GBD

LAND USE APPLICATION

WRITTEN NARRATIVE

Block 37 Apartments
February 14, 2014

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WRITTEN STATEMENT

Block 37 Apartments

SITE AND VICINITY

Block 37 is located in the South Waterfront subdistrict to Portland's Central City. The site is situated at the edge of the Willamette River along the Willamette River greenway. Bordering the site to the north is SW Gaines, a special Building Height Corridor, to the south is a "Green Street" along SW Lane alignment, and to the west is SW River Parkway, a parking access restricted. The improvements for the south side of SW Gaines, the east side of SW River Parkway and to the centerline of SW Lane are to be included within the scope of this Design Review Application.

The site improvements and architecture are intended to strengthen the urban fabric of South waterfront by creating pedestrian connection to the greenway, continuing the stormwater treatment expression along Lane, emphasizing the retail corner at Gaines and River Parkway and completing the urban enclosure of the central district.

ARCHITECTURAL SUMMARY

Block 37 is on a 72,749 SF site and is six stories and comprised of a 278 market-rate apartments, 226 parking stalls and over 6,000 SF of retail. The ground floor has pedestrian-oriented retail and 12 apartments with walk-up style entry stoops. The main entry is located mid-block on SW River Parkway directly aligned with the pedestrian access that cuts through the Ardea to the west with visual connection to the streetcar stop on SW Bond. With parking access limited on SW Lane, since it is a Green Street, and River Parkway, since it is parking restricted, the garage entry is located on SW Gaines. The ground level of parking is completely enclosed by ground level apartments. A total of 421+ long-term bike parking spaces are provided within the building along with 13 short-term bike racks in the sidewalk furnishing zone. An interior ramp accesses an additional level of below grade parking. Retail is located at the corner of SW Gaines and River Parkway, as required, as well as the corner of SW Lane and River Parkway. Both offer great opportunities for outside dining/café use as access points to the river and the greenway. The building height steps down to the east with terraces providing a gradual transition to the river and the greenway. It also has a large south facing courtyard along SW Lane.

The building's simple massing consists of a modified "U" shape that encloses a residential amenity terrace at level two along SW Lane. The building either projects or steps back to emphasis corners, break up the mass, and provides shadow lines, texture and visual interest. A common living room on the second level provides residents with outdoor living space to enjoy the river view and greenway while activating the greenway and providing eyes on the trail. The ground level building materials are clear vision glass, dark brick and metal panel. Upper levels consist of stucco, metal panels and large windows.

ZONING SUMMARY

	Allowed / Required	Proposed
Zone	CXdg	
Use 33.130.100	Household Living, Retail Sales and Service + more	Conforms – use is Apartment Housing and Retail
Site Area		72,749 SF – land area 59,530 - buildable area
FAR 33.510.200	5:1	Conforms – FAR is 3.71:1
Height 33.510.205	125' & 75' for first 125' from top of bank	Conforms – Building is 72'
Min. Setback 33.130.215	0'	Conforms
Max. Setback 33.130.215	10' in Pedestrian District	Conforms
Bldg Coverage 33.130.220	No limit	Conforms
Req'd Landscaping 33.130.225	None	Conforms
Req'd Bldg Lines 33.130.230 33.510.215	SW River Parkway - bldg. must extend to lot line along min 75% or commit space to active use	Conforms – Building either extends to lot line or extend sidewalk to bldg. face.
Grnd Flr Windows 33.130.230 33.510.220	50% of all façade lengths & 25% of ground floor wall area up to 9' above finished grade. This does not apply to residential units	Conforms
Active Use 33.510.225	SW Gaines - 50% of ground floor walls. 12' clear, 25' deep. Uses include retail and residential	Conforms
Parking Restrictions 33.510.225	SW Gaines – vehicle areas not allowed	Conforms
Screening 33.130.235	Garbage and ground level mechanical equipment	Conforms
Ped Reqmts 33.130.240	Connect main entrance to adjacent street and internal areas	Conforms
Ext Display 33.510.240	Display of good not allowed. Dining is allowed	Conforms
Special Height Corridor 33.510.252	SW Gaines - Portions of buildings within 50' of the centerline limited to 50' – note trees are not req'd	Modification Requested
Accessways 33.510.252	SW Lane – building to setback min of 30' from centerline of accessway & meet landscaping stds 33.510.215	Modification Requested

Req'd Retail 33.510.252	SW Gaines & River – retail to extend min 25' from corner ea. Direction, 12' clear height, 25' deep	Conforms
Fences 33.130.270	Front: in setback max.3'6" Side: in setback max 8' Rear: < 50% obscuring max 8', > 50% obscuring 3'6"	Conforms
Street Trees 20.40	Required for all development	Conforms
Recycling 33.130.310	Recycling area required for residential and retail	Conforms
Signage Title 32		To be submitted at a later date
Parking-Auto 33.266.130 33.510	Residential: min .33/DU, max. 1.7/DU Retail: no min or max if in structured parking	Conforms Residential Level 01: 42 Residential Level P1 UG: 184
Parking-Bikes 33.266.220	Short Term Residential: 1/20 DU Short Term Retail: 2 Long Term Residential: 1.5/ DU Long Term Retail: 2	Short Term Residential: 14 Short Term Retail: 2 Long Term Residential: 417 Long Term Retail: 2
Loading 33.266.310	Two spaces 18'x9'x10 clear or one 35'x10' x13' clear, forward motion and paved	Modification Requested on Forward Motion

LEED SUMMARY

The project is targeting LEED Silver. Specific strategies that will be used will include on site high performance envelope, rainwater treatment, native landscaping, light-colored roof with filtration rock, access to public transportation and high efficiency MEP systems. Through strategic design, development and construction techniques, Block 37 will strive to earn the necessary credits in order to be certified by the U.S. Green Building Council.

PREVIOUS CONDITIONS OF APPROVAL

Below is a list of the land use case review that the City of Portland has on record for the site. We do not believe there are any relevant conditions of approval from previous land use reviews on the site.
LU 10-204930 DZGW
EA 13-151841 DA

DESIGN REVIEW NARRATIVE

Block 37 Apartments

SOUTH WATERFRONT DESIGN GUIDELINES

SECTION A
PORTLAND PERSONALITY

A1 INTEGRATE THE RIVER
Central City Fundamental Design Guideline

Block 37 is directly adjacent to the Willamette Greenway along its eastern boundary. The river is integrated into the project through the architecture and site development and infrastructure. The river view is of primary importance to the design and greatly influenced the shape in order to maximize views for the residents. The building stair-steps back from the greenway trail in an eroding edge with terraces and landscape planters that soften the built form as it extends towards the greenway and while providing a visual extension of the greenway into the edge of the building. An approximately 8 foot level change between the greenway and the private patios is achieved with gradual terraces. A second level common living room provides residents the opportunity to relax along the river's edge while creating activity and providing "eyes on the park" – effectively expanding the public realm. Additionally, residents will have excellent opportunities to enjoy the river from the many balconies, and with enhanced connections to the greenway right at their doorstep. The pedestrian experience and increased housing opportunities will help connect the city with the river.

As a part of the project, the Green Street along SW Lane will be completed and will provide connection to the new bike and pedestrian trails along the greenway for all of the residents of the district. A large south facing courtyard is accessed off of Lane with a gracious stair that connects to the Green Street bringing greater pedestrian activation to the base of the building and the Green Street.

Lastly, the building's stormwater management system implements on-site filtration while celebrating water. A waterfall funnels the building's stormwater from the second level terrace down to bio-swale filtration ponds on SW Lane that is linked to the river.

A1-1 CONTRIBUTE TO THE CREATION OF RIVER EDGE VARIETY
South Waterfront Design Guideline

In addition to the terracing, planter and form that stair-steps back from the greenway edge, Block 37 provides variety in its form along the river. The two other buildings along the river's edge in South Waterfront District are towers that sit on podiums that fill their blocks. Block 37 is a podium building that fills its block and does not rise above 75'. This maintains continuity in the pedestrian realm while providing more sunlight and less shadow to the greenway trail than a tower form and while maintaining views for the surrounding towers and hills to the west. Its mass

is broken up with volumes that project and recede to create a variety of volumes along with the balconies and stoops that not only create variety, but provide opportunities for residents to enjoy river views and provide "eyes on the street."

A1-2 INCORPORATE ACTIVE USES ALONG THE RIVER

South Waterfront Design Guideline

Retail at the corner of SW Gaines and River Parkway serves to strengthen and build upon the pedestrian connection to the greenway along Gaines. The building face is setback long Gaines to provide the opportunity for a café to spill out onto the sidewalk with tables and chairs. Canopies provide pedestrian protection. Walk-up units with stoops along SW Gaines and SW Lane contribute to the expansion of the public realm by creating outdoor rooms where residents and sit and people-watch.

Along SW Lane, a gear room is provided for residents to store and rent paddle boards and kayaks along with a dog and bike repair station. Biking is encouraged with over 400 bike parking spaces being provided. The project team is actively working with Portland Parks and Recreation to provide a hardscape connection from SW Lane to the greenway trail to further promote walking, biking and boating.

A2 EMPHASIZE PORTLAND THEMES

Central City Fundamental Design Guideline

A2-1 RECOGNIZE THE WILLAMETTE RIVER'S MARITIME/NAUTICAL HISTORY AS AN IMPORTANT THEME

South Waterfront Design Guideline

The project celebrates several Portland-related themes including a vital pedestrian focused streetscape and an emphasis on bicycle transportation. The orientation of the ground-level spaces activate all adjacent streets with retail, front stoops and landscaping along with a pedestrian terrace on the greenway. An active stormwater filtration system expresses the movement of water towards the river through the waterfall from the second level courtyard that connects to bio-swale filtration ponds along SW Lane and the river.

The boardwalks over the filtration ponds at SW Lane harken back to the notion of wood dock structures of the district's maritime past that served to provide connection from the water to land much like the connection the boardwalks provide from the private residences to the Green Street.

A3 RESPECT THE PORTLAND BLOCK STRUCTURES

Central City Fundamental Design Guideline

Block 37 aligns with the established grid structure of the South Waterfront neighborhood. The urban building edges along SW Gaines, SW River Parkway and SW Lane come to the lot line in a variety of forms with walk-up front entries to individual apartments and glass expanses of retail storefronts. Each of these expressions provides a strong edge and respects the urban character of the neighborhood while creating opportunities for active pedestrian environments.

A4 USE UNIFYING ELEMENTS

Central City Fundamental Design Guideline

The unique district lighting, street furniture and public way materials will be used to unify the project and the entire district. The streetcar, aerial tram and greenway trails all serve to connect the district with not only the central downtown district but now the eastside central city as well with the new light rail bridge. Block 37 will further unify the district by completing the urban fabric with a podium that meets the lot line, maintains the cohesive pedestrian scale established by the surrounding tower podiums and by using unifying materials already found in the district – brick, stucco, and metal panel. It is designed to relate to other buildings in the district through simple but bold building forms and coloration as well as landscape treatments at the building perimeter along the sidewalk.

A4-1 INCORPORATE INDIGENOUS/ECOLOGICAL CONCEPTS IN THE URBAN LANDSCAPE

South Waterfront Design Guideline

A4-2 INCORPORATE STORMWATER MANAGEMENTS SYSTEMS IN DEVELOPMENT

South Waterfront Design Guideline

The "green" pedestrian accessway, SW Lane Street, is designed to accommodate a bio-swale as well as a pedestrian link to the greenway trail and the river. All site storm water eventually works its way to this natural treatment element before continuing to the river. A waterfall along the stairs that connect the south courtyard to this green street celebrates rain while carrying storm water to the bio-swales. Non-occupied roof surfaces incorporate artistically assembled filtration rock providing function and visual interest. Plantings along the greenway follow Portland Parks and Recreations' greenway planting palette to seamlessly blur the line between private and public property while enhancing indigenous habitat. The project is targeting LEED Silver certification. Energy efficiency, a high performance envelope, environmentally sound material selection, native plantings and resource conservation are all integrated into the design.

A5 ENHANCE, EMBELLISH AND IDENTIFY AREAS

Central City Fundamental Design Guideline

A5-1 CONSIDER SOUTH WATERFRONT'S HISTORY AND SPECIAL QUALITIES

South Waterfront Design Guideline

An active stormwater filtration system expresses the movement of water towards the river through the waterfall from the second level courtyard that connects to the bio-swales along Lane which eventually serve to help replenish the river. The boardwalks over the bioswales harken back to the notion of wood dock structure that serve to provide connection from the water to land and thus incorporate the maritime/nautical thematic elements into the urban landscape while providing a consistent and unifying element with the boardwalks along Ardea along SW Lane.

The unique district lighting, street furniture and public way materials will be used to unify the project and the entire district. Street tress, stormwater treatment and landscaping are coordinated with the district standards.

A6 RE-USE / REHABILITATE / RESTORE BUILDINGS

Central City Fundamental Design Guideline

There are no existing structures on the Block 37 site; therefore the guideline does not apply although the restoration of the riverbank and completion of the greenway trail in front of the site meets the spirit of the guideline to restore significant elements in the city.

A7 ESTABLISH AND MAINTAIN A SENSE OF URBAN ENCLOSURE
Central City Fundamental Design Guideline

Block 37 responds to and reinforces its place within both the existing and the developing urban context of the South Waterfront District. These responses can be seen in a number of gestures. The ground floor extends to the lot lines and creates a strong urban edge. The retail spaces are held back to allow doors to be opened without protruding into the pedestrian way and provides more area for the retail to spill out into the sidewalk. The corners at SW Gaines and SW Lane are reinforced with retail and strong massing form that accentuates the building's corners. The walk-ups along SW Gaines and W Lane provide a comfortable street edge leading to the greenway. In addition, balconies, canopies, lighting and a strong differentiated base serve to articulate the urban edge.

A8 CONTRIBUTE TO VIBRANT STREETSCAPE
Central City Fundamental Design Guideline

There are two aspect of this project that contributes to the vibrancy of adjacent streetscape. First is the retail space that occupies the River Parkway frontage. There will be retail entrances at both the southwest and northwest corners of the block accentuated by the tall first floor of the building. The retail base has large amounts of vision glass to connect and energize the street with the activity in the retail spaces. The retailers will have the opportunity to utilize the building zone of the sidewalk and provide sidewalk seating. The second contributing factor is the ground level residential interaction with the street. Ground level units have direct interaction with the street via entrance stoops along both SW Gaines and SW Lane. The building's main entry lobby mid-block on SW River Parkway had visual connection to the streetcar stop on SW Bond through the Ardea's pedestrian way. All of these elements will add to the activity of the street and the creation of a place in which to live, work, shop and play.

A9 STRENGTHEN GATEWAYS
Central City Fundamental Design Guideline

Block 37 is not located at a designated city gateway. However the location of the site within the South Waterfront district sets the areas as a major landmark and gateway as one enters Portland on 1-5. On a smaller scale, the accentuated northwest retail corner entrance will serve as a gateway to the greenway while strengthening the intersection as a retail node.

SECTION B
PEDESTRIAN EMPHASIS

B1 REINFORCE AND ENHANCE THE PEDESTRIAN SYSTEM
Central City Fundamental Design Guideline

B1-2 ENHANCE ACCESSWAY TRANSITIONS

South Waterfront Design Guideline

Block 37 provides extensions of the planned streets and pedestrian system as well as a strong pedestrian orientation to all adjacent streets. River Parkway has been designated a retail spine that will reinforce the north south pedestrian system through the district. The building corners at SW Gaines and SW Lane are reinforced with retail and strong massing form that accentuates the building's corners and strengthens the retail node at the intersection of SW Gaines and River Parkway encouraging pedestrian movement to the greenway. Connection to the Willamette Greenway, which includes both walking and biking trails, will provide a natural environment experience. The walk-ups along both SW Gaines and SW Lane provide transition from the urban network to the greenway. Sidewalk materials, components and street trees conform to the South Waterfront District Street Plan criteria and standards. Scoring patterns in the paving and thoughtful placement of benches all add to the pedestrian friendly environment. Canopies and well-lit sidewalks further enhance the pedestrian experience. Lastly the project team is working with Portland Parks and Recreation to provide a pedestrian connection to the greenway walking and biking trails from SW Lane.

B1-1 FACILITATE TRANSIT CONNECTIONS

South Waterfront Design Guideline

River Parkway is not a transit street, however SW Bond and SW Moody, one and two blocks to the west are designated transit streets. The primary retail entrances are oriented to the intersections of SW Gaines and SW Lane offering a convenient pedestrian linkage to the transit streets to the west. The main lobby is located in the center of the block along River Parkway directly across from the pedestrian corridor that cuts through the Ardea providing visual as well as direct connection to the streetcar stop on SW Bond. The site also has a direct connection to the greenway walking and bike paths, which serves as an excellent alternative transit route into downtown.

B2 PROTECT THE PEDESTRIAN

Central City Fundamental Design Guideline

Along River Parkway curb extensions increase the width of the sidewalk and make for safer pedestrian crossings. Street trees and street furniture placed within the street furniture zone, between the movement zone of the sidewalk and the curb will help create a physical barrier between pedestrians and vehicles. In addition, parallel parking will provide for another layer of protection and maintain a human scale within the right-of-way. Canopies along river Parkway will provide protection from wet weather. Light from the retail storefront, overhead canopies and residential stops will help illuminate the sidewalk and activities while increasing the pedestrian security.

B2-1 INCORPORATE OUTDOOR LIGHTING THAT RESPONDS TO DIFFERENT USES

South Waterfront Design Guideline

C12 INTEGRATE EXTERIOR LIGHTING

Central City Fundamental Design Guideline

The frontages of the project require lighting to accommodate several diverse uses. Lighting for individual residential walk-up entrances along with the building lobby entrance will provide both security and architectural enhancement through downlights integrated into canopies and building overhangs. The retail frontages rely on general street lighting, lighting from the display windows and down lighting in the canopies. Accent lighting is anticipated in association with future retail signage. General pedestrian lighting along the frontages will be in accordance with South Waterfront streetscape standards. In addition, discrete landscape lighting is proposed for the terraces along the greenway to enhance evening connection to the trails. Fire-pits on the second floor common living area will provide both warmth and mood lighting. Finally step lighting will be incorporated into the stairs that connect the south courtyard to SW Lane. All outdoor lighting will be carefully planned to comply with LEED night sky criteria.

B3 BRIDGE PEDESTRIAN OBSTACLES

Central City Fundamental Design Guideline

The street intersections will include curb extensions to minimize the street crossing distance while also slowing traffic. SW Lane is designed as a Green Street that will have a special emphasis on pedestrian friendliness. As a part of the Willamette Greenway improvements pedestrian and bike connections will be provided at SW Gaines. The project team is currently working with Portland Parks and Recreation to provide both pedestrian and bike connection at the termination of the greenway trail to SW Lane.

B4 PROVIDE STOPPING AND VIEWING PLACES

Central City Fundamental Design Guideline

The retail frontage along River Parkway will offer numerous places to stop and view into the retail space. The retail frontage is slightly pulled back to provide more space for retailers to spill out on the sidewalk. Street furniture along all streets will provide additional opportunities to stop and appreciate the views to the river. In addition the residential stoops along SW Gaines and SW Lane, greenway terraces, balconies and the common living room along the greenway all provide views to the river encourage interaction and provide eyes on the street. Street furniture and planting walls will provide opportunities for pedestrians to sit and rest. Lastly the waterfall at the south terrace and the bio-swales provide pedestrian interest and variety.

B5 MAKE PLAZAS, PARKS AND OPEN SPACES SUCCESSFUL

Central City Fundamental Design Guideline

The south courtyard provides residents with common landscape space to relax and socialize in the sun. The courtyard augments the Green Street on SW Lane with a waterfall and gracious stairway that connects the pedestrian system with the greenway trail and the rest of the district. The stoops along SW Lane and Gaines provide additional opportunities for residents to sit and enjoy the sun and watch the people passing by while enlivening the Green Street. The common living room on the second floor along the greenway provides additional opportunities for residents to view the river and activities along the greenway trail. These spaces provide a variety of areas from more active to contemplative and serve to connect the pedestrian environment through the project into the surrounding district.

B6 DEVELOP WEATHER PROTECTION

Central City Fundamental Design Guideline

The main lobby and retail entrances are protected from the weather with canopies that will mitigate the effects of rain wind, glare, reflection and sunlight on the pedestrian environment. The residential entrances along Gaines and Lane have stoops where the building face is setback and provides protection from the elements.

B7 INTEGRATE BARRIER-FREE DESIGN

Central City Fundamental Design Guideline

All exterior and interior spaces in the building have been designed for barrier-free access and accessible routes to each apartment and the retail spaces. Six fully accessible units are sprinkled throughout the building in a variety of unit types providing various living options for those who require accessible units. All accessibility elements are well integrated and do not detract from the building's overall design.

SECTION C
PROJECT DESIGN

C1 ENHANCE VIEW OPPORTUNITIES

Central City Fundamental Design Guideline

SW Gaines is a Special building Height corridor that aligns and ends in a Minor Viewpoint. Portions of buildings over fifty feet are required to setback fifty feet of the centerline of SW Gaines. The project is requesting a modification to this standard since the entire length of the building's massing sets back 6' from the property line and the entire massing does not extend beyond 75.' The setback provides even greater visual access to and from the greenway in the east west direction and the lower stature building mass provides greater access to sunlight along the street and the greenway than a point tower massing, The limited height also preserves views for the surrounding towers.

The view corridor along SW Lane is maintained and provides connection to the greenway trail which leads to view opportunities of Mt. Hood. Lane is a designated accessway and the building is required to set back at least 30' from the centerline of the accessway. In addition the area between the building and the accessway must meet required landscaping standards that further project the view corridor.

The massing of the building was designed to maximize both views to the river and sunlight. Terraces and private stoops are provided along the greenway to take advantage of views and provide eyes on the park. The common living room on the second level faces the greenway and provides outdoor space for all residents to enjoy the park view.

C2 PROMOTE QUALITY AND PERMANENCE IN DEVELOPMENT

Central City Fundamental Design Guideline

The entire development on Block 37 will be constructed of high-quality and durable materials found elsewhere in the district. The base of the building consists of a cast-in-place structural frame clad in aluminum storefront windows, brick and metal canopies. The floors above integrate VPI commercial vinyl windows, stucco, metal panel and glass railings. The large windows are recessed to create texture and shadow while the building form projects for emphasis or recesses to create from breaks and massing variety. As a LEED certified building, the envelope and mechanical systems will be highly energy efficient.

C3 RESPECT ARCHITECTURAL INTEGRITY
Central City Fundamental Design Guideline

This guideline is intended to address the rehabilitation or remodeling of existing structures. Since Block 37 is an entirely new development, this guideline does not apply.

C4 COMPLEMENT THE CONTEXT OF EXISTING BUILDINGS
Central City Fundamental Design Guideline

Block 37 responds to and helps define the context of the district. The massing reinforces the podium heights of the surrounding towers and steps back from the greenway providing landscape planting opportunities, balconies and terraces that soften the building edge along the river while following the development pattern of the towers to the north. The walk-up units along both SW Gaines and SW Lane create transitions between the public sidewalk and residences while providing opportunities for residents to landscape, relax and view those passing by similar to many of the surrounding buildings. Several design elements in the project are found in adjacent buildings including ground floor active use and an emphasis on sculptural use of variously textured exterior siding materials found elsewhere in the district.

C4-1 DEVELOP COMPLIMENTARY STRUCTURED PARKING
South Waterfront Design Guideline

The two-story structured parking garage is well integrated into the design of the building. The apartment lobby, retail and ground floor residential units wrap the ground level parking along all streets. The second story is below grade. 226 parking stalls are provided for the use of residents. Entry to the parking garage is along SW Gaines since SW River Parkway is a parking access restricted street and SW Lane is a Green Street. At the request of the Atwater resident's the project team is working to located the parking garage entrance further east and offset from their garage entrance, but will need to get approval from PBOT since stormwater filtration planters are currently planned for in that location.

C5 DESIGN FOR COHERENCY
Central City Fundamental Design Guideline

The overall project uses a coherent palette of materials that are well knit together. The building massing is simple and clear with a strong base expressed in brick and retail areas that with storefront glazing and canopies. The upper floors are clad in stucco contrasted against textural metal panels and large setback windows that provide a coherent rhythm and texture. The massing is broken up with variations in façade depth that serve to emphasis corners. A consistent module of window sizes and panel sizes create coherency in the forms.

C6 DEVELOP TRANSITIONS BETWEEN BUILDINGS AND PUBLIC SPACES

Central City Fundamental Design Guideline

The river frontage meets this guideline by a series a low planters walls, terracing down between the private terraces to the public realm of the greenway. The frontages along SW Gaines and SW Lane utilize a combination of slightly elevated stoops to define the line between public and private. The River Parkway frontage is primarily retail with immediate access from the public way into the various shops as well as the main building lobby. The main building lobby and the retail entrances have canopies that provide both pedestrian weather connection and transition.

C7 DESIGN CORNERS THAT BUILD ACTIVE INTERSECTIONS

Central City Fundamental Design Guideline

The building corners at SW Gaines and SW Lane are reinforced with retail and a strong massing form that accentuates the building's corners and strengthens the retail node at the intersection of SW Gaines and River Parkway serving to encourage pedestrian movement to the greenway. The primary retail entrances with cantilevered canopies to emphasize them are oriented to the intersections of SW Gaines and SW Lane offering a convenient pedestrian linkage to the transit streets to the west and the greenway to the east. The taller height at the ground floor serves to accentuate the base of the building while providing retailers with a highly visible location to display merchandise. Finally, sidewalk extensions at the corners provide more space for pedestrian activity, retail seating, viewing and stopping opportunities.

C8 DIFFERENTIATE THE SIDEWALK-LEVEL OF THE BUILDINGS

Central City Fundamental Design Guideline

The taller height at the ground floor is expressed in brick with retail areas that have storefront glazing and canopies. The frontages along SW Gaines and SW Lane utilize a combination of slightly elevated stoops to define the line between public sidewalk and private entrances. The upper floors are clad in white stucco large windows and metal panel. The base is a dark brick that contrasts with the white stucco on the floors above - further enhancing the differentiation between the ground floor and upper floors.

C9 DEVELOP FLEXIBLE SIDEWALK-LEVEL SPACES

Central City Fundamental Design Guideline

Retail frontage and spaces have been designed to accommodate a variety of uses. The space is designed to be flexible and allow tenants in a variety of sizes and uses. Storefronts are designed to allow flexible location of entrances and easy subdivision of space. Back-of-house support spaces such as restrooms and trash connect to all retail areas which also support easy subdivision of space and finally, shafts have been designed into the spaces to allow for a restaurant to occupy the space on the corner of SW Gaines and River Parkway.

C10 INTEGRATE ENCROACHMENTS

Central City Fundamental Design Guideline

There are a series of canopies along River Parkway that extend over the sidewalk which are well integrated into the façade. All of the canopies project and announce primary pedestrian building entrances while adding depth and pattern to the exterior façade. Retail signage is anticipated and planned for the retail canopies and the area directly above the canopies. Signage will be submitted at a later date and will meet title 33 regulations.

C11 INTEGRATE ROOFS AND USE ROOF TOPS

Central City Fundamental Design Guideline

Block 37 has two elevated courtyards on the second level (the roof of the garage). Both combine hardscape and landscape materials. Large landscape planters act as dividers between the public and private areas of the courtyard while also treating all of the storm-water for the project. As the building's mass steps back from the greenway, the adjacent roofs are utilized as terraces. The upper level roof is designed as a flat roof concealed behind a perimeter parapet. There is limited mechanical equipment on the roof, but what is there has been consolidated into one area and is well-screened. The roof itself is covered in a rock pattern that creates texture and interest for those looking at the roof from the surrounding towers. At six stories, the rooftop design has limited skyline impacts and is well integrated with the overall design concept.

C13 INTEGRATE SIGNS

Central City Fundamental Design Guideline

C13-1 COORDINATE DISTRICT SIGNS

Central City Fundamental Design Guideline

No specific signage designs are proposed with this application. Potential retail signage and associated accent lighting has been anticipated for integration with the canopies. A building signage program will be developed and well integrated to compliment the architectural integrity of the building while also providing information and way finding.

SOUTH WATERFRONT GREENWAY DESIGN GUIDELINES

1 DESIGN A COHESIVE GREENWAY TRAIL SYSTEM

Retail at the corner of SW Gaines and SW River Parkway strengthens the retail node while encouraging pedestrian movement to the greenway. Greenway connection from the trails to SW Gaines will be developed as a part of the Willamette Greenway trail development in 2014. The project team is working with Portland Parks and Recreation to provide pedestrian and bike connection to the greenway trails from SW Lane. Similar to the podiums of the towers to the north, the building stair-steps back from the greenway trail creating continuity in transition.

2 ADDRESS GREENWAY EDGES

The building stair-steps back from the greenway trail in an eroding edge with terraces and landscape planters that soften the built form as it extends towards the greenway and while providing a visual extension of the greenway into the edge of the building. A 5 foot level change between the greenway and the private patios is achieved with gradual terraces, grading and integrated plantings that blur the line between public and private.

2-1 ADDRESS GREENWAY EDGES

SW Gaines and SW Lane are designed as "Universal Streets" intended to be biased toward the pedestrian and bicyclist. They incorporate stormwater planters, street furnishings, sidewalk extensions to that calm traffic and visual permeability to the adjacent retail spaces. The frontages utilize a combination of slightly elevated stoops to define the line between public and private. SW Gaines ends in a turnaround cul-de-sac. The north half of the SW Lane accessway will be developed and bollards will restrict vehicle access. Views connections along both streets are enhanced by the building mass stepping back from the right of way.

2-2 ADDRESS ADJACENT OPEN SPACE

The south courtyard provides residents with common open space while augmenting the Green Street on SW Lane with a waterfall and gracious stairway that provides a clear connection to the accessway and greenway trail to the east. The bio-swales reflect the adjacent greenway habitat character while providing continuity of design along the accessway. The stoops along SW Lane and Gaines provide additional opportunities for residents to sit and enjoy the sun and watch the people passing by while enlivening the Green Street. The common living room on the second floor along the greenway provides additional opportunities for residents to view the river and activities along the greenway trail. These spaces provide a variety of areas from more active to contemplative and serve to connect the pedestrian environment through the project into the surrounding district.

2-3 ADDRESS BRIDGES

Block 37 is not adjacent to any bridges, but it will have limited views to the new lightrail bridge and Ross Island Bridge to the north. The terracing form of the building along the greenway enhances the views to those bridges from the greenway trail.

3 INCORPORATE A DIVERSE SET OF GATHERING PLACES

Block 37's terraces, walk-up stoops, balconies, southern courtyard and common living room all provide a diverse set of both large and small spaces for gathering and play as well as to enjoy the views and activities along the river. The walk-up stoops serve to extend the greenway west while providing residential viewing terraces back to the east. The common living room along the greenway provides and overlook to the river and serves a gathering space for residents while provide visual interest and variety to those moving along the greenway trail.

4 INTEGRATE MATERIALS, STRUCTURES, AND ART

Sidewalk materials, components and street trees conform to the South Waterfront District Street Plan criteria and standards. Scoring patterns in the paving and thoughtful placement of benches all add to the pedestrian friendly environment.

The boardwalks over the bioswales along SW Lane harken back to the notion of wood dock structures that serve to provide connection from the water to land and thus incorporate the maritime/nautical thematic elements into the urban landscape while providing a consistent and unifying element with the boardwalks along the Ardea's frontage.

General pedestrian lighting along the frontages will be in accordance with South Waterfront streetscape standards. In addition, discrete landscape lighting is proposed for the terraces along the greenway to enhance evening connection to the trails. Fire-pits on the second floor common living area will provide both warmth and mood lighting. Finally step lighting will be incorporated into the stairs that connect the south courtyard to SW Lane. All outdoor lighting will be carefully planned to comply with LEED night sky criteria.

5 ENHANCE THE RIVERBANK
6 DESIGN DIVERSE PLANT COMMUNITIES

The Willamette Greenway Park sits between Block 37 and the riverbank. As a part of the development two rows of stone columns will be placed between the building and the property line to provide both bank and soil liquefaction stabilization. Native landscape plantings will be used throughout the development site. The bio-swales along SW Lane enhance habitat and celebrate the natural environment. Plantings along the greenway will match the planting palette of the Willamette Greenway park. The Bureau of Environmental Services owns and controls the bio-swale between the greenway and the river in front of the property and discourages connection to the river at this location. That being said, greenway access is provided at Gaines that connects to the trails and to river access further north.

DESIGN ADVICE REQUEST HEARING COMMENTS

Block 37 Apartments

The following comments are from the August 1, 2013 D.A.R. Hearing

GENERAL

- This design needs to blur the line between the existing towers and the new economics of development. It has to be done poetically and express a sensibility that these are "badass modern" homes.
- This building requires substantial shifts and has a long way to go to meet stated expectations.

Response

The building's massing and materials have been greatly simplified. The brick at the ground level provides a strong contrast and clear differentiation between the base of the building and the upper stucco levels. Large rectangular stucco frames on the upper levels accentuate the corners and break up the overall massing – similar to the metal panel frames expressed on the John Ross. Large punched windows painted the match adjacent metal panels create a glassy infill expression between the rectangular stucco frames. The high quality materials are consistent with materials found elsewhere in the district.

SW GAINES HEIGHT CORRIDOR MODIFICATION

- The modification could be approvable if it is demonstrated that the shadow impact on Gaines is no more than a project that conforms to the standards. There was support for the upper floors encroaching as much as proposed.

Response

The shadow impact on Gaines from the building's massing is no more than a project that conforms to the standards. A sun study will be provided.

SW LANE SETBACK MODIFICATION

- The ground level should conform to the standard. There was support for the upper floors encroaching as much as proposed.

Response

The ground level sets back 30' from the centerline of Lane. The upper floors project to the property line providing protection from the weather at the residential stoops. A modification is requested for the upper levels.

COMPOSITION AND MATERIALS

- The elevation is confusing. There is a lack of hierarchy. Stick with a primary material and maybe add a secondary. Do more design with fewer materials and moves. The wood is incongruous and odd.
- Celebrate the honesty of forms. Make the building simple and elegant.
- There are massing shifts in plan that do not clearly translate in the volume
- Study proportions – the parapet looks heavy and the base of the second floor is skinny.
- For cement panels to be allowed, they need to be very secondary and minimal.
- Commercial grade vinyl windows are acceptable when bounded by higher quality materials and punched.
- Be clear and systematic with color.

Response
See the response to the general comments above. Cement panels are no longer being used on the project. The building form has been simplified. The parapet height has been reduced and the second floor adjusted. The commercial grade vinyl windows are surrounded by stucco and metal panels and are setback to create a punched expression and shadow lines.

CORNERS

- All corners need to be excellent.
- The commission mostly agreed with public testimony eroding the corner at the Greenway while supporting an urban edge at the ground level. One commissioner supported the corner as proposed.
- The ground level of the building against the Greenway urbanizes the Greenway which is a good thing.
- There was support for making a great corner at Gaines/River but not consensus on this solution. Concern was expressed with the amount of service near the corner, the ground level layout and the upper floors at the corner.

Response
The corner at Gaines and the greenway has been pulled back and eroded. The ground level still creates a strong urban edge. The expression of the corner at Gaines and River is strong and emphasizes the corner in a more dignified expression. The project team is working with PBOT to move the garage entry to the east.

RIVER

- The inclination to have outdoor spaces open up to the river was right. The proposal lacks river connection.
- Show erosion in the building at the river.
- The ground level needs more work – activation, interest and landscape design. Soften the edge
- Would moving the garage entry closer to the greenway create more activity? Build in flexibility for the ground floor units to be converted to future retail. If the club room is next to the second floor courtyard then the courtyard would be activated.
- The ground level units need to be able to accommodate commercial uses.

Response
A common outdoor living room has been added at the second level along the greenway to provide greater connection to the river. The building's massing has been further eroded along this edge providing private terraces and balconies at various levels. The ground level terraces site approx. 5' above the greenway therefore terracing landscape planters transition the building edge to the sloping grade between the building and the greenway. Plantings in this transition space will match the Willamette Greenway trail plantings in order to blur the line between public and private space and while pulling the greenway into the project helping to make the greenway feel larger.

GROUND LEVEL

- The south courtyard is buried with little street connection. It needs a more robust pedestrian level connection.
- Provide canopies. The guidelines encourage weather protection.
- Need good transitions to the Greenway
- The first 30' have to be great

- Concern was expressed with the cor-ten at the touch zone.

Response
The south courtyard provides the residents with a more quiet and contemplative space than the common living room along the greenway. It is meant to feel more private while providing residents with access to the Green Street and greenway. A waterfall takes stormwater down along the stair and connects to the bio-swales in Lane to create greater pedestrian interest. The cor-ten has been eliminated from the project.

PARKING

- The commission supported the parking entry along Gaines, but requested studies for other locations.
- Explore achieving a higher parking ratio

Response
The team has studied and would like to move the garage entry to the east, but needs to work with PBOT to determine if it is possible due to planned filtration planters along the ROW. Putting the garage entry along River parkway, an access restricted street, would require the elimination of either the building entry or the retail space at the corner of Lane which is not supported by the district goals. Putting the garage entry on Lane would bring regular traffic to a pedestrian accessway and would require that the loading move to SW Gaines near the corner so that access to the elevators could be maintained. This option also does not support the goals of the district guidelines.

The team has look at improving parking efficiency, but was not able to do so without adding an additional level below grade which would be cost prohibitive.

ROOF

- Very big concerns with the roof – explore and design it.
- Explore an eco-roof as an option. If it's not green, it has to be designed and beautiful. If using rocks, think about long term maintenance and weeds.

Response
The roof has been designed with a heavily textured rock pattern that provides variety in color, shadow and texture while providing stormwater filtration.

DESIGN MODIFICATIONS

Block 37 Apartments

MODIFICATION 1

LOADING STANDARDS

(33.266.310)

F. Forward Motion

Inside the central city plan district loading facilities that abut light rail or streetcar alignment must be designed so that vehicles enter and exit the site in forward motion.

PURPOSE

The regulations ensure that access to and from loading facilities will not have a negative effect on the traffic safety or other transportation function of the abutting right-of-way.

PROPOSAL

A designated loading facility 44' long, 12' wide and with 15' of clearance is located on the south side of the building off of SW Lane. This loading space has off-loading staging area and corridor that directly connects to the building's elevators. Small truck loading 18' long, 9' wide and a clearance of 10' will be allowed to unload within the parking garage.

Parking access is limited on this site. River Parkway is designated as Parking Access Restricted Street in which no parking or loading activities are permitted so as to provide for traffic safety and encourage pedestrian-oriented activities along the street. SW Gaines is a preferred retail-use focus area street where ground floor active uses are encouraged to create stronger connection to and activity along the greenway. SW Lane is a Green Accessway meant to ensure frequent pedestrian, bike and visual access.

APPROVAL CRITERIA:

A. The resulting development will better meet the applicable designed guidelines:

The limit the impact to the ground level uses and ground floor window impacts, a modification to allow loading trucks to back into SW Lane and then proceed in forward motion onto SW River Parkway is requested.

To be able to maintain forward motion, a truck would be required to turnaround on-site. This would take up area for ground floor active use or parking. To minimize the impact to SW Gaines, a preferred retail focus street, the larger loading area is located on the western edge of SW Lane. This location also limits the impact to ground floor window standards along Gaines and Lane by breaking up services areas between the two streets. Since large vehicle loading is not anticipated to be a dialing activity, there will be minimal impact to SW Lane.

B. On Balance, the proposal will be consistent with the purpose for which a modification is requested.

The loading spaces provided are consistent with the purpose of the standard which is to ensure that adequate areas for loading are provided for large developments and that safety is maintained with the movement of large vehicles. By pulling loading vehicles into the building, loading can be adequately provided in a safe manner without impacting the sidewalks or pedestrian movement.

MODIFICATION 2

SPECIAL BUILDING HEIGHT CORRIDORS

(33.510.252)

A.2. Special Building Heights

The portion of a building that is within 50' of the centerline of a street or accessway designated as a special building height corridor may be no more than 50' in height.

PURPOSE

Special building heights along designated east-west corridors and tower orientation standards provide visual access to the Greenway from points west of the district, provide visual access to the Tualatin Hills from points east of the district, provide access to sunlight along designated streets, and encourage an urban form that is visually permeable and varied.

PROPOSAL

SW Gaines is a special building height street with a minor viewpoint. The entire face of the building along Gaines is setback 6' from the lot line and projects a total of 75' in height.

APPROVAL CRITERIA:

A. The resulting development will better meet the applicable designed guidelines:

The building better meets the guidelines by creating a strong and varied urban form. Maintaining the 72' height at the corner of SW Gaines and SW River Parkway places greater emphasis on the intersection thereby drawing the pedestrian eye, and hopefully pedestrian, to this preferred retail focus street. Setting the entire building façade back 6 from the lot line increases the view corridor and opens up the view to the pedestrian and they move west to east towards the viewpoint at the end of Gaines.

B. On Balance, the proposal will be consistent with the purpose for which a modification is requested.

The proposal is consistent with the desire to provide visual access, sunlight and an urban for that is visually permeable and varied.

VISUAL ACCESS
By setting the entire building face back from the lot line visual access is increased for both pedestrians in both the east and west direction. Views from east side of the river are blocked by Ross Island. The designated viewpoints from the east are located further north and the view of Gaines is effectively blocked by the Atwater tower podium. Views from the hills to the west are enhanced by a tower not rising from the podium base and the additional 6' setback from the centerline of Gaines. Views from Riva, the only tower within the district affected, down Gaines

will be slightly impacted for the podium of the Ardea is 50' tall which means that a small 22' portion of the building will impact that view.

SUNLIGHT

Sunlight along Gaines is not affected by the increased building height. A tower is allowed to be built on the site which would create greater shading on both Gaines and the greenway than the podium. In addition, modeling the entire building at 50' tall 50' from the centerline shows that the surrounding towers shade Gaines more than the increased building height.

URBAN FORM

The building form is varied from the surrounding podiums in that they are all towers that sit on a podium that is no more than 3 stories or 50'. This building creates a strong urban edge while enhancing permeability by setting the building back and increase the vision cone to the river view.

MODIFICATION 3

ACCESSWAY

(33.510.252)

B.3. Setback

If the accessway is 60' wide or less, buildings must be setback at least 30 feet from the centerline of the accessway.

PURPOSE

Accessways provide physical access and connections to the Greenway trail that provide safe and convenient bicycle and pedestrian connection to and from the greenway trail while contributing to the stormwater management in the subdistrict. They also provide visual connection to the greenway and transition from the natural emphasis of the greenway to the urban emphasis of the rest of the district.

PROPOSAL

SW Lane is an accessway. The ground floor of the building is setback 30' from the centerline of the accessway. The upper levels of the building project to the property line. The project team is working with Portland Parks and Recreation to provide a connection to the greenway trail.

APPROVAL CRITERIA:

A. The resulting development will better meet the applicable designed guidelines:

At the ground floor, the building is setback 30 feet from the centerline of SW Lane and complies with the standard. The upper levels of the building project past the 30' setback requirements to provide weather protection, to better integrate lighting and to create variety in the façade, by breaking up massing planes.

B. On Balance, the proposal will be consistent with the purpose for which a modification is requested.

The proposal is consistent with the desire to provide convenient pedestrian, bicycle and visual connection to the greenway and stormwater management.

CONNECTION
The building is setback at the ground level and therefore provides ample pedestrian and bicycle connection to the greenway. Since the greenway trail will be completed prior to the completion of Block 37, the trail as currently design ends at the SW Lane alignment but does not connect. The project team is working with Portland Parks and Recreation to build the connection with SW Lane as a part of the Block 37's construction. The building's upper floors only project about 3'-10" into the required setback, maintaining ample visual connection to the greenway .

STORMWATER MANAGEMENT

The project celebrates the treatment of stormwater along SW Lane with a stormwater waterfall that carries stormwater from the second level courtyard to the bio-swales in the accessway. The bio-swales use natural plantings to treat water as it makes its way to the river. Boardwalks cross the bio-swales to provide connection back to the stoops along SW. Lane. These treatments all work together to provide transition from the natural environment to the built urban form.

MODIFICATION 4

TANDEM PARKING

(33.266.130.F.1.a)

F.1 a. Access to parking spaces

All parking areas, except stacked parking areas, must be designed so that a vehicle may enter or exit without having to move another vehicle.

PURPOSE

The standards are meant to promote vehicle areas which are save and attractive for motorists and pedestrian. The parking layout standards are intended to promote safe circulation within the parking area, provide for the effective management of stormwater runoff from vehicle areas, and provide for convenient entry and exit of vehicle.

PROPOSAL

The structured parking is for residents only. The proposed deign includes 22 tandem parking spaces out of a total of 226 stalls. These stalls will be shared with the residents of one unit.

APPROVAL CRITERIA:

A. The resulting development will better meet the applicable designed guidelines:

The configuration better meets the intent of the design guidelines by accommodating the most parking spaces possible, leaving on-street parking for visitors to the area.

B. On Balance, the proposal will be consistent with the purpose for which a modification is requested.

The proposal is consistent with the goal of promoting safe and convenient parking since the stalls that are shared are common to one household and therefore are convenient for those residents who have two cars.

BICYCLE PARKING CALCULATIONS

Block 37 Apartments

REQUIRED BICYCLE PARKING CALCULATIONS

(33.266.220)

BICYCLE PARKING

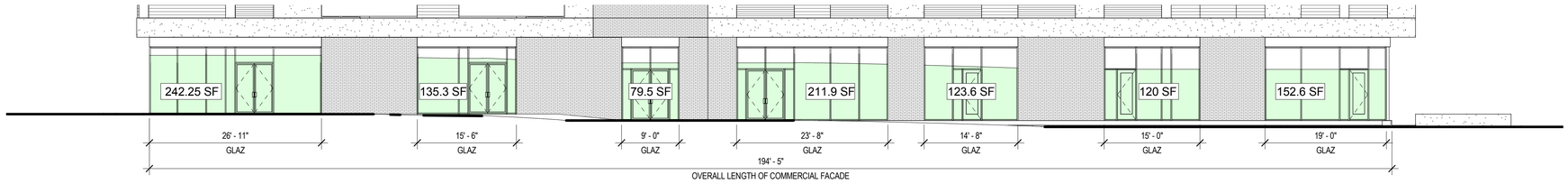
REQUIRED COUNTS

USE	AREA (NSF) / UNIT COUNT		LONG-TERM		SHORT-TERM	
			FACTOR	# STALLS	FACTOR	# STALLS
PHASE-I						
RETAIL-1 (SW / Multnomah)	6193	SF	2 or 1/12,000 sf	2	2 or 1/5,000 sf	2
APARTMENTS (West of Grid 15)	278	CT	1.5/1	417	2 or 1/20	14
PROJECT COMBINED TOTALS:				**419**		**16**

APARTMENTS - LONG TERM	REQUIRED:	279	PROVIDED	389
BIKE STALL TYPES & LOCATIONS				
LEVEL-01: Wall-mount vert. rail & hook in unit				18
LEVEL-02: Wall-mount vert. rail & hook in unit				41
LEVEL-03-04: Wall-mount vert. rail & hook in unit				86
LEVEL-05-06: Wall-mount vert. rail & hook in unit				84
LEVEL-02-06: Secoure Storage Room				160

GROUND FLOOR WINDOW CALCULATIONS

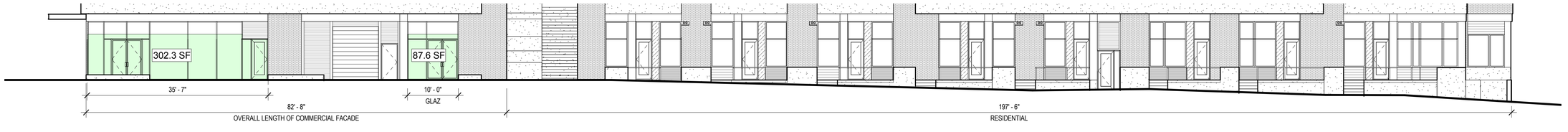
Block 37 Apartments



GROUND FLOOR WINDOWS SUMMARY
FACADE LENGTH : 97.2' REQUIRED / 123'-9" PROVIDED (63.7%)
WINDOW AREA : 437.4 SF. REQUIRED / 1065.15 SF PROVIDED (60.1%)

3 West - SW RIVER PKWY

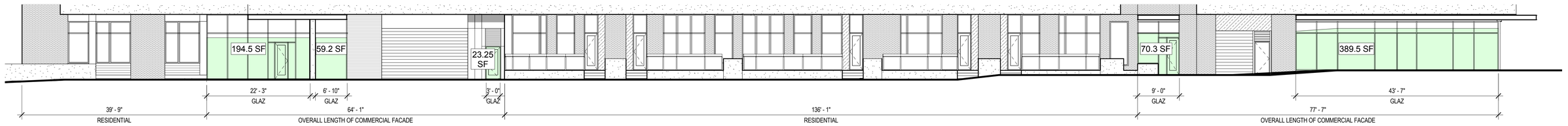
3/32" = 1'-0"



GROUND FLOOR WINDOWS SUMMARY
FACADE LENGTH : 41'-4" REQUIRED / 45'-7" PROVIDED (55.1%)
WINDOW AREA : 182 SF. REQUIRED / 410.25 SF PROVIDED (55.1%)

2 South - SW LANE

3/32" = 1'-0"



GROUND FLOOR WINDOWS SUMMARY
FACADE LENGTH : 70'-10" REQUIRED / 84'-10" PROVIDED (60%)
WINDOW AREA : 318.75 SF. REQUIRED / 763.5 SF PROVIDED (60%)

1 North - SW GAINES

3/32" = 1'-0"

ACTIVE USE, SPECIAL BUILDING HEIGHT, ACCESSWAY & REQ'D RETAIL CALCULATIONS

Block 37 Apartments

SW GAINES ST.

60' 0" ROW

318' - 2"

49' - 6"
RETAIL DEPTH AND LENGTH
44' - 3 1/2"

9' - 0" | 4' - 0" | 9' - 0" | 7' - 0" | 3' - 0" | 9' - 0" | 9' - 0" | 4' - 0" | 9' - 0" | 4' - 0" | 9' - 0" | 3' - 0" | 3' - 0" | 7' - 6" | 6' - 11" | 7' - 6" | 7' - 6" | 4' - 6"

37' - 0"
F.O. BLD. GRND. FLR.
35' - 0"
F.O. BLD. ABOVE

35' - 6 1/2"
RETAIL DEPTH AND LENGTH

GARAGE ENTRY

38' - 0"

DN

UP

33.510.252 SPECIAL BLD. HEIGHT @ GAINES PORTIONS OF BLDG. OVER 50'-0" TO SET BACK 50'-0" FROM CENTERLINE

33.510.252 ACCESSWAY @ LANE BLDG. TO SETBACK 30'-0" FROM CENTERLINE

33.510.252 REQUIRED RETAIL TO EXTEND A MINIMUM OF 25' FROM EACH CORNER

33.510.225 ACTIVE USE @ GAINES 50% OF GROUND FLOOR WALL @ 25' DEEP.

159'-1" REQ'D ; 160'-2" PROVIDED

100' - 0"

WILLAMETTE GREENWAY

205' - 1"

SW RIVER PARKWAY

GREENWAY

2002 TOP OF BANK LINE

GREENWAY BOUNDARY

100' - 0"

37' - 0"

38' - 0"

UP

up

50' - 0"
ROW

25' - 0"
CL OF R.O.W

30' - 0"
F.O. BLD. GRND. FLR.

25' - 0"
F.O. BLD. ABOVE

25' 0"

35' 0"

SW LANE ST.

286' - 0"

REPLACE THIS SHEET WITH 11X17 EXHIBIT

STORMWATER MANAGEMENT PLAN

Block 37 Apartments

Harper
Houf Peterson
Righellis Inc.

Block 37

Stormwater Management Report

2/13/2014

Prepared For:

GBD Architects
1120 NW Couch St.
Ste. 300
Portland, Oregon

GBD-49

Prepared By:

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Janelle Brannan, P.E.

HHPR

ENGINEERS ◆ PLANNERS
LANDSCAPE ARCHITECTS ◆ SURVEYORS

Designer's Certification Statement

I hereby certify that this Stormwater Management Report for the South Waterfront Block 37 development has been prepared by me or under my supervision and meets minimum standards of the City of Portland and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of the drainage facilities designed by me.

Table of Contents

Project Description

The South Waterfront Block 37 project is located at SW River Parkway and SW Gaines Street. The proposed development includes construction of a mixed use building and pedestrian pathway to the South Waterfront Greenway Trail. Frontage improvements for the project includes construction of the sidewalk corridor on SW River Parkway and on SW Gaines Street.

Existing Site Conditions

The existing 1.67 acre site is undeveloped gravel with some raised planters. The existing roadway is developed to including curb and gutter with a temporary asphalt sidewalk behind the curb.

The site is directly west of the Willamette River, and generally slopes toward the river. Geotechnical Reports have been completed for the site by GeoDesign the most current dated February 1st 2013. The report generally describes the soil composed of fill overlying alluvial silt, sand, and gravel, then overlying the dense to very dense gravel of the Troutdale Formation. The fill was noted to be between 7 and 17 feet below the ground surface. Groundwater was noted to be at approximately 15 to 16 feet below the ground surface. During extreme flooding of the Willamette River, the groundwater levels are expected to rise to elevation 31 feet (COP Datum)

GeoDesign has completed a Level 1 Environmental Site Assessment for the project site, dated September 12, 2012. The project site was identified having historical operations that resulted in soil and groundwater contamination. Further investigation of the site is ongoing to determine if the soil is contaminated.

Proposed Site Improvements / Stormwater Management Requirements

The proposed public and private improvements will create additional impervious areas. These impervious surfaces will need to be managed per the 2008 City of Portland Stormwater Management Manual (SWMM). Per the SWMM, the Stormwater Infiltration and Discharge Hierarchy is to be used to determine the feasibility of the stormwater option to be used for the site. The following addresses each category in the Hierarchy;

Category 1: Requires total onsite infiltration with vegetated infiltration facilities.

Total on-site stormwater infiltration will not be feasible on this site due the contaminated soils.

Category 2: Requires total onsite infiltration with a vegetated facility that overflows to a subsurface infiltration facility.

Total on-site stormwater infiltration will not be feasible on this site due the contaminated soils.

Category 3: Requires onsite detention with vegetated facilities that overflow to a drainage way, river, or storm-only pipe.

The stormwater management for this project falls into this category. The building roof area and pedestrian easement area (SW Lane) will meet water quality requirements using a combination of flow through planters located on the second level terrace of the building, and water quality

swale located within the pedestrian easement. SW Gaines Street has been noted as a green street, with this project a stormwater planter will be constructed to treat stormwater runoff from the southerly half of SW Gaines from the intersection of SW River Parkway to the location of the stormwater planter.

Detention will not be required for this site since both the public storm only line in SW Gaines, and the private storm only line in SW Lane outfall to the Willamette River directly east of the site.

Category 4: Required onsite detention with vegetated facilities that overflow to the combined sewer system.

There is not a combined sewer system adjacent to the site.

Conclusion

The stormwater management for the site falls under Category 3 of the Stormwater Infiltration and Discharge Hierarchy of the 2008 City of Portland Stormwater Management Manual. Stormwater management requirements for the 1.67 acre site will be met using a combination of Stormwater Planters and Swales.

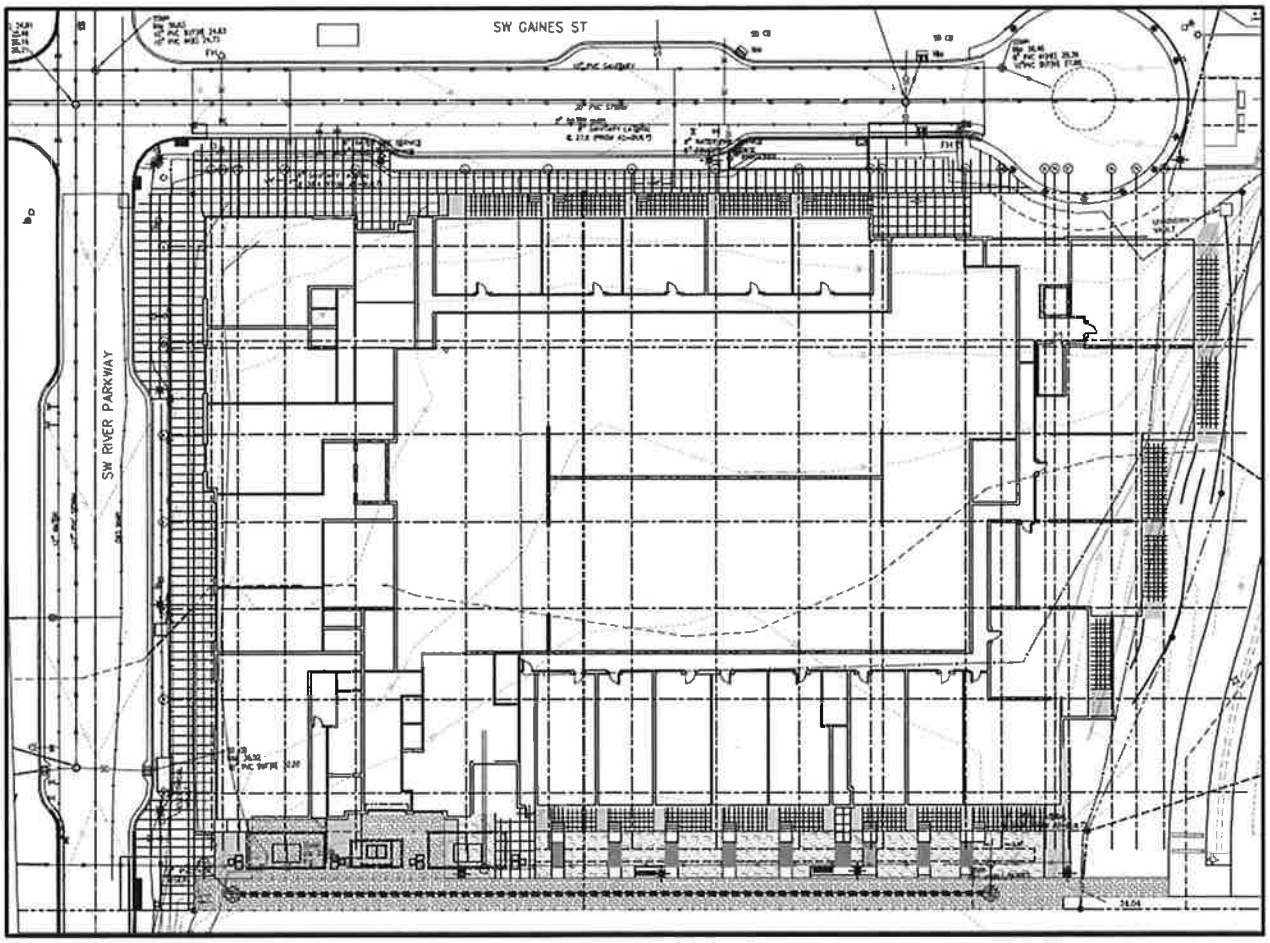
Maps and Calculations

Existing Conditions Aerial

EXISTING CONDITIONS

NTS

Proposed Site Plan



SITE PLAN
NTS

SW Gaines Street (Public)

SW Gaines Street has been identified as a green street. The proposed stormwater planter will be located toward the easterly end of the street, mirroring the stormwater planter on the north side of the street.

SW Gaines is developed with a concrete intersection at SW River Parkway and asphalt roadway with a cul-de-sac at the east end terminating the street. The basin area for the proposed planter will be the southerly half of SW Gaines, begin at the intersection of SW Gaines and SW River Parkway and continuing to the proposed planter location.

Impervious Area: 6,900sf
The proposed planter dimensions: 44lf by 9ft wide
Roadway slope 1.4%
Proposed Check Dam at 22lf

Using the City of Portland's PAC to calculate stormwater management requirements:

RESULTS

		Overflow Volume			
Pollution Reduction	PASS	0 CF	4%	Surf. Cap. Used	Run PAC
			17%	Rock Cap. Used	

Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.005	0.043	0.122	0.144

FACILITY FACTS

Total Facility Area Including Freeboard =	396 SF
Sizing Ratio (Total Facility Area / Catchment Area) =	0.057

Building and Pedestrian Easement (Private)

The Building roof area is being collected in four locations, divided up in this report as basins A through D. SW Lane, Pedestrian Easement, is basin E. The following table summarizes the basin information:

Basin	Location	Area	WQ	WQ Location
A	Roof Area (West)	14,628sf	Planter A	Interior Courtyard
B	Roof Area (Middle), Interior Courtyard	33,945sf	Swale A	SW Lane
C	Roof Area (NE)	5,696sf	Planter B	East 2nd level Terrace
D	2nd Level Terrace	5,169sf	Swale B	SW Lane
E	SW Lane	4,664sf	Swale A	SW Lane

Planter A Calculations

Planer A is a flat flow through planter located in the Courtyard area of the building.

Impervious Area: 14,628sf
Proposed planter area: 366sf
Proposed storage depth: 4"
Proposed freeboard depth: 2"

Using the City of Portland's PAC to calculate stormwater management requirements:

RESULTS

		Overflow Volume			
Pollution Reduction	PASS	0 CF	67%	Surf. Cap. Used	Run PAC

Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.207	0.252	0.298	0.343

FACILITY FACTS

Total Facility Area Including Freeboard =	366 SF
Sizing Ratio (Total Facility Area / Catchment Area) =	0.025

Planter B Calculations

Planer B is a flat flow through planter located in the 2nd Level Terrace of the building.

Impervious Area: 5,696sf
Proposed planter area: 142sf
Proposed storage depth: 4”
Proposed freeboard depth: 2”

Using the City of Portland’s PAC to calculate stormwater management requirements:

RESULTS		Overflow Volume			
Pollution Reduction	PASS	0 CF	68%	Surf. Cap. Used	Run PAC

Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.080	0.098	0.116	0.134

FACILITY FACTS	
Total Facility Area Including Freeboard =	142 SF
Sizing Ratio (Total Facility Area / Catchment Area) =	0.025

SW Lane Swale Calculations

Swale A will treat basins B and the majority of basin E.

Impervious Area: 38,609sf
Swale dimensions: 4ft bottom, 3:1 side slopes, downstream depth 12"
Swale Length 140LF
Swale Slope 1.7%
Check Dam at 30lf

Using the City of Portland's PAC to calculate stormwater management requirements:

RESULTS		Overflow Volume			Run PAC
Pollution Reduction	PASS	0 CF	82%	Surf. Cap. Used	

Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.523	0.643	0.763	0.883

FACILITY FACTS	
Total Facility Area Including Freeboard =	1,400 SF
Sizing Ratio (Total Facility Area / Catchment Area) =	0.036

Swale B will treat basins D and the adjacent portion of basin E.

Impervious Area: 5,400sf
Swale dimensions: 4ft bottom, 3:1 side slopes, downstream depth 12"
Swale Length 200LF
Swale Slope 4.75%
Check Dam at 10lf

Using the City of Portland's PAC to calculate stormwater management requirements:

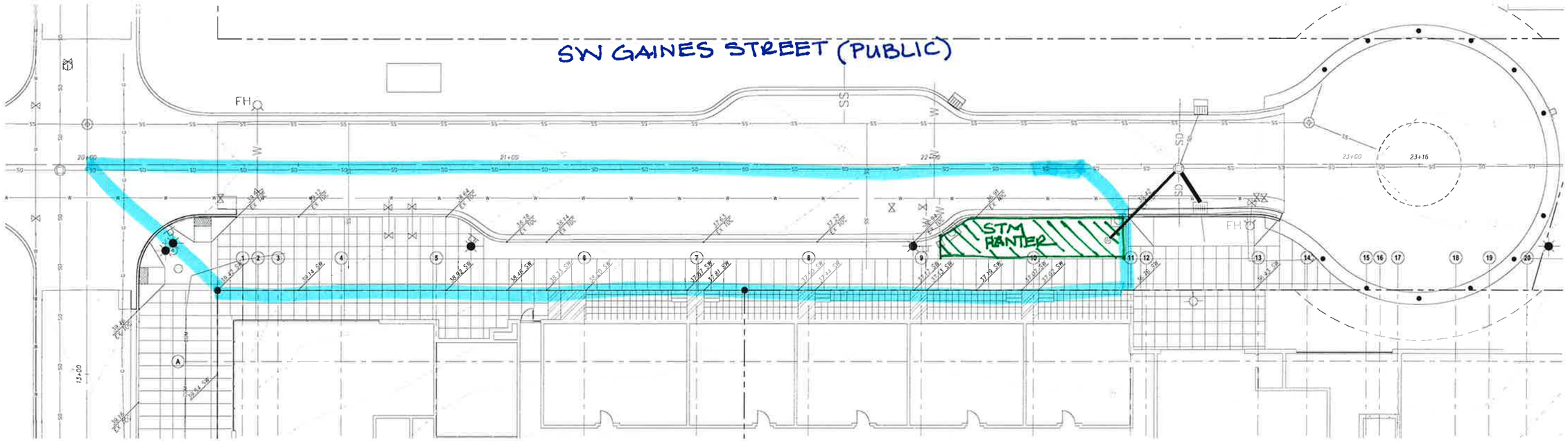
RESULTS		Overflow Volume			Run PAC
Pollution Reduction	PASS	0 CF	73%	Surf. Cap. Used	

Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.073	0.090	0.107	0.123

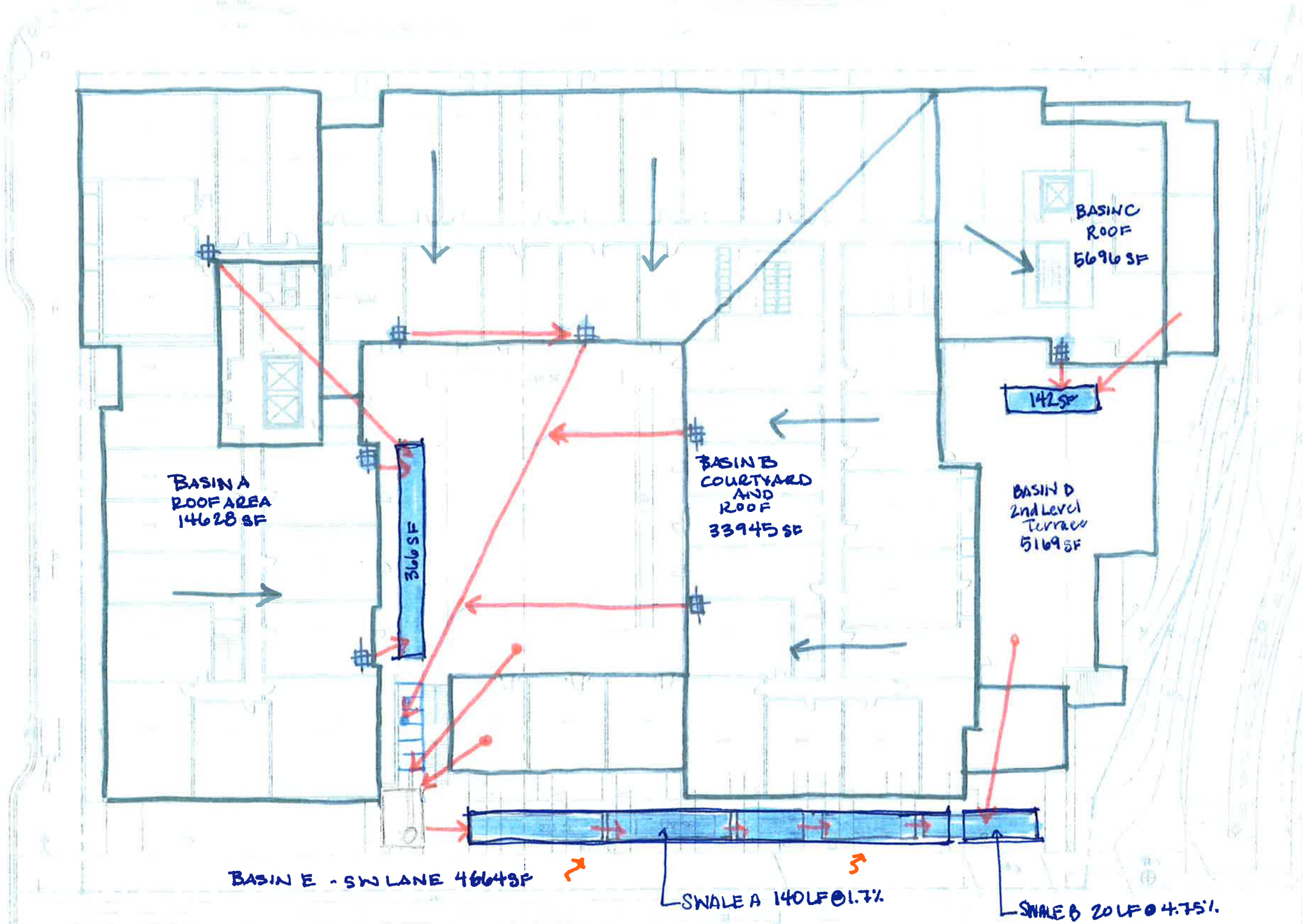
FACILITY FACTS	
Total Facility Area Including Freeboard =	200 SF
Sizing Ratio (Total Facility Area / Catchment Area) =	0.037

BASIN MAP



Impervious Area: 6900SF

BASIN MAP



BLOCK 37 - WC PLANTERS

Presumptive Approach Calculator ver. 1.2

Catchment Data

Catchment ID: Planter

Project Name: SW Gaines
Project Address: SW Gaines east of River Parkway
Designer: JLB
Company: HHPR

Date: 02/13/14
Permit Number: 0

Run Time 2/13/2014 9:37:22 AM

Drainage Catchment Information

	Catchment Area	
Catchment ID	Planter	
Impervious Area	6,900	SF
Impervious Area	0.16	ac
Impervious Area Curve Number, CN_{imp}	98	
Time of Concentration, Tc, minutes	5	min.

Site Soils & Infiltration Testing Data

Infiltration Testing Procedure:	Open Pit Falling Head	
Native Soil Field Tested Infiltration Rate (I_{test}):	2	in/hr
Bottom of Facility Meets Required Separation From High Groundwater Per BES SWMM Section 1.4:	Yes	

Correction Factor Component

CF_{test} (ranges from 1 to 3)	2	

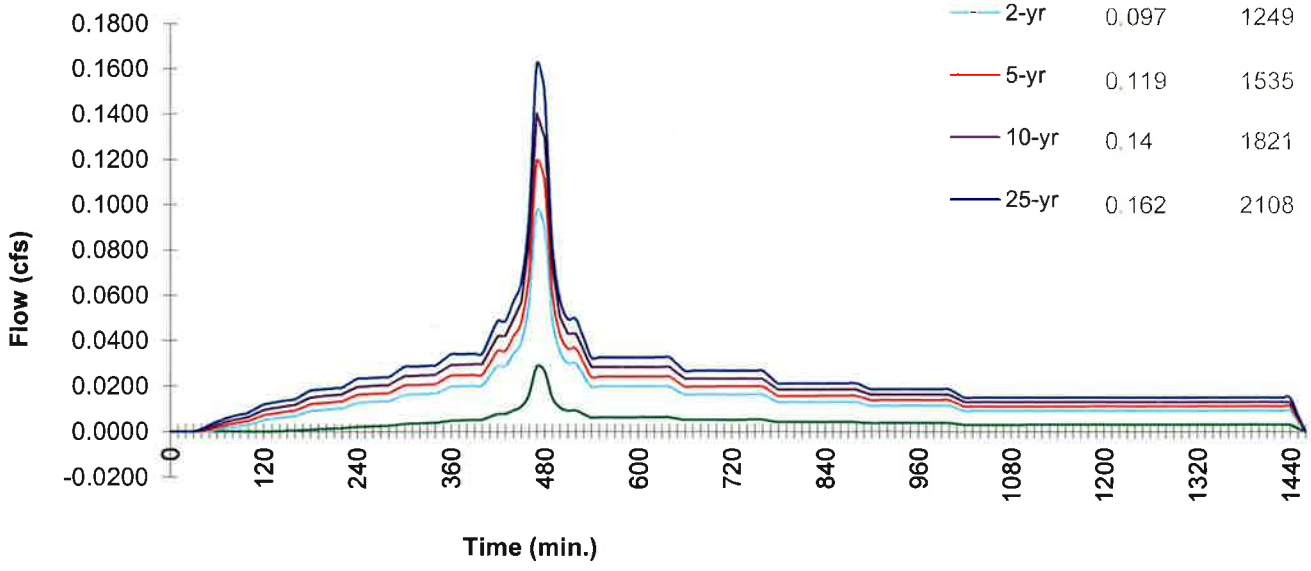
Design Infiltration Rates

I_{dsgn} for Native (I_{test} / CF_{test}):	1.00	in/hr
I_{dsgn} for Imported Growing Medium:	2.00	in/hr

Execute SBUH

SBUH Results

	Peak Rate (cfs)	Volume (cf)
PR	0.028	361
2-yr	0.097	1249
5-yr	0.119	1535
10-yr	0.14	1821
25-yr	0.162	2108



Printed: 2/13/2014 9:37 AM

Presumptive Approach Calculator ver. 1.2

Catchment ID: Planter

Run Time 2/13/2014 9:37:22 AM

Project Name: SW Gaines **Catchment ID:** Planter **Date:** 2/13/2014

Instructions:
1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility configuration.
5. Complete data entry for all highlighted cells.

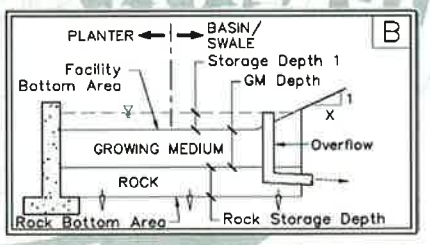
Catchment facility will meet Hierarchy Category: 3

Goal Summary:

Hierarchy Category	SWMM Requirement	RESULTS box below needs to display...	
		Pollution Reduction as a	10-yr (aka disposal) as a
3	Off-site flow to drninageway, river, or storm-only pipe system	PASS	N/A

Facility Type = Planter (Sloped)

Facility Configuration: B



Refer to Sloped Facility Worksheet and enter Variable Parameters

Calculation Guide
Max. Rock Stor. Bottom Area
Per Swale Dims

DATA FOR ABOVE GRADE STORAGE COMPONENT

Infiltration Area = 395 sf
Surface Capacity Volume = 258.8 cf

Growing Medium Depth = 18 in
Freeboard Depth = N/A in

Surface Capacity at Depth 1 = 259 cf
Infiltration Area at 75% Depth1 = -3 SF
GM Design Infiltration Rate = 2.00 in/hr
Infiltration Capacity = 0.018 cfs

BELOW GRADE STORAGE

Rock Storage Bottom Area = 352 sf
Rock Storage Depth = 30 in
Rock Void Ratio = 0.3

Rock Storage Capacity = 264 cf

Native Design Infiltration Rate = 1.00 in/hr
Infiltration Capacity = 0.008 cfs

RESULTS

Pollution Reduction: **PASS**

Overflow Volume: 0 CF

4% Surf. Cap. Used

17% Rock Cap. Used

Run PAC

Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.005	0.043	0.122	0.144

FACILITY FACTS

Total Facility Area Including Freeboard = 396 SF
Sizing Ratio (Total Facility Area / Catchment Area) = 0.057

Presumptive Approach Calculator Ver 1.2

Instructions:

1. Refer to facility graphics on the Graphics tab, then fill in all relevant facility parameters in the Data Entry table below. Data entry cells vary based on Facility Configuration selected on Facility Design Data tab.
2. Delete all facility parameters that may have been entered by the previous iteration that are no longer applicable.

Run Time 2/13/2014 9:37:22 AM

Project Name: SW Gaines **Date:** 2/13/2014 **Catchment ID:** Planter

Data Entry

Parameters | **Rock Storage Parameters** | **Error Messages**

Facility Segment	Length of facility segment (ft) $L_{segment}$	Downstream Check Dam Length (ft) L_{dam}	Longitudinal Facility Slope (ft/ft) S	Bottom Width (ft) W_{bottom}	Side Slope Right X_{right}:1	Side Slope Left X_{left}:1	Downstream Depth (inches) D_{ds}	Landscape Width (ft) $W_{landscape}$	Rock Storage Width (ft) W_{rock}	Rock Storage Depth (inches) D_{rock}	Rock Void Ratio v
1	22	0	0.014	9	0	0	9.7	9	8	30	0.3
2	22	0.16	0.014	9	0	0	9.7	9	8		
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

Project Name: Depth 2= Depth 3=

Worksheet Calculations

Parameters | **Rock Storage Parameters**

Facility Segment	Adjusted Length of facility segment (ft) L_{adjust}	Adjusted Length if $D_{up} = 0$ (ft) $L_{adjust2}$	Upstream Depth (inches) D_{up}	Downstream Top Width (ft) $W_{top\text{-}ds}$	Upstream Top Width (ft) $W_{top\text{-}up}$	Downstream Cross-sectional Area (sf) A_{ds}	Upstream Cross-sectional Area (sf) A_{up}	**Surface Capacity Volume** (cf) $V_{surface}$	75% of Max. Downstream Depth (inches) $D_{ds75\%}$	75% of Max. Upstream Depth (inches) $D_{up75\%}$	75% of Max. Adjusted Length if $D_{up75\%} = 0$ (ft) $L_{adjust3}$	75% of Max. Downstream Top Width (ft) $W_{top\text{-}ds75\%}$	75% of Max. Upstream Top Width (ft) $W_{top\text{-}up75\%}$	**Infiltration Area @ 75% Full** (sf) $A_{75\%}$	Rock Storage Length (ft) L_{rock}	**Rock Storage Bottom Area** (sf) A_{rock}	**Rock Storage Capacity Volume** (cf) V_{rock}
1	22.00	N/A	6.00	9.00	9.00	7.28	4.50	130	7.28	3.58	N/A	9.00	9.00	198	22	176	132
2	21.92	N/A	6.02	9.00	9.00	7.28	4.51	129	7.28	3.59	N/A	9.00	9.00	197	22	176	132
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
								259	$V_{surface}$ @ Depth1					**395**		**352**	**264**

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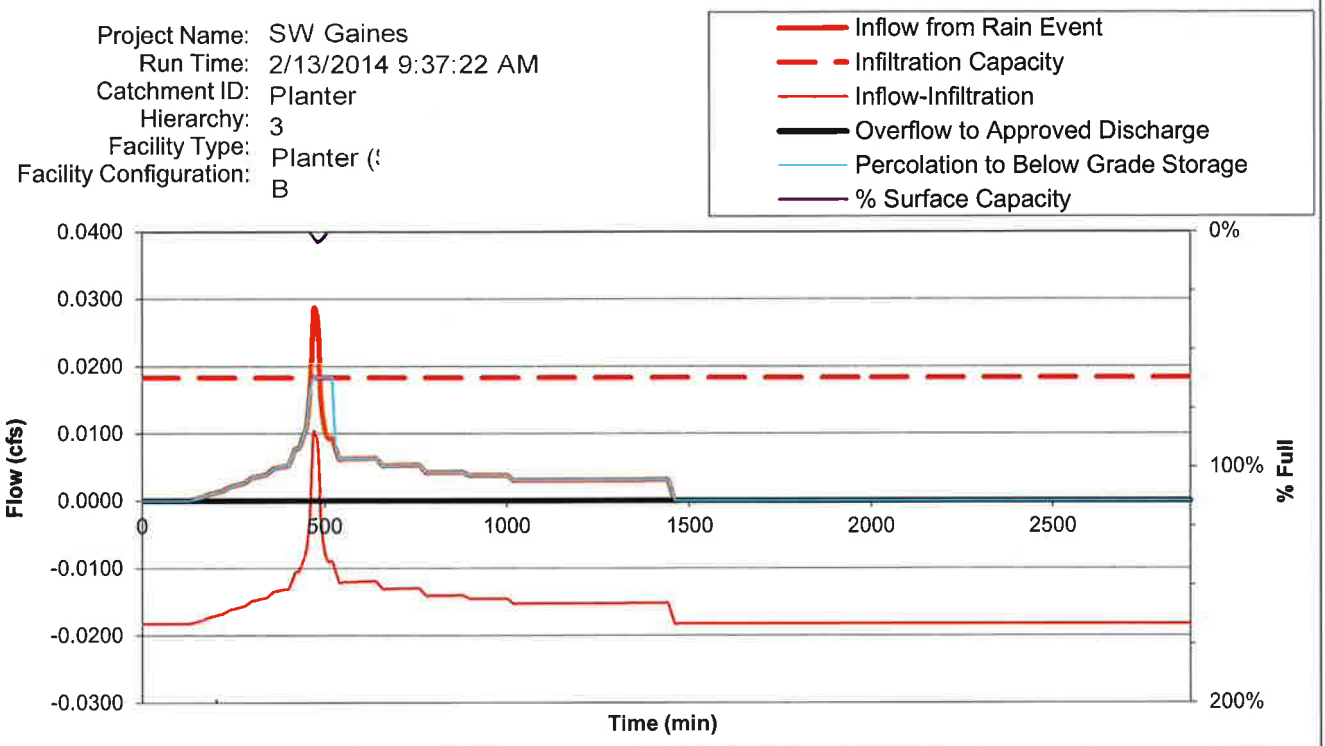
BES - Presumptive Approach Calculator - Ver 1.2

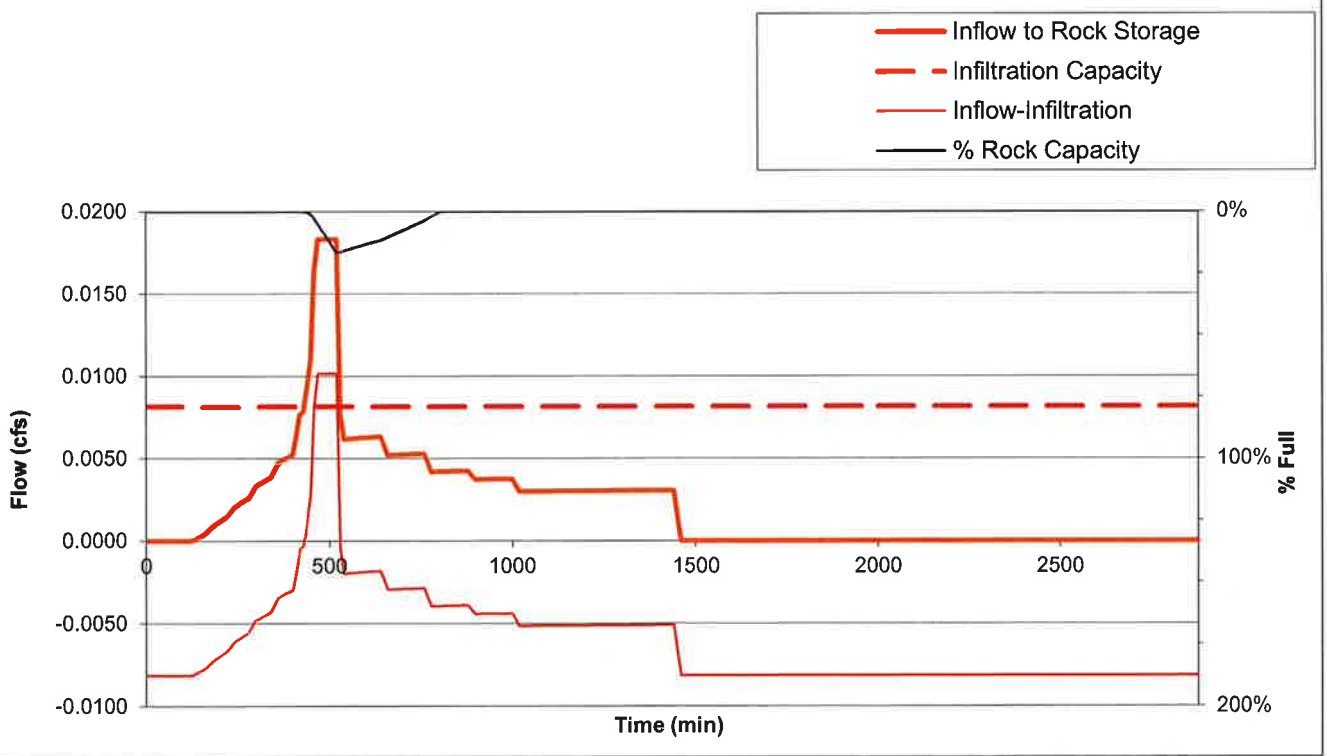
PR Con-A&B

Pollution Reduction Event
Surface Facility Modeling

Project Name: SW Gaines
Run Time: 2/13/2014 9:37:22 AM
Catchment ID: Planter
Hierarchy: 3
Facility Type: Planter (
Facility Configuration: B



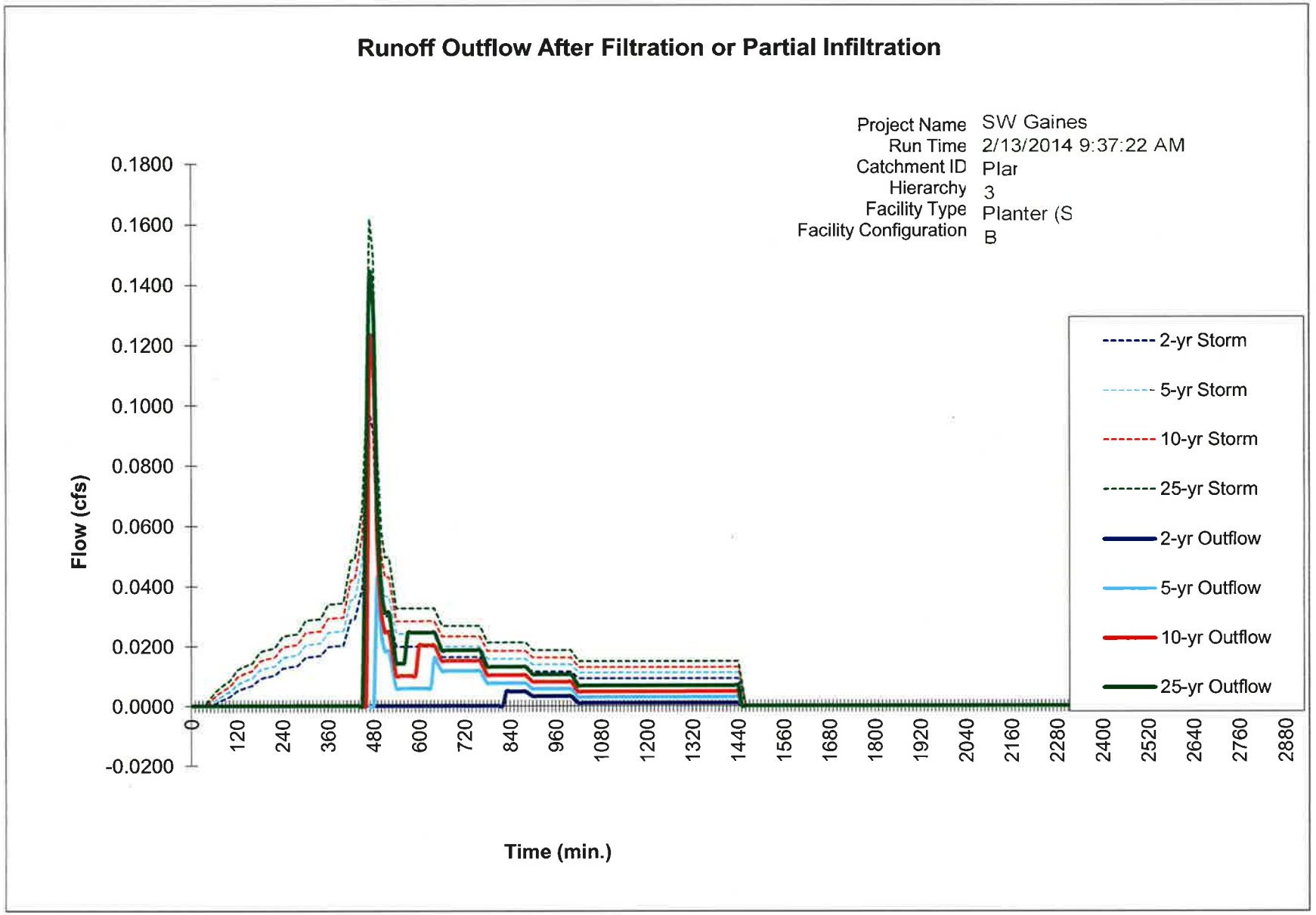
Pollution Reduction Event
Below Grade Modeling



Printed: 2/13/2014 9:38 AM

BES - Presumptive Approach Calculator - Ver 1.2

Output Chart



Presumptive Approach Calculator ver. 1.2

Catchment Data

Catchment ID: Planter A

Project Name: SouthWaterFront - Block37
Project Address: SW River Parkway and SW Gaines
Portland Oregon
Designer: JLB
Company: HHPR

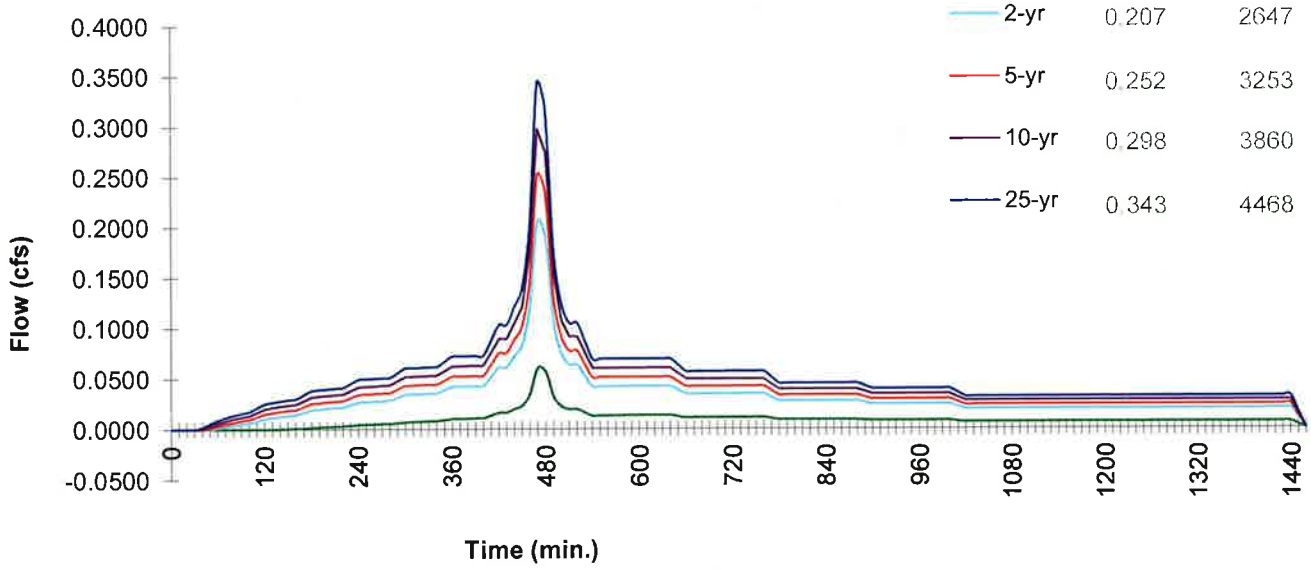
Date: 02/03/14
Permit Number: 0
Run Time 2/14/2014 7:26:32 AM

Drainage Catchment Information		
Catchment ID	Planter A	
	Catchment Area	
Impervious Area	14,628	SF
Impervious Area	0.34	ac
Impervious Area Curve Number, CN_{imp}	98	
Time of Concentration, Tc, minutes	5	min.
Site Soils & Infiltration Testing Data		
Infiltration Testing Procedure:	Open Pit Falling Head	
Native Soil Field Tested Infiltration Rate (I_{test}):	10	in/hr
Bottom of Facility Meets Required Separation From High Groundwater Per BES SWMM Section 1.4:	Yes	
Correction Factor Component		
CF_{test} (ranges from 1 to 3)	2	
Design Infiltration Rates		
I_{dsgn} for Native (I_{test} / CF_{test}):	5.00	in/hr
I_{dsgn} for Imported Growing Medium:	2.00	in/hr

Execute SBUH

SBUH Results

	Peak Rate (cfs)	Volume (cf)
PR	0.06	764
2-yr	0.207	2647
5-yr	0.252	3253
10-yr	0.298	3860
25-yr	0.343	4468



Printed: 2/14/2014 7:26 AM

Presumptive Approach Calculator ver. 1.2

Catchment ID: Planter A

Run Time 2/14/2014 7:26:32 AM

Project Name: SouthWaterFront - Block37 **Catchment ID:** Planter A **Date:** 2/3/2014

imported file Planter A 02132014.xls - 2/14/2014 7:26:34 AM

Instructions:

1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility configuration.
5. Complete data entry for all highlighted cells.

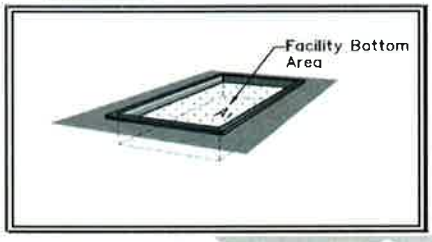
Catchment facility will meet Hierarchy Category: 3

Goal Summary:

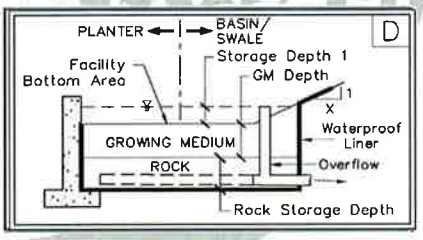
Hierarchy Category	SWMM Requirement	RESULTS box below needs to display...	
		Pollution Reduction as a	10-yr (aka disposal) as a
3	Off-site flow to drainageway, river, or storm-only pipe system.	PASS	N/A

Facility Type = Planter (Flat)

Facility Shape: Rectangle/Square



Facility Configuration: D



Calculation Guide
Max. Rock Stor. Bottom Area
366 SF

DATA FOR ABOVE GRADE STORAGE COMPONENT

BELOW GRADE STORAGE

Facility Bottom Area =	366	sf
Bottom Width =	10.0	ft
Facility Side Slope =	0	to 1
Storage Depth 1 =	4	in <Warning
Growing Medium Depth =	18	in
Freeboard Depth =	N/A	in
Surface Capacity at Depth 1 =	122	cf
GM Design Infiltration Rate =	2.00	in/hr
Infiltration Capacity =	0.017	cfs

Rock Storage Capacity =		cf
Native Design Infiltration Rate =		in/hr
Infiltration Capacity =		cfs

RESULTS

Pollution Reduction: PASS

Overflow Volume: 0 CF 67% Surf. Cap. Used

Run PAC

Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.207	0.252	0.298	0.343

Current data has been imported:

Planter A 02132014.xls 2/14/2014 7:26:34 AM

FACILITY FACTS

Total Facility Area Including Freeboard = 366 SF

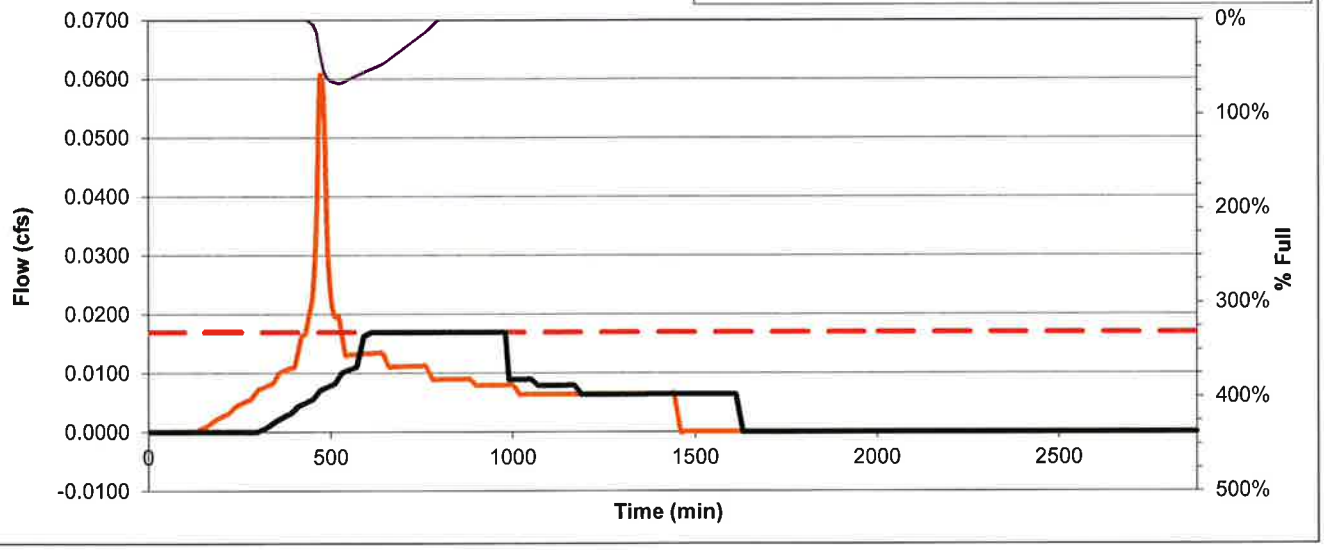
Sizing Ratio (Total Facility Area / Catchment Area) = 0.025

BES - Presumptive Approach Calculator - Ver 1.2

PR Con-D

Pollution Reduction Event
Surface Facility Modeling

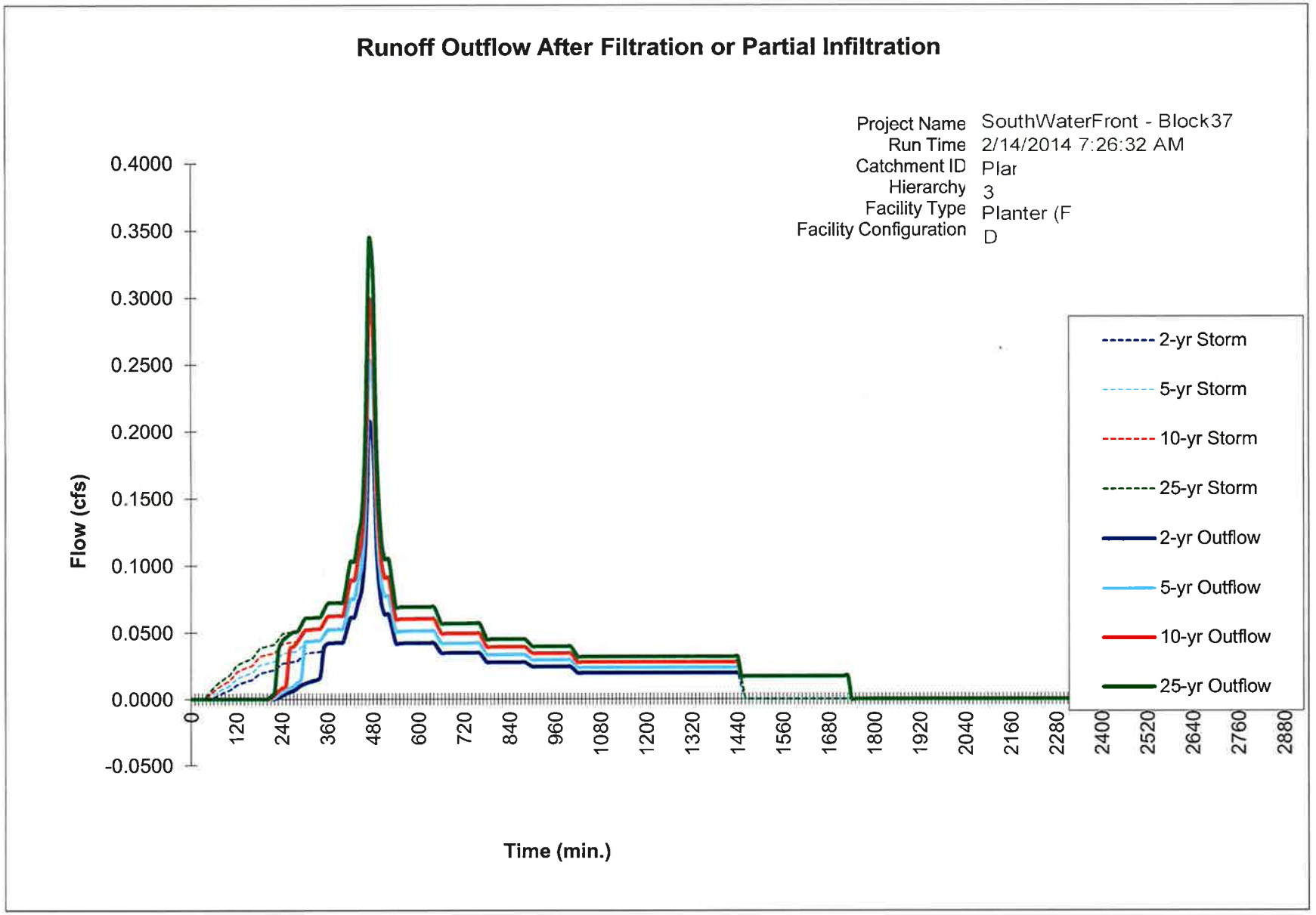
Project Name: SouthWaterFront - Block37
Run Time: 2/14/2014 7:26:32 AM
Catchment ID: Planter A
Hierarchy: 3
Facility Type: Planter (I
Facility Configuration: D



Printed: 2/14/2014 7:26 AM

BES - Presumptive Approach Calculator - Ver 1.2

Output Chart



Presumptive Approach Calculator ver. 1.2

Catchment Data

Catchment ID: Planter B

Project Name: SouthWaterFront - Block37
Project Address: SW River Parkway and SW Gaines
Portland Oregon
Designer: JLB
Company: HHPR

Date: 02/03/14
Permit Number: 0

Run Time 2/14/2014 7:28:00 AM

Drainage Catchment Information

	Planter B Catchment Area	
Catchment ID		
Impervious Area	5,696	SF
Impervious Area	0.13	ac
Impervious Area Curve Number, CN_{imp}	98	
Time of Concentration, Tc, minutes	5	min.

Site Soils & Infiltration Testing Data

Infiltration Testing Procedure:	Open Pit Falling Head	
Native Soil Field Tested Infiltration Rate (I_{test}):	10	in/hr
Bottom of Facility Meets Required Separation From High Groundwater Per BES SWMM Section 1.4:	Yes	

Correction Factor Component

CF_{test} (ranges from 1 to 3)	2	

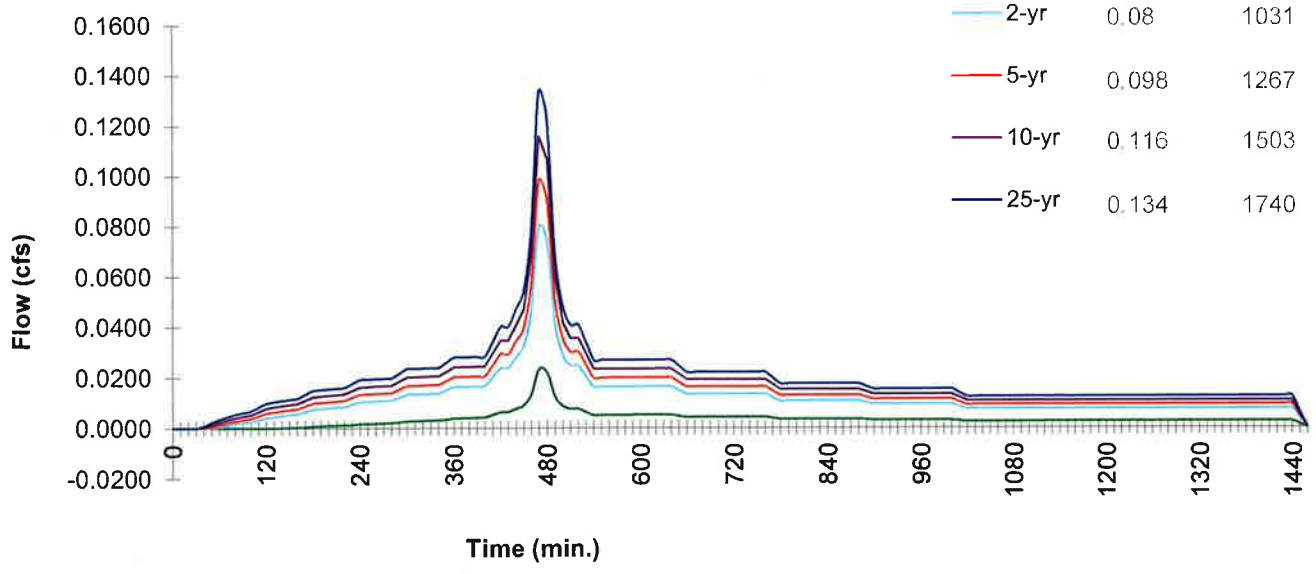
Design Infiltration Rates

I_{dsgn} for Native (I_{test} / CF_{test}):	5.00	in/hr
I_{dsgn} for Imported Growing Medium:	2.00	in/hr

Execute SBUH

SBUH Results

	Peak Rate (cfs)	Volume (cf)
PR	0.024	298
2-yr	0.08	1031
5-yr	0.098	1267
10-yr	0.116	1503
25-yr	0.134	1740



Printed: 2/14/2014 7:28 AM

Presumptive Approach Calculator ver. 1.2

Catchment ID: Planter B

Run Time 2/14/2014 7:28:00 AM

Project Name: SouthWaterFront - Block37 **Catchment ID:** Planter B **Date:** 2/3/2014

imported file Planter B 02132014.xls - 2/14/2014 7:28:02 AM

Instructions:

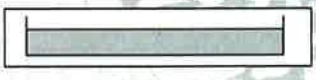
1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility configuration.
5. Complete data entry for all highlighted cells.

Catchment facility will meet Hierarchy Category: 3

Goal Summary:

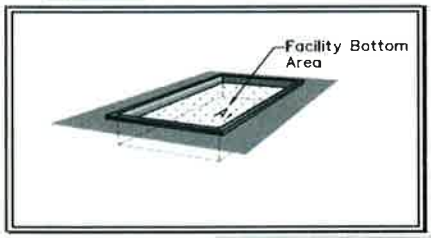
Hierarchy Category	SWMM Requirement	RESULTS box below needs to display...	
		Pollution Reduction as a	10-yr (aka disposal) as a
3	Off-site flow to drainageway, river, or storm-only pipe system.	PASS	N/A

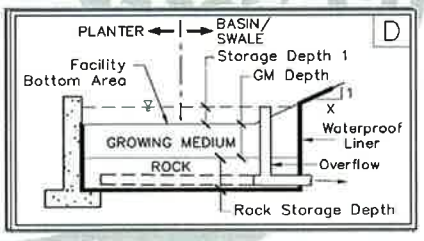
Facility Type = Planter (Flat)



Facility Shape: Rectangle/Square

Facility Configuration: D





Calculation Guide
Max. Rock Stor. Bottom Area
142 SF

DATA FOR ABOVE GRADE STORAGE COMPONENT

BELOW GRADE STORAGE

Facility Bottom Area =	142	sf
Bottom Width =	10.0	ft
Facility Side Slope =	0	to 1
Storage Depth 1 =	4	in <Warning
Growing Medium Depth =	18	in
Freeboard Depth =	N/A	in
Surface Capacity at Depth 1 =	47	cf
GM Design Infiltration Rate =	2.00	in/hr
Infiltration Capacity =	0.007	cfs

Rock Storage Capacity =		cf
Native Design Infiltration Rate =		in/hr
Infiltration Capacity =		cfs

RESULTS

Pollution Reduction: PASS

Overflow Volume: 0 CF 68% Surf. Cap. Used

Run PAC

Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.080	0.098	0.116	0.134

Current data has been imported:

Planter B 02132014.xls 2/14/2014 7:28:02 AM

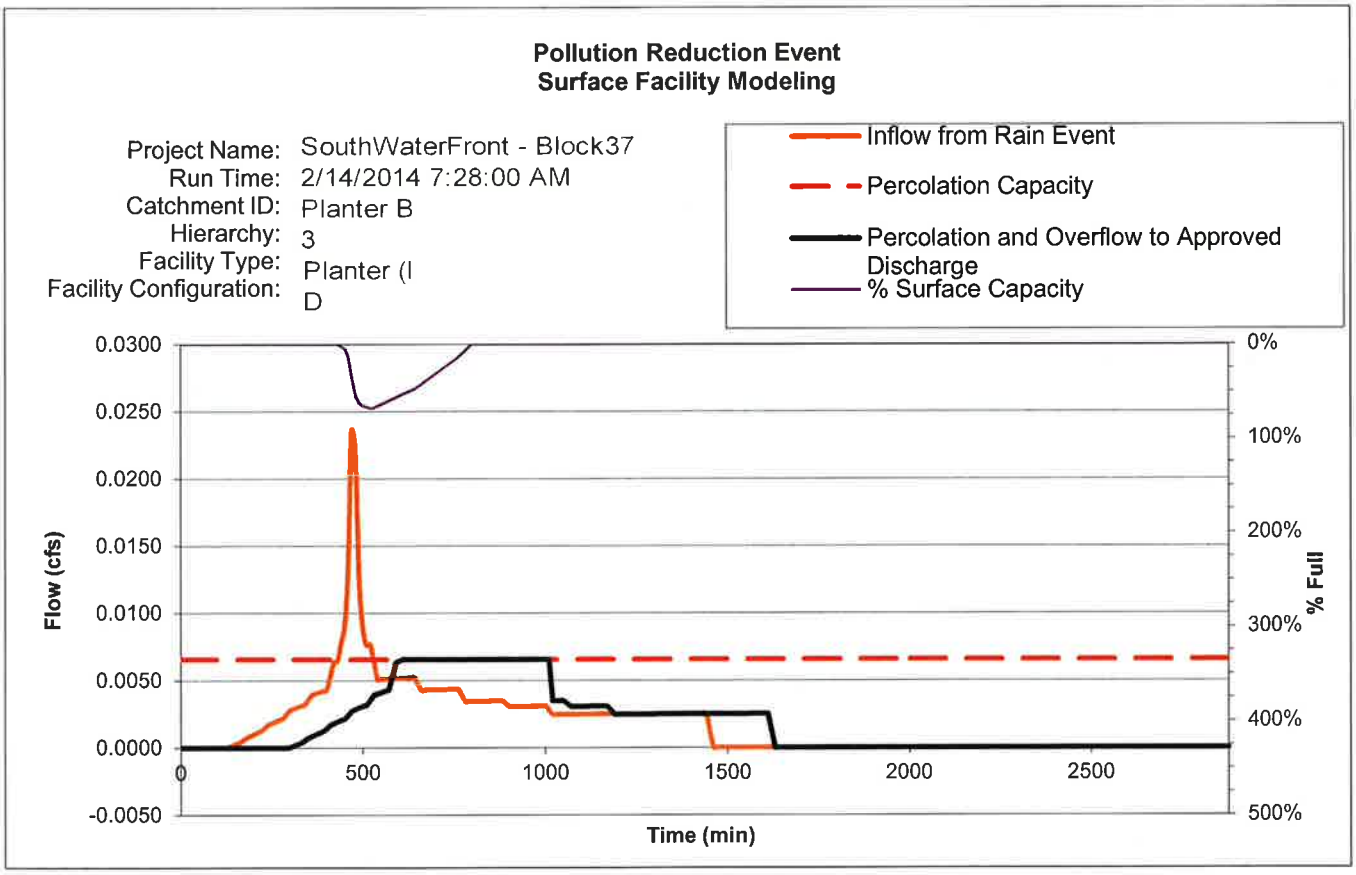
FACILITY FACTS

Total Facility Area Including Freeboard = 142 SF

Sizing Ratio (Total Facility Area / Catchment Area) = 0.025

BES - Presumptive Approach Calculator - Ver 1.2

PR Con-D



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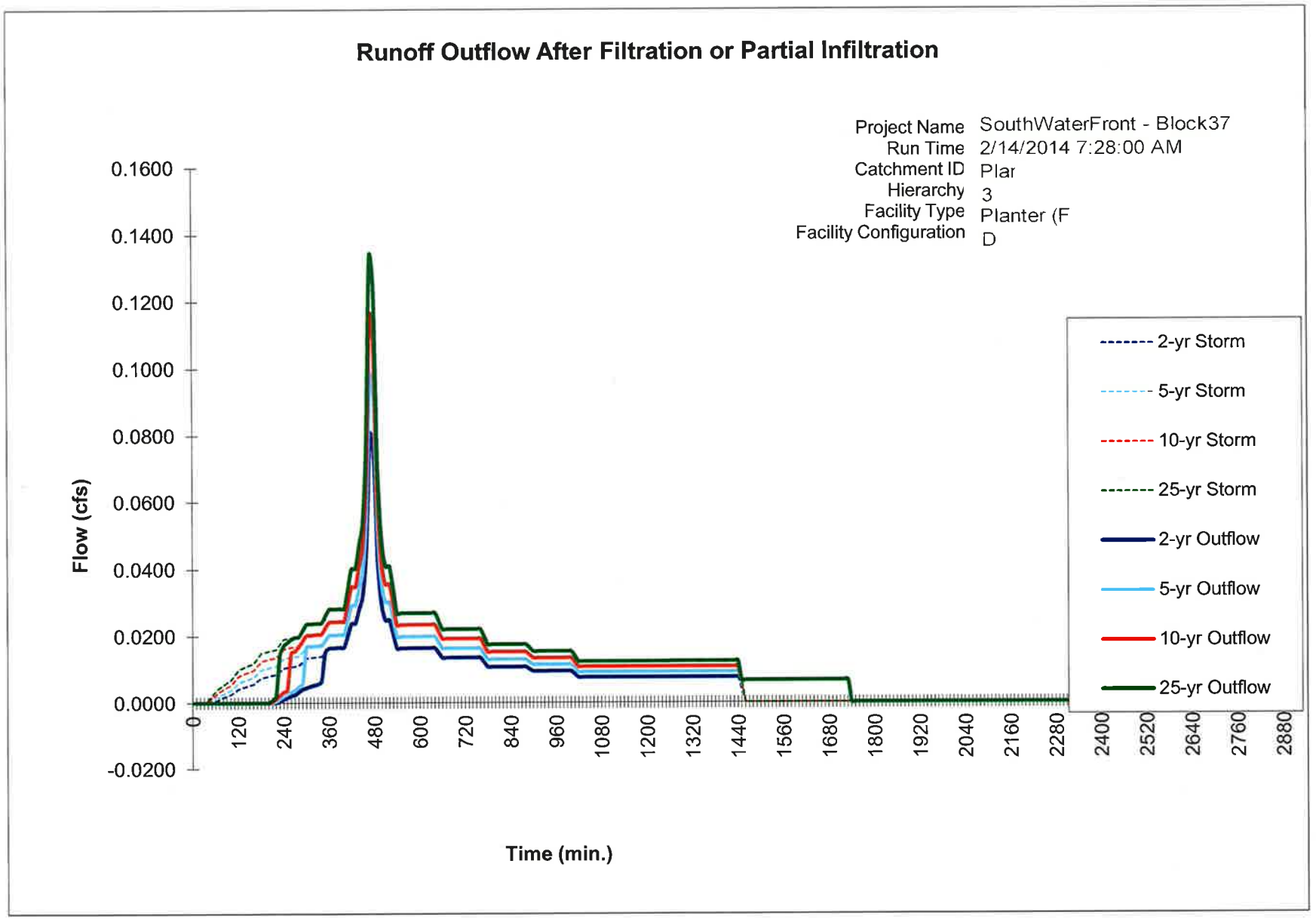
BES - Presumptive Approach Calculator - Ver 1.2

Output Chart



Presumptive Approach Calculator ver. 1.2

Catchment Data

Catchment ID: Swale A
Date: 02/12/14
Permit Number: 0
Run Time 2/12/2014 5:52:28 PM

Project Name: BLOCK 37
Project Address: SW River Parkway and SW Gaines
Portland Oregon
Designer: JLB
Company: HHPR

Drainage Catchment Information

	Swale A Catchment Area	
Catchment ID		
Impervious Area	38,609	SF
Impervious Area	0.89	ac
Impervious Area Curve Number, CN_{imp}	98	
Time of Concentration, Tc, minutes	5	min.

Site Soils & Infiltration Testing Data

Infiltration Testing Procedure:	Open Pit Falling Head	
Native Soil Field Tested Infiltration Rate (I_{test}):	2	in/hr
Bottom of Facility Meets Required Separation From High Groundwater Per BES SWMM Section 1.4:	Yes	

Correction Factor Component

CF_{test} (ranges from 1 to 3)	2	

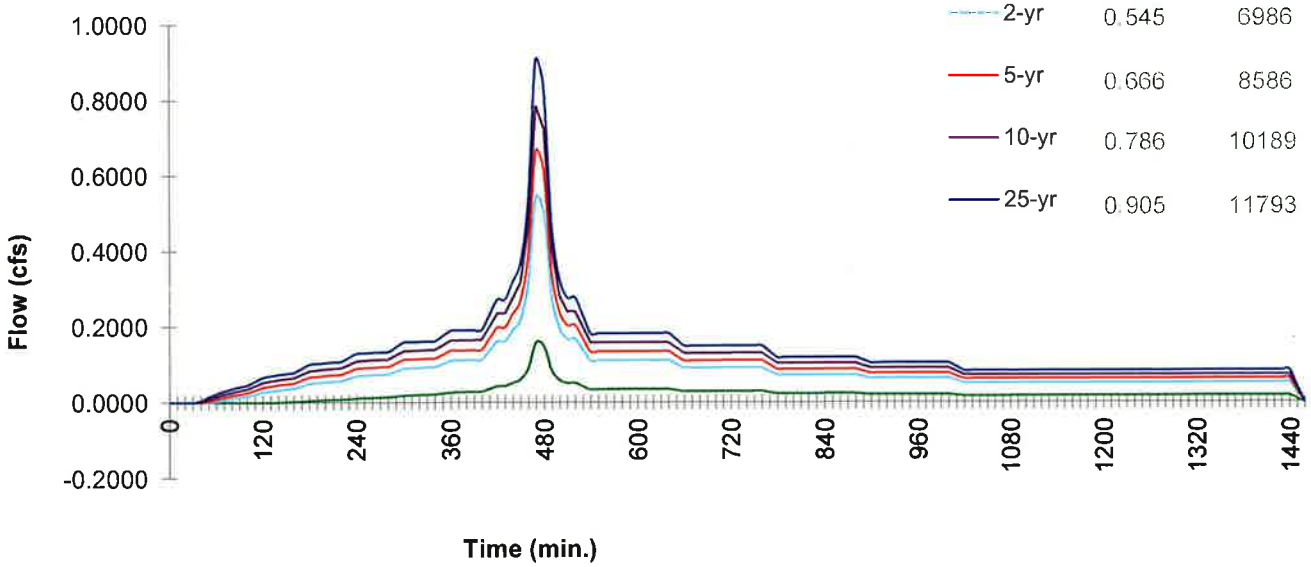
Design Infiltration Rates

I_{dsgn} for Native (I_{test} / CF_{test}):	1.00	in/hr
I_{dsgn} for Imported Growing Medium:	2.00	in/hr

Execute SBUH

SBUH Results

	Peak Rate (cfs)	Volume (cf)
PR	0.159	2017
2-yr	0.545	6986
5-yr	0.666	8586
10-yr	0.786	10189
25-yr	0.905	11793



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Presumptive Approach Calculator ver. 1.2

Catchment ID: Swale

Run Time 2/12/2014 5:52:28 PM

Project Name: BLOCK 37 **Catchment ID:** Swale **Date:** 2/12/2014

Instructions:
1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility configuration.
5. Complete data entry for all highlighted cells.

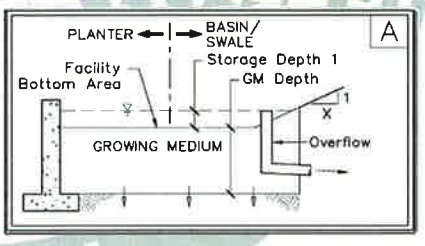
Catchment facility will meet Hierarchy Category: 3

Goal Summary:

Hierarchy Category	SWMM Requirement	RESULTS box below needs to display...	
		Pollution Reduction as a	10-yr (aka disposal) as a
3	Off-site flow to drainageway, river, or storm-only pipe system.	PASS	N/A

Facility Type = Swale

Facility Configuration: A



Refer to Sloped Facility Worksheet and enter Variable Parameters

Calculation Guide
Max. Rock Stor. Bottom Area
Per Swale Dims

DATA FOR ABOVE GRADE STORAGE COMPONENT

Infiltration Area = 969 sf
Surface Capacity Volume = 661.1 cf

BELOW GRADE STORAGE

Rock Storage Bottom Area = 969 sf
Rock Storage Depth = 0 in

Growing Medium Depth = 18 in
Freeboard Depth = N/A in

Surface Capacity at Depth 1 = 661 cf
Infiltration Area at 75% Depth1 = 11 SF
GM Design Infiltration Rate = 2.00 in/hr
Infiltration Capacity = 0.045 cfs

Rock Storage Capacity = 0 cf
Native Design Infiltration Rate = 1.00 in/hr
Infiltration Capacity = 0.022 cfs

Native Infiltration Rate Used in PA

RESULTS

Pollution Reduction: PASS

Overflow Volume: 0 CF

82% Surf. Cap. Used

Run PAC

Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.523	0.643	0.763	0.883

Current data has been exported:

Swale 02122014.xls 2/12/2014 5:52:40 PM

FACILITY FACTS

Total Facility Area Including Freeboard = 1,400 SF
Sizing Ratio (Total Facility Area / Catchment Area) = 0.036

Presumptive Approach Calculator Ver 1.2

Instructions:

1. Refer to facility graphics on the Graphics tab, then fill in all relevant facility parameters in the Data Entry table below. Data entry cells vary based on Facility Configuration selected on Facility Design Data tab.
2. Delete all facility parameters that may have been entered by the previous iteration that are no longer applicable.

Run Time 2/12/2014 5:52:28 PM

Project Name: BLOCK 37 **Date:** 2/12/2014 **Catchment ID:** Swale

Data Entry

Parameters | **Rock Storage Parameters** | **Error Messages**

Facility Segment	Length of facility segment (ft) $L_{segment}$	Downstream Check Dam Length (ft) L_{dam}	Longitudinal Facility Slope (ft/ft) S	Bottom Width (ft) W_{bottom}	Side Slope Right X_{right}:1	Side Slope Left X_{left}:1	Downstream Depth (inches) D_{ds}	Landscape Width (ft) $W_{landscape}$	Rock Storage Width (ft) W_{rock}	Rock Storage Depth (inches) D_{rock}	Rock Void Ratio v
1	30	0	0.017	4	3	3	12	10			
2	30	0.16	0.017	4	3	3	12	10			
3	30	0.16	0.017	4	3	3	12	10			
4	30	0.16	0.017	4	3	3	12	10			
5	20	0.16	0.017	4	3	3	10	10			
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

Project Name: Depth 2= Depth 3=

Worksheet Calculations

Parameters | **Rock Storage Parameters**

Facility Segment	Adjusted Length of facility segment (ft) L_{adjust}	Adjusted Length if $D_{up} = 0$ (ft) $L_{adjust2}$	Upstream Depth (inches) D_{up}	Downstream Top Width (ft) W_{top-ds}	Upstream Top Width (ft) W_{top-up}	Downstream Cross-sectional Area (sf) A_{ds}	Upstream Cross-sectional Area (sf) A_{up}	**Surface Capacity Volume** (cf) $V_{surface}$	75% of Max. Downstream Depth (inches) $D_{ds75\%}$	75% of Max. Upstream Depth (inches) $D_{up75\%}$	75% of Max. Adjusted Length if $D_{up75\%} = 0$ (ft) $L_{adjust3}$	75% of Max. Downstream Top Width (ft) $W_{top-ds75\%}$	75% of Max. Upstream Top Width (ft) $W_{top-up75\%}$	**Infiltration Area @ 75% Full** (sf) $A_{75\%}$	Rock Storage Length (ft) L_{rock}	**Rock Storage Bottom Area** (sf) A_{rock}	**Rock Storage Capacity Volume** (cf) V_{rock}
1	30.00	N/A	5.88	10.00	6.94	7.00	2.68	145	9.00	2.88	N/A	8.50	5.44	209	30	209	0
2	29.92	N/A	5.90	10.00	6.95	7.00	2.69	145	9.00	2.90	N/A	8.50	5.45	209	30	209	0
3	29.92	N/A	5.90	10.00	6.95	7.00	2.69	145	9.00	2.90	N/A	8.50	5.45	209	30	209	0
4	29.92	N/A	5.90	10.00	6.95	7.00	2.69	145	9.00	2.90	N/A	8.50	5.45	209	30	209	0
5	19.92	N/A	5.94	9.00	6.97	5.42	2.71	81	7.50	3.44	N/A	7.75	5.72	134	20	134	0
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
								661	$V_{surface}$ @ Depth1					969		969	0

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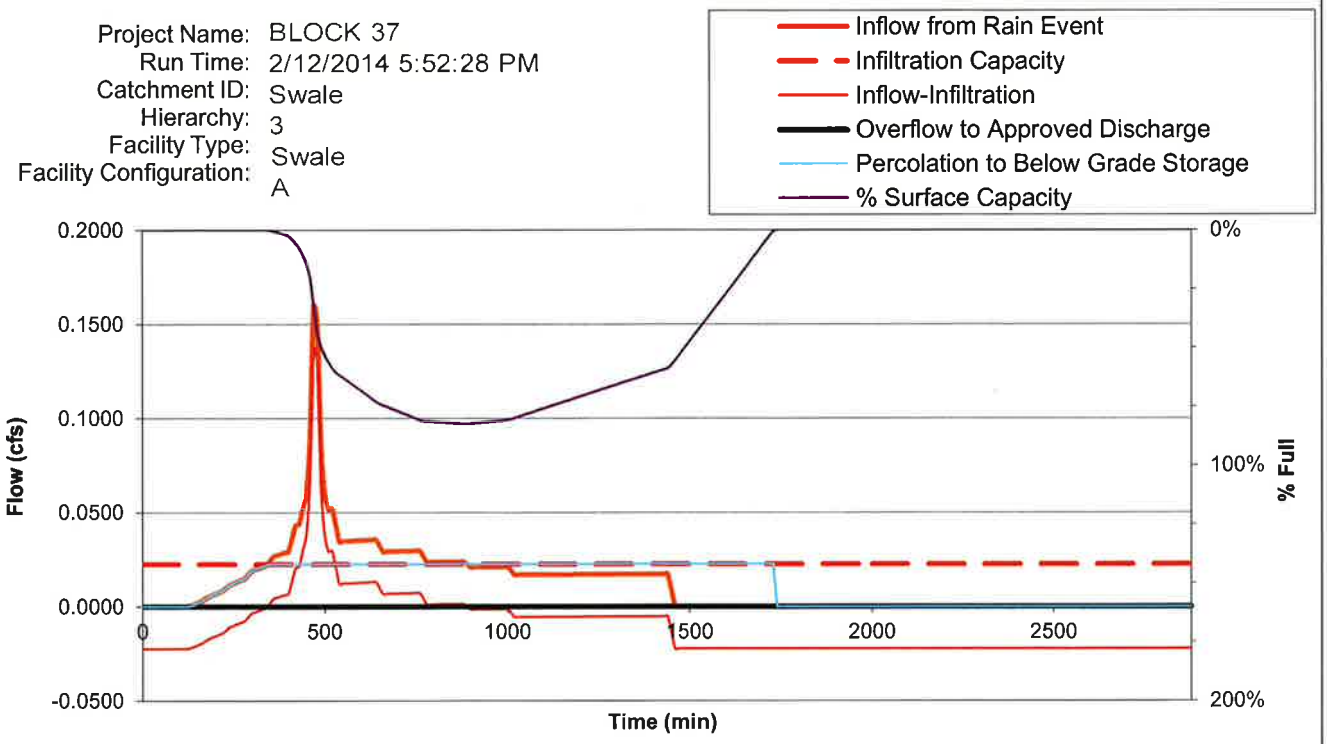
BES - Presumptive Approach Calculator - Ver 1.2

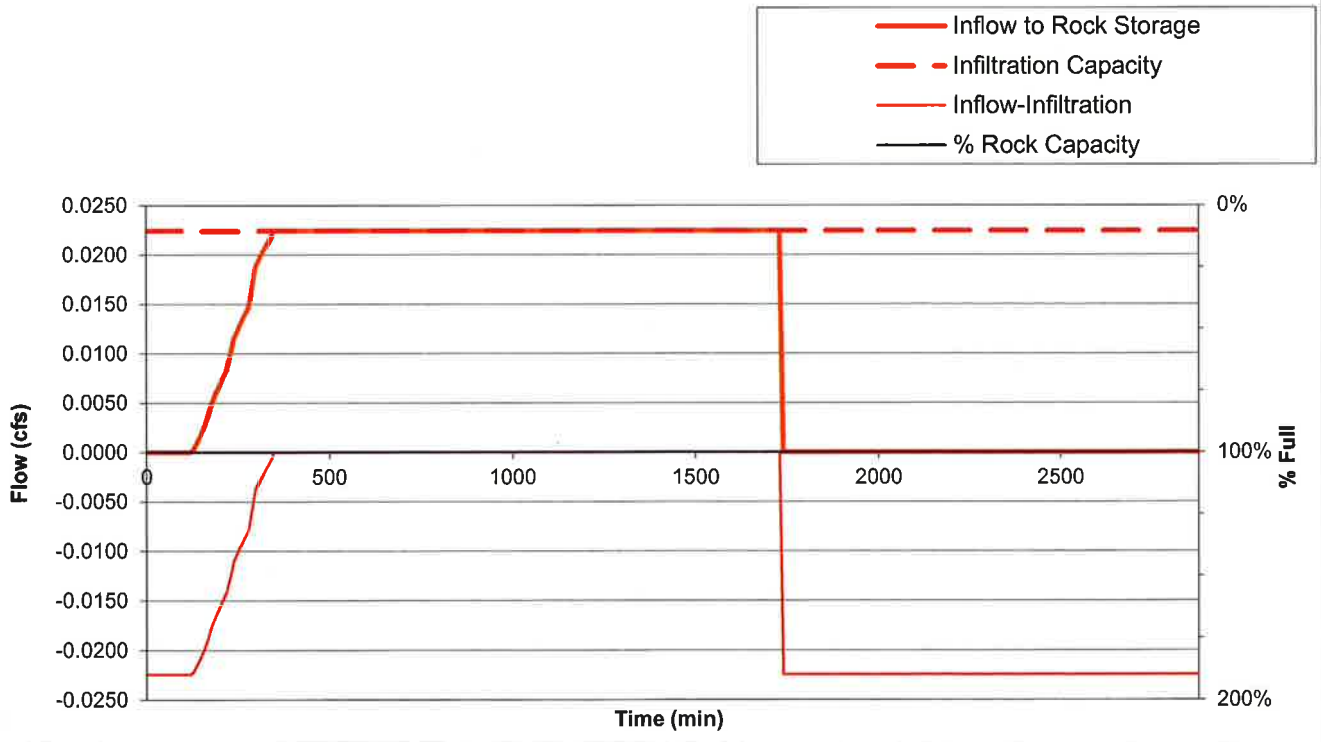
PR Con-A&B

Pollution Reduction Event
Surface Facility Modeling

Project Name: BLOCK 37
Run Time: 2/12/2014 5:52:28 PM
Catchment ID: Swale
Hierarchy: 3
Facility Type: Swale
Facility Configuration: A



Pollution Reduction Event
Below Grade Modeling



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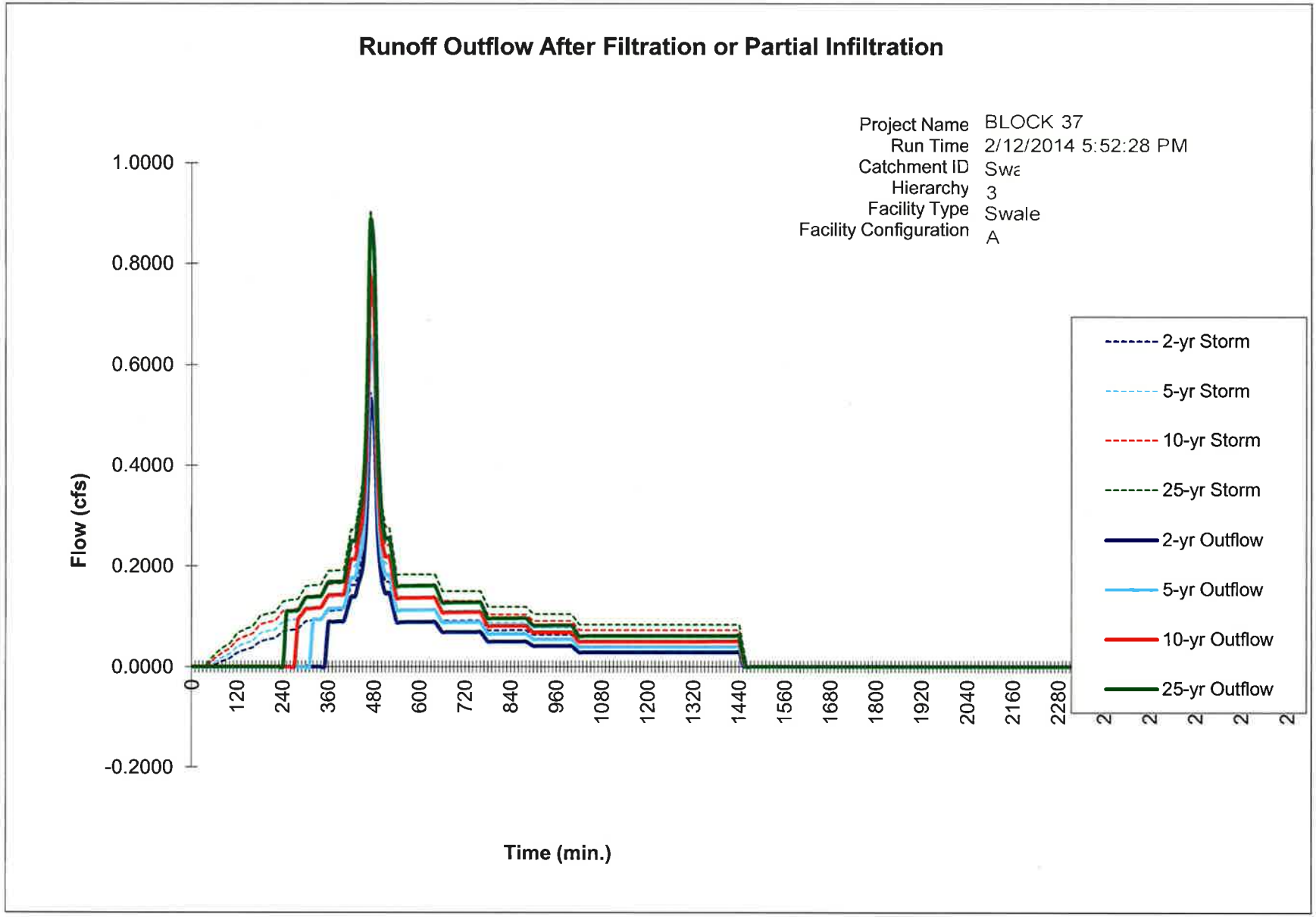
BES - Presumptive Approach Calculator - Ver 1.2

Output Chart



Presumptive Approach Calculator ver. 1.2

Catchment Data

Catchment ID: Swale B

Project Name: BLOCK 37
Project Address: SW River Parkway and SW Gaines
Portland Oregon
Designer: JLB
Company: HHPR

Date: 02/12/14
Permit Number: 0
Run Time 2/12/2014 5:53:45 PM

Drainage Catchment Information

	Swale B	
Catchment ID		
	Catchment Area	
Impervious Area	5,400	SF
Impervious Area	0.12	ac
Impervious Area Curve Number, CN_{imp}	98	
Time of Concentration, Tc, minutes	5	min.

Site Soils & Infiltration Testing Data

Infiltration Testing Procedure:	Open Pit Falling Head	
Native Soil Field Tested Infiltration Rate (I_{test}):	2	in/hr
Bottom of Facility Meets Required Separation From High Groundwater Per BES SWMM Section 1.4:	Yes	

Correction Factor Component

CF_{test} (ranges from 1 to 3)	2	

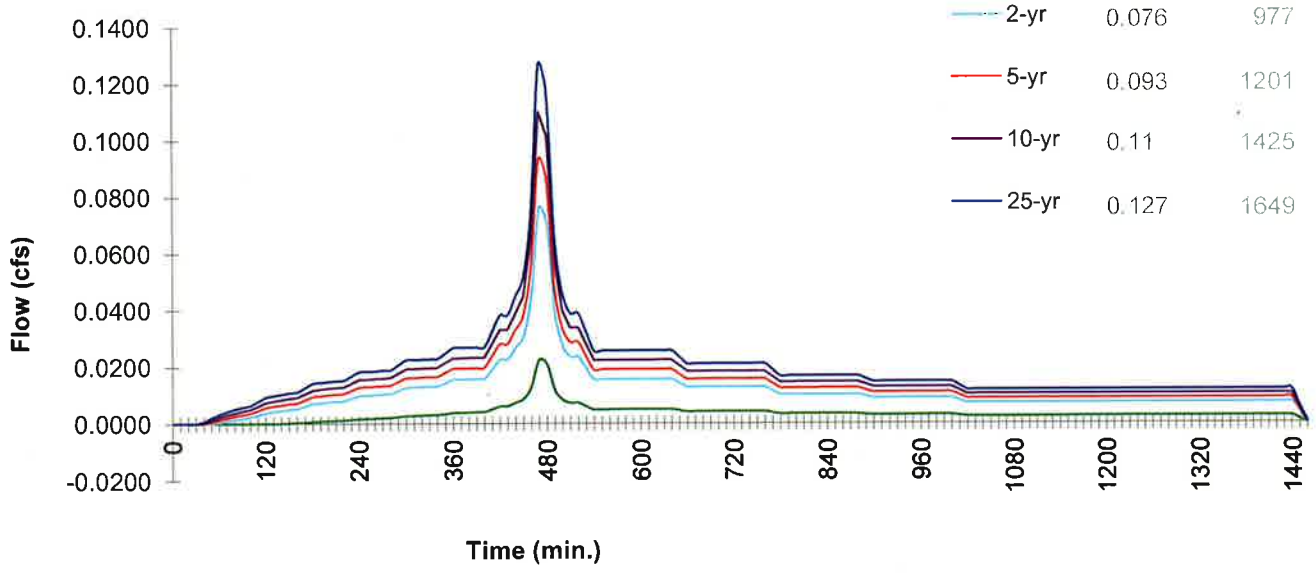
Design Infiltration Rates

I_{dsgn} for Native (I_{test} / CF_{test}):	1.00	in/hr
I_{dsgn} for Imported Growing Medium:	2.00	in/hr

Execute SBUH

SBUH Results

	Peak Rate (cfs)	Volume (cf)
PR	0.022	282
2-yr	0.076	977
5-yr	0.093	1201
10-yr	0.11	1425
25-yr	0.127	1649



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Presumptive Approach Calculator ver. 1.2

Catchment ID: Swale B

Run Time 2/12/2014 5:53:45 PM

Project Name: BLOCK 37 **Catchment ID:** Swale B **Date:** 2/12/2014

imported file Swale b 02122014.xls - 2/12/2014 5:53:47 PM

Instructions:

1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility configuration.
5. Complete data entry for all highlighted cells.

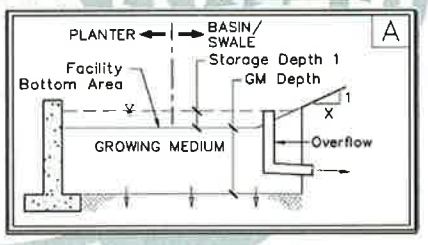
Catchment facility will meet Hierarchy Category: 3

Goal Summary:

Hierarchy Category	SWMM Requirement	RESULTS box below needs to display...	
		Pollution Reduction as a	10-yr (aka disposal) as a
3	Off-site flow to drainageway, river, or storm-only pipe system.	PASS	N/A

Facility Type = Swale

Facility Configuration: A



Refer to Sloped Facility Worksheet and enter Variable Parameters

Calculation Guide
Max. Rock Stor. Bottom Area
Per Swale Dims

DATA FOR ABOVE GRADE STORAGE COMPONENT

Infiltration Area = 141 sf
Surface Capacity Volume = 99.0 cf

BELOW GRADE STORAGE

Rock Storage Bottom Area = 141 sf
Rock Storage Depth = 0 in

Growing Medium Depth = 18 in
Freeboard Depth = N/A in

Surface Capacity at Depth 1 = 99 cf
Infiltration Area at 75% Depth1 = 3 SF
GM Design Infiltration Rate = 2.00 in/hr
Infiltration Capacity = 0.007 cfs

Rock Storage Capacity = 0 cf

Native Design Infiltration Rate = 1.00 in/hr
Infiltration Capacity = 0.003 cfs

Native Infiltration Rate Used in PA

RESULTS

Pollution Reduction	Overflow Volume		
PASS	0 CF	73%	Surf. Cap. Used

Run PAC

Output File

	2-yr	5-yr	10-yr	25-yr
Peak cfs	0.073	0.090	0.107	0.123

Current data has been imported:

Swale b 02122014.xls 2/12/2014 5:53:47 PM

FACILITY FACTS

Total Facility Area Including Freeboard = 200 SF
Sizing Ratio (Total Facility Area / Catchment Area) = 0.037

Presumptive Approach Calculator Ver 1.2

Instructions:

1. Refer to facility graphics on the Graphics tab, then fill in all relevant facility parameters in the Data Entry table below. Data entry cells vary based on Facility Configuration selected on Facility Design Data tab.
2. Delete all facility parameters that may have been entered by the previous iteration that are no longer applicable.

Run Time 2/12/2014 5:53:45 PM

Project Name: BLOCK 37 **Date:** 2/12/2014 **Catchment ID:** Swale B

Data Entry

Parameters | **Rock Storage Parameters** | **Error Messages**

Facility Segment	Length of facility segment (ft) $L_{segment}$	Downstream Check Dam Length (ft) L_{dam}	Longitudinal Facility Slope (ft/ft) S	Bottom Width (ft) W_{bottom}	Side Slope Right X_{right}:1	Side Slope Left X_{left}:1	Downstream Depth (inches) D_{ds}	Landscape Width (ft) $W_{landscape}$	Rock Storage Width (ft) W_{rock}	Rock Storage Depth (inches) D_{rock}	Rock Void Ratio v
1	10	0	0.0475	4	3	3	12	10			
2	10	0.16	0.0475	4	3	3	12	10			
3											
4											
5											
6											
7											
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15											
16											
17											
18											
19											
20											

Project Name: Depth 2= Depth 3=

Worksheet Calculations

Parameters | **Rock Storage Parameters**

Facility Segment	Adjusted Length of facility segment (ft) L_{adjust}	Adjusted Length if D_{up} = 0 (ft) $L_{adjust2}$	Upstream Depth (inches) D_{up}	Downstream Top Width (ft) $W_{top\text{-}ds}$	Upstream Top Width (ft) $W_{top\text{-}up}$	Downstream Cross-sectional Area (sf) A_{ds}	Upstream Cross-sectional Area (sf) A_{up}	**Surface Capacity Volume (cf) $V_{surface}$**	75% of Max Downstream Depth (inches) $D_{ds75\%}$	75% of Max Upstream Depth (inches) $D_{up75\%}$	75% of Max Adjusted Length if $D_{up75\%}$ = 0 (ft) $L_{adjust3}$	75% of Max Downstream Top Width (ft) $W_{top\text{-}ds75\%}$	75% of Max Upstream Top Width (ft) $W_{top\text{-}up75\%}$	**Infiltration Area @ 75% Full (sf) $A_{75\%}$**	Rock Storage Length (ft) L_{rock}	**Rock Storage Bottom Area (sf) A_{rock}**	**Rock Storage Capacity Volume (cf) V_{rock}**
1	10.00	N/A	6.30	10.00	7.15	7.00	2.93	50	9.00	3.30	N/A	8.50	5.65	71	10	71	0
2	9.92	N/A	6.35	10.00	7.17	7.00	2.95	49	9.00	3.35	N/A	8.50	5.67	70	10	70	0
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0
								99	$V_{surface}$ @ Depth1					**141**		**141**	**0**

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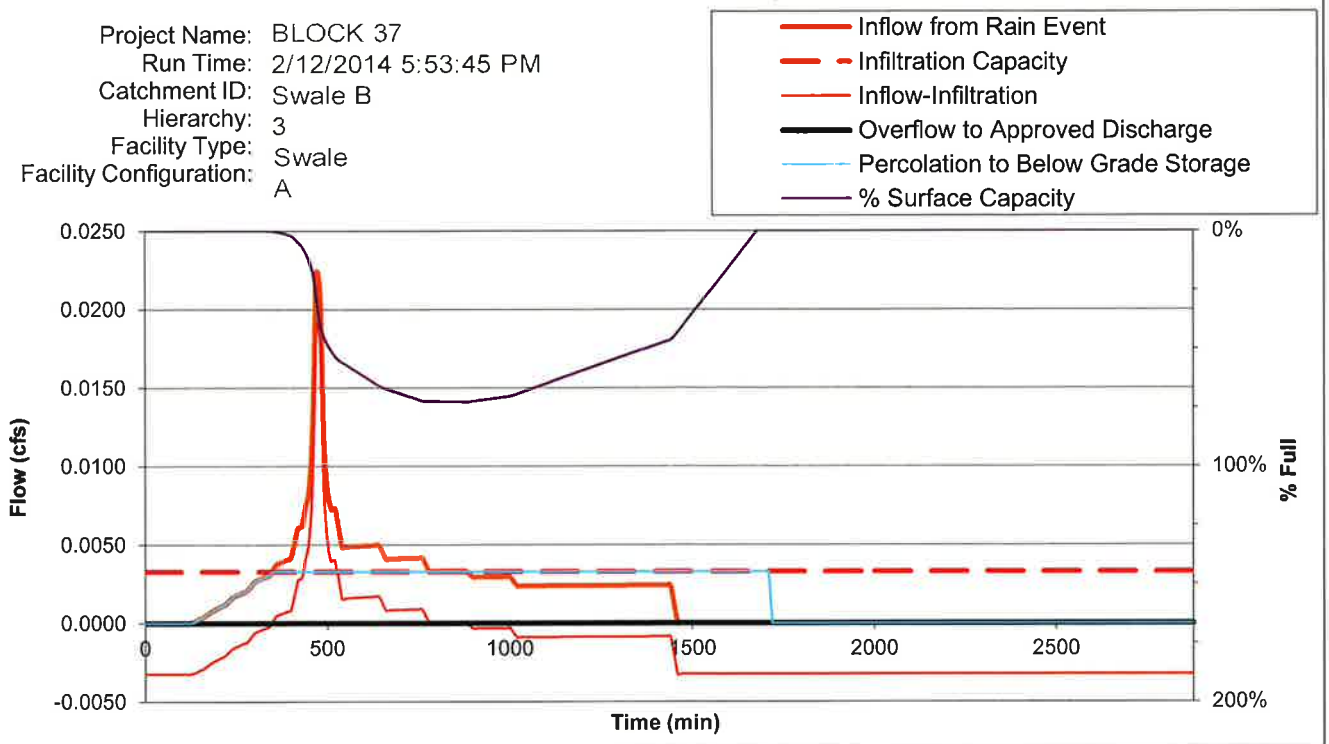
BES - Presumptive Approach Calculator - Ver 1.2

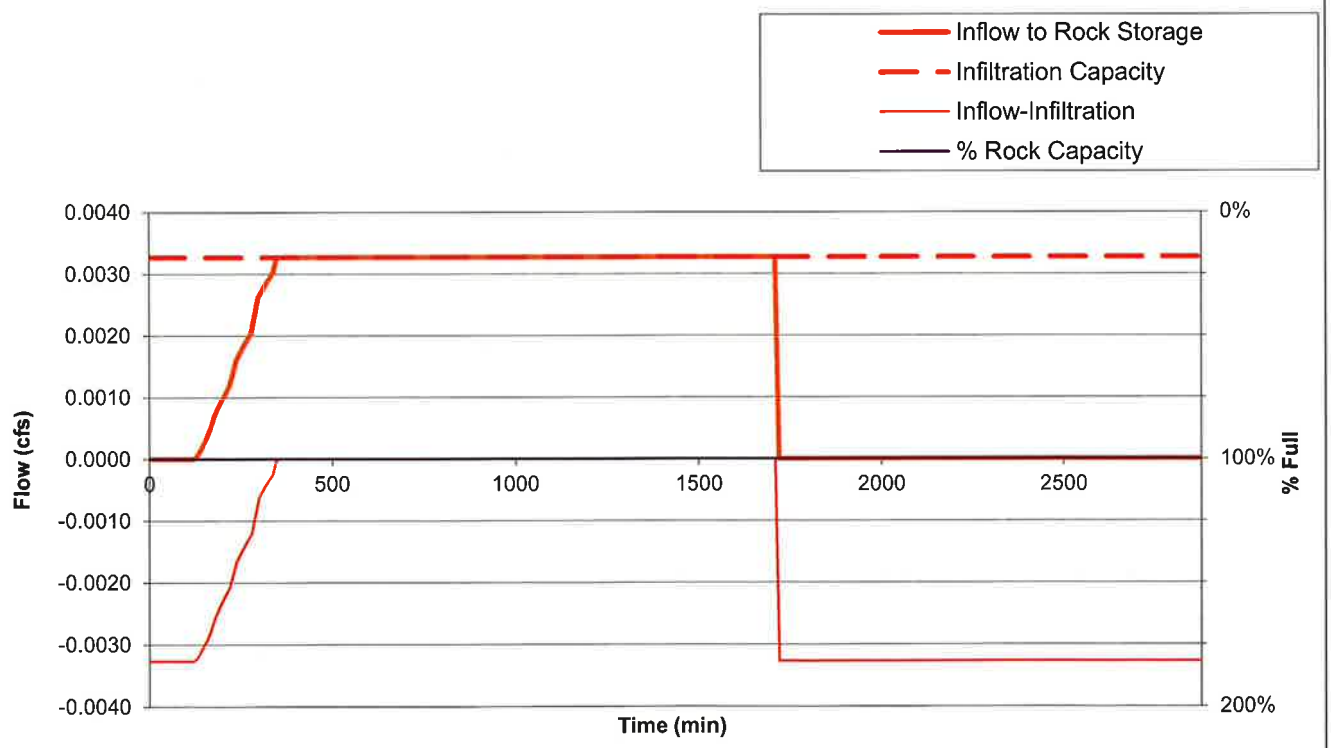
PR Con-A&B

Pollution Reduction Event
Surface Facility Modeling

Project Name: BLOCK 37
Run Time: 2/12/2014 5:53:45 PM
Catchment ID: Swale B
Hierarchy: 3
Facility Type: Swale
Facility Configuration: A



Pollution Reduction Event
Below Grade Modeling



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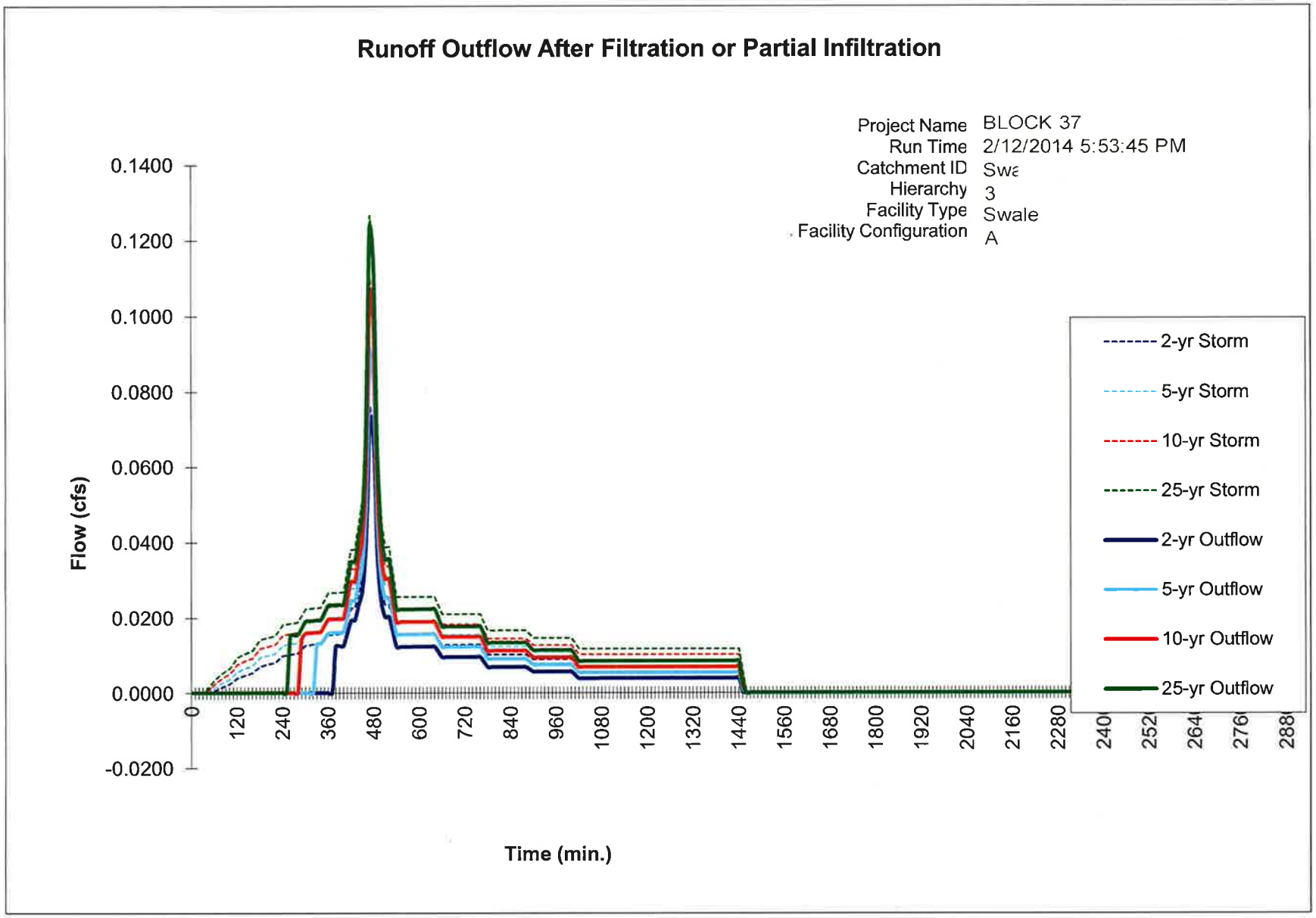
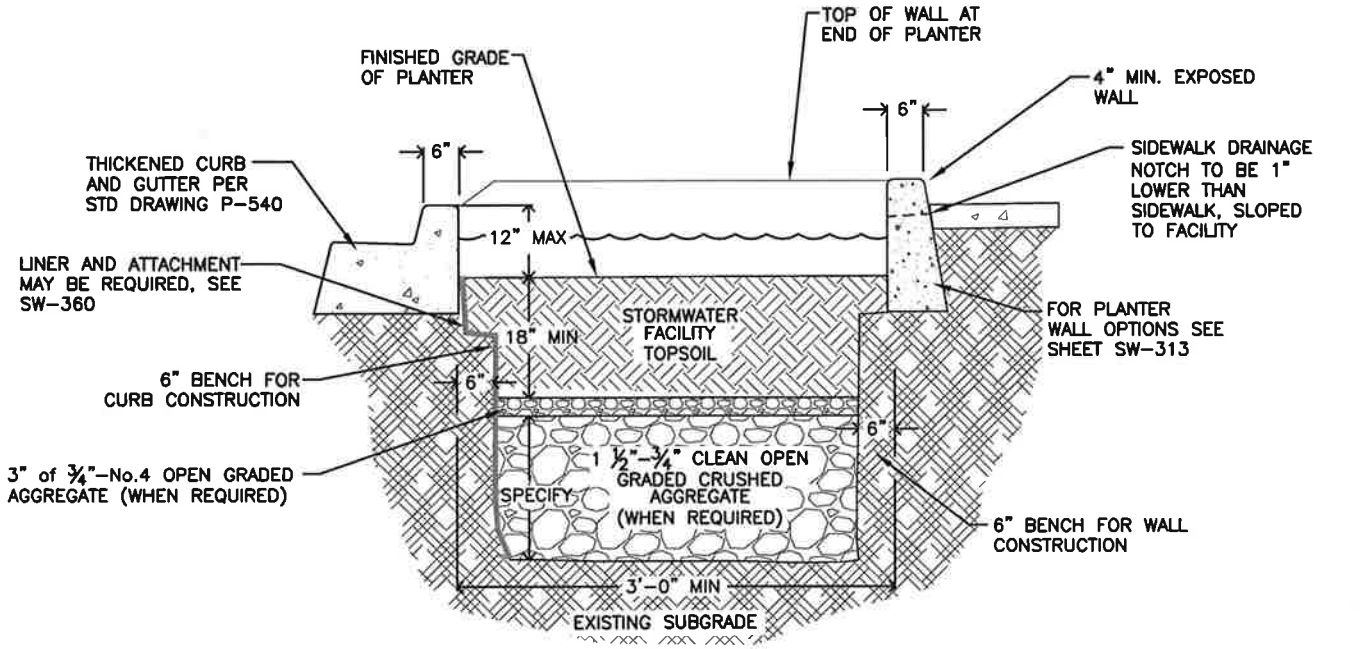
BES - Presumptive Approach Calculator - Ver 1.2

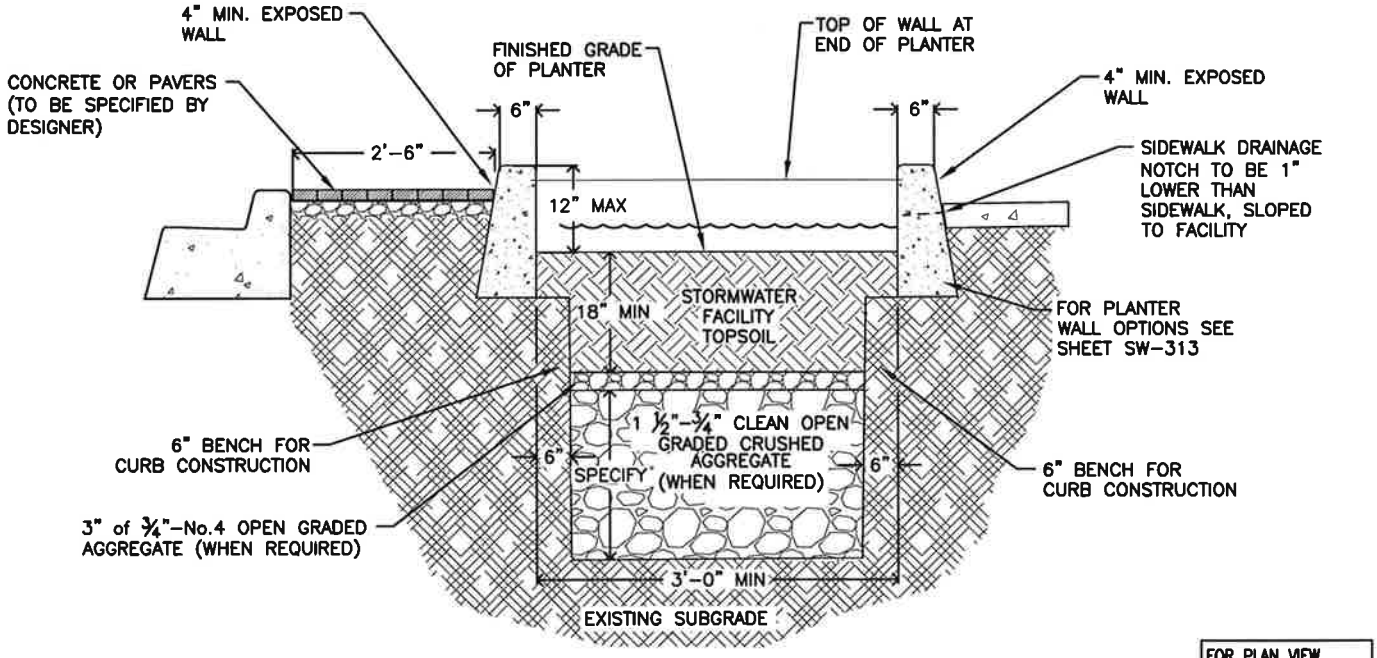
Output Chart





SECTION A-A
PLANTER WITHOUT PARKING

FOR PLAN VIEW REFER TO SW-310



SECTION B-B
PLANTER WITH PARKING

FOR PLAN VIEW REFER TO SW-311

DESIGNER INFORMATION

See SW-335 and SW-336 for Channel and Grate.

CONSTRUCTION NOTE

Scarify the native soil following the initial excavation and before installing topsoil or rock.

- DRAWING NOT TO SCALE -

STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS

NUMBER

SW-312

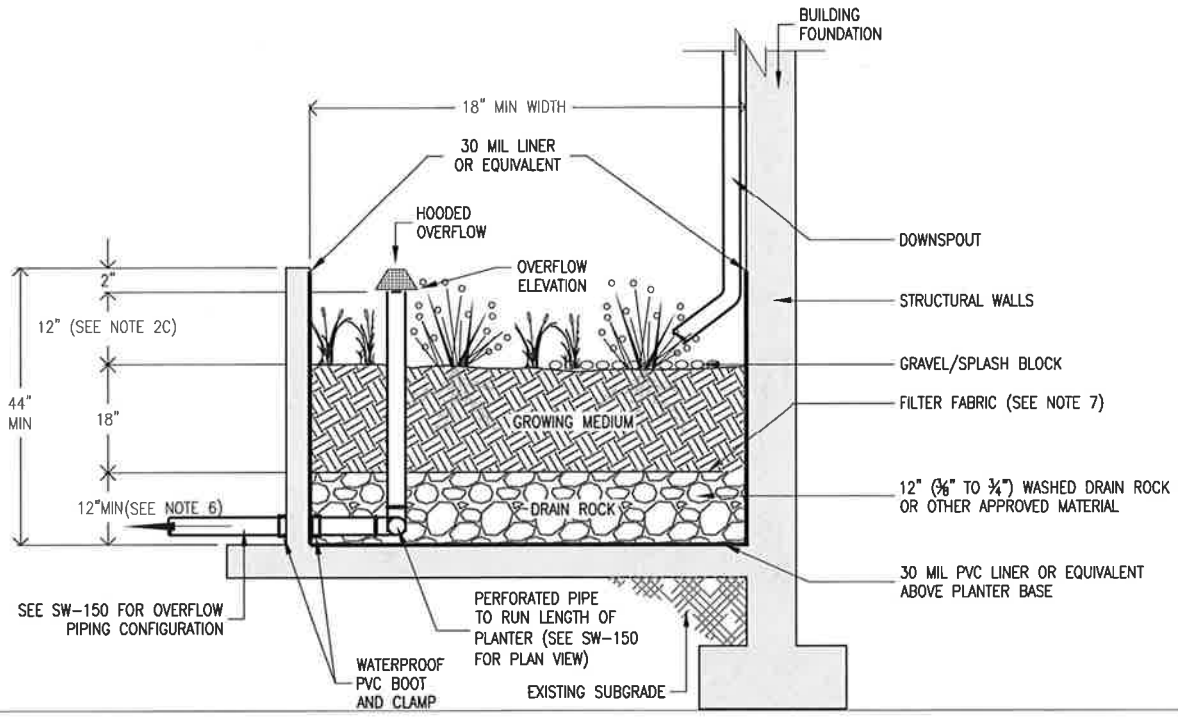
- 2011 GREEN STREETS -

Sections Views
Planters

Bureau of Environmental Services

City of Portland

SET REVISED: 12-08-2011



1. Provide protection from all vehicle traffic, equipment staging, and foot traffic in proposed infiltration areas prior to, during, and after construction.

2. Dimensions:
   a. Width of flow-through planter: 18" minimum.
   b. Width of infiltration planter: 30" minimum.
   c. Depth of planter (from top of growing medium to overflow elevation). Simplified: 12"; Presumptive: 6"- 18".
   d. Slope of planter: 0.5% or less.

3. Setbacks (from centerline of facility):
   a. Infiltration planters must be 10' from foundations and 5' from property lines.
   b. Flow-through planters must be less than 30" in height above surrounding area if within 5 feet of property line.

4. Overflow:
   a. Overflow required for Simplified Approach.
   b. Inlet elevation must allow for 2" of freeboard, minimum.
   c. Protect from debris and sediment with strainer or grate.

5. Piping: shall be ABS Sch.40, cast iron, or PVS Sch.40. 3" pipe required for up to 1,500 sq ft of impervious area, otherwise 4" min. Piping must have 1% grade and follow the Uniform Plumbing Code.

6. Drain rock:
   a. Size for infiltration planter: 1½" - ¾" washed
   b. Size for flow-through planter: ¾" washed
   c. Depth for Simplified: 12"
   d. Depth for Presumptive: 0-48", see calcs.

7. Separation between drain rock and growing medium: Use filter fabric (see SWMM Exhibit 2-4 Geotextile table) or a gravel lens (¾ - ¼ inch washed, crushed rock 2 to 3 inches deep).

8. Growing medium:
   a. 18" minimum
   b. See Appendix F.3 for specification or use sand/loam/compost 3-way mix.

9. Vegetation: Follow landscape plans otherwise refer to plant list in SWMM Appendix F. Minimum container size is 1 gallon. # of plantings per 100sf of facility area:
   a. Zone A (wet) 115 herbaceous plants, OR
   b. Zone A (wet) 100 herbaceous plants and 4 small shrubs.

10. Planter walls:
   a. Material shall be stone, brick, concrete, wood, or other durable material (no chemically treated wood).
   b. Concrete, brick, or stone walls shall be included on foundation plans.

11. Waterproof liner: Shall be 30 mil PVC or equivalent, for flow-through facilities.

12. Install washed pea gravel or river rock to transition from inlet or splash pad to growing medium.

13. Inspections: Call BDS IVR Inspection Line, (503) 823-7000, for appropriate inspections.

- DRAWING NOT TO SCALE -

STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS

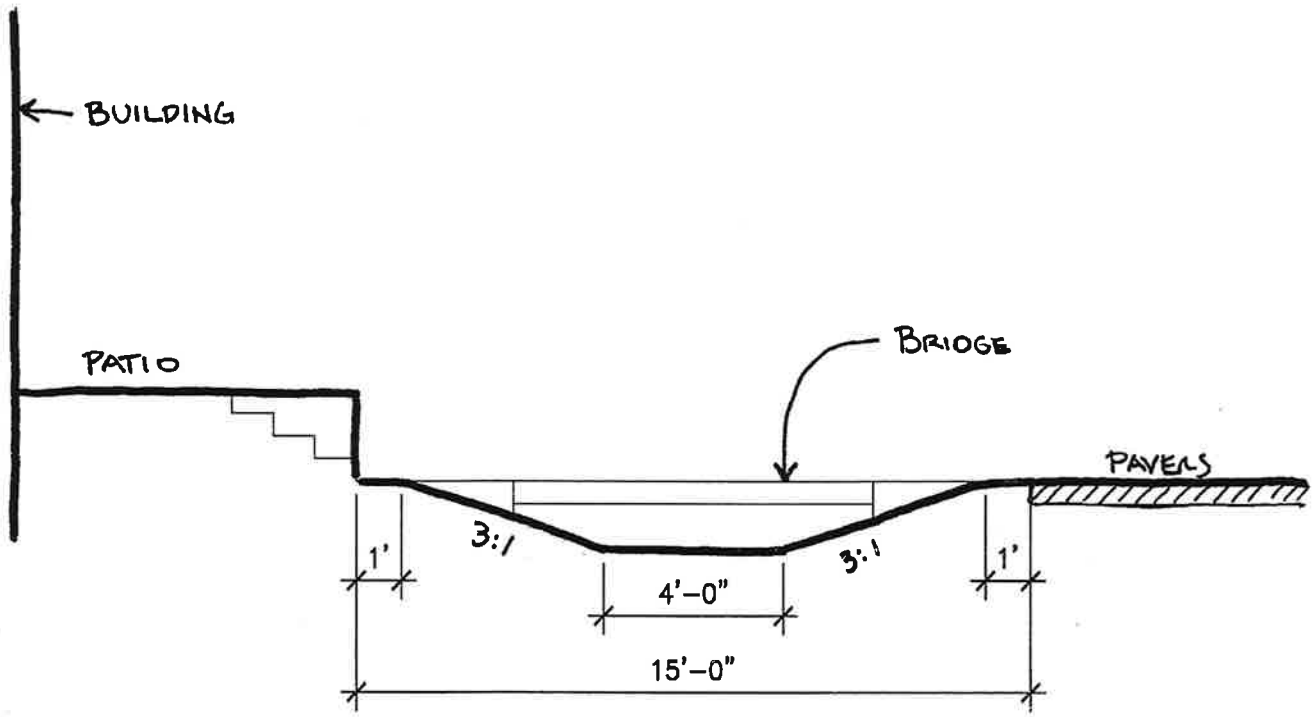
- Simplified / Presumptive Design Approach -

Planter

NUMBER

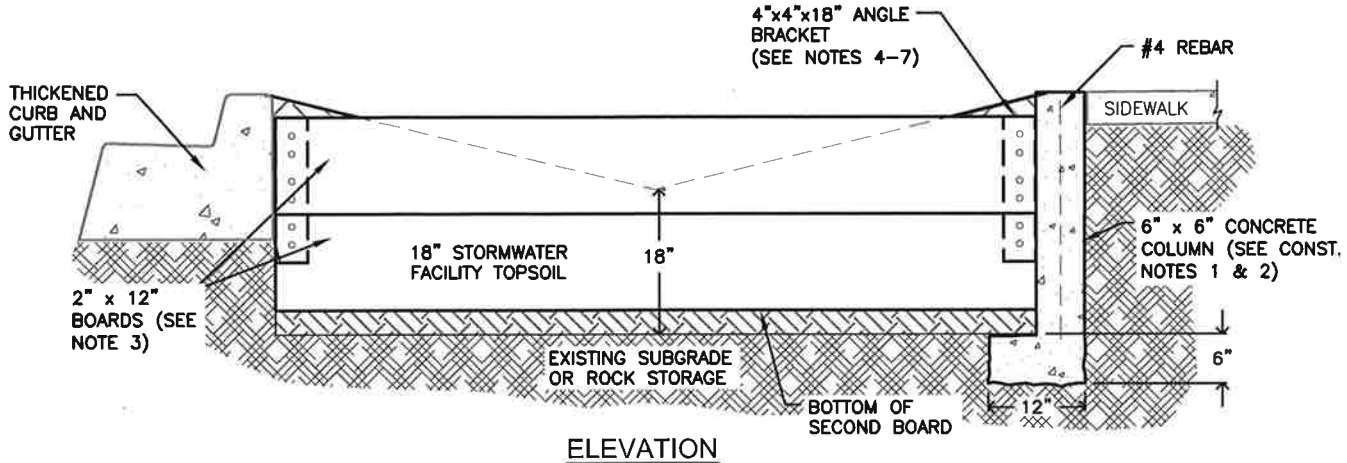
SW-130

Bureau of Environmental Services

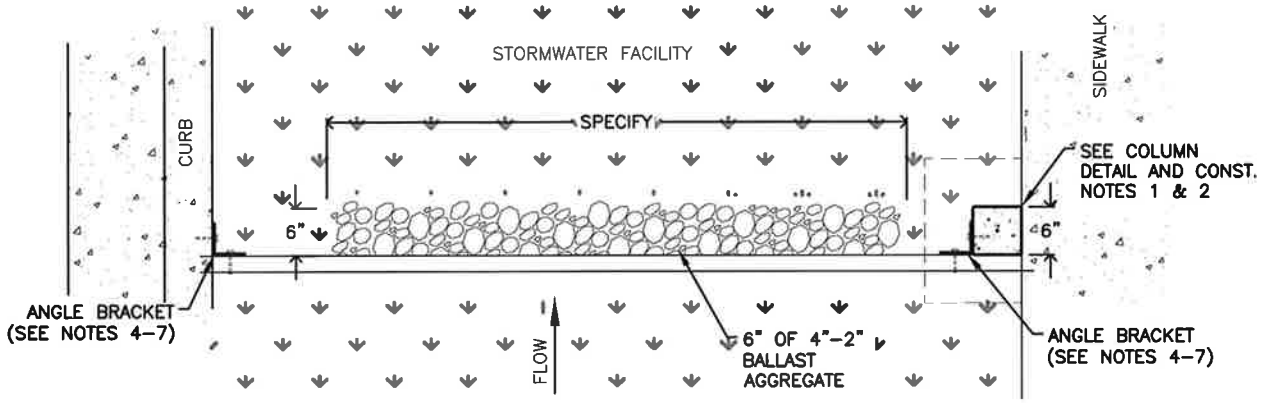


BLOCK 37 - SECTION @ SWALE

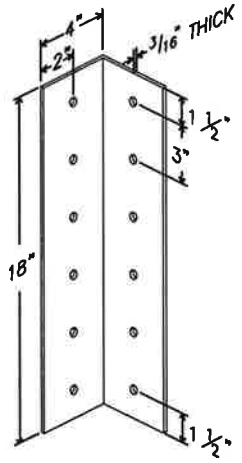
2·10·14
1/4"=1'-0"



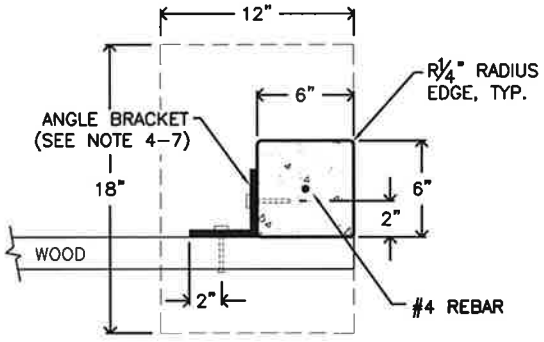
ELEVATION



PLAN



BRACKET DETAIL



COLUMN DETAIL

DESIGNER INFORMATION

1. Provide elevations and stationing and/or dimensioning for check dams.
2. Ensure that check dam elevations do not cause stormwater to overflow to sidewalk.

CONSTRUCTION NOTES

1. Construction grade concrete to be 3000 psi.
2. Base of column is 12" x 18" and 6" thick.
3. Lumber to be a naturally rot-resistant wood (e.g. Cedar, etc.). Manufactured products can be used with approval. No chemically treated wood will be allowed.
4. All fastners to be stainless steel or aluminum.
5. 4" x 4" x 18" angle bracket to be made of min. 3/16" stainless steel, or aluminum.
6. Top of bracket to be no higher than top of check dam.
7. Min. 3 bolts to concrete, min. 2 bolts per board, and 5/16" dia.

- DRAWING NOT TO SCALE -

STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS

NUMBER

SW-341

- 2011 GREEN STREETS -

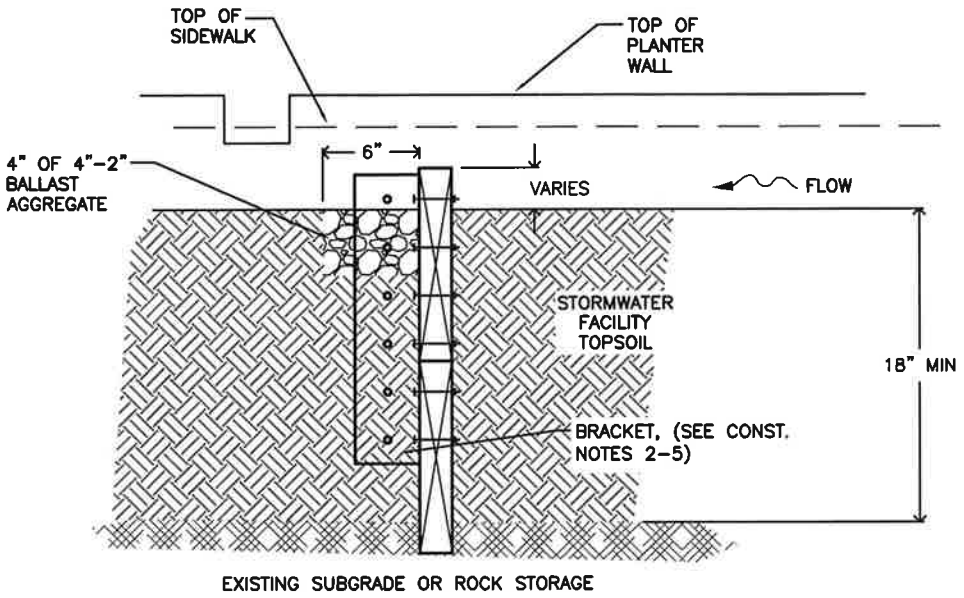
Wood Check Dam for Swales

Check Dams

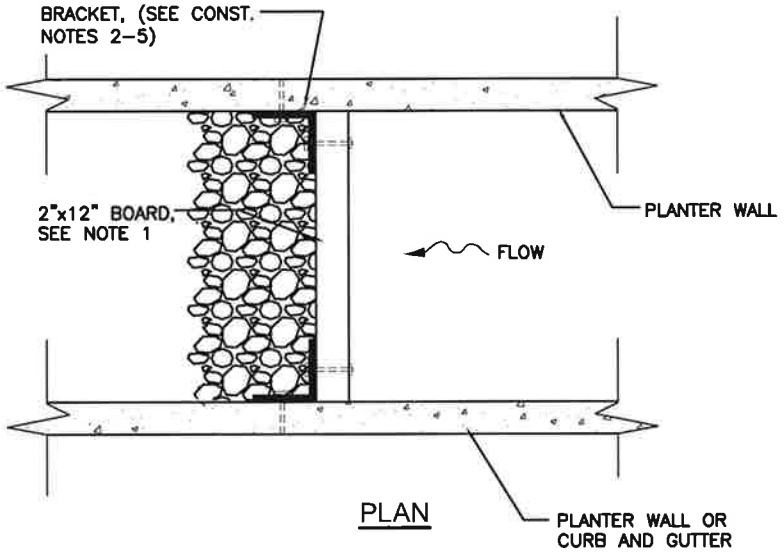
Bureau of Environmental Services

City of Portland

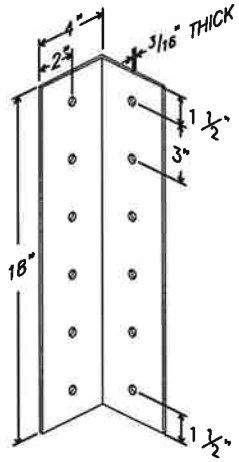
SET REVISED: 12–08–2011



ELEVATION



PLAN



BRACKET DETAIL

DESIGNER INFORMATION

1. For use in planters and curb extension planters.
2. Provide elevations and stationing and/or dimensioning for check dams.
3. Ensure check dam elevations do not cause stormwater to overflow to sidewalk.
4. Cannot be used with "L-shaped" planter wall.

CONSTRUCTION NOTES

1. Lumber to be a naturally rot-resistant wood (e.g. cedar, etc.). Manufactured products may be used with approval. No chemically treated wood will be allowed.
2. All fasteners to be stainless steel or aluminum.
3. 4" x 4" x 18" angle bracket to be made of min. 3/16" stainles steel or aluminum.
4. Top of bracket to be no higher than top of check dam.
5. Minimum 3 bolts to concrete, minimum 2 bolts per board and 5/16" diameter bolts.

- DRAWING NOT TO SCALE -

STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS

NUMBER

SW-342

- 2011 GREEN STREETS -

Wood Check Dam for Planters

Check Dams

Bureau of Environmental Services

City of Portland

SET REVISED: 12-08-2011