OR126B & McVAY HWY: MISSISSIPPI AVE – UPRR TRACKS (PHASE 1) Stormwater Management Plan

PREPARED FOR: City of Springfield; Oregon Department of Transportation

COPY TO: Steve Katko/CH2M

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PROJECT NUMBER: 656986

REVISION NO.: 0

APPROVED BY: Richard Attanasio/CH2M

Introduction

As part of the Glenwood Refinement Plan, roadway improvements, including increased parking and a multi-use path adjacent to the road, are planned on Franklin Boulevard, also known as Oregon Highway 126 (OR 126) soon to be annexed into Springfield, Oregon. Attachment A shows a map of the project area. Stormwater management facilities are planned to treat runoff from the new and reconstructed impervious surfaces resulting from this project. The proposed stormwater management plan is outlined below.

A. Project Description

Franklin Blvd is highly industrialized and provides the main transportation link between Eugene and Springfield and the intent of the project is to improve this link for drivers, bicyclists and pedestrians. To do this, improvements to the roadway are planned as well as increased parking, and continuous bicycle and pedestrian facilities. Two roundabouts are to be located along this stretch of road near Oregon-Highway 225, also known as McVay Highway. The two roundabouts are positioned at project locations Eastbound 116+00 and 119+00 (OR 126).

Enhanced stormwater management will accompany the new and redeveloped impervious surface area resulting from the project, using Low Impact Development Approaches (LIDA) stormwater infiltration planters and infiltration rain gardens, in accordance with the guidance in the Glenwood refinement Plan.

B. Stormwater Quality Design Standards

Stormwater quality design standards for the LIDA alternatives were implemented from the Springfield Engineering Design Standards and Procedures Manual (EDSPM) with reference to the Eugene Stormwater Management Manual (SWMM) for the facility design standards. The project and stormwater facilities will be owned and maintained by the City of Springfield.

Because this project falls within the Glenwood Refinement Plan boundary, each stormwater facility must capture and retain on-site the first one inch of rainfall in a 24-hour period using LIDA. In addition, the water quantity control design goal, using EDSPM guidelines, is to maximize the amount of runoff infiltrated to the greatest extent practicable, taking into account site limitations such as

soil type and lot size and configuration. Treatment will be provided for all impervious area affected by the project.

C. Stormwater Capacity Design Standards

Stormwater capacity design standards for conveyance followed guidance from the EDSPM. This includes sizing inlets to accept flow from a 10 year storm event. As both McVay Highway and OR 126 are classified as minor arterial streets, inlets are to be located to ensure that the spread shall not run deeper than 4 inches against a curb nor extend more than 2 feet into the travel lane for flows from the 10 year storm event. Pipes are to be 12 inches in diameter and maintain a minimum velocity of 3 feet per second with a Manning's *n*-value equal to 0.012. Combination gutter-curb inlets are used where possible, except around the roundabout island where there is a mountable curb and grate inlets will be used.

LIDA facilities have been designed to retain runoff from the 25-year event. The 25-year event will be infiltrated within 24 hours. Runoff in excess of the 25-year event will occupy freeboard volume within the facilities. Once the freeboard volume is exhausted storage of excess runoff will be through surface ponding.

Setting

A. Water Resources

Stormwater generated from the modifications and additions of impervious surface is treated and infiltrated into the groundwater.

Projects located in floodplain areas, generally described as the 100-year floodplain, have the potential to raise flood levels and increase floodplain area, posing a risk to adjacent property and habitats, due to project fill material placed within floodplain limits. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) inventory flood zones. The maps covering the project site, located in Attachment B, indicates that the project site is not located in the FEMA 100-year flood plain. The project is not expected to impact the existing FEMA floodplain area.

B. Affected Area

Proposed roadway improvements will add new and redeveloped impervious surface area. Stormwater runoff, especially from large storm events, will collect roadway contaminants and increase runoff volume and peak flow rate. This can lead to a deterioration of water quality and pose a risk to the aquatic habitat and natural environment. Using Springfield's EDSPM as guidance, runoff from the total project area up to the 25-year event will be controlled and treated prior to infiltration. Because of these measures, no negative impact to receiving waterways is expected.

C. Climate

The Natural Resource Conservation Service (NRCS) (formerly Soil Conservation Service, SCS) classifies storm rainfall distribution in the project vicinity as Type IA. Total precipitation amounts are available from the Springfield EDSPM. The precipitation amounts are described in Table 1.

Table 1Total Precipitation for Type 1A 24-Hour Storm Events for Springfield, Oregon

| Storm Event | Precipitation (in) |
|-----------------|--------------------|
| Water Quality * | 1.0 |
| 2-year | 3.3 |
| 5-year | 3.8 |
| 10-year | 4.3 |
| 25-year | 4.8 |
| 100-year | 5.2 |

^{*} Specific to Glenwood Refinement Project

D. Soils

NRCS Soil Survey

Soils south and east of the project are primarily composed of gravelly sandy loam or fine sandy loam in hydrologic soil group A, which exhibits high infiltration rates even when thoroughly wet. Soils north of the project are primarily composed of silt loam in hydrologic soil group B with moderate infiltration rates. See Attachment C for the soil maps and soil descriptions, acquired through the NRCS Web Soil Survey (WSS).

Infiltration Testing

Infiltration rate testing was completed using the *open pit falling head* method, following the procedure laid out in Eugene's SWMM. Three locations were tested. The results are summarized in Table 2 with the Infiltration Test Results Discussion and Illumination Pole Foundation Recommendations Design Memorandum is contained in Attachment D.

Table 2 *Infiltration Test Results*

| Location | Infiltration Rate (in/hr) |
|----------|---------------------------|
| B2 | 7.2 |
| В7 | >1000 gal/hr |
| B10 | 0.6 |

Stormwater Management

A. Existing Drainage

The existing Franklin Blvd is crowned and runoff sheet flows into grate inlets or curb inlets along the edge of the roadway where it enters the stormwater sewer main. The gravity main runs along the roadway and generally slopes east to west. The discharge location of the existing storm system is unclear; it may discharge to the Willamette River at some point or it may discharge to drywells.

B. Proposed Drainage

The proposed drainage systems will collect stormwater runoff that sheet flows from the crown of the road and radially from the roundabout shoulder to the center in the project areas. Runoff will be collected and infiltrated in planters and rain gardens. Runoff will enter planters through curb cut inlets. Drainage to rain gardens will be collected by an enclosed stormwater system flowing through a pollution control manhole prior to entering the rain garden. Pervious concrete pavement will be used in the access road on the north side of the project. The two possible treatment facilities are described below.

Inlet Placement

Both McVay Highway and OR 126 are classified as minor arterial streets. Following the EDSPM, most inlets have been located to ensure that the spread shall not run deeper than 4 inches against a curb nor extend more than 2 feet into the travel lane for flows from the 10 year storm event.

Due to the configuration of the road and placement of the planters, there are a few cases where the spread extends more than 2 feet into the travel lane. The proximity of the traveled way to the curb precludes the use of a depressed gutter section at the curb cuts, since it would adversely affect ride quality. Larger spread occur in locations where the first curb cut of a planter collects flow from a large area that cannot be captured elsewhere. While measures have been taken to reduce the flow to the first curb cut of a planter, such as increasing the number of curb cuts in a planter upstream so as to minimize the bypass, in some cases these efforts could not completely mitigate the flow. For example, as shown in Figure 1, PA-8 collects direct runoff from over 2,500 sf of roadway. This flow cannot be reduced as there is a driveway upstream of the planter. Bypass flows from PA-9 and PA-10 have been minimized so as to not exacerbate the spread at PA-8 and similar locations.

The recurrence interval for the design is 10-year for on-grade inlets and 25-year for local sag point inlets as described in the EDSPM. See Attachment E for pipe conveyance and inlet spacing calculations.

Pervious Concrete

Pervious concrete pavement will be used in the access road on the north side of OR126 from WB 210+22 to 214+31, following guidance from the SWMM. Using a pervious surface on the 7,344 sf of access road will allow rainfall to immediately filter into the pavement. The proposed pervious concrete will be 9" thick with a 12" open graded aggregate base for storage before infiltration. This reduces the overall amount of impervious area within the project limits.

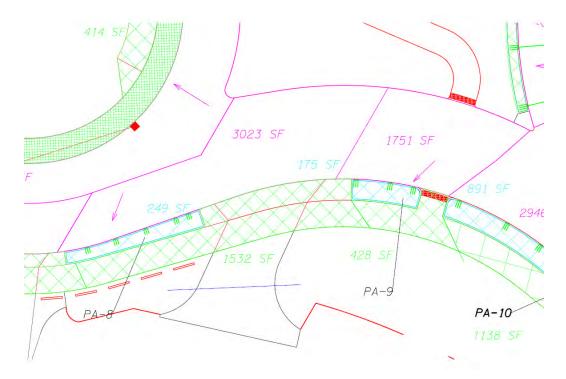


Figure 1 – The first curb cut in Planter PA-8 collects runoff from over 2,500 sf upstream. Bypass flow from Planters PA-10 and PA-9 have been minimized and two curb cuts are placed as far upstream as possible to mitigate the spread into the travel lane.

C. Water Quality

Water quality has the potential to be impacted by project execution. Construction activities are temporary in nature and can negatively affect water quality. Sedimentation from ground disturbance, such as grading and filling operations and clearing activities, as well as spills of fuel and oil or other chemicals from machinery equipment or construction materials are typical examples of potential construction impacts. Discharges of these pollutants to surface waters from construction activities and accidents (especially when carried by runoff from storm events) are potentially significant impacts. These risks are short-term, and will cease upon completion of the project.

Operation and maintenance activities associated with the new roadway surfaces pose a risk to water quality. Common pollutants from roadway activity and infrastructure consist of suspended solids, polycyclic aromatic hydrocarbons (whether leaked directly or through emissions air deposited), heavy metals (such as zinc, copper, iron), and lubricants (grease and oils). When carried by stormwater runoff to receiving waterways, this negatively impacts water quality and poses risk to the environment and aquatic organisms.

The water quality treatment requirement, as directed by EDSPM guidelines and Glenwood Refinement Plan, is to capture and retain on-site a minimum of 1 inch of rainfall in a 24-hour period using on-site LIDA systems. All facilities are designed in accordance with Eugene's SWMM with a few variances described in a memo sent to and approved by the City of Springfield and summarized in Table 3. The full memo can be found in Attachment F. Where feasible, facilities are designed with a 10% extra capacity. All will allow full infiltration of the 25-year storm event within 24 hours.

Treatment will be provided for nearly all the developed project impervious area by directing runoff to one of a number of planters and rain gardens for full infiltration into the ground. These facilities are identified in Attachment G and described below. Impervious area on the far west end of the project where it ties into the existing OR 126 roadway will be directed to inlets connected to the existing storm sewer. See Attachment G for facility sizing calculations.

Table 3
Variances From City of Eugene's SWMM

| City of Eugene SWMM Criteria | Proposed Design | Rationale |
|---|--|---|
| "Planters located next to public sidewalks or curbs shall have a minimum 12 inch-wide flat area between the planter wall and the sidewalk or curb." (from 2.3.11) | There will be no distinct "flat area" separating planter and sidewalk. | SWMM is not clear on this requirement. No separation is shown in the SWMM standard details for stormwater planters. Additionally, edge protection, as a curb, will be provided adjacent to bike and pedestrian paths. Adjoining sidewalks are also 10-feet wide, which provides additional protection over standard sidewalk widths. The additional treatment area is necessary to provide the requisite storage within the right-of-way. |
| Infiltration Rain garden "storage depth shall be no more than 12 inches." (2.3.9) | Two rain gardens will have 24" storage depth. One rain garden will have a storage depth of 25" | All rain gardens are designed to fully infiltrate the 25-year storm event. A 12-inch or less depth would require and overflow structure that would require a new stormwater outfall to the river. Increasing their depth also provides for a centralized location to treat the stormwater runoff, thus reducing the number of required rain gardens. |
| No maximum total depth is explicitly required, however Eugene details imply a maximum of 14-inches. (Appendix B) | Selected rain gardens will be 4-feet deep. | This is necessary to allow areas of the roadway to be piped to the rain gardens, thus again allowing for the centralized treatment of the stormwater runoff. Otherwise the runoff around the truck aprons, for example could not be conveyed to a site for treatment. |

Infiltration Rain Gardens

Three rain gardens are planned to collect and treat stormwater before allowing full infiltration into the ground. Prior to entering each rain garden, runoff will pass through a pollution control manhole.

Rain Garden 1 (RG-1)

A rain garden is proposed in the center of the Brooklyn Street Roundabout. Runoff from the travel lanes surrounding the roundabout will be directed into inlets and piped to the rain garden. Though the total depth is four feet, the storage depth of the rain garden (potential depth of the water) will be 24". A total of 11,295 sf of runoff will be treated and infiltrated in RG-1. The facility is sized for an additional 6% capacity.

Rain Garden 2 (RG-2)

A second rain garden is proposed in the center of the McVay Highway Roundabout. Runoff from the travel lanes surrounding the roundabout will be directed into inlets and piped to the rain garden. Though the total depth is four feet, the storage depth of the rain garden will be 24". A total of 20,933 sf will be treated and infiltrated in RG-2. RG-2 is sized for an additional 10% capacity.

Rain Garden 3 (RG-3)

A third rain garden is proposed in southeast of the McVay Highway Roundabout. Runoff from the travel lanes along the southeast side of the roundabout will be directed into inlets and piped to the rain garden. Though the total depth is four feet, the storage depth of the rain garden will be 24". A total of 32,807 sf will be treated and infiltrated in RG-3. RG-3 is sized for an additional 10% capacity.

Stormwater Planters

The remaining impervious area will be treated by one of thirteen total stormwater planters. Eleven will have 12" ponding depth, two will have a 9" ponding depth, and one will have 7" of ponding depth. The two with 9" ponding depth have relatively large amounts of space available for the corresponding impervious area compared to the deeper planters. The planter with 7" ponding depth is composed of three sub-planters that will be hydraulically connected to allow flow to reach hydraulic equilibrium and be fully treated.

12" Stormwater Planters (PA-X)

Eleven stormwater planters with a storage depth of 12" are proposed throughout the project. Runoff will flow into these planters via curbcuts. The number of curbcuts has been optimized with as few openings as possible to meet the spread limitations where feasible. A total of 47,801 sf will be treated and infiltrated into 12" planters. Planters are sized for an additional 10% capacity except as noted below and in Table 4.

PA-3

Planter PA-3 is designed to treat 8,970 sf of runoff with a storage depth of 12.3" for the 25-year storm event. Additional runoff (via bypass flows) has been minimized however due to the configuration of the roadway and sideway, notably the bus stop just east of the planter and its location in a sag, the required storage depth must be greater than 12". This planter does not have additional capacity. Full infiltration is expected to occur within 24 hours.

PA-7 and PA-8

Planter PA-8 is designed to treat 2,700 sf of runoff for the 25-year storm event. However, approximately 4,500 sf of runoff is expected to drain to that planter. The additional runoff will drain as bypass flow to PA-7. In additional to bypass runoff from PA-8, PA-7 is sized with an additional 10%

capacity and will treat the full amount with a 12" storage depth. Full infiltration is expected within 24 hours.

PA-2 and PA-9

Planters PA-2 and PA-9 are designed with no additional capacity.

9" Stormwater Planters (PB-X)

Two stormwater planters with a storage depth of 9" are proposed the project. The planter in the median, west of the left-turn lane onto Brooklyn St. is divided into sub-planters so that the requirements for illumination and tree plantings can also be met. Runoff will flow into these planters via curbcuts. The number of curbcuts has been optimized with as few openings as possible to meet the spread limitations where feasible. A total of 10,527 sf will be treated and infiltrated into 12" planters.

7" Stormwater Planters (PC-X)

One stormwater planter with a storage depth of 7" is proposed in the median, east of the left turn lane onto Brooklyn St. The planter will be divided into sub-planters so that the requirements for illumination and tree plantings can also be met. The sub-planters will be of varying depth with respect to the top of curb but the elevation of the treatment media will be consistent at 440.95 ft in all three sub-planters. Runoff will flow into these planters via curbcuts and a V-cut ditch connected to PC-1A. This V-cut will accept runoff from the westbound left turn lane as well as the eastbound roadway and drain it to planter PC-1A. The sub-planters will be hydraulically connected by two 12" pipes, one between PC-1A and PC-1B and one between PC-1B and PC-1C. This will allow the water to freely flow between the sub-planters and allow full infiltration. The number of curbcuts has been optimized with as few openings as possible to meet the spread limitations where feasible. A total of 10,917 sf will be treated and infiltrated into the 7" sub-planters.

Table 4 *Summary of Stormwater Treatment Facilities*

| Facility ID | Contributing Surface Area (sf) | Facility Bottom Area* (sf) | Facility Storage Depth (in) |
|-------------|--------------------------------------|----------------------------------|-----------------------------------|
| PA-1 | 1,447 | 190 | 12.0 |
| PA-2 | 3,543 | 300 [†] | 12.0 |
| PA-3 | 8,970† | 741 [†] | 12.3 |
| PA-4 | 5,234 | 762 | 12.0 |
| PA-5 | 3,085 | 821 | 12.0 |
| PA-6 | 951 | 290 | 12.0 |
| PA-7 | 6,293 | 659 | 12.0 |
| PA-8 | 2,700 | 219 [†] | 12.0 |
| PA-9 | 2,170 | 175 [†] | 12.0 |
| PA-10 | 6,069 | 891 | 12.0 |
| PA-11 | 6,653 | 699 | 12.0 |
| PB-1 | 10,527 | 2,027 | 9.0 |
| PB-2 | 3,124 | 316 | 9.0 |
| PC-1 | 10,917 | 1,215 | 7.0 |
| RG-1 | 11,295 | 333± | 24.0 |
| RG-2 | 20,933 | 1,054 | 24.0 |
| RG-3 | 32,807 | 1,416 | 24.0 |

^{*} Sized for 10% additional capacity except where noted

Filterra®

There are three locations throughout the project that, due to limited right-of-way, space for stormwater planters is not available. In those locations, runoff will be treated with a Filterrra® bioretention treatment system. In this system, runoff drains from the roadway to a curb-inlet and flows through a treatment media contained in a vault-like container. The treated water flows to a drywell where it will infiltrate into the soils below. The locations and treated areas are summarized in Table 5. A total of 19,835 sf will be treated by a Filterra system and infiltrated through a drywell.

[†] Not sized for additional capacity

[±] Sized for 6% additional capacity

Table 5Summary of Filterra Bioretention Systems

| Facility ID | Location | Contributing Surface Area (sf) | Facility Size |
|-------------|--------------|--------------------------------------|---------------|
| Filterra 1 | WB 209+28.90 | 4,674 | 4'x4' |
| Filterra 2 | EB 108+09.86 | 8,790 | 8'x4' |
| Filterra 3 | MCV 24+88.35 | 4,953 | 4'x12' |

D. Spill Response

As with any public system operations is required to have a spill response plan. Any potential contaminants released will flow to the planters and rain gardens. This may necessitate removal and replacement of the growing medium depending on the type and quality of the potential contaminant. A Spill Response Form is contained in Attachment H.

Summary

Proposed roadway improvements will add new and redeveloped impervious surface area to Franklin Blvd. Stormwater generated by the increased new impervious area will produce increased runoff volume and peak flow rate that will all be infiltrated up to the 25-year event. The stormwater will also pick up roadway contaminants and pollutants that will be treated prior to infiltration. Using Springfield's EDSPM and the Eugene Stormwater Management Manual as a guidance documents, the runoff will be controlled, treated and infiltrated meeting all applicable regulations. As a result of the measures described in this memorandum, no negative impact to receiving waterways is expected.

References

City of Eugene. 2014. Stormwater Management Manual.

City of Springfield. 2012. Engineering Design Standards and Procedures.

City of Springfield. 2014. Glenwood Refinement Plan.

Contech Engineered Solutions. 2016. Filterra® Bioretention System Solutions Guide.

Federal Emergency Management Agency (FEMA). *Flood Map Service Center*. Available online at https://msc.fema.gov/portal/. Accessed 08/12/2015.

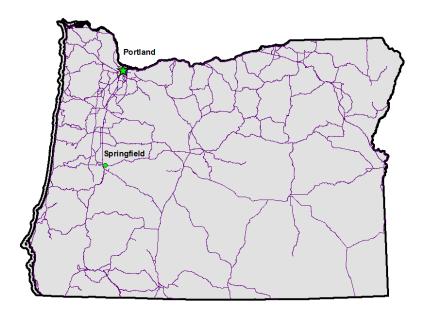
Oregon Department of Transportation (ODOT). 2014. Hydraulics Manual.

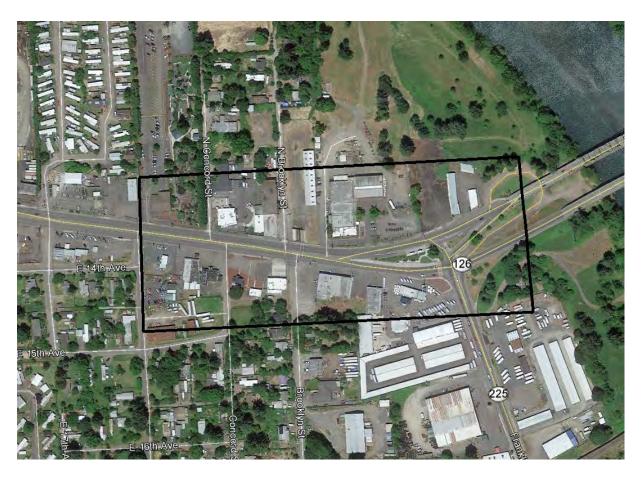
Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. *Web Soil Survey*. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed 08/12/2015.

| STORMWATER MANAGEMENT TECHNICAL MEMORA | NDUM | |
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Attachment A

Project Vicinity Map



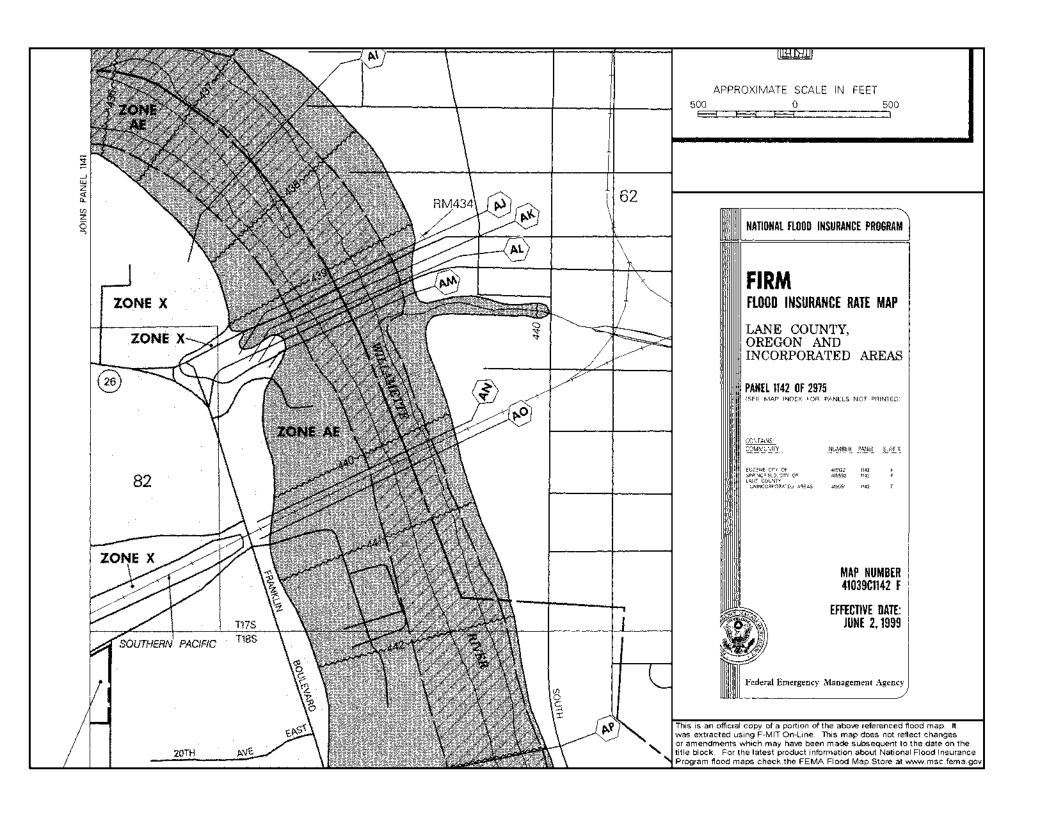


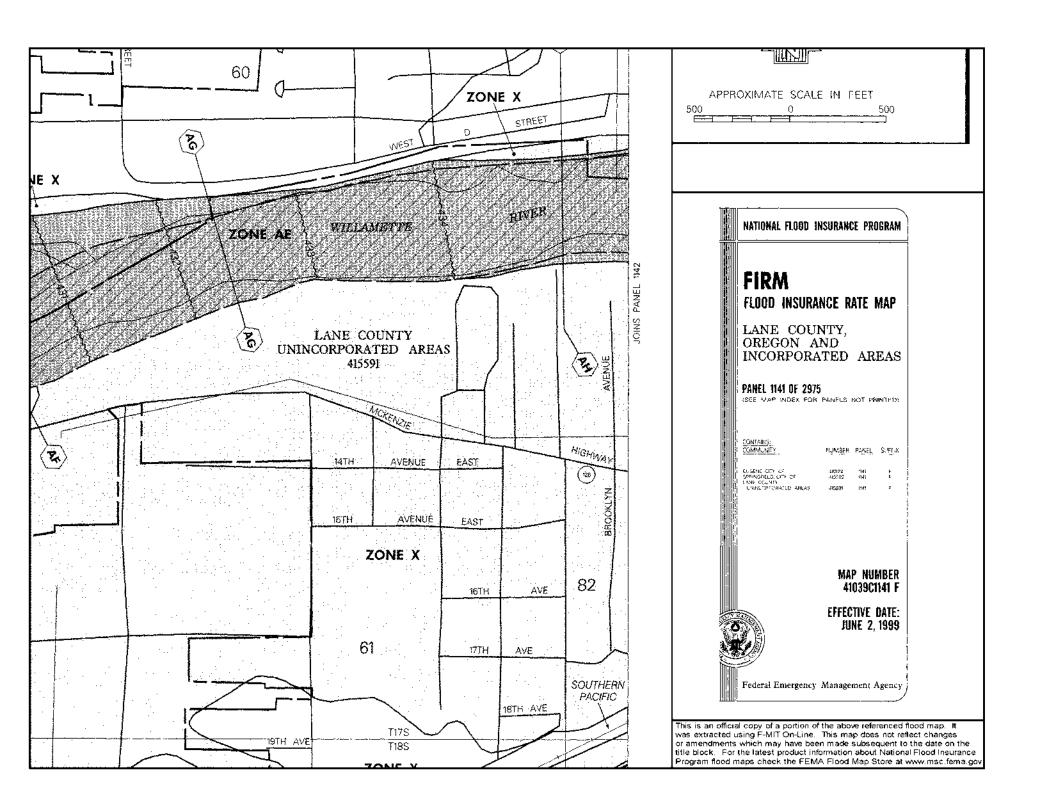
Attachment A
Project Vicinity Map

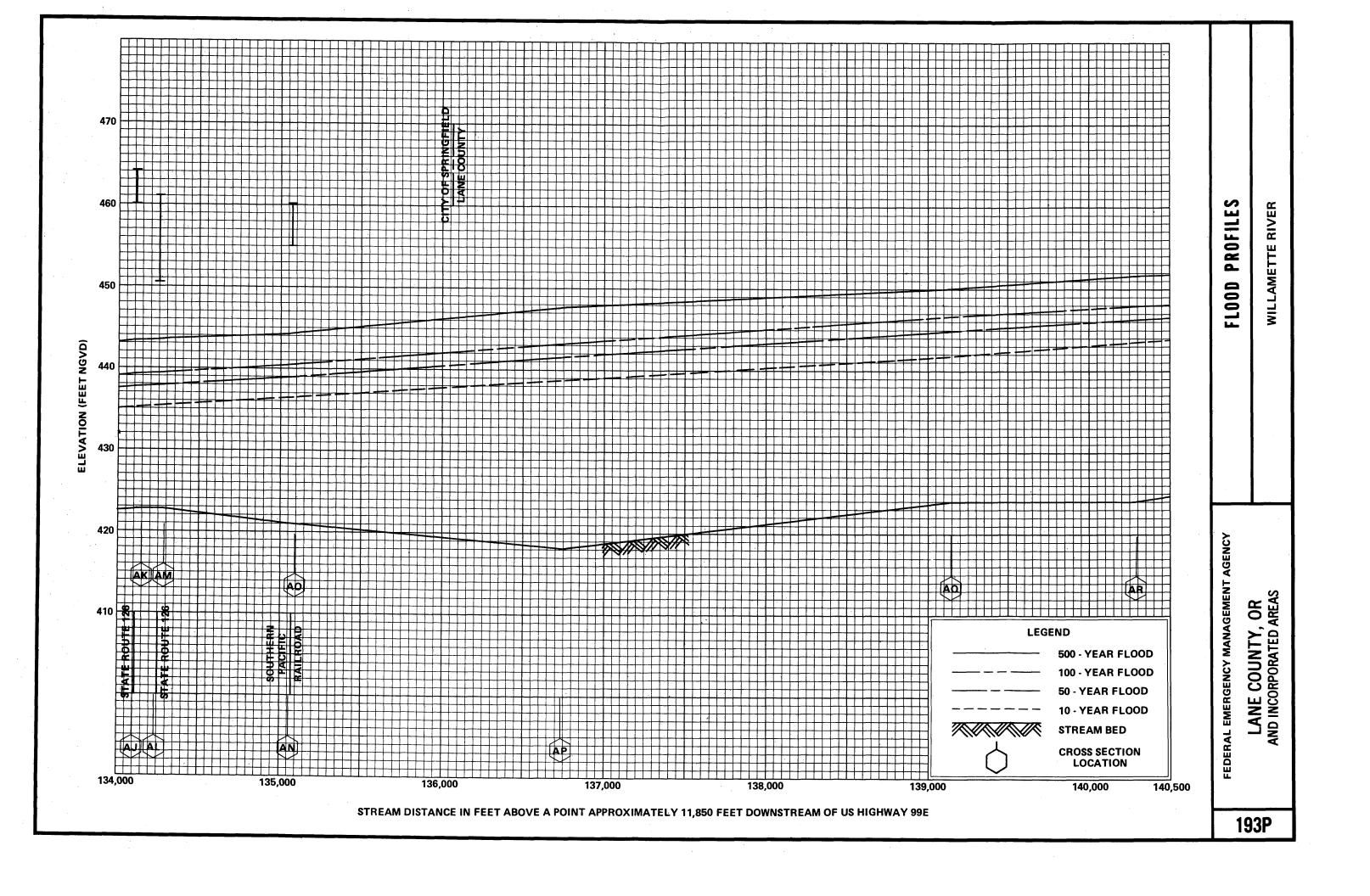


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Attachment B







Attachment C

NRCS Web Soil Survey Map and Soil Type Descriptions



Attachment C NRCS Soil Survey Map



Lane County Area, Oregon

23—Camas-Urban land complex

Map Unit Setting

National map unit symbol: 235y Elevation: 400 to 1,200 feet

Mean annual precipitation: 40 to 60 inches Mean annual air temperature: 52 to 54 degrees F

Frost-free period: 165 to 210 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Camas and similar soils: 50 percent

Urban land: 40 percent

Estimates are based on observations, descriptions, and transects of the

mapunit.

Description of Camas

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Sandy and gravelly alluvium

Typical profile

H1 - 0 to 14 inches: gravelly sandy loam H2 - 14 to 60 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 9 to 17 inches to strongly contrasting

textural stratification

Natural drainage class: Excessively drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98

to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare Frequency of ponding: None

Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): 4w Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A

Other vegetative classification: Well drained < 15% Slopes

(G002XY002OR)

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 8

Data Source Information

Soil Survey Area: Lane County Area, Oregon Survey Area Data: Version 11, Sep 15, 2014

Lane County Area, Oregon

30—Cloquato-Urban land complex

Map Unit Setting

National map unit symbol: 2367 Elevation: 300 to 800 feet

Mean annual precipitation: 40 to 60 inches Mean annual air temperature: 52 to 54 degrees F

Frost-free period: 165 to 210 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Cloquato and similar soils: 45 percent

Urban land: 40 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cloquato

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Alluvium from mixed sources

Typical profile

H1 - 0 to 14 inches: silt loam H2 - 14 to 50 inches: silt loam

H3 - 50 to 60 inches: stratified sand to silt loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat):

Moderately high to high (0.57 to 1.98 in/hr) Depth to water table: More than 80 inches

Frequency of flooding: Occasional Frequency of ponding: None

Available water storage in profile: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B

Other vegetative classification: Well drained < 15% Slopes

(G002XY002OR)



Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 8

Data Source Information

Soil Survey Area: Lane County Area, Oregon Survey Area Data: Version 11, Sep 15, 2014

Lane County Area, Oregon

97—Newberg-Urban land complex

Map Unit Setting

National map unit symbol: 239x Elevation: 300 to 850 feet

Mean annual precipitation: 40 to 60 inches Mean annual air temperature: 52 to 54 degrees F

Frost-free period: 165 to 210 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Newberg and similar soils: 50 percent

Urban land: 35 percent

Estimates are based on observations, descriptions, and transects of the

mapunit.

Description of Newberg

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Recent silty alluvium

Typical profile

H1 - 0 to 14 inches: fine sandy loam H2 - 14 to 65 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98

to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Occasional Frequency of ponding: None

Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2w Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: A

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Data Source Information

Soil Survey Area: Lane County Area, Oregon Survey Area Data: Version 11, Sep 15, 2014

Lane County Area, Oregon

95—Newberg fine sandy loam

Map Unit Setting

National map unit symbol: 239v Elevation: 290 to 850 feet

Mean annual precipitation: 40 to 60 inches Mean annual air temperature: 52 to 54 degrees F

Frost-free period: 165 to 210 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Newberg and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the

mapunit.

Description of Newberg

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Recent silty alluvium

Typical profile

H1 - 0 to 14 inches: fine sandy loam H2 - 14 to 65 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98

to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Occasional Frequency of ponding: None

Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

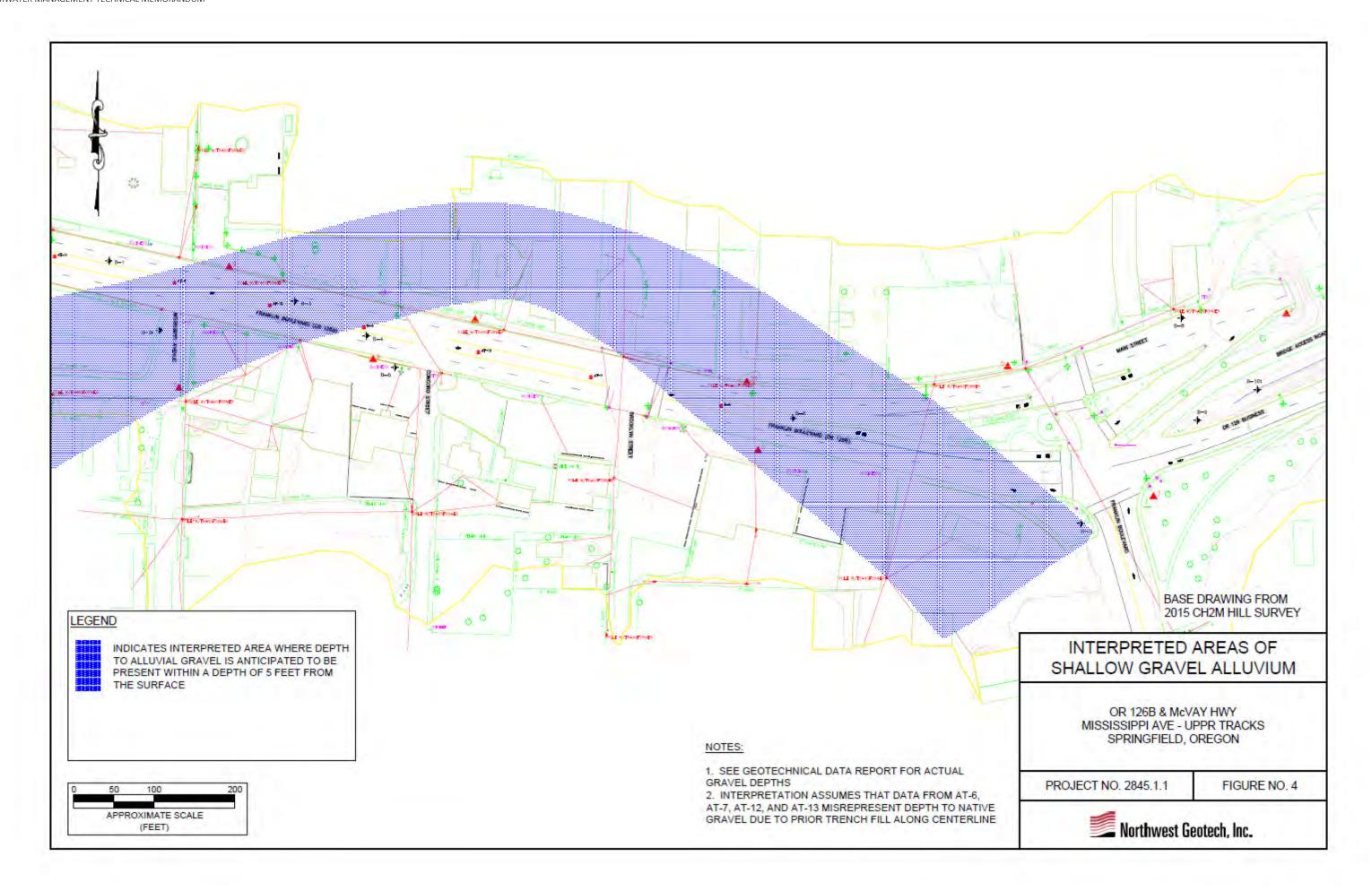
Land capability classification (irrigated): 2w Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: A

Data Source Information

Soil Survey Area: Lane County Area, Oregon Survey Area Data: Version 11, Sep 15, 2014

| OR126B & MCVAY HWY: MISSISSIPPI AVE — UPRR TRACKS (PHASE 1) STORMWATER MANAGEMENT PLAN | |
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| OR126B & MCVAY HWY: MISSISSIPPI AVE — UPRR TRACKS (PHASE 1) STORMWATER MANAGEMENT PLAN |
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| Attachment E |
| Inlet and Conveyance Calculations |
| |

| Project: Project Number | | | Franklin Blv 656986 | d | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|-------------------------------------|----------|------------------------|-------------------------------------|-------------------------------------|-------------------|-------------------|--------------------|-------------------------|--------------|----------------------------------|------------------|----------------------|-------------------------|-------------------------|-------------------------|----------------------------|-------------------------|----------------------|-----------------------|----------------------|------------------------|--------------------------------------|-----------------------|--------------------------|----------------|---------------|--|----------------------------|----------------------|----------------------|----------------------|----------------------|-------------------------|----------------------|-------------------|--|---|
| Project Number | | | 030380 | | | | | | | | | | | Slope | | | | | | | | | | | | | | | | | | | | | | | | |
| Locatio | on | Side | Inlet | From STA | To STA | | Section Length | Area | Area | С | CA Tct | o Intensity | y Flow Ω | Pavement Long. SL | Pavement Cross Sx | S'w | | Pavement Manning's | | Total Gutter Qg | Depth D | Opening Length L | $L_{\scriptscriptstyle{\mathrm{T}}}$ | Spread Calc'd T | _ | Check | | Gutter Inlet Width Type W | r Gutter Velocity Vg | Eo | Effi- ciency E | Rf | Rs | Intercept Flow Qi | Bypass Flow | Bypass % | Bypass Check | |
| RG-1 - North Sig | | Side | No. | JIA | JIA | (ft) | (ft) | (ft ²) | (ac) | 0.90 | | n) (in/hr) | | (ft/ft) | (ft/ft) | ft/ft | <u></u> | 0.016 | (cfs) | (cfs) | (ft) | (ft) | (ft) | (ft) | T _{MAX} (ft) | | **/. | (ft) | (ft/sec) | | | | 113 | (cfs) | (cfs) | | | Remarks |
| STA WB 216+85 | | Lt | 2 3 | 216+85.00 216+65.02 | 216+65.02 216+06.94 | 1.0 1.0 | 0 | 0 | 0.011 | | 0.01 5.0 0.03 5.0 | | 0.02 | 0.010 0.010 | 0.020 0.020 | | 0.0200 0.0200 | 0.016 0.016 | 0.00 | 0.02 0.06 | 0.03 0.05 | 1.95 1.95 | 3.66 5.80 | 1.71 2.58 | 3.50 3.50 | OK OK | | G-2 1.50 G-2 1.50 | | 1.00 0.90 | 1.00 0.94 | 1.00 1.00 | 0.54 0.41 | 0.02 0.06 | 0.00 | 0% 6% | OK OK | |
| | 215+40.00 | | 4 | | | | 0 | 0 | | | 0.04 5.0 | | | 0.010 | 0.020 | | 0.0200 | 0.016 | 0.00 | 0.08 | 0.06 | 1.95 | 6.48 | 2.85 | 3.50 | | | G-2 1.50 | | 0.86 | 0.92 | 1.00 | 0.38 | 0.07 | 0.01 | 8% | ок | |
| | to 117+90 117+09.63 | | 6 | 117+90.00 | 117+09.63 | 1.0 | 0 | 0 | | | 0.06 5.0 | | | 0.010 | 0.020 | | 0.0200 | 0.016 | 0.00 | 0.12 | 0.07 | 1.95 | 7.71 | 3.33 | 3.50 | | | G-2 1.50 | | 0.80 | 0.87 | 1.00 | 0.34 | 0.11 | 0.02 | 13% | ок | |
| | 116+52.84 115+92.81 | | 8 | 117+09.63 116+52.84 | 116+52.84 115+92.81 | 1.0 | 0 | 0 | | | 0.03 5.0 0.03 5.0 | | 0.07 | 0.010 0.010 | 0.020 0.020 | | 0.0200 0.0200 | 0.016 0.016 | 0.02 0.01 | 0.08 0.08 | 0.06 0.06 | 1.95 1.95 | 6.53 6.34 | 2.86 2.79 | 3.50 3.50 | | | G-2 1.50 G-2 1.50 | | 0.86 0.87 | 0.91 0.92 | 1.00 1.00 | 0.38 0.39 | 0.08 0.07 | 0.01 0.01 | 9% 8% | OK OK | |
| Sag to RG-1 | | | | | | | | | | | | | | | | | | | | | | | | | | Wide | | | | | | | | | | | | Spread Calculated using Flowmater- Attached; Sag |
| RG-3 - OR126 STA MCV-R 2+2 | 5+25.00 7 to 5+94 | Rt | 5 | 215+40.00 | 115+92.81 | 1.0 | 0 | 0 | 0.043 | 0.90 | 0.04 5.0 | 0 2.45 | 0.09 | 0.000 | 0.015 | 0.000 | 0.0150 | 0.016 | 0.01 | 0.11 | 0.07 | 1.95 | 2.20 | 3.60 | 3.42 | Spread | 0.42 | G-2 1.50 | | | 1.00 | | | 0.11 | N/A | | | located at CI2 5+25 |
| | 5+36.15 4+36.26 3+29.21 | Rt | 19 20 | 5+94.15 5+36.15 4+36.26 | 5+36.15 4+36.26 3+29.21 | 1.0 1.0 1.0 | 0 0 0 | 0 0 0 | 0.028 0.067 0.074 | | 0.03 5.0 0.06 5.0 0.07 5.0 | 0 2.10 | 0.05 0.13 0.14 | 0.035 0.035 0.024 | 0.020 0.020 0.020 | | 0.1053 0.0964 0.0898 | 0.016 0.016 0.016 | 0.00 0.00 0.03 | 0.05 0.13 0.17 | 0.04 0.05 0.06 | 2.50 2.50 2.50 | 2.95 4.52 4.72 | 1.90 2.65 3.17 | 3.42 3.42 3.42 | OK OK OK | 0.54 C | CG-30 1.43 CG-30 1.43 CG-30 1.43 | 1.46 1.82 1.69 | 0.98 0.87 0.80 | 0.97 0.77 0.74 | 1.00 1.00 1.00 | 0.36 0.27 0.30 | 0.05 0.10 0.13 | 0.00 0.03 0.04 | 3% 23% 26% | OK Check Inlet Type | |
| | 2+78.26 2+27.08 | Rt | 21 22 23 | 3+29.21 2+78.26 | 2+78.26 2+27.08 | 1.0 | 0 | 0 | 0.023 | 0.90 | 0.07 5.0 0.02 5.0 0.02 5.0 | 0 2.10 | 0.04 | 0.014 0.014 | 0.020 0.020 0.020 | 0.087 | 0.0898 0.0952 0.1029 | 0.016 0.016 0.016 | 0.03 0.04 0.00 | 0.09 0.05 | 0.05 0.04 | 2.50 2.50 2.50 | 2.90 2.16 | 2.74 2.13 | 3.42 3.42 3.42 | ОК | 0.52 C | CG-30 1.43 CG-30 1.43 | 1.15 | 0.86 0.95 | 0.97 1.00 | 1.00 1.00 1.00 | 0.46 0.52 | 0.08 0.05 | 0.00 | 3% 0% | Check Inlet Type OK OK | |
| RG-3 - OR126 STA EB 119+95 t | to 123+88 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 123+27.97 122+28.05 121+14.93 | Lt | 18 31 32 | 123+80.00 123+27.97 122+28.05 | 123+27.97 122+28.05 121+14.93 | 1.0 1.0 1.0 | 0 0 0 | 0 0 0 | 0.019 0.032 0.055 | 0.90 | 0.02 5.0 0.03 5.0 0.05 5.0 | 0 2.10 | 0.04 0.06 0.10 | 0.035 0.035 0.024 | 0.020 0.020 0.020 | 0.087 0.087 0.087 | 0.1070 0.1044 0.0962 | 0.016 0.016 0.016 | 0.00 0.00 0.00 | 0.04 0.06 0.11 | 0.03 0.04 0.05 | 2.50 2.50 2.50 | 2.49 3.14 3.74 | 1.64 2.00 2.66 | 3.42 3.42 3.42 | OK OK OK | 0.72 C | CG-30 1.43 CG-30 1.43 CG-30 1.43 | 1.51 | 1.00 0.97 0.87 | 1.00 0.94 0.86 | 1.00 1.00 1.00 | 0.40 0.34 0.34 | 0.04 0.06 0.09 | 0.00 0.00 0.01 | 0% 6% 14% | OK OK OK | |
| | 120+51.36 119+95.37 | Lt | 33 34 | 121+14.93 | 120+51.36 119+95.37 | 1.0 | 0 | 0 | 0.044 | 0.90 | 0.04 5.0 | 0 2.10 | 0.08 | 0.014 | 0.020 0.020 | 0.087 | 0.0936 0.0982 | 0.016 0.016 | 0.01 0.00 | 0.10 0.07 | 0.06 0.05 | 2.50 2.50 | 3.08 2.66 | 2.86 2.51 | 3.42 3.42 | ОК | 0.50 C | CG-30 1.43 CG-30 1.43 | 1.19 | 0.84 0.90 | 0.95 0.99 | 1.00 1.00 | 0.45 0.47 | 0.09 0.07 | 0.00 | 5% 1% | OK OK | |
| RG-3 - McVay STA MCV 22+68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 22+25.00 20+90.00 | | 30 26 | 22+68.00 20+45.00 | 22+25.00 | 1.0 | 0 | 0 | 0.041 | | 0.04 5.0 | | 0.08 | 0.004 | 0.020 | 0.087 | 0.0890 | 0.016 | 0.00 | 0.08 | 0.06 | 2.50 | 2.05 3.03 | 3.24 2.44 | 3.42 | ок | | CG-30 1.43 CG-30 1.43 | | 0.79 | 0.96 | 1.00 | 0.66 | 0.08 | 0.00 | 0% 4% | ок | |
| Sag to RG-3 | | | | | | | | | | | | | | | | | | | | | | | | | | Wide | | | | | | | | | | | | Spread Calculated using Flowmater- Attached; Sag |
| | 20+98.81 | Lt | 27 | 22+25.00 | 20+90.00 | 1.0 | 0 | 0 | 0.113 | 0.90 | 0.10 5.0 | 0 2.45 | 0.25 | 0.000 | 0.015 | 0.087 | 0.0150 | 0.016 | 0.00 | 0.25 | 0.04 | 4.00 | 3.16 | 3.56 | 3.42 | Spread | 0.40 | CG-48 1.43 | | | 1.00 | | | 0.25 | N/A | | | located at MCV 20+98.81 |
| RG-3 - McVay STA MCV 22+68 | 3 to 20+89 | | | | | | | | | | | | | | | | | | | | | | | | | Wido | | | | | | | | | | | | |
| STA EB2 15+06 | | | 29 | 22+68.00 | 22+10.00 | 1.0 | 0 | 0 | 0.058 | | 0.05 5.0 | | 0.11 | 0.004 | 0.020 | 0.087 | 0.0838 | 0.016 | 0.00 | 0.11 | 0.07 | 2.50 | 2.46 | 3.69 | 3.42 | Spread | 0.39 | CG-30 1.43 | 0.80 | 0.73 | 1.00 | 1.00 | 0.62 | 0.11 | 0.00 | 0% | ок | |
| Sag to RG-3 | 15+44.00 | Rt | 10-1 | 15+06.00 | 15+40.00 | 1.0 | 0 | 0 | 0.040 | 0.90 | 0.04 5.0 | 0 2.10 | 0.08 | 0.013 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.00 | 0.08 | 0.05 | 1.50 | 6.89 | 2.62 | 3.42 | OK | 0.55 | Curb 1.43 | 1.10 | 0.88 | 0.36 | 0.90 | 0.22 | 0.03 | 0.05 | 64% | Check Inlet Type | Spread Calculated using |
| | 21+12.40 | Rt | 25 | 22+10.00 | 20+00.00 | 1.0 | 0 | 0 | 0.116 | 0.90 | 0.10 5.0 | 0 2.45 | 0.26 | 0.000 | 0.015 | 0.087 | 0.0150 | 0.016 | 0.05 | 0.30 | 0.05 | 2.50 | 3.41 | 3.67 | 3.42 | Wide Spread | 0.39 | CG-30 1.43 | | | 1.00 | | | 0.30 | N/A | | | Flowmater- Attached; Sag located at MCV 21+12.40 |
| Filterra #3 McVay | | | | | | | | | | | | | | | | | | | | | | | | | | Mid. | | | | | | | | | | | | |
| | 24+88.00 | Rt | F4x12 | 22+68.00 | 24+88.00 | 1.0 | 0 | 0 | 0.110 | 0.90 | 0.10 5.0 | 0 2.10 | 0.21 | 0.006 | 0.007 | 0.000 | 0.0070 | 0.016 | 0.00 | 0.21 | 0.06 | 1.50 | 15.84 | 8.48 | 3.42 | Wide Spread | 0.17 | Curb 1.43 | 0.82 | 0.39 | 0.16 | 0.93 | 0.14 | 0.03 | 0.17 | 84% | Check Inlet Type | |
| RG-2 - South Sid STA CI3 6+40 to | | | | | | | | | | | | | | | | | | | | | | | | | | Wide | | | | | | | | | | | | |
| | 5+50.37 4+71.20 | Lt | 35 36 | 6+40.00 5+50.37 | 5+50.37 4+71.20 | 1.0 | 0 0 | 0 | 0.042 | 0.90 | 0.07 5.0 0.04 5.0 | 0 2.10 | 0.08 | 0.022 | 0.015 0.015 | 0.000 | 0.0150 0.0150 | 0.016 | | 0.14 0.11 | 0.05 0.05 | 1.95 1.95 | 12.45 10.38 | 3.60 3.37 | 3.50 | ОК | | G-2 1.50 | 1.25 | 0.76 0.79 | 0.81 | 1.00 | 0.19 | 0.11 0.09 | 0.03 0.02 | 19% 16% | Check Inlet Type Check Inlet Type | |
| PB-2 STA CI3 2+70 to | 4+00.96 3+60 | Lt | 37 | 4+71.20 | 4+00.96 | 1.0 | Ü | U | | | | | | 0.018 | 0.015 | 0.000 | 0.0150 | 0.016 | 0.02 | 0.09 | 0.05 | 1.95 | 9.69 | 3.17 | 3.50 | | | G-2 1.50 | | 0.82 | 0.87 | 1.00 | 0.25 | 0.08 | 0.01 | 13% | OK | |
| | 3+30.00 3+50.00 | | 2-1 2-2 | 3+30.00 3+45.00 | 3+45.00 3+50.00 | 1.0 1.0 | 0 | 0 | | | 0.01 5.0 0.01 5.0 | | | 0.007 0.007 | 0.020 0.020 | | 0.0200 0.0200 | 0.016 0.016 | 0.00 0.01 | 0.02 0.02 | 0.04 0.04 | 1.50 1.50 | 3.17 3.56 | 1.76 1.95 | 3.42 3.42 | | | Curb 1.43 Curb 1.43 | | 0.99 0.97 | 0.68 0.63 | 0.95 0.94 | 0.45 0.42 | 0.01 0.02 | 0.01 0.01 | | Check Inlet Type Check Inlet Type | |
| PA-10 to PA-7 STA EB2 10+25 | to 15+06 14+85.00 | Rt | 10-2 | 15+15.00 | 14+85.00 | 1.0 | 0 | 0 | 0.017 | 0.90 | 0.02 5.0 | 0 2.10 | 0.03 | 0.008 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.02 | 0.05 | 0.05 | 1.50 | 5.21 | 2.54 | 3.42 | ОК | 0.56 | Curb 1.43 | 0.84 | 0.89 | 0.46 | 0.92 | 0.32 | 0.03 | 0.03 | 54% | Check Inlet Type | |
| | 14+70.00 14+55.00 | Rt Rt | 10-3 10-4 | 14+85.00 14+70.00 | 14+70.00 14+55.00 | 1.0 1.0 | 0 | 0 | 0.010 0.011 | 0.90 0.90 | 0.01 5.0 0.01 5.0 | 0 2.10 0 2.10 | 0.02 0.02 | 0.017 0.017 | 0.020 0.020 | 0.000 0.000 | 0.0200 0.0200 | 0.016 0.016 | 0.03 0.03 | 0.05 0.05 | 0.04 0.04 | 1.50 1.50 | 6.21 6.30 | 2.11 2.14 | 3.42 3.42 | OK OK | 0.68 0.67 | Curb 1.43 Curb 1.43 | 1.09 1.09 | 0.95 0.95 | 0.39 0.39 | 0.90 0.90 | 0.23 0.22 | 0.02 0.02 | 0.03 0.03 | 61% 61% | Check Inlet Type Check Inlet Type | |
| | 14+40.00 14+20.00 14+02.00 | Rt | 10-5 10-6 9-1 | 14+55.00 14+40.00 14+20.00 | 14+40.00 14+20.00 14+02.00 | 1.0 1.0 1.0 | 0 0 0 | 0 0 0 | 0.020 | 0.90 | 0.01 5.0 0.02 5.0 0.01 5.0 | 0 2.10 | | 0.017 0.017 0.017 | 0.020 0.020 0.020 | | 0.0200 0.0200 0.0200 | 0.016 0.016 0.016 | 0.03 0.04 0.05 | 0.06 0.07 0.08 | 0.04 0.05 0.05 | 1.50 1.50 1.50 | 6.65 7.40 7.47 | 2.24 2.47 2.49 | 3.42 3.42 3.42 | OK OK OK | 0.58 | Curb 1.43 Curb 1.43 Curb 1.43 | 1.21 | 0.93 0.90 0.90 | 0.37 0.33 0.33 | 0.90 0.89 0.89 | 0.21 0.19 0.19 | 0.02 0.02 0.03 | 0.04 0.05 0.05 | 63% 67% 67% | Check Inlet Type Check Inlet Type Check Inlet Type | |
| | 13+93.00 13+80.00 | Rt | 9-2 9-3 | 14+02.00 13+93.00 | 13+93.00 13+80.00 | 1.0 | 0 | 0 | 0.011 | 0.90 | 0.01 5.0 0.01 5.0 | 0 2.10 | 0.02 | 0.017 0.017 0.017 | 0.020 0.020 | 0.000 | 0.0200 0.0200 | 0.016 0.016 | 0.05 0.05 | 0.07 0.07 | 0.05 0.05 | 1.50 1.50 | 7.29 7.22 | 2.44 | 3.42 3.42 | ОК | 0.59 | Curb 1.43 Curb 1.43 | 1.19 | 0.91 0.91 | 0.34 0.34 | 0.89 | 0.20 | 0.02 0.02 | 0.05 0.05 | 66% 66% | Check Inlet Type Check Inlet Type | |
| | 13+15.00 | Rt | 8-1 | 13+80.00 | 13+15.00 | 1.0 | 0 | 0 | 0.061 | 0.90 | 0.05 5.0 | 0 2.10 | 0.12 | 0.005 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.05 | 0.16 | 0.08 | 1.50 | 7.02 | 4.19 | 3.42 | | 0.34 | Curb 1.43 | 0.91 | 0.67 | 0.35 | 0.92 | 0.29 | 0.06 | 0.10 | 65% | Check Inlet Type | |

| Project: Project Numb | oer: | | Franklin Blv 656986 | d | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|--|--|---|--|--|--|---|---|--|--|---|--|--|--|---|--|--|---|--|--|--|--|--|--|--|---|--|---|--|--|--|--|--|--|--|--|--|---|
| Loca | ition | Side | Inlet No. | From STA | To STA | | Section Length (ft) | Area (ft²) | Area (ac) | C 0.90 | со | o Intensity I n) (in/hr) | / Flow Q | Slope Pavement Long. SL (ft/ft) | Pavement Cross Sx (ft/ft) | S'w ft/ft | | Pavement Manning's n 0.016 | Bypass Qb | Total Gutter Qg (cfs) | Depth D (ft) | Opening Length L (ft) | L _T (ft) | Spread Calc'd T (ft) | Max T _{MAX} (ft) | Check | | Gutte nlet Width ype W (ft) | r Gutter Velocity Vg (ft/sec) | Eo | Effi- ciency E | Rf | Rs | Intercept Flow Qi (cfs) | Bypass Flow (cfs) | Bypass % | Bypass Check | Remarks |
| | 13+10.00 12+98.00 12+86.00 12+75.00 12+14.00 12+05.00 11+94.00 11+72.00 11+61.00 11+49.00 11+37.00 | Rt R | 8-2 8-3 8-4 8-5 7-1 7-2 7-3 7-4 7-5 7-6 7-7 7-8 7-9 | 13+15.00 13+10.00 12+98.00 12+98.00 12+75.00 12+14.00 12+05.00 11+94.00 11+61.00 11+61.00 | 13+10.00 12+98.00 12+86.00 12+75.00 12+14.00 12+05.00 11+94.00 11+72.00 11+61.00 11+49.00 11+37.00 11+25.00 | 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 0 | 0.003 0.005 0.005 0.005 0.041 0.005 0.005 0.005 0.005 0.005 0.005 0.005 | 0.90 (| 5.00 5.00 5.00 5.00 | 0 2.10 0 2.10 | 0.01 0.01 0.01 0.01 0.08 0.01 0.01 0.01 | 0.005 0.005 0.005 0.005 0.005 0.005 0.015 0.015 0.015 0.015 0.015 0.015 | 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 | 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 | 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 | 0.10 0.07 0.04 0.02 0.01 0.05 0.03 0.02 0.02 0.01 0.01 | 0.11 0.08 0.05 0.03 0.09 0.06 0.04 0.03 0.03 0.02 0.02 | 0.07 0.06 0.05 0.05 0.07 0.06 0.04 0.03 0.03 0.03 0.03 | 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 | 5.99 5.09 4.28 3.57 5.38 4.93 5.56 5.07 4.68 4.38 4.16 4.01 3.91 | 3.64 3.15 2.69 2.29 3.40 2.76 2.00 1.84 1.72 1.62 1.54 1.49 | 3.42 3.42 3.42 3.42 3.42 3.42 3.42 3.42 | Spread OK | 0.45 0.53 0.62 0.42 0.52 0.71 0.78 0.83 0.88 0.93 0.96 0.96 | 1.43 2.47 2.47 2.47 2.47 2.47 2.47 2.47 2.47 | 0.75 0.68 0.61 0.77 0.77 1.00 0.94 0.90 0.86 0.84 | 0.74 0.80 0.87 0.93 0.77 0.86 0.96 0.98 0.99 1.00 1.00 | 0.40 0.47 0.54 0.62 0.44 0.43 0.47 0.50 0.53 0.55 0.57 | 0.93 0.93 0.94 0.95 0.93 0.91 0.92 0.92 0.92 0.92 0.93 0.93 | 0.32 0.36 0.40 0.45 0.35 0.25 0.27 0.29 0.31 0.32 0.33 | 0.04 0.03 0.03 0.02 0.04 0.03 0.02 0.02 0.01 0.01 0.01 0.01 | 0.07 0.04 0.02 0.01 0.05 0.03 0.02 0.02 0.01 0.01 0.01 0.01 | 60% 53% 46% 38% 56% 52% 57% 53% 50% 47% 45% 43% | Check Inlet Type | |
| PA-4 STA EB2 9+75 | 9+95.00 10+10.00 | | 4-1 4-2 | 9+80.00 9+95.00 | 9+95.00 10+10.00 | 1.0 1.0 | 0 0 | 0 0 | | | 0.01 5.00 0.01 5.00 | 0 2.10 0 2.10 | 0.02 0.02 | 0.003 0.003 | 0.020 0.020 | 0.000 0.000 | 0.0200 0.0200 | 0.016 0.016 | 0.00 | 0.02 0.02 | 0.04 0.04 | 1.50 1.50 | 2.45 2.63 | 2.06 2.20 | 3.42 3.42 | | | Curb 1.43 Curb 1.43 | 0.44 0.46 | 0.96 0.94 | 0.82 0.78 | 0.96 0.96 | 0.60 0.58 | 0.02 0.02 | 0.00 0.00 | 18% 22% | Check Inlet Type Check Inlet Type | |
| PA-5 to PA-6 STA EB 114+3 | | Rt R | 6-1 6-2 6-3 6-4 5-1 5-2 5-3 5-4 5-5 | 115+85.00 115+63.00 115+52.00 115+41.00 115+25.00 115+05.00 114+92.00 114+80.00 114+68.00 114+56.00 | 115+63.00 115+52.00 115+41.00 115+25.00 115+05.00 114+92.00 114+68.00 114+68.00 114+56.00 114+44.00 | 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 | 0.009 0.004 0.005 0.005 0.017 0.009 0.009 0.009 0.009 | 0.90 (| 5.00 | 2.10 0 2.10 0 2.10 0 2.10 0 2.10 0 2.10 0 2.10 0 2.10 | 0.02 0.01 0.01 0.03 0.02 0.02 0.02 0.02 | 0.006 0.006 0.006 0.006 0.006 0.006 0.006 0.006 0.006 | 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 | 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 | 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 | 0.00 0.00 0.00 0.00 0.00 0.01 0.01 0.01 | 0.02 0.01 0.01 0.03 0.03 0.03 0.03 0.03 | 0.04 0.03 0.03 0.03 0.05 0.04 0.04 0.04 0.04 | 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 | 2.86 2.47 2.44 2.43 3.83 3.68 3.58 3.52 3.49 3.47 | 1.75 1.54 1.52 1.52 2.28 2.20 2.14 2.11 2.09 2.08 | 3.42 3.42 3.42 3.42 3.42 3.42 3.42 3.42 | OK OK OK OK OK OK OK OK | 0.93 C 0.94 C 0.94 C 0.63 C 0.65 C 0.67 C 0.68 C | turb 1.43 | 0.50 0.50 0.66 0.64 0.63 0.62 0.62 | 0.99 1.00 1.00 1.00 0.93 0.94 0.95 0.95 0.95 | 0.74 0.81 0.82 0.82 0.59 0.61 0.62 0.63 0.64 | 0.95 0.95 0.95 0.96 0.94 0.94 0.94 0.94 | 0.50 0.54 0.54 0.54 0.42 0.43 0.44 0.44 0.45 | 0.01 0.01 0.01 0.01 0.02 0.02 0.02 0.02 | 0.00 0.00 0.00 0.00 0.01 0.01 0.01 0.01 | 26% 19% 18% 41% 39% 38% 37% 36% 36% | Check inlet Type Check inlet Type | |
| Sag in PA-4 | 10+30.00 | Rt | 4-3 | 11+83.00 | 9+95.00 | 1.0 | 0 | 0 | 0.108 | 0.90 | 0.10 5.00 | 0 2.45 | 0.24 | 0.000 | 0.020 | 0.000 | 0.02 | 0.02 | 0.02 | 0.26 | 0.15 | 1.50 | 2.69 | 7.47 | 3.42 | Wide Spread | 0.19 | urb 1.43 | | | 1.00 | | | 0.26 | N/A | | | Spread Calculated using Flowmater- Attached; Sag located at EB2 10+30 |
| RG-2 - Northe STA WB 218+5 | 90 to CI2 2+25 220+80.00 219+84.07 1+25.00 2+25.00 | Lt Lt Lt | 14 15 16 13 | 221+42.50 220+80.00 219+84.07 1+25.00 | 220+80.00 219+84.07 1+25.00 2+25.00 | 1.0 1.0 1.0 1.0 | 0 0 0 0 | 0 0 0 0 | 0.037 0.090 0.052 0.032 | | 0.08 5.00 0.05 5.00 | 0 2.10 | 0.07 0.17 0.10 0.06 | 0.027 0.025 0.025 0.025 | 0.020 0.020 0.020 0.020 | 0.087 0.087 | 0.1019 0.0899 0.0925 0.0984 | 0.016 0.016 0.016 0.016 | 0.00 0.00 0.05 0.03 | 0.07 0.17 0.15 0.09 | 0.04 0.06 0.06 0.05 | 2.50 2.50 2.50 2.50 | 3.13 4.84 4.41 3.52 | 2.22 3.16 2.95 2.50 | 3.43 3.43 3.43 3.43 | OK OK OK | 0.45 C | G-30 1.43 G-30 1.43 G-30 1.43 G-30 1.43 | 1.73 1.66 | 0.94 0.80 0.83 0.90 | 0.94 0.73 0.78 0.89 | 1.00 1.00 1.00 1.00 | 0.37 0.29 0.31 0.35 | 0.07 0.13 0.11 0.08 | 0.00 0.05 0.03 0.01 | 6% 27% 22% 11% | OK Check Inlet Type Check Inlet Type OK | |
| RG-2 - Northw STA 217+45 to | | | 11 12 | 220+60.00 218+95.00 | 218+95.00 218+45.00 | 1.0 1.0 | 0 | 0 | | | 0.07 5.00 0.03 5.00 | 0 2.10 0 2.10 | 0.14 0.05 | 0.027 0.027 | 0.014 0.014 | | 0.0140 0.0140 | 0.016 0.016 | 0.00 0.03 | 0.14 0.08 | 0.05 0.04 | 1.95 1.95 | 13.73 11.01 | 3.57 2.93 | 3.50 3.50 | | 0.42 0.51 | G-2 1.50 G-2 1.50 | | 0.77 0.85 | 0.81 0.88 | 1.00 1.00 | 0.17 0.20 | 0.11 0.07 | 0.03 0.01 | 19% 12% | Check Inlet Type OK | |
| PA-3 STA WB2 16+0 | 00 to 16+85 16+83.00 16+72.00 | | 3-1 3-2 | 17+80.00 16+84.00 | 16+84.00 16+72.00 | 1.0 | 0 | 0 | | | | 0 2.10 0 2.10 | | | 0.020 | | | 0.016 0.016 | | 0.16 0.11 | 0.09 | 1.50 1.50 | 6.64 5.47 | 4.33 3.82 | | Wide | | Curb 1.43 | | 0.66 | 0.37 | 0.92 | 0.31 | 0.06 | 0.10 | 63% 56% | Check Inlet Type Check Inlet Type | |
| PB-2 STA CI3 2+70 t | to 3+60 3+10.00 2+90.00 2+85.00 2+76.00 | Rt Rt | 2-3 2-5 2-6 2-7 | 3+30.00 3+15.00 2+90.00 2+90.00 | 3+15.00 2+90.00 2+85.00 2+70.00 | 1.0 1.0 1.0 1.0 | 0 0 0 | 0 0 0 0 | 0.009 0.009 | 0.90 (0.90 (| 0.01 5.00 0.01 5.00 | 0 2.10 0 2.10 0 2.10 0 2.10 | 0.02 0.02 | | 0.020 0.020 0.020 0.020 | 0.000 0.000 | 0.0200 0.0200 0.0200 0.0200 | 0.016 0.016 0.016 0.016 | 0.00 0.01 0.01 0.02 | 0.02 0.03 0.03 0.04 | 0.04 0.03 0.04 0.04 | 1.50 1.50 1.50 1.50 | 3.54 4.78 5.08 5.41 | 1.94 1.67 1.77 1.87 | 3.42 3.42 3.42 3.42 | OK OK | 0.86 C | Curb 1.43 Curb 1.43 Curb 1.43 Curb 1.43 | 0.93 0.96 | 0.97 0.99 0.99 0.98 | 0.63 0.49 0.47 0.44 | 0.94 0.92 0.91 0.91 | 0.42 0.28 0.27 0.25 | 0.02 0.01 0.01 0.02 | 0.01 0.01 0.02 0.02 | 37% 51% 53% 56% | Check Inlet Type Check Inlet Type Check Inlet Type Check Inlet Type | |
| PA-11 STA WB 217+4 | 45 to 218+25 | | | | | | | | | | | | | | | | | | | | | | | | | Wide | | | | | | | | | | | | |
| | 218+10.00 | Rt | 11-1 | 218+80.00 | 218+10.00 | 1.0 | 0 | 0 | 0.095 | 0.90 | 0.09 5.00 | 0 2.10 | 0.18 | 0.005 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.02 | 0.20 | 0.09 | 1.50 | 7.77 | 4.50 | 3.42 | Spread Wide | 0.32 | curb 1.43 | 0.98 | 0.64 | 0.32 | 0.91 | 0.26 | 0.06 | 0.14 | 68% | Check Inlet Type | |
| | 218+03.00 217+95.00 217+80.00 217+65.00 217+50.00 | Rt Rt Rt | 11-2 11-3 11-4 11-5 11-6 | 218+10.00 218+03.00 217+95.00 217+80.00 217+65.00 | 218+03.00 217+95.00 217+80.00 217+65.00 217+50.00 | 1.0 1.0 1.0 1.0 1.0 | 0 0 0 0 | 0 0 0 0 | 0.007 0.015 0.015 | 0.90 (0.90 (0.90 (| 0.01 5.00 0.01 5.00 0.01 5.00 | | | 0.005 0.005 0.005 0.005 0.005 | 0.020 0.020 0.020 0.020 0.020 | 0.000 0.000 0.000 | 0.0200 0.0200 0.0200 0.0200 0.0200 | 0.016 0.016 0.016 0.016 0.016 | 0.14 0.09 0.06 0.05 0.04 | 0.14 0.11 0.09 0.08 0.06 | 0.08 0.07 0.07 0.06 0.06 | 1.50 1.50 1.50 1.50 1.50 | 5.95 5.59 5.30 4.85 | 4.00 3.55 3.36 3.20 2.96 | 3.42 3.42 3.42 | Wide Spread OK OK | 0.40 C 0.43 C 0.45 C | turb 1.43 turb 1.43 turb 1.43 turb 1.43 turb 1.43 | 0.83 0.80 0.78 | 0.69 0.75 0.77 0.79 0.83 | 0.36 0.41 0.43 0.45 0.49 | 0.92 0.92 0.93 0.93 0.93 | 0.29 0.32 0.33 0.35 0.37 | 0.05 0.04 0.04 0.04 0.03 | 0.09 0.06 0.05 0.04 0.03 | 59% 57% 55% 51% | Check Inlet Type | |
| PA-3 STA WB2 16+0 Sag in PA-3 | 00 to 16+85 16+20.00 16+35.00 16+50.00 | Rt | 3-6 3-5 3-4 | 16+05.00 16+20.00 16+35.00 | 16+20.00 16+35.00 16+50.00 | 1.0 1.0 1.0 | 0 0 0 | 0 0 0 | 0.017 | 0.90 | 0.02 5.00 | 0 2.10 0 2.10 0 2.10 | 0.03 | | 0.020 | 0.000 | 0.0200 0.0200 0.0200 | 0.016 0.016 0.016 | | 0.02 0.04 0.05 | 0.04 0.05 0.05 | 1.50 1.50 1.50 | 2.62 3.44 3.77 | 1.98 2.53 2.74 | 3.42 3.42 3.42 | ОК | 0.57 C | Curb 1.43 Curb 1.43 | 0.56 | 0.97 0.89 0.86 | 0.78 0.64 0.60 | 0.96 0.95 0.95 | 0.56 0.49 0.46 | 0.01 0.02 0.03 | 0.00 0.01 0.02 | 22% 36% 40% | Check Inlet Type Check Inlet Type Check Inlet Type | |

| Project: Project Numl | ber: | | Frankl | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------|--|---|--|---|---|--|--|---|--------------------------------------|---|---|---|--|--|--|---|---|--|--|--|--|--|--|--|--|--|--|-------------------------------------|--|---|--|--|--|--|--|--|--|---|--|--|---|
| Loca | ation | Sic | le In N | | From STA | To STA | | Section Length (ft) | Area (ft²) | | .rea C ac) 0.9 | | Tc to I CO (min) | ntensity I (in/hr) | | Slope avement Long. SL (ft/ft) | Pavement Cross Sx (ft/ft) | S'w ft/ft | Equiv. Cross Se | Pavemen Manning' n 0.016 | 's Bypas Qb | ss Gutter Qg | Depth D (ft) | Opening Length L (ft) | L _T (ft) | Spread Calc'd T (ft) | | Check | W/T | Gutt Inlet Wid Type W (ft | h Velocity Vg | , Eo | Effi- ciency E | Rf | Rs | Intercept Flow Qi (cfs) | Bypass Flow (cfs) | Bypass % | Bypass Check | | Remarks |
| | | 16+60 R | t 3 | -3 | 16+72.00 | 16+50.00 | 1.0 | 0 | 0 | 0. | .030 0.9 | 90 0.03 | 5.00 | 2.45 | 0.07 | 0.000 | 0.020 | 0.000 | 0.02 | 0.02 | 0.11 | 0.18 | 0.12 | 1.50 | 2.30 | 5.85 | 3.42 | Wide Spread | 0.24 | Curb 1.4 | | | 1.00 | | | 0.18 | N/A | | | Flown | d Calculated using nater- Attached; Sag ed at EB2 16+60 |
| PA-1 to PA-2 STA WB2 14+ | + 75 to 16 15+ | 6 +25 -37.00 R -76.00 R | | | 16+05.00 15+37.00 | 15+37.00 14+76.00 | 1.0 1.0 | 0 0 | 0 | | .029 0.9 .022 0.9 | | | | | 0.004 0.004 | 0.015 0.020 | 0.000 0.000 | 0.0150 0.0200 | | 0.00 0.03 | | 0.05 0.06 | 1.50 1.50 | 4.87 4.53 | 3.54 3.23 | 3.42 3.42 | Wide Spread OK | | Curb 1.4 Curb 1.4 | | 0.75 0.79 | 0.48 0.51 | 0.95 0.94 | 0.40 0.41 | 0.03 0.04 | 0.03 0.03 | 52% 49% | Check Inlet Ty Check Inlet Ty | | |
| Sag in PA-1 | 14+ | -40.00 R | t 1 | -1 | 14+76.00 | 14+20.00 | 1.0 | 0 | 0 | 0. | .018 0.9 | 90 0.02 | 5.00 | 2.45 | 0.04 | 0.000 | 0.020 | 0.000 | 0.02 | 0.02 | 0.03 | 0.07 | 0.06 | 1.50 | 1.58 | 3.12 | 3.42 | ОК | 0.46 | Curb 1.4 | 3 | | 1.00 | | | 0.07 | N/A | | | Flown | d Calculated using mater- Attached; Sag ed at WB2 14+40 |
| PB-1 STA EB | 111+ 111+ 111+ 111+ 111+ 112+ 112+ 112+ | -18.00 L1 -34.00 L1 -47.00 L1 -60.00 L1 -92.00 L1 -07.00 L1 -07.00 L1 -32.00 L1 -47.00 L1 -65.00 L1 -79.00 L1 | C C C C C C C C C C C C C C C C C C C | -1 1 1 1 1 -2 1 1 -2 1 1 -3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 111+10.00 111+18.00 111+34.00 111+47.00 111+60.00 111+77.00 111+92.00 112+16.00 112+16.00 112+47.00 112+47.00 112+65.00 | 111+18.00 111+34.00 111+47.00 111+60.00 111+92.00 112+07.00 112+16.00 112+32.00 112+47.00 112+47.00 112+65.00 112+79.00 | 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 | 0. 0. 0. 0. 0. 0. 0. | 004 0.9 008 0.9 007 0.9 007 0.9 009 0.9 008 0.9 008 0.9 008 0.9 008 0.9 008 0.9 008 0.9 | 90 0.01 90 0.01 90 0.01 90 0.01 90 0.01 90 0.01 90 0.00 90 0.00 90 0.01 | 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 | 2.10 2.10 2.10 2.10 2.10 2.10 2.10 2.10 | 0.02 0.01 0.01 0.02 0.02 0.02 0.01 0.02 0.02 | 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 | 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 | 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 | 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 | 0.00 0.00 0.00 0.00 0.01 0.01 0.01 0.00 0.00 | 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 | 0.03 0.03 0.04 0.04 0.04 0.04 0.03 0.04 0.04 | 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 | 1.99 2.71 2.79 2.83 3.09 3.10 2.73 2.86 2.93 3.18 2.98 | 1.31 1.73 1.77 1.79 1.94 1.95 1.74 1.88 1.92 2.07 | 3.42 3.42 3.42 3.42 3.42 3.42 3.42 3.42 | OK | 0.83 0.81 0.80 0.74 0.74 0.73 0.82 0.76 0.74 0.69 | Curb 1.4 | 3 0.52 3 0.53 3 0.54 3 0.57 3 0.57 3 0.57 3 0.53 3 0.53 0.54 0.57 | 1.00 0.99 0.99 0.99 0.97 0.97 0.97 0.98 0.98 0.97 | 0.92 0.77 0.75 0.74 0.70 0.70 0.70 0.76 0.74 0.73 0.68 0.72 | 0.96 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 | 0.60 0.52 0.51 0.51 0.48 0.48 0.52 0.51 0.51 0.48 | 0.01 0.01 0.01 0.02 0.02 0.02 0.01 0.01 | 0.00 0.00 0.00 0.00 0.01 0.01 0.00 0.00 | 8% 23% 25% 26% 30% 30% 24% 24% 26% 27% 32% | OK Check Inlet Ty | pe pe pe pe pe pe pe pe | |
| PC-1 STA EB | 113+ 113+ 113+ 113+ | -75.00 Lt -61.00 Lt -52.00 Lt -47.00 Lt -42.00 Lt | t A t A t PE | -2 1 -1)-4)-3 | 114+05.00 113+75.00 0+00.00 0+00.00 0+00.00 113+75.00 | 113+75.00 113+61.00 113+52.00 113+47.00 113+42.00 113+37.00 | 1.0 1.0 1.0 1.0 | 0 0 0 0 0 | 0 0 0 0 0 | 0. | 007 0.9 010 0.9 008 0.9 008 0.9 008 0.9 | 90 0.01 90 0.01 90 0.01 | 5.00 5.00 5.00 5.00 | 2.10 2.10 2.10 2.10 | 0.02 0.02 0.02 0.02 | 0.006 0.006 0.006 0.006 0.006 0.006 | 0.005 0.008 0.011 0.014 0.017 0.020 | 0.000 0.000 0.000 0.000 0.000 0.000 | 0.0050 0.0080 0.0110 0.0140 0.0170 0.0200 | 0.016 | 0.00 0.01 0.02 0.02 0.02 | 0.03 0.03 0.03 0.03 | 0.02 0.03 0.04 0.04 0.04 | 1.50 1.50 1.50 1.50 1.50 1.50 | 5.88 5.96 5.24 4.59 4.03 3.53 | 3.81 3.70 3.20 2.79 2.43 2.13 | 3.42 3.42 3.42 3.42 3.42 3.42 | REVISE REVISE OK OK OK | 0.39 0.45 0.51 0.59 | Curb 1.4 Curb 1.4 Curb 1.4 Curb 1.4 Curb 1.4 Curb 1.4 | 0.49 0.55 0.59 0.61 | 0.71 0.73 0.79 0.85 0.91 0.95 | 0.41 0.41 0.46 0.51 0.57 0.63 | 0.97 0.96 0.95 0.95 0.95 0.94 | 0.34 0.33 0.36 0.38 0.41 0.44 | 0.01 0.01 0.01 0.02 0.02 | 0.01 0.02 0.02 0.02 0.01 0.01 | 59% 59% 54% 49% 43% 37% | Check Inlet Ty Check Inlet Ty Check Inlet Ty Check Inlet Ty Check Inlet Ty Check Inlet Ty | pe pe pe | |
| Sag in EB V-c | | -30.00 Lt | t PC | 0-1 1 | 112+79.00 | 113+37.00 | 1.0 | 0 | 0 | 0. | .090 0.9 | 90 0.08 | 5.00 | 2.45 | 0.20 | 0.000 | 0.020 | 0.000 | 0.02 | 0.02 | 0.01 | . 0.21 | 0.13 | 1.50 | 2.45 | 6.48 | 3.42 | Wide Spread | 0.22 | Curb 1.4 | 3 | | 1.00 | | | 0.21 | N/A | | | Flown | d Calculated using mater- Attached; Curb ag located in PD-1 |
| PB-1 STA EB - drai | 111+ 110+ 110+ | : -02.00 R: -86.00 R: -78.00 R: | t B | -1 1 -2 1 | 111+10.00 111+02.00 110+86.00 110+78.00 | 111+02.00 110+86.00 110+78.00 110+65.00 | 1.0 1.0 1.0 1.0 | 0 0 0 0 | 0 0 0 0 | 0. | 004 0.9 008 0.9 004 0.9 007 0.9 | 90 0.01 90 0.00 | | | 0.01 0.01 | 0.005 0.005 0.005 0.005 | 0.020 0.020 0.015 0.010 | 0.000 0.000 0.000 0.000 | 0.0200 0.0200 0.0150 0.0100 | | 0.00 0.00 0.00 0.00 | 0.01 | 0.03 0.03 0.03 0.03 | 1.50 1.50 1.50 1.50 | 1.99 2.71 2.79 4.14 | 1.31 1.73 1.82 2.68 | 3.42 3.42 3.42 3.42 | OK OK OK | 0.83 0.79 0.53 | Curb 1.4 Curb 1.4 Curb 1.4 Curb 1.4 | 0.52 0.45 0.44 | 1.00 0.99 0.98 0.87 | 0.92 0.77 0.75 0.56 | 0.96 0.95 0.96 0.96 | 0.60 0.52 0.52 0.42 | 0.01 0.01 0.01 0.01 | 0.00 0.00 0.00 0.01 | 8% 23% 25% 44% | OK Check Inlet Ty Check Inlet Ty Check Inlet Ty | pe | |
| Filterra #2 Franklin EB | 108+ | -10.00 R | t F8 | x4 1 | | 108+10.00 | | 0 | 0 | | | 90 0.18 | | | | | | | 0.0200 | 0.016 | 0.01 | 0.39 | 0.12 | 1.50 | 10.33 | 5.76 | | Wide | | Curb 1.4 | | 0.53 | 0.25 | 0.90 | 0.20 | 0.10 | 0.29 | 75% | Check Inlet Ty | pe | |
| PB-1 to PC-1 STA WB | 211+ 211+ 211+ 211+ 212+ 212+ 212+ 212+ | -52.00 R 69.00 R 84.00 R 98.00 R 98.00 R 97.00 R | t D t D t D t E t E t E t E t F t F t PC t PC t PC | -1 2-2 2-3 2-3 2-4 2-2 2-2 2-2 2-2 2-2 2-2 2-2 2-2 2-2 | 211+40.00 211+52.00 211+69.00 211+84.00 211+98.00 212+07.00 212+22.00 212+54.00 212+54.00 213+17.00 213+22.00 213+27.00 213+22.00 | 211+52.00 211+69.00 211+84.00 211+98.00 212+07.00 212+22.00 212+36.00 212+54.00 212+66.00 213+17.00 213+22.00 213+27.00 213+32.00 213+32.00 | 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0.0 0.0 0.0 0.0 0.0 0.0 0.0 | 005 0.9 008 0.9 008 0.9 0010 0.9 007 0.9 078 0.9 005 0.9 008 0.9 | 90 0.01 90 0.01 90 0.01 90 0.00 90 0.01 | 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 | 2.10 2.10 2.10 2.10 2.10 2.10 2.10 2.10 | 0.02 0.02 0.02 0.01 0.02 0.02 0.02 0.01 0.15 | 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 | 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 | 0.000 0.000 0.000 | 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 0.0200 | 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 | 0.10 0.06 0.04 | 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 | 0.03 0.04 0.04 0.03 0.04 0.04 0.04 0.04 | 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 | 2.49 2.93 2.99 3.02 2.66 2.87 2.96 3.22 3.03 6.97 6.03 5.30 4.67 4.29 | 1.63 1.89 1.92 1.94 1.73 1.85 1.90 2.05 1.94 4.09 3.59 3.20 2.86 2.65 | 3.42 3.42 3.42 3.42 3.42 | Wide Spread OK OK | 0.76 0.75 0.74 0.83 0.77 0.75 0.70 0.74 0.35 | Curb 1.4 | 3 0.55 0.55 0.56 0.52 0.54 3 0.55 0.58 0.58 0.56 0.58 0.58 0.56 0.58 0.78 0.78 0.78 | 1.00 0.98 0.97 0.97 0.99 0.98 0.96 0.97 0.68 0.74 0.79 0.84 0.87 | 0.81 0.73 0.71 0.78 0.74 0.72 0.68 0.71 0.35 0.40 0.45 0.50 | 0.96 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 | 0.55 0.50 0.50 0.49 0.53 0.51 0.50 0.48 0.49 0.28 0.32 0.35 0.38 | 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.02 0.01 0.05 0.04 0.04 0.03 0.03 | 0.00 0.01 0.01 0.01 0.00 0.00 0.01 0.01 | 19% 27% 29% 29% 22% 26% 28% 32% 29% 65% 60% 55% 50% | Check Inlet Ty | pe | |
| PC-1 STA WB | 214+ 214+ 214+ 214+ 214+ | -85.00 R -65.00 R -50.00 R -35.00 R -20.00 R | t C t C t B t B | -2 2 -1 2 -6 2 -5 2 | 215+45.00 214+85.00 214+65.00 214+50.00 214+35.00 | 214+85.00 214+65.00 214+50.00 214+35.00 214+20.00 214+06.00 | 1.0 1.0 1.0 1.0 | 0 0 0 0 | 0 0 0 0 0 | 0. 0. 0. 0. | 021 0.9 007 0.9 012 0.9 012 0.9 | 90 0.02 90 0.01 | 5.00 5.00 5.00 5.00 5.00 | 2.10 2.10 2.10 2.10 2.10 | 0.04 0.01 0.02 0.02 0.02 | 0.006 0.006 0.006 0.006 0.006 | 0.020 0.020 0.020 0.020 0.020 | 0.000 0.000 0.000 | 0.0200 0.0200 0.0200 0.0200 0.0200 | 0.016 0.016 0.016 0.016 0.016 | 0.00 0.02 0.01 0.01 0.02 | 0.04 0.03 0.03 0.04 | 0.05 0.04 0.05 0.05 0.05 0.05 | 1.50 1.50 1.50 1.50 1.50 1.50 | 4.08 3.66 3.85 3.96 4.02 3.81 | 2.41 2.19 2.29 2.34 2.38 2.26 | 3.42 3.42 3.42 3.42 3.42 | OK OK OK OK | 0.59 0.65 0.63 0.61 0.60 | Curb 1.4 Curb 1.4 Curb 1.4 Curb 1.4 Curb 1.4 Curb 1.4 | 3 0.68 3 0.64 3 0.66 3 0.67 3 0.67 | 0.91 0.94 0.93 0.92 0.91 | 0.56 0.61 0.59 0.58 0.57 0.59 | 0.94 0.94 0.94 0.94 0.94 | 0.40 0.43 0.42 0.41 0.41 | 0.02 0.02 0.02 0.02 0.02 0.02 | 0.02 0.01 0.01 0.02 0.02 | 44% 39% 41% 42% 43% 41% | Check Inlet Ty Check Inlet Ty Check Inlet Ty Check Inlet Ty Check Inlet Ty Check Inlet Ty | rpe rpe rpe rpe | |

| roject: roject Numbei | er: | | Franklin Blvo 656986 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|----------|-------|-------------------------|-------------|-----------|-------|-----|-------|-------|------|----------|--------------|-------|----------------------------------|------------------------------------|-------|--------|----------------------------|--------------|-------|------------|------------------------|----------------|-------------------------------|-------------------------|--------|------|----------------------------|-------------------|----------|----------------------|------|------|-------------------------|----------------|-------------|------------------|--------------------------|
| Locatio | | Side | Inlet No. | From STA | To STA | Width | | Area | Area | | CC | to Intensity | | Slope Pavement Long. SL | Pavement Cross Sx (ft/ft) | S'w | | Pavement Manning's n | Bypass Qb | Qg | Depth D | Opening Length L | L _T | Spread Calc'd T (ft) | Max T _{MAX} | Check | | Gut Inlet Wid Type V | dth Veloc V Vg | ty Eo | Effi- ciency E | Rf | Rs | Intercept Flow Qi | Bypass Flow | Bypass % | Bypass Check | Domanda |
| | | | | | | (ft) | (π) | (11.) | (ac) | 0.90 | (mi | , , , | (CTS) | (π/π) | (14,14) | π/π | | 0.016 | (cfs) | (cfs) | (π) | (ft) | (11) | (, | (π) | | | | t) (ft/se | | | | | (cfs) | (cfs) | | | Remarks |
| | 213+91.0 | | B-2 | 214+06.00 | 213+91.00 | 1.0 | 0 | 0 | 0.006 | | 0.01 5.0 | | 0.01 | 0.006 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.01 | 0.02 | 0.04 | 1.50 | 3.36 | 2.02 | 3.42 | | | | 43 0.6 | | 0.66 | 0.95 | 0.46 | 0.02 | 0.01 | | Check Inlet Type | |
| | 213+77.0 | | B-1 | 213+91.00 | 213+77.00 | 1.0 | 0 | 0 | 0.007 | | 0.01 5.0 | | 0.01 | 0.006 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.01 | 0.02 | 0.04 | 1.50 | 3.18 | 1.92 | 3.42 | OK | | Curb 1.4 | | | 0.68 | 0.95 | 0.47 | 0.01 | 0.01 | 32% | Check Inlet Type | |
| | 213+68.0 | | A-4 | 213+77.00 | 213+68.00 | 1.0 | 0 | 0 | 0.009 | | 0.01 5.0 | | 0.02 | 0.006 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.01 | 0.02 | 0.04 | 1.50 | 3.30 | 1.99 | 3.42 | OK | | Curb 1.4 | | | 0.66 | 0.95 | 0.46 | 0.02 | 0.01 | 34% | Check Inlet Type | |
| | 213+57.0 | 00 Rt | A-3 | 213+91.00 | 213+57.00 | 1.0 | 0 | 0 | 0.007 | 0.90 | 0.01 5.0 | 0 2.10 | 0.01 | 0.006 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.01 | 0.02 | 0.04 | 1.50 | 3.14 | 1.91 | 3.42 | ОК | 0.75 | Curb 1.4 | 43 0.58 | 0.98 | 0.69 | 0.95 | 0.47 | 0.01 | 0.01 | 31% | Check Inlet Type | |
| ng in PC-1A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ig in PC-1A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Spread Calculated usin |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Flowmater- Attached; (|
| | 213+42.0 | no Rt | A-2 | 213+36.00 | 213+57 00 | 1.0 | 0 | 0 | 0.011 | 0.90 | 0.01 5.0 | 0 2.45 | 0.02 | 0.000 | 0.020 | 0.000 | 0.02 | 0.02 | 0.03 | 0.05 | 0.05 | 1.50 | 1.38 | 2.49 | 3.42 | ОК | 0.57 | Curb 1.4 | 43 | | 1.00 | | | 0.05 | N/A | | | Cut Sag located in PC-1/ |
| | 215 1210 | | | 213 - 30.00 | 213.37.00 | 2.0 | | Ü | 0.011 | 0.50 | 0.01 | 2.13 | 0.02 | 0.000 | 0.020 | 0.000 | 0.02 | 0.02 | 0.00 | 0.05 | 0.05 | 2.50 | 1.50 | 2.1.5 | 5 | O. | 0.57 | | | | 2.00 | | | 0.00 | 14/14 | | | |
| B-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ΓA WB -> drair | ins west | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 211+27.0 | 00 Rt | C-1 | 211+40.00 | 211+27.00 | 1.0 | 0 | 0 | 0.007 | 0.90 | 0.01 5.0 | 0 2.10 | 0.01 | 0.005 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.00 | 0.01 | 0.03 | 1.50 | 2.52 | 1.62 | 3.42 | ОК | 0.88 | Curb 1.4 | 43 0.50 | 1.00 | 0.80 | 0.95 | 0.54 | 0.01 | 0.00 | 20% | Check Inlet Type | |
| | 211+10.0 | 00 Rt | B-3 | 211+27.00 | 211+10.00 | 1.0 | 0 | 0 | 0.009 | 0.90 | 0.01 5.0 | 0 2.10 | 0.02 | 0.005 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.00 | 0.02 | 0.04 | 1.50 | 2.97 | 1.87 | 3.42 | ОК | 0.76 | Curb 1.4 | 43 0.55 | 0.98 | 0.72 | 0.95 | 0.50 | 0.01 | 0.01 | 28% | Check Inlet Type | |
| | 210+95.0 | | B-2 | 211+10.00 | 210+95.00 | 1.0 | 0 | 0 | 0.008 | | 0.01 5.0 | 0 2.10 | 0.02 | 0.005 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.01 | 0.02 | 0.04 | 1.50 | 3.03 | 1.91 | 3.42 | OK | 0.75 | Curb 1.4 | 43 0.50 | 0.97 | 0.71 | 0.95 | 0.49 | 0.01 | 0.01 | 29% | Check Inlet Type | |
| | 210+80.0 | 00 Rt | B-1 | 210+95.00 | 210+80.00 | 1.0 | 0 | 0 | 0.009 | 0.90 | 0.01 5.0 | | 0.02 | 0.005 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.01 | 0.02 | 0.04 | 1.50 | 3.18 | 1.99 | 3.42 | OK | 0.72 | Curb 1.4 | 43 0.58 | 0.97 | 0.68 | 0.95 | 0.48 | 0.02 | 0.01 | 32% | Check Inlet Type | |
| | 210+71.0 | | A-2 | 210+80.00 | 210+71.00 | 1.0 | 0 | 0 | 0.004 | | 0.00 5.0 | | 0.01 | 0.005 | 0.018 | 0.000 | 0.0180 | 0.016 | 0.01 | 0.01 | 0.03 | 1.50 | 2.82 | 1.80 | 3.42 | OK | 0.79 | | 43 0.50 | 0.98 | 0.75 | 0.95 | 0.51 | 0.01 | 0.00 | 25% | Check Inlet Type | |
| | 210+58.0 | 00 Rt | A-1 | 210+71.00 | 210+58.00 | 1.0 | 0 | 0 | 0.007 | 0.90 | 0.01 5.0 | 0 2.10 | 0.01 | 0.005 | 0.009 | 0.000 | 0.0090 | 0.016 | 0.00 | 0.02 | 0.03 | 1.50 | 4.52 | 2.93 | 3.42 | OK | 0.49 | Curb 1.4 | 43 0.44 | 0.83 | 0.52 | 0.96 | 0.40 | 0.01 | 0.01 | 48% | Check Inlet Type | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| lterra #1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| anklin WB | | | | | | | | | | | | | | | | | | | | | | | | | | Mida | | | | | | | | | | | | |
| | 200 20 | 00 Dt | | 240 5000 | 200 20 00 | 4.0 | • | | 0.440 | 0.00 | 0.40 5.0 | | | 0.005 | 0.000 | 0.000 | 0.0000 | 0.046 | | | 0.00 | 4.50 | | | | Wide | 0.00 | | 40 | | | 0.04 | | | | =00/ | | |
| | 209+29.0 | JU Kt | F4x4 | 210+58.00 | 209+29.00 | 1.0 | 0 | 0 | 0.110 | 0.90 | 0.10 5.0 | 0 2.10 | 0.21 | 0.006 | 0.020 | 0.000 | 0.0200 | 0.016 | 0.01 | 0.22 | 0.09 | 1.50 | 8.41 | 4.52 | 3.42 | Spread | 0.32 | Curb 1.4 | 43 1.00 | 0.64 | 0.30 | 0.91 | 0.24 | 0.06 | 0.15 | 70% | Check Inlet Type | |

Worksheet for RG1: Sag Located at CI2 5+25

| | Worksheet for Not. Jag Loca | atca at CIZ J+ZJ |
|------------------------|-----------------------------|------------------|
| Project Description | | |
| Solve For | Spread | |
| Input Data | | |
| Discharge | 0.110 | 0 ft³/s |
| Gutter Width | 0.00 | 0 ft |
| Gutter Cross Slope | 0.02 | 2 ft/ft |
| Road Cross Slope | 0.02 | 2 ft/ft |
| Grate Width | 2.25 | 5 ft |
| Grate Length | 2.67 | 7 ft |
| Local Depression | 0.00 | 0 in |
| Local Depression Width | 0.00 | 0 ft |
| Grate Type | P-50 mm (P-1-7/8") | |
| Clogging | 50.00 | 0 % |
| Results | | |
| Spread | 3.60 | 0 ft |
| Depth | 0.07 | 7 ft |
| Gutter Depression | 0.00 | 0 ft |
| Total Depression | 0.00 | 0 ft |
| Open Grate Area | 2.70 | 0 ft² |
| | | |

4.92 ft

Active Grate Weir Length

Worksheet for RG3: Sag Located at MCV 20+98.81

| Solve For | Spread | |
|---------------------|--------|-------|
| Input Data | | |
| Discharge | 0.250 | ft³/s |
| Gutter Width | 0.00 | ft |
| Gutter Cross Slope | 0.02 | ft/ft |
| Road Cross Slope | 0.02 | ft/ft |
| Curb Opening Length | 4.00 | ft |

0.70 ft

Curb Throat Type Horizontal

Local Depression1.50inLocal Depression Width4.60ftThroat Incline Angle90.00degrees

Results

Opening Height

Project Description

 Spread
 3.56 ft

 Depth
 0.04 ft

 Gutter Depression
 0.00 ft

 Total Depression
 0.13 ft

Worksheet for RG3: Sag Located at MCV 21+12.40

| Project Description | | | |
|------------------------|------------|-------|---------|
| Solve For | Spread | | |
| Input Data | | | |
| Discharge | | 0.300 | ft³/s |
| Gutter Width | | 0.00 | ft |
| Gutter Cross Slope | | 0.02 | ft/ft |
| Road Cross Slope | | 0.02 | ft/ft |
| Curb Opening Length | | 4.00 | ft |
| Opening Height | | 0.70 | ft |
| Curb Throat Type | Horizontal | | |
| Local Depression | | 1.50 | in |
| Local Depression Width | | 4.60 | ft |
| Throat Incline Angle | | 90.00 | degrees |
| Results | | | |
| Spread | | 3.67 | ft |
| Depth | | 0.05 | ft |
| Gutter Depression | | 0.00 | ft |
| Total Depression | | 0.13 | ft |

Worksheet for PA-4: Curb Cut Sag Located at EB2 10+30

| Project Description | | | |
|------------------------|----------|-------|---------|
| Solve For | Spread | | |
| Input Data | | | |
| Discharge | | 0.260 | ft³/s |
| Gutter Width | | 0.00 | ft |
| Gutter Cross Slope | | 0.02 | ft/ft |
| Road Cross Slope | | 0.02 | ft/ft |
| Curb Opening Length | | 1.50 | ft |
| Opening Height | | 0.50 | ft |
| Curb Throat Type | Vertical | | |
| Local Depression | | 0.00 | in |
| Local Depression Width | | 0.00 | ft |
| Throat Incline Angle | | 0.00 | degrees |
| Results | | | |
| Spread | | 7.47 | ft |
| Depth | | 0.15 | ft |
| Gutter Depression | | 0.00 | ft |
| Total Depression | | 0.00 | ft |

Worksheet for PA-3: Curb Cut Sag Located at WB2 16+60

| Project Description | | | |
|------------------------|----------|-------|---------|
| Solve For | Spread | | |
| Input Data | | | |
| Discharge | | 0.180 | ft³/s |
| Gutter Width | | 0.00 | ft |
| Gutter Cross Slope | | 0.02 | ft/ft |
| Road Cross Slope | | 0.02 | ft/ft |
| Curb Opening Length | | 1.50 | ft |
| Opening Height | | 0.50 | ft |
| Curb Throat Type | Vertical | | |
| Local Depression | | 0.00 | in |
| Local Depression Width | | 0.00 | ft |
| Throat Incline Angle | | 0.00 | degrees |
| Results | | | |
| Spread | | 5.85 | ft |
| Depth | | 0.12 | ft |
| Gutter Depression | | 0.00 | ft |
| Total Depression | | 0.00 | ft |
| | | | |

Worksheet for PA-1: Curb Cut Sag Located at WB2 14+40

| Project Description | | | |
|------------------------|----------|-------|---------|
| Solve For | Spread | | |
| Input Data | | | |
| Discharge | | 0.070 | ft³/s |
| Gutter Width | | 0.00 | ft |
| Gutter Cross Slope | | 0.02 | ft/ft |
| Road Cross Slope | | 0.02 | ft/ft |
| Curb Opening Length | | 1.50 | ft |
| Opening Height | | 0.50 | ft |
| Curb Throat Type | Vertical | | |
| Local Depression | | 0.00 | in |
| Local Depression Width | | 0.00 | ft |
| Throat Incline Angle | | 0.00 | degrees |
| Results | | | |
| Spread | | 3.12 | ft |
| Depth | | 0.06 | ft |
| Gutter Depression | | 0.00 | ft |
| Total Depression | | 0.00 | ft |
| | | | |

Worksheet for PD-1: Curb Cut Sag Located EB

| Project Description | | | |
|------------------------|----------|-------|---------|
| Solve For | Spread | | |
| Input Data | | | |
| Discharge | | 0.210 | ft³/s |
| Gutter Width | | 0.00 | ft |
| Gutter Cross Slope | | 0.02 | ft/ft |
| Road Cross Slope | | 0.02 | ft/ft |
| Curb Opening Length | | 1.50 | ft |
| Opening Height | | 0.50 | ft |
| Curb Throat Type | Vertical | | |
| Local Depression | | 0.00 | in |
| Local Depression Width | | 0.00 | ft |
| Throat Incline Angle | | 0.00 | degrees |
| Results | | | |
| Spread | | 6.48 | ft |
| Depth | | 0.13 | ft |
| Gutter Depression | | 0.00 | ft |
| Total Depression | | 0.00 | ft |
| | | | |

Worksheet for PC-1: Curb Cut Sag Located WB

| Project Description | | | | |
|------------------------|----------|-------|---------|--|
| Solve For | Spread | | | |
| Input Data | | | | |
| Discharge | | 0.050 | ft³/s | |
| Gutter Width | | 0.00 | ft | |
| Gutter Cross Slope | | 0.02 | ft/ft | |
| Road Cross Slope | | 0.02 | ft/ft | |
| Curb Opening Length | | 1.50 | ft | |
| Opening Height | | 0.50 | ft | |
| Curb Throat Type | Vertical | | | |
| Local Depression | | 0.00 | in | |
| Local Depression Width | | 0.00 | ft | |
| Throat Incline Angle | | 0.00 | degrees | |
| Results | | | | |
| Spread | | 2.49 | ft | |
| Depth | | 0.05 | ft | |
| Gutter Depression | | 0.00 | ft | |
| Total Depression | | 0.00 | ft | |

Conveyance Project: Project Number: Date: Franklin Blvd 656986

3/7/2016

| | Location | | | | | | Hyar | ology | | | | | | | <u> </u> | ewer Desi | gn | | |
|------------------|-------------------|-------|--------------------|-------|------|------|------|--------|-------|-------|-----------|-------|----------|--------|----------|-----------|-------|----------|------|
| | | | Area | Area | C | CA | CA | Tc | Tc | Tc | Intensity | Flow | Diameter | Length | Slope | Manning's | . , | Velocity | |
| Approx. I | nlet Location | Inlet | | | | | Sum | Upstrm | Pipe | Total | I | Q | D | L | S | n | Qf | V | Q/Qf |
| (Upstream | End of Pipe) | No. | (ft ²) | (ac) | 0.90 | | | (min) | (min) | (min) | (in/hr) | (cfs) | (in) | (ft) | (ft/ft) | 0.012 | (cfs) | (fps) | |
| G-1 - North Netw | ork - Path 1 | | | | | | | | | | | | | | | | | | |
| Sta WB | 216+64.96 Rt | 2 | 479 | 0.011 | 0.90 | 0.01 | 0.01 | 5.00 | 0.41 | 5.41 | 2.10 | 0.02 | 12 | 50 | 0.68% | 0.012 | 3.18 | 4.05 | 0.01 |
| Sta WB | 216+06.94 Rt | 3 | 1437 | 0.033 | 0.90 | 0.03 | 0.04 | 5.41 | 0.40 | 5.81 | 2.10 | 0.08 | 12 | 52 | 0.77% | 0.012 | 3.39 | 4.31 | 0.02 |
| Sta WB | 215+54.77 Rt | 4 | 1786 | 0.041 | 0.90 | 0.04 | 0.08 | 5.81 | 0.10 | 5.92 | 2.10 | 0.16 | 12 | 11 | 0.53% | 0.012 | 2.81 | 3.58 | 0.06 |
| G-1 - South Netw | ork - Path 2 | | | | | | | | | | | | | | | | | | |
| Sta EB | 117+09.63 Lt | 6 | 2831 | 0.065 | 0.90 | 0.06 | 0.06 | 5.00 | 0.44 | 5.44 | 2.10 | 0.12 | 12 | 50 | 0.60% | 0.012 | 2.99 | 3.81 | 0.04 |
| Sta EB | 116+52.84 Lt | 7 | 1525 | 0.035 | 0.90 | 0.03 | 0.09 | 5.44 | 0.49 | 5.93 | 2.10 | 0.19 | 12 | 50 | 0.48% | 0.012 | 2.67 | 3.41 | 0.07 |
| Sta EB | 115+92.81 Lt | 8 | 1612 | 0.037 | 0.90 | 0.03 | 0.12 | 5.93 | 0.33 | 6.26 | 1.95 | 0.24 | 12 | 52 | 1.13% | 0.012 | 4.10 | 5.23 | 0.06 |
| Sta Cl2 | 5+38.29 Rt | 5 | 1873 | 0.043 | 0.90 | 0.04 | 0.24 | 6.26 | 0.28 | 6.54 | 1.95 | 0.47 | 12 | 31 | 0.55% | 0.012 | 2.86 | 3.65 | 0.16 |
| i-2 - NE Network | c - Path 6 | | | | | | | | | | | | | | | | | | |
| Sta WB | 220+80.00 Lt | 14 | 1612 | 0.037 | 0.90 | 0.03 | 0.03 | 5.00 | 0.34 | 5.34 | 2.10 | 0.07 | 12 | 84 | 2.88% | 0.012 | 6.55 | 8.34 | 0.01 |
| Sta WB | 219+84.07 Lt | 15 | 3920 | 0.09 | 0.90 | 0.08 | 0.11 | 5.34 | 0.19 | 5.53 | 2.10 | 0.24 | 12 | 35 | 1.51% | 0.012 | 4.74 | 6.04 | 0.05 |
| Sta Cl3 | 01+25.00 Rt | 16 | 2265 | 0.052 | 0.90 | 0.05 | 0.16 | 5.53 | 0.17 | 5.70 | 2.10 | 0.34 | 12 | 56 | 5.20% | 0.012 | 8.80 | 11.21 | 0.04 |
| i-2 - South Netw | ork - Path 7 | | | | | | | | | | | | | | | | | | |
| Sta Cl3 | 05+50.37 Lt | 35 | 3267 | 0.075 | 0.90 | 0.07 | 0.07 | 5.00 | 0.38 | 5.38 | 2.10 | 0.14 | 12 | 78 | 1.90% | 0.012 | 5.32 | 6.78 | 0.03 |
| Sta Cl3 | 04+71.21 Lt | 36 | 1830 | 0.042 | 0.90 | 0.04 | 0.11 | 5.38 | 0.38 | 5.76 | 2.10 | 0.22 | 12 | 68 | 1.47% | 0.012 | 4.68 | 5.96 | 0.05 |
| Sta Cl3 | 04+00.96 Lt | 37 | 1699 | 0.039 | 0.90 | 0.04 | 0.14 | 5.76 | 0.52 | 6.28 | 1.95 | 0.27 | 12 | 83 | 1.18% | 0.012 | 4.19 | 5.34 | 0.07 |
| G-2 - NW Networ | rk - Path 3 and 4 | | | | | | | | | | | | | | | | | | |
| Sta Cl3 | 02+10.12 Lt | 11 | 3180 | 0.073 | 0.90 | 0.07 | 0.07 | 5.00 | 0.36 | 5.36 | 2.10 | 0.14 | 12 | 51 | 0.90% | 0.012 | 3.66 | 4.66 | 0.04 |
| Sta Cl3 | 02+36.60 Lt | 12 | 1263 | 0.029 | 0.90 | 0.03 | 0.09 | 5.36 | 0.58 | 5.95 | 2.10 | 0.19 | 12 | 57 | 0.44% | 0.012 | 2.56 | 3.26 | 0.08 |
| Sta WB | 218+63.13 Rt | 13 | 1394 | 0.032 | 0.90 | 0.03 | 0.12 | 5.95 | 0.29 | 6.23 | 1.95 | 0.24 | 12 | 28 | 0.44% | 0.012 | 2.56 | 3.26 | 0.09 |
| 6-3 - North Netw | ork Path 8 | | | | | | | | | | | | | | | | | | |
| Sta EB | 123+27.97 Lt | 18 | 828 | 0.019 | 0.90 | 0.02 | 0.02 | 5.00 | 0.37 | 5.37 | 2.10 | 0.04 | 12 | 36 | 0.44% | 0.012 | 2.56 | 3.26 | 0.01 |
| Sta EB | 122+28.05 Lt | 31 | 1394 | 0.032 | 0.90 | 0.03 | 0.03 | 5.00 | 0.44 | 5.44 | 2.10 | 0.06 | 12 | 43 | 0.44% | 0.012 | 2.56 | 3.26 | 0.02 |
| Sta EB | 121+14.93 Lt | 32 | 2396 | 0.055 | 0.90 | 0.05 | 0.05 | 5.00 | 0.08 | 5.08 | 2.10 | 0.10 | 12 | 22 | 3.27% | 0.012 | 6.98 | 8.89 | 0.01 |
| Sta EB | 120+51.36 Lt | 33 | 1917 | 0.044 | 0.90 | 0.04 | 0.04 | 5.00 | 0.23 | 5.23 | 2.10 | 0.08 | 12 | 35 | 1.05% | 0.012 | 3.95 | 5.04 | 0.02 |
| Sta EB | 119+95.37 Lt | 34 | 1525 | 0.035 | 0.90 | 0.03 | 0.03 | 5.00 | 0.18 | 5.18 | 2.10 | 0.07 | 12 | 44 | 2.65% | 0.012 | 6.28 | 8.00 | 0.01 |
| | | | | | | | | | | | | | 1 | | | | | | |
| Sta MCV | 21+11.22 Rt | 25 | 2614 | 0.06 | 0.90 | 0.05 | 0.05 | 5.00 | 0.08 | 5.08 | 2.10 | 0.11 | 12 | 8 | 0.44% | 0.012 | 2.56 | 3.26 | 0.04 |

| Sta MCV | 20+80.70 Rt | 26 | 1786 | 0.041 | 0.90 | 0.04 | 0.09 | 5.00 | 0.11 | 5.11 | 2.10 | 0.19 | 12 | 26 | 2.80% | 0.012 | 6.46 | 8.23 | 0.03 | ОК |
|---------------|--------------|-------|-------|-------|------|------|------|------|------|------|------|------|----|-----|----------------|-------|------|------|------|----|
| Sta MCV | 22+09.76 Rt | 29 | 2526 | 0.058 | 0.90 | 0.05 | 0.05 | 5.00 | 0.44 | 5.44 | 2.10 | 0.11 | 12 | 43 | 0.44% | 0.012 | 2.56 | 3.26 | 0.04 | ОК |
| Sta MCV | 21+12.59 Lt | 30 | 1786 | 0.041 | 0.90 | 0.04 | 0.09 | 5.44 | 0.76 | 6.20 | 1.95 | 0.17 | 12 | 95 | 0.71% | 0.012 | 3.25 | 4.14 | 0.05 | OK |
| Sta MCV-R | 01+54.93 Lt | 38 | 4269 | 0.098 | 0.90 | 0.09 | 0.28 | 6.20 | 0.08 | 6.29 | 1.95 | 0.55 | 12 | 8 | 0.44% | 0.012 | 2.56 | 3.26 | 0.21 | OK |
| Sta MCV-R | 01+63.10 Lt | 27 | 436 | 0.01 | 0.90 | 0.01 | 0.38 | 6.29 | 0.10 | 6.39 | 1.95 | 0.74 | 12 | 10 | 0.44% | 0.012 | 2.56 | 3.26 | 0.29 | OK |
| Sta MCV-R | 01+73.37 Lt | 28 | 218 | 0.005 | 0.90 | 0.00 | 0.48 | 6.39 | 0.11 | 6.49 | 1.95 | 0.93 | 12 | 16 | 1. 05 % | 0.012 | 3.95 | 5.04 | 0.24 | OK |
| Sta MCV-R | 05+36.15 Rt | 19 | 1220 | 0.028 | 0.90 | 0.03 | 0.04 | 5.00 | 0.36 | 5.36 | 2.10 | 0.09 | 12 | 100 | 3.52% | 0.012 | 7.24 | 9.22 | 0.01 | ОК |
| Sta MCV-R | 04+36.26 Rt | 20 | 2919 | 0.067 | 0.90 | 0.06 | 0.13 | 5.36 | 0.45 | 5.81 | 2.10 | 0.28 | 12 | 107 | 2.62% | 0.012 | 6.25 | 7.96 | 0.04 | ОК |
| Sta MCV-R | 03+29.21 Lt | 21 | 3223 | 0.074 | 0.90 | 0.07 | 0.25 | 5.81 | 0.28 | 6.09 | 1.95 | 0.48 | 12 | 52 | 1.63% | 0.012 | 4.93 | 6.28 | 0.10 | ОК |
| Sta MCV-R | 02+78.26 Lt | 22 | 1002 | 0.023 | 0.90 | 0.02 | 0.31 | 6.09 | 0.18 | 6.27 | 1.95 | 0.60 | 12 | 51 | 3.57% | 0.012 | 7.29 | 9.29 | 0.08 | ОК |
| Sta MCV-R | 02+27.08 Lt | 23 | 1002 | 0.023 | 0.90 | 0.02 | 0.36 | 6.27 | 0.16 | 6.43 | 1.95 | 0.70 | 12 | 37 | 2.52% | 0.012 | 6.12 | 7.80 | 0.11 | ОК |
| Sta MCV-R | 20+73.56 Lt | 24 | 0 | 0 | 0.90 | 0.00 | 0.84 | 6.43 | 0.34 | 6.76 | 1.95 | 1.63 | 12 | 33 | 0.44% | 0.012 | 2.56 | 3.26 | 0.64 | ОК |
| Filterra 4x4 | | | | | | | | | | | | | | | | | | | | |
| Sta WB | 209+28.9 Lt | F4x4 | 4792 | 0.11 | 0.90 | 0.10 | 0.10 | 5.00 | 0.18 | 5.18 | 2.10 | 0.21 | 6 | 11 | 0.44% | 0.012 | 0.40 | 2.05 | 0.52 | ОК |
| Filterra 8x4 | | | | | | | | | | | | | | | | | | | | |
| Sta EB | 123+27.97 Lt | F8x4 | 10019 | 0.23 | 0.90 | 0.21 | 0.21 | 5.00 | 0.29 | 5.29 | 2.10 | 0.43 | 8 | 22 | 0.44% | 0.012 | 0.87 | 2.49 | 0.50 | ОК |
| Filterra 4x12 | | | | | | | | | | | | | | | | | | | | |
| Sta EB | 123+27.97 Lt | F4x12 | 4792 | 0.11 | 0.90 | 0.10 | 0.10 | 5.00 | 0.37 | 5.37 | 2.10 | 0.21 | 12 | 36 | 0.44% | 0.012 | 2.56 | 3.26 | 0.08 | ОК |





Franklin Blvd: Stormwater Drainage Design Variances

PREPARED FOR: Kristi Krueger/City of Springfield

PREPARED BY: Theresa Ring/CH2M

Richard Attanasio/CH2M

DATE: December 1, 2015 March 1st, 2016

PROJECT NUMBER: 656986

As part of the Franklin Blvd project, the City of Springfield code references the guidelines laid out by the City of Eugene's Stormwater Management Manual (SWMM) for LID drainage design. The Glenwood Refinement Plan calls for management of stormwater using LID principles. This project is therefore incorporating stormwater planters and infiltration raingardens as described in the Eugene SWMM with a couple of modifications on the required design criteria. These modifications are necessary to meet the project requirements within the given right-of-way and to construct the drainage system without providing a new stormwater outfall to the river. These variances to the Eugene SWMM are described below.

Variances

Table 1, below, provides the requirements out of the Eugene SWMM, changes in the proposed design and explains the reasoning behind the proposed changes:

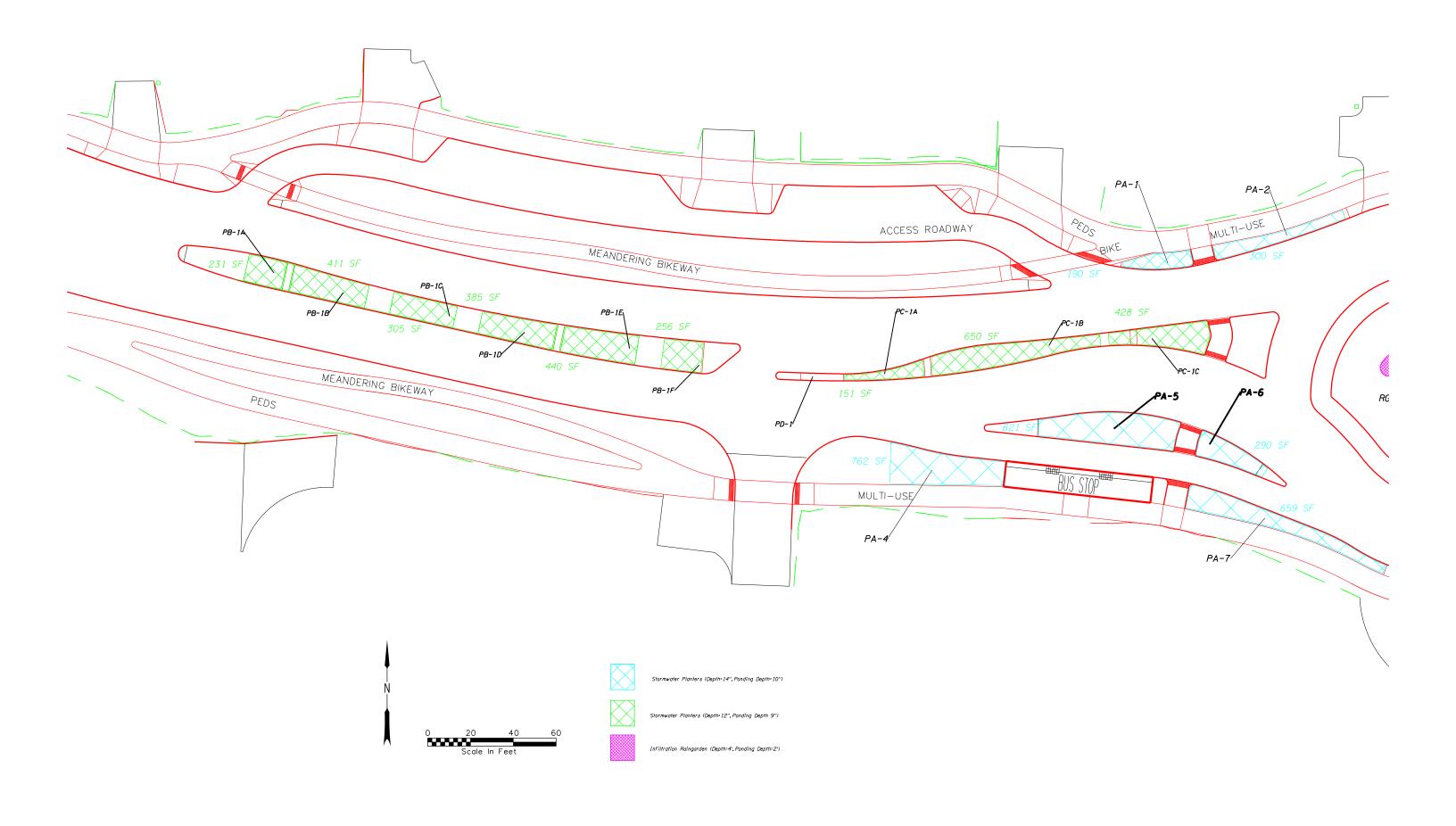
| Tal | ole | 1 |
|-----|-----|---|
|-----|-----|---|

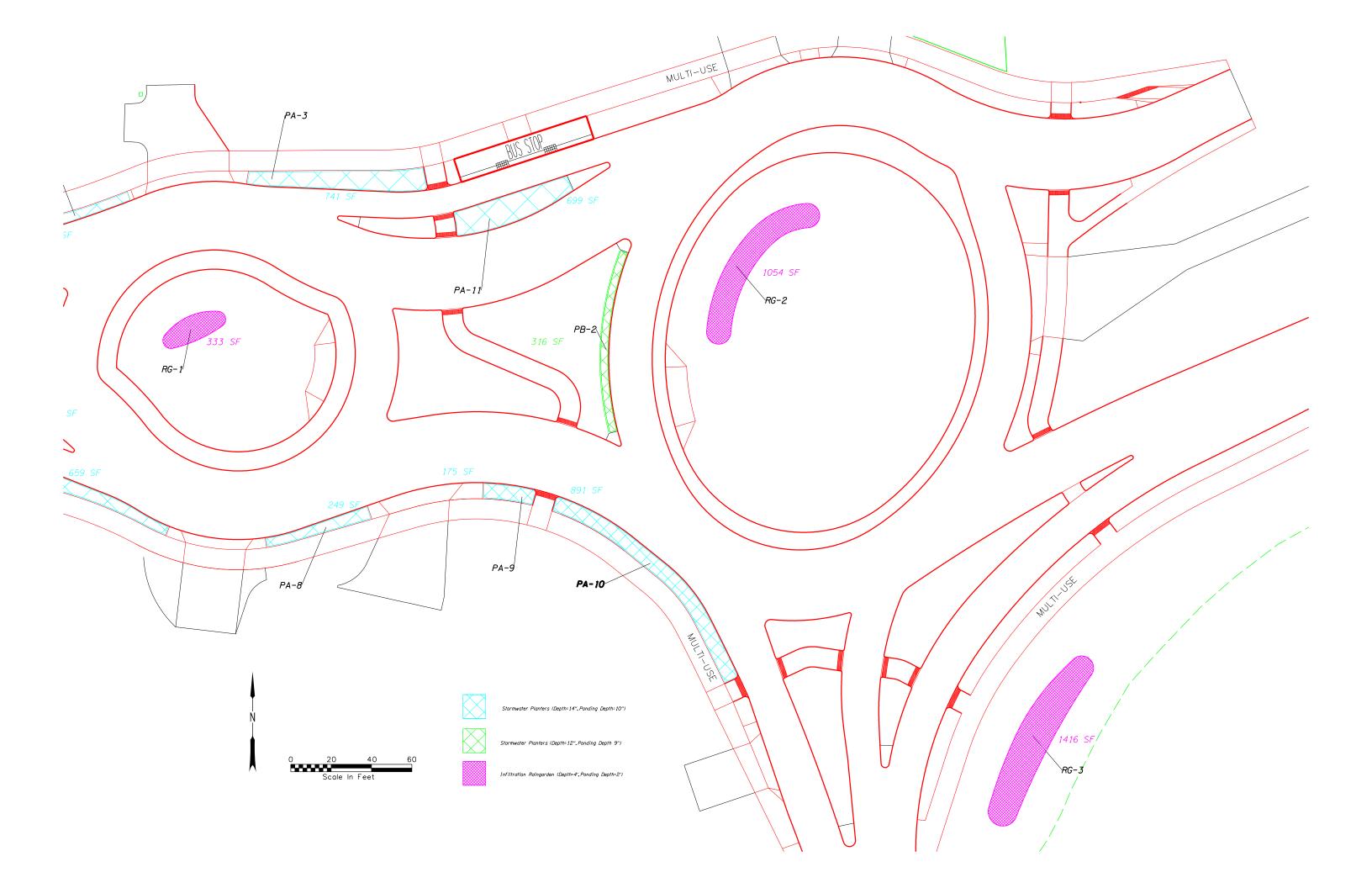
| City of Eugene SWMM Criteria | Proposed Design | Rationale |
|--|--|---|
| "Planters located next to public sidewalks or curbs shall have a minimum 12 inch-wide flat area between the planter wall and the sidewalk or curb." (2.3.11) | There will be no distinct "flat area" separating the planter wall from the sidewalk. | SWMM is not clear on this requirement. No separation is shown in the SWMM standard details for stormwater planters. Additionally, edge protection, as a curb, will be provided adjacent to bike and pedestrian paths. Adjoining sidewalks are also 10-feet wide, which provides additional protection over standard sidewalk widths. The additional treatment area is necessary to provide the requisite storage within the right-of-way. |

Table 1

| City of Eugene SWMM Criteria | Proposed Design | Rationale |
|--|--|---|
| Infiltration Raingarden "storage depth shall be no more than 12 inches." (2.3.9) | Selected raingardens will have 24-inches of storage depth. | All raingardens are designed to fully infiltrate the 25-year storm event. A 12-inch or less depth would require an overflow structure that would require a new stormwater outfall to the river. Increasing their depth also provided for a centralized location to treat the stormwater runoff, thus reducing the number of required raingardens. |
| No maximum total depth is explicitly required, however Eugene details imply a maximum of 14-inches. (Appendix B) | Selected raingardens will be 4-feet deep. | This is necessary to allow areas of the roadway to be piped to the raingardens, thus again allowing for the centralized treatment of the stormwater runoff. Otherwise the runoff around the truck aprons, for example, could not be conveyed to a site for treatment. |

The proposed variances to the Eugene SWMM are necessary to meet the drainage requirements, within the constrained envelope along the highly anticipated urbanized corridor of Franklin Blvd.







Attachment G

Stormwater Facility Sizing Calculators



| EUGENE | City of Eugene | - | | | | | | | |
|---|---|--|---|--|------------------------------------|----------------|-------|--|--|
| | Version 2.1 | | | | | | | | |
| Project Information | | | | | | | | | |
| Project Name: | Franklin Blvd | | | Date: | 6/7/2016 | | | | |
| Project Address: | Franklin Blvd | | | Permit Number: | : | | | | |
| | Springfield, OR | | | Catchment ID: | PA-1 | | | | |
| Designer: | Theresa Ring | | | | | | | | |
| Company: | CH2M | | | | | | | | |
| Instructions: | | | | | | | ļ | | |
| Complete this form for Provide a distinctive C calculations with the far The maximum drainage For infiltration facilities | atchment ID for each acility. ge catchment to be m in Class A or B soils | facility coordinated with | h the site basir ptive Approach ting has been l | is 1 acre (43,560 Sperfromed use an in | he appropriate SF) | | | | |
| Design Requirements: | | | | | | | | | |
| Choose "Yes" from the d Pollution Reduction Flow Continues Destination | on (PR) Yes rol (FC) Yes | v next to the design star *An infiltration facility must be | · | | | | | | |
| Site Data-Post Develop | ment | | | | | | | | |
| Total Square Footage Impervious Area = 1591.7 sqft Impervious Area CN = 98 Total Square Footage Pervious Area = 0 sqft Pervious Area CN = 85 Total Square Footage of Drainage Area = 1592 sft Time of Concentration Post Development = 5 min Weighted Average CN = 98 | | | | | | | | | |
| Site Data-Pre Developn | nent (Data in th | is section is only used | d if Flow Cont | rol is required) | | | | | |
| | e-Development CN= | 85 | Time of C | oncentration Pre-I | Development= | 10 | min | | |
| Soil Data | | | | | | | | | |
| | oil Infiltration Rate= oil Infiltration Rate= | 7.2 in/hr (See No 2.5 in/hr | ote 4) | | nation Design= nfiltration Rate | | in/hr | | |
| Design Storms Used Fo | or Calculations | | | | | | | | |
| Requirement | 24-hour | Design Storm | | | | | | | |
| Pollution Reduction | 1.0 inches | Water Quality | | | | | | | |
| Flow Control | 3.6 inches | Flow Control | | | | | | | |
| Destination | 4.8 inches | Flood Control | | | | | | | |
| | | | ı | | | | | | |
| Facility Data | | | | | | | _ | | |
| | | Infiltration Stormwate | er Planter | • | Surface Area= | 188.5 | | | |
| | Surface Width= | 6.5 ft | | • | ce Perimeter= | 71 | | | |
| _ | Surface Length= | 29 ft | | • | Bottom Area= | 189 | - | | |
| | acility Side Slopes= | 0 to 1 | | Facility Botto | om Perimeter= | 71 | ft | | |
| | Ponding Depth | 12 :- | | - | Pagin Valuma | 100 5 | of | | |
| | mwater Facility= ring Medium (Soil)= | 12 in 12 in | Dotic of F | | Basin Volume= | 188.5 0.118 | CI | | |
| pehin or Grow | ing wedidin (3011)= | 12 | Natio of F | acility Area to Imp | ei vious Aled= | 0.110 | i | | |

| Pollution Reduction-Calculation Results | | | | | | |
|---|---|--|--|--|--|--|
| Peak Flow Rate to Stormwater Facility = 0.008 cfs | Peak Facility Overflow Rate= 0.000 cfs | | | | | |
| Total Runoff Volume to Stormwater | | | | | | |
| Facility = 105 cf | Total Overflow Volume= 0 cf | | | | | |
| Max. Depth of Stormwater in Facility= 0.0 in | | | | | | |
| Drawdown Time= 0.2 hours | | | | | | |
| Yes Facility Sizing Meets Pollution Reduction Standards? | | | | | | |
| YES Meets Requirement of No Facility Flooding? | | | | | | |
| YES Meets Requirement for Maximum of 18 Hour | Drawdown Time? | | | | | |
| | | | | | | |
| Flow Control-Calculation Results | | | | | | |
| Peak Flow Rate to Stormwater Facility = 0.034 cfs | Peak Facility Overflow Rate= 0.000 cfs | | | | | |
| Total Runoff Volume to Stormwater | | | | | | |
| Facility = 446 cf | Total Overflow Volume= 0 cf | | | | | |
| | Peak Off-Site Flow Rate | | | | | |
| Max. Depth of Stormwater in Facility= 2.5 in | Filtration Facility Underdrain= N\A cfs | | | | | |
| Drawdown Time= 0.2 hours | | | | | | |
| Pre-Development Runoff Data | | | | | | |
| Peak Flow Rate = 0.019 cfs | | | | | | |
| Total Runoff Volume = 279 cf | | | | | | |
| | | | | | | |
| Yes Facility Sizing Meets Flow Control Standards | ? | | | | | |
| YES Meets Requirement for Post Development of YES Meets Requirement for Maximum of 18 Hour | site flow less or equal to Pre-Development Flow? Drawdown Time? | | | | | |
| Destination-Calculation Results | | | | | | |
| Peak Flow Rate to Stormwater Facility = 0.046 cfs | Peak Facility Overflow Rate= 0.000 cfs | | | | | |
| Total Runoff Volume to Stormwater | o.ooo ole | | | | | |
| Facility = 604 cf | Total Overflow Volume= 0 cf | | | | | |
| Max. Depth of Stormwater in Facility= 4.9 in | | | | | | |
| Drawdown Time= 0.2 hours | | | | | | |
| Yes Facility Sizing Meets Destination Standards? | | | | | | |
| YES Meets Requirement of No Facility Flooding? YES Meets Requirement for Maximum of 30 hour | Drawdown Time? | | | | | |



| EUGENE | City of Eugene | NICO TYPE TA Kan | man Distrib | dion | | | |
|---|--|--|---|---|--|--|------------------|
| | Version 2.1 | | | | | | |
| Project Information | VC131011 Z.1 | | | | | | |
| Project Name: Project Address: Designer: Company: | Franklin Blvd Franklin Blvd Springfield, OR Theresa Ring CH2M | | | Date: Permit Number: Catchment ID: | | | |
| | atchment ID for each cility. e catchment to be main Class A or B soils | facility coordinated with | the site basin tive Approach ing has been p | map to correlate the is 1 acre (43,560 Sperfromed use an ir | he appropriate | | |
| Design Requirements: | | | | | | | |
| Choose "Yes" from the di Pollution Reductio Flow Contr Destinatio | on (PR) Yes | v next to the design stan | · | | | | |
| Site Data-Post Developi | ment | | | | | | |
| Total Square Footage | pervious Area CN= | 3543 sqft 98 3543 sft 98 | | Square Footage P Pervi ncentration Post I | ious Area CN= | 85 | sqft min |
| Site Data-Pre Developm | ent (Data in th | is section is only used | if Flow Cont | rol is required) | | | |
| | -Development CN= | 85 | Time of C | oncentration Pre-I | Development= | 10 | min |
| | il Infiltration Rate= il Infiltration Rate= | 7.2 in/hr (See Not 2.5 in/hr | te 4) | | ation Design= nfiltration Rate | 2.5 | in/hr |
| Design Storms Used Fo | or Calculations | | | | | | |
| Requirement Pollution Reduction Flow Control Destination | 1.0 inches 3.6 inches | Design Storm Water Quality Flow Control Flood Control | | | | | |
| Facility Data | | | | | | | |
| Max. F in Storn | Facility Type= Surface Width= Surface Length= scility Side Slopes= conding Depth nwater Facility= ing Medium (Soil)= | Infiltration Stormwater 10 ft 30 ft 0 to 1 12 in 12 in | | Facility Surfa Facility Facility Botto | Surface Area= ce Perimeter= Bottom Area= om Perimeter= assin Volume= ervious Area= | 300 80 300 80 300.0 0.085 | ft sqft ft |

| Pollution Reduction-Calculation Results | | | | | | |
|---|--|--|--|--|--|--|
| Peak Flow Rate to Stormwater Facility = 0.019 cfs | Peak Facility Overflow Rate= 0.000 cfs | | | | | |
| Total Runoff Volume to Stormwater | | | | | | |
| Facility = 233 cf | Total Overflow Volume= 0 cf | | | | | |
| Max. Depth of Stormwater in Facility= 0.0 in | | | | | | |
| Drawdown Time= 0.2 hours | | | | | | |
| Yes Facility Sizing Meets Pollution Reduction Standards? | | | | | | |
| YES Meets Requirement of No Facility Flooding? | ? | | | | | |
| YES Meets Requirement for Maximum of 18 Hou | r Drawdown Time? | | | | | |
| | | | | | | |
| Flow Control-Calculation Results | | | | | | |
| Peak Flow Rate to Stormwater Facility = 0.077 cfs | Peak Facility Overflow Rate= 0.000 cfs | | | | | |
| Total Runoff Volume to Stormwater | | | | | | |
| Facility = 992 cf | Total Overflow Volume= 0 cf | | | | | |
| | Peak Off-Site Flow Rate | | | | | |
| Max. Depth of Stormwater in Facility= 5.3 in Drawdown Time= 0.2 hours | Filtration Facility Underdrain= N\A cfs | | | | | |
| Drawdown Time= 0.2 hours | | | | | | |
| Pre-Development Runoff Data | | | | | | |
| Peak Flow Rate = 0.042 cfs | | | | | | |
| Total Runoff Volume = 621 cf | | | | | | |
| | | | | | | |
| Yes Facility Sizing Meets Flow Control Standard | \$? | | | | | |
| YES Meets Requirement for Maximum of 18 Hou | ffsite flow less or equal to Pre-Development Flow? r Drawdown Time? | | | | | |
| Destination-Calculation Results | | | | | | |
| Peak Flow Rate to Stormwater Facility = 0.103 cfs | Peak Facility Overflow Rate= 0.000 cfs | | | | | |
| Total Runoff Volume to Stormwater | | | | | | |
| Facility = 1345 cf | Total Overflow Volume= 0 cf | | | | | |
| Max. Depth of Stormwater in Facility= 10.7 in Drawdown Time= 0.2 hours | | | | | | |
| Drawdown Time= 0.2 hours | | | | | | |
| Yes Facility Sizing Meets Destination Standards | ? | | | | | |
| YES Meets Requirement of No Facility Flooding? YES Meets Requirement for Maximum of 30 hour | | | | | | |



| EUGENE | City of Eugene | | | | | | |
|--|---|--|---|--|-----------------------------------|-------|-------|
| | Version 2.1 | | | | | | |
| Project Information | | | | | | | |
| Project Name: | Franklin Blvd | | | Date: | 6/3/2016 | | |
| Project Address: | Franklin Blvd | | | Permit Number: | | | |
| | Springfield, OR | | | Catchment ID: | PA-3 | | |
| Designer: | Theresa Ring | | | | | | |
| Company: | CH2M | | | | | | |
| Instructions: | | | | | | | ļ |
| Complete this form for Provide a distinctive C calculations with the far The maximum drainage For infiltration facilities | atchment ID for each acility. ge catchment to be m in Class A or B soils | facility coordinated with | h the site basin otive Approach ting has been p | n map to correlate the is 1 acre (43,560 Sperfromed use an ir | he appropriate SF) | | |
| Design Requirements: | | | | | | | |
| Choose "Yes" from the d Pollution Reduction Flow Continues Destination | on (PR) Yes rol (FC) Yes | v next to the design star *An infiltration facility must be | · | | | | |
| Site Data-Post Develop | ment | | | | | | |
| Total Square Footage Impervious Area = 8970 sqft | | | | | | | |
| Site Data-Pre Developn | nent (Data in th | is section is only used | d if Flow Cont | rol is required) | | | |
| | e-Development CN= | 85 | Time of C | oncentration Pre-I | Development= | 10 | min |
| Soil Data | | | | | | | |
| | oil Infiltration Rate= oil Infiltration Rate= | 7.2 in/hr (See No 2.5 in/hr | ote 4) | | ation Design= nfiltration Rate | 2.5 | in/hr |
| Design Storms Used Fo | or Calculations | | | | | | |
| Requirement | 24-hour | Design Storm | | | | | |
| Pollution Reduction | 1.0 inches | Water Quality | | | | | |
| Flow Control | 3.6 inches | Flow Control | | | | | |
| Destination | 4.8 inches | Flood Control | | | | | |
| Facility Data | 1 | | | | | | |
| I domity Data | F 1114 - T | I (') ((' O) (- | - Dit | F 1114 | 0f A I | 744 | |
| | | Infiltration Stormwate | er Planter | - | Surface Area= | 741 | |
| | Surface Width= | 13 ft | | • | ce Perimeter= | 140 | |
| _ | Surface Length= | 57 ft | | • | Bottom Area= | 741 | |
| | acility Side Slopes= | 0 to 1 | | Facility Botto | om Perimeter= | 140 | π |
| | Ponding Depth mwater Facility= | 12.0 in | | | asin Volume= | 741.0 | cf |
| | ring Medium (Soil)= | 12.0 III | Ratio of F | acility Area to Imp | | 0.083 | |
| | | | | | | 0.000 | i |

| Pollution Reduction-Calculation Results | | | | | | | | |
|--|--|--|--|--|--|--|--|--|
| Peak Flow Rate to Stormwater Facility = 0.047 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs | | | | | | | |
| Facility = 590 cf | Total Overflow Volume= 0 cf | | | | | | | |
| Max. Depth of Stormwater in Facility= 0.0 in Drawdown Time= 0.2 hours | | | | | | | | |
| Diawdowii Time- | | | | | | | | |
| Yes Facility Sizing Meets Pollution Red | Yes Facility Sizing Meets Pollution Reduction Standards? | | | | | | | |
| YES Meets Requirement of No Facility YES Meets Requirement for Maximum | - | | | | | | | |
| Flow Control-Calculation Results | | | | | | | | |
| Peak Flow Rate to Stormwater Facility = 0.194 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs | | | | | | | |
| Facility = 2511 cf | Total Overflow Volume= 0 cf | | | | | | | |
| | Peak Off-Site Flow Rate | | | | | | | |
| Max. Depth of Stormwater in Facility= 5.6 in | Filtration Facility Underdrain= N\A cfs | | | | | | | |
| Drawdown Time= 0.2 hours | | | | | | | | |
| Pre-Development Runoff Data | | | | | | | | |
| Peak Flow Rate = 0.107 cfs | | | | | | | | |
| Total Runoff Volume = 1573 cf | | | | | | | | |
| Yes Facility Sizing Meets Flow Control | Standards? | | | | | | | |
| YES Meets Requirement for Post Dev | elopment offsite flow less or equal to Pre-Development Flow? | | | | | | | |
| YES Meets Requirement for Maximum | | | | | | | | |
| Destination-Calculation Results | | | | | | | | |
| Peak Flow Rate to Stormwater Facility = 0.260 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs | | | | | | | |
| Facility = 3404 cf | Total Overflow Volume= 0 cf | | | | | | | |
| Max. Depth of Stormwater in Facility= 11.3 in | | | | | | | | |
| Drawdown Time= 0.3 hours | | | | | | | | |
| Yes Facility Sizing Meets Destination S | tandards? | | | | | | | |
| YES Meets Requirement of No Facility YES Meets Requirement for Maximum | | | | | | | | |
| | | | | | | | | |



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| Project Information | | | | | | | |
| Project Name: | Franklin Blvd | | | Date: | 6/3/2016 | | |
| Project Address: | Franklin Blvd | | | Permit Number: | | | |
| | Springfield, OR | | | Catchment ID: | PA-4 | | |
| Designer: | Theresa Ring | | | | | | |
| Company: | CH2M | | | | | | |
| Instructions: | | | | | | | |
| Complete this form for Provide a distinctive C calculations with the fa The maximum drainag | atchment ID for eacl | h facility coordinated with | h the site basir | n map to correlate th | ne appropriate | | |
| 4.For infiltration facilities | | | - | | nfiltration rate of | f 0.5 in/hr. | |
| For all facilities use a | maximum soil infiltra | tion rate of 2.5 in/hr for t | topsoil/growing | medium. | | | |
| Design Requirements: | | | | | | | |
| Choose "Yes" from the d | ropdown boxes belo | w next to the design star | ndards requirer | nents for this facility | y. | | |
| Pollution Reduction | on (PR) Yes | 1 | | | | | |
| Flow Conti | ` ' | | | | | | |
| Destination | ` ' | *An infiltration facility must be | chosen as the fac | ility type to meet destinat | tion requirements | | |
| Destination | on (D1) 103 | An initiation facility must be | chosen as the fac | illy type to meet destinati | ion requirements | | |
| Site Data-Post Develop | ment | | | | | | |
| Total Square Footage Im | e Impervious Area= pervious Area CN= | | Total | Square Footage Pervi | ervious Area= ous Area CN= | 0 85 | sqft |
| Total Square Footage Wei | e of Drainage Area= ghted Average CN= | | Time of Co | ncentration Post D | Development= | 5 | min |
| Site Data-Pre Developn | nent (Data in th | nis section is only used | d if Flow Cont | rol is required) | | | |
| Pre | -Development CN= | 85 | Time of C | oncentration Pre-D | Development= | 10 | min |
| Soil Data | | | | | | | |
| | oil Infiltration Rate= oil Infiltration Rate= | | ote 4) | | ation Design= filtration Rate | 2.5 | in/hr |
| Design Storms Used Fo | or Calculations | | | | | | |
| Requirement | 24-hour | Design Storm |] | | | | |
| Pollution Reduction | 1.0 inches | Water Quality | | | | | |
| Flow Control | 3.6 inches | Flow Control | 1 | | | | |
| Destination | 4.8 inches | Flood Control | 1 | | | | |
| Facility Data | | | | | | | |
| • | Facility Type= | Infiltration Stormwate | er Planter | Facility 5 | Surface Area= | 473 | saft |
| | Surface Width= | | | - | ce Perimeter= | 108 | |
| | Surface Length= | | | • | Bottom Area= | 473 | |
| Fs | -cility Side Slopes | | | • | m Perimeter= | 108 | |
| | Ponding Depth | 0101 | | i donity botto | i cimietei – | 100 | .` |
| | nwater Facility= | 12 in | | В | asin Volume= | 473.0 | cf |
| | ing Medium (Soil)= | | Ratio of F | acility Area to Impe | | 0.082 | |

| Pollution Reduction-Calculation Results | | | | | | |
|--|--|--|--|--|--|--|
| Peak Flow Rate to Stormwater Facility = 0.030 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs | | | | | |
| Facility = 379 cf | Total Overflow Volume= 0 cf | | | | | |
| Max. Depth of Stormwater in Facility= 0.0 in Drawdown Time= 0.2 hours | | | | | | |
| Diawdown Time 0.2 mours | | | | | | |
| Yes Facility Sizing Meets Pollution Reduction Standards? | | | | | | |
| YES Meets Requirement of No Facility Flooding YES Meets Requirement for Maximum of 18 H | - | | | | | |
| Flow Control-Calculation Results | | | | | | |
| Peak Flow Rate to Stormwater Facility = 0.124 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs | | | | | |
| Facility = 1612 cf | Total Overflow Volume= 0 cf | | | | | |
| | Peak Off-Site Flow Rate | | | | | |
| Max. Depth of Stormwater in Facility= 5.6 in | Filtration Facility Underdrain= N\A cfs | | | | | |
| Drawdown Time= 0.2 hours | | | | | | |
| Pre-Development Runoff Data | | | | | | |
| Peak Flow Rate = 0.069 cfs | | | | | | |
| Total Runoff Volume = 1009 cf | | | | | | |
| Yes Facility Sizing Meets Flow Control Standa | ords? | | | | | |
| | nt offsite flow less or equal to Pre-Development Flow? | | | | | |
| YES Meets Requirement for Maximum of 18 H | our Drawdown Time? | | | | | |
| Destination-Calculation Results | | | | | | |
| Peak Flow Rate to Stormwater Facility = 0.167 cfs | Peak Facility Overflow Rate= 0.000 cfs | | | | | |
| Total Runoff Volume to Stormwater Facility = 2185 cf | Total Overflow Volume= 0 cf | | | | | |
| Max. Depth of Stormwater in Facility= 11.5 in | Total Overnow Volume | | | | | |
| Drawdown Time= 0.5 hours | | | | | | |
| Yes Facility Sizing Meets Destination Standard | ds? | | | | | |
| YES Meets Requirement of No Facility Floodin YES Meets Requirement for Maximum of 30 ho | | | | | | |



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|--|---|--|---|---|--|--|------------------|
| | Version 2.1 | | | | | | |
| Project Information | 70.0.0 | | | | | | |
| Project Name: Project Address: Designer: Company: | Franklin Blvd Franklin Blvd Springfield, OR Theresa Ring CH2M | | | Date: Permit Number: Catchment ID: | | | |
| Company. | CITZIVI | | | | | | |
| Instructions: 1. Complete this form for 2. Provide a distinctive C calculations with the fa 3. The maximum drainag 4.For infiltration facilities For all facilities use a | catchment ID for each acility. ge catchment to be m in Class A or B soils | facility coordinated with | n the site basin otive Approach ting has been p | is 1 acre (43,560 Sperfromed use an ir | he appropriate | | |
| Design Requirements: | | | | | | | |
| Choose "Yes" from the d Pollution Reduction Flow Continues Destination | on (PR) Yes rol (FC) Yes | v next to the design star | · | | | | |
| Site Data-Post Develop | ment | | | | | | |
| Total Square Footage | pervious Area CN= | 3394 sqft 98 3394 sft 98 | | Square Footage P Pervi ncentration Post I | ious Area CN= | 85 | sqft min |
| Site Data-Pre Developn | nent (Data in th | is section is only used | d if Flow Cont | rol is required) | | | |
| | e-Development CN= | 85 | Time of C | oncentration Pre-I | Development= | 10 | min |
| Soil Data | | | | | | | |
| | oil Infiltration Rate= oil Infiltration Rate= | 7.2 in/hr (See No 2.5 in/hr | ote 4) | | ation Design= nfiltration Rate | 2.5 | in/hr |
| Design Storms Used Fo | or Calculations | | | | | | |
| Requirement Pollution Reduction Flow Control Destination | 24-hour 1.0 inches 3.6 inches 4.8 inches | Design Storm Water Quality Flow Control Flood Control | | | | | |
| Facility Data | | | | | | | |
| Max. I in Stori | Facility Type= Surface Width= Surface Length= acility Side Slopes= Ponding Depth mwater Facility= ving Medium (Soil)= | Infiltration Stormwate 8 ft 35 ft 0 to 1 12 in 12 in | | Facility Surfa Facility Facility Botto | Surface Area= ce Perimeter= Bottom Area= om Perimeter= assin Volume= ervious Area= | 280 86 280 86 280.0 0.083 | ft sqft ft |
| | (5511)- | | | iiip | | 0.000 | |

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| Pollution Reduction-Calculation Results | |
|--|---|
| Peak Flow Rate to Stormwater Facility = 0.018 | cfs Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | |
| Facility = 223 | |
| Max. Depth of Stormwater in Facility= 0.0 Drawdown Time= 0.2 | |
| Drawdown Time= 0.2 | hours |
| Yes Facility Sizing Meets Pollu | ution Reduction Standards? |
| YES Meets Requirement of YES Meets Requirement fo | No Facility Flooding? r Maximum of 18 Hour Drawdown Time? |
| Flow Control-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.073 | cfs Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | |
| Facility = 950 | |
| Max. Depth of Stormwater in Facility= 5.6 | Peak Off-Site Flow Rate Filtration Facility Underdrain= N\A cfs |
| | n Filtration Facility Underdrain= N∖A cfs hours |
| Brawaown Timo- | |
| Pre-Development Runoff Data | |
| Peak Flow Rate = 0.041 | ofs |
| Total Runoff Volume = 595 | of |
| Yes Facility Sizing Meets Flow | Control Standards? |
| <u> </u> | r Post Development offsite flow less or equal to Pre-Development Flow? r Maximum of 18 Hour Drawdown Time? |
| Destination-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.098 Total Runoff Volume to Stormwater | cfs Peak Facility Overflow Rate= 0.000 cfs |
| Facility = 1288 | cf Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 11.4 | n |
| Drawdown Time= 0.3 | hours |
| Yes Facility Sizing Meets Dest | ination Standards? |
| YES Meets Requirement of | No Facility Flooding? |
| | r Maximum of 30 hour Drawdown Time? |
| | * ** |



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| Project Information | | | | | | | |
| Project Name: | Franklin Blvd | | | Date: | 6/3/2016 | | |
| Project Address: | Franklin Blvd | | | Permit Number: | | | |
| | Springfield, OR | | | Catchment ID: | PA-6 | | |
| Designer: | Theresa Ring | | | | | | |
| Company: | CH2M | | | | | | |
| Instructions: | | | | | | | |
| Complete this form for Provide a distinctive C calculations with the fa The maximum drainag | atchment ID for eacl | n facility coordinated with | h the site basin | map to correlate th | ne appropriate | | |
| 4.For infiltration facilities | | | | | | 0.5 in/hr. | |
| | | tion rate of 2.5 in/hr for t | | | | | |
| Design Requirements: | | | | | | | |
| Choose "Yes" from the d | ropdown boxes belo | w next to the design star | ndards requirer | nents for this facility | y. | | |
| Dellution Deducti | on (DD) Voc | 1 | | | | | |
| Pollution Reduction | ` ' | | | | | | |
| Flow Conti | ` ' | | | | | | |
| Destination | on (DT) Yes | *An infiltration facility must be | chosen as the faci | lity type to meet destinat | ion requirements | | |
| Site Data-Post Develop | ment | | | | | | |
| | | 4040 a aft | Total | Causana Falatana D | | 0 | |
| Total Square Footage Im | pervious Area == pervious Area CN= | | lotai | Square Footage Po Pervi | ous Area CN= | 85 | sqft |
| Total Square Footage | of Drainage Area= | 1046 sft | Time of Co | ncentration Post I | Development= | 5 | min |
| Wei | ghted Average CN= | 98 | | | | | |
| Site Data-Pre Developn | nent (Data in th | nis section is only used | d if Flow Cont | rol is required) | | | |
| Pre | -Development CN= | 85 | Time of C | oncentration Pre-D | Development= | 10 | min |
| Soil Data | | | | | | | |
| | oil Infiltration Rate= oil Infiltration Rate= | | ote 4) | | ation Design= filtration Rate | 2.5 | in/hr |
| Design Storms Used Fo | or Calculations | | | | | | |
| Requirement | 24-hour | Design Storm |] | | | | |
| Pollution Reduction | 1.0 inches | Water Quality | | | | | |
| Flow Control | 3.6 inches | Flow Control | | | | | |
| Destination | 4.8 inches | Flood Control | | | | | |
| Facility Data | | 1 | | | | | |
| I acinty Data | Facility Tyme | Indituation Chammanata | n Diantan | Facility | C | 00 | |
| | | Infiltration Stormwate | er Planter | - | Surface Area= | | sqft |
| | Surface Width= | | | • | ce Perimeter= | 38 | |
| - | Surface Length= | | | • | Bottom Area= | | sqft 4 |
| | cility Side Slopes= Ponding Depth | 0 to 1 | | racility Botto | m Perimeter= | 38 | ¹ |
| | nwater Facility= | 12 in | | R | asin Volume= | 88.0 | cf |
| | ing Medium (Soil)= | | Ratio of Fa | acility Area to Imp | | 0.084 | |
| • | - ' | | | | | | |

| Pollution Reduction-Calculation Results | |
|---|--|
| Peak Flow Rate to Stormwater Facility = 0.005 cfs | Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | |
| Facility = 69 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 0.0 in Drawdown Time= 0.2 hours | |
| Drawdown Time= 0.2 hours | |
| Yes Facility Sizing Meets Pollution I | Reduction Standards? |
| YES Meets Requirement of No Fa YES Meets Requirement for Maxis | cility Flooding? mum of 18 Hour Drawdown Time? |
| Flow Control-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.023 cfs | Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | |
| Facility = 293 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 5.4 in | Peak Off-Site Flow Rate Filtration Facility Underdrain= N∖A cfs |
| Drawdown Time= 0.2 hours | r intransitive officer drain = 1474 cis |
| 5.4.1.40 m. 1 | |
| Pre-Development Runoff Data | |
| Peak Flow Rate = 0.013 cfs | |
| Total Runoff Volume = 183 cf | |
| Yes Facility Sizing Meets Flow Cont | trol Standards? |
| | Development offsite flow less or equal to Pre-Development Flow? mum of 18 Hour Drawdown Time? |
| Destination-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.030 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs |
| Facility = 397 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 10.8 in | |
| Drawdown Time= 0.2 hours | |
| Yes Facility Sizing Meets Destination | on Standards? |
| YES Meets Requirement of No Fa | cility Flooding? |
| | mum of 30 hour Drawdown Time? |
| | |



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| Project Information | | | | | | | |
| Project Name: Project Address: | Franklin Blvd Franklin Blvd Springfield, OR | | | Date: Permit Number: Catchment ID: | 6/24/2016 PA-7 | | |
| Designer: | Theresa Ring | | | | | | |
| Company: | CH2M | | | | | | |
| Instructions: 1. Complete this form forms: 2. Provide a distinctive of calculations with the form of | Catchment ID for each acility. ge catchment to be made in Class A or B soils maximum soil infiltrate. | n facility coordinated with | n the site basin otive Approach ting has been p | map to correlate the is 1 acre (43,560 Sperfromed use an ir | ne appropriate SF) | | |
| - Doorgii itoquii omonio | | | | | | | |
| Pollution Reducti Flow Cont Destinati | on (PR) Yes | w next to the design star | · | | | | |
| Site Data-Post Develop | oment | | | | | | |
| Total Square Footag | npervious Area CN= | 6922.3 98 6922 sft | | Square Footage Po Pervi ncentration Post D | ous Area CN= | 85 | sqft min |
| Site Data-Pre Developi | nent (Data in th | nis section is only used | d if Flow Cont | ol is required) | | | |
| Pr | e-Development CN= | 85 | Time of Co | oncentration Pre-D | Development= | 10 | min |
| Soil Data | | | | | | | |
| Design S | oil Infiltration Rate= oil Infiltration Rate= | 7.2 in/hr (See No 2.5 in/hr | ote 4) | | ation Design= filtration Rate | 2.5 | in/hr |
| Design Storms Used F | or Calculations | | | | | | |
| Requirement | 24-hour | Design Storm | | | | | |
| Pollution Reduction | 1.0 inches | Water Quality | | | | | |
| Flow Control | 3.6 inches | Flow Control | | | | | |
| Destination | 4.8 inches | Flood Control | | | | | |
| Facility Data | | | | | | | |
| Max. in Stor | Facility Type= Surface Width= Surface Length= acility Side Slopes= Ponding Depth mwater Facility= ving Medium (Soil)= | 12 in | | Facility Surfar Facility Facility Botto B | Surface Area= ce Perimeter= Bottom Area= m Perimeter= asin Volume= | 610 142 610 142 610.0 | ft sqft ft |
| Denth of Grov | vina Weallim (SOII)= | 1710 | RATIO Of Ea | acility Area to Imp | erviolis Area— | 0.088 | |

| Pollution Reduction-Calculation Results | |
|---|--|
| Peak Flow Rate to Stormwater Facility = 0.036 cfs | Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | |
| Facility = 455 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 0.0 in | |
| Drawdown Time= 0.2 hours | |
| Yes Facility Sizing Meets Pollution Reduction Sta | ndards? |
| YES Meets Requirement of No Facility Flooding? | |
| YES Meets Requirement for Maximum of 18 Hour | Drawdown Time? |
| | |
| Flow Control-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.149 cfs | Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | |
| Facility = 1938 cf | Total Overflow Volume= 0 cf |
| | Peak Off-Site Flow Rate |
| Max. Depth of Stormwater in Facility= 4.9 in | Filtration Facility Underdrain= NA cfs |
| Drawdown Time= 0.2 hours | |
| Pre-Development Runoff Data | |
| Peak Flow Rate = 0.083 cfs | |
| Total Runoff Volume = 1214 cf | |
| | |
| Yes Facility Sizing Meets Flow Control Standards | ? |
| YES Meets Requirement for Post Development of YES Meets Requirement for Maximum of 18 Hour | fsite flow less or equal to Pre-Development Flow? Drawdown Time? |
| Destination-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.201 cfs | Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | Tour Tubinity Overnow Rule 0.000 |
| Facility = 2627 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 9.7 in | <u></u> |
| Drawdown Time= 0.2 hours | |
| Yes Facility Sizing Meets Destination Standards? | |
| YES Meets Requirement of No Facility Flooding? YES Meets Requirement for Maximum of 30 hour | Drawdown Time? |



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| | Version 2.1 | | | | | | |
| Project Information | | | | | | | |
| Project Name: | Franklin Blvd | | | Date: | 6/29/2016 | | |
| Project Address: | Franklin Blvd | | | Permit Number: | | | |
| | Springfield, OR | | | Catchment ID: | PA-8 | | |
| Designer: | Theresa Ring | | | | | | |
| Company: | CH2M | | | | | | |
| Instructions: | | | | | | | |
| Complete this form for Provide a distinctive C calculations with the fa The maximum drainag For infiltration facilities | atchment ID for each acility. Je catchment to be m in Class A or B soils | facility coordinated with | n the site basir otive Approach ting has been l | n map to correlate the is 1 acre (43,560 Sperfromed use an ir | he appropriate SF) | | |
| Design Requirements: | | | | | | | |
| Choose "Yes" from the d Pollution Reduction Flow Conti | on (PR) Yes rol (FC) Yes | next to the design star *An infiltration facility must be | · | | | | |
| Site Data-Post Develop | ment | | | | | | |
| Total Square Footage | pervious Area CN= | 2700 sqft 98 2700 sft 98 | | Square Footage Porvi | ious Area CN= | 85 | sqft min |
| Site Data-Pre Developn | nent (Data in th | is section is only used | d if Flow Cont | rol is required) | | | |
| Pre | -Development CN= | 85 | Time of C | oncentration Pre-I | Development= | 10 | min |
| Soil Data | | | | | | | |
| | oil Infiltration Rate= oil Infiltration Rate= | 7.2 in/hr (See No 2.5 in/hr | ote 4) | | ation Design= nfiltration Rate | 2.5 | in/hr |
| Design Storms Used Fo | or Calculations | | | | | | |
| Requirement | 24-hour | Design Storm | | | | | |
| Pollution Reduction | 1.0 inches | Water Quality | | | | | |
| Flow Control | 3.6 inches | Flow Control | | | | | |
| Destination | 4.8 inches | Flood Control | | | | | |
| Facility Data | | | | | | | |
| r donney Data | Facility Type | Infiltration Ctormwate | r Dlantar | Facility | Surface Area | 240.75 | o oft |
| | Surface Width= | Infiltration Stormwate 7 Ift | rianter | - | Surface Area= ce Perimeter= | 218.75 | |
| | | 31.25 ft | | • | | 76.5 | |
| F- | Surface Length= | | | • | Bottom Area= | 219 | |
| | cility Side Slopes= Ponding Depth | 0 to 1 | | racility Botto | om Perimeter= | 77 1 | IL |
| | nwater Facility= | 12 in | | R | Basin Volume= | 218.8 | cf |
| | ing Medium (Soil)= | 12 in | Ratio of F | acility Area to Imp | | 0.081 | |

| Pollution Reduction-Calculation Results | |
|---|---|
| Peak Flow Rate to Stormwater Facility = 0.0 | 14 cfs Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | |
| | 78 cf Total Overflow Volume= 0 cf |
| | 0.0 in |
| Drawdown Time= | 0.2 hours |
| Yes Facility Sizing Meets P | ollution Reduction Standards? |
| | t of No Facility Flooding? t for Maximum of 18 Hour Drawdown Time? |
| Flow Control-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.0 | 58 cfs Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | T |
| Facility = | 56 cf Total Overflow Volume= 0 cf |
| May Donth of Stormwater in Facility | Peak Off-Site Flow Rate 5.8 in Filtration Facility Underdrain= N\A cfs |
| | 5.8 in Filtration Facility Underdrain= N\A cfs 0.2 hours |
| Brawdown Time- | 10uts |
| Pre-Development Runoff D | <u>ata</u> |
| Peak Flow Rate = 0.0 | 32 cfs |
| Total Runoff Volume = | 73 cf |
| Yes Facility Sizing Meets F | ow Control Standards? |
| | t for Post Development offsite flow less or equal to Pre-Development Flow? t for Maximum of 18 Hour Drawdown Time? |
| Destination-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.0 | 78 cfs Peak Facility Overflow Rate= 0.000 cfs |
| | 25 cf Total Overflow Volume= 0 cf |
| | 1.9 in |
| Drawdown Time= | 0.7 hours |
| Yes Facility Sizing Meets D | estination Standards? |
| YES Meets Requiremen | t of No Facility Flooding? |
| | t for Maximum of 30 hour Drawdown Time? |
| | |



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|---|--|-----------------------------------|--------------------|----------------------------|----------------------------------|--------------|-------|
| | Version 2.1 | | | | | | |
| Project Information | | | | | | | |
| Project Name: | Franklin Blvd | | | Date: | 6/3/2016 | | |
| Project Address: | Franklin Blvd | | | Permit Number: | | | |
| | Springfield, OR | | | Catchment ID: | PA-9 | | |
| Designer: | Theresa Ring | | | | | | |
| Company: | CH2M | | | | | | |
| Instructions: | | | | | | | |
| Complete this form for Provide a distinctive C calculations with the fa The maximum drainag | atchment ID for each | h facility coordinated with | h the site basin | map to correlate th | ne appropriate | | |
| 4.For infiltration facilities | | | | | | f 0.5 in/hr. | |
| For all facilities use a | maximum soil infiltra | tion rate of 2.5 in/hr for t | topsoil/growing | medium. | | | |
| Design Requirements: | | | | | | | |
| Choose "Yes" from the d | ropdown boxes belo | w next to the design star | ndards requirer | ments for this facility | y. | | |
| Pollution Reduction | on (PR) Yes | 1 | | | | | |
| Flow Conti | | | | | | | |
| | · ' | | | | | | |
| Destination | on (DT) Yes | *An infiltration facility must be | chosen as the faci | lity type to meet destinat | ion requirements | | |
| Site Data-Post Develop | ment | | | | | | |
| Total Square Footage | Imporvious Aroa- | 2170 sqft | Total | Sauaro Footago De | orvious Aroa- | 0 | caft |
| | pervious Area CN= | | iotai | Square Footage Po Pervi | ous Area CN= | 85 | sqft |
| Total Square Footage | of Drainage Area= | 2170 sft | Time of Co | ncentration Post D | Development= | 5 | min |
| - | ghted Average CN= | | | | | | 1 |
| Site Data-Pre Developn | nent (Data in th | nis section is only use | d if Flow Cont | rol is required) | | | |
| Pre | -Development CN= | 85 | Time of C | oncentration Pre-D | Development= | 10 | min |
| Soil Data | | | | | | | |
| | oil Infiltration Rate= oil Infiltration Rate= | | ote 4) | | ation Design= filtration Rate | 2.5 | in/hr |
| Design Storms Used Fo | or Calculations | | | | | | |
| Requirement | 24-hour | Design Storm |] | | | | |
| Pollution Reduction | 1.0 inches | Water Quality | | | | | |
| Flow Control | 3.6 inches | Flow Control | 1 | | | | |
| Destination | 4.8 inches | Flood Control | 1 | | | | |
| Facility Data | | | | | | | |
| • | Facility Type= | Infiltration Stormwate | er Planter | Facility 9 | Surface Area= | 176 | sqft |
| | Surface Width= | | or r lanto. | | ce Perimeter= | 60 | |
| | Surface Length= | | | • | Bottom Area= | | sqft |
| Fa | cility Side Slopes= | | | • | m Perimeter= | 60 | - |
| | Ponding Depth | | | 20110 | | 30 | - |
| | nwater Facility= | 12 in | | В | asin Volume= | 176.0 | cf |
| | ing Medium (Soil)= | | Ratio of Fa | acility Area to Impo | ervious Area= | 0.081 | |

| Peak Flow Rate to Stormwater Facility = 0.011 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs |
|---|--|
| Facility = 143 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 0.0 in | |
| Drawdown Time= 0.2 hours | |
| Yes Facility Sizing Meets Pollution Reduction | Standards? |
| YES Meets Requirement of No Facility Floodin YES Meets Requirement for Maximum of 18 H | = |
| Flow Control-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.047 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs |
| Facility = 607 cf | Total Overflow Volume= 0 cf |
| | Peak Off-Site Flow Rate |
| Max. Depth of Stormwater in Facility= 5.8 in | Filtration Facility Underdrain= N\A cfs |
| Drawdown Time= 0.2 hours | |
| Pre-Development Runoff Data | |
| Peak Flow Rate = 0.026 cfs | |
| Total Runoff Volume = 380 cf | |
| Yes Facility Sizing Meets Flow Control Standa | ards? |
| YES Meets Requirement for Post Developmen | nt offsite flow less or equal to Pre-Development Flow? |
| YES Meets Requirement for Maximum of 18 H | lour Drawdown Time? |
| Destination-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.063 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs |
| Facility = 823 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 11.9 in | |
| Drawdown Time= 0.7 hours | |
| Yes Facility Sizing Meets Destination Standard | ds? |
| YES Meets Requirement of No Facility Floodin YES Meets Requirement for Maximum of 30 h | |



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|---|-------------------------------------|-----------------------------------|-------------------|-----------------------------|----------------------------------|--------------|-------|
| | Version 2.1 | | | | | | |
| Project Information | | | | | | | |
| Project Name: | Franklin Blvd | | | Date: | 3/7/2016 | | |
| Project Address: | Franklin Blvd | | | Permit Number: | | | |
| | Springfield, OR | | | Catchment ID: | PA-10 | | |
| Designer: | Theresa Ring | | | | | | |
| Company: | CH2M | | | | | | |
| Instructions: | | | | | | | |
| Complete this form for Provide a distinctive C calculations with the fa The maximum drainag | atchment ID for eacl | h facility coordinated with | h the site basir | n map to correlate th | ne appropriate | | |
| 4.For infiltration facilities | in Class A or B soils | where no infiltration tes | ting has been p | perfromed use an in | | f 0.5 in/hr. | |
| For all facilities use a | maximum soil infiltra | tion rate of 2.5 in/hr for t | topsoil/growing | medium. | | | |
| Design Requirements: | | | | | | | |
| Choose "Yes" from the d | ropdown boxes belo | w next to the design star | ndards requirer | nents for this facility | y. | | |
| Pollution Reduction | on (PR) Yes | 1 | | | | | |
| Flow Conti | ` ' | | | | | | |
| | ` ' | | | | | | |
| Destination | on (DT) Yes | *An infiltration facility must be | chosen as the fac | lity type to meet destinati | ion requirements | | |
| Site Data-Post Develop | ment | | | | | | |
| | | CC7E O oaft | Tetal | Saucra Factoria D | omious Area | 0 | o off |
| Total Square Footage Im | pervious Area= pervious Area CN= | | iotai | Square Footage Pe Pervi | ous Area CN= | 85 | sqft |
| Total Square Footage | of Drainage Area= | 6676 sft | Time of Co | ncentration Post D | Develonment= | 5 | min |
| - | ghted Average CN= | | | | ovolopillo.it- | U | 1 |
| Site Data-Pre Developn | nent (Data in th | nis section is only used | d if Flow Cont | rol is required) | | | |
| | -Development CN= | | | oncentration Pre-D | Development= | 10 | min |
| Soil Data | | | | | | | |
| | oil Infiltration Rate= | | ote 4) | | ation Design= filtration Rate | 2.5 | in/hr |
| Design Storms Used Fo | or Calculations | | | | | | |
| Requirement | 24-hour | Design Storm | | | | | |
| Pollution Reduction | 1.0 inches | Water Quality | | | | | |
| Flow Control | 3.6 inches | Flow Control | 1 | | | | |
| Destination | 4.8 inches | Flood Control | 1 | | | | |
| Facility Data | · | | • | | | | |
| • | Facility Type= | Infiltration Stormwate | er Planter | Facility 5 | Surface Area= | 550 | sqft |
| | Surface Width= | | | - | ce Perimeter= | 130 | |
| | Surface Length= | | | • | Bottom Area= | 550 | |
| Fa | cility Side Slopes= | | | • | m Perimeter= | 130 | |
| | Ponding Depth | | | . 25, 25 | | .50 | - |
| | nwater Facility= | 12 in | | В | asin Volume= | 550.0 | cf |
| Depth of Grow | ing Medium (Soil)= | | Ratio of F | acility Area to Impe | ervious Area= | 0.082 | |

| Pollution Reduction-Calculation Results | |
|---|--|
| Peak Flow Rate to Stormwater Facility = 0.035 cfs | Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | |
| Facility = 439 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 0.0 in Drawdown Time= 0.2 hours | |
| Drawdown Time= 0.2 hours | |
| Yes Facility Sizing Meets Pollution | Reduction Standards? |
| YES Meets Requirement of No Fa YES Meets Requirement for Maxis | cility Flooding? mum of 18 Hour Drawdown Time? |
| Flow Control-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.144 cfs | Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | |
| Facility = 1869 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 5.6 in | Peak Off-Site Flow Rate Filtration Facility Underdrain= N∖A cfs |
| Drawdown Time= 0.2 hours | Tituation Facility Officerdiani- |
| Diamadini Timo- | |
| Pre-Development Runoff Data | |
| Peak Flow Rate = 0.080 cfs | |
| Total Runoff Volume = 1170 cf | |
| Yes Facility Sizing Meets Flow Conf | trol Standards? |
| · | Development offsite flow less or equal to Pre-Development Flow? mum of 18 Hour Drawdown Time? |
| Destination-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.194 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs |
| Facility = 2533 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 11.4 in | |
| Drawdown Time= 0.3 hours | |
| Yes Facility Sizing Meets Destination | on Standards? |
| YES Meets Requirement of No Fa | cility Flooding? |
| | mum of 30 hour Drawdown Time? |
| | |



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|-------------------------------|---|----------------------------------|--------------------|----------------------------|-----------------------|-----------|---|
| | Version 2.1 | | | | | | |
| Project Information | | | | | | | |
| Project Name: | Franklin Blvd | | | Date: | 3/7/2016 | | |
| Project Address: | Franklin Blvd | | | Permit Number: | | | |
| | Springfield, OR | | | Catchment ID: | PA-10 | | |
| Designer: | Theresa Ring | | | | | | |
| Company: | CH2M | | | | | | |
| Instructions: | | | | | | | |
| 1. Complete this form for | each drainage catchm | nent in the project site | that is to be size | zed per the Presum | ptive Approach. | | |
| 2. Provide a distinctive C | • | | | • | | | |
| calculations with the fa | acility. | • | | | | | |
| 3. The maximum drainag | e catchment to be mod | deled per the Presump | tive Approach | is 1 acre (43,560 S | ŝF) | | |
| 4.For infiltration facilities | in Class A or B soils w | here no infiltration test | ting has been p | oerfromed use an ir | nfiltration rate of 0 | .5 in/hr. | |
| For all facilities use a | maximum soil infiltratio | n rate of 2.5 in/hr for to | opsoil/growing | medium. | | | |
| Design Requirements: | | | | | | | |
| Choose "Yes" from the d | ropdown boxes below i | next to the design stan | ndards requirer | ments for this facility | y. | | |
| | (22) | - | | | , | | |
| Pollution Reduction | | | | | | | |
| Flow Contr | ` ' | | | | | | |
| Destination | on (DT) Yes */ | An infiltration facility must be | chosen as the faci | lity type to meet destinat | ion requirements | | |
| Site Data-Post Develop | ment | | | | | | |
| | _ | 7040.0 | T-4-1 | 0 | | 0(1 | |
| Total Square Footage | | 7318.3 sqft | Total | Square Footage P | _ | 0 sqft | |
| Im | pervious Area CN= | 98 | | Pervi | ious Area CN= | 85 | |
| Total Square Footage | of Drainage Area- | 7318 sft | Time of Co | ncentration Post I | Development- | 5 min | |
| | ghted Average CN= | 98 | Time of Co | incentration rost i | Jevelopinent_ | <u>J</u> | |
| Site Data-Pre Developm | | s section is only used | Lif Flow Cont | rol is required) | | | |
| | -Development CN= | 85 | | oncentration Pre-I | Development- | 10 min | |
| Soil Data | Bevelopment on- | 00 | 111110 01 0 | | zevelopilient= | 10 | |
| | oil Infiltration Rate= | 7.2 in/hr (See No | to 4) | Doctin | ation Design= | 3 Elip/br | |
| | oil Infiltration Rate= | 2.5 in/hr | ne 4) | | filtration Rate | 2.5 in/hr | |
| Design Storms Used Fo | | 2.0 | | | | | |
| Design Storms Used Fo | | | | | | | |
| Requirement | | Design Storm | | | | | |
| Pollution Reduction | | Vater Quality | | | | | |
| Flow Control | + | Flow Control | | | | | |
| Destination | 4.8 inches F | flood Control | | | | | |
| Facility Data | _ | | | | _ | | |
| | | nfiltration Stormwate | r Planter | - | Surface Area= | 600 sqft | |
| | Surface Width= | 10 ft | | • | ce Perimeter= | 140 ft | |
| | Surface Length= | 60 ft | | • | Bottom Area= | 600 sqft | |
| | cility Side Slopes= | 0 to 1 | | Facility Botto | om Perimeter= | 140 ft | |
| | Ponding Depth mwater Facility= | 12 in | | ь | asin Volume= | 600.0 cf | |
| | ing Medium (Soil)= | 12 in | Ratio of F | ם acility Area to Imp | | 0.082 | |
| 20ptil 01 010W | (0011/- | · · · · · | | , iiiip | 5 | 0.002 | , |

| Pollution Reduction-Calculation Results | |
|--|--|
| Peak Flow Rate to Stormwater Facility = 0.038 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs |
| Facility = 481 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 0.0 in Drawdown Time= 0.2 hours | |
| Diawdowii Tillie- 0.2 lilouis | |
| Yes Facility Sizing Meets Pollution Reduction | Standards? |
| YES Meets Requirement of No Facility Floodii YES Meets Requirement for Maximum of 18 H | = |
| Flow Control-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.158 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs |
| Facility = 2049 cf | Total Overflow Volume= 0 cf |
| | Peak Off-Site Flow Rate |
| Max. Depth of Stormwater in Facility= 5.7 in | Filtration Facility Underdrain= N\A cfs |
| Drawdown Time= 0.2 hours | |
| Pre-Development Runoff Data | |
| Peak Flow Rate = 0.087 cfs | |
| Total Runoff Volume = 1283 cf | |
| Yes Facility Sizing Meets Flow Control Standa | ards? |
| | nt offsite flow less or equal to Pre-Development Flow? |
| YES Meets Requirement for Maximum of 18 H | our Drawdown Time? |
| Destination-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.212 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs |
| Facility = 2777 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 11.6 in | |
| Drawdown Time= 0.5 hours | |
| Yes Facility Sizing Meets Destination Standard | ds? |
| YES Meets Requirement of No Facility Floodin YES Meets Requirement for Maximum of 30 h | |



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| | Version 2.1 | | | | | | |
| Project Information | | | | | | | |
| Project Name: | Franklin Blvd | | | Date: | 6/7/2016 | | |
| Project Address: | Franklin Blvd | | | Permit Number: | | | |
| | Springfield, OR | | | Catchment ID: | PB-1 | | |
| Designer: | Theresa Ring | | | | | | |
| Company: | CH2M | | | | | | |
| Instructions: | | | | | | | |
| Complete this form for Provide a distinctive C calculations with the far The maximum drainage For infiltration facilities | catchment ID for each acility. ge catchment to be m in Class A or B soils | facility coordinated with | h the site basir otive Approach ting has been l | n map to correlate the is 1 acre (43,560 Sperfromed use an ir | ne appropriate SF) | | |
| Design Requirements: | | | | | | | |
| Choose "Yes" from the c Pollution Reducti Flow Cont Destinati | on (PR) Yes rol (FC) Yes | v next to the design star *An infiltration facility must be | · | | | | |
| Site Data-Post Develop | ment | | | | | | |
| Total Square Footage | npervious Area CN= | 11579.7 sqft 98 11580 sft 98 | | Square Footage Porvi | ous Area CN= | 85 | sqft |
| Site Data-Pre Developn | nent (Data in th | is section is only used | d if Flow Cont | rol is required) | | | |
| Pre | e-Development CN= | 85 | Time of C | oncentration Pre-I | Development= | 10 | min |
| Soil Data | | | | | | | |
| | oil Infiltration Rate= oil Infiltration Rate= | 7.2 in/hr (See No 2.5 in/hr | ote 4) | | ation Design= filtration Rate | 2.5 | in/hr |
| Design Storms Used Fe | or Calculations | | | | | | |
| Requirement | 24-hour | Design Storm | | | | | |
| Pollution Reduction | 1.0 inches | Water Quality | | | | | |
| Flow Control | 3.6 inches | Flow Control | | | | | |
| Destination | 4.8 inches | Flood Control | | | | | |
| | 1.0 11101100 | r lood Control | l | | | | |
| Facility Data | | | | | _ | | |
| | | Infiltration Stormwate | er Planter | _ | Surface Area= | 1980 | |
| | Surface Width= | 11 ft | | • | ce Perimeter= | 382 | |
| | Surface Length= | 180 ft | | • | Bottom Area= | 1980 | |
| | acility Side Slopes= | 0 to 1 | | Facility Botto | om Perimeter= | 382 | ft |
| | Ponding Depth | | | = | <i></i> [| | |
| | mwater Facility= | 9 in | | | asin Volume= | 1485.0 | CT |
| Depth of Grow | /ing Medium (Soil)= | 12 in | Ratio of F | acility Area to Imp | ervious Area= | 0.171 | 1 |

| Pollution Reduction-Calculation Results | |
|---|---|
| Peak Flow Rate to Stormwater Facility = 0.061 cfs | Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | , |
| Facility = 761 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 0.0 in | |
| Drawdown Time= 0.2 hours | |
| Yes Facility Sizing Meets Pollution Reduction Sta | ndards? |
| YES Meets Requirement of No Facility Flooding? | |
| YES Meets Requirement for Maximum of 18 Hour | Drawdown Time? |
| | |
| Flow Control-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.250 cfs | Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | |
| Facility = 3241 cf | Total Overflow Volume= 0 cf |
| | Peak Off-Site Flow Rate |
| Max. Depth of Stormwater in Facility= 1.0 in | Filtration Facility Underdrain= N/A cfs |
| Drawdown Time= 0.2 hours | |
| Pre-Development Runoff Data | |
| Peak Flow Rate = 0.138 cfs | |
| Total Runoff Volume = 2030 cf | |
| - <u> </u> | |
| Yes Facility Sizing Meets Flow Control Standards | ? |
| YES Meets Requirement for Post Development off YES Meets Requirement for Maximum of 18 Hour | site flow less or equal to Pre-Development Flow? Drawdown Time? |
| Destination-Calculation Results | |
| Peak Flow Rate to Stormwater Facility = 0.336 cfs | Peak Facility Overflow Rate= 0.000 cfs |
| Total Runoff Volume to Stormwater | out rushing evernous reasons one |
| Facility = 4394 cf | Total Overflow Volume= 0 cf |
| Max. Depth of Stormwater in Facility= 2.1 in | |
| Drawdown Time= 0.2 hours | |
| Yes Facility Sizing Meets Destination Standards? | |
| YES Meets Requirement of No Facility Flooding? YES Meets Requirement for Maximum of 30 hour l | Drawdown Time? |



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| Project Information | | | | | | |
| Project Name: | Franklin Blvd | | Date: | 3/5/2016 | | |
| Project Address: | Franklin Blvd | | Permit Number: | | | |
| | Springfield, OR | | Catchment ID: | PB-2 | | |
| Designer: | Theresa Ring | | | | | |
| Company: | CH2M | | | | | |
| Instructions: | | | | | | |
| | each drainage catchment in the | project site that is to be size | d per the Presum | otive Approach. | | |
| | atchment ID for each facility coor | | | | | |
| calculations with the fa | - | | | | | |
| | e catchment to be modeled per the | ne Presumptive Approach is | 1 acre (43.560 SI | F) | | |
| _ | in Class A or B soils where no inf | | | | in/hr. | |
| | maximum soil infiltration rate of 2. | | | | | |
| Design Requirements: | | 3 | | | | |
| | | | | | | |
| Choose "Yes" from the d | ropdown boxes below next to the | design standards requireme | ents for this facility | ۲. | | |
| Dellution Deduction | on (DD) Voc | | | | | |
| Pollution Reduction | | | | | | |
| Flow Conti | . , | | | | | |
| Destination | on (DT) Yes *An infiltration f | acility must be chosen as the facility | type to meet destination | on requirements | | |
| Site Data-Post Develop | ment | | | | | |
| | | | | – | | |
| Total Square Footage | - | sqft Total Sc | quare Footage Pe | | 0 sqft | |
| Im | pervious Area CN= 98 | | Pervio | ous Area CN= | 85 | |
| Total Courses Footons | of Business Area | att Time of Com- | andredian Bast B | and an mont | E as in | |
| Total Square Footage | e of Drainage Area= 3436 ghted Average CN= 98 | SIT TIME OF CONC | centration Post D | evelopment= | 5 min | |
| | | anhuusad if Flau Cantus | Lie neguined) | | | |
| Site Data-Pre Developn | | s only used if Flow Contro | | | | |
| | -Development CN= 85 | Time of Cor | ncentration Pre-D | evelopment= | 10 min | |
| Soil Data | | | | | | |
| | | in/hr (See Note 4) | | ation Design= | 2.5 in/hr | |
| Design So | oil Infiltration Rate= 2.5 | in/hr | Soil Inf | filtration Rate | | |
| Design Storms Used Fo | or Calculations | | | | | |
| Requirement | 24-hour Design Sto | rm | | | | |
| Pollution Reduction | 1.0 inches Water Quali | ty | | | | |
| Flow Control | 3.6 inches Flow Contro | ol . | | | | |
| Destination | 4.8 inches Flood Contr | ol | | | | |
| Facility Data | | | | | | |
| | Facility Type= Infiltration | Stormwater Planter | Facility S | Surface Area= | 316 sqft | |
| | Surface Width= 3.16 | | Facility Surface | | 206.32 ft | |
| | Surface Length= 100 | | • | Bottom Area= | 316 sqft | |
| Fa | | to 1 | Facility Botton | | 206 ft | |
| | Ponding Depth | 1 | , = = = = = | | | |
| | mwater Facility= 9 | in | Ва | asin Volume= | 237.0 cf | |
| Depth of Grow | ring Medium (Soil)= 12 | in Ratio of Fac | ility Area to Impe | ervious Area= | 0.092 | |

| Pollution Reduction-Calculation Results | | | | |
|--|--|--|--|--|
| Peak Flow Rate to Stormwater Facility = 0.018 | cfs Peak Facility Overflow Rate= 0.000 cfs | | | |
| Total Runoff Volume to Stormwater | | | | |
| Facility = 226 | | | | |
| Max. Depth of Stormwater in Facility= 0.0 in Prawdown Time= 0.2 | | | | |
| Drawdown Time= 0.2 | hours | | | |
| Yes Facility Sizing Meets Pollu | ution Reduction Standards? | | | |
| YES Meets Requirement of No Facility Flooding? YES Meets Requirement for Maximum of 18 Hour Drawdown Time? | | | | |
| Flow Control-Calculation Results | | | | |
| Peak Flow Rate to Stormwater Facility = 0.074 | cfs Peak Facility Overflow Rate= 0.000 cfs | | | |
| Total Runoff Volume to Stormwater | | | | |
| Facility = 962 | | | | |
| Max. Depth of Stormwater in Facility= 4.5 i | Peak Off-Site Flow Rate Filtration Facility Underdrain= N\A cfs | | | |
| | hours | | | |
| 5.2]· | | | | |
| Pre-Development Runoff Data | | | | |
| Peak Flow Rate = 0.041 | cfs | | | |
| Total Runoff Volume = 602 | cf | | | |
| Yes Facility Sizing Meets Flow | Control Standards? | | | |
| Meets Requirement for Post Development offsite flow less or equal to Pre-Development Flow? YES Meets Requirement for Maximum of 18 Hour Drawdown Time? | | | | |
| Destination-Calculation Results | | | | |
| Peak Flow Rate to Stormwater Facility = 0.100 Total Runoff Volume to Stormwater | cfs Peak Facility Overflow Rate= 0.000 cfs | | | |
| Facility = 1304 | cf Total Overflow Volume= 0 cf | | | |
| Max. Depth of Stormwater in Facility= 8.7 | in | | | |
| Drawdown Time= 0.2 | hours | | | |
| Yes Facility Sizing Meets Dest | ination Standards? | | | |
| YES Meets Requirement of | No Facility Flooding? | | | |
| YES Meets Requirement for Maximum of 30 hour Drawdown Time? | | | | |
| | | | | |



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| | Version 2.1 | | | | | |
| Project Information | | | | | | |
| Project Name: Project Address: | Franklin Blvd Franklin Blvd Springfield, OR | | | Date: Permit Number: Catchment ID: | 6/7/2016 PC-1 | |
| Designer: | Theresa Ring | | | | | |
| Company: | CH2M | | | | | |
| Instructions: 1. Complete this form for 2. Provide a distinctive C calculations with the fa 3. The maximum drainag 4.For infiltration facilities For all facilities use a n Design Requirements: | atchment ID for each acility. le catchment to be mo in Class A or B soils | facility coordinated with odeled per the Presump | n the site basin otive Approach ting has been p | map to correlate the is 1 acre (43,560 Sperfromed use an in | ne appropriate | |
| Design Requirements. | | | | | | |
| Choose "Yes" from the d Pollution Reduction Flow Control Destination | on (PR) Yes | next to the design star | · | | | |
| Site Data-Post Develop | ment | | | | | |
| Total Square Footage | pervious Area CN= | 12008.7 98 12009 sft | | Square Footage Po Pervi | ous Area CN= | 0 85 5 min |
| Site Data-Pre Developm | nent (Data in thi | s section is only used | l if Flow Cont | rol is required) | | |
| Pre | -Development CN= | 85 | Time of C | oncentration Pre-D | Development= | 10 min |
| Soil Data | | | | | | |
| Design Sc | oil Infiltration Rate= oil Infiltration Rate= | 7.2 in/hr (See No 2.5 in/hr | ote 4) | | ation Design= filtration Rate | 2.5 in/hr |
| Design Storms Used Fo | or Calculations | | | | | |
| Requirement | | Design Storm | | | | |
| Pollution Reduction | 1.0 inches | Water Quality | | | | |
| Flow Control | | Flow Control | | | | |
| Destination | 4.8 inches | Flood Control | | | | |
| Facility Data | | | | | | |
| Max. I in Stori | Facility Type= Surface Width= Surface Length= scility Side Slopes= Ponding Depth mwater Facility= sing Medium (Soil)= | Infiltration Stormwate 10 ft 121 ft 0 to 1 7 in | | Facility Surfac Facility Facility Botto | Bottom Area= m Perimeter= asin Volume= | 1210 sqft 262 ft 1210 sqft 262 ft 705.8 cf |

| Pollution Reduction-Calculation Results | | | | |
|--|---|--|--|--|
| Peak Flow Rate to Stormwater Facility = 0.063 cfs | Peak Facility Overflow Rate= 0.000 cfs | | | |
| Total Runoff Volume to Stormwater | | | | |
| Facility = 790 cf | Total Overflow Volume= 0 cf | | | |
| Max. Depth of Stormwater in Facility= 0.0 in Drawdown Time= 0.2 hours | | | | |
| Drawdown Time= 0.2 hours | | | | |
| Yes Facility Sizing Meets Pollution | Reduction Standards? | | | |
| YES Meets Requirement of No Facility Flooding? YES Meets Requirement for Maximum of 18 Hour Drawdown Time? | | | | |
| Flow Control-Calculation Results | | | | |
| Peak Flow Rate to Stormwater Facility = 0.259 cfs | Peak Facility Overflow Rate= 0.000 cfs | | | |
| Total Runoff Volume to Stormwater | | | | |
| Facility = 3361 cf | Total Overflow Volume= 0 cf | | | |
| Max. Depth of Stormwater in Facility= 3.6 in | Peak Off-Site Flow Rate Filtration Facility Underdrain= N∖A cfs | | | |
| Drawdown Time= 0.2 hours | Tituation Facility Officerdiani- | | | |
| Diamadini Timo- | | | | |
| Pre-Development Runoff Data | | | | |
| Peak Flow Rate = 0.144 cfs | | | | |
| Total Runoff Volume = 2105 cf | | | | |
| Yes Facility Sizing Meets Flow Conf | trol Standards? | | | |
| YES Meets Requirement for Post Development offsite flow less or equal to Pre-Development Flow? YES Meets Requirement for Maximum of 18 Hour Drawdown Time? | | | | |
| Destination-Calculation Results | | | | |
| Peak Flow Rate to Stormwater Facility = 0.348 cfs Total Runoff Volume to Stormwater | Peak Facility Overflow Rate= 0.000 cfs | | | |
| Facility = 4557 cf | Total Overflow Volume= 0 cf | | | |
| Max. Depth of Stormwater in Facility= 6.8 in | | | | |
| Drawdown Time= 0.2 hours | | | | |
| Yes Facility Sizing Meets Destination | on Standards? | | | |
| YES Meets Requirement of No Fa | cility Flooding? | | | |
| YES Meets Requirement for Maximum of 30 hour Drawdown Time? | | | | |
| | | | | |



SPILL RESPONSE FORM

| Location | Date |
|--|---------------------------------|
| Address | Phone |
| Release Information | |
| Date of spill | Person who discovered the spill |
| Time spill started | Time spill was stopped |
| Material spilled | Estimated amount released |
| Attach a copy of the SDS (safety data sheet), if available. | |
| Mark the location of the spill and the direction of flow on a site | e drawing |
| Was there a threat to public safety? | □No □Yes |
| Is there a potential for future release? | □No □Yes |
| Did anyone come in direct contact with the spill? | □No □Yes |
| If yes, describe | |
| Describe how the release occurred. Include details such a weather, activities occurring prior to or during the release, and | |
| The release impacted (check all that apply) | water Groundwater Soil Air |
| Describe any impacts from the release (such as fish kill, evac | uation, etc.) |
| Response Action | |
| Who was notified and when did the notification occur. | |
| | |
| Describe actions taken in response to the release. Include actions taken by the first responders, and other immediate actions taken by the first responders. | |

| Yard | Date |
|------|------|
| taru | Date |

Recovery Action

| Who performed the site cleanup | | | | |
|--|------------------------------------|---------------|-----|------|
| If City or ODOT did not perform the cleanup, list the cleanup | ıp company's | | | |
| Name | | | | |
| Address | | | | |
| Phone | Project manager | | | |
| Describe cleanup activities. Include what actions were t | aken and when the actions were t | aken. | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Were soil or water samples collected? | | | □No | □Yes |
| If yes, who collected the samples? | | | | |
| Mark the sample collection and locations on a copy of the | site map. Attach copies of the sar | mple results. | | |
| How much contaminated soil was removed from the si | te (estimate volume)? | | | |
| Has all the contamination been removed from site? | | | □No | □Yes |
| Estimated volume of contaminated soil remaining, if any | | | | |
| Was a hazardous waste determination made? | | | □No | ∐Yes |
| List hazardous substances | | | | |
| | | | | |
| Were contaminated materials taken off-site for disposa | al? | | □No | □Yes |
| If yes, attach copies of receipts and/or documentation for o | | | | |
| List the name and address of the disposal location | nopodai. | | | |
| List the harne and address of the disposal location | | | | |
| Facility phone | Facility contact | | | |
| These answers are True and Complete to the best of m | ny ability. | | | |
| Name | Date | Position | | |
| Signature | | | | |
| Keep this form and all related docume | ntation on file at the y | ard | | |
| Accompanying documentation | | | | |
| ☐ A copy of the SDS for the spilled product | | | | |
| | direction | | | |
| A site map that shows the location of spill and the flow direction | | | | |
| A site map that shows the location of samples | | | | |
| Receipts for disposal of hazardous material | | | | |
| Receipts and/or documentation for disposal of contami | inated material (such as soil) | | | |
| | | | | |