The Rose

New Multifamily
Portland Oregon

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Overview:
The Rose is a90-unit multifamily project in the Gateway District of Portland, Oregon. The project is fully designed. The developer, Gordon Jones, owns the subject 44,000 sq. ft. site, comprised of six (6) tax parcels located at NE 97th & NE 99th between NE Glisan & E Burnside. The project will consist of two 4-story, elevator served, wood frame buildings of 45 units each. These buildings will front NE 97th & NE 99th Avenues with surface parking centered between the buildings. The project will target persons earning 60% of median family income, and the project has already received approval for the TOD 10-Limited Tax Exemption and SDC waivers.

Mr. Jones spent much of the past decade assembling the subject site while also actively participating in numerous committees designed to stimulate the renaissance of the Gateway Urban Renewal District. His participation, along with the success of these committees, resulted in City Grants and the formation of an LID (local improvement district) to fund improvements to NE 97th as a "model Green Street"; and the construction of a new innovative "Woonerf"* street, Everett Place, which will be a one-way shared pedestrian & vehicle street connecting NE 97th & NE 99th , in a 30 ft. ROW dedicated by the project. The combined City development costs total approximately $800,000. The cost for which will be paid through Grants from the Portland Development Commission and Bureau of Environmental Services, together with funding from a local improvement district.

Recently, three residential structures and one commercial structure upon the subject site were deconstructed. All structures were carefully recycled in pursuit of the team's Green Initiative and Earth Advantage Silver certification.

How the Proposed Project Meets Gateway Regional Center Design Guidelines:

A. 1. Pedestrian Emphasis: The two buildings in this proposal face NE 97th & NE 99th Streets. Neither are high-volume streets, differing considerably in character. NE 97th is currently being reconstructed as a model green street and will function as the main entrance into the project, but will have very little traffic. The south end of 97th is a right turn only as it is blocked from left turns by the eastbound MAX line. A new street, NE Everett Place, is proposed as part of the project and will be a one-way west to east "Woonerf" in a 30 ft. ROW connecting 97th & 99th. This will provide pedestrian access through the project via the sidewalk on the south side of Everett Place. NE 99th Ave. is a designated transit street and is planned as a north/south connector in the Gateway Street Plan. A new 9 ft. sidewalk in a 15 ft. ROW will be included in the project as required on transit streets.

The two buildings, The Rose West and The Rose East will be mirror images of one another. They will be set back from the street to allow private courtyards at each ground level unit entrance. These courtyards will have 4 ft. fenced and gated enclosures that will provide privacy, yet will allow occupants to engage with passersby. There are additional opportunities for landscape plantings including trees between the building and the sidewalk, providing a distance buffer between the building and vehicle noise and emissions. Each of the 15 ground floor units has their entrances on the street, as there is no interior corridor on the ground floor. This design allows for more density and also for ADA approved adaptable and/or fully accessible units at the ground level. The units on the non-street side of both buildings will have similar courtyards that will separate the entrance doors from the parking and sidewalk. The fences and vines will provide screening from car headlights. Orienting the building volume to the street creates a multistory built edge and allows for the surface parking being interior to the site. Structured parking is not economically feasible at this time in the Gateway market. However, this site design does leave the possibility open for an additional building to be built over structured parking that would serve all three buildings, in between the East and West buildings in the future.

A. 2. Enhance Visual and Physical Connections: This will be accomplished by the use of large, floor-to-ceiling, store-front windows at the lobby corner of each building, inviting pedestrians to view inside the lobby and provide light onto the street from the inside out. Also, there will be a steel trellis between the first and second floors that will spring from the fences at the courtyard entrance gates, connecting the building structurally and visually to the edge of the streetscape. The ground floor of the building will have a 10 ft. plate height, providing pedestrians a more pleasing presentation and visual connection to the residential units from the sidewalk.

A.3. Integrate Building Mechanical Equipment and Service Areas: The building doesnot have traditional mechanical rooms as there is no AC. The Sprinkler and elevator machine rooms are interior to the first floor and all air handling is thru-roof with no equipment mounged on the roof; air vents only for exhaust and make-up air. Trash/Recycling & Composting will be located in the center of the site, away from the buildings, and screened behind screened and landscaped enclosures. It will be covered by a structural arbor framework and roof that will mimic the design, materials and colors of the residential buildings. Plants and landscaping will further hide them and enhance the pedestrian environment.

There is no major equipment planned for the building roofs, only vents and air exchange devices No A/C is planned for the building except in the elevator equipment room and common lobby. Heat is planned to be radiant, infrared cove units that are non-mechanical. Individual unit heat recovery and ventilation systems are being explored and will be utilized if financially feasible. Another alternative is to utilize a passive air-to-air through wall pressure activated system and ventless dryers to reach a balanced exhaust and make-up air system. Corridors will utilize a combination of fan driven and radiant heat in a ductless system.

B.1. Convey Design Quality and Building Permanence: The first floor of the buildings will be slab-on-grade construction with 15 studio units, all adaptable or accessible to ADA standards. There is no center corridor on the first level and all units have doors that open into exterior gated courtyards, enclosed with four foot high fence-trellises providing privacy, yet providing the option to stand up and talk with neighbors and passersby. These smaller units will have a floor to ceiling height of approximately 9 ft. and 8 ft. window head height. The second, third and fourth floors are all similar with two bedroom units on the corners and six one-bedroom units in the middle. Each unit has a generous cantilevered deck with glass and aluminum railings. Ceiling heights on the upper floors are 8 ft. with 7 ft. window head height. Windows have been placed near corners to allow for the enhancement of natural light reflecting off of interior walls. The use of “E” glass on the southern and western exposures, and both interior and exterior window shading will reduce solar gain in the warm months, but allow it in the winter months.

Windows and exterior doors will be heavy duty vinyl and will be recessed as far as practical into the wall from the exterior cladding, modifying the flush appearance of flange-mounted windows and doors.

During the Design/Development phase we have considered other innovative and sustainable building methods such as; solar hot water heating, geothermal cooling, rain-water capture for both irrigation and grey-water use in the building, and heat recovery from exchanged exhaust systems. Some of these systems and methods will receive further consideration during final

design value engineering, and may or may not be incorporated based on their payback and economics specific to this building type.

Building colors will be in neutral tones with a Butter Rum color on the Board and Batten siding. There will be three different cladding styles, one horizontal, one vertical and one that is a smooth panel. All have been selected to present a clean, contemporary appearance. Metal trims, moldings and flashings are baked enamel. Railings are baked enamel or powder coated to an aluminum color. Bike corrals, trellises, courtyard entry columns and beams, and trash enclosure columns and beams will be the green accent color. All aluminum railings and metal trims and flashings will be clear aluminum. Gates, gate mesh, living wall posts & grid are all mild steel.

B. 2. Integrate Ground-Level Building Elements: Several design features are employed to connect the building to the street environment, reduce its scale and provide both public and private spaces to be enjoyed by both residents and pedestrians.

The 15 first floor studio units in each building have entrances on the street, providing activity and vitality to the sidewalks. The ground level courtyards all have covered areas to provide protection from the weather, as well as four-foot high living screen fence enclosures for privacy and security. A trellis along the length of the building and integrated into the unit entry gates, reduces the mass and connects the building to the street. Each courtyard and deck will have exterior lighting to provide the building and passersby with a warm and secure presence in the neighborhood. The exterior lobby entrance area will be covered, well-lit and signed to identify the building addresses in each building. Large storefront windows and similar concrete scoring patterns will connect the exterior entrance to the interior lobby, providing security and a welcoming environment

B.3. Design for Coherency: The Buildings are 4-story elevator served buildings with contemporary design features, including a first floor connected to the second story with trellises, covered courtyards and a 9 ft. plate height to differentiate it from the upper floors and provide a base to the building. The building will feature exterior cladding in three textures and shades; horizontal, vertical and flat panel, that will differentiate the architectural elements of the building mass and provide a coherent visual presentation when viewed from a distance. The roof of the building will have a stepped-out cornice on a “V” shaped roof that will drain to the center for dispersal down the building interior. There will be no external gutters or downspouts on the building.

B.4. Integrate Building Encroachments: There are no building encroachments in the building or site design. The rebuilding of NE 97th Ave. into a model green street, and the construction of the new Everett Plc. “Woonerf” will add greatly to the neighborhood environs. The integration of public benches and street lights (still in discussion with PBOT) in the ROW of NE 97th Ave., NE 99th Ave. and Everett Plc., as well as bike racks for visitors will enhance the pedestrian environment.

B.5. Integrate Roofs, Rooftop Lighting, and Signs: The roof will be a white reflective membrane with a variegated cornice treatment of both parapets and overhangs. The roof will be interrupted by the building features that protrude vertically, and will be lighted by the exterior deck lights as well as the interior unit lights. Parking lot lights are shielded and all building lights are recessed cans.

B.6. Integrate Ecological / Sustainable Concepts: The project's intent is to fully integrate meaningful ecological, green and sustainable concepts into the construction process and ongoing building operation. All construction activities and methods are being performed to meet Earth Advantage Silver or better certification, including the deconstruction and recycling of the buildings that existed on the site. We are currently investigating the feasibility of a rain-water capture system that would store water in underground cisterns and then use it for irrigation and possibly other building systems such as flushing toilets. Additionally, we are investigating innovative ventilation and heat recovery systems as the primary or secondary heat source. The building will incorporate "E" glass in the windows and doors to reduce solar gain in the summer months, as well as interior and exterior window shades on the western exposures where building overhangs do not provide shading. We will also continue to evaluate the use of roof-mounted solar PV panels for common area lighting and electric vehicle recharging. We plan to use white, reflective membrane roofs on all of the buildings to mitigate the heat island affect. We also will incorporate pervious asphalt paving and permeable concrete as a primary part of our storm water management program.

Our vision is to provide a living environment that encourages raising fresh fruits and vegetables, resident interaction, exercise, the use of alternative transportation modes and an overall sense of community. The plan incorporates a community garden and other edible vegetation on the site, such as fruit trees, berries, grapes, herbs etc., as a way to promote community interaction and healthy living.

C.1. Provide Opportunities for Active Uses at Major Street Intersections:
This project is a model for future development of the Gateway Street Plan and particularly the east / west connections that are so lacking in the District. Funding was attained through a Bureau of Environmental Services grant, a PDC grant and the formation of a Local Improvement District to construct both the "Model Green Street" at NE 97th Ave., and the "Flanders Woonerf", which will provide a one-way vehicle connection from 97th to 99th as well as providing a much needed pedestrian connection through the block. The two proposed buildings have their entrances at the intersections of 97th & Flanders and 99th & Flanders, providing pedestrians with gateways at either end of the 300 ft. long connecting street, where the pedestrians, motorists and bicyclists will come together. The building corners at these intersections are pulled back from the street to allow for benches, bicycle parking, visibility and a gathering place for pedestrian conversations. The use of large storefront lobby windows will provide a well-lighted and interactive feeling to these spaces.

C. 2. Enhance Gateway Locations: The combination of two identical, mirror-imaged buildings facing away from each other and a block apart will create a very visible and transitional image in the Gateway community. These buildings, urban in character and materials, will set a transitional standard for development in the district. The RXd zoning and Type III Design Review in Gateway encourages higher density, the use of superior materials and unique

parking solutions, such as structured or significantly reduced ratios. Although the current market in Gateway does not support concrete and steel construction, the Rose project does address these design criteria and will present a more urban vernacular. The parking is at grade, but is at a ratio that will require about half of the residents to use a transporation mode other than the automobile. Additionally, the site design allows for structured parking and a third building between the two proposed buildings in the future, resulting in the potential for greatly increased density on the site.

C.3. Support Open Spaces with New Development: The orientation of The Rose West toward NE 97th Ave. at the intersection with Everett Plc., and the reconstruction of the street as a model green street, will provide a vital and vibrant pedestrian environment that does not exist today. The project is oriented toward the bike path, the MAX line and a potential future park. This is an opportunity for the City and the Gateway Community to revisit the proposed linear park between NE 97th and the bike path between Everett and Burnside. Planning documents dating back a dozen years or more have envisioned this linear park as running from the Gateway MAX station all the way to the Stark / Washington couplet. With the new Rose project and the new streets providing the beginnings of a new urban neighborhood, now is the time for the City to revisit this opportunity. It is the perfect place for a community garden and park, with great access via bicycle, bus, light rail and walking, and would serve a large community that is park deficient and has no community garden. The project incorporates a community garden, and it is our intent that this space will be for outside gardeners as well as residents. However, space is limited and as additional high-density housing is added, there will be a need for a larger community space. We will also incorporate electric vehicle charging stations and have already engaged Ecotality® and ZipCar® to design and incorporate public charging stations in the project.

C.4. Develop Complementary Parking Areas: As previously discussed, this project does utilize at-grade parking areas, however at a reduced ratio of about (0.64:1). The parking is located behind the primary streets, NE 97th & Ne 99th Aves. It will be adjacent to the new sidewalk on the new, yet-to-be-built Everett Plc. “Woonerf” street. Landscape screening will be provided and trees and street furniture will help to mitigate the visual impact of the parking along Everett Plc. The asphalt paving in the parking lots will be pervious to provide for storm water infiltration.

C.5. Transition to Adjacent Neighborhoods: The four-story buildings are not out of scale with the neighborhood as it is transitioning. The property is bounded by a commercial nursing home on the north, a two-story triplex on half of the south boundary and a single family house that is proposed as a second phase of the project on the other half of the south boundary. There are two four story multi-family properties, each of similar scale within one block of the proposed project site. The building lobbies are located away from the single family homes adjacent to or facing the proposed project. The activity and lobbies are on the north end of the buildings where there is already an existing commercial use. The buildings will integrate into the neighborhood and will provide a consistent transition to the other properties that will eventually be redeveloped into higher density housing and mixed use buildings.

C.6. Build on View Opportunities: The Gateway area is on relatively high ground and the upper floors of the proposed buildings will be afforded excellent views of sunrises and Mt.

Hood to the east, and sunsets and downtown to the west. We expect these amenities to be a plus in attracting residents who will enjoy living in this neighborhood and will want to make it their long term home, adding to the strength and fabric of the community. The buildings themselves will be very visible from the 205 Freeway, the Glisan off ramp, the east and southbound MAX lines, and the bike path that connects to the Springwater Corridor. By providing a strong west facing presence on NE 97th, it is our hope that the Gateway Urban Renewal District's design plans will be reinvigorated and the proposed linear park along NE 97th will soon become a reality. This would further help to re-establish the neighborhood and would provide additional security on the bike path by increasing light and visibility.

C.7. Strengthen the Regional Center's Western Edge: The Rose project is situated on the western edge of the Gateway Regional Center. It is indeed a challenge building next to a major freeway and the appurtenant noise and pollution. However, with the help of the several City bureaus (PDC, BES & PBOT) and METRO, there has been the needed support to overcome these barriers. We have mobilized the community to form an LID to help finance the street improvements. We have worked cooperatively to design and build two very innovative streets as models that can be used throughout the Gateway URD. We intend to work with the City and the Gateway community to provide a linear park between the bike path and NE 97th as an additional mitigation and buffer from the freeway.

The Design Team:

Gordon Jones - Developer
Craig Monaghan – Architect
Rainier Pacific – Contractor
Jay Harris – Harris/McMonagle – Civil Engineer
Watson Structural Engineering, LLC – Structural Engineer
GeoPacific Engineering, Inc. - Geotechnical Engineer
Maria Cahill – Sustainable Practices / Consulting Engineer
Brian Bainson – Landscape Architect

The development team has diligently worked to ensure that the design is both attractive and practical, and that construction methods are lean and sustainable. The goal of the project is to provide a safe and communal environment that is interactive and provides a quality life style for persons of modest incomes.

Request for Modification to Land Use Review LU 11-178731 DZM – The Rose (also known as Gateway Gardens)

Purpose of Request: Modification to 33.120.255 Pedestrian Standards – Interior pedestrian walkways are required to be at least 5 feet wide if they serve more than 4 units. The project design is proposing 4 foot wide walkways and 4 foot wide pavers set in grass on the interior of the site.

33.825.040 Modifications That Will Better Meet Design Review Requirements
The review body may consider modification of site-related development standards, including the sign standards of Chapters 32.32 and 32.34 of the Sign Code, as part of the design review process. These modifications are done as part of design review and are not required to go through the adjustment process. Adjustments to use-related development standards (such as floor area ratios, intensity of use, size of the use, number of units, or concentration of uses) are required to go through the adjustment process. Modifications that are denied through design review may be requested as an adjustment through the adjustment process. The review body will approve requested modifications if it finds that the applicant has shown that the following approval criteria are met:

A. Better meets design guidelines. The resulting development will better meet the applicable design guidelines; and

B. Purpose of the standard. On balance, the proposal will be consistent with the purpose of the standard for which a modification is requested.

Purpose Statement: The pedestrian standards encourage a safe, attractive, and usable pedestrian circulation system in all developments. They ensure a direct pedestrian connection between abutting streets and buildings on the site, and between buildings and other activities within the site. In addition, they provide for connections between adjacent sites, where feasible. The standards promote configurations that minimize conflicts between pedestrians and vehicles. In order to facilitate additional pedestrian oriented space and less impervious surface, the standards also provide opportunities for access ways with low traffic volumes, serving a limited number of residential units, to be designed to accommodate pedestrians and vehicles within the same space when special paving treatments are used to signify their intended use by pedestrians as well as vehicles

WAIVER OF DESIGN GUIDELINES

In some cases, a design guideline may be waived during the design review process. An applicable guideline may be waived as part of the design review process when the proposed design better meets the goals for design review (previous page) than would a project that had complied with the guideline. If a waiver is requested, the applicants must explain in their application how the goals of design review are better met in the proposed design than would be possible if each guideline being considered for waiver

was followed. Allowing the waiver of one or more guidelines during the design review process reflects the city's concern that the design guidelines not stifle innovation.

A PEDESTRIAN EMPHASIS

A1 Strengthen Relationships Between Buildings and the Street

BACKGROUND

One of the Gateway Regional Center's defining characteristics is its existing street infrastructure. Included among these streets are historic main streets (Halsey / Weidler), a north-south commercial spine (102nd), some high volume-vehicle streets (Glisan, Stark / Washington), and a light rail transit street (Burnside). In addition, segments of 99th, Pacific, Burnside, and Main offer opportunities for new storefront retail businesses as well as other commercial and residential uses (please refer to the urban design concept diagram on page 11 for street designations). Different responses by new development, and associated setbacks, adjacent to each of these streets will emphasize the different functions of each street and add to the diversity of the regional center. Between Halsey and Stark, 102nd is planned to be significantly enhanced with improvements for pedestrian safety and additional landscaping. Because its function as a high-volume transportation corridor is not expected to change as the regional center develops, it will play a more important role as a "place-making" street, visually signaling the presence of the regional center's commercial spine. New development adjacent to 102nd should support the improved street by incorporating a setback with landscape plantings and trees between the building and sidewalk. Proposed new development adjacent to the high volume vehicle streets must accomplish multiple functions. Incorporating building setbacks that include some landscape plantings can provide a distance buffer between the building and excessive vehicle noise and emissions. Orienting larger building volumes to the street, creating a multistory built edge, increases opportunities for the development of quieter private or community outdoor spaces on the building's other side. It may also be possible to develop commercial components of the proposal that are oriented toward the street with additional uses (such as residential) either pushed back behind a parking area or behind and above the commercial uses.

GATEWAY REGIONAL CENTER DESIGN GUIDELINES
Gateway Regional Center Design Guidelines May 2004

New development proposals along existing main streets or potential new main streets should exhibit a strong pedestrian-orientation. Larger building volumes should be oriented to the main street to emphasize and enclose the street. Setback areas between the building and sidewalk should be designed as extensions of the sidewalk, offering public places for people to sit and gather, or space for tables and chairs, associated with a café or restaurant. Incorporating large ground floor windows allows for

increased visibility into retail storefronts. Buildings along residential/commercial streets are expected to exhibit the same type of sidewalk orientation as the main street buildings, only they are not expected to have storefront retail space at the ground level. Along these streets, other uses, such as office or residential, may also be located at the ground level, still encouraging pedestrian use, but not necessarily a continuous storefront-retail building edge. Generally, building setbacks along these streets should follow the same principles as those for the main streets, although setbacks adjacent to ground level residential uses may benefit from incorporated landscape plantings and/or trees. In general, where building setbacks incorporate landscape groundcovers, plants or trees, these areas should be considered as offering building and/or site storm water management capabilities. Please also refer to guideline B6, and page 77 of the Appendix for contact information on development sustainability. It is important to coordinate the design of new development concurrently with improvements to adjacent streets. Please refer questions on the street standards to the Portland Office of Transportation (see page 77 of the Appendix).

GUIDELINE
Integrate building setback areas with adjacent streets.

A2 Enhance Visual and Physical Connections

BACKGROUND

Strong visual and physical connections between the sidewalk and adjacent development are critical components to the success of the pedestrian environment. Usually, visual connections between a building and the sidewalk are ground-floor windows, and physical connections are doorways, although in either case, there may be others. Ground-floor windows that are oriented to the sidewalk are multifunctional. One function is an opportunity for pedestrians to “preview” interior spaces of a building. Generally, people are more comfortable entering places they have had an opportunity to see first. Another function is that items, activities, and/or building spaces on display to passing pedestrians provide a rich collection of different things to look at, enhancing any walking trip. Large ground-floor windows also provide copious amounts of daylight to interior spaces of the building, reducing a given building’s potential energy needs. Doorways allow pedestrians to move easily from the public exterior environment on the sidewalk to a private set of interior building spaces. This type of physical access should be integrated with incorporated ground-floor windows. Larger buildings often have a series of semi-public spaces at the ground-level that tenants of, or visitors to, the buildings move through en route to more private locations within. These spaces include main entries, lobbies or atriums and are often larger volume spaces that have lots of windows or glass associated with their design(s). When oriented to the sidewalk and street, these types of spaces support the pedestrian environment by developing views into and out of the grandest and most dynamic spaces of the building, subsequently encouraging movement to and from the sidewalk.

How The Rose Better Meets The Goals of Design Review and the Gateway Regional Center Design Guidelines

The Rose Apartment development is two buildings of 45 units each and includes two interior parking areas for 58 cars and other modes of transportation. This is a parking ratio of .64: 1. The project has several innovative features incorporated into the site design, including a new model "Green Street", NE 97th Avenue with a 9 ft. sidewalk fronting The Rose West, and a new 15 ft. wide sidewalk fronting The Rose East on NE 99th Ave. Additionally, the project will be served by a new "Woonerf" connecting street between NE 97th and NE 99th Avenues that will be one-way from West to East in a 30 ft. ROW and will provide access for pedestrians, bikes and cars through the project and the neighborhood. This 30 ft. ROW as well as an additional 9 ft. of ROW on NE 99th Ave. and an additional 3 ft. of ROW on NE 97th Ave. have already been dedicated to the City by the developer.

The modification to sidewalk width is only being requested for sidewalks that are interior to the site plan. All sidewalks in the public ROW, including the East / West sidewalk in Everett Place, are fully compliant with City standards and the Gateway Regional Center Design Guidelines. The interior sidewalks of The Rose site plan will serve a limited number of residents/guests and a limited number of cars (45 units per building and 29 cars per parking area). Because of this reality, coupled with a proposed design that includes adequate lighting, nice landscaping and a quality surface material, the proposed substandard paths will still be safe, attractive and usable. The 4 ft. wide pedestrian paths proposed are differentiated in their materials, are well marked and obvious for people wanting to get from the street to the building entries and from the parking to the unit entrances. The circulation system also provides for future connections to adjacent sites as shown on the Site Circulation Diagram. The sidewalk widths are more than adequate, yet minimize impervious surfaces and conserve resources. Wider sidewalks would reduce the amount of space available in the center of the project that is being utilized as a "community vegetable and flower garden" that will be available to the community at large as well as residents. Providing a substandard path that is still safe, attractive, adequate and usable allows the project to include this community asset, meet the landscaping buffer requirements that will serve the neighbors, and improve the experience of this development for its residents/guests. Thus, the proposal better meets Guidelines A1 & A2 of the Gateway District Design Guidelines

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GATEWAY GARDENS APARTMENTS

Stormwater Management Report
For "Rose East & Rose West" Buildings

Prepared for:
Gordon Jones

Site Address:
318 NE 97th Avenue (The Rose West)
333 NE 99th Avenue (The Rose East)
Portland, Oregon 97220

Land Use No: LU 11-178731 DZM, Design Review Application

Date: September 15, 2011
Revised April 6, 2012

Prepared by:
Harris McMonagle Associates Inc
8740 SW Scoffins Street
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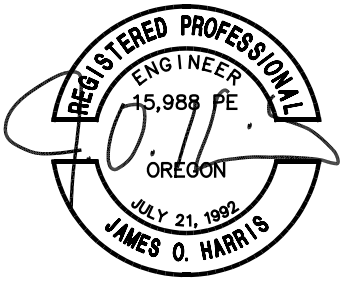
503 639 3453

Contact: James (Jay) O. Harris, PE



Stamp and Signature

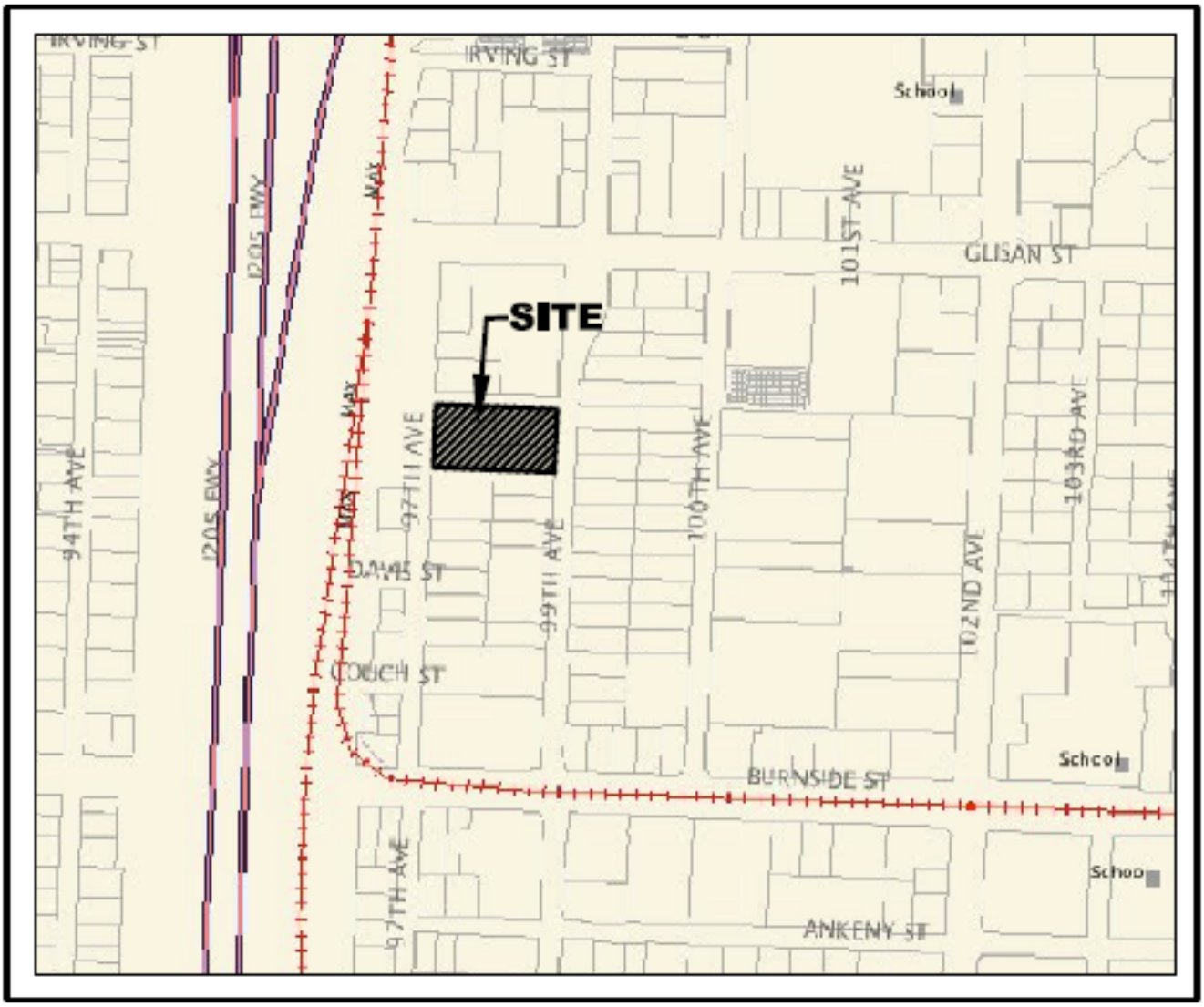
I hereby certify that this Stormwater Management Report for the Gateway Gardens Apartments has been prepared by me or under my supervision and meets minimum standards of the City of Portland and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and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

Section 3: Table of Contents:

Section 4: Project Overview and Description

- **Size and location of project site:**

The project site is located in east Multnomah County on the east side of NE 97th Avenue, 500 feet south of NE Glisan Street, City of Portland, Multnomah County, Oregon. The 1.06 acre site is shown as Tax Lots 9000, 9100, 9201, 6800, 6900 and 7000 on Assessor's Map 1N 2E 33DA.



VICINITY MAP
NO SCALE

- **Property Zoning:**

Multnomah County RXd (High Density Multifamily Residential)

- **Type of Development/Proposed Improvements:**

Construction of two 45 unit apartment buildings adjacent to the NE 97th Avenue and NE 99th Avenue and the construction of the associated parking and landscape areas, as shown on the Development Review Plans in Section 8.

- **Watershed Description:**

Willamette River Watershed. The Willamette Watershed includes Forest Park, downtown Portland, industrial districts on both sides of the river, and the city's most densely populated residential neighborhoods. It extends from near Sauvie Island to just north of Lake Oswego and from the West Hills to the suburban neighborhoods east of I-205.

The development is located in the Outer East Subwatershed within the Willamette River Watershed. The Outer East subwatershed extends from the eastern edge of Portland's combined sewer service area at about 82nd Avenue to about 160th Avenue and includes the area not within either the Columbia Slough or Johnson Creek watersheds. There are no stream channels in the subwatershed.

- **Permits Required: (Local, State, Federal)**

Permits required for this project consist of permits issued through the City of Portland Bureau of Development Services for erosion control, storm drainage, and the building construction. No Federal or State Permits are required. An underground injection control permit is required from the Oregon State Department of Environmental Quality for the construction of the two drywells shown on the Development Review Plan set in Section 8.

- **Existing vs. Post-Construction Conditions:**

Several single family homesites currently exist on the project site and will be removed with the construction of the apartment site improvements.. The yard areas of the existing single family homes consist of several large trees, some landscape shrubs, with a mowed grass groundcover. The average slopes range from 2 to 3 percent, draining generally from the west to the east. No seeps, springs or evidence of groundwater drainage are apparent onsite.

The proposal to construct two 45 unit apartment buildings adjacent to the NE 97th Avenue and NE 99th Avenue and the construction of the associated parking and landscape areas, as shown on the Development Review Plans in Section 8.

The rainfall falling on the roof areas is proposed to travel through vegetated ecoroofs, and then will discharge into a drywells located with the new parking lot areas..

The runoff from the newly created parking lot impervious surfaces is proposed to infiltration into the native soil by the use of permeable asphalt pavement.

The runoff from the newly created walkway and patio impervious surfaces is proposed to infiltration into the native soil by the use of permeable concrete pavement.

Refer to sheet 4 of the attached site construction plans in Section 8, for the location/design of the proposed drywells and pervious pavement surfaces.

Section 5: Methodology

- **Drainage at Existing Site:**
  - Potential Impacts on the Proposed Site from neighboring properties.

No overland or subsurface flows impacts the project site from neighboring properties as the depth to the groundwater table is in excess of 20 feet, and the adjacent existing homes have a significant amount of grass groundcover, and large landscape areas.

  - Potential Impacts from the Proposed Site on Existing Drainage

The impervious surfaces created with this project are proposed to have minimal impact to the existing drainage system as all of the runoff from the newly created pervious and impervious areas onsite is proposed to be infiltrated into the native soils through the use of drywells and pervious pavement systems.

  - Techniques for mitigating potential conflicts or problems.

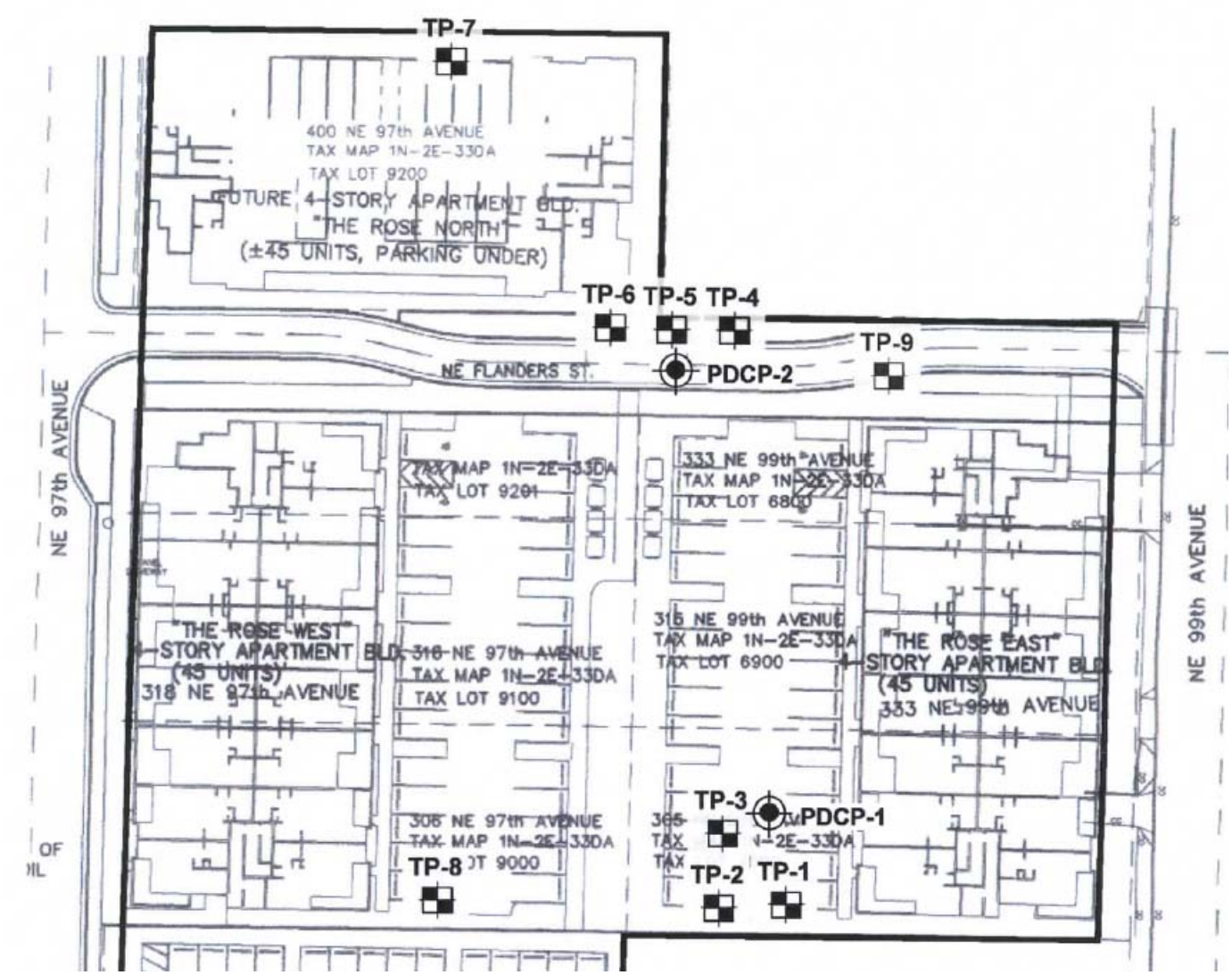
As shown on sheet 4 of the Development Review Plans, a emergency overflow system is designed to covey any excess surface runoff to the proposed drywell system, if the permeable pavement systems fail to covey the rainfall event.

- **Infiltration Testing Results:**

GeoPacific Engineering completed a soils report dated October 20, 2011 for the project site that included infiltration of the existing soils. Table 1, the infiltration result summary, and the test pit location plan, from the GeoPacific Report are included for reference below. Refer to the full Geotechnical Report for additional information.

Table 1. Summary of Infiltration Test Results

Test Pit	Depth (feet)	Soil Type	Infiltration Rate(in/hr)	Hydraulic Head Range (inches)
TP-1	12	Sandy Gravel (GW) with Cobbles	86	0 - 2
TP-2	1.0	Sandy Silt (ML) with Cobbles	1.3	2 - 8
TP-3	2.25	Sandy Silt (ML) with Cobbles	0.7	4.5 - 6.5
TP-4	13	Sandy Gravel (GW) with Cobbles	240	0 - 2
TP-5	2.5	Sandy Silt (ML) with Cobbles	0.7	9 - 11
TP-6	1.5	Sandy Silt (ML) with Cobbles	2	1 - 6.5



GeoPacific Engineering 10-21-11 Soils Report
Test Pit Location Map

GeoPacific Engineering recommends on page 9 of the soils report to use a unfactored infiltration rate of 1 in/hr in the design of the shallow infiltration facilities, and 50 in/hr for the infiltration rate of the deeper facilities.

The infiltration rate of the proposed drywell systems should perform adequately as the infiltration rates below the test depths of 12 feet are in excess of 20 inches/hour. The future design of the permeable pavement systems may need to include amendment to the existing native soils, increasing the baserock section for additional storage, and/or the installation of pavement under drains connected to the drywell systems, to properly transmit the runoff from the design storm events.

- **Narrative that defines the proposed Stormwater management techniques**:

The runoff from the proposed roof impervious surface will travel through the vegetated ecoroofs, then be collected in the building gutters and conveyed in a hard piped system to the proposed drywells. The drywells are sized to the City of Portland 2008 Storm Water Management Manual Standards, as

discussed in Section 6.

The precipitation that falls upon the permeable pavement surfaces in the parking lot, walkways, and patio areas, will be transmitted through the voids in the pavement material, through the baserock section, and infiltrate into the native soils.

- **Discharge Point for runoff from private and public impervious areas**:

The runoff from the impervious surfaces created will discharge on the private project site, as shown on sheet 4 of the attached construction plans. Refer to Section 8 for a reduced copy of the development review plans.

- **Stormwater Hierarchy Category Justification:**

Due to the existence of average infiltration rates for the site, drainage is proposed to flow into onsite infiltration systems. Onsite infiltration systems are classified in the 2008 City of Portland Storm Water Management Manual as Hierarchy Category 1 and 2.

Section 6: Analysis

- **Design Assumptions:**

    - Design Storms used:

The simplified approach is being utilized for the design of the drywells and pervious pavement systems. The City of Portland Storm Water Management Manual utilizes the 25 year storm event for the design storm in the simplified approach sizing methodologies.

    - Computation methods:

The simplified approach is being used to size the facilities. The depth and diameter of the proposed drywells is sized by the using the roof top impervious surface area and selecting the drywell size from Exhibit 2-36 as shown on the drywell standard detail #SW-170. The roof top areas for each of the Rose East and West Buildings is approximately 10,000 sf, thus requiring a 20-foot deep, 48-inch drywell for each building. Note that the installation of the ecoroofs on each building will significantly reduce the actual building impervious area by 20 to 30%

The proposed permeable concrete and asphalt paving systems for the patios, walkways, and parking lot areas are sized at 1:1 factor. The infiltration rate of the existing soil is approximately 1 in/hr. The slope of the permeable pavement surfaces is proposed not to exceed a 4% slope.

Refer to the attached completed simplified approach sizing worksheet in Section 8.

    - Software Used:

The City of Portland used various software programs in their preparation of the sizing factors used in the simplified approach method.

    - Safety Factor, curve numbers, and design coefficients:

Safety factors were included in the simplified approach methodologies prepared by the City of Portland.

- Clarify variations from the norm.

No variation from standard design practices was used in the design of the discharge system for the project, other than during the final design of the project it is possible that sub-drain lines and/or amendment the existing native soils may be needed to improve the infiltration rates under the proposed pervious pavement systems.

- **PAC Narrative Form and Printouts:**

The PAC forms were not used as the design calculations are being completed by the simplified approach method.

- **Conveyance Requirements and Design:**

The conveyance system for the building drain lines will be sized and installed per the current version of the Oregon Specialty Uniform Plumbing Code.

- **Table of Impervious Area Treated:**

Catchment/ Facility ID	Source (Pvmt/Roof)	Impervious Area (sf)	Ownership	Facility Type	Facility Size	Curve #
Roofs	Rose east/west	19,820	Private	Infiltration	See plan	98
Roofs	Recycling east/west	840	Private	Infiltration	See plan	98
Paving	Parking east/west	14,146	Private	Infiltration	See Plan	98
Paving	Walkways	2440	Private	Infiltration	See Plan	98

- **Comparison Table of the Flow Rates for Pre and Post Construction:** (Sec 1.3.2)

Not applicable when using the simplified approach design.

- **Determination of the escape route or Inundation Level for the 24-hour 100 year event:**

The 100 year storm event may exceed the available infiltration capacity of the onsite soils in the permeable pavement areas, especially as the infiltration rate of the pavement reduces with time. An overland flow path/channel is proposed in the permeable parking lot design to direct overland flows to storm drainage inlets that discharge into the site building roof top drywells, if needed during an unusual storm event. If for some reason the two building roof top drywells fail, a overflow piping system will convey the excess storm drainage runoff to a third emergency overflow drywell, as shown on the development review storm drainage plan.

Overland flow route paths discharging onto the public street(s) were considered in the design of the grading plan and storm drainage system for the project. The current emergency overflow inlet, piping, and drywell system design is the preferred option as the development of the overland flow paths is problematic for the following reasons:

A. <u>Direct Parking lot flows to NE Flanders Street:</u> BES requested in their review letter dated 10-3-2011 the evaluation of grading the apartment parking lot areas to drain to the north, onto NE Flanders Street. Both the Rose East and Rose West apartment buildings are to be constructed adjacent to the back of the sidewalk on NE 99th and Ne 97th Avenues. NE 97th and NE 99th

Avenues roadways slope from the north to the south at an approximate grade of 1.5%. The finish floor of each building is set higher than the adjacent sidewalk grade. Unless the north end of the buildings are constructed below the sidewalk elevations, or the building finish floor elevations are stepped through the center of the building, the parking lots in the rear of each building will need to also need to slope downhill from the north to the south, approximating the profile of the adjacent public roadways.

Andrew Abi, project manager for the City of Portland NE Flanders Street LID, spoke to BES about the potential of future storm runoff from the building parking lots flowing onto the NE Flanders Street. BES indicated that the infiltration planters on NE Flanders were not designed to infiltrate runoff from the project site and would prefer that the overland flows from the parking areas be directed to a different location.

B. Direct overland flows to NE 97th: The project site slopes towards NE 99th Avenue to the east at an approximate gradient of 0.70%. The parking lot areas are both lower than NE 97th Avenue and overland flows can not be directed to the west to NE 97th Avenue.

C. Direct overland flows to NE 99th: The Rose West and Rose East apartment parking areas could be potentially designed to overflow into the landscape area located adjacent to the south side of the Rose East building and flow onto NE 99th Avenue, as the public street is situated at approximately the same elevation as the Rose East parking lot area. The Rose East building is to be constructed 6.0 from the south property line of the project site.

This option for overland flow release to NE 99th Avenue was not chosen for the following reasons:

1. The Uniform Building Code requires that the side yard to the apartment building slope away from the building for a minimum of 5 feet which leaves little space to construct a swale.
2. The slope between the Rose East parking area and NE 99th Avenue would less than 0.5%
3. Due to the flat slope, future landscape improvements could easily to block the overland flow path, directing overland flows onto the neighbor to the south of the project site.

Note that the inlet grate in the Rose East Parking lot will be the lowest point on the project site (elevation +/-292.6). If a significant failure occurs in the drywells and/or the permeable pavement systems, the south end of the Rose East parking lot will store approximately 0.5' of stormwater, before the water would enter the southerly Rose East Apartment Units.

Section 7: Engineering Conclusions

- **Based on Compliance with Stormwater Management Manual:**

The Storm Drainage water quality, conveyance, and discharge design for the proposed garage construction complies with the Standards set forth in the 2008 City of Portland Storm Water Management Manual.

- **How Water Quality, Flow Control and Discharge Requirements are Satisfied:**

  - Water Quality:

Water quality is not required for the roof top drainage, as outlined in the stormwater management manual.

Water quality is provided in the permeable pavement surfaces, as discussed in the stormwater management manual.

  - Conveyance

The conveyance piping is to be sized/installed per the Oregon State Specialty Plumbing Code at the time of preparation of the construction plans and building department permitting for the project.

- Discharge

The proposed infiltration facilities will convey the discharge, as designed using the Simplified Approach in the City of Portland Stormwater Management Manual.

- **Post Construction Peak Flow = ½ Pre Development Peak Flow (2 yr 24 hr)**

The proposed infiltration facilities/measures, when maintained properly, will not increase the flows from the pre-development and post construction peak flows from the site.

Section 8: Stormwater Facility Details and Exhibits

Form 1 - SIMPLIFIED APPROACH

Total impervious area being developed or redeveloped: → 37,246 **BOX 1**

1 Impervious Area Reduction

Ecoroof	20,660 sf
Pervious asphalt or concrete	16,586 sf
Permeable pavers	_____ sf

Total Impervious Area Reduction: → 37,246 **BOX 2**

Total impervious area requiring stormwater management: → 0 **BOX 3**

2 Surface Facilities	**Impervious Area Managed**		**Sizing Factor**		**Facility Surface Area**
Planter	_____ sf	x	0.06	=	_____ sf
Swale	_____ sf	x	0.09	=	_____ sf
Basin	_____ sf	x	0.09	=	_____ sf
Vegetated Filter Strip for walks and driveways	_____ sf	x	0.20	=	_____ sf

Overflow will be directed to *(check all that apply)*:

☒ **Subsurface facility** ☐ **Surface water**
☐ **Stormwater sewer** ☐ **Combined Sewer**

3 Subsurface Facilities

The following subsurface facilities can receive overflow from the facilities listed above or can be used independently to manage stormwater from residential roofs. If stormwater is generated from anything other than residential roofs, the facilities are subject to the UIC (Underground Injection Control) requirements.

		(See Section 2.3.3 for sizing information)	**Facility Size**
Drywell	20,660 sf	48" Diameter	20' Depth (2 drywells)
Soakage Trench	_____ sf	_____ Length	_____ Width

Sum of Total Impervious Area Managed → 37,246 **BOX 4**

(BOX 4 should be greater than or equal to BOX 3)

4 Escape Route

In the event the stormwater facility temporarily fails or rainfall exceeds the facility design capacity, describe where flows will drain to in order to maintain public safety and avoid property damage. Depending on site conditions, this may include storage in an overflow structure, parking lot, street, or landscaped area. An emergency flow path and inlets are shown on sheet 4 of the development review plans that conveys parking lot runoff to the onsite drywells.

LIVING SCREEN
THE WESTERN GROUP

4' HT. MILD STEEL

A welded wire mesh green wall system

The Living Screen is a modular parallel-panel system welded together to create a growing area for vine plants. This panel system is attached to a building using standoffs to improve wall durability. Vines are planted below the screens and maintained to encourage natural growth, winding back and forth between the panels covering the walls.

The Living Screen can also be anchored to posts to create a fence, a free standing wall, or a trellis system.

Living screen panels can be incorporated with existing or new construction. The panels offer a wide range of benefits: improving energy efficiency, increasing building attractiveness, and improving air quality.

Living Screens are often used as exterior cladding on large concrete sided buildings, especially parking garages.

The Western Group provides project-specific design assistance to ensure a successful installation.

FINISH OPTIONS

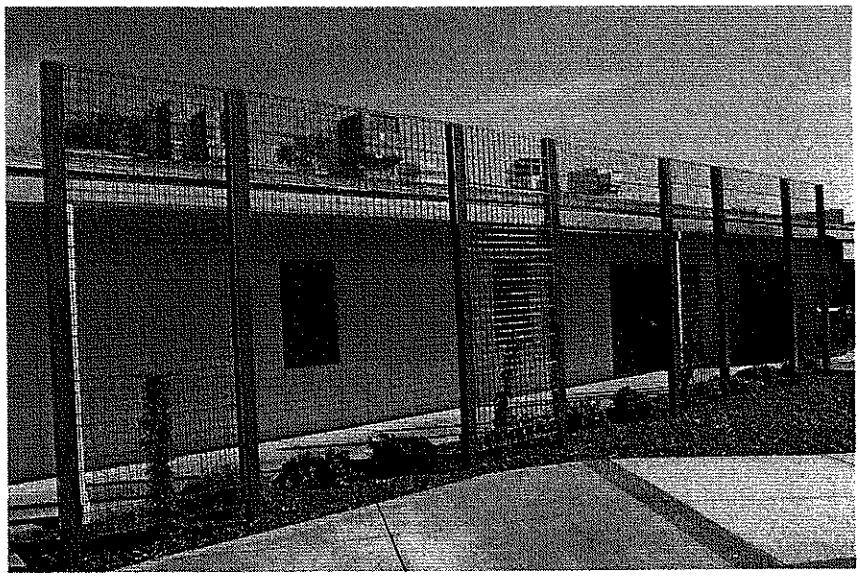
- HOT DIP GALVANIZE
- EXTERIOR GRADE POWDER COAT
- STAINLESS STEEL

PANEL SIZES

- WIDTH: 2' to 8'
- LENGTH: 2' to 16'

PRODUCT OPTIONS

- PARTIAL OR FULL-LENGTH FLASHING
- FULL SET OF ATTACHMENT HARDWARE



SPECIFICATIONS

- STANDARD: 3" ON CENTER MESH
- 10 GAUGE A-82 MILD STEEL WIRE/ GALFAN WIRE
- 16 GAUGE (0.060 DIA) A-569 USED FOR FLASHING
- PRE-DRILLED MOUNTING HOLES

ADDITIONAL OPTIONS

- CUSTOM MESH AND / OR PERFORATED PATTERNS AVAILABLE
- PROJECT SPECIFIC DESIGN ASSISTANCE
- UNIQUE TRIM ALTERNATIVES
- SELECTION OF MOUNTING HARDWARE

The Western Group

The Screening People
www.architecturalwire.com

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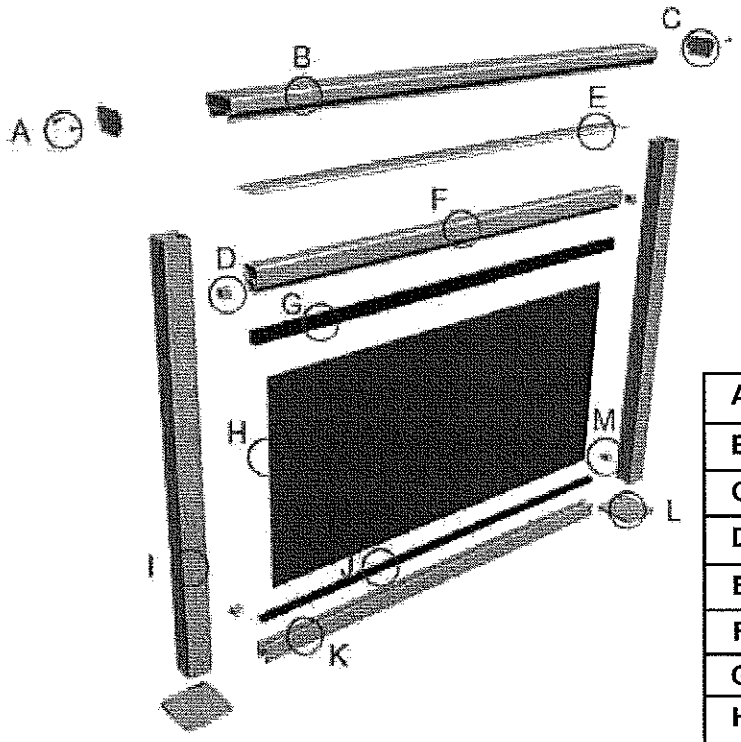
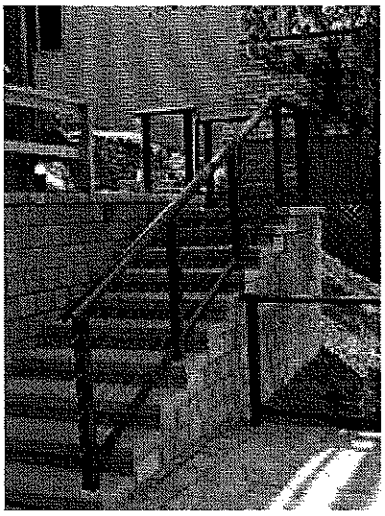
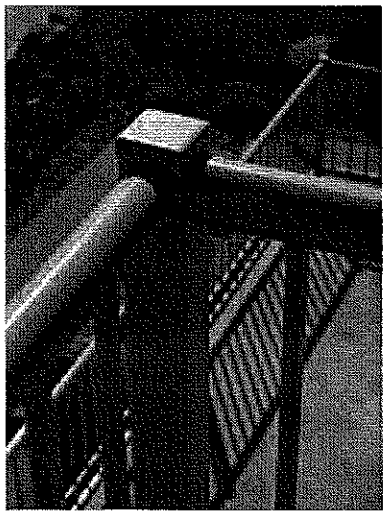
Email: portland@thewesterngroup.com

Railing Diagram



A	Screws - #8 x .75 SS FH SMS
B	Top Rail (6005-T5 Alum)
C	End Cap (5052 Alum)
D	Rail Connecting Block
E	Top Rail Infill (6005-T5 Alum)
F	Midrail
G	Vinyl
H	Infill - Glass, Cable, Picket or Custom
I	Post (6005-T5 Alum)
J	Vinyl for Glass or Picket Railing
K	Bottom Rail (6005-T5 Alum)
L	Base Plate or Alternative Mounting Method (6005-T5 Alum)
M	Rail Connecting Block

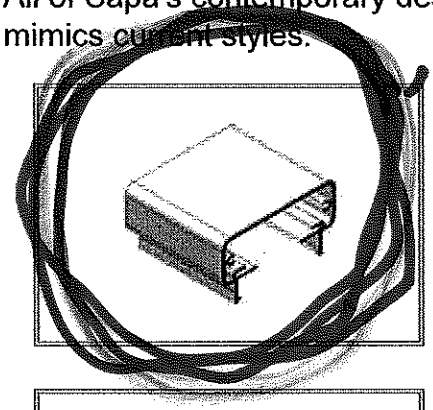




sapa:

Contemporary Top Rail Designs

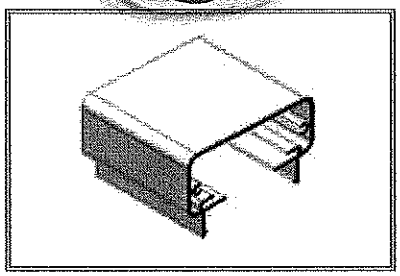
All of Sapa's contemporary designs provide a continuous top rail. Contemporary mimics current styles.



Alumarail Flat Top Rail 200 Series

Specifications

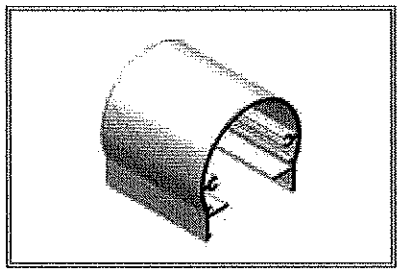
- 3 1/2" W x 1 1/4" H



Top Rail 250 Series

Specifications

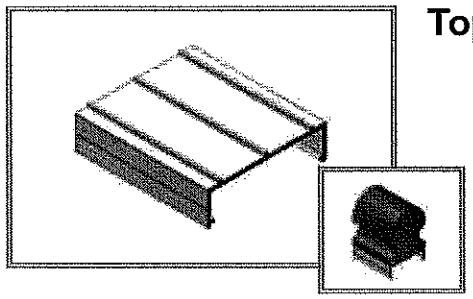
- Top surface sloped 4% inward
- 3 9/16" W x 2 1/8" H



Top Rail 300 Series

Specifications

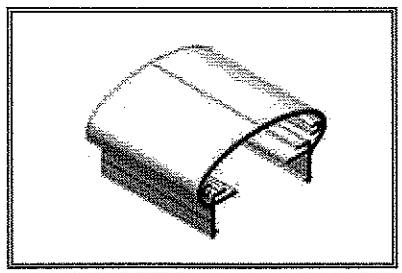
- 3" W x 2.89" H



Top Rail 400 Series for Wood Attachment

Specifications

- Continuous top rail
- Custom built wood provides a traditional and interchangeable design
- Individual wood design attached to an aluminum channel
- 3/4" W x 2.67" H



Alumarail Elliptical Top Rail 999 Series

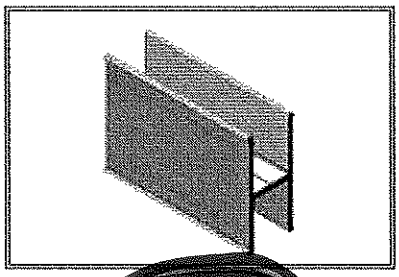
Specifications

- Continuous top rail
- 3 1/2" W x 1 7/8" H

Specify Sapa Railing Systems into your drawings and Sapa's drafting team can provide details in either PDF or AutoCAD (DWG) files.

Contact Us:
1-800-547-0790 x3467
sapa-inc@sapagroup.com

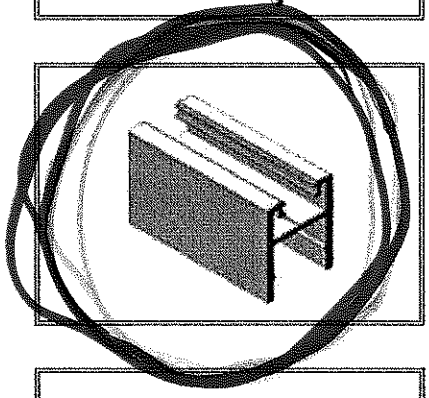
Bottom Rail Designs



Bottom Rail 100 Series

Specifications

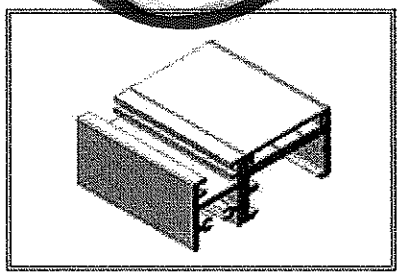
- Fits in-between posts
- Connect using a RCB
- Used with Picket infill
- Can be used with any Top Rail Design
- 15/16" W x 2 1/8" H



Bottom Rail 200 Series

Specifications

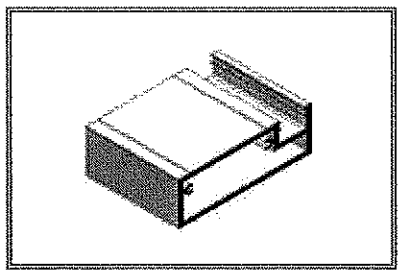
- Fits in-between posts
- Connect using a RCB
- Used with Picket, Glass or Cable infill
- Can be used with any Top Rail Design
- 1 3/8" W x 1 3/4" H



Bottom Rail 600 Series

Specifications

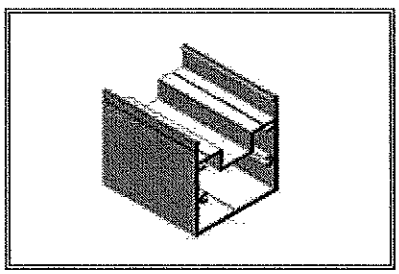
- Fits in-between posts
- Exclusively used with the 600 series
- 3 1/2" W x 1 1/2" H



Bottom Rail 700 Series

Specifications

- Exclusively used with the 700 series
- A continuous bottom rail design
- 4 1/4" W x 1 3/8" H



Bottom Rail 900 Series

Specifications

- A continuous bottom rail design
- 2 11/16" W x 2 11/16" H

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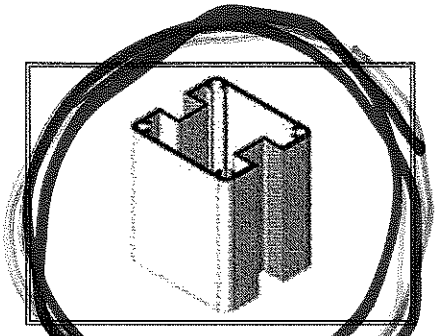
Specify Sapa Railing Systems into your drawings and Sapa's drafting team can provide details in either PDF or AutoCAD (DWG) files.

sapa:

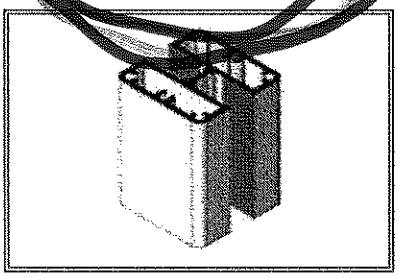
Post Options Continued



Glass Pocket Post Shallow

Specifications

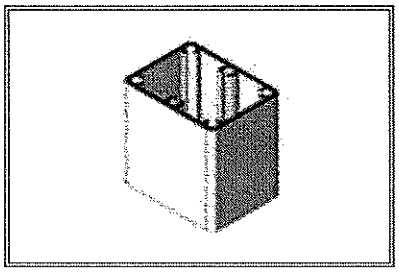
- Allows Stanchion mounting style
- 2 5/8" W x 2 3/8" D



Glass Pocket Post Deep

Specifications

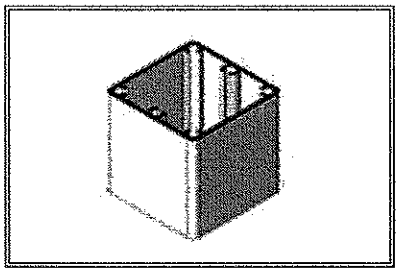
- Prohibits Stanchion mounting style
- Allows for flexible field installation
- 2 3/8" square



Post 600 Series

Specifications

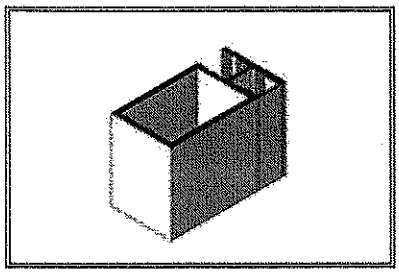
- Not exclusive to 600 Series
- 2" W x 3" D



Post 600c Series

Specifications

- 3 1/8" square



Post 700 Series

Specifications

- Provides a curtain wall like appearance
- Captures infill on all 4 sides
- 4 1/4" W x 2 1/4" D

Specify Sapa Railing Systems into your drawings and Sapa's drafting team can provide details in either PDF or AutoCAD (DWG) files.

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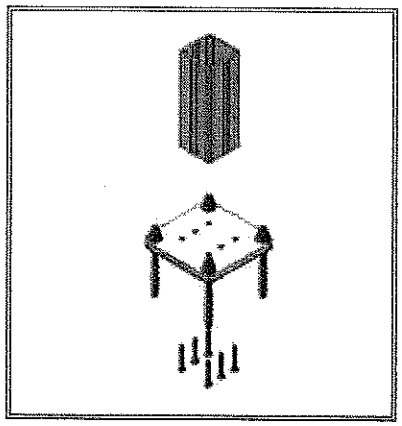
Mounting Methods

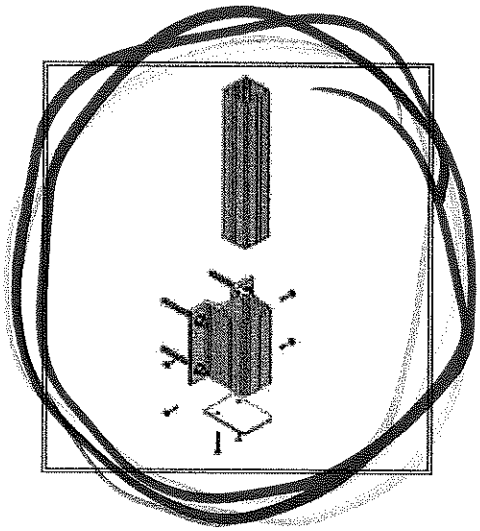


Base Mount

Specifications

- Centered or Offset
- Optional isolation pad (neoprene)
- Mounts with an epoxy, expansion, or lag bolts
- 5" x 5" footprint
- 3/8" minimum thickness

SEE DTL. SIMILAR



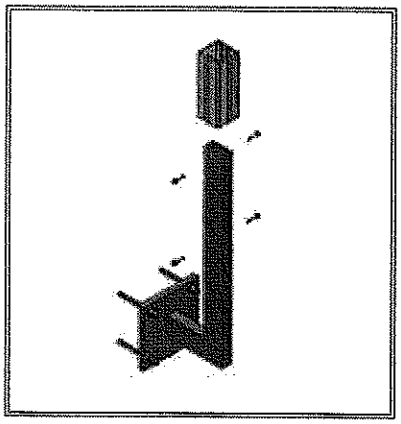
Fascia Mount

Specifications

- Flush, 1" or 2" Fascia Mounts available
- Mounts with a epoxy, expansion, or lag bolts
- 6" x 6" footprint
- Inside & outside corners available in 1" only

*Other offsets available

C.5
A6.0

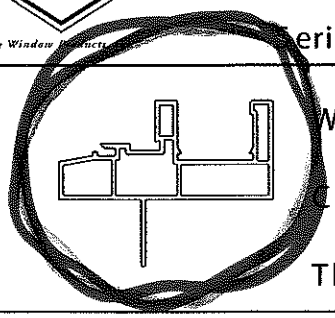
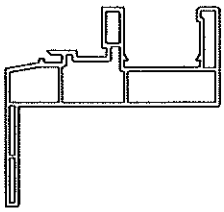
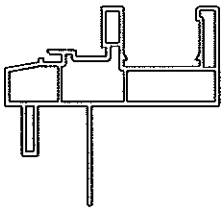
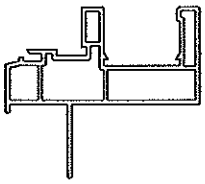
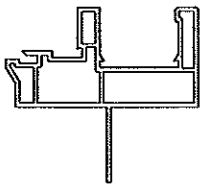
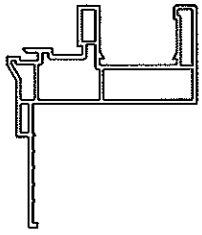


Goose Neck Mount

Specifications

- Mounts with an epoxy, expansion, or lag bolts
- 6" x 6" footprint

Cascade Windows - Frame Options

Series	Frame Code	Common Application
		
WinPro	W	3-1/4" wide, 1-1/4" nail-fin setback New construction - all exteriors Available with 'Ripped Fin' for block-frame installations, and wood double-hung replacement
Cascade	W	
Thermal-Pro	W	
		
WinPro	F	3-1/4" wide, w/ dual-wall flush-fin (1-1/2") Replacement - stucco exterior, other exteriors
Cascade	F	
Thermal-Pro	F	
		
WinPro	J	3-1/4" wide, w/ integral J-trim (3/4" x 3/4" channel) New construction - vinyl siding exteriors
Cascade	J	
Thermal-Pro	(n/a)	
		
WinPro	K	3" wide, w/ 1" setback fin and exterior edge lip. New construction - stucco exterior
Cascade	K	
Thermal-Pro	(n/a)	
		
WinPro	N	2-3/4" wide (at outer edge), 1-3/8" nail-fin setback Aluminum window replacement - various exteriors Available with 'Ripped Fin' for block-frame installations. Full bottom support required (interior and exterior of nail-fin)
Cascade	(n/a)	
Thermal-Pro	N	
		
WinPro	Z	2-3/4" wide, w/ stepped 1-7/8" flush-fin (z-bar) Replacement - stucco exterior, other exteriors
Cascade	(n/a)	
Thermal-Pro	Z	

Additional Frame options available:

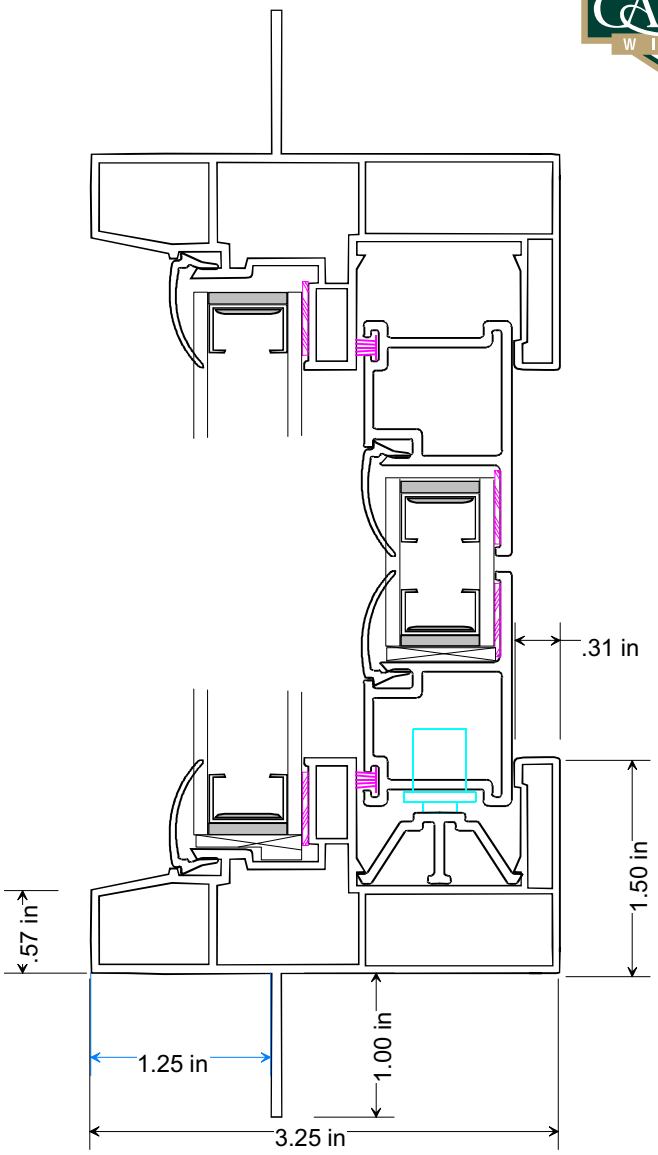
"R" = "F" frame profile on bottom only, with "W" frame at top and sides, with nail fin removed.

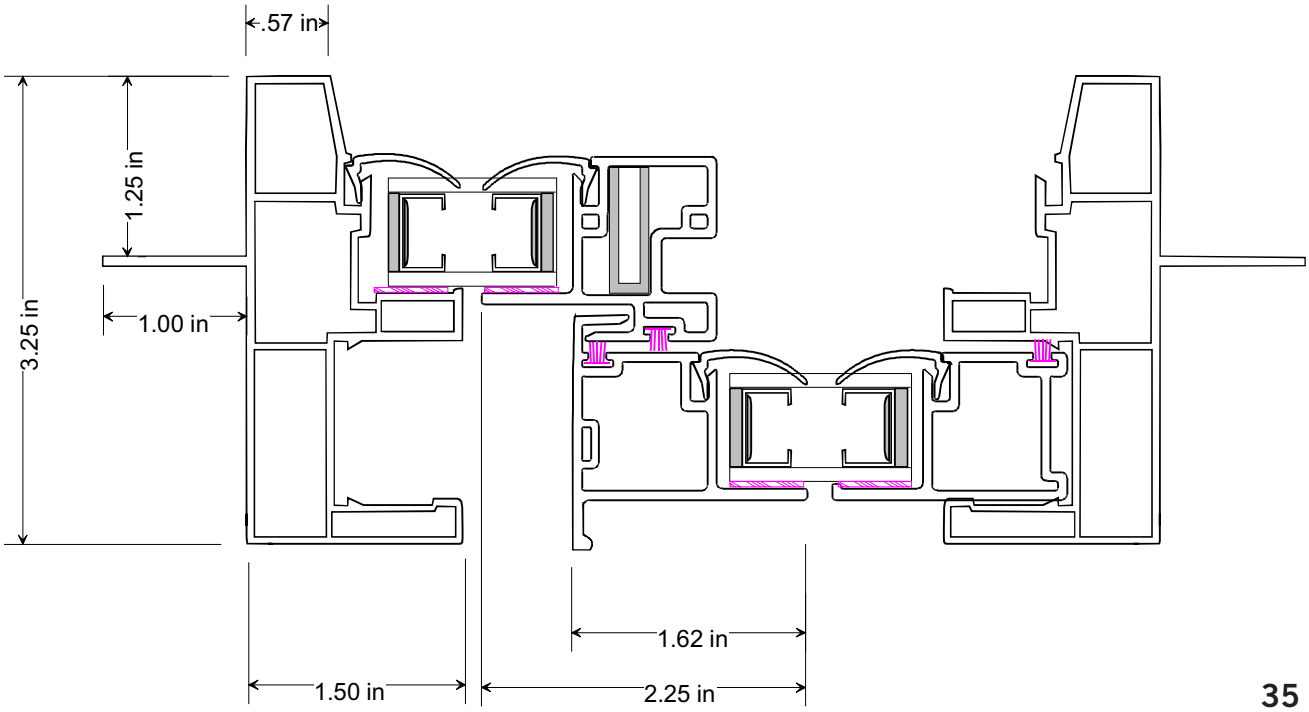
"D" = "J" frame profile on bottom only with "W" frame at top and sides, with nail fin removed.

WINDOW SECTIONS

MODELS 9100, 9130

SCALE: 3/4" = 1"

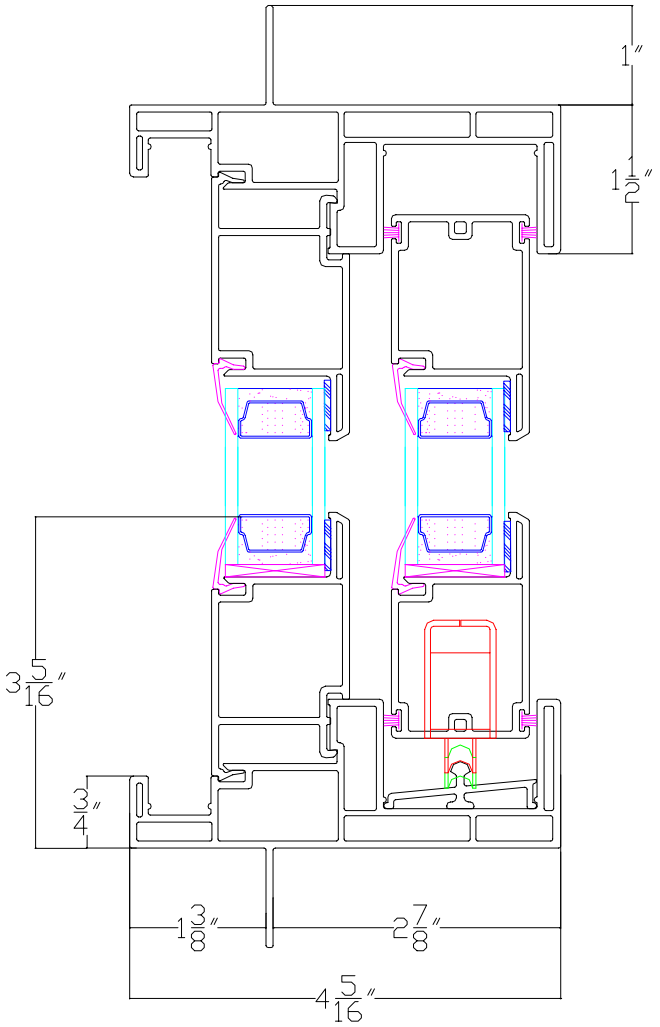


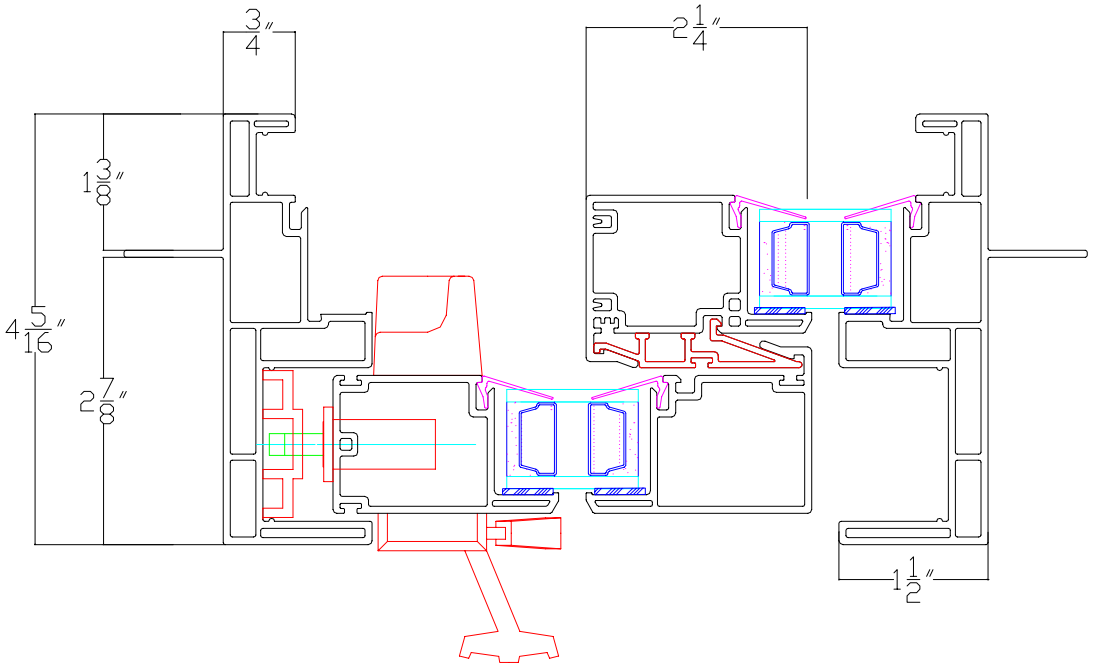


PATIO DOOR SECTIONS

MODELS 9700, 9730

SCALE: 1/2" = 1"





CATALOG NO. FPL250

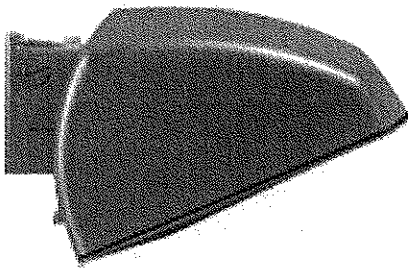
PARKING LOT LIGHT

TYPE NO. _____ JOB NAME ROSE

Stonco

1-3

FloodPak Series
FPL



ORDERING INFORMATION

Catalog Number: Example: FPL350PMAL-8

FPL					
SERIES	WATTAGE	LAMP SOURCE	LAMP	OPTIONS	VOLTAGE
FPL- FloodPak Large	**250-**250W **320-**320W **350-**350W **400-**400W*	**PMA-**Pulse Start Metal Halide (CWA) **LX-**High Pressure Sodium (CWA)	**L-**Lamp furnished	**AMC-**Automatic standby auxiliary light. Lamp included.	**1-**120V **5-**480V **8-**120V, 208V, 240V, 277V

*Requires reduced outer jacketed lamp.
HID units supplied with clear medium base lamp.

ACCESSORIES

FPLKNUCKLE - Adjustable 2" Tenon Slipfitter.

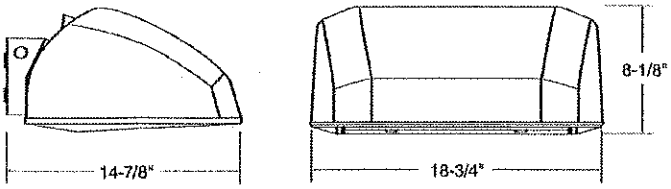
FPLARM - Shoebox Arm. Converts FloodPak to pole-mount (minimum 4" square pole).

FPLSHIELD - Vandal Shield. Helps protect lens and lamp from breakage. Clear polycarbonate shield snaps in place over glass lens.

FPLRPA - Round pole adapter.

FPL552 - Replacement Lens.

TECHNICAL INFORMATION

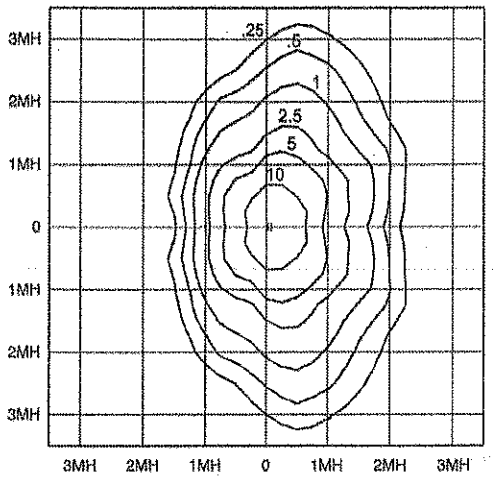


UL Wet Location Listed.

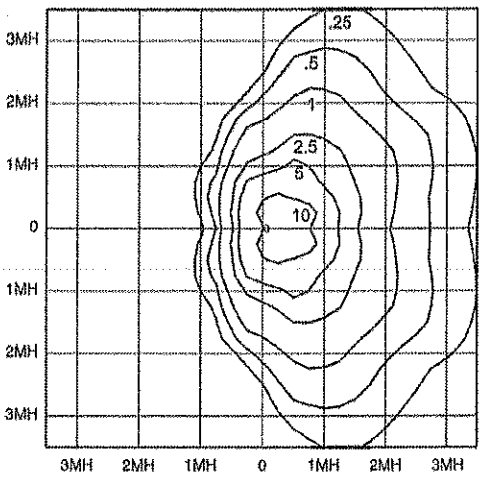
PRODUCT SPECIFICATIONS

- The FloodPak is a perfect blend of architectural design and performance.
- The FloodPak can be surface mounted in various positions. Use it as a cut-off wallpack or tip it up 22.5° for forward throw with semi-cut-off. Tip it up 45° for floodlighting, or turn it over and use it for indirect/accent lighting.
- The FloodPak can also be pole mounted or ground mounted using mounting accessories.
- Precision die cast aluminum construction. All exposed hardware is stainless steel.
- Duraplex II dark bronze polyester powder finish is standard but the FloodPak is available in a variety of designer colors.
- Hinged door frame with clear tempered glass lens.
- Multi-faceted reflection system provides uniform distribution.
- Injection molded triple finger silicone gasket.
- UL wet location listed for above or below horizontal aiming.
- Complete with a UL approved mounting box rated for 90°C supply wire with integral bubble level.
- Integral heat sink ensures cool operation.
- Meets IESNA cut-off requirements.
- Contractor Friendly design with integral cable permitting easy, hands free wiring.

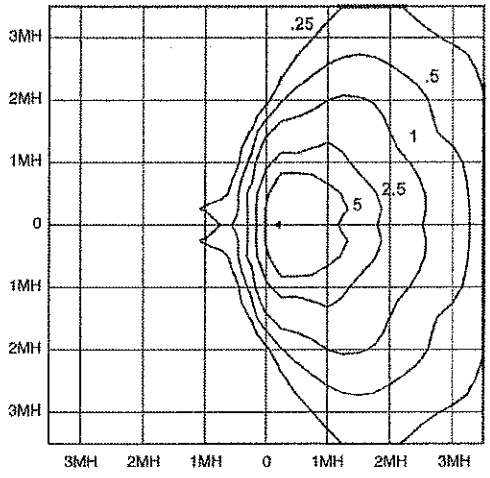
PHOTOMETRICS



FPL400MAL-8 @ 0°



FPL400MAL-8 @ 22.5°



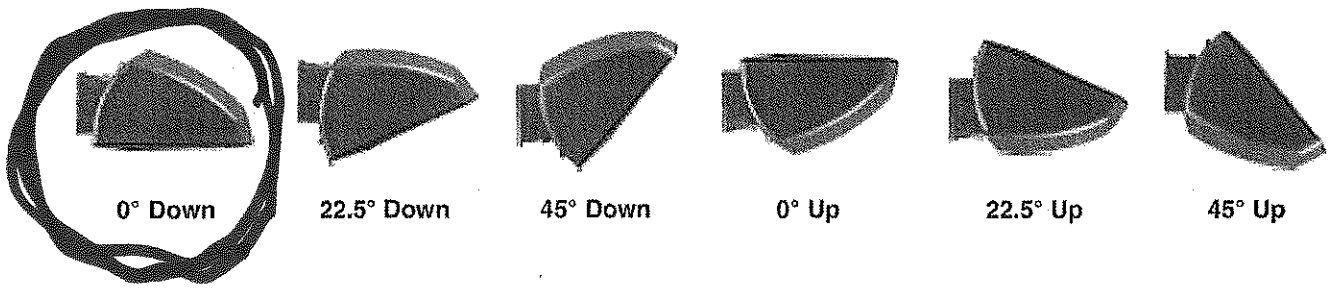
FPL400MAL-8 @ 45°

FOOTCANDLE CORRECTION
Multiply the following factors times the footcandle values for changes in mounting height.

To Change from 20'				
New Hght.	15'	20'	25'	30'
Factor	1.78	1.0	.64	.44

LAMP AND WATT CONVERSIONS				
Lamp	250W MH	250W HPS	400W HPS	400W MH
Multiplier	.57	.79	1.39	1.0

MOUNTING OPTIONS



0° Down | 22.5° Down | 45° Down | 0° Up | 22.5° Up | 45° Up

Composite Pole — RT35

TAPERED POLE 3.5 INCHES AT POST TOP

- Tapered composite pole shaft
- Direct Embedded and Anchor Base models
- XTREME® elastomeric urethane base cover

Ordering Information

SAMPLE CATALOG NUMBER LOGIC

	B	C	D	E	F	G	H
RT35	16	DE	BLK	TXT	30	-35	•
RT35	20	AB	DGR	SMS	35	-40	•
POLE	ABOVE GRADE HEIGHT	INSTALLATION METHOD	COLOR	SURFACE FINISH	TENON O.D.	TENON HEIGHT	OPTIONS

B Above Grade Height

Cat No.	Description
RT35-10	10 feet/3.0M
RT35-11	11 feet/3.4M
RT35-12	12 feet/3.7M
RT35-13	13 feet/4.0M
RT35-14	14 feet/4.3M
RT35-15	15 feet/4.6M
RT35-16	16 feet/4.9M
RT35-17	17 feet/5.2M
RT35-18	18 feet/5.5M
RT35-19	19 feet/5.8M
RT35-20	20 feet/6.1M
RT35-21	21 feet/6.40M
RT35-22	22 feet/6.71M
RT35-23	23 feet/7.01M
RT35-24	24 feet/7.32M
RT35-25	25 feet/7.62M
RT35-26	26 feet/7.92M
RT35-27	27 feet/8.32M
RT35-28	28 feet/8.53M
RT35-29	29 feet/8.84M
RT35-30	30 feet/9.14M

C Installation Method

Cat No.	Description
DE	Direct Embedded
AB	Anchor Base

D Color

Cat No.	Description
BLK	Black
MTB	Matte Black
DBZ	Dark Bronze
DGR	Dark Green
HTG	Hunter Green
SLV	Silver
WHT	White
GRY	Grey
CC	Custom color - Please provide a min. 3" x 3" color chip.
RAL	Please provide a four digit RAL color number.

E Surface Finish

Cat No.	Description
TXT	Natural texture of the reinforcing strands
SMS	Smooth surface finish

F Tenon O.D. (outside diameter)

Cat No.	Description
23	2 3/8" (60 mm)
27	2 7/8" (73mm)
30	3" (76 mm)
35	3 1/2" (89 mm)
40	4" (102 mm)

G Tenon Height

Cat No.	Description
-30	3.0" (76 mm)
-35	3.5" (89mm)
-40	4.0" (102 mm)
-50	5.0" (127 mm)
-60	6.0" (178mm)

• For other tenon sizes contact the factory.

H Options

Cat No.	Description
DTC	Top pole cap and drilling for a side mounted arm(s). Provide template or drawing for hole locations.
FLD	Top pole cap. Field drill to accept a luminaire.
R1	Single receptacle and housing with spring loaded cover. Molded in dark grey color. Standard location is 12"/305mm below the top of the pole.

ABOVE GRADE HEIGHT 20' MODEL SHOWN

20'

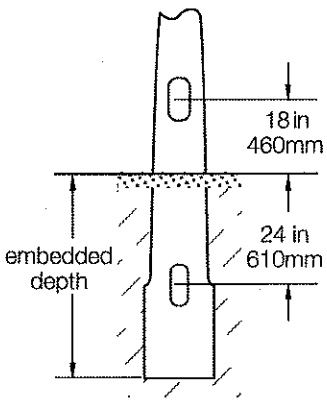
H Options

Cat No.	Description
RC	Receptacle housing and a NEC approved cover. GFCI receptacle by others. Standard location is 12"/305mm below the top of the pole.
RBC	XTREME urethane composite base cover for direct embedded (DE) installations. Standard with anchor base AB configuration. Painted to match the pole color.

• Other accessories are shown on the Accessories specification sheet.

WHATLEY INC. A VALMONT COMPANY
3550 Odessa Way Aurora, CO 80011 office 303-287-8053 fax 303-286-7216 whatley.com 877-959-7678

Direct Embedded - DE



SHAFT LENGTH	EMBEDDED DEPTH
10 to 13 feet	3ft/.91M
14 to 24 feet	4ft/1.2M
25 to 30 feet	5ft/1.5M

* Embedded depths may vary per local codes, site soil conditions, drainage and very high wind conditions.

Hand hole is:
2.5"/62mm x 5"/125mm.

Specifications

POLE SHAFT
The pole shaft shall be round tapered, smooth with a .14"/3.5mm per foot taper, with the top of the post at 3.5"/88mm diameter. The hand hole shall be 2.5"/62mm x 5"/125mm with a cover. The shaft shall be constructed of continuous fiberglass filament combined with a thermosetting epoxy resin. The glass filament shall be helically wound at alternating high and low angle layers for maximum compressive and bending strength. The hand hole area and hardware attachment areas shall be reinforced. The poles shall be designed with a minimum safety factor of 2:1 and have a maximum deflection of 10% under full wind loading conditions.

The butt end of the embedded-type post shall be enlarged and oval to increase the resistance to rotation and provide maximum ground bearing resistance (anti-lift). The post shall be non-conductive and chemically inert.

PERFORMANCE CRITERIA
The post shall be designed with a minimum safety factor of 2:1 and have no more than a 10% deflection at full wind loading. The post shall deflect no more than 2.5% of the above-ground length with 100 lbs. of lateral top load (stiffness). Poles shall be tested and rated per ASCE 7-98 and AASHTO 2001 specifications for pole structures.

DIRECT EMBEDDED INSTALLATION
Direct embedded poles shall have a 2.5 inch (62mm) by 5 inch (125mm) slot for conduit entrance 24 inches (610mm) below finished grade. Embedded depths may vary per local codes, site soil conditions, drainage and very high wind conditions.

ANCHOR BASE
Anchor bases shall be constructed of steel or aluminum base plate. The base shall be factory bonded to the post.

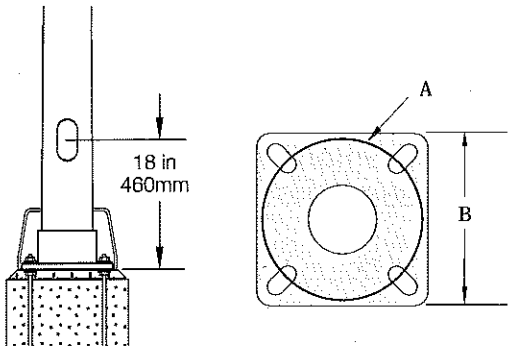
POST TOP
A painted 6061-T6 aluminum tenon shall be firmly bonded to the pole for mounting a post-top luminaire or arm.

FINISH
The surface of the post shall be uniform and consistent for the entire length of the post. A UV-resistant catalyzed urethane coating shall be extremely durable and retains its gloss after a 5000 hour exposure test (ASTM) to the sun, with no dulling or chalking of the surface.

BASE COVER
The base cover shall be one or two piece and constructed of a proprietary elastomeric urethane and finished to match the post. The base shall be corrosion free and extremely resistant to impact and chipping.

WARRANTY
The products shall be warranted to be free of defects for three years from the date of shipment from the factory.

Anchor Base Installation - AB



Anchor Base Dimensions for RT35

- Hand hole is 2.5"/62mm x 5"/125mm
- Mounting slots are .75"/19mm x 1.5"/38mm for 8" bolt circle and 1"/25mm x 1.5"/38mm for 10" & 12" bolt circle
- Conduit entry hole in base plate is 4.0"/100mm

SHAFT LENGTH	BOLT CIRCLE (A)	BASE PLATE SIZE (B)	ANCHOR BOLTS
6'-13'	8"/203MM	7.5"/190MM	5/8" x 21"
14'-26'	10"/254MM	10"/254MM	3/4" x 21"
27'-30'	12"/304MM	11.5"/292MM	3/4" x 21"

Wind Loading Data for Direct Embedded and Anchor Base

			WIND SPEED (MPH) WITH 3 SECOND GUST FACTOR						
Cat No.	Description	WT	90	100	110	120	130	140	150
10	10 feet/3.10M	32	9.4	7.3	5.8	4.8	4.0	3.4	2.9
11	11 feet/3.35M	34	9.4	7.2	5.7	4.7	4.0	3.3	2.9
12	12 feet/3.66M	35	9.3	7.2	5.7	4.7	3.9	3.3	2.8
13	13 feet/3.96M	37	9.3	7.1	5.6	4.6	3.9	3.2	2.8
14	14 feet/4.27M	43	9.2	7.0	5.6	4.6	3.8	3.2	2.7
15	15 feet/4.57M	47	9.1	6.8	5.5	4.5	3.7	3.1	2.6
16	16 feet/4.88M	51	8.3	6.2	5.0	4.1	3.4	2.8	2.4
17	17 feet/5.18M	53	8.1	6.1	4.9	4.0	3.3	2.7	2.3
18	18 feet/5.49M	56	8.0	6.0	4.8	3.9	3.2	2.7	2.2
19	19 feet/5.79M	61	7.8	5.9	4.7	3.8	3.1	2.6	2.2
20	20 feet/6.10M	64	7.6	5.8	4.6	3.7	3.0	2.5	2.1
21	21 feet/6.40M	67	7.4	5.6	4.5	3.6	2.9	2.4	2.0
22	22 feet/6.71M	72	7.2	5.5	4.4	3.5	2.8	2.3	1.9
23	23 feet/7.01M	76	7.0	5.4	4.2	3.4	2.7	2.2	1.8
24	24 feet/7.32M	80	6.4	4.9	3.9	3.1	2.5	2.0	1.7
25	25 feet/7.62M	84	6.3	4.8	3.8	3.0	2.4	1.9	1.6
26	26 feet/7.92M	88	6.1	4.7	3.6	2.9	2.3	1.8	1.5
27	27 feet/8.32M	99	6.0	4.6	3.5	2.8	2.2	1.8	1.4
28	28 feet/8.53M	102	5.8	4.4	3.4	2.7	2.1	1.7	1.3
29	29 feet/8.84M	106	5.7	4.3	3.3	2.6	2.0	1.6	1.2
30	30 feet/9.14M	110	5.5	4.2	3.2	2.4	1.9	1.5	1.2

Wind speed values are for a 3-second gust per ASCE 7-98 and AASHTO 2001. Calculated per ASCE 7-98, 50-year recurrence interval,1.0 Importance factor. Assumes load 12 inches above the pole top. Safety factor = 2.0. Maximum fixture weight is 100 pounds.

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whatley.com

SPC7394 02/11

EXTERIOR LIGHTS

EL27HE13IC

6" Compact Fluorescent Vertical mounted lamp with integral fluorescent ballast. IC rated housing, adjusts 1 3/8" to accommodate ceiling thicknesses.

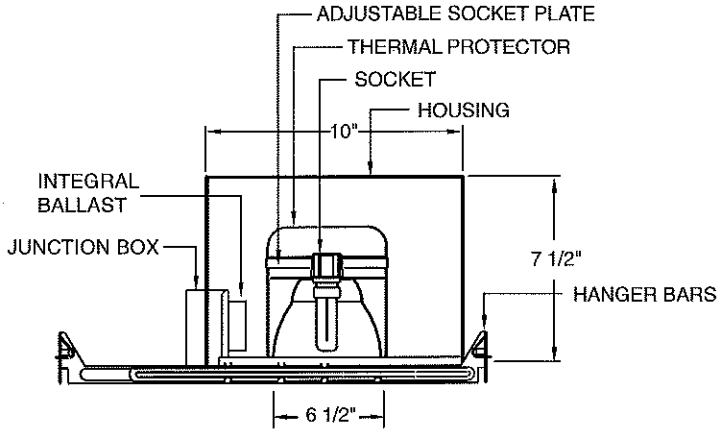
PROJECT INFORMATION:

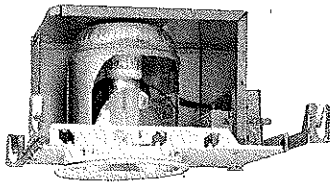
Project Name: (ALL IN SOFFITS)

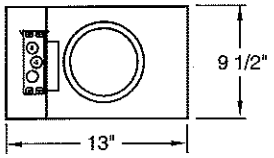
Fixture Type:

Date:

DIMENSIONS







PLAN VIEW

PRODUCT SPECIFICATIONS

Housing Features: For use in insulated ceilings. Integral thermal protector guards against improper lamping. Single wall construction.

Adjustable socket bracket allows the use of different lamp types and sizes as well as proper and consistent lamp positioning.

Lamp: Designed for (1) 13W 4 Pin PL-T compact fluorescent lamp

Trim Ring: Polycarbonate trim ring, metal trim ring, designed to conceal ceiling cutout.

EL27HE13IC = (1) 13W 4 Pin PL-T 120/277V H.P.F. Electronic Ballast

INSTALLATION

Junction Box: Pre-wired junction box provided with 1/2" and 3/4" knockout. U.L. listed/C.U.L. listed: for through branch wiring, maximum (8) No. 12 AWG branch circuit conductors (4 in, 4 out). Junction box provided with removable access plates.

Mounting: Hanger bars span 24" joists and can be repositioned 90 degrees.

Mounting Frame: Stamped steel material and painted for corrosion resistance.

Labels:
- U.L. listed for damp locations.
- U.L. listed for feed through.
- U.L. listed for direct contact with insulation.

CATALOG NUMBER

Example: EL27HE13IC-ELA99SC
See trims page for variety of trims available.

2042 East Vernon Avenue, Vernon, CA 90058 • Tel: (323) 231-2600 Fax: (323) 231-3200 • www.elcolighting.com

ELCO LIGHTING

ELCO Lighting

Specification Data
Panasonic Ventilation Fan

Panasonic

WhisperGreen® VENTILATION FAN

FV-08VKM3 (0-80 CFM)

ENERGY STAR

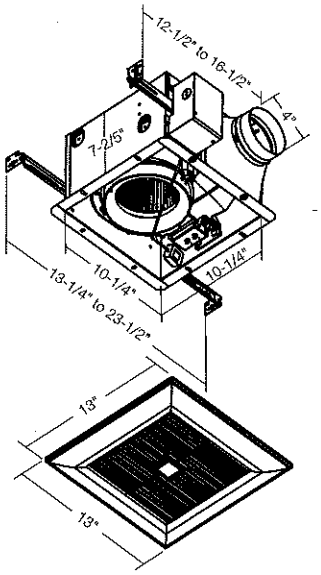
Description
Ventilating fan shall be Low Noise ceiling mount type rated for continuous run. Fan shall be ENERGY STAR rated and certified by the Home Ventilating Institute (HVI). Evaluated by Underwriters Laboratories and conform to both UL and cUL safety standards.

Motor/Blower:
- Enclosed DC brushless motor technology, currently more energy efficient than the minimum ENERGY STAR requirements, rated for continuous run.
- Power Rating shall be 120 volts and 60 Hz.
- Fan shall be UL listed for tub/shower enclosure when used with a GFCI branch circuit wiring.
- Motor equipped with thermal cut-off fuse control.
- Removable with permanently lubricated plug-in motor.

Housing:
- Rust proof paint, galvanized steel body.
- Detachable 4" diameter duct adapter.
- Built-in backdraft damper.
- Expandable extension bracket up to 24".
- Double hanger bar system allowing for ideal positioning.

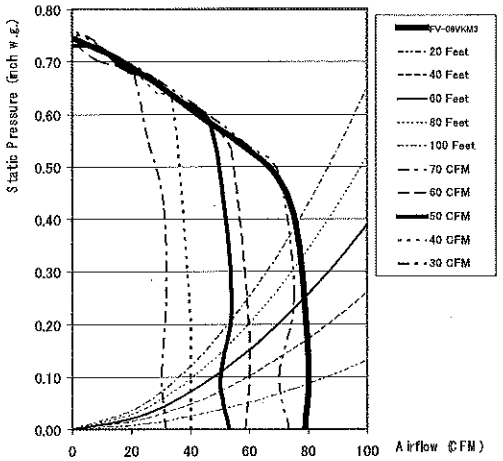
Grille:
- Attractive design using PP material.
- Attaches directly to housing with torsion springs.

Warranty:
- The factory warranty shall be a minimum of 6 years limited warranty on the motor and 3 year limited warranty on parts.



Typical Specifications:
Ventilating fan shall be of the ceiling mount, ENERGY STAR rated type, with variable speed of 0-80 CFM and no more than 0.3 sone as certified by the Home Ventilating Institute (HVI) at 0.1 static pressure in inches water gauge. Power consumption shall be no greater than 7.0 watts and ENERGY STAR rated with efficiency rating of no less than 12.1 CFM/watt. The motor shall be enclosed with brushless DC motor engineered to run continuously. Power rating shall be 120v/60Hz. Duct diameter shall be no less than 4". Fan shall be UL and cUL listed for tub/shower enclosure when used with GFCI branch circuit wiring. Fan shall be California Title 24 compliant.

DC Motor Technology:
- Allows the fan to run continuously at a pre-set lower level (0, 30 – 70 CFM). The fan then elevates to a maximum level of operation (80 CFM) when motion sensor is activated.
- When fan faces static pressure, its speed is automatically increased to ensure that the desired CFM is not compromised, which allows the fan to perform as rated.
- Automatically activates whenever someone enters or leaves the room.



WhisperGreen	FV-08VKM3											
Static Pressure in inches w.g.	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25	0.1	0.25
Air Volume (CFM)	80	79	70	75	60	59	50	54	40	39	30	32
Noise (sones)	<0.3	0.4	<0.3	0.4	<0.3	0.3	<0.3	0.3	<0.3	<0.3	<0.3	<0.3
Power Consumption (watts)	7.0	11.0	5.4	10.1	5.0	8.7	4.3	7.5	3.7	6.6	3.2	5.8
Energy Efficiency (CFM/Watt)	12.1	7.6	13.3	7.7	13.6	7.7	12.4	7.7	12.8	7.1	11.4	6.7
Speed (RPM)	832	1130	791	1125	773	1106	749	1101	740	1093	745	1087
Current (amps)	0.02	0.01	0.03	0.01	0.05	0.01	0.05	0.02	0.05	0.03	0.06	0.04
Power Rating (V/Hz)	120/60		120/60		120/60		120/60		120/60		120/60	

As of 1/11

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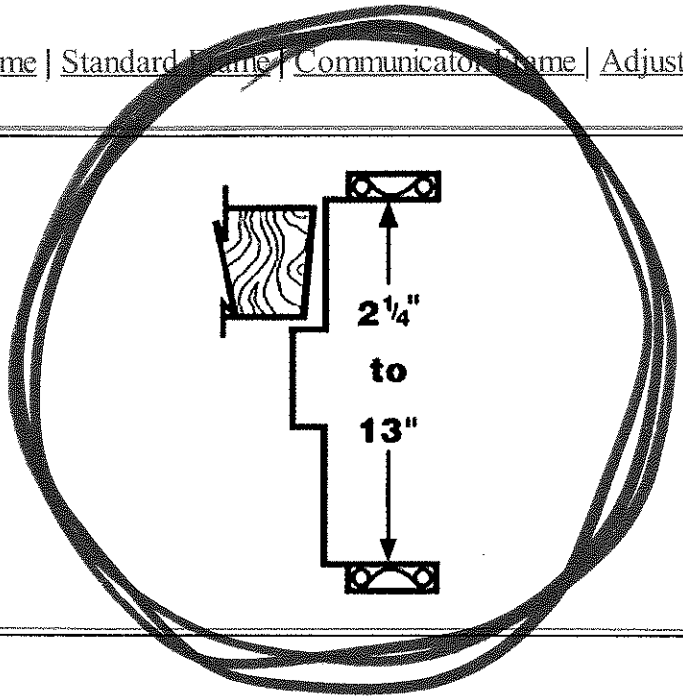
Model	Quantity	Comments	Project:
			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
			Date:

EXT. DOOR FRAME

Frame Styles

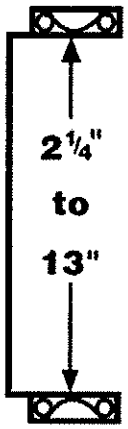
Home | Standard Frame | Communicator Frame | Adjustable Frame | Fixed Throat Kerf Frame | Pocket Frame



Standard Frame

For openings requiring a Single Swing, Pair, Transom, Sidelite or Borrowed Lite frame.

Wall sizes: 2-1/4" to 13".
Note: Mullions are limited to wall sizes from 3-1/2" to 13".



No-Stop

Frame profile without a door stop.

With Stop and ***No-Stop*** material can both be used on the same opening. Typically this will only be seen in sidelite units. The door section will be supplied With Stop and the glazing section as No-Stop. This is accomplished by utilizing a split header.

Wall sizes: 2-1/4" to 13".
Note: Mullions are limited to wall sizes from 3-1/2" to 13".

Communicating Frame

For Openings connecting two (2) rooms, each with their own door for privacy.

Our Standard Communincating Frames are designed to utilize a 1-3/8" and a 1-3/4" door.

Available on request are frames made to accommodate two 1-3/8" doors or two 1-3/4"

GeoPacific Engineering, Inc.

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

October 20, 2011
Project No: 11-2393

Chris Good
Miranda Homes
17223 SE Royer Road
Damascus, Oregon 97089

Copy: Jay Harris, Harris McMonagle (jay@h-mc.com)

Via email with hard copies mailed

Subject: Geotechnical Engineering Report
Gateway Gardens
NE 97th and 99th Avenue
Portland, Oregon

This report presents the results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above referenced project. The purpose of this study was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for site development. This geotechnical study was performed in accordance with GeoPacific Proposal No. P-4021, dated July 27, 2011, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services*.

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The site consists of seven tax lots (TL 232, 305, 306, 315, 318, 333 and 400) located south of NE Glisan Street and between NE 97th Avenue and NE 99th Avenue (Figures 1 and 2). The property totals approximately 1.7 acres in size and is flat to very gently sloping to the south. Two residential and one commercial structure have recently been cleared from the site. Vegetation consists primarily of short grasses and sparse trees.

Site improvements will consist of four new apartment buildings, with preliminary plans indicating a total of 162 units. We understand that the three-story structures will be of conventional timber framed construction, with spread footing foundations and slab-on-grade lower floors. The proposed improvements will also include new driveway and at-grade parking areas, storm water disposal facilities, and associated underground utilities. The storm water facilities may include permeable paving, swales, or dry wells. Approximately 300 lineal feet of new roadway (NE Flanders Street) will be constructed through the site. The grading plan for the project has not yet been completed; however, we anticipate maximum depth of cut and height of fill will be about 5 feet or less.

REGIONAL GEOLOGIC SETTING

Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The site is underlain by the Quaternary age (last 1.6 million years) Willamette Formation, a catastrophic flood deposit associated with repeated glacial outburst flooding of the Willamette Valley (Yeats et al., 1996). The last of these outburst floods occurred about 10,000 years ago. These deposits typically consist of horizontally layered, micaceous, silt to coarse sand and cobbles forming poorly-defined to distinct beds less than 3 feet thick.

Underlying the Willamette Formation is the Tertiary-aged (2-65 million years ago) Troutdale formation - a partially cemented conglomerate and sandstone deposited by an ancestral Columbia River (Trimble, 1963). Regionally, the Troutdale Formation is informally divided into an upper and a lower member (Phillips, 1987). Lithologies in the upper member include lenticular layers of volcaniclastic (vitric) sand, quartzite-bearing gravel, fine-grained sand, silt and clay, micaceous quartz-rich sand, and conglomerate with a cumulative average thickness of 100 to 150 feet. The lower member consists primarily of laminated silty clay and sand with reported thicknesses in water well logs of up to 880 feet and is the equivalent of the Sandy River Mudstone.

At least three major source zones capable of generating damaging earthquakes are thought to exist in the vicinity of the subject site. These include the Portland Hills Fault Zone, the Gales Creek-Newberg-Mt. Angel Structural Zone, and the Cascadia Subduction Zone.

Portland Hills Fault Zone

The Portland Hills Fault Zone is a series of NW-trending faults that include the central Portland Hills Fault, the western Oatfield Fault, and the eastern East Bank Fault. These faults occur in a northwest-trending zone that varies in width between 3.5 and 5.0 miles. The combined three faults vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years) sediment (Madin, 1990). The Portland Hills Fault occurs along the Willamette River at the base of the Portland Hills, and is about 5.5 miles southwest of the site. The Oatfield Fault occurs along the western side of the Portland Hills, and is about 7.5 miles southwest of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000). No historical seismicity is correlated with the mapped portion of the Portland Hills Fault Zone, but in 1991 a M3.5 earthquake occurred on a NW-trending shear plane located 1.3 miles east of the fault (Yelin, 1992). Although there is no definitive evidence of recent activity, the Portland Hills Fault Zone is assumed to be potentially active (Geomatrix Consultants, 1995).

Gales Creek-Newberg-Mt. Angel Structural Zone

The Gales Creek-Newberg-Mt. Angel Structural Zone is a 50-mile-long zone of discontinuous, NW-trending faults that lies about 26.5 miles southwest of the subject site. These faults are recognized in the subsurface by vertical separation of the Columbia River Basalt and offset seismic reflectors in the overlying basin sediment (Yeats et al., 1996; Werner et al., 1992). A recent geologic reconnaissance and photogeologic analysis study conducted for the Scoggins Dam site in the Tualatin Basin revealed no evidence of deformed geomorphic surfaces along the structural zone (Unruh et al., 1994). No seismicity has been recorded on the Gales Creek or Newberg Faults (the faults closest to the subject site); however, these faults are considered to be potentially active because they may connect with the seismically active

Mount Angel Fault and the rupture plane of the 1993 M5.6 Scotts Mills earthquake (Werner et al. 1992; Geomatrix Consultants, 1995).

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies roughly along the Oregon Coast at depths of 20 and 40 kilometers.

FIELD EXPLORATION

The site-specific exploration for this study was conducted on September 26, 2011 by excavating 9 test pits to depths of 1 to 13 feet below ground surface, using a backhoe with a 2-foot-wide bucket and rock teeth provided by Dan Fischer Excavating. The approximate test pit locations are shown on the attached site plan (Figure 2). It should be noted that exploration locations were determined in the field by pacing or taping distances from apparent property corners and other site features shown on the plans provided. As such, the locations of the explorations should be considered approximate.

During excavation of the test pits, a GeoPacific geologist observed and recorded soil information such as color, stratigraphy, strength, and soil moisture. Soils were classified in general accordance with the Unified Soil Classification System (USCS). Results of the exploration program are shown on the backhoe test pit logs attached to this report. At the completion of each test pit, the excavation was backfilled using the excavated soils, and tamped with the excavator bucket. This backfill should not be expected to behave as engineered fill and some settling and/or erosion of the ground surface may occur.

The field exploration also included infiltration testing and portable dynamic cone penetrometer (PDCP) testing, discussed separately on Pages 4 and 5 of this report respectively.

SUBSURFACE CONDITIONS

The following discussion is a summary of subsurface conditions encountered in our explorations. For more detailed information regarding subsurface conditions at specific exploration locations, refer to the attached test pit logs. Also, please note that subsurface conditions can vary between exploration locations, as discussed in the *Uncertainty and Limitations* section below.

Soils

On-site soils consist of a topsoil horizon, native soil horizon, and coarse grained Willamette Formation material as described below.

Topsoil Horizon – Directly underlying the ground surface in test pits TP-1 through TP-9 was a topsoil horizon consisting of brown, moderately organic Sandy Silt with Cobbles. The topsoil horizon contained many fine roots, was generally loose, and characterized by a stiff consistency. In test pits, the topsoil horizon was approximately 6 to 9 inches thick.

Willamette Formation (Fine Grained Facies) – Soils belonging to the fine grained facies of the Willamette Formation were encountered beneath the topsoil horizon in all of the test pits. This material consisted primarily of very stiff, Sandy Silt with trace Cobbles extending to depths of about 4 to 6 feet below the ground surface (bgs).

Willamette Formation (Coarse Grained Facies) – Test pits TP-1, TP-4, and TP-7 through TP-9 were excavated to depths of about 5.5 to 13 feet bgs. These test pits were of sufficient depth to penetrate through the fine-grained Willamette Formation, and into Sandy Gravel with Cobbles belonging to the coarse grained facies of the Willamette Formation. The Sandy Gravel with Cobbles material extended beyond the maximum depth of exploration (5.5 to 13 feet bgs) in the above-mentioned test pits.

Groundwater

Groundwater was not encountered in any of the test pits, which ranged in depth from about 1 to 13 feet bgs. Regional geologic mapping by Snyder (2008) indicates that static groundwater is present at a depth of approximately 200 feet below the ground surface. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors. Perched groundwater conditions often occur over fine-grained native deposits and engineered fill such as those beneath the site, particularly during the wet season.

INFILTRATION TESTING

Soil infiltration testing was performed using the open pit falling head method in test pits TP-1 and TP-4 and the encased falling head method in test pits TP-2, TP-3, TP-5 and TP-6. Soils in test pits were pre-saturated prior to testing. Following the soil saturation, infiltration tests were conducted. The water level was measured to the nearest 0.1 inch with reference to the ground surface. The change in water level was recorded at half-hour intervals for a total period of 3.5 hours. Table 1 presents the results of the falling head infiltration tests.

Table 1. Summary of Infiltration Test Results

Test Pit	Depth (feet)	Soil Type	Infiltration Rate(in/hr)	Hydraulic Head Range (inches)
TP-1	12	Sandy Gravel (GW) with Cobbles	86	0 - 2
TP-2	1.0	Sandy Silt (ML) with Cobbles	1.3	2 - 8
TP-3	2.25	Sandy Silt (ML) with Cobbles	0.7	4.5 - 6.5
TP-4	13	Sandy Gravel (GW) with Cobbles	240	0 - 2
TP-5	2.5	Sandy Silt (ML) with Cobbles	0.7	9 - 11
TP-6	1.5	Sandy Silt (ML) with Cobbles	2	1 - 6.5

Recommendations for design and construction of on-site storm water infiltration systems are presented in the *Conclusions and Recommendations* section.

PORTABLE DYNAMIC CONE PENETROMETER TESTING

During the exploration program, field tests were conducted with a Portable Dynamic Cone Penetrometer (PDCP) to determine the strength parameters of the soil for support of pavement. Correlated California Bearing Ratio (CBR) values at each test location are summarized on Table 2, for the depth intervals indicated.

Table 2. PDCP Field Test Results and Correlated CBR Values

PDCP Designation	Material Tested	Depth Interval of Test (feet)	Average Penetration Per Blow (mm)	Correlated CBR
PDCP-1	Sandy SILT (ML) with Cobbles	0.3 – 1.5	7.3	45
PDCP-2	Sandy SILT (ML) with Cobbles	0.3 – 1.7	14.7	20

CONCLUSIONS AND RECOMMENDATIONS

Results of this study indicate that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. The proposed structure may be supported on shallow foundations bearing on competent undisturbed native soils, or engineered fill, designed and constructed as recommended in this report.

Recommendations are presented below for site preparation, undocumented fill removal and old drywell backfill; engineered fill; wet weather earthwork; structural foundations; concrete slabs-on-grade floors; footing and roof drains; seismic design; stormwater infiltration facilities; excavation conditions and utility trenches; pavement sections; pervious pavement; and erosion control considerations.

Site Preparation, Undocumented Fill Removal and Old Drywell Backfill

Proposed structure and parking areas should be cleared of debris. Undocumented fill within the proposed building footprints, beneath pavements or other settlement-sensitive improvements, should be completely removed and replaced with engineered fill. Undocumented fill was not encountered our explorations; however some fill may exist outside our exploration locations, especially in the vicinity of former structures. If encountered within the proposed building footprint, soft to medium stiff soils may need to be overexcavated and replaced with engineered fill. The depth of over-excavation should be determined by GeoPacific during construction.

Following removal of surficial debris and undocumented fill, the exposed subgrade should be ripped or tilled to a depth of 12 inches, moisture conditioned, and compacted in-place prior to the placement of engineered fill or crushed aggregate base for pavement. Exposed subgrade soils should be evaluated by GeoPacific. For large areas, this evaluation is normally performed by proof-rolling the exposed subgrade with a fully loaded scraper or dump truck. For smaller areas where access is restricted, the subgrade should be evaluated by probing the soil with a steel probe. Soft/loose soils identified during subgrade preparation should be compacted to a firm and unyielding condition or over-excavated and replaced with engineered fill, as described below. The depth of overexcavation, if required, should be evaluated by GeoPacific at the time of construction.

We understand that a number of old dry wells are present on site from former structures. For backfilling deeper portions of the dry wells, we recommend placement of controlled density fill (CDF), which is essentially a lean mix concrete consisting of water, sand and cement. We recommend use of "excavatable" CDF so that future excavations can be made through the dry well backfill if any new utilities or other excavations are needed in the affected areas. Above a depth of about 10 feet, at the contractor's option, backfill may consist of granular soils such as "reject rock," recycled concrete or similar material approved by GeoPacific. The granular backfill should be placed in lifts no thicker than about 18 inches and compacted with a "hoe-pac" excavator attachment to a minimum of 90 percent of Modified Proctor (ASTM D-1557). This backfill specification should also be used for any basements or other depressions that require fill during the demolition process.

Engineered Fill

In general, we anticipate that soils from planned cuts and utility trench excavations will be suitable for use as engineered fill provided they are adequately moisture conditioned prior to compacting. Imported fill material should be reviewed by GeoPacific prior to being imported to the site. Oversize material greater than 6 inches in size should not be used within 3 feet of foundation footings, and material greater than 12 inches in diameter should not be used in engineered fill.

Engineered fill should be compacted in horizontal lifts not exceeding 8 inches using standard compaction equipment. We recommend that engineered fill be compacted to at least 90 percent of the maximum dry density determined by ASTM D1557 (Modified Proctor) or equivalent. On-site soils may be wet or dry of optimum; therefore, we anticipate that moisture conditioning of native soil will be necessary for compaction operations.

Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill. Field density testing should generally conform to ASTM D2922 and D3017, or D1556. Engineered fill should be periodically observed and tested by the project geotechnical engineer or his representative. Typically, one density test is performed for at least every 2 vertical feet of fill placed or every 500 cubic yards, whichever requires more testing. Because testing is performed on an on-call basis, we recommend that the earthwork contractor be held contractually responsible for test scheduling and frequency.

Wet Weather Earthwork

The on-site soils are moisture sensitive and may be difficult to handle or traverse with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. Earthwork performed during the wet-weather season will probably require expensive measures such as cement treatment or imported granular material to compact fill to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;

- Material used as engineered fill should consist of clean, granular soil containing less than 5 percent fines. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;
- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and
- Bales of straw and/or geotextile silt fences should be strategically located to control erosion.

If cement or lime treatment is used to facilitate wet weather construction, GeoPacific should be contacted to provide additional recommendations and field monitoring.

Structural Foundations

Based on our understanding of the proposed project and the results of our exploration program, and assuming our recommendations for site preparation are followed, native deposits and/or engineered fill soils should be encountered at or near the foundation level of the proposed structures. These soils are generally stiff to dense, and should provide adequate support of the structural loads.

Shallow, conventional isolated or continuous spread footings may be used to support the proposed structures, provided they are founded on competent native soils, or compacted engineered fill placed directly upon the competent native soils. We recommend a maximum allowable bearing pressure of 2,000 pounds per square foot (psf) for designing the footings. The recommended maximum allowable bearing pressure may be increased by 1/3 for short term transient conditions such as wind and seismic loading. All footings should be founded at least 18 inches below the lowest adjacent finished grade. Minimum footing widths should be determined by the project engineer/architect in accordance with applicable design codes.

Assuming construction is accomplished as recommended herein, and for the foundation loads anticipated, we estimate total settlement of spread foundations of less than about 1 inch and differential settlement between two adjacent load-bearing components supported on competent soil of less than about ½ inch. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied.

Wind, earthquakes, and unbalanced earth loads will subject the proposed structure to lateral forces. Lateral forces on a structure will be resisted by a combination of sliding resistance of its base or footing on the underlying soil and passive earth pressure against the buried portions of the structure. For use in design, a coefficient of friction of 0.45 may be assumed along the interface between the base of the footing and subgrade soils. Passive earth pressure for buried portions of structures may be calculated using an equivalent fluid weight of 390 pounds per cubic foot (pcf), assuming footings are cast against dense, natural soils or engineered fill. The recommended coefficient of friction and passive earth pressure values do not include a safety factor. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

Footing excavations should be trimmed neat and the bottom of the excavation should be carefully prepared. Loose, wet or otherwise softened soil should be removed from the footing excavation prior to placing reinforcing steel bars.

The above foundation recommendations are for dry weather conditions. Due to the high moisture sensitivity of on-site soils, construction during wet weather may require overexcavation of footings and backfill with compacted, crushed aggregate. GeoPacific should observe foundation excavations prior to placing formwork and reinforcing steel, to verify that adequate bearing soils have been reached.

Concrete Slab-on-grade Floors

Preparation of areas beneath concrete slab-on-grade floors should be performed as recommended in the *Site Preparation* section. Care should be taken during excavation for foundations and floor slabs, to avoid disturbing subgrade soils. If subgrade soils have been adversely impacted by wet weather or otherwise disturbed, the surficial soils should be scarified to a minimum depth of 8 inches, moisture conditioned to within about 3 percent of optimum moisture content, and compacted to engineered fill specifications. Alternatively, disturbed soils may be removed and the removal zone backfilled with additional crushed rock.

For evaluation of the concrete slab-on-grade floors using the beam on elastic foundation method, a modulus of subgrade reaction of 200 kcf (115 pci) should be assumed for the stiff native silt soils anticipated at foundation depth. This value assumes the concrete slab system is designed and constructed as recommended herein, with a minimum thickness of crushed rock of 8 inches beneath the slab.

Interior slab-on-grade floors should be provided with an adequate moisture break. The capillary break material should consist of Open-Graded Aggregate per ODOT Standard Specifications Section 02630.11. The minimum recommended thickness of capillary break materials on re-compacted soil subgrade is 8 inches. The total thickness of crushed aggregate will be dependent on the subgrade conditions at the time of construction, and should be verified visually by proof-rolling. Under-slab aggregate should be compacted to at least 90 percent of its maximum dry density as determined by ASTM D1557 or equivalent.

In areas where moisture will be detrimental to floor coverings or equipment inside the proposed structure, appropriate vapor barrier and damp-proofing measures should be implemented. A commonly applied vapor barrier system consists of a 10-mil polyethylene vapor barrier placed directly over the capillary break material. With this type of system, an approximately 2-inch thick layer of sand is often placed over the vapor barrier to protect it from damage, to aid in curing of the concrete, and also to help prevent cement from bleeding down into the underlying capillary break materials. Other damp/vapor barrier systems may also be feasible. Appropriate design professionals should be consulted regarding vapor barrier and damp proofing systems, ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

Footing and Roof Drains

To minimize the fluctuation of soil moisture content near structural foundations, we recommend that the structures be constructed with perimeter footing drains. Footing drains should consist of 4-inch minimum diameter perforated PVC pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, crushed rock or 1"- ¼" drain rock. The drain pipe and surrounding drain rock should be wrapped in non-woven geotextile (Mirafi 140N, or approved equivalent) to minimize the potential for clogging and/or ground loss due to piping. Water collected from the footing drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. The footing drains should include clean-outs to allow periodic maintenance and inspection.

Down spouts and roof drains should collect roof water in a system separate from the footing drains in order to reduce the potential for clogging. Roof drain water should be directed to an appropriate

discharge point well away from structural foundations. Grades should be sloped downward and away from buildings to reduce the potential for ponded water near structures.

Seismic Design

Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2006 International Building Code (IBC) with applicable 2007 Oregon Structural Specialty Code (OSSC) revisions. We recommend Site Class D be used for design per the OSSC, Table 1613.5.2. Design values determined for the site using the USGS (United States Geological Survey) *Earthquake Ground Motion Parameters* utility are summarized below.

Table 3. Recommended Earthquake Ground Motion Parameters (2006 IBC / 2007 OSSC)

Parameter	Value
Location (Lat, Long), degrees	45.525, -122.563
Mapped Spectral Acceleration Values (MCE, Site Class B):	
Short Period, S_s	0.972 g
1.0 Sec Period, S_1	0.331 g
Soil Factors for Site Class D:	
F_a	1.111
F_v	1.738
$SD_s = 2/3 \times F_a \times S_s$	0.720 g
$SD_1 = 2/3 \times F_v \times S_1$	0.383 g

Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to earthquake shaking. Soil liquefaction is generally limited to loose, granular soils located below the water table. Following development, on-site soils will consist predominantly of stiff to dense native coarse and fine-grained soils which are not considered susceptible to liquefaction. Therefore, it is our opinion that special design or construction measures are not required to mitigate the effects of liquefaction.

Stormwater Infiltration Facilities

In-situ infiltration tests were conducted to assess the infiltration capacity of the near surface soils on site. Design of stormwater infiltration facilities will be performed by other. The approximate locations of the tests are shown on Figure 2, and the test methodology is discussed above in the *Infiltration Testing* section, above. Table 1 summarizes results of the infiltration testing.

Infiltration test results and test pit logs indicate two distinct soil units of import to stormwater infiltration system design. The upper, Sandy Silt with Cobbles unit exhibited infiltration rates of 0.7 to 2 inches per hour (iph) at test depths ranging from about 1 to 2.5 feet bgs. The deeper, Sandy Gravel with Cobbles unit exhibited infiltration rates of 86 and 240 iph at depths of 12 and 13 feet bgs in test pits TP-1 and TP-4 respectively (see Table 1).

For design of shallow infiltration facilities such as swales or pervious pavement, we suggest an unfactored infiltration rate of 1 iph. Soils deeper than about 12 feet exhibited very high infiltration rates. From a practical standpoint, we suggest an unfactored infiltration rate no greater than 50 iph for these deeper soils. The infiltration rates presented herein do not incorporate a factor of safety. For the design

infiltration rate, the system designer should incorporate an appropriate factor of safety against slowing of the rate over time due to biological and sediment clogging.

Infiltration test methods and procedures attempt to simulate the as-built conditions of the planned disposal system. However, due to natural variations in soil properties, actual infiltration rates may vary from the measured and/or recommended design rates. All systems should be constructed such that potential overflow is discharged in a controlled manner away from structures, and all systems should include an adequate factor of safety. Infiltration rates presented in this report should not be applied to inappropriate or complex hydrological models such as a closed basin without extensive further studies. This report presents infiltration test results only, and should not be construed as an approval of a system design. Evaluation of environmental implications of storm water disposal at this site is beyond the scope of this study.

Excavating Conditions and Utility Trenches

We anticipate that on-site soils can be excavated using conventional heavy equipment such as scrapers and trackhoes. Maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the contractor. Actual slope inclinations at the time of construction should be determined based on safety requirements and actual soil and groundwater conditions. All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Health Administration (OSHA) regulations (29 CFR Part 1926), or be shored. The existing native soils classify as Type B Soil and temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. This cut slope inclination is applicable to excavations above the water table only.

Shallow, perched groundwater may be encountered during the wet weather season and should be anticipated in excavations and utility trenches.

Vibrations created by traffic and construction equipment may cause some caving and raveling of excavation walls. In such an event, lateral support for the excavation walls should be provided by the contractor to prevent loss of ground support and possible distress to existing or previously constructed structural improvements.

PVC pipe should be installed in accordance with the procedures specified in ASTM D2321. We recommend that structural trench backfill be compacted to at least 90% of the maximum dry density obtained by Modified Proctor (ASTM D1557) or equivalent. Initial backfill lift thicknesses for a ¾"-0 crushed aggregate base may need to be as great as 4 feet to reduce the risk of flattening underlying flexible pipe. Subsequent lift thickness should not exceed 1 foot. If imported granular fill material is used, then the lifts for large vibrating plate-compaction equipment (e.g. hoe compactor attachments) may be up to 2 feet, provided that proper compaction is being achieved and each lift is tested. Use of large vibrating compaction equipment should be carefully monitored near existing structures and improvements due to the potential for vibration-induced damage.

Adequate density testing should be performed during construction to verify that the recommended relative compaction is achieved. Typically, at least one density test is taken for every 4 vertical feet of backfill on each 200-lineal-foot section of trench.

Pavement Sections

Table 4 presents our recommended minimum pavement section for dry-weather construction conditions. For design purposes, we used an estimated resilient modulus of 6,000 pci for compacted native soil. The recommendations presented in Table 4 were formulated using a traffic index of 4.0, using the Crushed Base Equivalent (CBE) method and an assumed design life (performance period) of 20 years.

Table 4. Recommended Minimum Dry-Weather Pavement Section

Material Layer	Layer Thickness (inches)		Compaction Standard
	NE Flanders Street	Automobile Parking Areas	
Asphaltic Concrete (AC)	3	3	91% of Rice Density AASHTO T-209
Crushed Aggregate Base ¾"-0 (leveling course)	2	2	95% of Modified Proctor ASTM D1557
Crushed Aggregate Base 1½"-0	12	8	95% of Modified Proctor ASTM D1557
Recommended Subgrade	12	12	95% of Standard Proctor or approved native

Native soil subgrade in pavement areas should be ripped or tilled to a minimum depth of 12 inches, moisture conditioned, and recompacted in-place to at least 95 percent of ASTM D698 (Standard Proctor) or equivalent. In order to verify subgrade strength, we recommend proof-rolling directly on subgrade with a loaded dump truck during dry weather and on top of base course in wet weather. Soft areas that pump, rut, or weave should be stabilized prior to paving. If pavement areas are to be constructed during wet weather, GeoPacific should review subgrade at the time of construction so that condition specific recommendations can be provided. Wet-weather pavement construction is likely to require soil amendment, or geotextile fabric and a 6-inch increase in base course thickness.

During placement of pavement section materials, density testing should be performed to verify compliance with project specifications. Generally, one subgrade, one base course, and one AC compaction test is performed for every 100 to 200 linear feet of paving.

The pavement sections recommended in Table 4 are for typical volumes of automobile traffic. Heavy truck traffic will reduce the design life of the pavements and may lead to inadequate pavement performance. If heavy truck traffic is anticipated, GeoPacific should be contacted for additional pavement design recommendations based on the traffic volumes expected.

Pervious Pavement

It is our understanding that some sidewalks and/or patios may be constructed using 5 inches of pervious concrete underlain by 6 inches of crushed rock. We suggest the pervious pavement designer assume a void ratio of 30 percent for the crushed rock / reservoir course, and an infiltration rate of subgrade soils of 1 iph with an appropriate factor of safety. These values are considered reasonable based on our experience with the specified materials, and infiltration test results. The crushed rock / reservoir course material should consist of Open-Graded Aggregate per ODOT Standard Specifications Section 02630.11. Care should be taken to avoid overcompaction of the subgrade soils and reservoir course, which could limit the void ratio of these materials and reduce the functionality as a pervious pavement.

We do not recommend a density specification for the crushed rock / reservoir course material beneath pervious pavements, due to concerns about overcompaction as discussed above. During placement of the base rock / reservoir course material, visual observations should be made to verify the material has been compacted to a relatively firm and unyielding condition.

Erosion Control Considerations

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion. In our opinion, the primary concern regarding erosion potential will occur during construction, in areas that have been stripped of vegetation. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which should include judicious use of straw bales and silt fences. If used, these erosion control devices should be in place and remain in place throughout site preparation and construction.

Erosion and sedimentation of exposed soils can also be minimized by quickly re-vegetating exposed areas of soil, and by staging construction such that large areas of the project site are not denuded and exposed at the same time. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets. Areas of exposed soil requiring permanent stabilization should be seeded with an approved grass seed mixture, or hydroseeded with an approved seed-mulch-fertilizer mixture.

UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and their consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, GeoPacific attempted to execute these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology at the time the report was prepared. No warranty, express or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.

REGISTERED PROFESSIONAL ENGINEER
64,422PE
OREGON
SEPTEMBER 26, 2000
SCOTT L. HARDMAN

10-20-11

EXPIRES: 06-30-2013

Beth K. Rapp, G.I.T.
Project Geologist

Scott L. Hardman, P.E., G.E.
Principal Geotechnical Engineer

Attachments: References
Figure 1 – Vicinity Map
Figure 2 – Site and Exploration Plan
Logs of Test Pits TP-1 through TP-9

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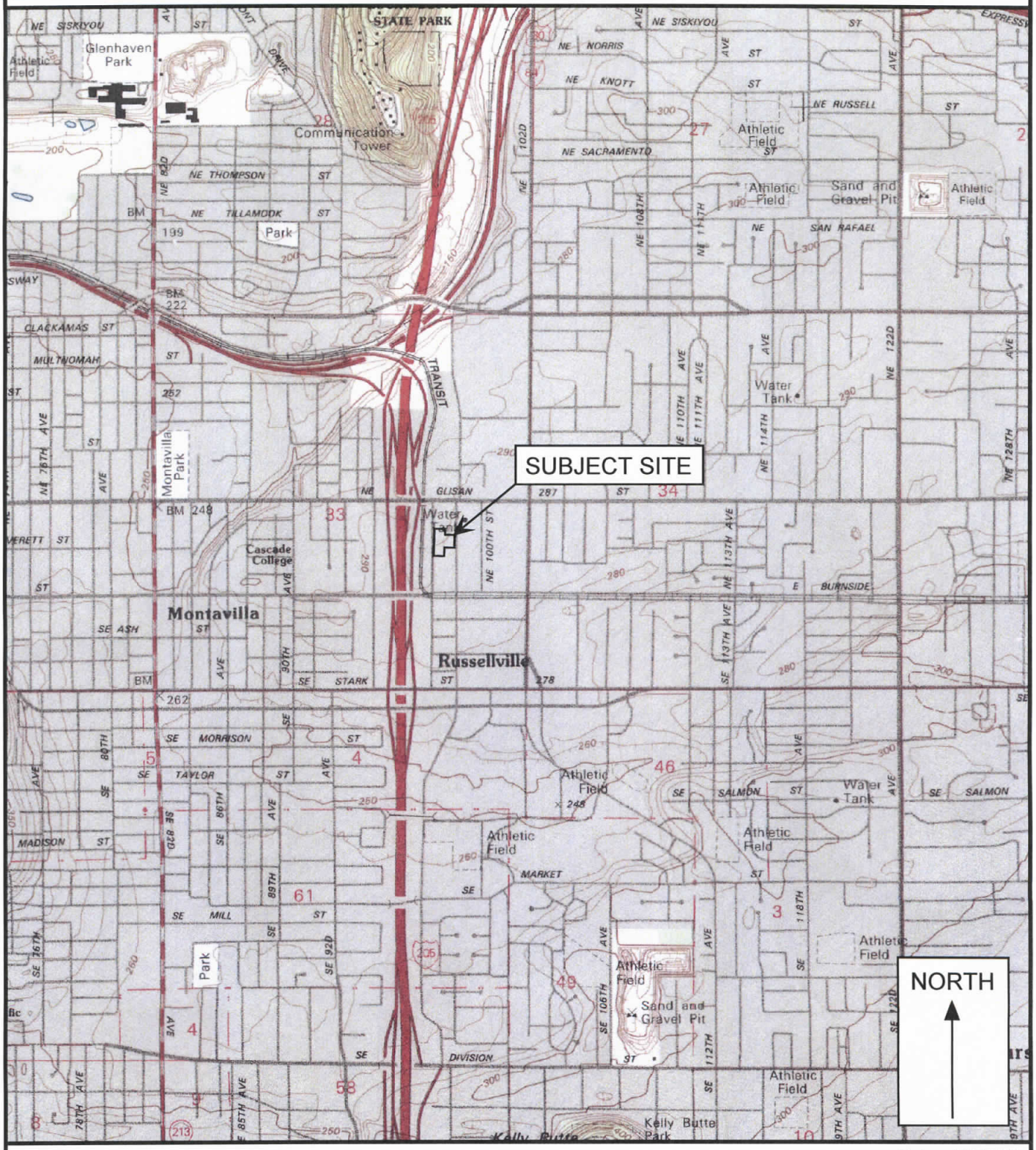
VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 ft

Date: 10/19/11
Drawn by: EKR

Base map: U.S. Geological Survey 7.5 minute Topographic Map Series, Mt. Tabor, Oregon Quadrangle, 1990

Project: Gateway Gardens Portland, Oregon	Project No. 11-2393	FIGURE 1

GeoPacific Engineering, Inc.
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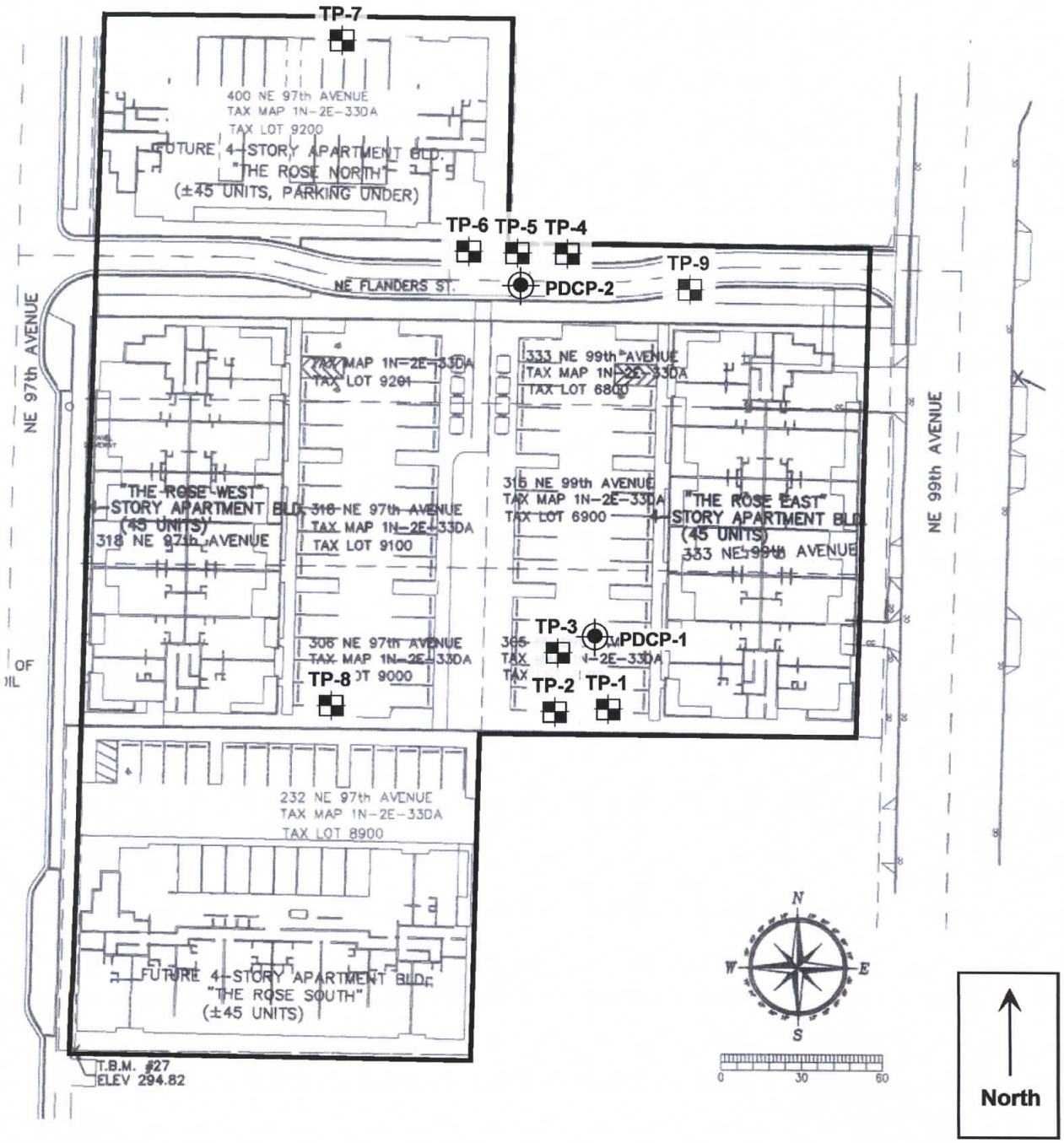
SITE PLAN AND EXPLORATION LOCATIONS



Legend

TP-1 Test Pit Designation and Approximate Location

PDCP-1 PDCP Designation and Approximate Location

0 60'
APPROXIMATE SCALE 1"=60'

Date: 10/19/11
Drawn by: EKR

Project: Gateway Gardens Portland, Oregon	Project No. 11-2393	FIGURE 2

GeoPacific Engineering, Inc.
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TEST PIT LOG

Project: Gateway Gardens
Portland, Oregon

Project No. 11-2393

Test Pit No. **TP- 1**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	4.5					Moderately organic, sandy SILT (OL-ML), trace subrounded cobbles, brown, fine roots throughout, loose, moist (Topsoil)
2	4.5					Very stiff, sandy SILT (ML), with subrounded cobbles, light brown, micaceous, trace roots in upper 4 feet, strong orange and gray mottling, trace black staining, moist (Willamette Formation - Fine Grained Facies)
3	4.5					
4	4.5					
5						
6						
7						Dense to very dense, sandy Gravel (GW) with subrounded cobbles, brown to gray, well graded, sand is coarse grained, moist (Willamette Formation - Coarse Grained Facies)
8						
9						
10						
11						
12						Test Pit Terminated at 12 Feet for Infiltration Testing.
13						
14						Note: No groundwater or seepage encountered.
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 9/26/11
Logged By: B. Rapp
Surface Elevation:

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Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

TEST PIT LOG

Project: Gateway Gardens Portland, Oregon	Project No. 11-2393	Test Pit No. **TP-2**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
0						Moderately organic, sandy SILT (OL-ML), trace subrounded cobbles, brown, fine roots throughout, loose, moist (Topsoil)
1						Very stiff, sandy SILT (ML), with subrounded cobbles, light brown, micaceous, trace black staining, moist (Willamette Formation - Fine Grained Facies)
2						Test Pit Terminated at 1 Foot for Infiltration Testing.
3						Note: No groundwater or seepage encountered.
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 9/26/11
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Gateway Gardens
Portland, Oregon

Project No. 11-2393

Test Pit No. **TP-3**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	4.5					Moderately organic, sandy SILT (OL-ML), trace cobbles, brown, moist (Topsoil)
2	4.5					Very stiff, sandy SILT (ML), with subrounded cobbles, light brown, micaceous, trace roots in upper 4 feet, strong orange and gray mottling, trace black staining, moist (Willamette Formation - Fine Grained Facies)
3						Test Pit Terminated at 2.25 Feet for Infiltration Testing.
4						Note: No groundwater or seepage encountered.
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 9/26/11
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Gateway Gardens Portland, Oregon	Project No. 11-2393	Test Pit No. **TP-4**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	4.5					Moderately organic, sandy SILT (OL-ML), trace subrounded cobbles, brown, fine roots throughout, loose, moist (Topsoil)
2	4.5					Very stiff, sandy SILT (ML), with subrounded cobbles, light brown, micaceous, trace fine roots, strong orange and gray mottling, trace black staining, moist (Willamette Formation - Fine Grained Facies)
3	4.5					
4	4.5					
5						
6						
7						
8						Dense to very dense, sandy Gravel (GW) with subrounded cobbles, brown to gray, well graded, sand is coarse grained, moist (Willamette Formation - Coarse Grained Facies)
9						
10						
11						
12						
13						Test Pit Terminated at 13 Feet for Infiltration Testing.
14						
15						Note: No groundwater or seepage encountered.
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 9/26/11
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Gateway Gardens Portland, Oregon	Project No. 11-2393	Test Pit No. **TP-5**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	4.5					Moderately organic, sandy SILT (OL-ML), trace cobbles, brown, moist (Topsoil)
2	4.5					Very stiff, sandy SILT (ML), with subrounded cobbles, light brown, micaceous, trace roots in upper 4 feet, strong orange and gray mottling, trace black staining, moist (Willamette Formation - Fine Grained Facies)
3						Test Pit Terminated at 2.5 Feet for Infiltration Testing.
4						
5						Note: No groundwater or seepage encountered.
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 9/26/11
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Gateway Gardens Portland, Oregon	Project No. 11-2393	Test Pit No. **TP-6**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1						Moderately organic, sandy SILT (OL-ML), trace subrounded cobbles, brown, fine roots throughout, loose, moist (Topsoil)
2						Very stiff, sandy SILT (ML), with subrounded cobbles, light brown, micaceous, trace black staining, moist (Willamette Formation - Fine Grained Facies)
3						Test Pit Terminated at 18 Inches for Infiltration Testing.
4						Note: No groundwater or seepage encountered.
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 9/26/11
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Gateway Gardens
Portland, Oregon

Project No. 11-2393

Test Pit No. **TP-7**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	4.5					Moderately organic, sandy SILT (OL-ML), trace subrounded cobbles, brown, fine roots throughout, loose, moist (Topsoil)
2	4.0					Very stiff, sandy SILT (ML), with subrounded cobbles, light brown, micaceous, trace fine roots, strong orange and gray mottling, trace black staining, moist (Willamette Formation - Fine Grained Facies)
3	4.0					
4	3.5					
5						Dense to very dense, Gravel with Sand (GW) and subrounded Cobbles, brown to gray, well graded, sand is medium to coarse grained, moist (Willamette Formation - Coarse Grained Facies)
6						
7						
8						
9						
10						Test Pit Terminated at 10 Feet.
11						
12						Note: No groundwater or seepage encountered.
13						
14						
15						
16						
17						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 9/26/11
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Gateway Gardens
Portland, Oregon

Project No. 11-2393

Test Pit No. **TP-8**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	4.0					Moderately organic, sandy SILT (OL-ML), trace subrounded cobbles, brown, fine roots throughout, loose, moist (Topsoil)
2	4.5					Very stiff, sandy SILT (ML), with subrounded cobbles, light brown, micaceous, trace fine roots, strong orange and gray mottling, trace black staining, moist (Willamette Formation - Fine Grained Facies)
3	4.5					
4	4.0					
5						
6						
7						Dense to very dense, Sandy Gravel (GW) with Cobbles, brown to gray, well graded, sand is coarse grained, moist (Willamette Formation - Coarse Grained Facies)
8						
9						
10						
11						Test Pit Terminated at 11 Feet.
12						
13						Note: No groundwater or seepage encountered.
14						
15						
16						
17						

LEGEND

Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 9/26/11
Logged By: B. Rapp
Surface Elevation:

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TEST PIT LOG

Project: Gateway Gardens
Portland, Oregon

Project No. 11-2393

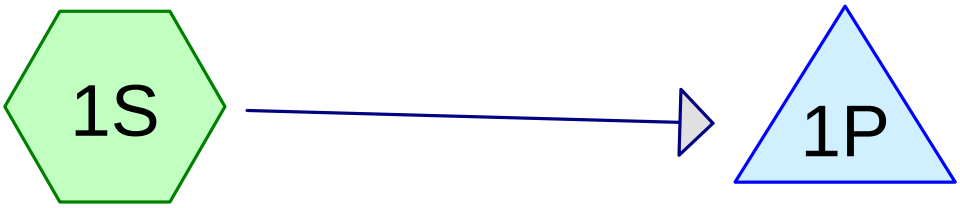
Test Pit No. **TP-9**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	4.5					Moderately organic, sandy SILT (OL-ML), trace subrounded cobbles, brown, fine roots throughout, loose, moist (Topsoil)
2	4.5					Very stiff, sandy SILT (ML), with subrounded cobbles, light brown, micaceous, trace fine roots, strong orange and gray mottling, trace black staining, moist (Willamette Formation - Fine Grained Facies)
3	4.5					
4	4.5					Dense to very dense, Sandy Gravel (GW) with Cobbles, brown to gray, well graded, sand is coarse grained, moist (Willamette Formation-Coarse Grained Facies)
5						
6						Test Pit Terminated at 5.5 Feet.
7						
8						Note: No groundwater or seepage encountered.
9						
10						
11						
12						
13						
14						
15						
16						
17						

LEGEND

Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 9/26/11
Logged By: B. Rapp
Surface Elevation:



Rose West Parking Lot

Exfiltration into Native Soil

Subcat Reach Pond Link

Drainage Diagram for Permeable Pvmt Infiltration
Prepared by Harris McMonagle Associates, Inc., Printed 4/16/2012

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.172	100	Parking lot permeable paving (1S)
0.172		**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.172	Other	1S
0.172		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Rose West Parking Lot Runoff Area=7,480 sf 100.00% Impervious Runoff Depth>2.58"
Flow Length=1' Slope=1.0000 '/' Tc=0.0 min CN=0/100 Runoff=0.14 cfs 0.037 af

Pond 1P: Exfiltration into Native Soil Peak Elev=295.48' Storage=1,443 cf Inflow=0.14 cfs 0.037 af
Outflow=0.00 cfs 0.004 af

Total Runoff Area = 0.172 ac Runoff Volume = 0.037 af Average Runoff Depth = 2.58"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.172 ac

Summary for Subcatchment 1S: Rose West Parking Lot

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

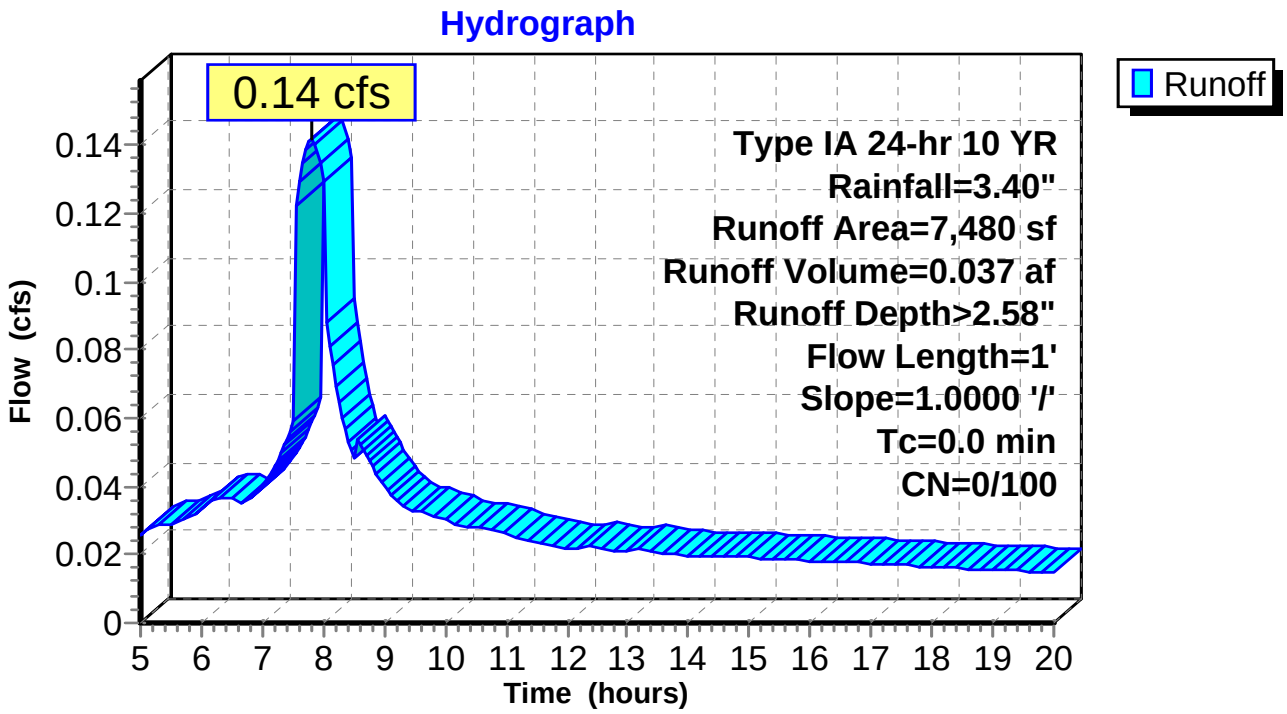
Runoff = 0.14 cfs @ 7.80 hrs, Volume= 0.037 af, Depth> 2.58"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 YR Rainfall=3.40"

	Area (sf)	CN	Description
*	7,480	100	Parking lot permeable paving
	7,480	100	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	1	1.0000	2.27		**Sheet Flow, Vertical flowrate to subgrade** Smooth surfaces n= 0.011 P2= 2.40"

Subcatchment 1S: Rose West Parking Lot



Hydrograph for Subcatchment 1S: Rose West Parking Lot

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
5.00	0.53	**0.00**	0.53	0.03
5.25	0.57	0.00	0.57	0.03
5.50	0.61	0.00	0.61	0.03
5.75	0.65	0.00	0.65	0.03
6.00	0.70	0.00	0.70	0.03
6.25	0.75	0.00	0.75	0.04
6.50	0.81	0.00	0.81	0.04
6.75	0.86	0.00	0.86	0.04
7.00	0.91	0.00	0.91	0.04
7.25	0.98	0.00	0.98	0.05
7.50	1.05	0.00	1.05	0.06
7.75	1.25	0.00	1.25	**0.14**
8.00	1.45	0.00	1.45	**0.13**
8.25	1.55	0.00	1.55	0.06
8.50	1.63	0.00	1.63	0.05
8.75	1.71	0.00	1.71	0.05
9.00	1.77	0.00	1.77	0.04
9.25	1.82	0.00	1.82	0.04
9.50	1.87	0.00	1.87	0.03
9.75	1.92	0.00	1.92	0.03
10.00	1.96	0.00	1.96	0.03
10.25	2.00	0.00	2.00	0.03
10.50	2.04	0.00	2.04	0.03
10.75	2.08	0.00	2.08	0.03
11.00	2.12	0.00	2.12	0.03
11.25	2.16	0.00	2.16	0.02
11.50	2.19	0.00	2.19	0.02
11.75	2.23	0.00	2.23	0.02
12.00	2.26	0.00	2.26	0.02
12.25	2.29	0.00	2.29	0.02
12.50	2.32	0.00	2.32	0.02
12.75	2.35	0.00	2.35	0.02
13.00	2.38	0.00	2.38	0.02
13.25	2.41	0.00	2.41	0.02
13.50	2.44	0.00	2.44	0.02
13.75	2.47	0.00	2.47	0.02
14.00	2.50	0.00	2.50	0.02
14.25	2.53	0.00	2.53	0.02
14.50	2.56	0.00	2.56	0.02
14.75	2.59	0.00	2.59	0.02
15.00	2.62	0.00	2.62	0.02
15.25	2.64	0.00	2.64	0.02
15.50	2.67	0.00	2.67	0.02
15.75	2.70	0.00	2.70	0.02
16.00	2.72	0.00	2.72	0.02
16.25	2.75	0.00	2.75	0.02
16.50	2.78	0.00	2.78	0.02
16.75	2.80	0.00	2.80	0.02
17.00	2.83	0.00	2.83	0.02
17.25	2.85	0.00	2.85	0.02
17.50	2.88	0.00	2.88	0.02
17.75	2.90	0.00	2.90	0.02
18.00	2.92	0.00	2.92	0.02
18.25	2.95	0.00	2.95	0.02
18.50	2.97	0.00	2.97	0.02
18.75	2.99	0.00	2.99	0.02
19.00	3.02	0.00	3.02	0.02
19.25	3.04	0.00	3.04	0.02
19.50	3.06	0.00	3.06	0.02
19.75	3.08	0.00	3.08	0.01
20.00	**3.10**	0.00	**3.10**	0.01

Summary for Pond 1P: Exfiltration into Native Soil

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.172 ac,100.00% Impervious, Inflow Depth > 2.58" for 10 YR event
Inflow = 0.14 cfs @ 7.80 hrs, Volume= 0.037 af
Outflow = 0.00 cfs @ 20.00 hrs, Volume= 0.004 af, Atten= 97%, Lag= 732.0 min
Primary = 0.00 cfs @ 20.00 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 295.48' @ 20.00 hrs Surf.Area= 7,452 sf Storage= 1,443 cf

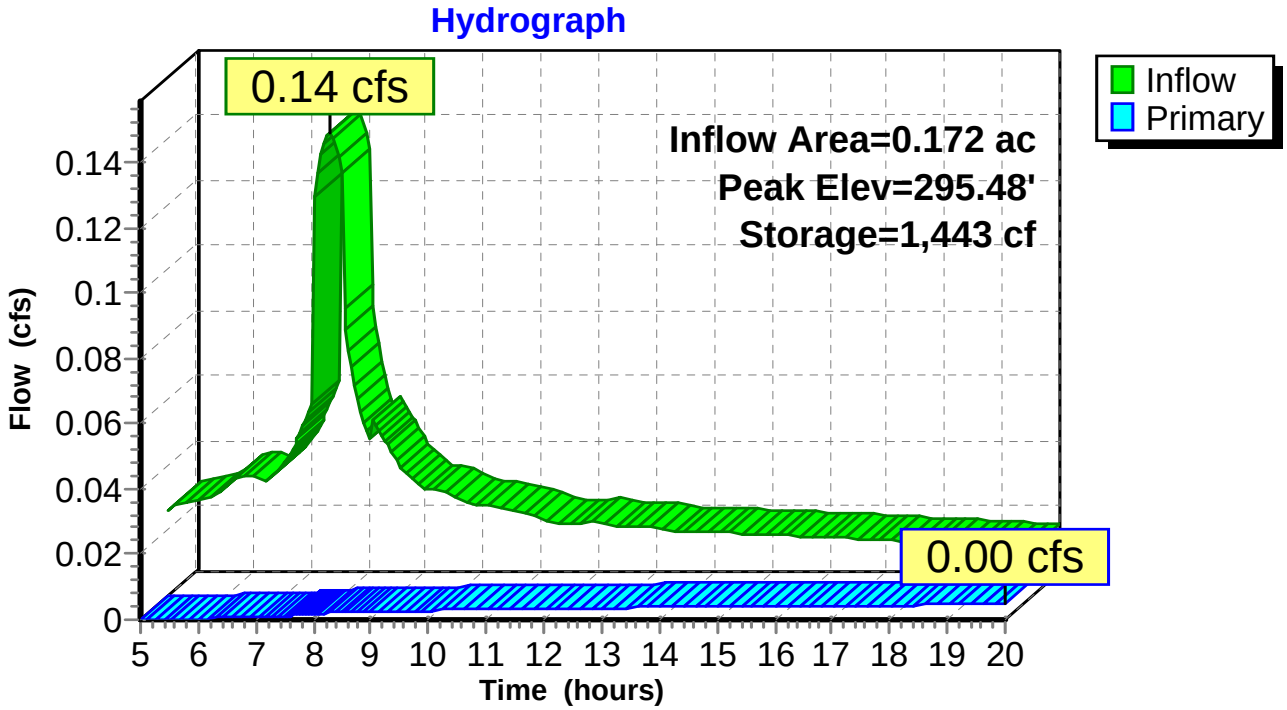
Plug-Flow detention time= 525.2 min calculated for 0.004 af (10% of inflow)
Center-of-Mass det. time= 222.3 min (863.5 - 641.2)

Volume	Invert	Avail.Storage	Storage Description
#1	295.00'	2,981 cf	**46.00'W x 162.00'L x 1.00'H Prismatoid** 7,452 cf Overall x 40.0% Voids

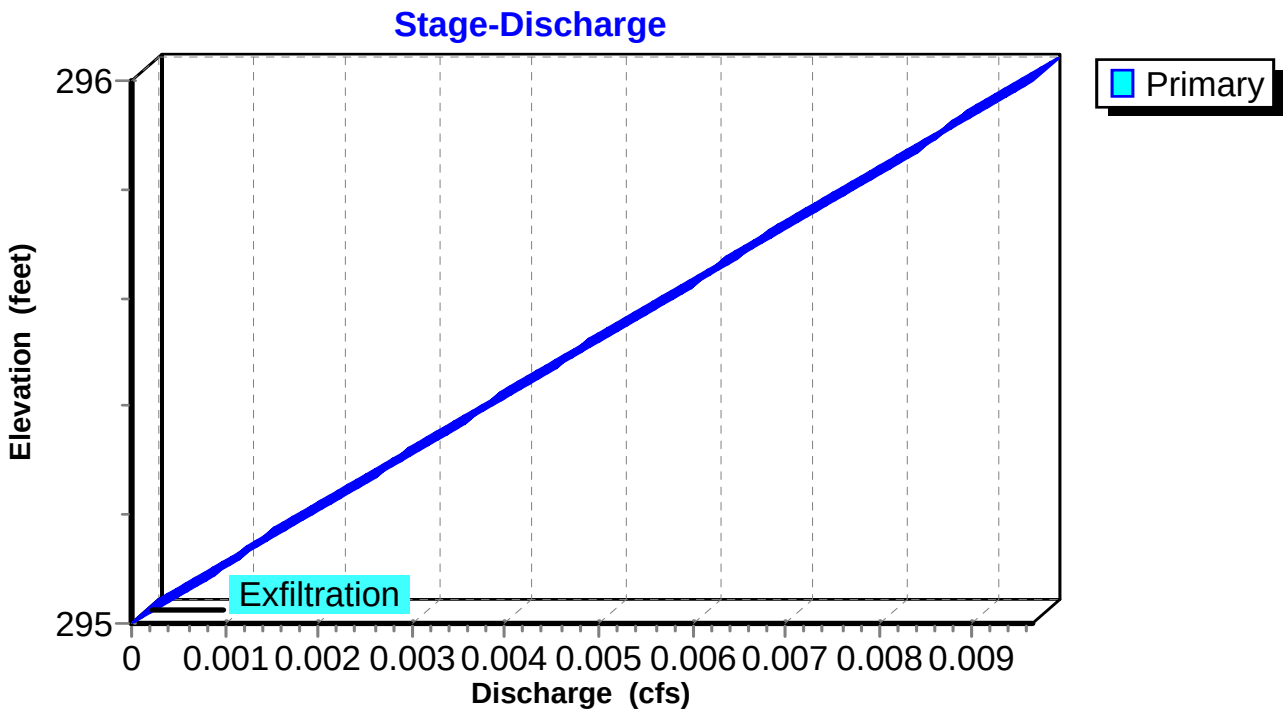
Device	Routing	Invert	Outlet Devices
#1	Primary	295.00'	**1.000 in/hr Exfiltration over Wetted area from 295.00' - 296.00'** Conductivity to Groundwater Elevation = 0.00' Excluded Wetted area = 7,452 sf

Primary OutFlow Max=0.00 cfs @ 20.00 hrs HW=295.48' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

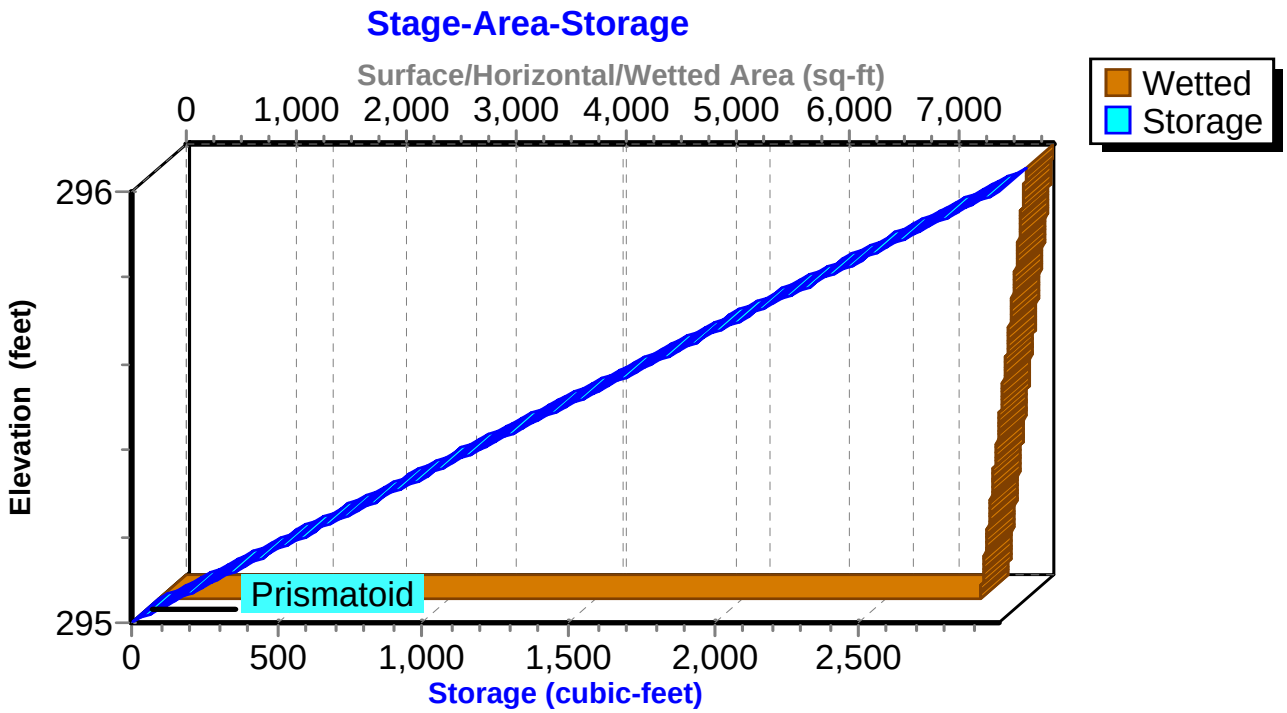
Pond 1P: Exfiltration into Native Soil



Pond 1P: Exfiltration into Native Soil



Pond 1P: Exfiltration into Native Soil



Hydrograph for Pond 1P: Exfiltration into Native Soil

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.03	2	295.00	0.00
5.50	0.03	53	295.02	0.00
6.00	0.03	107	295.04	0.00
6.50	0.04	172	295.06	0.00
7.00	0.04	236	295.08	0.00
7.50	**0.06**	322	295.11	0.00
8.00	**0.13**	556	295.19	0.00
8.50	0.05	677	295.23	0.00
9.00	0.04	758	295.25	0.00
9.50	0.03	818	295.27	0.00
10.00	0.03	870	295.29	0.00
10.50	0.03	916	295.31	0.00
11.00	0.03	959	295.32	0.00
11.50	0.02	999	295.33	0.00
12.00	0.02	1,033	295.35	0.00
12.50	0.02	1,067	295.36	0.00
13.00	0.02	1,099	295.37	0.00
13.50	0.02	1,131	295.38	0.00
14.00	0.02	1,160	295.39	0.00
14.50	0.02	1,189	295.40	0.00
15.00	0.02	1,217	295.41	0.00
15.50	0.02	1,244	295.42	0.00
16.00	0.02	1,270	295.43	0.00
16.50	0.02	1,295	295.43	0.00
17.00	0.02	1,319	295.44	0.00
17.50	0.02	1,342	295.45	0.00
18.00	0.02	1,364	295.46	0.00
18.50	0.02	1,385	295.46	0.00
19.00	0.02	1,406	295.47	0.00
19.50	0.02	1,425	295.48	0.00
20.00	0.01	**1,443**	**295.48**	**0.00**

Stage-Discharge for Pond 1P: Exfiltration into Native Soil

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
295.00	0.00	295.59	0.01
295.01	0.00	295.60	0.01
295.02	0.00	295.61	0.01
295.03	0.00	295.62	0.01
295.04	0.00	295.63	0.01
295.05	0.00	295.64	0.01
295.06	0.00	295.65	0.01
295.07	0.00	295.66	0.01
295.08	0.00	295.67	0.01
295.09	0.00	295.68	0.01
295.10	0.00	295.69	0.01
295.11	0.00	295.70	0.01
295.12	0.00	295.71	0.01
295.13	0.00	295.72	0.01
295.14	0.00	295.73	0.01
295.15	0.00	295.74	0.01
295.16	0.00	295.75	0.01
295.17	0.00	295.76	0.01
295.18	0.00	295.77	0.01
295.19	0.00	295.78	0.01
295.20	0.00	295.79	0.01
295.21	0.00	295.80	0.01
295.22	0.00	295.81	0.01
295.23	0.00	295.82	0.01
295.24	0.00	295.83	0.01
295.25	0.00	295.84	0.01
295.26	0.00	295.85	0.01
295.27	0.00	295.86	0.01
295.28	0.00	295.87	0.01
295.29	0.00	295.88	0.01
295.30	0.00	295.89	0.01
295.31	0.00	295.90	0.01
295.32	0.00	295.91	0.01
295.33	0.00	295.92	0.01
295.34	0.00	295.93	0.01
295.35	0.00	295.94	0.01
295.36	0.00	295.95	0.01
295.37	0.00	295.96	0.01
295.38	0.00	295.97	0.01
295.39	0.00	295.98	0.01
295.40	0.00	295.99	0.01
295.41	0.00	296.00	**0.01**
295.42	0.00		
295.43	0.00		
295.44	0.00		
295.45	0.00		
295.46	0.00		
295.47	0.00		
295.48	0.00		
295.49	0.00		
295.50	0.00		
295.51	0.00		
295.52	0.01		
295.53	0.01		
295.54	0.01		
295.55	0.01		
295.56	0.01		
295.57	0.01		
295.58	0.01		

Stage-Area-Storage for Pond 1P: Exfiltration into Native Soil

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
295.00	7,452	0
295.01	7,456	30
295.02	7,460	60
295.03	7,464	89
295.04	7,469	119
295.05	7,473	149
295.06	7,477	179
295.07	7,481	209
295.08	7,485	238
295.09	7,489	268
295.10	7,494	298
295.11	7,498	328
295.12	7,502	358
295.13	7,506	388
295.14	7,510	417
295.15	7,514	447
295.16	7,519	477
295.17	7,523	507
295.18	7,527	537
295.19	7,531	566
295.20	7,535	596
295.21	7,539	626
295.22	7,544	656
295.23	7,548	686
295.24	7,552	715
295.25	7,556	745
295.26	7,560	775
295.27	7,564	805
295.28	7,568	835
295.29	7,573	864
295.30	7,577	894
295.31	7,581	924
295.32	7,585	954
295.33	7,589	984
295.34	7,593	1,013
295.35	7,598	1,043
295.36	7,602	1,073
295.37	7,606	1,103
295.38	7,610	1,133
295.39	7,614	1,163
295.40	7,618	1,192
295.41	7,623	1,222
295.42	7,627	1,252
295.43	7,631	1,282
295.44	7,635	1,312
295.45	7,639	1,341
295.46	7,643	1,371
295.47	7,648	1,401
295.48	7,652	1,431
295.49	7,656	1,461
295.50	7,660	1,490
295.51	7,664	1,520
295.52	7,668	1,550
295.53	7,672	1,580
295.54	7,677	1,610
295.55	7,681	1,639
295.56	7,685	1,669
295.57	7,689	1,699
295.58	7,693	1,729
295.59	7,697	1,759
295.60	7,702	1,788
295.61	7,706	1,818
295.62	7,710	1,848
295.63	7,714	1,878
295.64	7,718	1,908
295.65	7,722	1,938
295.66	7,727	1,967
295.67	7,731	1,997
295.68	7,735	2,027
295.69	7,739	2,057
295.70	7,743	2,087
295.71	7,747	2,116
295.72	7,752	2,146
295.73	7,756	2,176
295.74	7,760	2,206
295.75	7,764	2,236
295.76	7,768	2,265
295.77	7,772	2,295
295.78	7,776	2,325
295.79	7,781	2,355
295.80	7,785	2,385
295.81	7,789	2,414
295.82	7,793	2,444
295.83	7,797	2,474
295.84	7,801	2,504
295.85	7,806	2,534
295.86	7,810	2,563
295.87	7,814	2,593
295.88	7,818	2,623
295.89	7,822	2,653
295.90	7,826	2,683
295.91	7,831	2,713
295.92	7,835	2,742
295.93	7,839	2,772
295.94	7,843	2,802
295.95	7,847	2,832
295.96	7,851	2,862
295.97	7,856	2,891
295.98	7,860	2,921
295.99	7,864	2,951
296.00	**7,868**	**2,981**