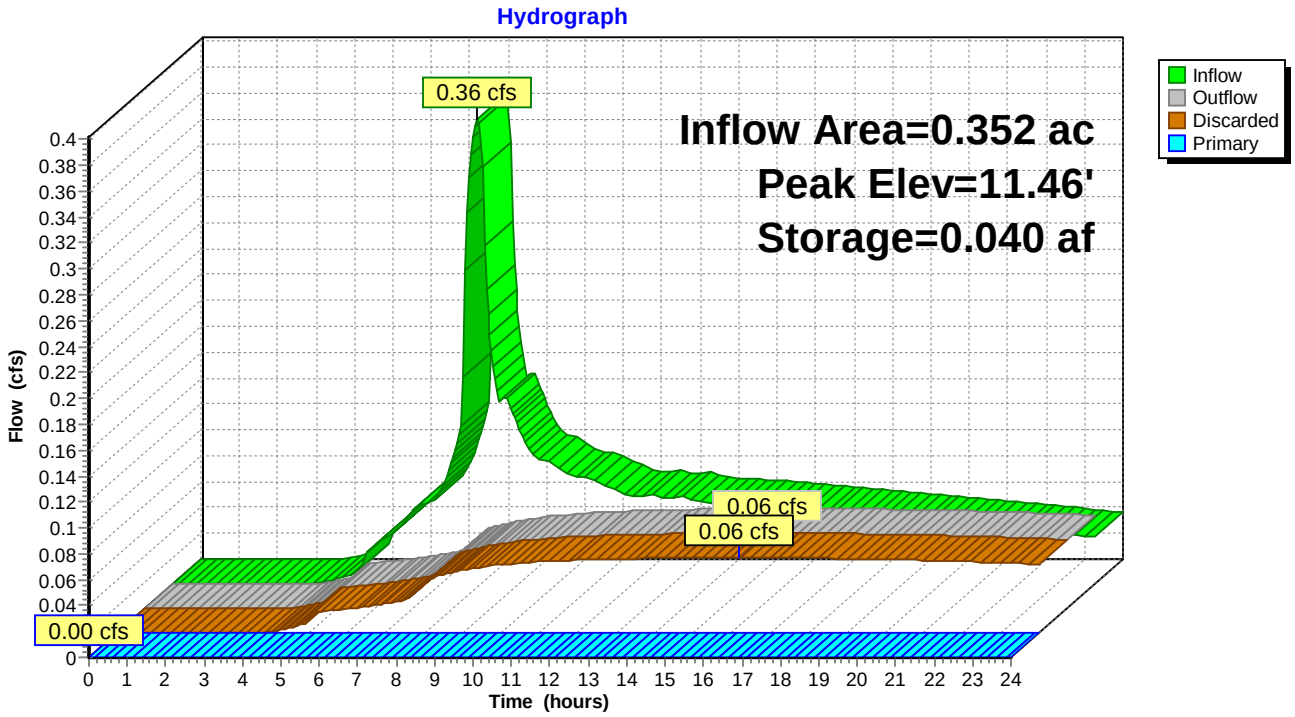
Volume	Invert	Avail.Storage	Storage Description
#1	10.00'	0.069 af	**14.00'W x 50.00'L x 2.10'H Prismatoid Z=4.5**

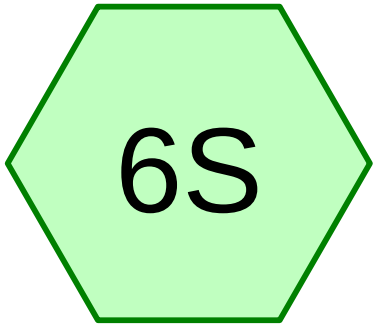
Device	Routing	Invert	Outlet Devices
#1	Discarded	10.00'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 8.00'
#2	Primary	12.00'	**16.0" x 16.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 16.20 hrs HW=11.46' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.06 cfs)

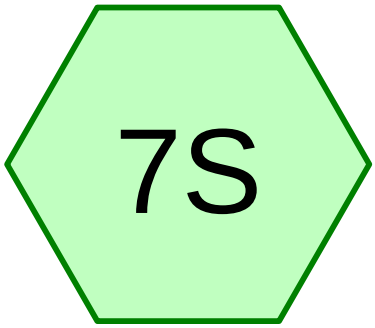
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Raingarden 2





Drainage 6



Drainage 7

Subcat Reach Pond Link

Routing Diagram for 614018-WWTP2-6S-7S

Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net, Printed 11/7/2014

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.187	79	50-75% Grass cover, Fair, HSG C (7S)
0.003	61	>75% Grass cover, Good, HSG B (6S)
0.034	98	Pavement (6S)
2.224	**79**	**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 6S: Drainage 6 Runoff Area=0.037 ac 91.89% Impervious Runoff Depth>2.94"
Tc=5.0 min CN=95 Runoff=0.03 cfs 0.009 af

Subcatchment 7S: Drainage 7 Runoff Area=2.187 ac 0.00% Impervious Runoff Depth>1.56"
Tc=5.0 min CN=79 Runoff=0.78 cfs 0.285 af

Total Runoff Area = 2.224 ac Runoff Volume = 0.294 af Average Runoff Depth = 1.59"
98.47% Pervious = 2.190 ac 1.53% Impervious = 0.034 ac

Summary for Subcatchment 6S: Drainage 6

New asphalt, concrete & on site landscape surfaces draining offsite to Fulton Ave.

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

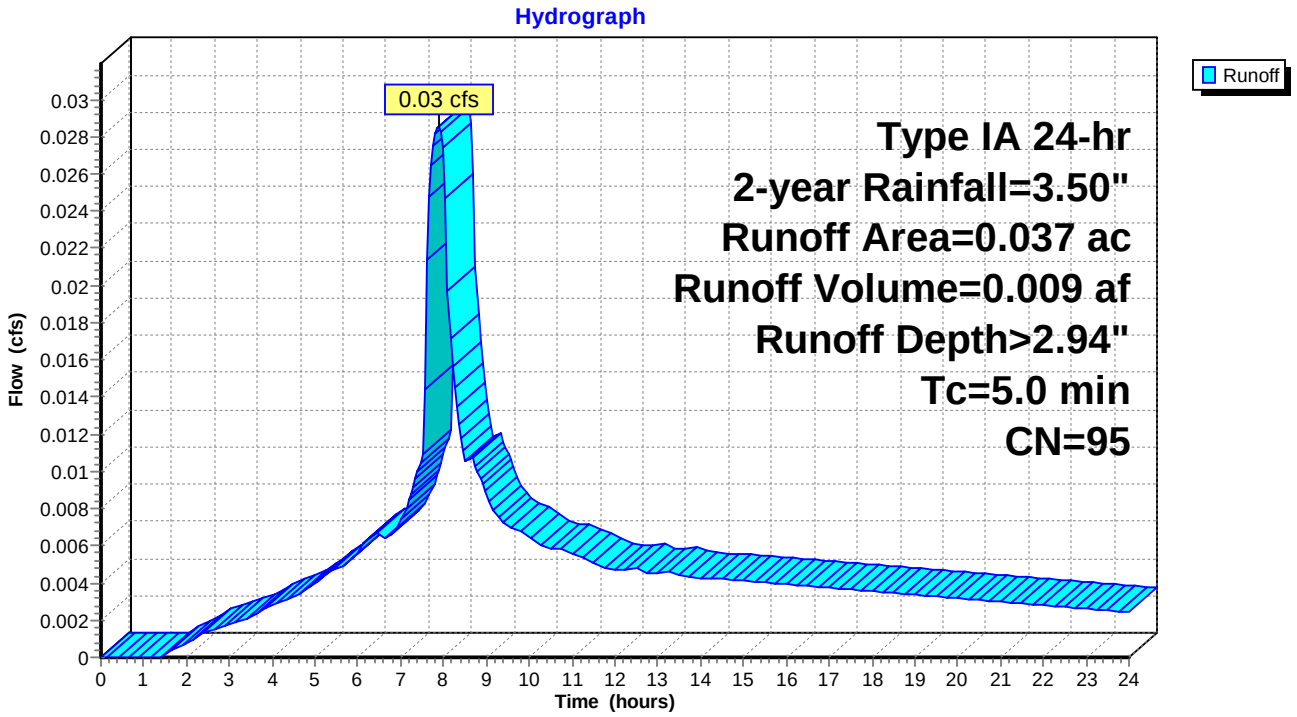
Runoff = 0.03 cfs @ 7.87 hrs, Volume= 0.009 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-year Rainfall=3.50"

	Area (ac)	CN	Description
*	0.034	98	Pavement
	0.003	61	>75% Grass cover, Good, HSG B
	0.037	95	Weighted Average
	0.003	61	8.11% Pervious Area
	0.034	98	91.89% Impervious Area

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

Subcatchment 6S: Drainage 6



Summary for Subcatchment 7S: Drainage 7

Existing condition of all drainage areas.

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

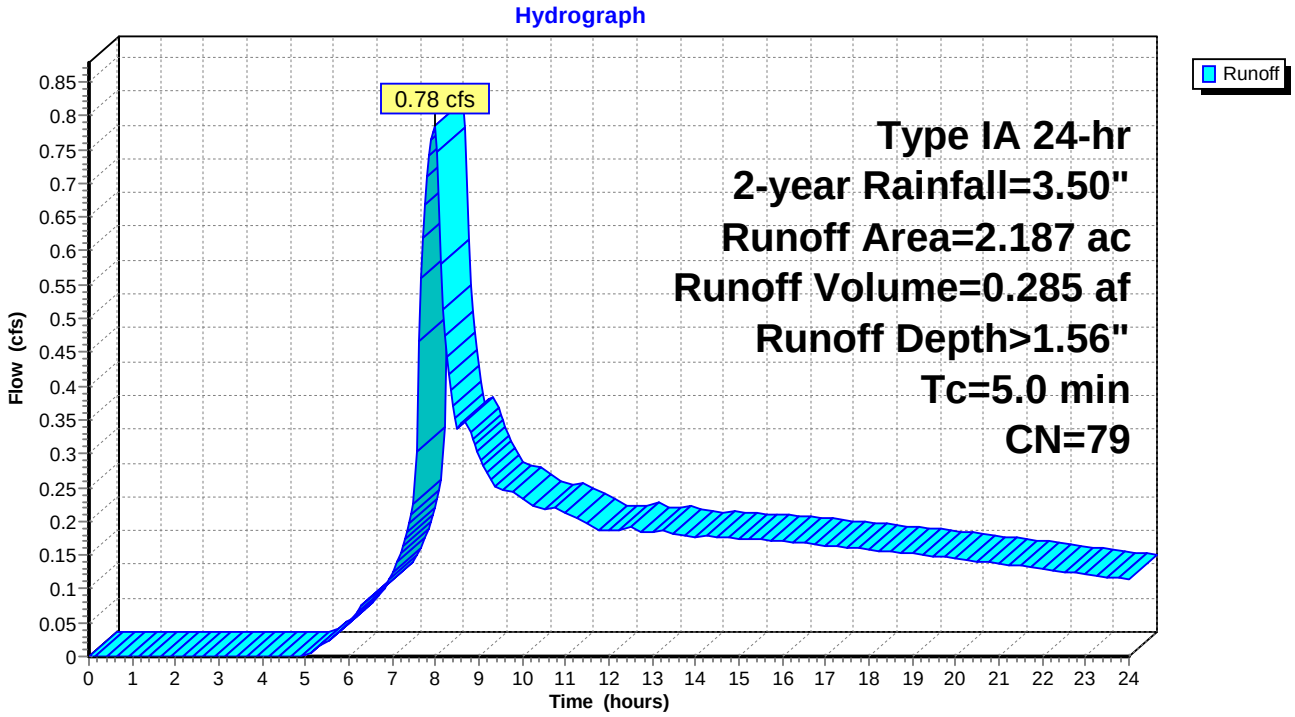
Runoff = 0.78 cfs @ 7.98 hrs, Volume= 0.285 af, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-year Rainfall=3.50"

Area (ac)	CN	Description
2.187	79	50-75% Grass cover, Fair, HSG C
2.187	79	100.00% Pervious Area

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

Subcatchment 7S: Drainage 7



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 6S: Drainage 6 Runoff Area=0.037 ac 91.89% Impervious Runoff Depth>3.92"
Tc=5.0 min CN=95 Runoff=0.04 cfs 0.012 af

Subcatchment 7S: Drainage 7 Runoff Area=2.187 ac 0.00% Impervious Runoff Depth>2.37"
Tc=5.0 min CN=79 Runoff=1.26 cfs 0.432 af

Total Runoff Area = 2.224 ac Runoff Volume = 0.445 af Average Runoff Depth = 2.40"
98.47% Pervious = 2.190 ac 1.53% Impervious = 0.034 ac

Summary for Subcatchment 6S: Drainage 6

New asphalt, concrete & on site landscape surfaces draining offsite to Fulton Ave.

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

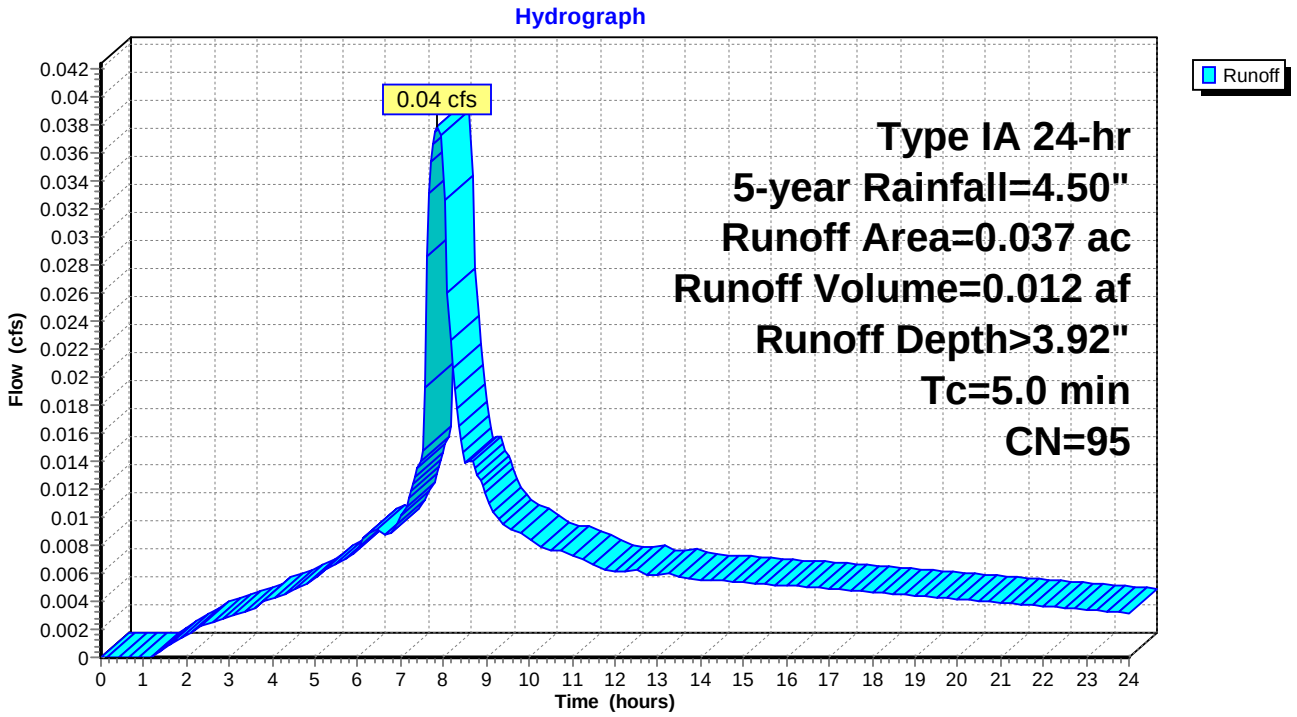
Runoff = 0.04 cfs @ 7.87 hrs, Volume= 0.012 af, Depth> 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5-year Rainfall=4.50"

	Area (ac)	CN	Description
*	0.034	98	Pavement
	0.003	61	>75% Grass cover, Good, HSG B
	0.037	95	Weighted Average
	0.003	61	8.11% Pervious Area
	0.034	98	91.89% Impervious Area

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

Subcatchment 6S: Drainage 6



Summary for Subcatchment 7S: Drainage 7

Existing condition of all drainage areas.

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

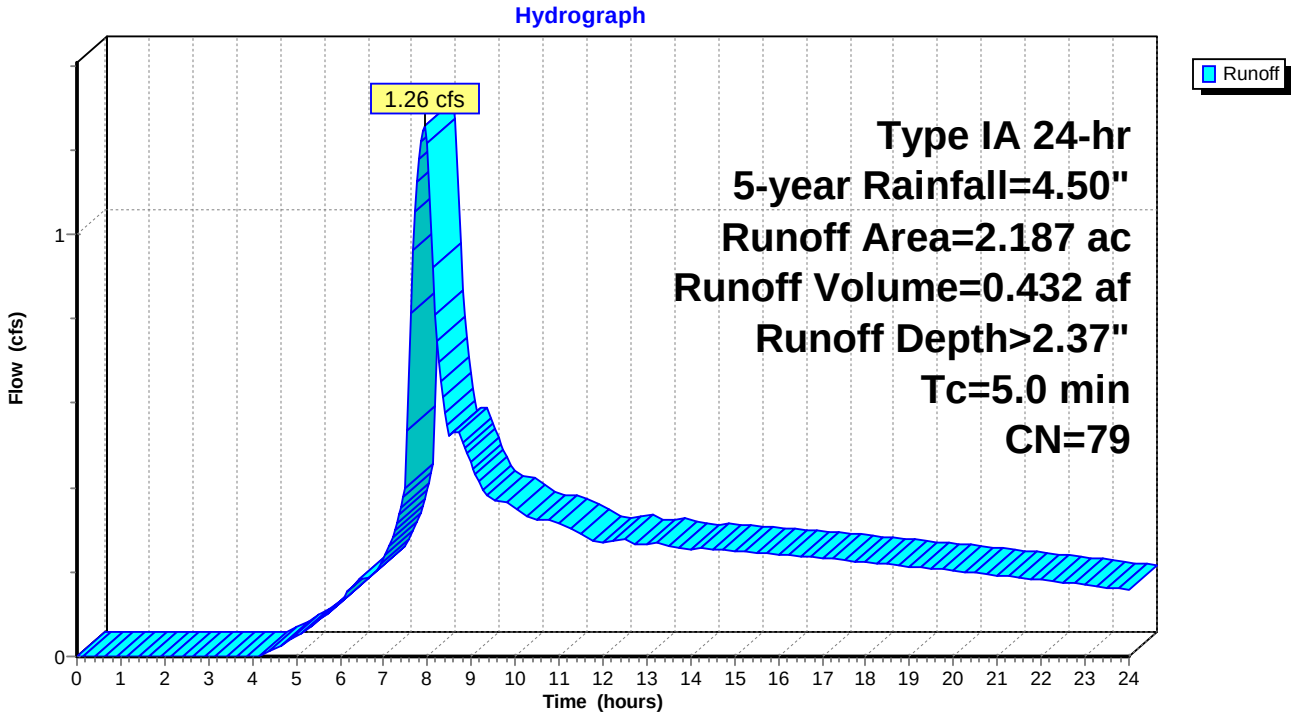
Runoff = 1.26 cfs @ 7.95 hrs, Volume= 0.432 af, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5-year Rainfall=4.50"

Area (ac)	CN	Description
2.187	79	50-75% Grass cover, Fair, HSG C
2.187	79	100.00% Pervious Area

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

Subcatchment 7S: Drainage 7



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 6S: Drainage 6 Runoff Area=0.037 ac 91.89% Impervious Runoff Depth>4.12"
Tc=5.0 min CN=95 Runoff=0.04 cfs 0.013 af

Subcatchment 7S: Drainage 7 Runoff Area=2.187 ac 0.00% Impervious Runoff Depth>2.54"
Tc=5.0 min CN=79 Runoff=1.36 cfs 0.463 af

Total Runoff Area = 2.224 ac Runoff Volume = 0.476 af Average Runoff Depth = 2.57"
98.47% Pervious = 2.190 ac 1.53% Impervious = 0.034 ac

Summary for Subcatchment 6S: Drainage 6

New asphalt, concrete & on site landscape surfaces draining offsite to Fulton Ave.

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

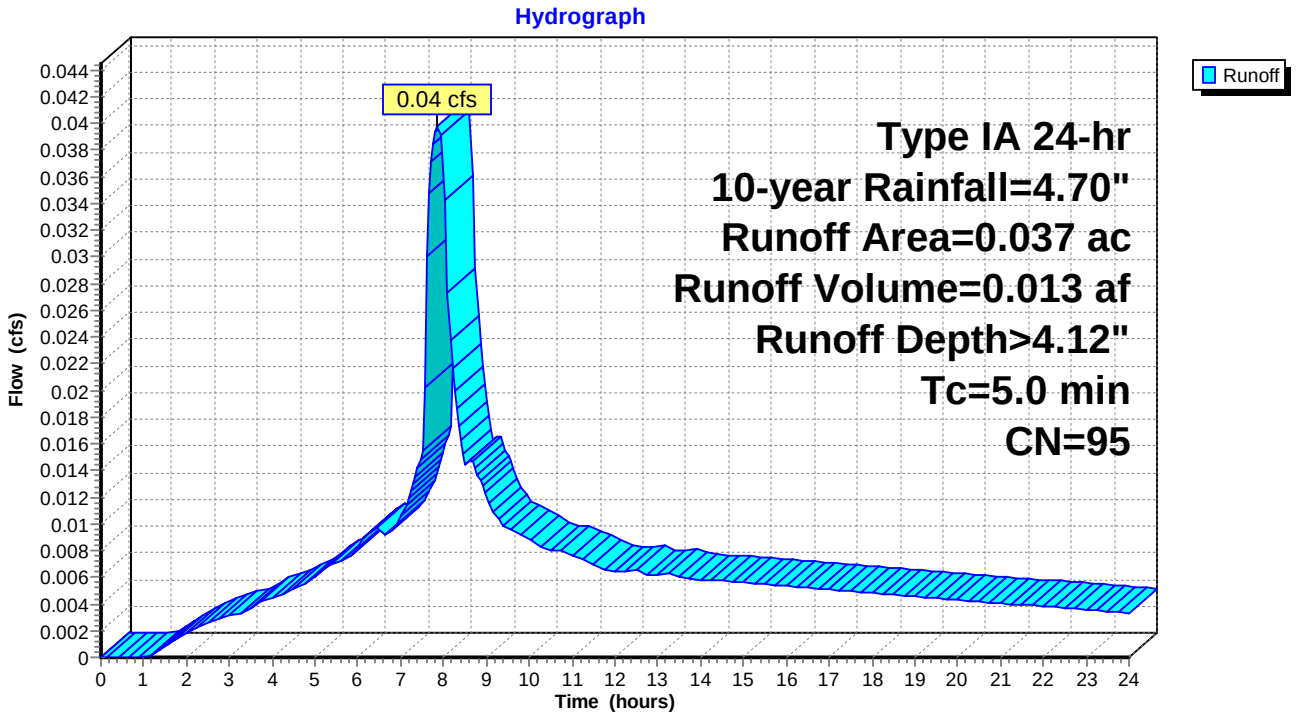
Runoff = 0.04 cfs @ 7.87 hrs, Volume= 0.013 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-year Rainfall=4.70"

	Area (ac)	CN	Description
*	0.034	98	Pavement
	0.003	61	>75% Grass cover, Good, HSG B
	0.037	95	Weighted Average
	0.003	61	8.11% Pervious Area
	0.034	98	91.89% Impervious Area

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

Subcatchment 6S: Drainage 6



Summary for Subcatchment 7S: Drainage 7

Existing condition of all drainage areas.

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

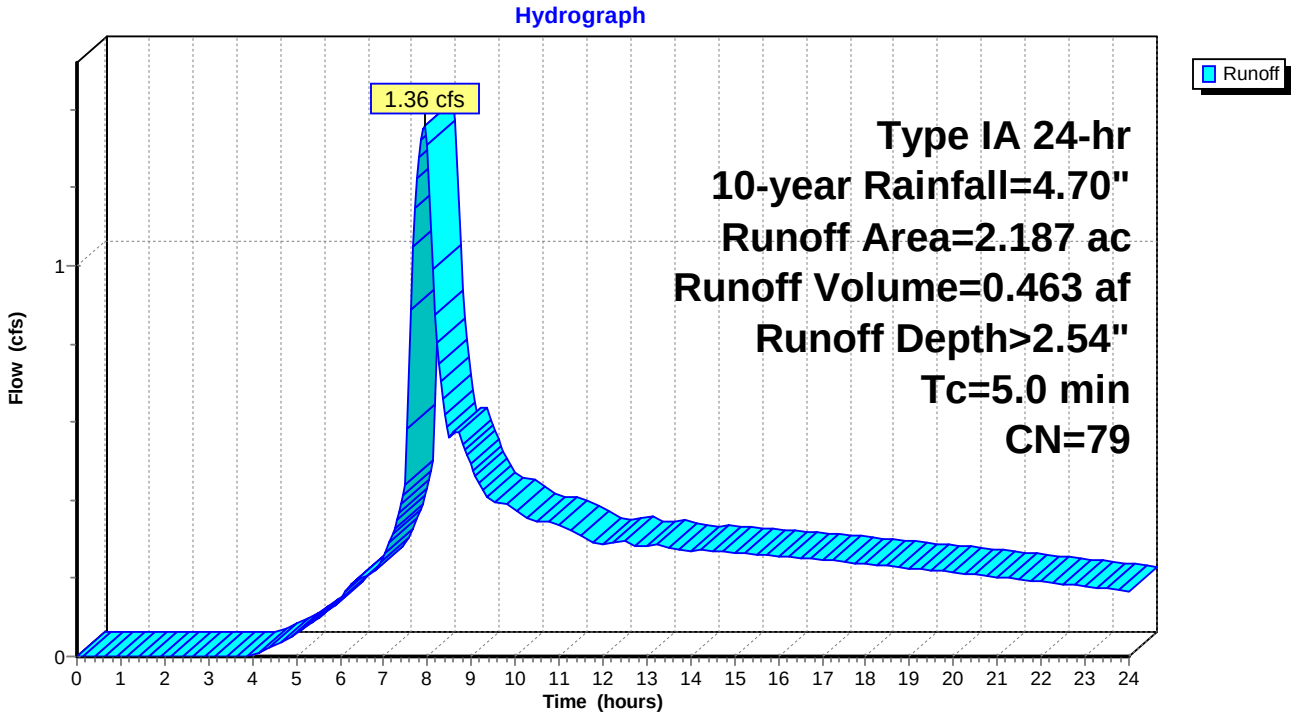
Runoff = 1.36 cfs @ 7.95 hrs, Volume= 0.463 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-year Rainfall=4.70"

Area (ac)	CN	Description
2.187	79	50-75% Grass cover, Fair, HSG C
2.187	79	100.00% Pervious Area

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

Subcatchment 7S: Drainage 7



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 6S: Drainage 6 Runoff Area=0.037 ac 91.89% Impervious Runoff Depth>4.91"
Tc=5.0 min CN=95 Runoff=0.05 cfs 0.015 af

Subcatchment 7S: Drainage 7 Runoff Area=2.187 ac 0.00% Impervious Runoff Depth>3.23"
Tc=5.0 min CN=79 Runoff=1.77 cfs 0.589 af

Total Runoff Area = 2.224 ac Runoff Volume = 0.604 af Average Runoff Depth = 3.26"
98.47% Pervious = 2.190 ac 1.53% Impervious = 0.034 ac

Summary for Subcatchment 6S: Drainage 6

New asphalt, concrete & on site landscape surfaces draining offsite to Fulton Ave.

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

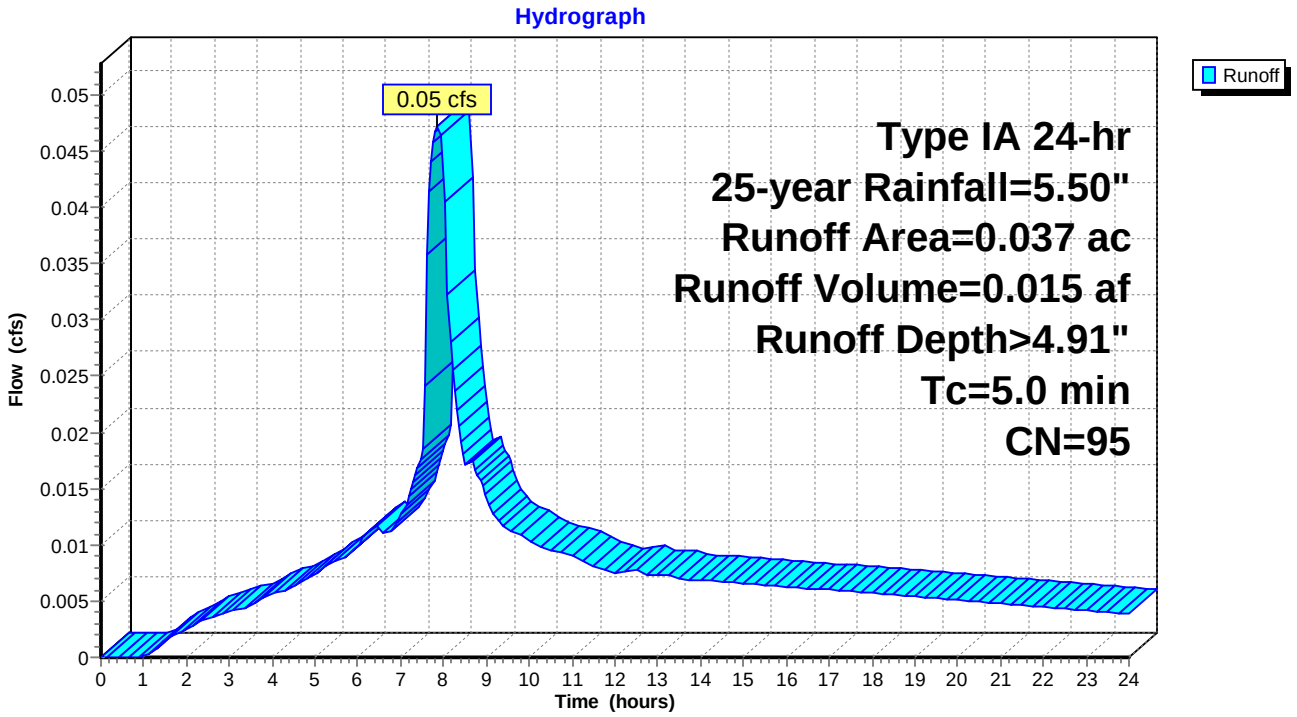
Runoff = 0.05 cfs @ 7.86 hrs, Volume= 0.015 af, Depth> 4.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-year Rainfall=5.50"

	Area (ac)	CN	Description
*	0.034	98	Pavement
	0.003	61	>75% Grass cover, Good, HSG B
	0.037	95	Weighted Average
	0.003	61	8.11% Pervious Area
	0.034	98	91.89% Impervious Area

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

Subcatchment 6S: Drainage 6



Summary for Subcatchment 7S: Drainage 7

Existing condition of all drainage areas.

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

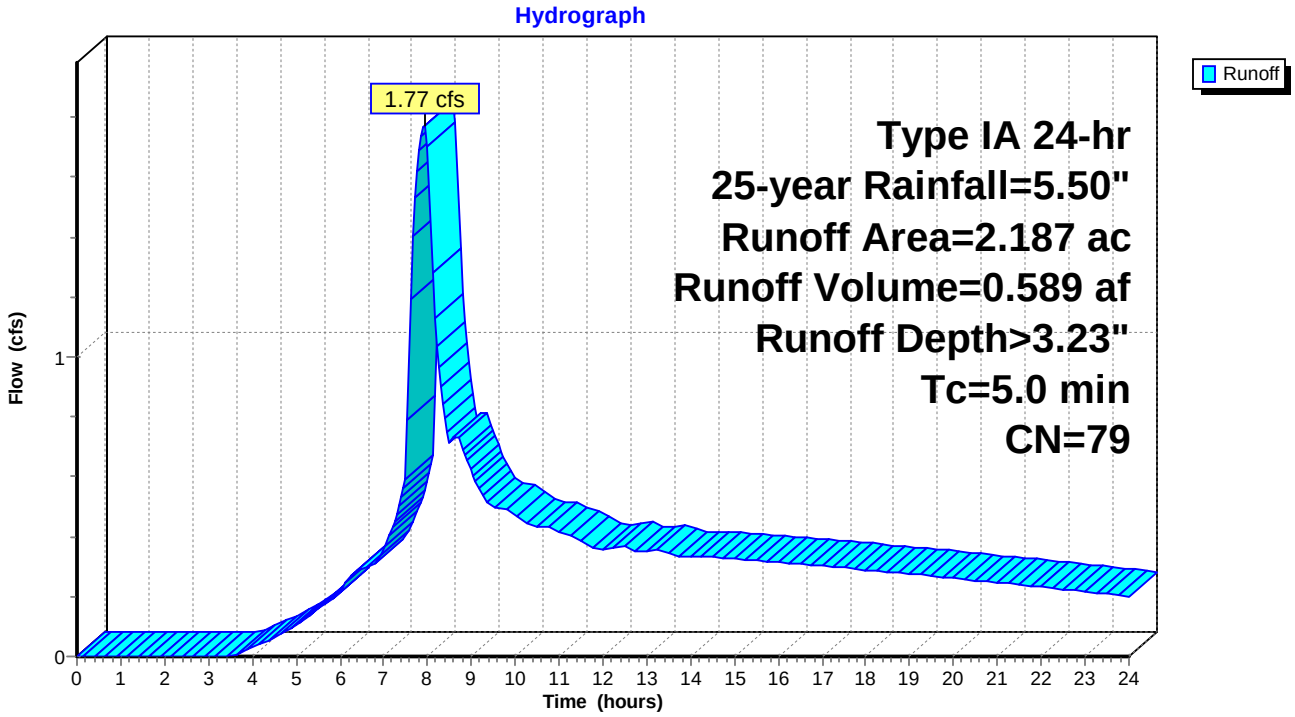
Runoff = 1.77 cfs @ 7.94 hrs, Volume= 0.589 af, Depth> 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-year Rainfall=5.50"

Area (ac)	CN	Description
2.187	79	50-75% Grass cover, Fair, HSG C
2.187	79	100.00% Pervious Area

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

Subcatchment 7S: Drainage 7



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 6S: Drainage 6 Runoff Area=0.037 ac 91.89% Impervious Runoff Depth>5.41"
Tc=5.0 min CN=95 Runoff=0.05 cfs 0.017 af

Subcatchment 7S: Drainage 7 Runoff Area=2.187 ac 0.00% Impervious Runoff Depth>3.67"
Tc=5.0 min CN=79 Runoff=2.03 cfs 0.670 af

Total Runoff Area = 2.224 ac Runoff Volume = 0.686 af Average Runoff Depth = 3.70"
98.47% Pervious = 2.190 ac 1.53% Impervious = 0.034 ac

Summary for Subcatchment 6S: Drainage 6

New asphalt, concrete & on site landscape surfaces draining offsite to Fulton Ave.

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

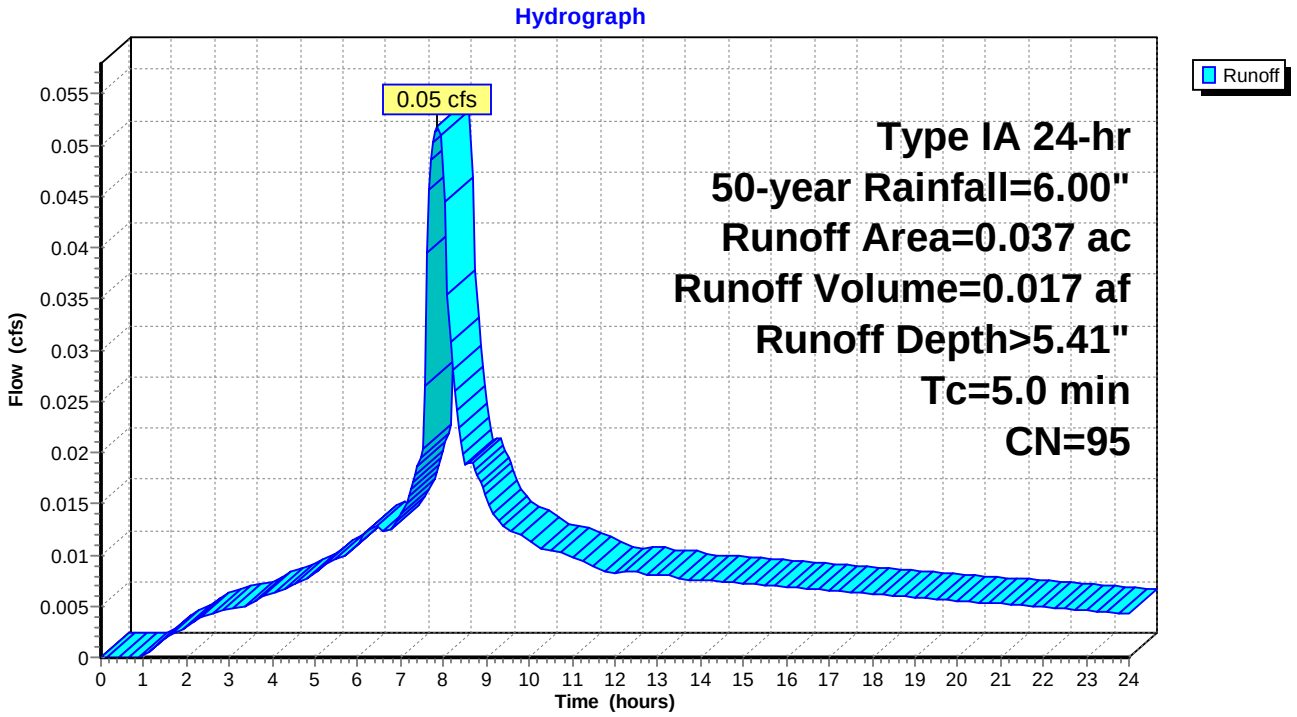
Runoff = 0.05 cfs @ 7.86 hrs, Volume= 0.017 af, Depth> 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50-year Rainfall=6.00"

	Area (ac)	CN	Description
*	0.034	98	Pavement
	0.003	61	>75% Grass cover, Good, HSG B
	0.037	95	Weighted Average
	0.003	61	8.11% Pervious Area
	0.034	98	91.89% Impervious Area

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

Subcatchment 6S: Drainage 6



Summary for Subcatchment 7S: Drainage 7

Existing condition of all drainage areas.

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

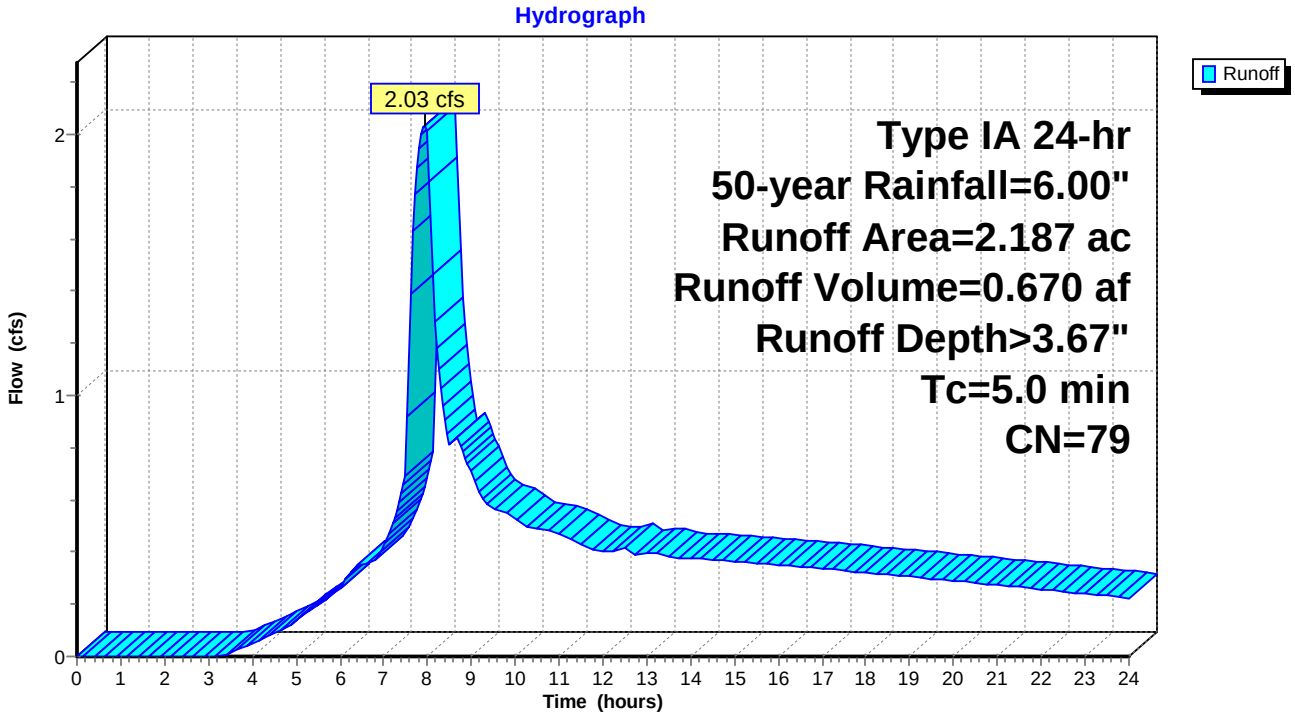
Runoff = 2.03 cfs @ 7.93 hrs, Volume= 0.670 af, Depth> 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50-year Rainfall=6.00"

Area (ac)	CN	Description
2.187	79	50-75% Grass cover, Fair, HSG C
2.187	79	100.00% Pervious Area

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

Subcatchment 7S: Drainage 7



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 6S: Drainage 6 Runoff Area=0.037 ac 91.89% Impervious Runoff Depth>5.90"
Tc=5.0 min CN=95 Runoff=0.06 cfs 0.018 af

Subcatchment 7S: Drainage 7 Runoff Area=2.187 ac 0.00% Impervious Runoff Depth>4.12"
Tc=5.0 min CN=79 Runoff=2.30 cfs 0.751 af

Total Runoff Area = 2.224 ac Runoff Volume = 0.770 af Average Runoff Depth = 4.15"
98.47% Pervious = 2.190 ac 1.53% Impervious = 0.034 ac

Summary for Subcatchment 6S: Drainage 6

New asphalt, concrete & on site landscape surfaces draining offsite to Fulton Ave.

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

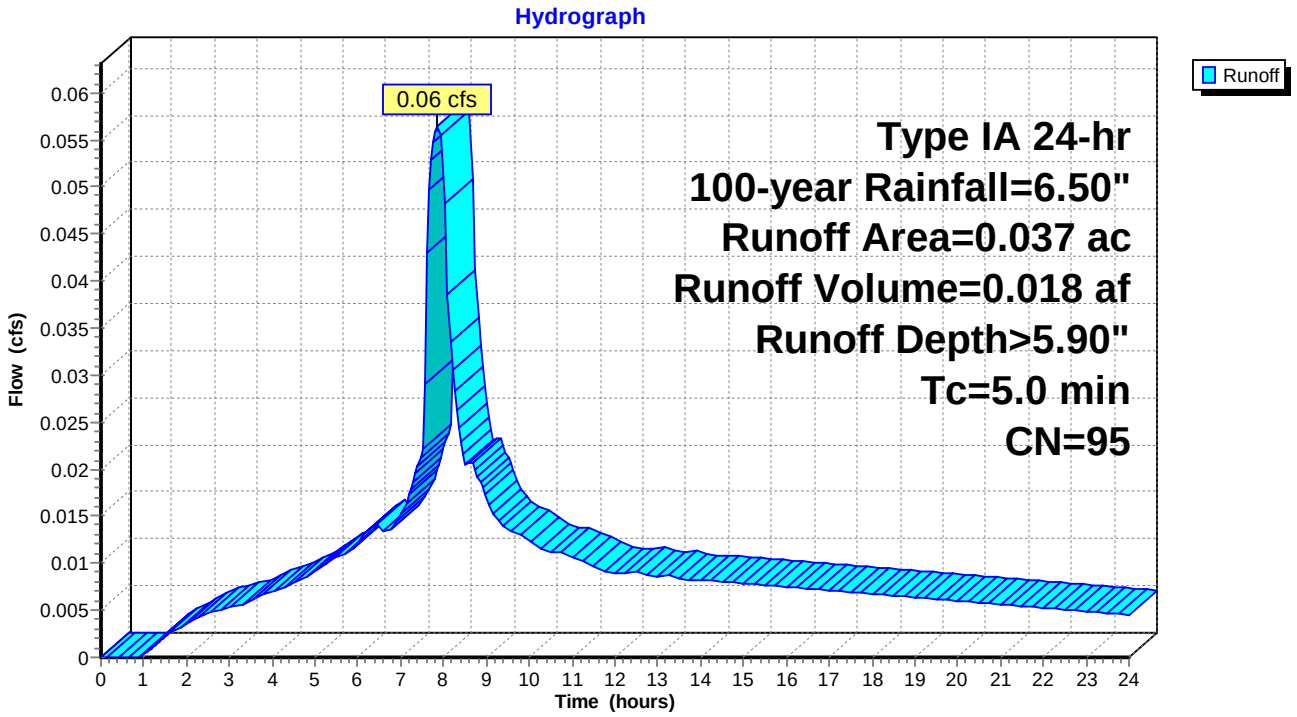
Runoff = 0.06 cfs @ 7.86 hrs, Volume= 0.018 af, Depth> 5.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-year Rainfall=6.50"

	Area (ac)	CN	Description
*	0.034	98	Pavement
	0.003	61	>75% Grass cover, Good, HSG B
	0.037	95	Weighted Average
	0.003	61	8.11% Pervious Area
	0.034	98	91.89% Impervious Area

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

Subcatchment 6S: Drainage 6



Summary for Subcatchment 7S: Drainage 7

Existing condition of all drainage areas.

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

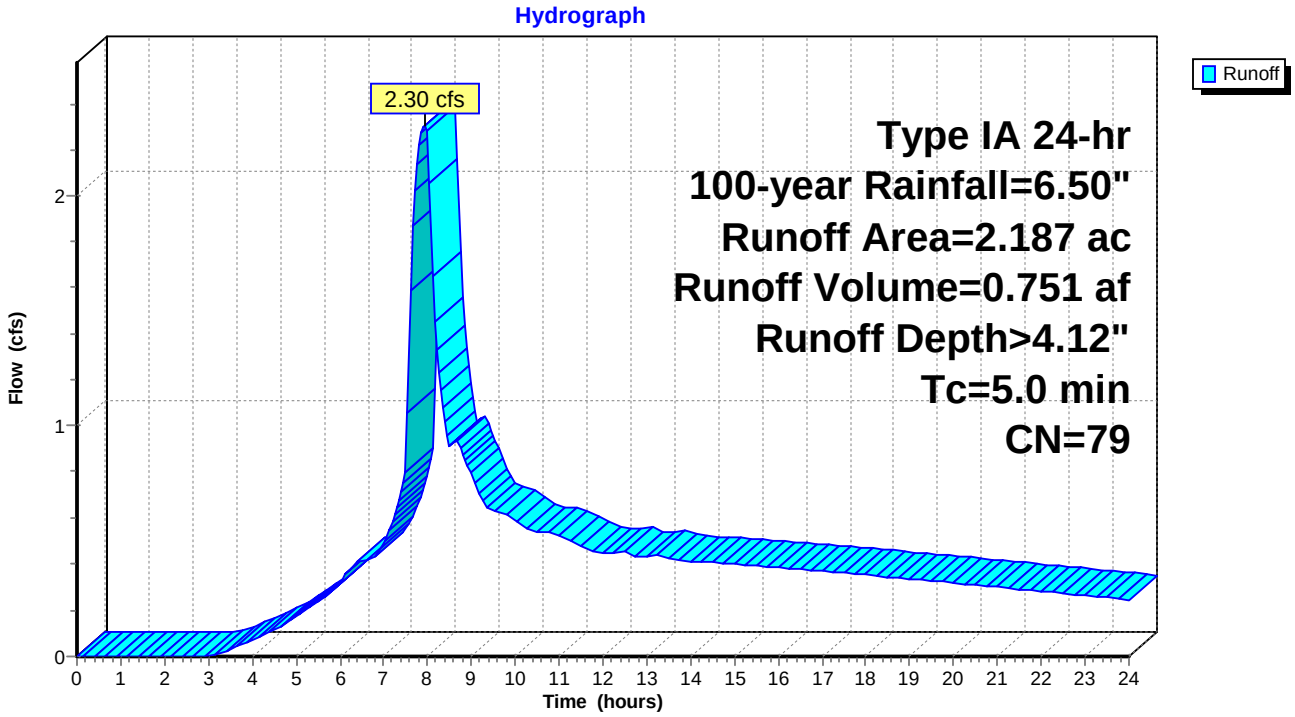
Runoff = 2.30 cfs @ 7.92 hrs, Volume= 0.751 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-year Rainfall=6.50"

Area (ac)	CN	Description
2.187	79	50-75% Grass cover, Fair, HSG C
2.187	79	100.00% Pervious Area

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

Subcatchment 7S: Drainage 7



Appendix B
Map & Soil Descriptions

Search

Map Unit Legend

Coos County, Oregon (OR011)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1B	Bandon sandy loam, 0 to 7 percent slopes	1.8	76.2%
8C	Bullards sandy loam, 7 to 12 percent slopes	0.4	16.7%
28	Heceta fine sand	0.2	7.1%
Totals for Area of Interest		**2.3**	**100.0%**

Legend

Soil Map

Scale 1:557 ±1%

Coos County, Oregon

8C—Bullards sandy loam, 7 to 12 percent slopes

Map Unit Setting

Elevation: 30 to 600 feet
Mean annual precipitation: 55 to 75 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Bullards and similar soils: 75 percent
Minor components: 8 percent

Description of Bullards

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed eolian and marine deposits

Typical profile

Oi - 0 to 3 inches: very strongly acid, slightly decomposed plant material
A1 - 3 to 10 inches: very strongly acid, sandy loam
A2 - 10 to 44 inches: very strongly acid, gravelly sandy loam
A3 - 44 to 63 inches: moderately acid, sand

Properties and qualities

Slope: 7 to 12 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Minor Components

Blacklock

Percent of map unit: 8 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Coos County, Oregon

1B—Bandon sandy loam, 0 to 7 percent slopes

Map Unit Setting

Elevation: 30 to 350 feet
Mean annual precipitation: 55 to 75 inches
Mean annual air temperature: 52 to 54 cegrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Bandon and similar soils: 80 percent
Minor components: 10 percent

Description of Bandon

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

Oe - 0 to 1 inches: very strongly acid, moderately decomposed plant material
H1 - 1 to 6 inches: very strongly acid, sandy loam
H2 - 6 to 31 inches: moderately acid, loam
H3 - 31 to 44 inches: , cemented
H4 - 44 to 61 inches: moderately acid, loam

Properties and qualities

Slope: 0 to 7 percent
Depth to restrictive feature: 20 to 36 inches to ortstein
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Minor Components

Blacklock

Percent of map unit: 10 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Report — Map Unit Description

Coos County, Oregon

28—Heceta fine sand

Map Unit Setting

Elevation: 0 to 80 feet
Mean annual precipitation: 50 to 70 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Heceta and similar soils: 80 percent

Description of Heceta

Setting

Landform: Deflation basins on dunes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits

Typical profile

H1 - 0 to 4 inches: slightly acid, fine sand
H2 - 4 to 60 inches: slightly acid, sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D

Description — Map Unit Description

Appendix C

Stormwater Drainage Area Map

MARPLE ST.

1S

1P

6S

2S

3S

4S

4P

5S

5P

SBR 2

SBR 1

EQUALIZATION BASIN

OPEN STREAM CHANNEL

TRENCH DRAIN

HEADWORKS

OFFICE/LAB

UV DISINFECTION

GEN

ELEC. ROOM

SHOP

IPS

FULTON AVE.

EMPIRE BLVD.

SD

OHE

PP

1S DRAINAGE AREA 1

- LANDSCAPE ONSITE NE: 13,041 SQ. FT.
- LANDSCAPE OFFSITE NE, FLOWING ONSITE: 8,062 SQ. FT.
- GRAVEL EAST OF SBR: 3,263 SQ. FT.

DRAINAGE AREA 1 TOTAL: 24,366 SQ. FT., 0.559 ACRES

1P ROCK DRAINAGE DITCH

- ROCK DRAINAGE DITCH: 1,633 SQ. FT. 0.037 ACRES

2S DRAINAGE AREA 2

- NW DRIVEWAY ONSITE: 526 SQ. FT.
- NW DRIVEWAY OFFSITE: 221 SQ. FT.
- PAVEMENT HEADWORKS & IPS: 28,207 SQ. FT.
- GRAVEL N & W of SBR: 5,781 SQ. FT.

DRAINAGE AREA 2 TOTAL: 34,735 SQ. FT., 0.797 ACRES

3S DRAINAGE AREA 3

- SBR: 19,206 SQ. FT.

DRAINAGE AREA 2 TOTAL: 0.441 ACRES

4S DRAINAGE AREA

- LANDSCAPE AROUND OFFICE: 1,537 SQ. FT.
- LANDSCAPE OFFSITE: 579 SQ. FT.
- OFFICE ROOF AND SIDEWALK: 2,612 SQ. FT.
- PAVEMENT ONSITE: 920 SQ. FT.

DRAINAGE AREA 3 TOTAL: 5,648 SQ. FT., 0.130 ACRES

4P RAINGARDEN 1

- RAINGARDEN 4P: 198 SQ. FT. 0.005 ACRES

5S DRAINAGE AREA

- LANDSCAPE ONSITE SW: 4,709 SQ. FT.
- LANDSCAPE OFFSITE SW: 1,152 SQ. FT.
- SHOP ROOF: 1,734 SQ. FT.
- PAVEMENT: 2,074 SQ. FT.

DRAINAGE AREA 4 TOTAL: 9,669 SQ. FT., 0.222 ACRES

5P RAINGARDEN 2

- BIOSWALE 5P: 2,000 SQ. FT. 0.046 ACRES

6S DRAINAGE AREA

- ONSITE PAVEMENT FLOWING OFFSITE: 560 SQ. FT.
- OFFSITE NEW PAVEMENT: 911 SQ. FT.

DRAINAGE AREA 5 TOTAL: 1,471 SQ. FT., 0.034 ACRES

OTHER

- NORTH STREAMBANK: 3,783 SQ. FT.
- WEST STREAMBANK: 3,437 SQ. FT.

LEGEND

- SLOPE DIRECTION
- PROPERTY AREA: 91,655 SQ. FT., 2.10 ACRES
- DRAINAGE AREA BORDER
- TOTAL DRAINAGE AREAS 1–6: 95,247 SQ. FT., 2.187 ACRES
- TOTAL AREAS TREATED ON SITE: 93,624 SQ. FT., 2.149 ACRES

PLAN
1"=20'

REGISTERED PROFESSIONAL ENGINEER 15,479 OREGON JULY 25, 1991 DANIEL P. GRABER EXPIRES 6/30/15

PRELIMINARY

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

CH2MHILL.

SHN
CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	DATE	REVISION	BY

DSGN DPG
DR DPG
CHK JMD
APVD

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE
CIVIL
STORMWATER DRAINAGE AREA MAP

SHEET 06-C-STRM
SEQ
DATE 09/2014
PROJ. NO. 490515

Appendix D

Site Grading Plan

MARPLE ST.

FULTON AVE.

EMPIRE BLVD.

TBM ELEV. 19.22
2½" ALUMINUM CAP
SURVEY DATUM: NAVD 88

EQUALIZATION BASIN

SEQUENCING BATCH REACTORS

ULTRAVIOLET DISINFECTION

WAS PUMPS

FF 16.5'

HEADWORKS FF 17.0

TRENCH DRAIN

ODOR CONTROL

FF 16.5'

ODOR CONTROL

GENERATOR

INFLUENT PUMP STATION FF 15.5

SHOP/ ELECTRICAL BUILDING FF 16.0

CONTROL BUILDING FF 16.5

LEGEND

-1.5% SLOPE DIRECTION

15' EXISTING CONTOUR ELEVATION

15' PROPOSED CONTOUR ELEVATION

16.58 FINISH GRADE SPOT ELEVATION

NOTES:

1. SEE CURB & PAVEMENT SECTION DETAIL _____
2. ONSITE STORMWATER TO BE DIRECTED TO WET WELL.
3. CONTRACTOR TO VERIFY LOCATION AND DEPTH OF UNDERGROUND UTILITIES.

PLAN
1"=20'

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

CH2MHILL.

SHN
CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	DATE	REVISION	BY

DSGN DPG
DR DPG
CHK JMD
APVD

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE

CIVIL

SITE GRADING MAP

SHEET 06-C-2003
SEQ
DATE 09/2014
PROJ. NO. 490515

DESIGN-DEV

Appendix E

Existing Site Conditions

MARPLE ST.

FULTON AVE.

EMPIRE BLVD.

EXISTING CULVERT

PROPERTY LINE

EXISTING OPEN STREAM CHANNEL

EXISTING CONCRETE SLABS

EXISTING SIDEWALK

EXISTING STORM DRAIN PIPE

EXISTING OPEN STREAM CHANNEL

EXISTING CULVERT

EXISTING EP

EXISTING CULVERT

30'

25'

20'

15'

10'

LEGEND

15' EXISTING CONTOUR ELEVATION

SLOPE DIRECTION

EXISTING SITE DRAINAGE MAP

1"=20'

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

CH2MHILL.

SHN CONSULTING ENGINEERS & GEOLOGISTS, INC.

NO.	DATE	REVISION	BY

DSGN DPG
DR DPG
CHK JMD
APVD

CITY OF COOS BAY WWTP 2 EXPANSION & UPGRADE

CIVIL

EXISTING SITE DRAINAGE MAP

SHEET 06-C-2000

SEQ

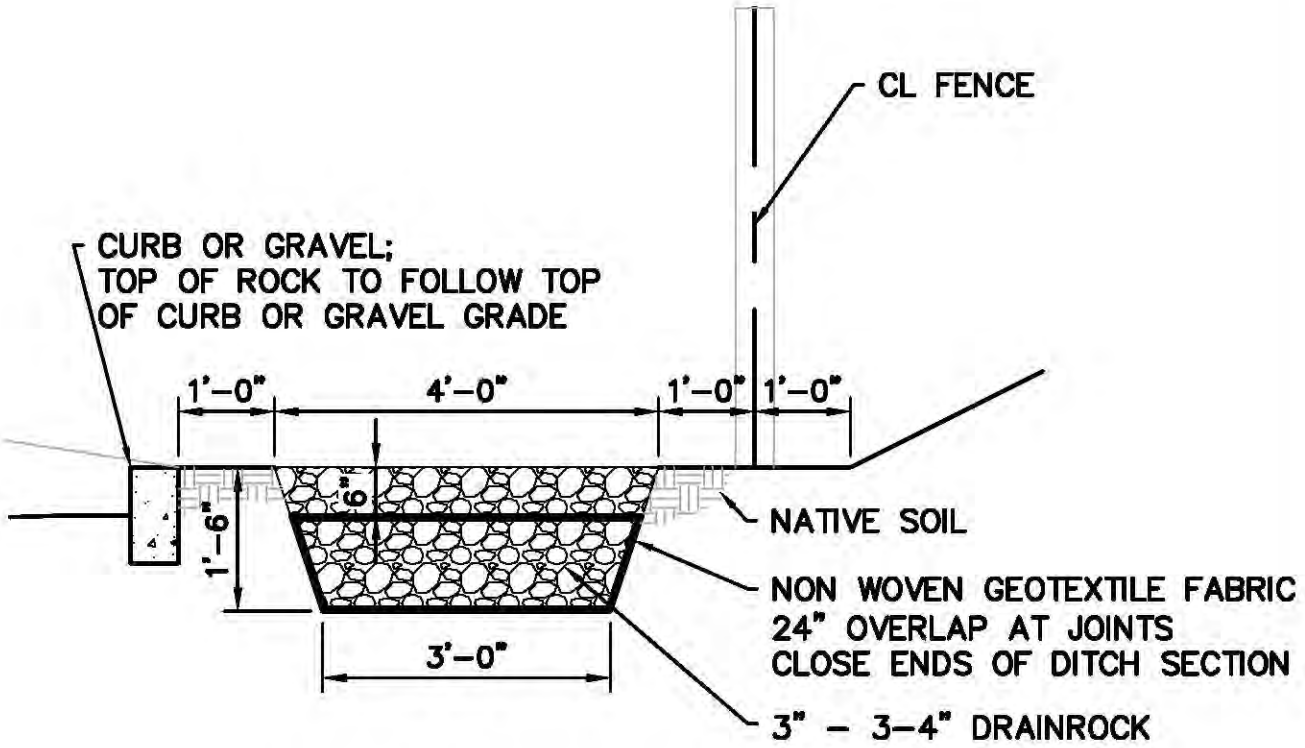
DATE 09/2014

PROJ. NO. 490515

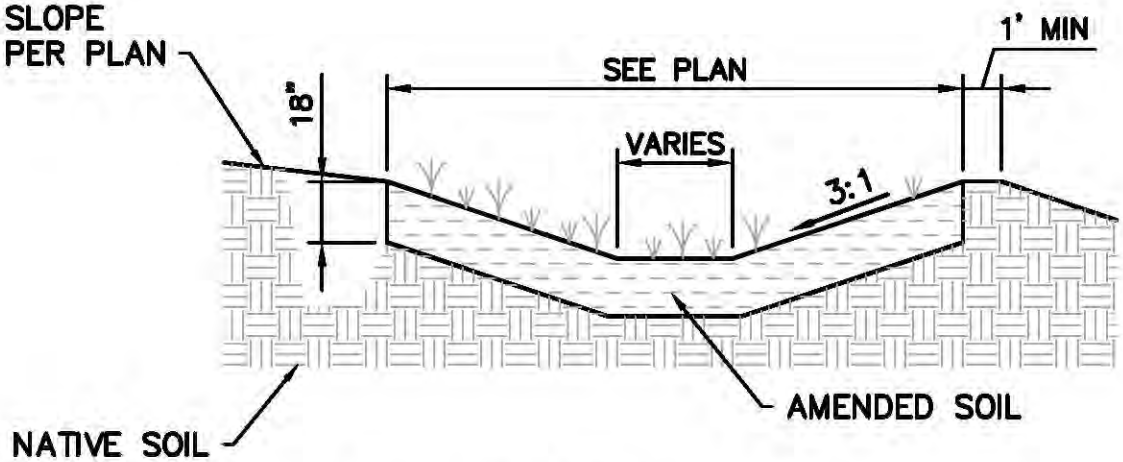
DESIGN-DEV

Appendix F

Stormwater Infiltration Structure Details



INFILTRATION DITCH
NTS



RAIN GARDEN
NTS

Consulting Engineers & Geologists, Inc.	Stormwater Drainage Details	SHN 614018.400	
	November 2014	614018-200-DETL-STRM	Detail:

\\CoosBaysvr1\Projects\2014\614018-WWTP2-Final\200-Dsgn-Dev-Phas\Dwgs\DETAILS-STANDARD Date: 11/2014

PART FIVE

VARIANCE APPLICATION

PART FIVE - VARIANCE APPLICATION

Chapter 17.350
A variance is requested from which requirement?

A variance is requested from the requirement for access onto major arterials given in *Chapter 17.145 Access Management* section of the City's Development Code. Empire Boulevard is classified as an arterial street. CBMC 17.145.050 (1) states the following requirement: *Arterial Streets. The minimum access spacing between access points shall be 500 feet.* The 500 foot distance is not possible due to site restrictions and plant configurations, and the applicant requests that this requirement be waived to allow a delivery access point at the north end of the site onto Empire Boulevard.

Required findings:

A. What physical, exceptional, extraordinary circumstances or conditions apply to your property that do not apply generally to other property in the same zoning district?

The City wishes to construct a new wastewater treatment plant (WWTP) on the City's undeveloped property, Tax Lot 2700 of T25S R13W.S10DA. The property has a 440 foot frontage on Empire Boulevard, a designated arterial street. There is a need for vehicle access during construction and occasional future operational access to the north part of the subject property from Empire Boulevard. Further, the site falls under Section 17.200.050 of the City Code, 'Nonresidential loading requirements', as follows:

> *Nonresidential off street loading shall be required for uses or buildings which receive or distribute merchandise by truck and shall be adequate to handle the needs of the particular use. Where practical difficulties make it impossible to provide off-street loading spaces, provisions shall be made to provide these spaces through a right-of-way use permit or loading zone.*

Due to the required size and placement of the treatment plant facilities and the site's steep rise to Marple Street, vehicular access to plant features on the north side of the site is limited without an entrance from Empire Boulevard. This additional access point would be used on a very infrequent basis for maintenance vehicles needing access to the SBR and UV facilities, or for site access during an emergency.

An existing waterway flows east to west just north of the site property. At the northwest property corner, the waterway turns south, crosses the property line and passes through a sixty-foot long buried culvert atop which there is a dirt driveway to the site's interior. This dirt driveway's location is the suggested access point from Empire Boulevard. At a point 180 feet south of the north property line, the waterway turns west to cross under Empire Boulevard, discharging to the bay.

A variance from the 500 foot distance is needed because the distance from Fulton Avenue north to the proposed access point at the dirt driveway is approximately 390 feet, less than the minimum 500 feet. Strict application of the 500-foot minimum access spacing between access points would prevent vehicle to the site from Empire Boulevard, and allow access only from Fulton Avenue. Access from Marple Street has not been proposed due to the steep bank between the plant site and Marple and the residential surroundings.

B. How would a strict application of the ordinance provisions constitute an unnecessary hardship or practical difficulty which is not self-created?

A strict application would prevent an access to Empire Boulevard to accomplish the important tasks of WWTP construction, operation and emergency access by only allowing site access from Fulton Avenue. The proposed access point is necessary to allow construction of the sequencing batch reactor, the equalization basin and the UV disinfection system, as access to the north half of the site is limited from the Fulton Avenue entrance.

Post-construction, the Empire Boulevard entrance will be necessary to allow very infrequent maintenance and emergency vehicle access to the facilities for plant operations and emergency response. Without an access point from Empire Boulevard, there is limited access to the north half of the site. The undeveloped parcel's north-south orientation and 440-foot frontage on Empire Boulevard create the need for an access point; the difficulty is not self-created.

C. Describe zoning and use of abutting properties in detail.

The zoning of the neighboring properties to the north, west and south of the site along Empire Boulevard is General Commercial, C-2. These properties largely have commercial developments and a few scattered residences; however, the property north of the site, between Webster and Pacific Avenues, has developed as a mobile home park. The property to the east across Marple Street is zoned as R-2 Single Family/Duplex Residential, and is generally residential in nature.

The Oregon Department of Transportation (ODOT) is planning to rebuild Empire Boulevard in this vicinity. The property immediately north of the proposed WWTP site has three access points for vehicles entering and leaving a developed mobile home park. Although exceeding the minimum spacing, these access points are long-standing and are to continue per the ODOT construct plans.

D. Will granting the variance have a negative effect on abutting properties? (Explain)

There would be a temporary negative effect upon properties along Empire Boulevard and directly across from the proposed access point as construction traffic would enter and leave the site during the construction period. This would require greater care by drivers entering Empire Boulevard. However, the construction traffic will be of limited duration, and future use of the proposed access point would be solely for very infrequent trips by delivery and plant maintenance vehicles needing access to facilities on the north half of the plant through a normally locked gate. Once construction at the new plant is complete, it is anticipated that the proposed entrance on Empire Boulevard would not be used more than once per month.

There would be a very limited negative effect to residents living on the east side of Marple Street or properties south of Fulton Avenue because the proposed access point is off Empire Boulevard at a distance of 390 feet north of Fulton Avenue. Most of this effect would be temporary during the construction phase. After construction, delivery trucks or emergency vehicles needing access to the north half of the site will pull into the paved driveway from Empire Boulevard and park while the manually operated double gate is unlocked and opened to allow vehicle access.

E. *Will granting the variance create a safety hazard? (Explain)*

ODOT is planning to reconstruct sections of Empire Boulevard, and the following information has been confirmed per ODOT's construction drawings, "Empire Boulevard, Newmark Avenue to Wisconsin Avenue", Sheets 7A, 8 and 8a.

The requested access point is twenty-five feet in width. In this vicinity, Empire Boulevard is on a southerly slope with good sight distance and visibility both north and south. The posted vehicular speed is 35 mph with no passing zone in either direction. Although vehicles would slow to turn into the proposed driveway, there is ample visual sight distance for a turn to be completed safely without posing a safety hazard to either following or oncoming vehicles.

There are three existing driveways allowing access from Empire Boulevard into the mobile home park directly north of the City's property. The proposed access point is 140 feet south of the closest driveway, with two other driveways at total distances of 200 and 400 feet north from the proposed access point.

The ODOT drawings do not show any cross-walks in the vicinity of the requested WWTP access point. There are cross-walks planned at the intersection of Fulton and Empire at the south end of the site, and across Pacific Avenue to the north. However, these cross-walks are at least 350 feet away from the proposed access point. The requested variance will not endanger pedestrians.

The above statements are true to the best of my belief and knowledge. As applicant, I understand that the Planning Commission requests the attendance of me, or my representative, at the meeting(s) where this request is scheduled for consideration.

Signature of Applicant or Authorized Agent

11/21/14
Date

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Appendix A

Proof of Ownership

RECORDING REQUESTED BY:

GRANTOR'S NAME:
Albert D. Valdez and Terri M. Valdez

GRANTEE'S NAME:
City of Coos Bay

SEND TAX STATEMENTS TO:
City of Coos Bay
500 Central Ave
Coos Bay, OR 97420

AFTER RECORDING RETURN TO:
City of Coos Bay
500 Central Ave.
Coos Bay, OR 97420

Escrow No: 360611003893-TTCOO06

003893
AFTER RECORDING
RETURN TO
Ticor Title Insurance
300 West Anderson Ave - Box 1075
Coos Bay, OR 97420-0233

490 Fulton Avenue
Coos Bay, OR 97420

SPACE ABOVE THIS LINE FOR RECORDER'S USE

STATUTORY WARRANTY DEED

Albert D. Valdez and Terri M. Valdez, Grantor, conveys and warrants to

City of Coos Bay, an Oregon Municipal corporation, Grantee, the following described real property, free and clear of encumbrances except as specifically set forth below, situated in the County of Coos, State of Oregon:

Lot 2, Block 98, First Addition to Empire, Coos County, Oregon.

Subject to and excepting:

Rights of the public to any portion of the Land lying within the area commonly known as public streets, roads and highways.

The Land lies within the City of Coos Bay Urban Renewal Plan for the Empire District and is subject tot he terms and prov isions thereof.

Recording Date; September 5, 1995
Recording No: 95-09-0188

Amendments:
Recording Date: October 3, 1995
Recording No: 95-10-0113

Recording Date: may 27, 1998
Recording No: 98-05-1136

Recording Date; June 19, 2003
Recording No: 2003-8933

In consideration, $108,000.00

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT

COOS COUNTY CLERK, OREGON
TERRI L. TURI, CCC, COUNTY CLERK
TOTAL $46.00
12/02/2011 02:21:29PM
PAGE 1 OF 2
2011 9627

ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009.

THE TRUE AND ACTUAL CONSIDERATION FOR THIS CONVEYANCE IS $108,000.00. (See ORS 93.030)

DATED: November 23, 2011

Albert D. Valdez

Terri M. Valdez

OFFICIAL SEAL
JANET M RUBIN
NOTARY PUBLIC-OREGON
COMMISSION NO. 453394
MY COMMISSION EXPIRES NOVEMBER 17, 2014

State of OREGON

COUNTY of Coos

This instrument was acknowledged before me on Nov 23, 20 11

by Albert D. Valdez and Terri M. Valdez

Janet M. Rubin, Notary Public - State of Oregon

My commission expires: 11-17-2014

I, Rodger Craddock, City Manager, as ~~Mayor~~ of the City of Coos Bay, and on behalf of the City of Coos Bay, do hereby accept this transfer of interest in the subject real property to the City of Coos Bay from the grantors herein.

STATE OF OREGON
County of Coos.

On Dec 1, 2011, before me personally appeared the above-named Rodger Craddock, and acknowledged that he executed the foregoing instrument freely and voluntarily.

Janet M. Rubin
NOTARY PUBLIC FOR OREGON

OFFICIAL SEAL
JANET M RUBIN
NOTARY PUBLIC-OREGON
COMMISSION NO. 453394
MY COMMISSION EXPIRES NOVEMBER 17, 2014

360611003893-TTCOO06
Deed (Warranty-Statutory)

COOS COUNTY CLERK, OREGON
TERRI L. TURI, CCC, COUNTY CLERK
TOTAL $46.00

12/02/2011 02:21:29PM
PAGE 2 OF 2

2011 9627

RECORDING REQUESTED BY:

GRANTOR'S NAME:
LJW Properties, LLC

GRANTEE'S NAME:
City of Coos Bay

SEND TAX STATEMENTS TO:
City of Coos Bay
500 Central
Coos Bay, OR 97420

AFTER RECORDING RETURN TO:
City of Coos Bay
500Central
Coos Bay, Oregon 97420

Escrow No: 360611003902-TTCOO06

003902

AFTER RECORDING
RETURN TO
Ticor Title Insurance
300 West Anderson Ave - Box 1075
Coos Bay, OR 97420-0233

695 South Empire Blvd
Coos Bay, OR 97420

In consideration: $495,000.00

SPACE ABOVE THIS LINE FOR RECORDER'S USE

STATUTORY WARRANTY DEED

LJW PROPERTIES, LLC, Grantor, conveys and warrants to

City of Coos Bay, an Oregon Municipal corporation, Grantee, the following described real property, free and clear of encumbrances except as specifically set forth below, situated in the County of Coos, State of Oregon:

Parcel 1: Beginning at a point South 24° 46 1/2' West 130 feet distance from the Southeasterly corner of Block 129, Empire City, Coos County, Oregon, which point would be a Westerly side of Fourth Street extended; thence South 24° 46 1/2' West along what would be the Westerly line of Fourth Street extended 326.7 feet to a point; thence at right angles with the Westerly line of Fourth Street extended North 65° 13 1/2' West a distance of 225 feet, more or less, to the center of the County Road or highway; thence Northeasterly along the center line of the County Road or highway about 327 feet, which point would be in the center of Broadway Street extended; thence South 65° 13 1/2' East about 240 feet to the place of beginning.

Parcel 2: Beginning at a point South 24° 46 1/2' West 30 feet distance from the Southeasterly corner of Block 129 of the Empire City, Coos County, Oregon, which point would be on the line of the Westerly side of 4th Street extended; thence South 24° 46 1/2' West along what would be the Westerly line of 4th Street extended 100 feet to a point; thence at right angles with the Westerly line of 4th Street extended North 65° 13' West a distance of 240 feet, more or less, to the center line of the County Road or highway; thence Northeasterly along the center line of the County Road or highway about 100 feet, which point would be in the center of Broadway Street extended; thence South 65° 13 1/2' East about 240 feet to the place of beginning, all being in Section 19, Township 25 South, Range 13 West of the Willamette Meridian, Coos County, Oregon.

SAVE AND EXCEPT THEREFROM the property described as follows: Beginning at the intersection of the South line of Webster Avenue and the West line of Marple Street in the First Addition to Empire, Coos County, Oregon, said point also being South 23° 34' West 30 feet from the Southeast corner of Block 129, Empire City, Coos County, Oregon; thence South 23° 34' West along the West line of said Marple Street 40 feet; thence North 66° 26' West 210 feet, more or less, to the East line of Empire Boulevard, also known as Cape Arago State Highway; thence North 23° 34' East along the East line of said Empire Boulevard 40 feet to the South line of said Webster Avenue; thence South 66° 26' East along the South line of said Webster Avenue 210 feet, more or less, to the point of beginning.

Parcel 3: Lot 1, Block 98, First Addition to Empire, Coos County, Oregon.

COOS COUNTY CLERK, OREGON
TERRI L. TURI, CCC, COUNTY CLERK
TOTAL $51.00
12/02/2011 02:21:29PM
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EXCEPTING that portion conveyed to the State of Oregon, by and through its State Highway Commission, more fully described in Book 122, Page 632, Deed Records of Coos County, Oregon.

Subject to and excepting:

The land lies within the City of Coos Bay Urban Renewal Plan for the Empire District and is subject to the terms and provisions thereof.

Rights of the Public to any portion of the Land lying within the area commonly known as public streets, roads and highways.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009.

THE TRUE AND ACTUAL CONSIDERATION FOR THIS CONVEYANCE IS $495,000.00. (See ORS 93.030) As paid to a qualified intermediary pursuant to an IRC section 1031 exchange.

DATED: December 1, 2011

LJW PROPERTIES, LLC

BY: LJW Properties, LLC Virginia A Webster

State of OREGON

COUNTY of Coos

This instrument was acknowledged before me on Dec 1, 20 11

by Virginia A. Webster, member

Janet M. Rubin, Notary Public - State of Oregon

My commission expires: 11-17-2014

OFFICIAL SEAL
JANET M RUBIN
NOTARY PUBLIC-OREGON
COMMISSION NO. 453394
MY COMMISSION EXPIRES NOVEMBER 17, 2014

360611003902-TTCOO06
Deed (Warranty-Statutory)

I, Rodger Craddock, as City Manager of the City of Coos Bay, and behalf of the City of Coos Bay do hereby accept this transfer of interest in the subject real property to the City of Coos Bay from the grantors herein.

STATE OF OREGON

County of Coos

On December 1, 2011, before me personally appeared the above-named Rodger Craddock, and acknowledged that he executed the foregoing instrument freely and voluntarily.

Notary Public for Oregon

OFFICIAL SEAL
JANET M RUBIN
NOTARY PUBLIC-OREGON
COMMISSION NO. 453394
MY COMMISSION EXPIRES NOVEMBER 17, 2014

360611003902-TTCOO06
Deed (Warranty-Statutory)

COOS COUNTY CLERK, OREGON
TERRI L. TURI, CCC, COUNTY CLERK
TOTAL $51.00

12/02/2011 02:21:29PM
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COOS COUNTY ASSESSOR'S OFFICE

250 North Baxter Street, Coquille, Oregon 97423
(541) 396-3121 Ext. 268
FAX (541)396-6071/TDD 1-800-735-2900

STEVE JANSEN
ASSESSOR

CONSOLIDATION REQUEST FORM
FEE: $40.00

TO PROTECT THE INTERESTS OF THE TAXPAYER, THE ASSESSOR'S OFFICE WILL NOT CONSOLIDATE ACCOUNTS WITHOUT WRITTEN CONSENT.

Accounts (parcels) being considered for "consolidation" must meet the following criteria.

1. Names(s) of owner(s) of each parcel must be identical – to the letter.
2. Each owner's interest in each parcel must be identical.
3. Parcels must be touching or abutting.
4. All taxes must be paid.
    - You must voluntarily pre-pay your property taxes if you want your consolidation request processed between July 1, and September 1.
5. Any mortgage, lien contract, etc. must cover all parcels being considered for "consolidation".
6. Classes of the properties must be the same, (i.e. residential cannot be consolidated with commercial, etc.)
7. Parcels must be in compliance with ORS 92.190(4) (Property line adjustment).
8. Parcels must be in compliance with ORS 92.060 (Partition plat) requirements.

Between Sept. 1 and the time that tax statements are mailed, no consolidations can be processed.

****

Please combine our property identified by the following accounts/or tax lot numbers.

The City of Coos Bay is requesting that the following three tax lots be consolidated. They are located on the northeast corner of S. Empire Boulevard and Fulton Avenue: 25S13W19DATL0270000, 25S13W19DATL0260000, and 25S13W19DATL0260100. The City is also requesting that the lot consolidation assign the new tax lot number as 25S13W19DATL0270000 (Tax Lot 2700) with an address of 490 Fulton Avenue.

Signature of owner(s) _____

Print Name(s) Rodger Craddock

Date: 4/22/14

Appendix B

Authorized Agent Consent Form

CONSENT FOR AUTHORIZED AGENT

On this 21st day of November 2014, I, Roger Craddock, duly authorized agent for the City of Coos Bay, owner of the property described as Township 25S, Range13W, Section 19DA, Tax Lot 2700, hereby grant permission to SHN Consulting Engineers & Geologists, Inc. to submit an application to the City of Coos Bay for a Site Plan and Architectural Review.

Owner's Signature Jim Hossley for Roger Craddock

Appendix C

Certified List of Property Owners Within Site's 500 Foot Radius

NEW WASTEWATER TREATMENT PLANT NO. 2 - PROPERTIES WITHIN 500 FEET

OWNER	MAIL	MAIL CITY	MAIL STATE	ZIP	TRS	TAXLOT	SITE ADDRESS
ALLWARDT, THEODORE & MARIAN	98126 W BENHAM LN #29	BROOKINGS	OR	97415	25S13W19DA	2401	520 FULTON
ANDERSON, PATRICK D. & CAROL A.	93784 HIGH LN	COOS BAY	OR	97420	25S13W19DA	800	557 S MARPLE
BABBS, GERALD D.; ETAL	684 S WASSON	COOS BAY	OR	97420	25S13W20CB	9500	684 S WASSON
BAER, RANDY L., SR. & COLEEN L.	649 S WALL ST	COOS BAY	OR	97420	25S13W20CB	10400	649 S WALL
BAER, RANDY L., SR. & COLEEN L.	649 S WALL ST	COOS BAY	OR	97420	25S13W20CB	10500	655 S WALL
BARNETT, EMERY	506 S MARPLE ST	COOS BAY	OR	97420	25S13W19DA	3300	506 S MARPLE
BASNEY, SANDRA L.	64904 E BAY RD	NORTH BEND	OR	97459	25S13W19DA	1300	570 S WALL
BENDER, KARL J. & DAWNA	805 S EMPIRE BLVD	COOS BAY	OR	97420	25S13W19DA	6300	755 S EMPIRE BV
BENDER, KARL J. & DAWNA G.	805 S EMPIRE BLVD	COOS BAY	OR	97420	25S13W19DA	6200	805 S EMPIRE BV
BOUTHILLIER REVOCABLE LIVING TRUST	8458 POINSETTIA DR	BUENA PARK	CA	90620	25S13W20CB	3100	569 S WALL
BROWNING, THOMAS W. & SANDRA K.	662 S WASSON	COOS BAY	OR	97420	25S13W20CB	9700	662 S WASSON
BRYANT, FORREST R. & EILEEN M.	321 CLARKS MILL AVE	WATERFORD	CA	95386	25S13W19DA	3900	596 S EMPIRE BV
CABOT, MICHAEL J.	6376 EGRET CT	VENTURA	CA	93003	25S13W19DA	3400	475 PACIFIC AV
CABRERA, MIRNA M.	660 S WALL ST	COOS BAY	OR	97420	25S13W19DA	2000	660 S WALL
CALDERA, A. DWAYNE & MELODY	525 FULTON	COOS BAY	OR	97420	25S13W19DA	7100	
CALDERA, ALFRED D. & MELODY J.	525 FULTON	COOS BAY	OR	97420	25S13W19DA	6600	
CALDERA, ALFRED D. & MELODY J.	525 FULTON	COOS BAY	OR	97420	25S13W19DA	6601	525 FULTON
CALDERA, ALFRED D. & MELODY J.	525 FULTON	COOS BAY	OR	97420	25S13W19DA	7300	
CITY OF COOS BAY	500 CENTRAL	COOS BAY	OR	97420	25S13W19DA	2800	
CITY OF COOS BAY	500 CENTRAL AV	COOS BAY	OR	97420	25S13W19DA	5300	
CITY OF COOS BAY	500 CENTRAL	COOS BAY	OR	97420	25S13W19DA	5400	
CITY OF COOS BAY	500 CENTRAL AV	COOS BAY	OR	97420	25S13W19	500	100 FULTON AV
CLARK, FRED	63273 SHASTA RD	COOS BAY	OR	97420	25S13W19DA	1200	595 S MARPLE
COMBIE, STUART W. & ROBIN L.	545 S MARPLE	COOS BAY	OR	97420	25S13W19DA	600	545 S MARPLE
CONLON, PATRICK D.; ETAL	555 S EMPIRE BV	COOS BAY	OR	97420	25S13W19DA	3500	555 S EMPIRE BV
COOS BAY RESORT LLC; ETAL	5331 SW MACADAM AVE SUITE 258	PORTLAND	OR	97239	25S13W19	700	
COQUILLE INDIAN TRIBE TRUST	PO BOX 569	SILETZ	OR	97380	25S13W19DA	6700	
COX, WILLIAM & LENA	67118 W WESTVIEW RD	NORTH BEND	OR	97459	25S13W19DA	1900	644 S WALL
DUBISAR, VICKI L.	P.O. BOX 3375	COOS BAY	OR	97420	25S13W19DA	5000	676 EMPIRE BV S
DUBISAR, VICKI L.; ET AL	P.O. BOX 3375	COOS BAY	OR	97420	25S13W19DA	5100	
DUBISAR, VICKI L.; ET AL	P.O. BOX 3375	COOS BAY	OR	97420	25S13W19DA	5200	676 S EMPIRE BV
DYNGE, GARY M. & DEBIE L.	567 S WALL	COOS BAY	OR	97420	25S13W20CB	3000	567 S WALL
GARRETT, CAROL L.; ETAL	563 S WALL	COOS BAY	OR	97420	25S13W20CB	2800	563 S WALL
GREEN, ANNA K.	58850 SEVEN DEVILS RD	BANDON	OR	97411	25S13W19DA	4600	652 S EMPIRE BV
HAKE, ROCKSANN	676 S WASSON ST	COOS BAY	OR	97420	25S13W20CB	9600	676 S WASSON
HERZ, VERNE A.	525 S MARPLE ST	COOS BAY	OR	97420	25S13W19DA	300	525 S MARPLE
HOFFMANN SIEGFRIED W. & HOFFMANN, DONNA	530 MONTGOMERY AVE	COOS BAY	OR	97420	25S13W19DA	1400	611 S MARPLE
HOFFMANN SIEGFRIED W. & HOFFMANN, DONNA	530 MONTGOMERY AVE	COOS BAY	OR	97420	25S13W19DA	1401	
HOFFMANN SIEGFRIED W. & HOFFMANN, DONNA	530 MONTGOMERY AVE	COOS BAY	OR	97420	25S13W19DA	1400	611 S MARPLE
JAEGGLI, NATHANIEL D. & SALLY B.	94964 ECHO SPRINGS LN	NORTH BEND	OR	97459	25S13W19DA	100	518 S WALL
JANICE L. WALLENSTEIN REVOCABLE TRUST	3516 SW 58TH DR	PORTLAND	OR	97221	25S13W19AD	3600	
JANICE L. WALLENSTEIN REVOCABLE TRUST	3516 SW 58TH DR	PORTLAND	OR	97221	25S13W19AD	3500	
JANICE L. WALLENSTEIN REVOCABLE TRUST	3516 SW 58TH DR	PORTLAND	OR	97221	25S13W19DA	4100	
JANICE L. WALLENSTEIN REVOCABLE TRUST	3516 SW 58TH DR	PORTLAND	OR	97221	25S13W19	400	

NEW WASTEWATER TREATMENT PLANT NO. 2 - PROPERTIES WITHIN 500 FEET

OWNER	MAIL	MAIL CITY	MAIL STATE	ZIP	TRS	TAXLOT	SITE ADDRESS
JANICE L. WALLENSTEIN REVOCABLE TRUST	3516 SW 58TH DR	PORTLAND	OR	97221	25S13W19	300	
JOHNSON, JOHNNY R.; ETAL	675 S WALL	COOS BAY	OR	97420	25S13W20CB	10700	675 S WALL
KAMP, ROBERT VANDE & KILDAY, KATHRINE L.	2570 OCEAN BLVD SE	COOS BAY	OR	97420	25S13W19DA	3601	
LEISY, MICHAEL & LYNNE	88643 WEISS ESTATES LN	BANDON	OR	97411	25S13W20CB	2900	565 S WALL
LEWIS W. ROBERTS LIVING TRUST	8928 E ADAMS AVE	FOWLER	CA	93625	25S13W19DA	6100	817 S EMPIRE BV
LONG, GLORIA G.	53877 BEACH LOOP RD	BANDON	OR	97411	25S13W20CB	2600	
LONG, GLORIA G.	53877 BEACH LOOP RD	BANDON	OR	97411	25S13W20CB	2700	
LYONS, MELINDA A.	667 S WALL	COOS BAY	OR	97420	25S13W20CB	10600	667 S WALL
MAIN LAND, L.L.C.	96521 KENTUCK WAY LN	NORTH BEND	OR	97459	25S13W20CB	10100	
MAIN LAND, L.L.C.	96521 KENTUCK WAY LN	NORTH BEND	OR	97459	25S13W20CB	10100	
MAKARUK, LORNA C.	515 S MARPLE	COOS BAY	OR	97420	25S13W19DA	200	515 S MARPLE
MCCORMICK, RONALD O. & DORINDA S.	850 PREFONTAINE DR	COOS BAY	OR	97420	25S13W19DA	400	530 S WALL
MICKELSON, ROZALIA; ETAL	407 S EMPIRE BV	COOS BAY	OR	97420	25S13W19	800	
MILLER, RICK E.; ETAL	2650 CLARK	NORTH BEND	OR	97459	25S13W19DA	2400	680 S WALL
MKG TRUST	2285 HAYES ST	NORTH BEND	OR	97459	25S13W19AD	3400	
MKG TRUST	2285 HAYES ST	NORTH BEND	OR	97459	25S13W19AD	3300	
MKG TRUST	2285 HAYES ST	NORTH BEND	OR	97459	25S13W19AD	3200	520 S EMPIRE BV
MKG TRUST	2285 HAYES ST	NORTH BEND	OR	97459	25S13W19AD	3202	
MKG TRUST	2285 HAYES ST	NORTH BEND	OR	97459	25S13W19AD	3203	
MKG TRUST	2285 HAYES ST	NORTH BEND	OR	97459	25S13W19AD	3204	
MKG TRUST	2285 HAYES ST	NORTH BEND	OR	97459	25S13W19AD	3401	
MKG TRUST	2285 HAYES ST	NORTH BEND	OR	97459	25S13W19AD	3402	
MORGAN, MARGARET E.	P.O. BOX 171	LETHA	ID	83636	25S13W20CB	10800	
NELSON, GREGORY L.; ET AL	6447 CASTLE LAKE CT NE	KEIZER	OR	97303	25S13W19DA	4200	
NELSON, ROGER D.	706 S WASSON	COOS BAY	OR	97420	25S13W19DA	7400	706 S WASSON
NETTLES, MARVIN R.	25730 DAHLIN DR	VENETA	OR	97487	25S13W19DA	900	560 S WALL
NGUYEN, RICHARD M. & TRAN, THANH K.	630 S WASSON	COOS BAY	OR	97420	25S13W19DA	2500	510 FULTON
NGUYEN, RICHARD M. & TRAN, THANH K.	630 S WASSON	COOS BAY	OR	97420	25S13W20CB	9800	630 S WASSON
OSHI, MS	P.O. BOX 72267	FAIRBANKS	AK	99707	25S13W20CB	3200	660 WEBSTER
PARKER, TALMUS & MARGIE	629 S MARPLE	COOS BAY	OR	97420	25S13W19DA	1800	
PARKER, TALMUS & MARGIE	629 S MARPLE	COOS BAY	OR	97420	25S13W19DA	1700	629 S MARPLE
POET, JERRY L., JR.	9205 CANTANA ST	LAS VEGAS	NV	89123	25S13W19DA	1100	583 S MARPLE
PUMP, LINDA	661 S MARPLE ST	COOS BAY	OR	97420	25S13W19DA	2100	661 S MARPLE
ROAM, JUDY M. & LUTHER E.	PO BOX 1164	OAKRIDGE	OR	97463	25S13W19DA	1600	630 S WALL
ROSSI, B. KEVIN	629 S WALL	COOS BAY	OR	97420	25S13W20CB	10200	629 S WALL
RUTLEDGE, DAVID E., SR. & ROSE M.	620 S WASSON	COOS BAY	OR	97420	25S13W20CB	9900	620 S WASSON
SANDERS, DARRELL M. & CAROL A.	664 S EMPIRE BLVD	COOS BAY	OR	97420	25S13W19DA	4900	664 S EMPIRE BV
SANDERS, DARRELL M. & CAROL A.	664 S EMPIRE BLVD	COOS BAY	OR	97420	25S13W19DA	4800	658 S EMPIRE BV
SCHWALM, BILLIE	515 FULTON AVE	COOS BAY	OR	97420	25S13W19DA	6500	515 FULTON
SCOTT, VIRGIL M. & INEZ M.	3596 FOOTS CREEK RD R FORK	GOLD HILL	OR	97525	25S13W19DA	2200	
SHERIDAN PARKER ATWOOD TRUST	1115 MADISON ST NE #235	SALEM	OR	97301	25S13W19DA	4300	608 S EMPIRE BV
SIDHU, MEHAR DIN; ET AL	1038 BROADWAY ST	SALEM	OR	97301	25S13W19DA	6400	705 EMPIRE BV S
SINGH, YASHVEER & AVENA A.	675 S MARPLE	COOS BAY	OR	97420	25S13W19DA	2300	675 S MARPLE
SLC PROPERTIES, LLC	PO BOX 298	COOS BAY	OR	97420	25S13W20CB	10101	

NEW WASTEWATER TREATMENT PLANT NO. 2 - PROPERTIES WITHIN 500 FEET

OWNER	MAIL	MAIL CITY	MAIL STATE	ZIP	TRS	TAXLOT	SITE ADDRESS
SPELLMAN, WILLIAM B.	694 S WASSON	COOS BAY	OR	97420	25S13W20CB	9400	694 S WASSON
SPURGIN FAMILY REVOCABLE LIVING TRUST	PO BOX 852	SACRAMENTO	CA	95691	25S13W19DA	5600	
TRENT, DONALD D. & CAROLIN R.	540 S WALL	COOS BAY	OR	97420	25S13W19DA	500	540 S WALL
VAN DE KAMP, ROBERT J.; ETAL	576 S EMPIRE BLVD	COOS BAY	OR	97420	25S13W19DA	3800	576 S EMPIRE BV
VAN DUONG, CHANH; ETAL	650 S WASSON	COOS BAY	OR	97420	25S13W20CB	9801	652 S WASSON
VANZELF, WILLIAM T., II	568 SOUTH WALL ST	COOS BAY	OR	97420	25S13W19DA	1000	568 S WALL
WARMING, LYLE R. & DOROTHY	PO BOX 5522	CHARLESTON	OR	97420	25S13W19DA	4700	
WATKINS, GUY & DOLORES J.	PO BOX 147	NORTH BEND	OR	97459	25S13W20CB	10000	608 S WASSON
WHITAKER, JERALD; ETAL	PO BOX 147	NORTH BEND	OR	97459	25S13W19DA	700	554 S WALL
WIGGINS, TANYA G.; ETAL	5 SUMAC CT	WIMBERLEY	TX	78676	25S13W19DA	1500	622 S WALL
WILSON, PATRICIA A.	63595 CENTENNIAL RD	COOS BAY	OR	97420	25S13W19DA	3200	536 S MARPLE