

2011 Stormwater Capital Improvement Plan

Prepared for

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CITATION

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CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.



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KEY TERMS

1992 Plan	Stormwater Comprehensive Plan
BMP	Best Management Practice
BNSF	Burlington Northern Santa Fe
cfs	cubic feet per second
CIPs	capital improvement projects
City	City of Sumner
CLOMR	Conditional Letter of Map Revision
CMP	corrugated metal pipe
FEMA	Federal Emergency Management Agency
LOMA	Letter of Map Adjustment
LOMR	Letter of Map Revision
Plan Update	Stormwater Capital Improvement Plan Update
SWRLID	Stormwater Retrofit and Low Impact Development
TIP	Transportation Improvement Plan
UPRR	Union Pacific Railroad
WWHM	Western Washington Hydrology Model

1. CAPITAL IMPROVEMENTS

1.1 PREVIOUS CAPITAL IMPROVEMENT PLANS

Several stormwater and surface water plans have been prepared for the City of Sumner (City). Those plans are listed below.

- *Design Technical Memorandum Salmon Creek Culvert Replacement Project* (Cosmopolitan Engineering Group 1999)
- *Draft Stormwater Quality Action Plan* (KCM 1995)
- *Stormwater Comprehensive Plan* (1992 Plan) (Parametrix 1992)
- *East Sumner Neighborhood Plan* (City of Sumner 2001)

One of the primary goals of this *Stormwater Capital Improvement Plan Update* (Plan Update) is to summarize the solutions that have been previously identified to alleviate existing deficiencies, alleviate future deficiencies identified by hydrologic and hydraulic modeling, and to improve water quality within the City's existing stormwater infrastructure and receiving waters. This section presents a description of capital improvement projects (CIPs) that are proposed to achieve this goal.

The 1992 Plan and stormwater planning performed in 2004 identified several CIPs. Several of these projects have been completed. Projects in the 1992 Plan that have not been constructed are either incorporated into this plan update or removed from the project list if a different project is proposed.

The criteria used to evaluate projects to be included in this Plan Update are as follows:

- CIPs in the 1992 Plan that have been incorporated into a project as a result of the planning performed in 2004.
- CIPs previously identified that have not yet been completed.
- Current CIPs identified by the City and reflected in the stormwater rate analysis.

The major drainage basins within the City that are discussed in this Plan Update are shown in Figure 1-1.

1.2 1992 PLAN

The following project descriptions summarize the status of the CIPs from the 1992 Plan. Table 1-1 lists all projects from the 1992 Plan and their current status.

1.2.1 Project No. 92-1 – Willow Street and Sumner Avenue Improvement

Project 92-1 has been incorporated into CIP 18. Project 92-1 originally proposed upsizing approximately 400 linear feet of 12-inch pipe on Sumner Avenue and 1,150 linear feet of 15-inch pipe on Willow Street with 21-inch pipe in order to alleviate surcharge upstream of the existing 48-inch outfall to the Puyallup River south of SR 410 between Alder Avenue and Cherry Avenue due to undersized conveyance in Basin B.

The invert elevation of the existing conveyance on Willow Street appears to be approximately 8 feet below grade at the Guptil Avenue/Willow Street intersection. Due to this depth, this project was expanded into CIP 18 to provide stormwater control on Wood Avenue between Park Street and Willow Street. The expansion includes installing stormwater catchment and conveyance on Wood Avenue and Silver Street, and upsizing existing conveyance on Guptil Avenue from Silver Street to Willow Street and on Willow Street from Wood Avenue to Sumner Avenue.

1.2.2 Project No. 92-2 – Puyallup Street Improvement

Project 92-2 has been incorporated into CIP 19. Project 92-2 proposed upsizing approximately 1,175 linear feet of existing 24-inch pipe with 30-inch pipe to alleviate surcharge in the existing 24-inch outfall, west of Puyallup Street, to the White River in Basin C. To date, this project has not been completed.

1.2.3 Project No. 92-3 – Zehnder Street Outfall System Improvements

Project 92-3 has been removed from the CIP list and replaced with CIP 5 and CIP 21. Project 92-3 has been partially completed through completion of CIP 5. Project 92-3 was proposed due to undersized conveyance in Basin E to reduce surcharging upstream of the existing 42-inch Sessler outfall, which parallels Zehnder Avenue, to the White River. Project 92-3 included extensive conveyance upsizing from the Sessler outfall, at the White River, to the intersection of Valley Avenue and Main Street.

CIP 5 included installing a bypass from the Sessler outfall conveyance to the District 11 outfall conveyance at Daffodil Street Court East. Additionally, CIP 21 proposes intercepting runoff that currently flows to the headwaters of the Sessler outfall and rerouting it south of SR 410 to the Puyallup River. Completion of these projects will lessen the demand on the Sessler outfall system, thus likely reducing surcharge within the system. Based on the improvements in CIP 5 and CIP 21, Project 92-3 was removed from the CIP list.

1.2.4 Project No. 92-4 – Pacific Avenue Improvements

Project 92-4 has been incorporated into CIP 20 and has been completed. This project proposed upsizing and extending existing conveyance on Valley Avenue in front of the Cannery to reduce surcharging in the undersized, existing 8-inch outfall to the White River.

1.2.5 Project No. 92-5 – Rivergrove Road Outfall

The intent of Project 92-5 has been met through construction of a development. Project 92-5 proposed installing approximately 420 feet of 18-inch pipe, 900 feet of 21-inch pipe, and 1,080 feet of 24-inch pipe on Rivergrove Road.

1.2.6 Project No. 92-6 – East Sumner Trunk System with Diversion to the Puyallup River

Project 92-6 has been completed. Project 92-6 proposed extensive reconstruction of the District 11 outfall interceptor from SR 410 to the outfall at Salmon Creek, west of East Valley Highway, to reduce surcharge and flooding due to inadequate capacity.

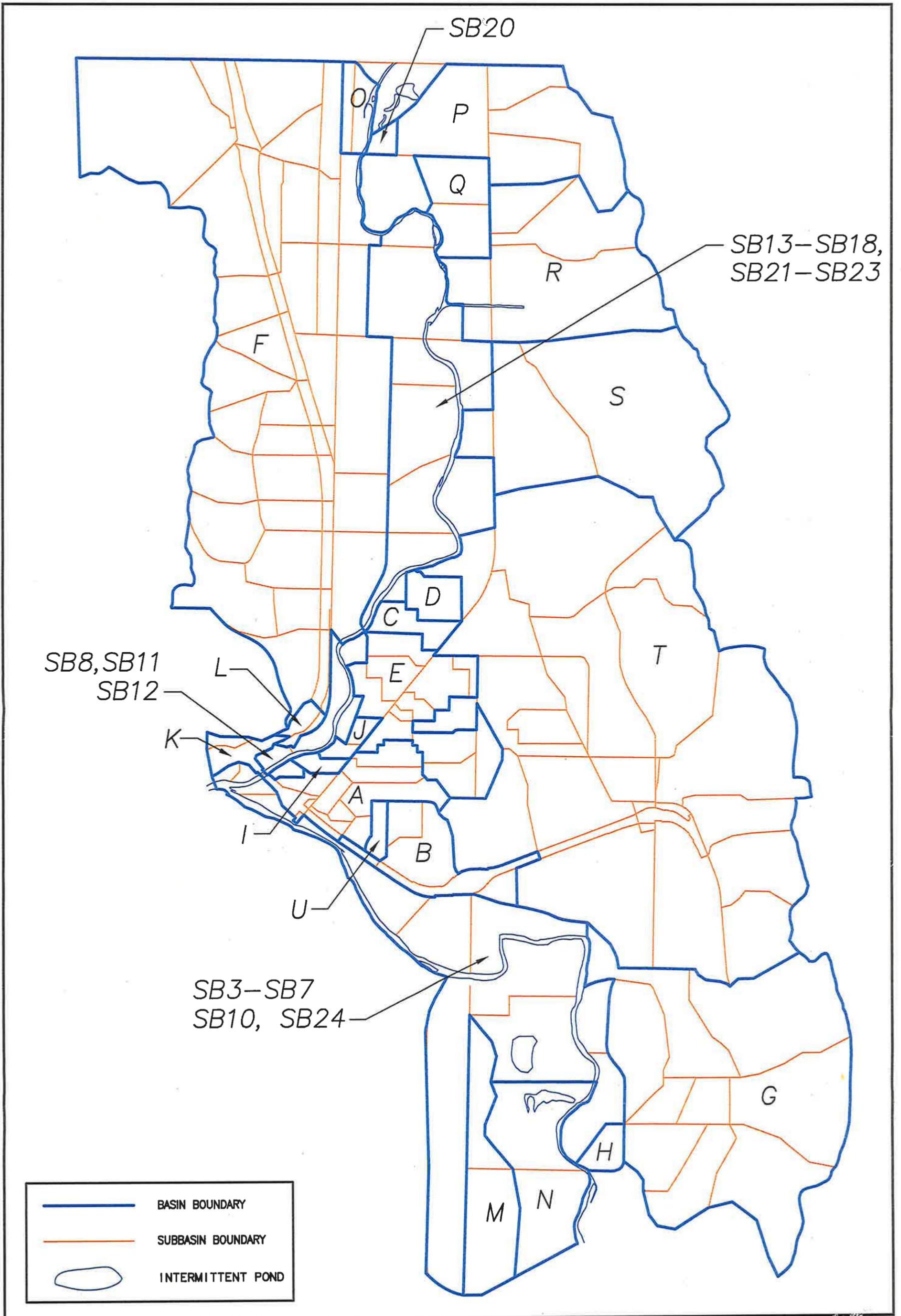


Figure 1-1
Stormwater Capital Improvement Plan
Study Area Boundary
and Basin Locations

Table 1-1. Plan Capital Improvement Projects and Current Status

Project No.	Name	Status	Comment
92-1	Willow Street and Sumner Avenue Improvement	Included in new CIP (Project No. 18).	
92-2	Puyallup Street Improvement	Included in new CIP (Project No. 19).	
92-3	Zehnder Street Outfall System Improvements	Removed from list. Partially completed through completion of CIP 5.	CIP Projects 5 and 21 eliminated the need for this project. CIP 5 has been completed.
92-4	Pacific Avenue Improvements	Completed through CIP 20.	CIP 20 has been completed.
92-5	Rivergrove Road Outfall	Completed by development.	
92-6	East Sumner Trunk System with Diversion to Puyallup River	Completed.	
92-7	South SR 410 Diversion Interceptor	Included in new CIP (Project No. 21).	
92-8	Meade McCumber Street/Valley Avenue Improvement	Partially completed.	Remainder to be constructed in CIP Project Nos. 7 and 22.
92-9	Parker Avenue/Elm Street Interceptor	Partially completed.	Remainder to be constructed in CIP Project Nos. 13 and 15.
92-10	South Parker Road Improvements	Not constructed.	Project not required.
92-11	North Parker Connection	Included in new CIP (Project No. 14).	
92-12	64th Street East Improvements	Included in new CIP (Projects Nos. 10 and 23).	CIP 23 has been completed.
92-13	160th and Main Street Improvements	Included in new CIP (Project No. 24).	
92-14	East Elm Street Outfall	Completed.	Remainder was constructed when CIP Project No. 16 was completed.
92-15	Van Tassel Road Outfall	Partially completed.	Remainder to be constructed in CIP Project Nos. 11 and 12.
92-16	East Main Street Outfall	Partially completed.	Remainder of project not required.
92-17	Poole Road Outfall	Included in new CIP (Project No. 25).	
92-18	Wahl Road Interceptor	Included in new CIP (Project No. 26).	

Table Continues

Table 1-1. Plan Capital Improvement Projects and Current Status (Continued)

Project No.	Name	Status	Comment
92-19	South Valley Avenue Outfall	Not constructed	Project outside city limits, not included in new CIP.
92-20	Van Ogles Creek Outfall Pipe System Improvements	Not constructed	Project outside city limits, not included in new CIP.
92-21	Van Ogles Creek Rehabilitation and Crossing Improvements	Not constructed	Project outside city limits, not included in new CIP.
92-22	Alderton Pond Improvements	Not constructed	Project outside city limits, not included in new CIP.
92-23	Alderton Creek Rehabilitation and Crossing Improvements	Not constructed	Project outside city limits, not included in new CIP.
92-24	142nd Avenue Interceptor	Completed.	
92-25	24th Street Outfall to White River	Not constructed.	To be built as part of 24th Street Interchange project.
92-26	16th Street Outfall to White River	Partially completed.	Remainder of project not required.
92-27	139th Avenue East Ditch Improvements	Not constructed.	Project outside city limits, not included in new CIP.
92-28	136th Avenue East and 24th Street East Improvements	Partially completed.	Remainder to be constructed in CIP Project No. 28.
92-29	West Northeast 16th Outfall and System Improvements	Not constructed.	Project outside city limits, not included in new CIP.
92-30	West Northeast 8th Outfall and System Improvements	Not constructed.	Project outside city limits, not included in new CIP.
92-31	Culvert Crossing Railroad at North 8th Street East	Not constructed.	To be constructed as part of 8th Street corridor improvements.
92-32	Puget Power and Light Canal Drainage Improvements	Included in new CIP (Project No. 29).	
92-33	Middle Creek Drainage Improvements	Not constructed.	Not included in CIP; would require dredging Middle Creek.
92-34	Salmon Creek Improvements	Included in new CIP (Projects Nos. 33 – 39).	

1.2.7 Project No. 92-7 – South SR 410 Diversion Interceptor

Project 92-7 has been incorporated into CIP 21. Project 92-7 was proposed to reduce flooding in Basin T due to surcharging in the existing 36-inch culvert under SR 410 east of 158th Avenue East. This project is being included in CIP 21, excluding approximately 1,500 linear feet of 18-inch pipe along 75th Street East, which has been eliminated due to proposed modifications to the original Project 92-18/CIP 26.

1.2.8 Project No. 92-8 – Meade-McCumber Street/Valley Avenue Improvement

Project 92-8 has been incorporated into CIP 7 and CIP 22. Project 92-8 has been partially completed. Project 92-8 was proposed to solve flooding problems on 151st Street, 152nd Street, and Meade-McCumber Street. The original project proposed the following improvements:

1. Installing approximately 1,275 linear feet of 18-inch pipe along 63rd Street East. This portion of the project is being included as CIP 7 – 151st Avenue East and 152nd Avenue East Improvements.
2. Installing approximately 1,275 linear feet of 30-inch pipe along Meade-McCumber Street. This portion of the project has been completed.
3. Installing approximately 1,400 linear feet of 24-inch pipe on Valley Avenue from Gault Street to Meade-McCumber Street. Approximately 1,200 linear feet of 24-inch pipe has been installed to date.
4. Installing approximately 750 linear feet of 15-inch pipe on Meade-McCumber Street west of Valley Avenue. This portion of the project is being included in CIP 22 – Meade-McCumber Street Improvements.
5. Installing approximately 500 linear feet of 24-inch pipe on Meade-McCumber Street west of Parker Road, which has been completed.

1.2.9 Project No. 92-9 – Parker Avenue/Elm Street Interceptor

Project 92-9 has been incorporated into CIP 13 and CIP 15. Project 92-9 has been partially completed. Project 92-9 was proposed to reduce flooding along Parker Road south of and to Elm Street, and included installing approximately 2,850 feet of 36-inch pipe on Parker Road from Main Street to Elm Street, and approximately 1,350 feet of 39-inch pipe on Elm Street from Parker Road to the 60-inch stormwater interceptor on East Valley Highway. A portion of the conveyance proposed under Project 92-9 has already been installed. The portions of work not completed to date were carried forward during the 2004 planning with a different configuration than originally proposed.

Site investigation showed existing conveyance located on Parker Road from Main Street to 53rd Street Court East. CIP 15 proposes installing stormwater conveyance and catchments on Parker Road from 53rd Street Court East to Elm Street. New conveyance on Parker Road will be tied to the existing 36-inch-diameter conveyance on Parker Road at Daffodil Street Court East.

CIP 13 proposes installing stormwater catch basins and conveyance on Elm Street between Parker Road and East Valley Highway. Conveyance on Elm Street will tie to the existing 60-inch stormwater interceptor at the Elm Street/East Valley Highway intersection.

1.2.10 Project No. 92-10 – South Parker Road Improvements

Project 92-10 has been removed from the project list. This project was proposed to reduce ponding on Parker Road south of Main Street. Based on the City's stormwater base maps, a majority of the conveyance proposed in the 1992 Plan is in place; however, 12-inch pipe was installed rather than 18-inch pipe as originally recommended. The City did not identify flooding in this area; therefore, this project is not included in this Plan Update.

1.2.11 Project No. 92-11 – North Parker Connection

Project 92-11 has been incorporated into CIP 14. Project 92-11 was proposed to reduce flooding on Parker Road north of Elm Street, and included installing approximately 1,650 feet of 24-inch pipe on Parker Road to the conveyance on Elm Street proposed under Project 92-9. Conveyance in this area is proposed under CIP 14, with a different configuration than originally identified.

CIP 14 proposes installing stormwater catch basins and conveyance on Parker Road north of Elm Street routed to a new biofiltration swale located between parcels approximately 650 feet north of the Elm Street/Parker Road intersection. The biofiltration swale outfalls to Salmon Creek.

1.2.12 Project No. 92-12 – 64th Street East Improvements

Project 92-12 has been incorporated into CIP 10 and CIP 23. Project 92-9 has been partially completed. Project 92-12 was proposed to reduce flooding along 64th Street East from Wahl Road to 158th Avenue East, and included installing approximately 1,900 feet of 18-inch pipe and 600 feet of 24-inch pipe on 64th Street East 158th Avenue East to Wahl Road. Conveyance from 158th Avenue East to 160th Avenue East is already in place.

CIP 10 proposes installing 24-inch pipe from midway between 160th Avenue East and Wahl Road to the existing outfall to Salmon Creek at Wahl Road. CIP 23 proposed installing 18-inch pipe on 64th Street East from midway between 160th Avenue East and Wahl Road to the existing conveyance at 160th Avenue East. CIP 23 has been completed.

1.2.13 Project No. 92-13 – 160th Avenue East and Main Street Improvements

Project 92-13 has been incorporated into CIP 24. This project was proposed to reduce ponding along 160th Avenue East and Main Street due to lack of conveyance. To meet the intent of this project, it was proposed under CIP 24 to install stormwater catchments and conveyance on 160th Avenue East from 64th Street East to Main Street, and on Main Street from 160th Avenue East to connect to the existing 24-inch-diameter conveyance located on the south side of Main Street approximately midway between 159th Avenue Court East and 158th Avenue Court East.

1.2.14 Project No. 92-14 – East Elm Street Outfall

Project 92-14 has been incorporated into CIP 16. Project 92-14 has been completed. Project 92-14 was proposed to reduce flooding on Elm Street between Parker Road and Salmon Creek due to the lack of conveyance. This project included installing approximately 1,275 feet of 18-inch pipe on Elm Street from Parker Road to 160th Avenue East. Based on the City's stormwater base maps, conveyance has been installed on Elm Street from Parker Road to approximately midway between Parker Road and 160th Avenue East.

CIP 16 proposed filling the existing ditch on the north side of Elm Street and installing catch basins and conveyance. CIP 16 has been completed.

1.2.15 Project No. 92-15 – Van Tassel Road Outfall

Project 92-15 has been incorporated into CIP 11 and CIP 12. Project 92-15 was proposed to reduce ponding along Van Tassel Road (160th Avenue East) north of Main Street due to the lack of conveyance, and included installing approximately 1,025 feet of 18-inch pipe and 1,650 feet of 24-inch pipe on 160th Avenue East to outfall to Salmon Creek near the 160th Avenue East/Elm Street intersection.

The City's stormwater base map shows that conveyance has been installed on 160th Avenue East from just south of Washington Street to just south of 52nd Street East. This conveyance system outfalls to a ditch, which ultimately outfalls to Salmon Creek at the intersection of Elm Street. Site investigation shows existing conveyance on the east side of 160th Avenue East from Main Street to Elm Street. Existing conveyance on the east side of the street appears to be comprised of a combination of pipe, culvert, and open ditches. However, based on field investigation and information provided by the City, the existing conveyance is in poor shape and needs to be replaced.

CIP 11 proposes extending existing conveyance to service the south end of 160th Avenue East to Main Street, connecting to the existing conveyance on Main Street. CIP 12 proposes to install conveyance on the north end of 160th Avenue East from approximately Washington Street to the existing outfall at Elm Street.

1.2.16 Project No. 92-16 – East Main Street Outfall

Project 92-16 has been removed from the project list. Project 92-16 has been partially completed and the remainder has been determined to not be required. Project 92-16 was proposed to reduce flooding along Main Street east of Poole Road, and included installing approximately 1,225 feet of 30-inch pipe on Main Street from Poole Road to the existing outfall to Salmon Creek at the intersection at Sumner-Tapps Highway.

Based on the information presented in the City's stormwater base map, approximately 500 feet of 18-inch-diameter conveyance has been installed on Main Street from the intersection with Sumner-Tapps Highway. The City has indicated that installation of additional or upsized stormwater conveyance in this area would not reduce flooding due to surcharge from Salmon Creek. Therefore, this project has been eliminated from the project list.

1.2.17 Project No. 92-17 – Poole Road Outfall

Project 92-17 has been incorporated into CIP 25. Project 92-17 was proposed to reduce ponding along Poole Road north of Main Street, and included installing approximately 1,500 feet of 18-inch pipe on Poole Road north of Main Street. City staff has indicated that there is an existing 10-inch pipe in place on the east side of Poole Road from Main Street to Salmon Creek. However, field investigation shows that the existing stormwater infrastructure on Poole Road is badly deteriorated and is in need of replacement.

CIP 25 proposes upsizing the existing 10-inch pipe with 24- and 30-inch-diameter pipe.

1.2.18 Project No. 92-18 – Wahl Road Interceptor

Project 92-18 has been incorporated into CIP 26. Project 92-18 proposed collecting runoff along Wahl Road and routing flow north to a proposed constructed wetland area, before discharging to Salmon Creek on the south side of SR 410. Flow from the wetland would be routed to Salmon Creek and then north through the existing 36-inch culvert under SR 410 east of Wahl Road. However, modeling performed at the time of the 1992 Plan suggests that the existing 36-inch culvert conveying Salmon Creek under SR 410 does not have sufficient capacity to convey additional flow.

Therefore, CIP 26 proposes a variation of this project with conveyance being installed along Wahl Road routing the flow south to 75th Street East. Flow will then be conveyed westward to connect to the conveyance and outfall to the Puyallup River proposed under CIP 21.

1.2.19 Project No. 92-19 – South Valley Avenue Outfall

Project 92-19 has been removed from the project list. This project proposed installing stormwater catchments and conveyance on Valley Avenue south of the SR 410 interchange, and included installing approximately 1,050 feet of 18-inch pipe and 1,200 feet of 30-inch pipe on Valley Avenue and approximately 1,050 feet of 18-inch pipe on Cherry Dale Lane. Conveyance on Cherry Dale Lane has been installed.

This project is located outside of the city limits, and does not appear to benefit the City of Sumner. Therefore, this project has been removed from the project list.

1.2.20 Project No. 92-20 – Van Ogles Creek Outfall Pipe System Improvements

Project 92-20 has been removed from the project list. Project 92-20 was proposed to reduce surcharging in and upstream of the existing 15-inch outfall to Van Ogles Creek at Wood McCumber Road in Basin G due to undersized conveyance. This project area is considerably south of the city limits and the identified stormwater service area. Therefore, this project is excluded from the project list.

1.2.21 Project No. 92-21 – Van Ogles Creek Rehabilitation and Crossing Improvements

Project 92-21 has been removed from the project list. This project was proposed to address flooding along 92nd Street East due to lack of conveyance and undersized culverts. Project 92-21 is outside of the city limits and the established stormwater service area and is not included in the project list.

1.2.22 Project No. 92-22 – Alderton Pond Improvements

Project 92-22 has been removed from the project list. This project was proposed to reduce surcharging and flooding in Basin N due to an undersized culvert under Annis Bowman Road and the lack of maintenance at Alderton Pond. This project is located considerably south of the city limits and the Sumner stormwater service area. Therefore, this project is not included in the project list.

1.2.23 Project No. 92-23 – Alderton Creek Rehabilitation and Crossing Improvements

Project 92-23 has been removed from the project list. Project 92-23 was proposed to address surcharge in and upstream of the existing 24-inch outfall to the Puyallup River due to undersized conveyance. This project is outside of the city limits, and therefore is not included in the project list.

1.2.24 Project No. 92-24 – 142nd Avenue Interceptor

Project 92-24 has been completed. This project was proposed to prevent potential flooding in the ditch paralleling Union Pacific Railroad (UPRR) between 24th Street East and the White River. The project included installing catchments and conveyance on 142nd Avenue East from 24th Street East to outfall at a constructed wetlands area west of the White River Bridge. The project also included rehabilitating an existing ditch on the east side of UPRR between 24th Street East and the White River. As proposed, all runoff would have been conveyed south to the constructed wetlands to provide water quality control prior to outfall to the White River.

Conveyance has been installed the full length of 142nd Avenue East (from the White River to 24th Street East), with approximately half of the conveyance routing water south to outfall to the White River on the northeast side of 45th Street East, and half of the conveyance routing water north to an outfall to the White River located on the east end of 24th Street East. Rehabilitation of the existing ditch on the east side of UPRR was completed by multiple developments in that area.

Drainage improvements in this area have been installed that meet the intent of the project proposed in the 1992 Plan

1.2.25 Project No. 92-25 – 24th Street Outfall to White River

Project 92-25 has been completed as part of the 24th Street Interchange construction. This project was originally proposed to help alleviate flooding on 24th Street East from UPRR to 142nd Avenue East, and included installing catchment and conveyance from UPRR to the White River and rehabilitating an existing ditch on the east side of UPRR between 16th Street East and 24th Street East.

Conveyance has been installed on 24th Street East from 142nd Avenue East to the White River, and rehabilitation of the existing ditch on the east side of UPRR from 16th Street East to 24th Street East is not necessary due to recent development in that area.

1.2.26 Project No. 92-26 – 16th Street Outfall to White River

Project 92-26 has been partially completed, and the remainder of the project has been removed from the project list. Project 92-26 was proposed to reduce flooding in the existing drainage ditch on the east side of UPRR at 16th Street East, and included installing conveyance along 16th Street East from UPRR to the White River and rehabilitating an existing ditch on the east side of UPRR from 8th Street East to 16th Street East.

The south half of the street improvement on 16th Street East, including storm drainage improvements, were constructed during development. Runoff from the 16th Street East improvements is routed to an on-site stormwater control facility located south of 16th Street East before discharging to the White River. The ditch rehabilitation portion of this project has not been included in the CIP list because a majority of the area that contributed flow to this ditch in the past has been developed. Runoff from the developed area is collected and conveyed to the stormwater control facility mentioned above.

1.2.27 Project No. 92-27 – 139th Avenue East Ditch Improvements

Project 92-27 has been removed from the project list. Project 92-27 was proposed to provide drainage to alleviate flooding on the east and west sides of 139th Avenue East between the King/Pierce County Line and 8th Street East. However, this project is located within the city of Pacific, and therefore is not being included in the project list.

1.2.28 Project No. 92-28 – 136th Avenue East and 24th Street East Improvements

Project 92-28 has been partially completed, and the remainder has been incorporated into CIP 28. Project 92-28 was proposed to reduce flooding on 136th Avenue East and 24th Street East due to lack of stormwater conveyance and undersized culverts. The project included installing catchments and conveyance on 136th Avenue East from 16th Street East to 24th Street East, rehabilitating an existing ditch on the west side of UPRR from 16th Street East to 24th Street East, and upsizing an existing culvert to convey ditch flow under 24th Street East.

Catchments and conveyance have been installed along portions of 136th Avenue East, but is currently so scattered that it is of little use.

CIP 28 proposes installing conveyance the full length of 136th Avenue East from 16th Street East to 24th Street East and rehabilitating the existing drainage ditch paralleling UPRR from 16th Street East to 24th Street East.

1.2.29 Project No. 92-29 – West Northeast 16th Outfall and System Improvements

Project 92-29 has been removed from the project list. Project 92-29 was proposed to reduce flooding along 132nd Avenue East and 136th Avenue East north of 16th Street East and 16th Street East west of 136th Avenue East. However, this area is located outside of Sumner city limits, within the city of Pacific, and is not included in the project list.

1.2.30 Project No. 92-30 – West Northeast 8th Outfall and System Improvements

Project 92-30 has been removed from the project list. Project 92-30 was proposed to alleviate surcharging in an existing culvert under 136th Avenue East at 8th Street East, and included installing approximately 2,300 feet of 36-inch pipe on 8th Street East discharging to Drainage Ditch No. 24. This project is located in the city of Pacific, and therefore is not included in the project list.

1.2.31 Project No. 92-31 – Culvert Crossing Railroad at North 8th Street East

Project 92-31 was proposed to reduce flooding along 8th Street East, east of Burlington Northern Santa Fe (BNSF) railroad, due to surcharge of existing culverts. The project includes boring and installing a 36-inch culvert under BNSF at 8th Street, and rehabilitating an existing drainage ditch located on the north side of 8th Street East. A majority of the stormwater issues related to this area have been addressed by the 8th Street Corridor Improvement Plans prepared by Pierce County. Project 92-31 will be constructed in conjunction with the road construction.

1.2.32 Project No. 92-32 – Puget Power and Light Canal Drainage Improvements

Project 92-32 has been incorporated into CIP 29. Project 92-32 was proposed to alleviate flooding adjacent to BNSF north of 24th Street East. The project included installing approximately 2,350 feet of 18-inch pipe along 148th Avenue East, which discharges to the existing canal from the White River Power Plant, and rehabilitating existing ditches on the east and west sides of BNSF, north of 24th Street.

1.2.33 Project No. 92-33 – Middle Creek Drainage Improvements

Project 92-33 has been removed from the project list. Project 92-33 was proposed to reduce flooding on the east side of BNSF by boring and installing a 48-inch culvert under BNSF at Middle Creek, rehabilitating existing drainage ditches on the east and west sides of BNSF, and widening Middle Creek to increase hydraulic capacity. The permits necessary to dredge Middle Creek would be difficult to obtain and therefore this project was eliminated from the project list.

1.2.34 Project No. 92-34 – Salmon Creek Improvements

Project 92-34 has been incorporated into CIP 33 through CIP 39. Several projects were proposed to alleviate existing surcharge and flooding within Salmon Creek due to inadequate hydraulic capacity.

Projects concerning improvements to the Salmon Creek main channel were proposed, and included options such as widening Salmon Creek, constructing a channel paralleling Salmon Creek to provide flood control, dredging Salmon Creek, and limiting development in the basins tributary to Salmon Creek. Salmon Creek improvements were presented in a general manner, recommending that additional planning and studies be completed to develop projects to increase water quality and hydraulic capacity.

To further refine projects related to Salmon Creek improvement, Cosmopolitan Engineering Group developed project designs to remove or replace existing culverts located on Salmon Creek at the confluence with the White River and East Main Street. The intent of these projects was to:

- Improve water quality within Salmon Creek by producing less restricted flow.
- Improve fish habitat quality by removing existing culverts.
- Restore the stream bed and banks, or replace existing pipe culverts with box culverts.
- Increase hydraulic capacity of Salmon Creek by eliminating or lessening flow restrictions.

The culvert removal and replacement projects proposed by Cosmopolitan have been incorporated into the capital improvement project list under CIPs 33 through 39.

2. RECOMMENDED CAPITAL IMPROVEMENT PROJECTS

The recommended CIPs described below include projects recommended in the 1992 Plan that have not been completed to date, projects identified by City staff, projects identified during 2004 planning, and projects identified after 2004.

The land-use designations within the study area have not changed significantly since the 1992 Plan. For the purposes of this CIP, the hydrologic and hydraulic modeling output data compiled during the 1992 Plan were used in evaluating recommended CIPs.

It is important to note that individual pipe reaches for recommended projects were not hydraulically modeled. Therefore, the pipe sizes indicated should be confirmed during project design.

The criteria used to evaluate the recommended projects are the same as described in Section 1. Project priority was determined by considering the surcharge/flooding potential identified by modeling results completed during the 1992 Plan, information provided by City personnel, project conformance with City planning, recommendations by City staff, and availability of funding.

2.1 COMPLETED PROJECTS

Several projects have been completed since the 1992 Plan and was developed and the stormwater planning was performed in 2004. The following is a list of the completed projects.

- Project 92-5, Rivergrove Road Outfall.
- Project 92-6, East Sumner Trunk System with Diversion to Puyallup River.
- Project 92-16, East Main Street Outfall.
- Project 92-24, 142nd Avenue Interceptor.
- Project 92-25, 24th Street Outfall to White River.
- Project 92-26, 16th Street Outfall to White River.
- Project 92-31, Culvert Crossing Railroad at North 8th Street East (will be completed as part of current road construction project).
- CIP 3, 42-Inch Puyallup River Outfall Improvements.
- CIP 5, Sessler Outfall High Flow Bypass; addresses need previously identified for Project 92-3.
- CIP 9, Bock Avenue Improvements.
- CIP 16, Elm Street Outfall Improvements; includes Project 92-14, East Elm Street Outfall.
- CIP 20, Valley Avenue East Improvements; includes Project 92-4, Pacific Avenue Improvements.
- CIP 23, 64th Street East Improvements; includes part of Project 92-12, 64th Street East Improvements.
- CIP 30, Zehnder Street Improvements.
- CIP 32, Valley Avenue Improvements.
- CIP 42, 8th Street East Corridor Improvements.

- CIP 48, Milwaukee Ditch Regional Facility.
- Site A.1, 42-Inch Outfall Water Quality Facility.

2.2 PROPOSED CIPS

Following is a discussion of the recommended CIPs. Figure 2-1 is an overall site map showing the locations of the recommended projects. Appendix A contains detailed figures and Appendix B contains planning-level cost opinions for each recommended capital improvement project. Table 2-1 summarizes each project, listing priority, scheduled completion date, and cost opinions in 2010 dollars and at the expected time of completion. Projects prioritized as high, medium, and low are scheduled for completion in 0–5 years, 5–10 years, and 10–20 years, respectively. All of the project costs shown for the following projects are in 2010 dollars.

2.2.1 CIP 1 – Alder Avenue High Flow Bypass

CIP 1 is proposed to reduce surcharge upstream of the existing 48-inch outfall to the Puyallup River off Alder Avenue due to the outfall being submerged during high flows. CIP 1 consists of constructing an approximate 25,000 gallons per minute, low-head pump station at the Alder Avenue/Maybell Street intersection. An overflow pipe will be installed from the existing Type II catch basin, located at the corner of Alder Avenue and Maybell Street, to the proposed pump station, with a 36-inch butterfly valve installed in the existing stormwater conveyance line upstream of the overflow to the pump station. Flow from the pump station will be routed to the existing 36-inch conveyance downstream of the butterfly valve, which would be closed when upstream conveyance is surcharged.

Per the Department of Ecology Western Washington Hydrology Model (WWHM), assuming the future land use at buildout presented in the 1992 Plan, the expected 25-year and 100-year flow frequencies for areas contributing runoff to this outfall are approximately 58 cubic feet per second (cfs) and 74 cfs, respectively. An outfall analysis will need to be conducted during high flows to verify that it is feasible to operate the pump station at the expected flows without surcharging the existing storm drain manholes on SR 410 when the outfall is submerged. This project can be modified to include a force main if further analysis indicates that utilizing the existing 36-inch-diameter stormwater conveyance with the pump station is not feasible. However, installing a force main will likely add significant cost.

2.2.2 CIP 2 – Gary Street Improvements

CIP 2 is proposed to reduce flooding on Gary Street and Gault Street caused by a lack of stormwater conveyance. It is reported that Gary and Gault Streets flood during minor to moderate storm events.

CIP 2 consists of installing approximately 750 feet of 12-inch pipe on Gault Street, approximately 575 feet of 12-inch pipe on Wood Avenue, and approximately 90 feet of 12-inch and 515 feet of 18-inch pipe on Gary Street. The 18-inch pipe on Gary Street will connect to the existing 24-inch conveyance at the intersection of Gary Street and Valley Avenue.

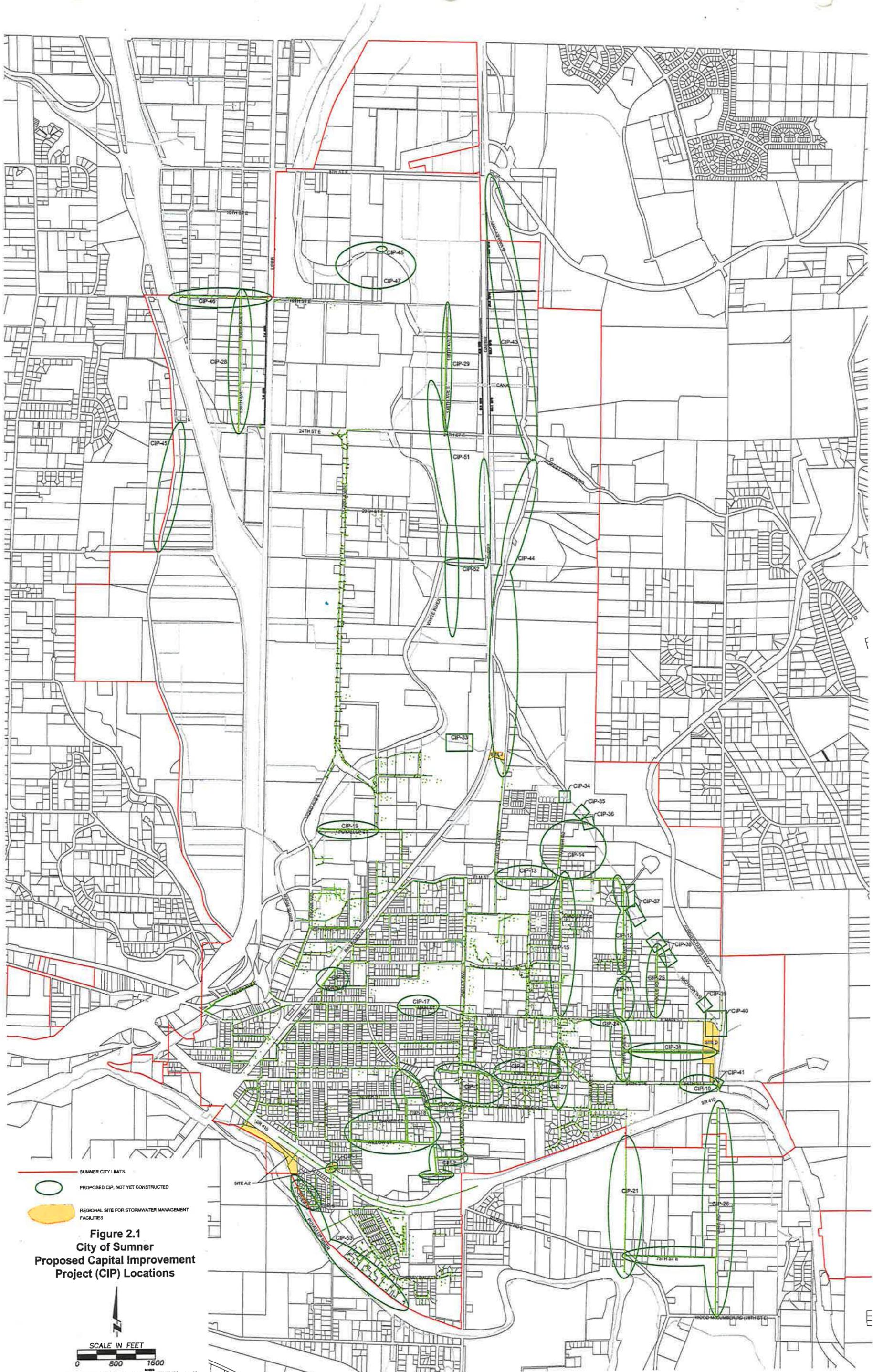


Figure 2.1
City of Sumner
Proposed Capital Improvement
Project (CIP) Locations

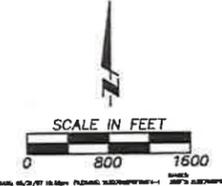


Table 2-1. Capital Improvement Plan Schedule

Project No. – Description	Project Priority ^a	Funding Source Percentages ^b	Total Cost Year 2010 (\$)	Year of Completion										
				2011 (\$)	2012 (\$)	2013 (\$)	2014 (\$)	2015 (\$)	2016 (\$)	2017 (\$)	2018 (\$)	2019 (\$)	2020 (\$)	2021–2030 (\$)
Seattle Construction Cost Index – 4/14/03 (increases at 4.5%)			7642	7642	7986	8345	8721	9113	9523	9952	10400	10868	11357	11868
Capital Improvement Projects														
CIP No. 1 – Alder Avenue High Flow Bypass	LOW	80/20	\$5,566,000											\$7,483,400
CIP No. 2 – Gary Street Improvements	HIGH	30/70	\$291,000				\$322,900							
CIP No. 4 – Railroad Street Improvements	50/50	20/80	\$80,000											\$107,600
CIP No. 6 – River Street Improvements	LOW	20/80	179,000											\$240,708
CIP No. 7 – 151st Avenue East and 152nd Avenue East Improvements; incorporates part of Project 92-8	HIGH	20/80	\$408,000				\$452,800							
CIP No. 8 – 63rd Street Court East Improvements	HIGH	20/80	\$485,000					\$548,100						
CIP No. 10 – 64th Street East Outfall Improvements; incorporates part of Project 92-12	HIGH	50/50	\$196,000	\$205,500										
CIP No. 11 – South 160th Avenue East Improvements; incorporates part of Project 92-15; TIP construction in 2014	HIGH	50/50	\$107,000				\$118,800							
CIP No. 12 – North 160th Avenue East Improvements; incorporates part of Project 92-15	HIGH	50/50	\$293,000			\$319,200								
CIP No. 13 – Elm Street Interceptor; incorporates part of Project 92-9; TIP construction in 2013	HIGH	40/60	\$278,000			\$302,800								
CIP No. 14 – North Parker Road Improvements; incorporates Project 92-11; TIP construction in 2014	HIGH	30/70	\$184,000			\$200,500								
CIP No. 15 – Parker Road Improvements; incorporates part of Project 92-9; TIP construction in 2013	HIGH	20/80	\$335,000			\$364,900								
CIP No. 17 – Main Street Improvements	LOW	10/90	\$169,000											\$227,300
CIP No. 18 – Willow Street Interceptor and Tributary Improvements; incorporates Project 92-1	HIGH	10/90	\$1,155,000					\$1,350,400						
CIP No. 19 – Puyallup Street Outfall Improvements; incorporates Project 92-2	HIGH	40/60	\$1,803,000					\$2,037,500						
CIP No. 21 – South SR-410 Diversion Interceptor; incorporates remainder of Project 92-3 and Project 92-7	LOW	80/20	\$11,641,000											\$15,651,800
CIP No. 22 – Meade-McCumber Street Improvements; incorporates part of Project 92-8	LOW	20/80	\$146,000											\$196,400
CIP No. 24 – East Main Street/160th Avenue East Improvements; incorporates Project 92-13; TIP construction in 2013	HIGH	80/20	\$251,000			\$273,400								
CIP No. 25 – Poole Road Outfall Improvements; incorporates Project 92-17	HIGH	60/40	\$402,000		\$429,700									
CIP No. 26 – Wahl Road Interceptor; incorporates Project 92-18	LOW	100/0	\$1,424,000											\$1,914,700
CIP No. 27 – South Parker Road Improvements; TIP construction in 2013	HIGH	20/80	\$77,000			\$83,900								
CIP No. 28 – 136th Avenue East Improvements	HIGH	70/30	\$726,000		\$776,000									

Table Continues

Table 2-1. Capital Improvement Plan Schedule (continued)

Project No. – Description	Project Priority ^a	Funding Source Percentages ^b	Total Cost Year 2010 (\$)	Year of Completion											
				2011 (\$)	2012 (\$)	2013 (\$)	2014 (\$)	2015 (\$)	2016 (\$)	2017 (\$)	2018 (\$)	2019 (\$)	2020 (\$)	2021–2030 (\$)	
CIP No. 29 – Puget Sound Power and Light Canal Drainage; incorporates Project 92-32	LOW	50/50	\$591,000												\$794,700
CIP No. 31 – 62nd Street East; TIP construction in 2013	HIGH	100/0	\$244,000			\$265,800									
CIP No. 33 – REI/Railroad Culvert Improvements	LOW	50/50	\$207,000												\$278,400
CIP No. 34 – Parker Road Culvert Improvements	HIGH	30/70	\$84,000	\$88,100											
CIP No. 35 – Puyallup Watershed Access Culvert Improvements	HIGH	30/70	\$76,000	\$79,700											
CIP No. 36 – 47th Street Court East Culvert Improvements	HIGH	80/20	\$75,000		\$80,200										
CIP No. 37 – 160th Avenue East Culvert Improvements; TIP construction in 2014	HIGH	80/20	\$667,000			\$726,500									
CIP No. 38 – 162nd Avenue East Culvert Improvements	HIGH	80/20	\$183,000				\$203,100								
CIP No. 39 – East Main Street Culvert Improvements	HIGH	80/20	\$28,000					\$31,700							
CIP No. 40 – Salmon Creek Restoration; TIP construction in 2014	HIGH	60/40	\$291,000				\$322,900								
CIP No. 41 – 64th Street East Culvert Improvements	HIGH	50/50	\$350,000			\$381,300									
CIP No. 43 – East Valley Highway Improvements – Detention Pond with Bioswale; TIP construction in 2012/2013	HIGH	80/20	\$2,063,000		\$1,102,500	\$1,123,500									
CIP No. 44 – East Valley Highway Improvements; TIP construction in 2012/2013	80/20	80/20	\$934,000	\$240,000	\$370,900	\$378,000									
CIP No. 45 – West Valley Highway Improvements – Detention Pond with Bioswale	LOW	50/50	\$534,000												\$718,000
CIP No. 46 – 16th Street East Improvements	LOW	70/30	\$472,000												\$634,700
CIP No. 47 – White River Levee Improvements	HIGH	40/60	\$2,988,000			\$3,254,500									
CIP No. 49 – Golf Course Culvert Improvements	HIGH	50/50	\$247,000	\$259,000											
CIP No. 50 – Development Rights Relinquished by City	HIGH	40/60	\$1,524,600		\$1,629,500										
CIP No. 51 – 24th Street Setback Levee	HIGH/LOW	100/0	\$16,000,000			\$450,000									\$20,907,600
CIP No. 52 – Number 9 Ditch and Forest Canyon Class III Habitat Improvements	LOW	80/20	\$651,000												\$875,300
CIP No. 53 – Rivergrove Puyallup River Improvements	HIGH	100/0	\$12,268,000	\$3,215,300	\$3,277,900	\$3,340,600	\$3,403,200								
SITE A.2 – 48-Inch Outfall Water Quality Facility	HIGH	30/70	\$1,633,000			\$1,778,700									
SITE D – Detention Pond with Water Quality Facility	HIGH	90/10	\$1,466,000		\$1,566,800				\$440,700						\$1,919,000
SITE J – Water Quality Treatment	MED	50/50	\$383,000												
TOTAL – CAPITAL ASSET FUNDS (Includes inflation) (City-funded only – exclude developer or LID-funded projects)			\$70,195,600	\$4,087,600	\$9,233,500	\$13,243,600	\$4,823,700	\$3,967,700	\$440,700	0	0	0	0	\$50,030,900	

^a Project Priority Identification: HIGH Completed within 0–5 years
MED Completed within 5–10 years
LOW Completed within 10–20 years

^b Allocation between capital cost and replacement cost, respectively. Based on rate analysis provided by City.

2.2.3 CIP 3 – 42-Inch Puyallup River Outfall Improvements

CIP 3 has been completed. CIP 3 was proposed to reduce surcharge in the existing 42-inch outfall to the Puyallup River located south of SR 410 at Mountain Circle Drive. The existing outfall terminates at an undersized culvert south of SR 410 before discharging to a drainage ditch routed to the Puyallup River. The restriction at the outfall results in system surcharge upstream, creating flooding during moderate to major events.

CIP 3 consisted of upsizing the existing culvert to 42-inch-diameter to reduce head loss prior to release resulting in surcharge upstream of the outfall.

2.2.4 CIP 4 – Railroad Street Improvements

CIP 4 is proposed to reduce flooding on North Street due to lack of conveyance on Railroad Street and undersized conveyance on North Street. Surcharge within the existing line sometimes results in flooding in the downtown area on Main Street.

CIP 4 consists of installing approximately 435 feet of 18-inch pipe along Railroad Street from North Street to Ryan Avenue. These improvements will provide conveyance on Railroad Street and provide a bypass when existing conveyance on North Street surcharges due to high flows.

2.2.5 CIP 5 – Sessler Outfall High Flow Bypass

CIP 5 has been completed. CIP 5 incorporated part of Project 92-3. CIP 5 was proposed to reduce surcharging upstream of the existing 42-inch Sessler outfall by providing a high flow bypass to the District 11 outfall at Salmon Creek. The existing 60-inch District 11 outfall was initially sized to accommodate flow from Subbasins T13 through T20; however, past improvements have been installed routing runoff from Subbasin T19 to the Sessler outfall. Additionally, runoff from Subbasin T12 is currently routed to the District 11 outfall. CIP 21 proposes that Subbasin T12 runoff be routed south to outfall to the Puyallup River. In light of this information, it seemed feasible to presume that overflow from the Sessler outfall conveyance will not overtax the District 11 system.

Construction of a high-flow bypass was recommended is a reasonably inexpensive way to reduce surcharge in the conveyance upstream of the Sessler outfall. This project consisted of placing a 60-inch Type II catch basin over the existing 36-inch conveyance on Valley Avenue at Daffodil Street Court East, and installing approximately 15 feet of 24-inch pipe from the new 60-inch Type II to the existing 24-inch conveyance tributary to the District 11 outfall on Daffodil Street Court East.

2.2.6 CIP 6 – River Street Improvements

CIP 6 is proposed to reduce potential surcharging in the existing stormwater infrastructure along 141st Avenue East and River Street due to undersized conveyance by abandoning approximately 360 feet of existing 12-inch pipe and installing approximately 800 feet of 24-inch pipe. The existing 12-inch pipe is located beneath existing homes. Therefore, the proposed 24-inch pipe will be rerouted and installed within existing right-of-way. Surcharge/flooding has not been reported in this area.

2.2.7 CIP 7 – 151st Avenue East and 152nd Avenue East Improvements

CIP 7 incorporates part of Project 92-8. CIP 7 is proposed to alleviate flooding on 63rd Street Court East, 151st Avenue East, and 152nd Avenue East due to lack of and undersized conveyance. This project includes installing approximately 465 feet of 12-inch pipe on 63rd Street Court East west of Valley Avenue, replacing approximately 400 feet of 8-inch

pipe, 350 feet of 10-inch pipe, and 40 feet of 12-inch pipe with 180 feet of 12-inch pipe and 610 feet of 18-inch pipe on 63rd Street East, east of West Valley, installing approximately 670 feet of 12-inch pipe on 151st Avenue East, and installing approximately 360 feet of 12-inch pipe on 152nd Avenue East. Reports of flooding in this area are limited to the 63rd Street Court East/152nd Avenue East intersection.

2.2.8 CIP 8 – 63rd Street Court East Improvements

CIP 8 is proposed to alleviate flooding on 63rd Street Court East between 152nd Avenue East and Parker Road due to lack of conveyance. CIP 8 includes installing approximately 1,095 feet of 12-inch pipe and 570 feet of 18-inch pipe on 63rd Street Court East. This conveyance will be routed to an existing 36-inch pipe tributary to the District 11 outfall on 154th Avenue East. The project also includes installing approximately 1,180 feet of 6-inch laterals. Storm laterals will be installed to adjacent lots, terminating at a cleanout at the property line, to provide on-site drainage and to discourage suspected illegal connections to the sanitary sewer system.

Portions of this project could be financed through a LID due to the fact that drain laterals will be installed to all existing lots adjacent to the proposed improvements.

2.2.9 CIP 9 – Bock Avenue Improvements

CIP 9 has been completed. CIP 9 was proposed to reduce ponding on Bock Avenue, and included installing approximately 830 feet of 12-inch pipe. Stormwater improvements were completed as part of a street reconstruction project.

2.2.10 CIP 10 – 64th Street East Outfall Improvements

CIP 10 incorporates part of Project 92-12. CIP 10 is proposed to reduce flooding along 64th Street East due to inadequate conveyance by replacing approximately 720 feet of existing drainage ditch with approximately 720 feet of 24-inch pipe to the west of Sumner-Tapps Highway.

Completion of this project will likely not eliminate flooding in this area due to Salmon Creek surcharge caused by constrictions downstream of 64th Street East.

2.2.11 CIP 11 – South 160th Avenue East Improvements

CIP 11 incorporates part of Project 92-15. CIP 11 is proposed to alleviate flooding on 160th Avenue East just north of Main Street due to lack of and undersized existing conveyance. CIP 11 includes installing approximately 720 feet of 12-inch pipe and 255 feet of 18-inch pipe on 160th Avenue East north of Main Street. The 18-inch pipe would be connected to the existing 18-inch conveyance system on Main Street that is ultimately routed to Salmon Creek via existing conveyance on Poole Road.

These improvements will be installed as part of a street improvement project, and therefore the cost estimate prepared for this project does not include street restoration. The Sumner Transportation Improvement Plan (TIP) indicates that the street improvement project will be constructed in 2014. Flow control and water quality treatment for CIP 11 would be provided through the stormwater facility for CIP 16; consequently, stormwater facility costs are included in the costs for CIP 16.

2.2.12 CIP 12 – North 160th Avenue East Improvements

CIP 12 incorporates part of Project 92-15. CIP 12 is proposed to reduce flooding on North 160th Avenue East due to inadequate conveyance between Washington Street and Elm Street. This project includes replacing approximately 690 feet of existing drainage ditch with 690 feet of 24-inch pipe, and replacing approximately 1,200 feet of existing 18-inch-diameter conveyance with approximately 1,290 feet of new 18-inch pipe, including approximately 245 feet of new 12-inch-diameter laterals.

Completion of this project will not likely eliminate all flooding in this area due to surcharge of Salmon Creek. This project will be completed in conjunction with street improvements. The CIP 12 costs do not include street restoration costs. Flow control and water quality treatment for CIP 12 would be provided through the stormwater facility for CIP 16; consequently, stormwater facility costs are included in the costs for CIP 16.

2.2.13 CIP 13 – Elm Street Interceptor

CIP 13 incorporates part of Project 92-9. CIP 13 is proposed to alleviate flooding on Elm Street between Parker Road and East Valley Highway due to lack of conveyance. This project includes installing approximately 140 feet of 12-inch pipe, 600 feet of 18-inch pipe, and 610 feet of 24-inch pipe. The 24-inch pipe will be connected to the existing 60-inch interceptor at East Valley Highway, upstream of the District 11 outfall.

Stormwater improvements on Elm Street will be installed as part of a street improvement project scheduled for construction in 2013. The cost opinion includes costs for a flow control pond. The cost opinion also includes costs for a biofiltration swale for water quality treatment.

2.2.14 CIP 14 – North Parker Road Improvements

CIP 14 incorporates Project 92-11. CIP 14 is proposed to reduce flooding on Parker Road north of Elm Street caused by a lack of conveyance and includes installing approximately 610 feet of 12-inch pipe and 440 feet of 18-inch pipe. The conveyance will be routed to converge at a bioswale constructed to outfall to Salmon Creek approximately 650 feet north of Elm Street.

Completion of this project will not completely eliminate flooding in this area due to Salmon Creek surcharging. Excluding construction of the bioswale, CIP 14 will be constructed with a street reconstruction project. The costs for this project do not include street restoration costs. The Sumner TIP indicates that street improvements are planned for construction in 2013. The cost opinion includes costs for a flow control pond. The cost opinion also includes costs for a media cartridge system for water quality treatment.

2.2.15 CIP 15 – Parker Road Improvements

CIP 15 incorporates part of Project 92-9. CIP 15 is proposed to reduce flooding on Parker Road south of Elm Street caused by a lack of stormwater conveyance. CIP 15 includes installing approximately 125 feet of 12-inch pipe on Elm Street and installing approximately 280 feet of 12-inch pipe and 345 feet of 18-inch pipe on Parker Road to connect to the existing 36-inch conveyance system on Parker Road at the intersection of Daffodil Street Court East. CIP 15 also includes installing new catch basins and approximately 345 feet of 12-inch-diameter laterals on the existing stormwater mainlines from Daffodil Street Court East to Main Street to accommodate street widening.

The stormwater improvements proposed in CIP 15 will be completed as part of a street improvement project. The costs do not include roadway restoration. The street improvement project is scheduled for construction in 2013. The cost opinion includes costs for a flow control pond. The cost opinion also includes costs for a biofiltration swale for water quality treatment.

2.2.16 CIP 16 – Elm Street Outfall Improvements

CIP 16 has been completed. CIP 16 incorporated Project 92-14. CIP 16 was proposed to reduce flooding along Elm Street west of 160th Avenue East caused by inadequate conveyance. This project included replacing approximately 460 feet of open ditch along Elm Street with approximately 460 feet of 18-inch pipe to outfall to Salmon Creek at the 160th Avenue East intersection. Conveyance from 160th Avenue East and CIP 12 will converge with Elm Street conveyance at the intersection prior to the outfall to Salmon Creek. A water quality vault will be installed after the convergence to treat runoff prior to the Salmon Creek outfall.

2.2.17 CIP 17 – Main Street Improvements

CIP 17 is proposed to reduce surcharging in existing conveyance caused by lack of hydraulic capacity, and includes replacing approximately 750 feet of existing 12-inch pipe with 320 feet of 18-inch pipe and 430 feet of 21-inch pipe.

Modeling conducted for the 1992 Plan indicates that the conveyance in this area is undersized; however, there are no reports of flooding.

2.2.18 CIP 18 – Willow Street Interceptor and Tributary Improvements

CIP 18 incorporates Project 92-1. CIP 18 is proposed to alleviate surcharging in existing conveyance upstream of the 48-inch outfall to the Puyallup River south of SR 410. CIP 18 includes upsizing approximately 385 feet of existing 12-inch pipe on Sumner Avenue between Rainier Street and Willow Street with 21-inch pipe, upsizing approximately 1,170 feet of existing 15-inch pipe on Willow Street between Sumner Avenue and Guptil Avenue with 24-inch pipe, replacing approximately 290 feet of 10-inch pipe and 340 feet of 8-inch pipe on Willow Street between Guptil Avenue and Wood Avenue with 965 feet of 18-inch pipe, replacing approximately 445 feet of existing 15-inch pipe on Guptil Avenue between Willow Street and Rainier Street with 18-inch pipe, replacing approximately 240 feet of existing 10-inch pipe and 230 feet of existing 12-inch pipe with 12-inch pipe, and installing approximately 2,155 feet of 12-inch-diameter conveyance system on Wood Avenue.

Although upsizing the existing conveyance on Willow Street and Sumner Avenue will increase the hydraulic capacity of this run, surcharge downstream of this reach is still likely unless CIP 1 is completed.

2.2.19 CIP 19 – Puyallup Street Outfall Improvements

CIP 19 incorporates Project 92-2. CIP 19 is proposed to reduce surcharge in the existing outfall to the White River west of Puyallup Street, and includes replacing approximately 1,175 feet of existing 24-inch pipe with 30-inch pipe. A water quality facility will be installed prior to outfall to the White River. Due to the limited amount of space available at the outfall, options for treatment will likely be limited to emerging technologies such as package media filters or manufactured storm drain structures.

Modeling completed during development of the 1992 Plan indicates that the existing 24-inch conveyance on Puyallup Street is undersized and surcharging. However, flooding has not been reported in this area.

A grant application was completed for CIP 19 as part of Ecology's Fiscal Year 2011 Stormwater Retrofit and Low Impact Development (SWRLID) funding program. The grant application considered a vault, a media cartridge system, and a constructed wetland for stormwater treatment. The grant application also considered treatment of the entire contributing area or for a partial retrofit. The recommendation in the grant application predesign report included a media cartridge system to provide basic treatment of the entire contributing area.

The proposed treatment system includes four vaults with media treatment cartridges, a bypass structure to route the design flows to the treatment units and high flows to the existing piping, new storm drain for connection to the existing piping near the outfall, and a Tideflex® valve on the outfall. The system was designed to treat up to 3.47 cfs.

The preliminary design of the treatment system and piping layout is documented in the *CIP 19 (Puyallup Street) White (Stuck) River Outfall Stormwater Treatment Retrofit Predesign Report* (Parametrix 2010a). The project is included on Ecology's draft funding offer list for \$1,000,000. The remainder of the project costs will need to be provided by the City.

2.2.20 CIP 20 – Valley Avenue East Improvements

CIP 20 has been completed. CIP 20 incorporated project 92-4. CIP 20 was proposed to alleviate surcharging in the existing 8-inch outfall to the White River, and reduce ponding along Valley Avenue East caused by inadequate conveyance. This project included installing approximately 190 feet of 12-inch pipe, 600 feet of 18-inch pipe, and 715 feet of 24-inch pipe along Valley Avenue East to outfall to the White River. A water quality facility was installed with this project.

2.2.21 CIP 21 – South SR 410 Diversion Interceptor

CIP 21 incorporates the remainder of Project 92-3 and Project 92-7. CIP 21 is proposed to reduce flooding in Basin T south of SR 410 due to inadequate capacity in the existing 36-inch culvert east of 158th Avenue East. Additionally, eliminating flow from south of SR 410 in this area will lessen the demand on the District 11 outfall to Salmon Creek, making it more feasible to reduce surcharge in the Sessler outfall by providing a high-flow bypass from Sessler to District 11 in CIP 5. This project consists of installing approximately 600 feet of 30-inch pipe, 600 feet of 36-inch pipe, 1,230 feet of 42-inch pipe, and 350 feet of 60-inch pipe from SR 410 to outfall to the Puyallup River south of Riverside Road East. A water quality facility will be constructed prior to the outfall to the Puyallup River.

Construction of this project will require the City to complete the environmental documentation and permitting for establishing another outfall to the Puyallup River. The type of water quality facility constructed will be dependent on the permit conditions and the availability of land in the area of the outfall. However, there does not appear to be sufficient area to construct a wet pond or bioswale. Therefore, treatment options will be limited.

Benefits of this project include alleviation of flooding south of SR 410 and reducing flow to the District 11 outfall. Therefore, CIP 21 is included in the project list event though the project is located outside of the current Sumner city limits.

2.2.22 CIP 22 – Meade-McCumber Street Improvements

CIP 22 incorporates part of Project 92-8. CIP 22 is proposed to reduce flooding caused by inadequate conveyance along Meade-McCumber Street, east of Valley Avenue. CIP 22 includes replacing approximately 370 feet of existing 10-inch pipe and 420 feet of existing 12-inch pipe with 790 feet of 15-inch pipe to connect to the existing 30-inch conveyance on Meade-McCumber Street on the east side of Valley Avenue.

2.2.23 CIP 23 – 64th Street East Improvements

CIP 23 has been completed. CIP 23 incorporated part of Project 92-12. CIP 23 was proposed to reduce ponding caused by undersized conveyance along 64th Street East, east of 160th Avenue East. This project included installing approximately 80 feet of 12-inch pipe and replacing approximately 480 feet of existing 12-inch pipe with 18-inch pipe on 64th Street East.

2.2.24 CIP 24 – East Main Street and 160th Avenue East Improvements

CIP 24 incorporates Project 92-13. CIP 24 is proposed to reduce flooding caused by inadequate conveyance along Main Street and 160th Avenue East, south of Main Street. This project includes installing approximately 605 feet of 12-inch pipe and 675 feet of 18-inch mainline on 160th Avenue East, and installing approximately 295 feet of 18-inch pipe and 210 feet of 24-inch mainline on Main Street, including approximately 290 feet of associated 12-inch laterals. The 24-inch pipe on Main Street will connect to the existing 24-inch conveyance on Main Street between 159th Avenue Court East and 158th Avenue Court East.

CIP 24 will be completed as part of a street improvement project scheduled for construction in 2013. Therefore, roadway restoration was not included in the costs for CIP 24. The costs for CIP 24 include a biofiltration swale for water quality treatment. However, flow control for CIP 24 would be provided through the stormwater facility at Site D; consequently, flow control costs for CIP 24 are included in the costs for Site D.

2.2.25 CIP 25 – Poole Road Outfall Improvements

CIP 25 incorporates Project 92-17. CIP 25 is proposed to alleviate flooding along Poole Road caused by inadequate conveyance, and includes replacing approximately 1,450 feet of 10-inch conveyance with approximately 900 feet of 24-inch conveyance and 570 feet of 30-inch conveyance from Main Street to the outfall at Salmon Creek. The project also includes approximately 140 feet of 12-inch storm drain. A water quality facility will be installed at the outfall before discharging to discharging Salmon Creek.

Completion of this project will likely not eliminate all flooding on Poole Road due to Salmon Creek surcharge. CIP 25 will be completed in conjunction with a road improvement project, and therefore street restoration was not included in the cost for CIP 25. The cost opinion includes costs for a flow control pond. The cost opinion also includes costs for a media cartridge system for water quality treatment.

2.2.26 CIP 26 – Wahl Road Interceptor

CIP 26 incorporates Project 92-18. CIP 26 is proposed to reduce flooding along Wahl Road south of SR 410 and help reduce Salmon Creek surcharge and flooding south and north of SR 410. CIP 26 consists of installing approximately 490 feet of 12-inch pipe, 250 feet of 15-inch pipe, 1,200 feet of 18-inch pipe, 1,210 feet of 24-inch pipe, 620 feet of 30-inch pipe, and 960 feet of 36-inch pipe on Wahl Road from SR 410 to Wood McCumber Road. Conveyance on Wahl Road will converge at 75th Street East and be routed to the 60-inch outfall proposed under CIP 22 via approximately 1,870 feet of 48-inch pipe.

Although located outside of city limits, this project has been included on the project list because it will decrease the volume of runoff routed to Salmon Creek south of SR 410, thus decreasing flooding both north and south of the freeway. This project will likely not be completed until the area south of SR 410 is developed. Completion of this project will include establishing a new outfall to the Puyallup River under CIP 21. Costs for completing environmental documentation, environmental permitting, and land acquisition to establish the outfall are included under the cost for CIP 21.

2.2.27 CIP 27 – South Parker Road Improvements

CIP 27 will be completed as part of a road reconstruction project scheduled for construction in 2013, and includes replacing existing laterals and catch basins on Parker Road between 62nd Street Court East and Meade-McCumber Street to accommodate street widening and reconstruction. Approximately 240 feet of 12-inch-diameter storm laterals will be installed.

These storm improvements will be completed during a street widening project and, therefore, street restoration costs are not included in the cost for CIP 27. The costs for CIP 27 include flow control and water quality treatment for new impervious surfaces. The costs for CIP 27 assume that the existing pavement will not be removed and replaced but will have spot repairs if needed or be overlaid. If the existing pavement is removed and replaced, treatment retrofit would likely be required, which would increase flow control and water quality treatment costs. The cost opinion includes costs for a flow control pond. The cost opinion also includes costs for a biofiltration swale for water quality treatment.

2.2.28 CIP 28 – 136th Avenue East Improvements

CIP 28 is proposed to alleviate flooding on 136th Avenue East and 24th Street East caused by inadequate conveyance. CIP 28 includes installing a new mainline, laterals, and catch basins the full length of 136th Avenue East from 16th Street East to 24th Street East. CIP 28 consists of installing approximately 400 feet of 12-inch, 1,625 feet of 30-inch, and 1,595 feet of 36-inch-diameter storm conveyance.

Stormwater improvements on 136th Avenue East will be completed as part of a road reconstruction project. Therefore, street restoration was not included in the cost for CIP 28. Stormwater mitigation for CIP 28 is addressed through the stormwater facility constructed for CIP 48; consequently, costs for stormwater mitigation are included in CIP 48. CIP 48 has been constructed.

2.2.29 CIP 29 – Puget Power and Light Canal Improvements

CIP 29 incorporates Project 92-32. CIP 29 is proposed to alleviate flooding adjacent to UPRR and along 148th Avenue East north of 24th Street East caused by lack of conveyance. This project includes installing approximately 270 feet of 12-inch pipe and 2,320 feet of 18-inch pipe on 148th Avenue East, which converges and outflows to the canal from the White River Power Plant. Also included in the project is rehabilitating approximately 6,860 feet of the existing drainage ditch on the east and west sides of BNSF. These drainage ditches ultimately outfall to the power plant canal. Flow from conveyance on each side of 148th Avenue East will be routed through water quality facilities prior to discharging to the canal.

This project will be completed in conjunction with roadway improvements and, therefore, street restoration costs were not included in the cost for CIP 29. The cost opinion includes costs for a media cartridge system for water quality treatment.

2.2.30 CIP 30 – Zehnder Street Improvements

CIP 30 has been completed. CIP 30 was proposed to reduce ponding along Zehnder Street between Railroad Street and Fryar Avenue caused by inadequate conveyance. This project included installing approximately 115 feet of 8-inch ductile iron storm pipe, 155 feet of 8-inch pipe, and 765 feet of 12-inch storm pipe. A water quality vault treatment BMP was installed prior to the connection to the existing 24-inch-diameter conveyance.

2.2.31 CIP 31 – 62nd Street East

This project consists of providing stormwater conveyance for future extension of 62nd Street East between 160th Avenue East and Sumner-Tapps Highway. Approximately 845 feet of 12-inch, 595 feet of 18-inch, and 540 feet of 24-inch piping will be installed to service the future street extension. This conveyance will likely be routed to a future regional stormwater detention/water quality facility to be located just west of the Sumner-Tapps Highway at proposed Regional Facility Site D, as identified in the *East Sumner Neighborhood Plan*. Further discussion concerning the regional facility proposed to service this area can be found under Site D in Section 3 below.

Stormwater infrastructure will be installed concurrently with street construction; therefore, this cost estimate does not include traffic control, land acquisition, or street restoration. Permitting associated with construction of the future regional stormwater control facility is included in the regional facility cost estimate outlined in Section 3. Construction of 62nd Street East is scheduled in 2013. Flow control and water quality treatment for CIP 31 would be provided through the stormwater facility at Site D; consequently, stormwater facility costs are included in the costs for Site D.

2.2.32 CIP 32 – Valley Avenue Improvements

CIP 32 has been completed. CIP 32 consisted of retrofitting the existing stormwater infrastructure on Valley Avenue between Washington Street and Elm Street to accommodate street widening and reconstruction. This project included bioretention cells for water quality treatment with higher flows routed to overflow pipes that connect to the existing conveyance system. The existing 36-inch mainline and mainline structures remained in place.

2.2.33 CIP 33 – REI/Railroad Culvert Improvements

Projects Nos. 33 through 39 consist of replacing existing culverts at various locations to increase hydraulic capacity in Salmon Creek to alleviate surcharge and flooding upstream of the confluence with the White River. These projects also include creek bank restoration, removing several existing culverts, and reestablishing the stream channel to improve fish habitat in the area of the proposed projects and throughout the stream reach within the Sumner city limits. Additionally, the natural streambed and flow line will be reestablished adjacent to and in all culverts by placing a minimum 2-foot depth of channel rock. Thus, in conjunction with the stream bank restoration, the habitat and water quality will be improved.

These projects are presented as designed by Cosmopolitan Engineering in March 1999. Costs associated with these projects are as estimated by Cosmopolitan Engineering, adjusted to 2010 dollars using the ENR Construction Cost Index, except that estimated costs for contingency, permitting, additional engineering, and construction management were added to the original estimates.

CIP 33 consists of replacing existing culverts at two locations near the confluence with the White River to increase hydraulic capacity and reduce flooding caused by surcharge in Salmon Creek.

Salmon Creek is routed through approximately 30-foot-long dual 48-inch-diameter corrugated metal pipe (CMP) culverts on the east side of the REI property. The first part of Project No. 33 would replace the existing dual 48-inch culverts with approximately 25 feet of a 10-foot-wide by 8-foot-deep three-sided box culvert with wing walls. The existing gravel driveway serviced by this culvert will be reestablished.

The second part of Project No. 33 will replace an existing 16-foot-long, 60-inch-diameter concrete culvert located on the west side of BNSF with approximately 20 feet of a 10-foot-wide by 8-foot-deep three-sided box culvert with wing walls. The existing driveway serviced by this culvert will also be reestablished.

CIP 33 includes Sites A and B from the 1999 Cosmopolitan design.

2.2.34 CIP 34 – Parker Road Culvert Improvements

CIP 34 is proposed to alleviate surcharge in Salmon Creek at Parker Road due to inadequate hydraulic capacity, and consists of replacing an existing 28-foot-long, 36-inch-diameter concrete culvert under Parker Road north of Elm Street with 25 feet of 10-foot-wide by 5-foot-deep box culvert. Parker Road will be rebuilt in the area of the culvert replacement as part of this project. CIP 34 includes Site C from the 1999 Cosmopolitan design.

2.2.35 CIP 35 – Puyallup Watershed Access Culvert Improvements

CIP 35 consists of replacing an existing 21-foot-long, 54-inch-diameter CMP culvert located under the access road to the Puyallup Watershed off Parker Road with 25 feet of a 10-foot-wide by 5-foot-deep box culvert, and reestablishing the access road following culvert installation. CIP 35 includes Site D from the 1999 Cosmopolitan design.

2.2.36 CIP 36 – 47th Street Court East Culvert Improvements

CIP 36 will replace an existing 15-foot-long, 60-inch-diameter steel culvert off 47th Street Court East with 20 feet of a 10-foot-wide by 5-foot-wide concrete box culvert. CIP 36 includes Site E from the 1999 Cosmopolitan design.

2.2.37 CIP 37 – 160th Avenue East Culvert Improvements

CIP 37 proposes creek restoration and culvert replacement to increase Salmon Creek hydraulic capacity and fish habitat adjacent to 160th Avenue East south of Elm Street. This project will be completed in multiple phases as described below.

The first phase of CIP 37 will replace approximately 45 feet of 48-inch-diameter culvert under the northern-most access to the Weber Meats plant with 35 feet of a 10-foot-wide by 5-foot-deep concrete box culvert. Asphalt pavement disturbed at the access to the Weber Meats plant and 160th Avenue East during culvert construction will be reestablished.

Currently, approximately 250 feet of Salmon Creek is routed under the Weber Meats building. The second phase of this project consists of establishing a channel around the Weber building on the east side of 160th Avenue East. The 1999 Cosmopolitan design proposed two options for this portion of the project, the first option being to abandon the existing culvert under the Weber building and establish an 8-foot-wide channel to convey the entire design flow of 179 cfs, and the second option being to establish a 6-foot-wide channel with a capacity of approximately 129 cfs, while maintaining the existing culvert under the Weber building as a high-flow bypass.

The 1999 Cosmopolitan design indicated that the second option is preferred due to site constraints pertaining to the location of the existing Weber building and the location of an existing natural gas main paralleling 160th Avenue East. Construction of the preferred option consists of installing a weir structure at the start of the existing culvert on the south side of

the Weber building to provide high flow bypass. From the weir structure, approximately 65 feet of 10-foot-wide by 5-foot-deep box culvert will be installed in the constructed channel paralleling 160th Avenue East. The channel will be constructed by installing sheet piling, excavating the channel between the sheet piling, and installing a minimum 2-foot depth of channel rock to establish the streambed while maintaining a minimum 4-foot channel depth. The newly constructed channel will be connected to the existing Salmon Creek via approximately 40 feet of 10-foot-wide by 5-foot-deep box culvert installed under the southern access to Weber Meats.

Although the 1999 Cosmopolitan design recommended construction of option two, construction of a 6-foot-wide channel will provide a capacity of only approximately 129 cfs, thus routing approximately 50 cfs to the high flow bypass during major precipitation events. Based on the information provided in the *Draft Stormwater Quality Action Plan* (KCM 1995), the existing culvert meant to serve as a high-flow bypass only has a capacity of approximately 28 cfs. Additionally, it does not seem prudent to maintain a culvert directly beneath the existing Weber building. Therefore, additional site investigation should be conducted to verify the location of the existing natural gas main to make sure that there is not sufficient room to construct an 8-foot-wide channel as proposed in option one, above, or that the project be revised to include relocating the existing gas main and utility poles located along the Weber Meats frontage.

The third phase of this project is to remove an existing 48-inch-diameter culvert located east of 160th Avenue East and reestablishing the stream channel to improve fish habitat.

The fourth phase of Project 37 consists of replacing approximately 31 feet of dual 24-inch-diameter CMP culverts with 25 feet of 10-foot-wide by 5-foot-deep concrete box culvert beneath an existing gravel drive adjacent to 160th Avenue East. The driveway will be reestablished as part of this project.

Portions of this project should be coordinated with 160th Avenue East improvements scheduled for construction in 2014 and completion of CIP 12. Other portions could be constructed in advance of the roadway improvement.

CIP 37 includes Sites F, G, H and I from the 1999 Cosmopolitan design.

2.2.38 CIP 38 – 162nd Avenue East Culvert Improvements

CIP 38 replaces three separate culvert sections off 162nd Avenue East (Poole Road). The first phase of this project consists of removing 28 feet of 24-inch-diameter culvert and two lengths of 26-foot-long 30-inch-diameter culverts beneath an existing gravel drive north of 162nd Avenue East, and installing 25 feet of 10-foot-wide by 3-foot-deep concrete box culvert. The gravel drive and stream bank restoration adjacent to the culvert is included in this project.

Phase 2 of Project 38 will remove approximately 18 feet of 36-inch-diameter culvert under an existing gravel drive located to the north of 162nd Avenue East. Approximately 25 feet of 10-foot-wide by 3-foot-deep box culvert will be installed and the gravel drive will be restored.

Phase 3 consists of removing two 20-foot lengths of 30-inch-diameter culvert and an existing cinderblock bridge over Salmon Creek and installing 25 feet of 10-foot-wide by 3-foot-deep precast box culvert under an existing gravel driveway to the east of 162nd Avenue East. Stream bank and gravel driveway restoration will be completed following box culvert installation.

CIP 38 includes Sites J, K, and L from the 1999 Cosmopolitan design.

2.2.39 CIP 39 – East Main Street Culvert Improvements

This project consists of removing approximately 25 feet of existing 60-inch-diameter CMP culvert located north of East Main Street at the intersection with Sumner-Tapps Highway, and restoring the streambed and banks to enhance fish habitat.

CIP 39 includes Site M from the 1999 Cosmopolitan design.

2.2.40 CIP 40 – Salmon Creek Restoration

Salmon Creek is currently routed from the south side of East Main Street to the north side of East Main via a 24-inch-diameter CMP culvert located at the Sumner-Tapps Highway intersection. The 1999 Cosmopolitan design proposed that a new stream channel be constructed from the southwest corner of the East Main Street/Sumner-Tapps Highway intersection to approximately 200 feet west of the intersection. The new channel would have been routed to a 10-foot-wide by 5-foot-deep three-sided box culvert with wing walls installed under East Main Street to intersect with the existing Salmon Creek channel on the south side of the street. The existing 24-inch-diameter culvert would have been abandoned in place. However, per the Sumner *Six-Year Transportation Improvement Plan*, the City plans on eliminating access to Sumner-Tapps Highway from Main Street by demolishing the existing intersection and constructing a cul-de-sac at the end of Main Street. This proposed street closure provides the City with an opportunity to eliminate approximately 150 linear feet of undersized culvert on Salmon Creek, thus enhancing viable fish habitat and reducing surcharge upstream of the Main Street/Sumner-Tapps Highway intersection.

This project will reestablish approximately 150 feet of stream channel at the current location of the 24-inch culvert, replace approximately 50 feet of existing 24-inch-diameter culvert with a 10-foot-wide by 5-foot-deep three-sided box culvert (at the driveway located at the northwest corner of the intersection), and restore existing stream bank in the project location.

CIP 40 will be completed as part of a road reconstruction project. Therefore, the construction estimate does not include any street restoration or structural improvements necessary to reestablish the stream channel adjacent to Sumner-Tapps Highway and Main Street. The road project is scheduled for construction in 2014.

CIP 40 includes Sites N and O from the 1999 Cosmopolitan design.

2.2.41 CIP 41 – 64th Street East Culvert Improvements

CIP 41 consists of replacing approximately 150 feet of existing 36-inch CMP culvert under Sumner-Tapps Highway at the 64th Street East intersection with approximately 150 feet of 10-foot-wide by 5-foot-deep box culvert with wing walls installed from the southeast corner of the intersection to the northwest corner of the intersection. The existing 36-inch culvert paralleling Sumner-Tapps Highway conveying flow from the south will be abandoned between the existing storm drain manhole just south of the intersection to the existing 36-inch culvert to be replaced. Flow from the existing storm drain manhole will be rerouted via 42-inch-diameter reinforced concrete pipe to the start of the 10-foot by 5-foot three-sided box culvert at the southeast corner of the intersection.

Stream-bank restoration in the area of the culvert replacement and pavement restoration will be completed as part of this project.

2.2.42 CIP 42 – 8th Street East Corridor Improvements

CIP 42 has been completed. This project was led by Pierce County. The City provided a portion of the costs for improvements to the stormwater facility between Butte Avenue Southeast and Lake Tapps Parkway East.

2.2.43 CIP 43 – East Valley Highway Improvements (North)

The Sumner *Six-Year Transportation Improvement Plan* schedules East Valley Highway improvements from 8th Street East to Forest Canyon Road to be completed in 2012/2013, including widening from two to three lanes and installing curb/gutter and sidewalk on both sides of the street.

CIP 43 consists of installing new stormwater infrastructure on East Valley Highway from 8th Street East south to the intersection with Forest Canyon Road. CIP 43 includes installing approximately 3,550 linear feet of 12-inch-diameter pipe, 2,000 linear feet of 18-inch-diameter pipe, and 2,000 linear feet of 24-inch-diameter pipe for conveyance of road surface runoff. Runoff from the road will be routed to a stormwater facility for water quality and flow control prior to release.

The East Valley Highway widening project identified in the City's *Six-Year Transportation Improvement Plan* only spans from 8th Street East to Forest Canyon Road. However, discussion with City personnel indicates that the full length from 8th Street East to the Salmon Creek Bridge will be improved within the next 10 to 15 years. Therefore, the preliminary stormwater control facility sizing completed for CIP 43 includes the impervious surface anticipated to be created when East Valley Highway widening is completed for the full length between 8th Street East and Salmon Creek. Stormwater conveyance improvements between Forest Canyon Road and the Salmon Creek Bridge are outlined below, in CIP 44.

The detention pond designed for preliminary cost estimating was used, utilizing the Ecology WWHM program assuming pasture predeveloped condition. Preliminary detention-pond sizing was completed assuming that only the flow from the improved roadway, that is three 12-foot-wide lanes, two 5-foot-wide planter strips, and two 7-foot-wide concrete sidewalks, will be routed to the pond. The estimated impervious surface associated with CIP 44 was also included in the stormwater facility preliminary design.

CIP 43 will be completed as part of road reconstruction, and therefore pavement restoration costs have not been included.

2.2.44 CIP 44 – East Valley Highway Improvements (South)

CIP 44 includes installing approximately 3,550 linear feet of 12-inch-diameter pipe, 2,000 linear feet of 18-inch-diameter pipe, and 2,000 linear feet of 24-inch-diameter pipe. Runoff from the roadway will be routed to the stormwater control facility outlined in CIP 43 above.

This project will likely be completed as part of a road improvement project and, therefore, pavement replacement and restoration are not included in the cost for CIP 44. The road improvement project is scheduled for construction in 2012/2013.

2.2.45 CIP 45 – West Valley Highway Improvements

CIP 45 proposes installing stormwater infrastructure, including a stormwater control facility, to service West Valley Highway south of 24th Street East. This project includes installing approximately 1,350 linear feet of 12-inch-diameter storm pipe and 1,000 linear feet of 18-inch-diameter storm pipe. Runoff from the roadway will be routed to a water quality and detention facility to provide water quality and flow control prior to release.

The detention pond used for preliminary cost estimating was sized using the Ecology WWIIM program assuming pasture predeveloped condition. The detention pond was sized assuming that only flow from the improved roadway, that is three 12-foot-wide lanes, two 5-foot-wide planter strips, and two 7-foot-wide concrete sidewalks, will be routed to the pond.

This project will likely be completed as part of a road improvement project. Therefore, pavement restoration is not included in the cost for CIP 45. The cost opinion includes costs for a flow control pond. The cost opinion also includes costs for a biofiltration swale for water quality treatment.

2.2.46 CIP 46 – 16th Street East Improvements

CIP 46 is proposed to alleviate flooding on 16th Street East west of the railroad due to limited conveyance elements. CIP 46 proposes to install approximately 2,270 feet of 12-inch-diameter storm drain, including catch basins, on 16th Street East west of the UPRR. The project also includes a water quality treatment Best Management Practice (BMP). The project is located between the UPRR and SR 167. The project will discharge to the Milwaukee Ditch through an existing outfall.

2.2.47 CIP 47 – White River Levee Improvements

CIP 47 is proposed to prevent flooding south of the White River levee. CIP 47 proposes to increase the height of the levee north of 16th Street East. The cost for CIP 47 includes environmental permitting, floodplain modeling, and preparing a Letter of Map Revision (LOMR) or Letter of Map Adjustment (LOMA) for review by the Federal Emergency Management Agency (FEMA). A Conditional Letter of Map Revision (CLOMR) does not result in a change to the Flood Insurance Rate Map, and building permits cannot be issued based on a CLOMR. Consequently, a CLOMR is not included.

2.2.48 CIP 48 – Milwaukee Ditch Regional Facility

CIP 48 has been completed. CIP 48 was proposed to provide regional stormwater treatment as part of the 136th Avenue roadway improvements project and CIP 28. The facility has been completed in advance of roadway construction. Conveyance costs for the roadway are included in CIP 28.

2.2.49 CIP 49 – Golf Course Culvert Improvements

CIP 49 is proposed to improve the hydraulic operation of an existing culvert on the relocated outlet from a stream and wetland complex west of the City's golf course and south of Stewart Road. The project includes replacing approximately 25 feet of an existing 30-inch-diameter culvert with a three-sided box culvert.

2.2.50 CIP 50 – Development Rights Relinquished by City

CIP 50 is the results of a negotiated settlement with the United States Army Corps of Engineers to obtain the permits for the 24th Street Interchange project. This project includes donation of 30 acres of City-owned land. Approximately 20 acres are undevelopable because they are within 200 feet of the White River. The costs for CIP 50 are not reflected in the rate study.

2.2.51 CIP 51 – 24th Street Setback Levee

CIP 51 is proposed to alleviate flooding and improve habitat for the White River. CIP 51 is located east of the White River between 16th Street East and Salmon Creek. A feasibility analysis is currently in process and scheduled for completion by 2011. The feasibility analysis is considering potential land uses that may include compensatory storage bank for wetlands, habitat or flood storage, levees, public recreation through trails, public education, and small farm plots available to the public. The feasibility analysis includes preliminary design of alternatives and selection of a preferred alternative. A 30 percent design will be prepared based on the preferred alternative. The study area includes land currently owned by the City and land that is privately owned.

In November 2010, a technical memorandum was submitted to the City identifying three alternatives. At the time of this Plan Update, the alternative that may be selected is referred to as the Conservation Option. This option includes:

- Excavation of a side channel through the project area.
- Increasing floodplain storage through excavation for the side channel.
- Restoring approximately 82 acres of channel migration zone and habitat areas.
- Maintaining areas north of 24th Street as riparian habitat.
- Construction of engineered log jams and cottonwood fences to deter side channel migration and protect the existing bridge and utilities.
- Construction of an armored berm just north of 24th Street to protect an existing pedestrian bridge, utilities, and access road.
- Constructing a new bridge for 24th Street over the proposed side channel.
- Installing some fill to allow for public use at certain locations.
- Floodplain modeling to determine changes in the floodplain boundary.

CIP 51 would be located on land currently owned by the City and does not include property acquisition.

2.2.52 CIP 52 – Number 9 Ditch and Forest Canyon Class III Habitat Improvements

CIP 52 is proposed to improve the habitat of an existing stream and to replace an existing culvert under the railroad. CIP 52 includes approximately 3,000 feet of stream enhancement. CIP 52 also includes a jack-and-bore installation of approximately 120 feet of 42-inch-diameter culvert under the railroad tracks.

Due to its proximity to the white river, CIP 52 could potentially be combined with CIP 51.

2.2.53 CIP 53 – Rivergrove Puyallup River Improvements

CIP 53 is proposed to alleviate flooding on the north side of the Puyallup River within the city limits and includes construction of a permanent flood wall. Flood protection or mitigation measures may be required on the south side of the Puyallup River; however, those areas are outside the city limits. CIP 53 assumes that costs for flood protection or mitigation outside of the city limits will be paid for by others. CIP 53 will extend approximately 4,200 feet downstream from the SR 162/Valley Avenue Interchange along the Riverwalk Condominiums, the Rivergrove Apartments, and Rainier Manor. The cost for CIP 53 includes sheet piling with a concrete cap for the permanent wall, environmental permitting, floodplain modeling, and preparing a LOMR or LOMA for review by FEMA. A CLOMR does not result in a change to the Flood Insurance Rate Map, and building permits cannot be issued based on a CLOMR. Consequently, a CLOMR is not included.

3. REGIONAL STORMWATER FACILITIES

Stormwater planning performed in 2004 identified ten potential sites within the City limits for construction of regional stormwater flow control and/or water quality treatment facilities.

The 2004 planning included preliminary modeling using WWHM for Sites A, E, H, I, and J. The modeling was completed using the basin characteristics and model inputs presented in the 1992 Plan, with the exception that the Low Density Residential and Medium Density Residential density assumptions were revised to more accurately represent development trends. Preliminary modeling for Sites C and D was completed using the WWHM and the land-use designations outlined in the East Sumner Neighborhood Plan.

Seven criteria were established to evaluate each site for its potential to provide regional stormwater control. The criteria were:

1. **Conformance with City Planning:** Areas identified as regional facility sites in the City's existing planning documents.
2. **Availability of Property:** The areas identified for potential regional facility locations are either owned by the City or known to be available for purchase presently or in the near future.
3. **Hydraulic Feasibility:** Potential regional facility locations were evaluated to verify that it was possible to route stormwater to the area either through existing stormwater conveyance, retrofitting existing conveyance, or installing new conveyance.
4. **Location Within the Watershed:** Potential regional facilities located nearer the discharge point of the watershed are able to collect more runoff than those located nearer the headwaters. Furthermore, facilities located far from a discharge point must discharge back into the collection system unless separate conveyance lines are also constructed. Thus, stormwater control facilities located near the watershed discharge are more valuable than those located near the headwaters.
5. **Percent of Watershed Captured:** This criterion evaluates the percent of the total watershed runoff that could be routed to and through the facility if the necessary stormwater conveyance was in place. The greater the percentage of capture, the more valuable the facility.
6. **Detention and/or Treatment Percent:** This criterion is used to quantify the capacity of each site to detain and/or treat the stormwater that could potentially be routed to the site if the necessary infrastructure was in place.
7. **Feasibility of Stormwater Control Facilities:** Four stormwater facility elements were evaluated for a majority of the potential regional facility sites. The stormwater facility options are as follows:

Detention Pond: Detention-pond sizing was completed using Ecology's WWHM program. The WWHM program sizes the pond as required to maintain the durations of the flows from the developed area at equal to or less than one-half of the 2-year flow frequency through the 50-year flow frequency.

Preliminary sizing for detention ponds was completed using assumed allowable depths. Subsurface investigation will be required to determine the wet weather high water elevation. If the high water elevation conflicts with the proposed pond depth, the pond will have to be resized using a shallower bottom elevation, or a semi-impervious lining material (such as clay) may need to be installed in the pond bottom and side slopes to prevent groundwater inflow.

Biofiltration Swale: Biofiltration swales can either be installed prior to the detention pond or after the detention pond. Swales prior to flow attenuation are sized using the target water quality rate determined by the WWHM. The target water quality flow rate is estimated from 91 percent of the total historic runoff volume from the site. Swales installed after flow attenuation are sized using the full release rate for the 2-year, 24-hour storm. Required swale dimensions are estimated as needed to provide a minimum 9-minute detention time while maintaining an approximate 0.33-foot depth for the water quality design storm. Unless specifically stated otherwise, references to bioswales in this plan assume installation before flow attenuation.

Media Cartridge Systems: Several media cartridge systems have been approved by Ecology for general use as a basic stormwater treatment BMP. Calculations for this Plan Update are based on Ecology's General Use Level Designation for Contech Stormwater Solutions, Inc. Stormwater Management Stormfilter®. The media includes a mixture of zeolite, perlite, and granular activated carbon. Media cartridge systems are more efficient than vaults or swales and require less of a footprint. Media cartridge systems can be designed as on- or off-line treatment facilities. Media cartridge systems are flow-rate-based BMPs. Design flow rates are calculated using WWHM and adjusted to a 15-minute time step.

The feasibility of each of these stormwater control elements are evaluated based on specific site characteristics such as depth to groundwater, soil type, location of sensitive areas, and existing land uses.

Wet ponds were not included in this evaluation since City personnel have voiced their concern about maintaining numerous open water facilities and the potential spread of the West Nile Virus to the Sumner area.

Preliminary modeling conducted for potential regional facility sizing assumes that traditional construction practices will be used during development. The effect of Low Impact Development techniques on facility sizing is not addressed.

3.1 POTENTIAL REGIONAL FACILITY LOCATIONS

Below is a brief discussion of each potential regional facility site using the seven criteria described above. See Figure 3-1 for potential regional facility site locations. Figure 3-1 shows only the site locations that are being carried forward in this Plan Update.

3.1.1 Site A – Between SR 410 and the Puyallup River

Site A is located between SR 410 and the Puyallup River bordered by Traffic Avenue on the west and Rainier Manor on the east. This site receives stormwater from Basins A and B via 42-inch and 48-inch outfalls, respectively, which currently discharge directly to the Puyallup River. The contributing area is approximately 337 acres identified in the 1992 Plan.

This site is comprised of six parcels, totaling approximately 8.3 acres, of which the City owns the westernmost and the easternmost parcels at 2.4 and 4.3 acres, respectively. The four parcels in-between are currently privately owned, but are vacant and have very low land value based on Pierce County Assessor's information. Therefore, it seems reasonable to assume that the City would be able to purchase this property to construct stormwater facilities.

This site is located at the discharge points of Basins A and B. The infrastructure routing flow to Site A is already in place, and would not require substantial retrofitting to construct a stormwater control facility. A majority of the area contains dense vegetation with trees and shrubs. City of Sumner ordinance requires a minimum 200-foot construction setback from the Puyallup River. However, variances are allowed for construction of stormwater facilities. Discussions with the City indicate that they would like to retain as much of the vegetation as practical, therefore precluding the option to construct a wet pond. The lack of space near the outfalls limits the type of treatment available because discharges to the Puyallup River are exempt from flow control at this location; any BMP at Site A would need to provide water quality treatment only.

Site A has been designated as Site A.1 and Site A.2. Site A.1 is on the west portion of Site A and includes the 42-inch-diameter outfall. Site A.2 is on the east portion of Site A and includes the 48-inch-diameter outfall. Proposed improvements at Site A.1 have been constructed. Improvements include the pipe improvements included with CIP 3, a hydrodynamic separator, and a Tideflex® valve. Site A.2 has not been completed. Proposed improvements for Site A.2 are discussed further below.

3.1.2 Site B – Southern Edge of Parcel Owned by Sumner School District

Site B has been removed from the project list because of limited benefit and extensive modification that would be required for the stormwater conveyance system. Site B is located at the southern edge of a 28.9-acre parcel owned by the Sumner School District-320, bordered by Robinson Road on the south. This site is located fairly high in the watershed, and extensive reconfiguration of the existing stormwater infrastructure would be required to route water to this location. Further, conveyance adjacent to this property ultimately flows to Site A. Therefore, the facility constructed at Site A would receive flows from this area.

This potential regional facility area is currently utilized as a play field at the Sumner Junior High School. Therefore, construction of a stormwater facility at this location would require the cooperation of and coordination with the Sumner School District. Safety concerns would likely eliminate the possibility of constructing a detention pond.

Construction of a stormwater control facility at this site does not appear practical given the existing land use, the lack of existing infrastructure, and the amount of effort required to reroute the existing conveyance to utilize this area.

3.1.3 Site C – Parcel Located in the Southeast Portion of Sumner

Site C has been removed from the project list. Site C is an approximate 4.0 acre parcel located in the southeast portion of Sumner, bordered by SR 410 on the south and 64th Street East on the north. The parcel is currently privately owned, but is vacant, and discussions with City personnel indicate that this area may be available for purchase in the future.

Based on existing infrastructure, this site is located fairly high in the watershed area, and does not currently receive significant runoff from within the city limits. A majority of the stormwater routed through this site comes from a 36-inch culvert that conveys water from the south of SR 410, which is outside of the Sumner city limits. This site is marked for construction of a regional detention facility for future development in the *East Sumner Neighborhood Plan*.

This site does not appear to lend itself well to construction of a stormwater control facility to service existing flows due to its location in the watershed and the lack of existing conveyance within city limits. This area would be better utilized as a regional detention/water quality facility for future adjacent development of the parcels to the north and east of this location.

3.1.4 Site D – Four Separate Parcels in Southeast Sumner

Site D is comprised of four separate parcels, totaling approximately 6.9 acres, located in southeast Sumner and bordered by 64th Street East on the south, Sumner-Tapps Highway on the east, and Main Street on the north. The City of Sumner owns the two parcels to the south, including 1.8 and 0.5 acres, while the parcels to the north, including 2.9 and 1.7 acres, are privately owned. A single family residence is currently located on the 0.5-acre City-owned parcel.

This area is identified in the *East Sumner Neighborhood Plan* as a regional detention site with outfall to Salmon Creek for the approximate 55 acres bounded by 64th Street East on the south, Sumner-Tapps Highway on the east, Main Street on the north, and 160th Avenue East on the east. An existing designated wetland is located on approximately one-quarter of the 1.8-acre City-owned parcel. However, the *East Sumner Neighborhood Plan* indicates that this area is planned for development. Therefore, it is assumed that mitigation of this wetland will occur off-site and this wetland area was not subtracted from the net usable area.

Currently, this area does not collect significant runoff, except minor flows from SR 410, and existing conveyance is not in place to convey stormwater to this site. Additionally, this site is located such that it does not receive significant runoff from within city limits. This area would be better utilized as a regional detention/water quality facility for future adjacent development to the east, rather than as a facility to control flows conveyed by existing stormwater infrastructure.

3.1.5 Site E – Vacant Parcel North of Elm Street

Site E has been removed from the project list. Site E is an approximate 5.4-acre vacant parcel located just north of Elm Street that is currently available for purchase. This parcel is bisected by Salmon Creek, resulting in only approximately 2.7 acres of usable space on the west side of the creek for installation of a stormwater management facility. This site is fairly level and is currently covered with prairie grass.

Conveyance from the eastern portion of Elm Street and the northern portion of 160th Avenue East converge at an existing outfall to Salmon Creek on the south side of this property. However, a majority of the existing flow from Elm Street flows from an existing detention/water quality facility to the southwest of the outfall. This site may be better utilized as a regional stormwater control facility for future adjacent development to the north and west. Installation of a water quality vault would be the least intrusive option if the City decides to utilize this site for construction of a water quality control facility for existing development.

3.1.6 Site F – East Parcel Bordered by BNSF Right-of-Way

Site F has been removed from the project list. Site F is an approximate 18.4-acre parcel bordered by BNSF right-of-way to the east. However, Salmon Creek divides the property from east to west, and a wetland is present just south of Salmon Creek, leaving only approximately 2.4 acres available for stormwater facility construction. The parcel was privately owned and vacant during the 2004 planning.

The southern portion of this area was marked for construction of a detention/water quality facility for future development in the *City of Sumner Stormwater Quality Action Plan* (KCM 1995). However, the areas adjacent to the southern portion of this parcel have been developed, including construction of individual stormwater control facilities. Therefore, being confined by BNSF on the east and south, Salmon Creek on the north, and developed property on the west; it seems unlikely that the southern portion of this parcel can be utilized for a stormwater facility. It may be possible, however, to utilize the northern portion of this property as a regional facility for future development of the properties north of Salmon Creek. Depending on site characteristics, elevation, and natural drainage patterns, the northern portion of this parcel may also be suitable for constructing a stormwater facility to service East Valley Highway improvements. At this time, however, this site does not appear to lend itself well to construction of a regional stormwater facility. Therefore, this site was not evaluated further.

3.1.7 Site G – Two City-Owned Parcels

Site G has been removed from the project list. Site G is comprised of two City-owned parcels, 2.0 acres each, bordered by Meade-McCumber Street on the south, Parker Road on the west, and 158th Avenue East on the east.

This area is near the headwaters of a large watershed that flows north to Salmon Creek. However, virtually all of the area adjacent to and upstream of this area has been developed, and includes stormwater flow control and treatment facilities. Therefore, the value of installing a treatment facility at this location would be small. Additionally, based on field investigation of the existing stormwater conveyance depth in the vicinity, it does not appear hydraulically feasible to intercept existing stormwater flows due to insufficient vertical drop.

This site does not appear viable for construction of a stormwater control facility for existing or future development.

3.1.8 Site H – Two Privately Owned Parcels East of Sumner

Site H has been removed from the project list. Site H is located on the east side of Sumner and is comprised of two privately owned parcels, 7.3 and 0.5 acres, bordered by Salmon Creek on the northeast and Main Street on the south. The 7.3-acre parcel is bisected by Salmon Creek from east to west, leaving only approximately 3.6 acres on the south side of the creek for stormwater facility construction. An occupied single family residence is currently located on the 0.5-acre parcel. Both parcels are privately owned.

This area is identified as a regional stormwater detention site for future development in the *East Sumner Neighborhood Plan*. Currently, there is not a significant-enough amount of runoff routed to this site for a regional facility to be effective. Stormwater conveyance adjacent to these parcels is east of Poole Road and is limited to approximately 500 feet of 18-inch piping on Main Street. Stormwater collected from Main Street west of Poole Road is routed north on Poole Road to outfall to Salmon Creek. It may be possible to reroute the existing conveyance on Poole Road to flow south and outfall at these parcels. However, this area may have more value if utilized as a regional detention and water quality facility for future adjacent development.

3.1.9 Site I – Privately Owned Parcel South of Main Street

Site I has been removed from the project list. Site I is an approximate 1.8-acre privately owned parcel located south of Main Street between Parker Road and 160th Avenue East. Currently, there is no significant stormwater infrastructure to route stormwater to a facility constructed at this location. It could be possible to reroute conveyance on 160th Avenue East north of Main Street to convey stormwater west on Main Street to this area. Also, stormwater conveyance could be constructed on 160th Avenue East south of Main Street. However, this area was marked for a regional detention facility in the *East Sumner Neighborhood Plan*, and may be more valuable if utilized as a regional facility for adjacent development.

3.1.10 Site J – City-Owned Parcel between East Valley Highway and BNSF Right-of-Way

Site J is part of an approximate 9.9-acre City-owned parcel bordered by East Valley Highway on the east and BNSF right-of-way on the west. Salmon Creek divides this property from east to west, with approximately one-tenth of the parcel located on the south side of the creek. The portion of the parcel located on the north side of Salmon Creek is allocated as a wetland bank for mitigation purposes. The south portion of the parcel is currently vacant except for the existing 60-inch District 11 outfall conveying stormwater from Subbasins T13 through T20, which includes approximately 558 acres identified in the 1992 Plan. An existing wetland covers approximately half of the area.

This site is located at the discharge point of a large contributing area. Stormwater conveyance routing runoff from Subbasins T13 through T20 is already in place and would not require significant rework to install a stormwater facility. Due to the limited space available, the only stormwater control option viable at this site is installation of hydrodynamic separators.

3.1.11 Summary

Potential regional facility Sites A.2 and J appear to be feasible for construction of a City-owned and constructed water quality facility to treat flows from existing infrastructure prior to discharging to receiving waters. Site D appears to be suitable for installation of regional flow control/water quality facility to serve adjacent future development and adjacent CIPs. Site A.1 has been completed. Sites C, E, H, and I have been removed from the project list.

3.2 SITE RECOMMENDATIONS FOR REGIONAL FACILITY

Below are recommendations about each potential site considered for construction of a regional facility within the Sumner city limits.

3.2.1 Site A.2 – Between SR 410 and the Puyallup River

Challenges associated with Site A.2 include lack of available area, the required 200-foot setback from the Puyallup River, the City's wishes to limit tree removal in this area, and the potential for the Puyallup River to deposit sediment in open facilities. A grant application was completed for Ecology's Fiscal Year 2011 SWRLID funding program. The grant application considered a vault, a media cartridge system, a constructed wetland, and a biofiltration swale for stormwater treatment. The grant application also considered treatment of the entire contributing area or for a partial retrofit. The recommendation in the grant application predesign report included media cartridge systems to provide basic treatment for part of the flows from the contributing area.

The 2004 stormwater planning reflected a treatment BMP being located between SR 410 and the Puyallup River. However, due to insufficient elevation difference between the conveyance system and the Puyallup River, the treatment BMP was moved north of SR 410 near the intersection of Sumner Avenue and Maybelle Street. The proposed treatment includes three vaults with media cartridges, a by-pass structure to route a treatment flow rate of 8.81 cfs to the treatment units and allow for high-flow bypass into the existing conveyance system, and an outlet pipe system from the treatment units to the existing storm drain system at the intersection of Maybelle Street and Alder Avenue.

The preliminary design of the treatment system and piping layout is documented in the *Site A.2 Puyallup River Outfall Stormwater Treatment Retrofit Predesign Report* (Parametrix 2010b). Site A.2 did not receive funding through the Fiscal Year 2011 SWRLID grant program but may be eligible for future funding.

3.2.2 Site D – Four Separate Parcels in Southeast Sumner

Based on the *East Sumner Neighborhood Plan*, this site is slated for construction of a regional detention/water quality facility to service future development of the approximate 54.5 acres located between 64th Street East, Sumner-Tapps Highway, Main Street, and 160th Avenue East. Modeling for this area was conducted using the land-use designations presented in the *East Sumner Neighborhood Plan*.

This area currently does not receive significant runoff from inside city limits; and except for minor conveyance lines on 64th Street East and Main Street, existing stormwater infrastructure is not in place to route runoff from existing developed areas. Therefore, it is recommended that this area be utilized for construction of a stormwater facility to service future development as indicated in the *East Sumner Neighborhood Plan*. A facility constructed on this site will outfall to Salmon Creek.

Following are brief descriptions of the most feasible stormwater facility elements for this site:

Detention Pond: Based on WWHM requirements, a detention pond volume of approximately 14.1 acre-feet will be required to service the approximate 54.5-acre contributing basin, resulting in pond dimensions of approximately 530-feet long and 270-feet wide at the base, 5-feet deep (including 1 foot of freeboard above the design storm volume) with 3:1 side slopes. The detention pond would provide flow control for adjacent private development, flow control for CIP 24, and flow control for CIP 31. CIP 24 will discharge to Salmon Creek through the conveyance system that outfalls at Site J.

Biofiltration Swale: The biofiltration swale has been sized to treat unattenuated water quality flow of approximately 4.2 cfs per WWHM. The required dimensions for a biofiltration swale installed prior to the detention pond are 535 feet long and 22 feet wide at the base, 1.99 feet deep, with 3:1 side slopes. The biofiltration swale would provide treatment for adjacent private development and treatment for CIP 31. Treatment for CIP 24 would be provided at CIP 24.

Summary: The estimated cost to construct a detention pond with biofiltration swale and piping is approximately \$1,441,000. The cost opinion includes approximately \$170,000 to purchase the two privately-owned parcels bordered by Main Street on the north and Sumner-Tapps Highway on the east.

The current Sumner Traffic Improvement Plan indicates that 62nd Street East will be extended from 160th Avenue East to Sumner-Tapps Highway. Construction of 62nd Street East as planned will essentially bisect Site D from west to east. This division, coupled with the location of Salmon Creek on the west and the irregular shapes of the two City-owned parcels to the south of the proposed 62nd Street East location, will make it difficult to utilize

the full area of Site D. The best option for facility location would be to construct the detention pond north of 62nd Street East with water quality on the south side of the street. Piping will need to be installed under the future street to provide conveyance from the detention pond to the water quality element.

Additionally, based on the available information, it does not appear that the parcels located north of the future street provide sufficient area to construct a detention pond per WWHM requirements for the fully developed 54.5 acres. Therefore, either additional acreage will need to be acquired, perhaps a portion of the parcel to the west, the detention facility will need to be designed such that a portion of the pond is located on the south side of the street or the size of the basin allowed to contribute flow to the facility will need to be limited. If the pond is constructed on both sides of the road, a large culvert will be needed under the road to equalize the storage and allow the water depth to remain below the road elevation.

This project will provide little benefit to the existing Sumner stormwater system. Therefore, a facility constructed at this location could be utilized to service future development. The most feasible funding option for this project would be for the facility to be developer subsidized and built, with a latecomer's agreement in place for repayment.

3.2.3 Site J – City-Owned Parcel between East Valley Highway and BNSF Right-of-Way

Site J is comprised of a portion, approximately 1 acre, of an approximate 9.9-acre City-owned parcel located south of Salmon Creek and west of East Valley Highway. An existing 60-inch outfall is located in this area, and based on information presented in the 1992 Plan, the area contributing runoff to this outfall is approximately 560 acres. A grant application was completed for Ecology's Fiscal Year 2011 SWRLID funding program. The grant application considered a vault, a media cartridge system, a constructed wetland and a hydrodynamic separator for stormwater treatment. The grant application also considered treatment of the entire contributing area or for a partial retrofit. The recommendation in the grant application predesign report included hydrodynamic separators to provide pretreatment of the entire contributing area.

Due to insufficient elevation difference between the conveyance system and Salmon Creek, treatment opportunities are limited at Site J. A pump station would be required to provide sufficient head to allow media cartridge systems to function properly. Because the hydrodynamic separators are considered by Ecology to provide pretreatment but not basic or enhanced treatment, it is not likely that funding would be received through the SWRLID grant program. A pump station is not included in the cost for Site J. The proposed treatment system includes four hydrodynamic separators, four bypass structures to route design flows to the treatment units, piping, and a Tideflex® valve on the outfall. The system was designed to treat up to 29.48 cfs.

The preliminary design of the treatment system and piping layout is documented in the *Site J Salmon Creek/White River Outfall Stormwater Treatment Retrofit Predesign Report* (Parametrix 2010c).

4. REFERENCES

City of Sumner. 2001. East Sumner neighborhood plan.

Cosmopolitan Engineering Group. 1999. Design technical memorandum Salmon Creek culvert replacement project.

KCM. 1995. Draft stormwater quality action plan.

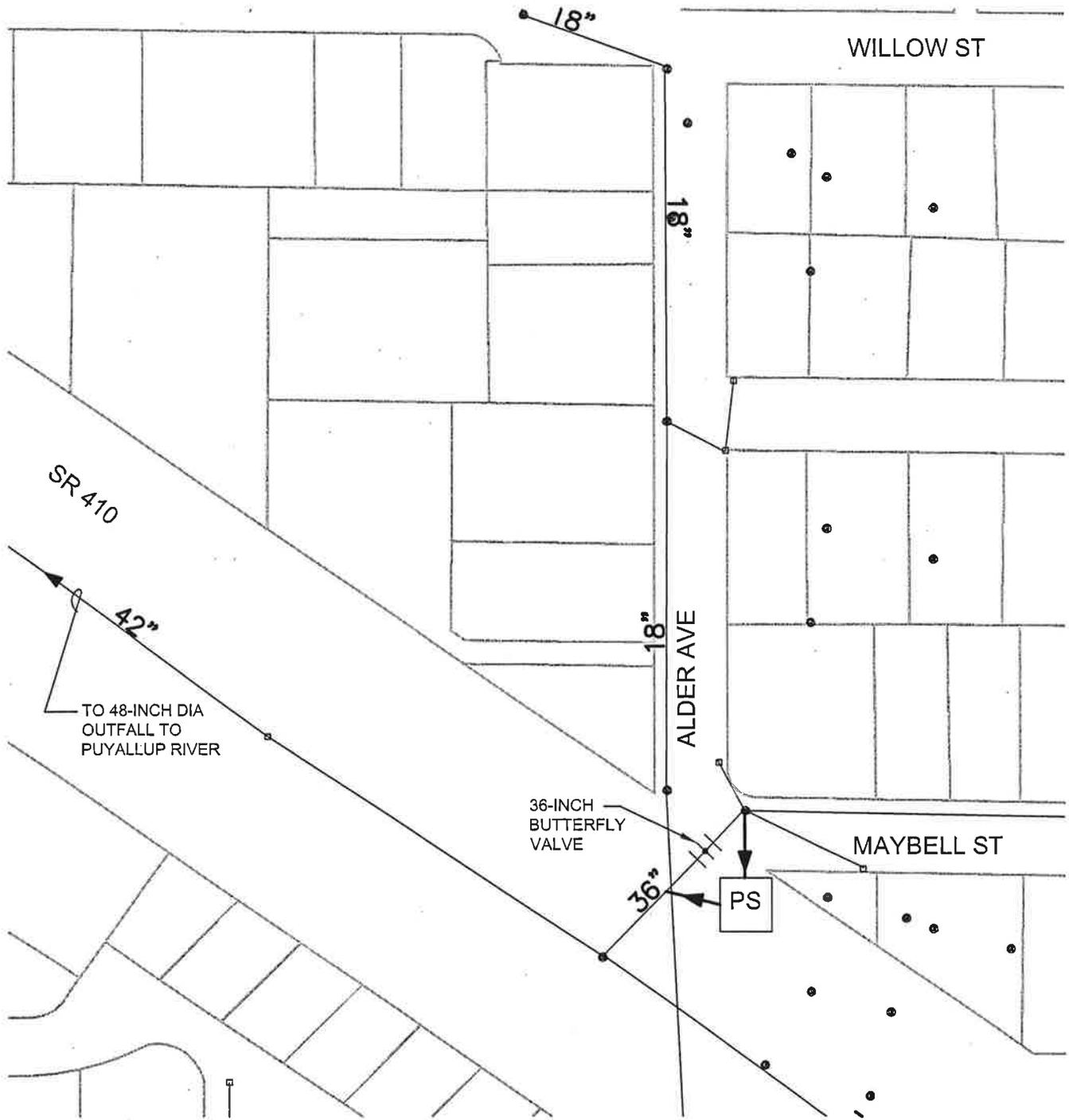
Parametrix. 1992. Stormwater comprehensive plan.

Parametrix. 2010a. CIP 19 (Puyallup Street) White (Stuck) River outfall stormwater treatment retrofit predesign report. August 2010.

Parametrix. 2010b. Site A.2 Puyallup River outfall stormwater treatment retrofit predesign report.

Parametrix. 2010c. Site J Salmon Creek/White River Outfall stormwater treatment retrofit predesign report.

APPENDIX A
Recommended Capital Improvement
Project Figures, CIPs 1–31

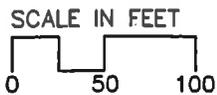


IMPROVEMENTS:

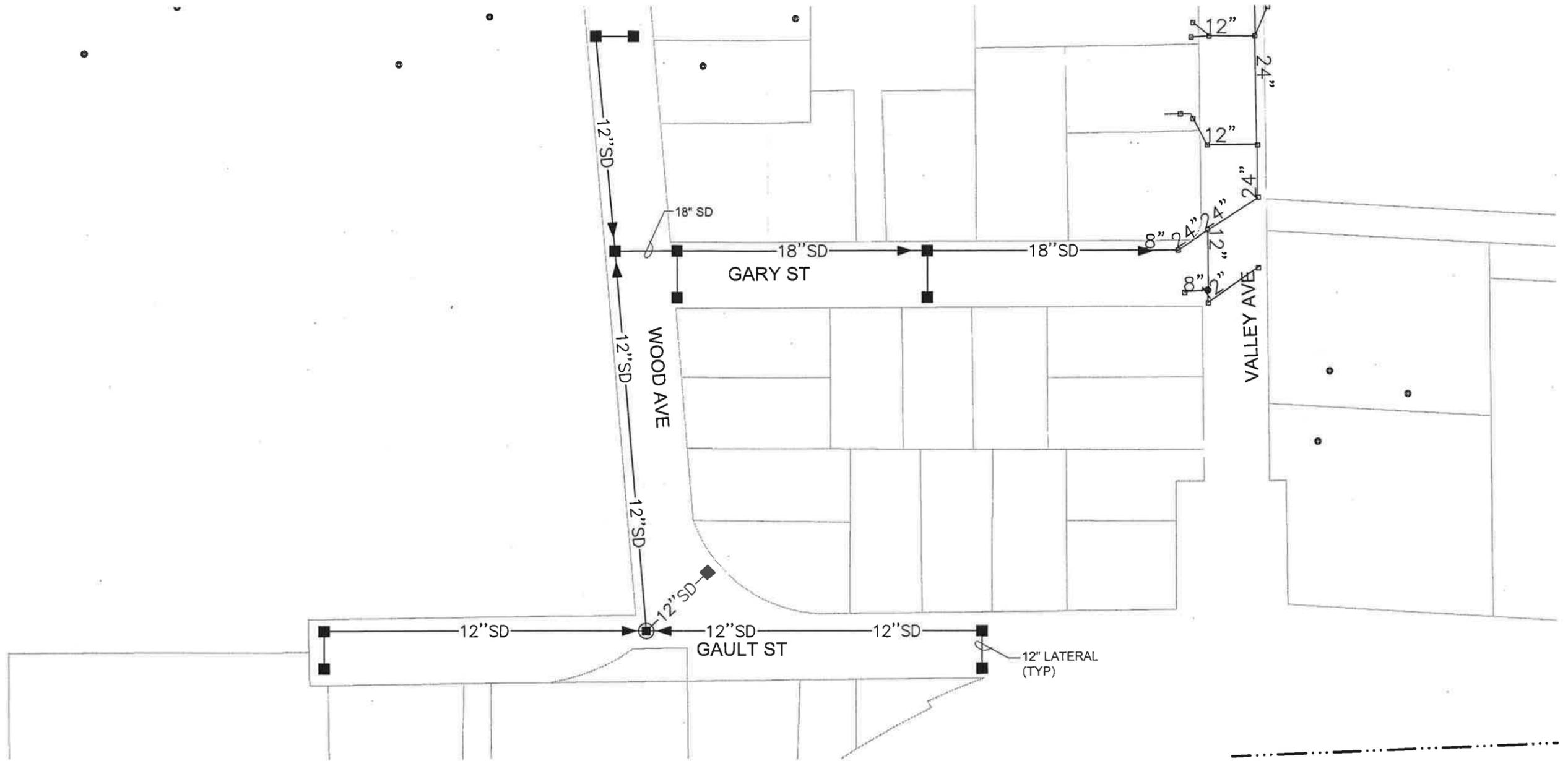
- INSTALL APPROX 100 LF 36" DIA SD PIPE
- INSTALL 1 - 36" BUTTERFLY VALVE
- INSTALL 1 LOW-HEAD PS

OBJECTIVES:

- PROVIDE HIGH FLOW BYPASS TO ALLEVIATE SURCHARGE IN 48" OUTFALL TO THE PUYALLUP RIVER.



**Figure CIP-1
Alder Avenue High
Flow Bypass**

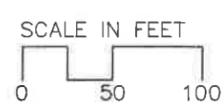


IMPROVEMENTS:

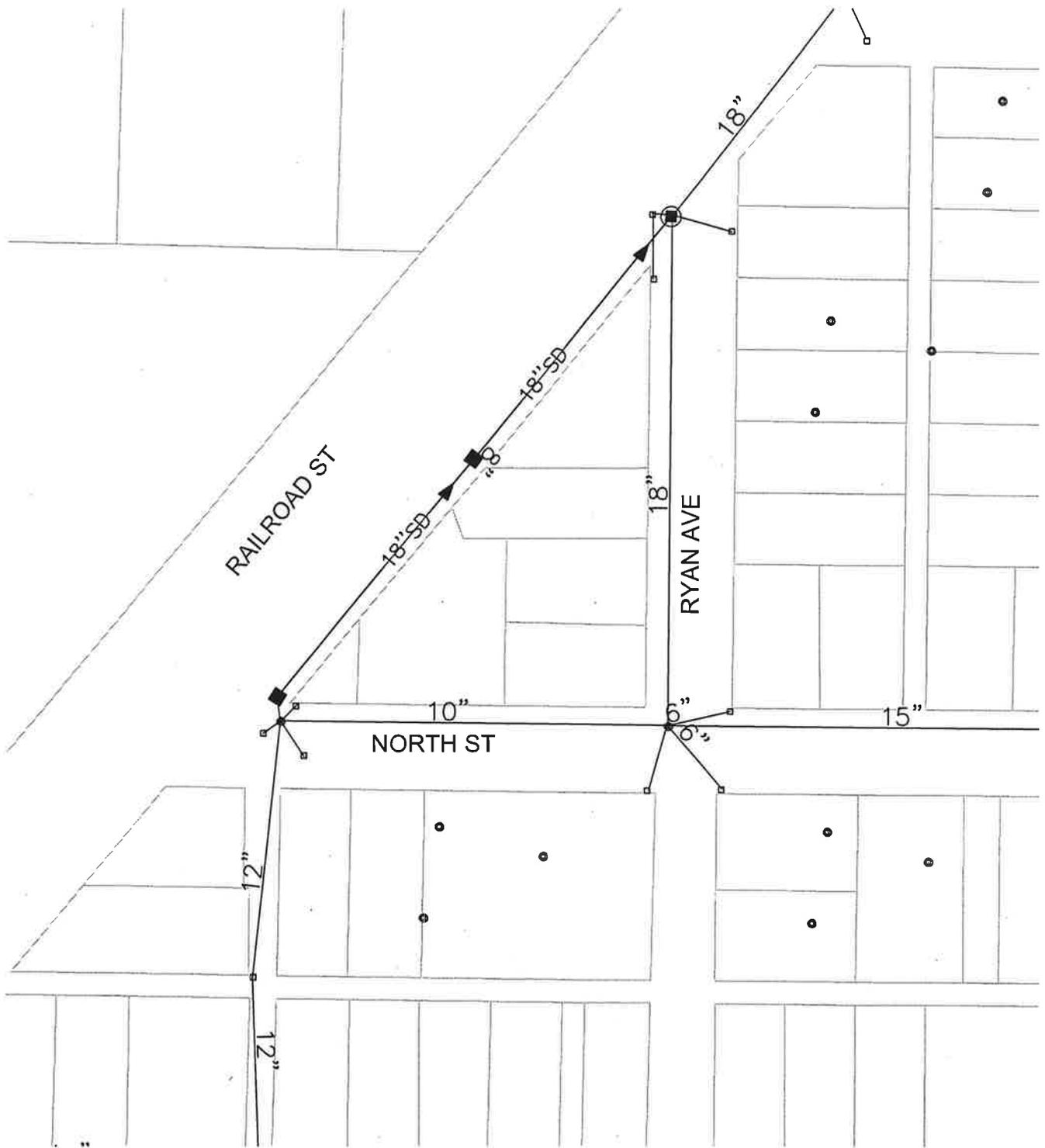
- REMOVE APPROX 30 LF EX 8" DIA SD PIPE
- INSTALL APPROX 1415 LF 12" DIA SD PIPE
- INSTALL APPROX 515 LF 18" DIA SD PIPE
- INSTALL 12 TYPE I CB
- INSTALL 1 - 48" TYPE II CB

OBJECTIVE:

ELIMINATE FLOODING ON GARY STREET, WOOD AVENUE, AND GAULT STREET DUE TO LACK OF CONVEYANCE.



**Figure CIP-2
Gary Street Improvements**

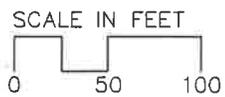


IMPROVEMENTS:

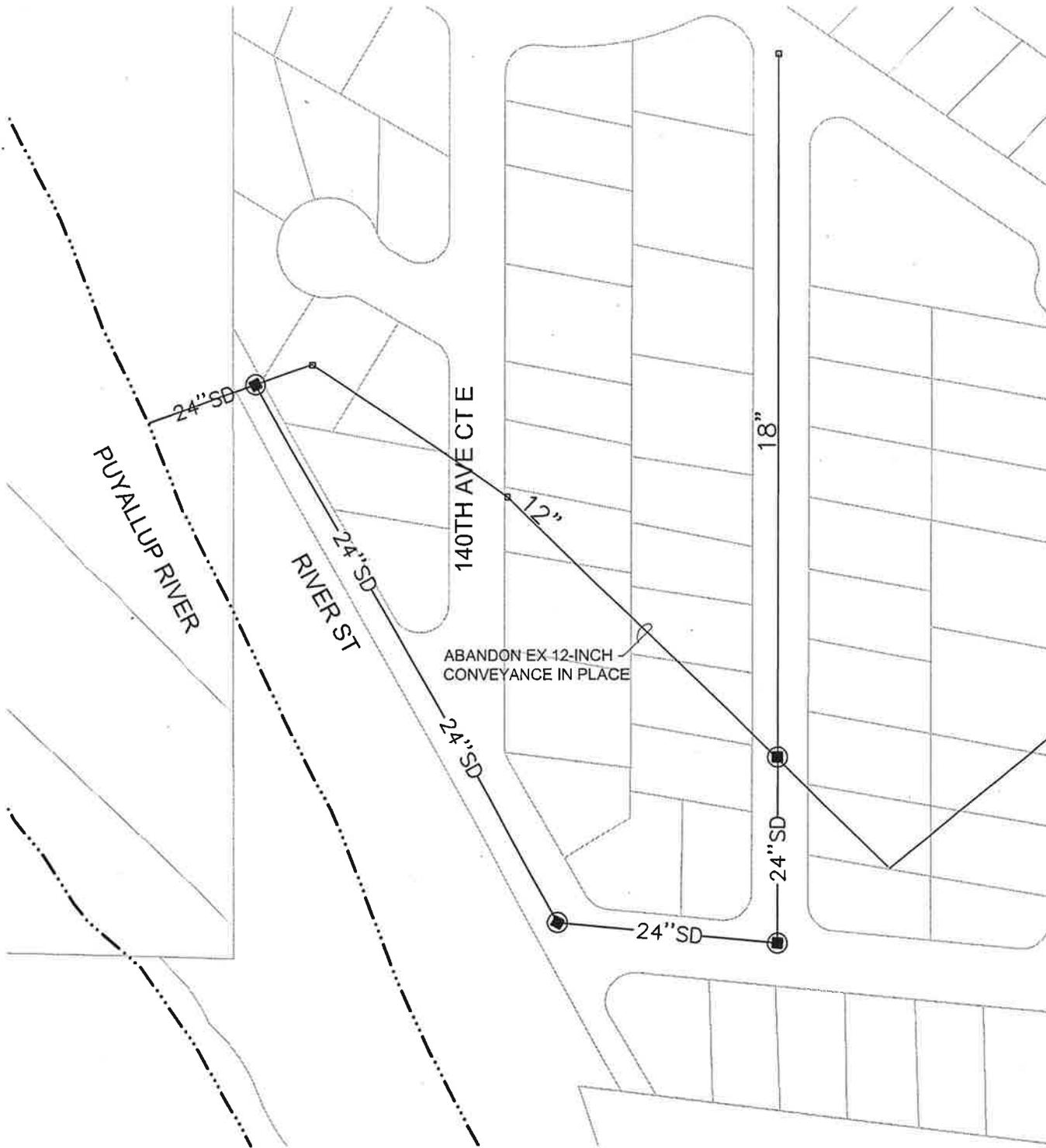
INSTALL APPROX 435 LF 18" DIA SD PIPE
 INSTALL 2 TYPE I CB
 INSTALL 1 - 48" TYPE II CB

OBJECTIVE:

PROVIDE BYPASS TO ALLEVIATE FLOODING OFF NORTH ST (8" DIA CONVENYANCE CURRENTLY SHOWN ON BASE MAP BUT HAS NOT ACTUALLY BEEN INSTALLED PER PUBLIC WORKS DIRECTOR)



**Figure CIP-4
 Railroad Street
 Improvements**

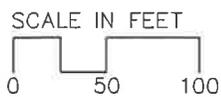


IMPROVEMENTS:

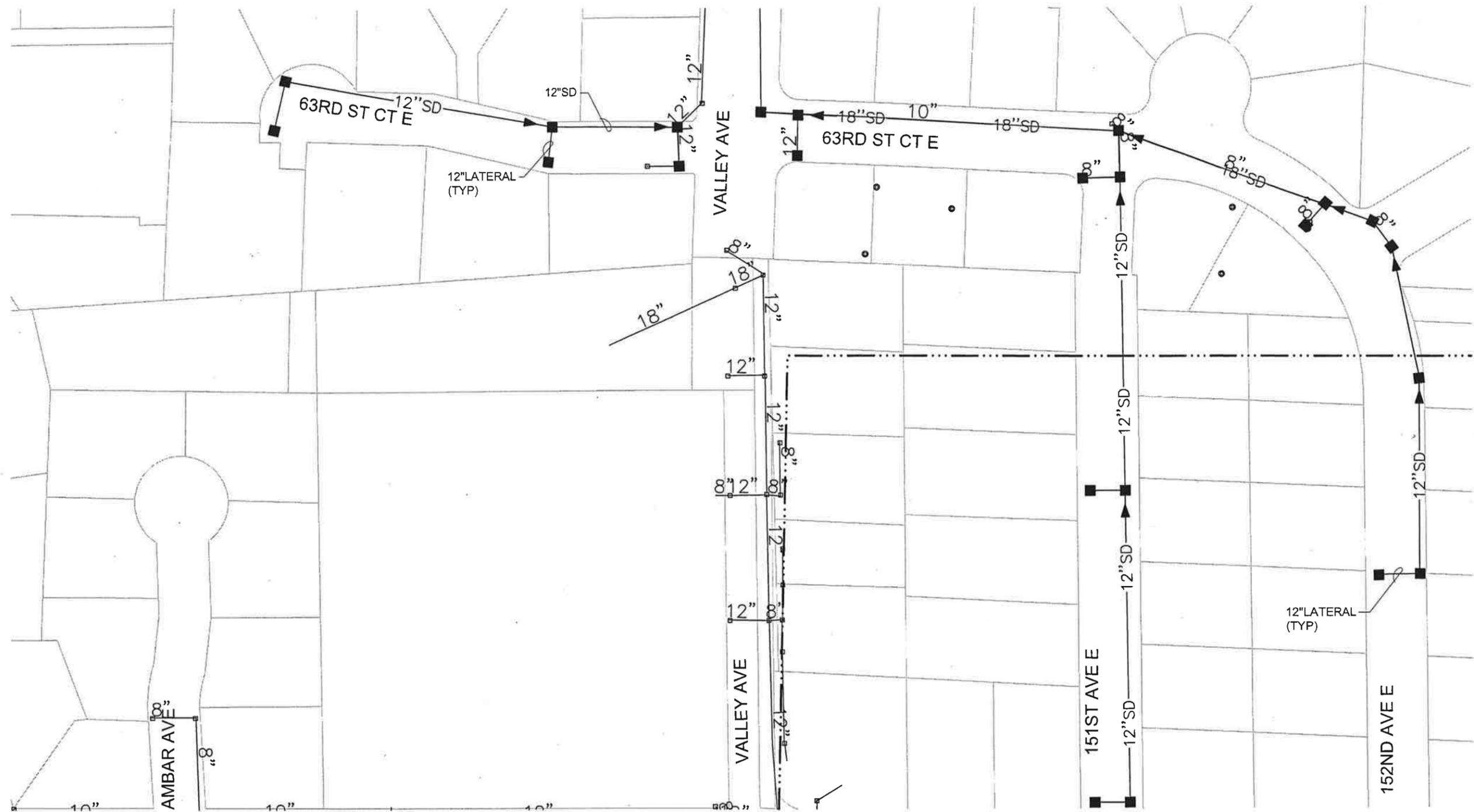
ABANDON APPROX 360 LF EX 12" DIA SD PIPE
 INSTALL APPROX 800 LF 24" DIA SD PIPE
 INSTALL 4 - 48" TYPE II CB

OBJECTIVE:

INCREASE HYDRAULIC CAPACITY TO PREVENT SURCHARGE.



**Figure CIP-6
 River Street
 Improvements**

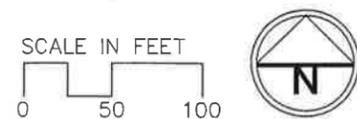


IMPROVEMENTS:

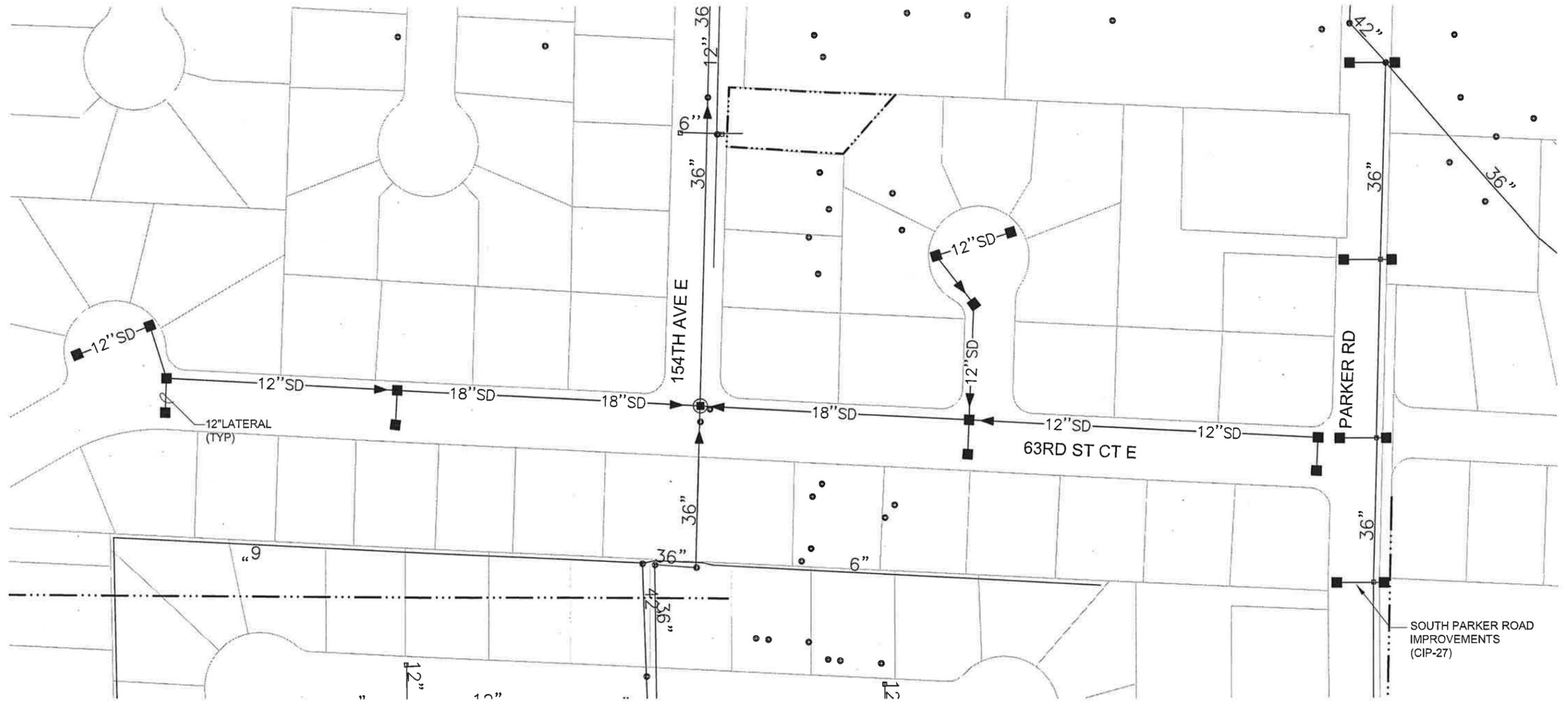
REMOVE APPROX 400 LF 8" DIA SD PIPE. REMOVE APPROX 350 LF 10" Ø SD PIPE
 REMOVE APPROX 125 LF 12" DIA SD PIPE
 INSTALL APPROX 1675 LF 12" DIA SD PIPE
 INSTALL APPROX 610 LF 18" DIA SD PIPE
 INSTALL 23 TYPE I CB

OBJECTIVE:

PROVIDE CONVEYANCE ON 63RD STREET CT E WEST OF VALLEY AVENUE. UPSIZE EXISTING CONVEYANCE ON 63RD STREET CT E EAST OF VALLEY AVE TO ALLEVIATE EXISTING FLOODING. UPSIZE AND EXTEND CONVEYANCE ON 152ND AVENUE E TO ALLEVIATE EXISTING FLOODING. PROVIDE CONVEYANCE ON 151ST AVENUE E.



**Figure CIP-7
 151st Avenue E &
 152nd Avenue E
 Improvements**



IMPROVEMENTS:

- INSTALL APPROX 1095 LF 12" DIA SD PIPE
- INSTALL APPROX 570 LF 18" DIA SD PIPE
- INSTALL 13 TYPE I CB
- INSTALL 1 - 54" TYPE II CB
- PROVIDE YARD DRAIN STUBS W/CLEANOUT AT ROW FOR ADJACENT LOTS
- APPROX 1180 LF 6" DIA SD PIPE
- APPROX 34 - 6" CO

OBJECTIVE:

ALLEVIATE EXISTING FLOODING ON 63RD STREET CT E AND ELIMINATE SUSPECTED ILLEGAL CONNECTIONS TO SANITARY SEWER.

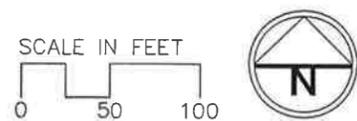
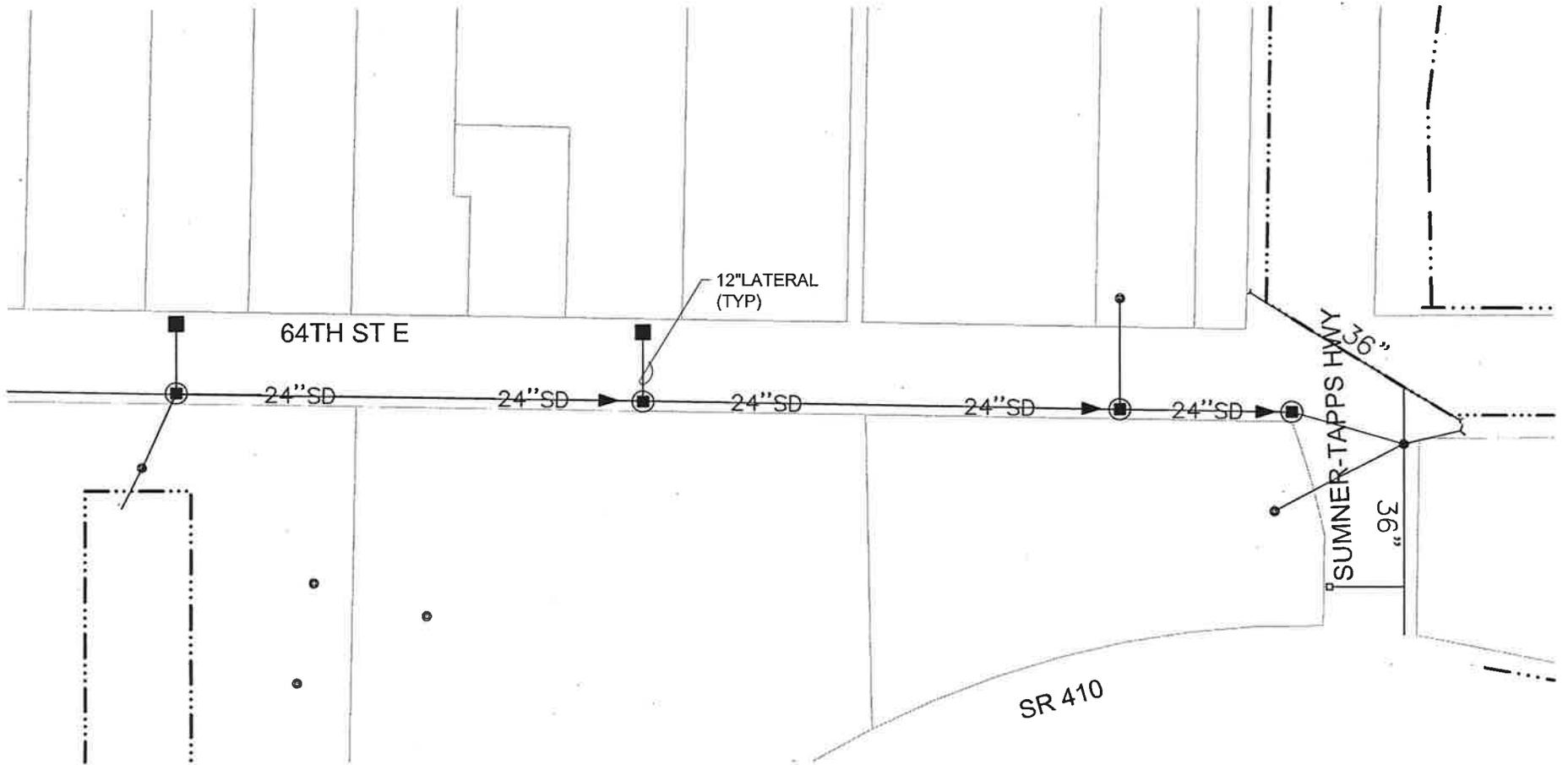


Figure CIP-8
63rd Street Ct E
Improvements

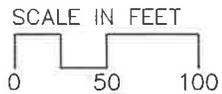


IMPROVEMENTS:

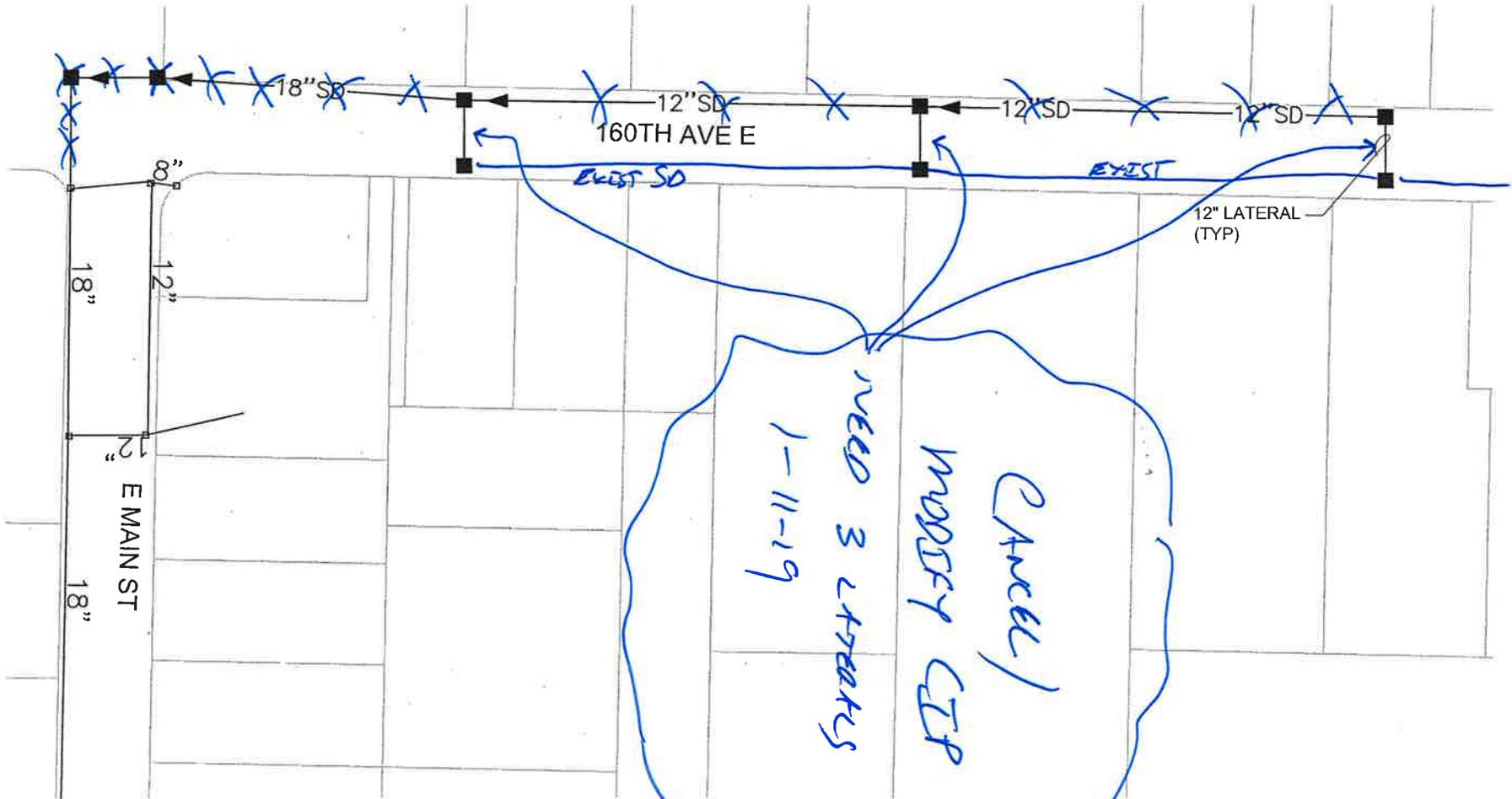
- BACKFILL APPROX 720 LF ROADSIDE DITCH
- INSTALL APPROX 90 LF 12" DIA SD PIPE
- INSTALL APPROX 720 LF 24" DIA SD PIPE
- INSTALL 2 TYPE I CB
- INSTALL 4 - 48" TYPE II CB

OBJECTIVE:

MINIMIZE FLOODING ON 64TH STREET E DUE TO INADEQUATE CONVEYANCE.



**Figure CIP-10
64th Street E Outfall
Improvements**



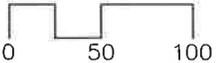
(CANCEL)
 MODIFY CIP
 NEED 3 LATERALS
 1-11-19

IMPROVEMENTS:

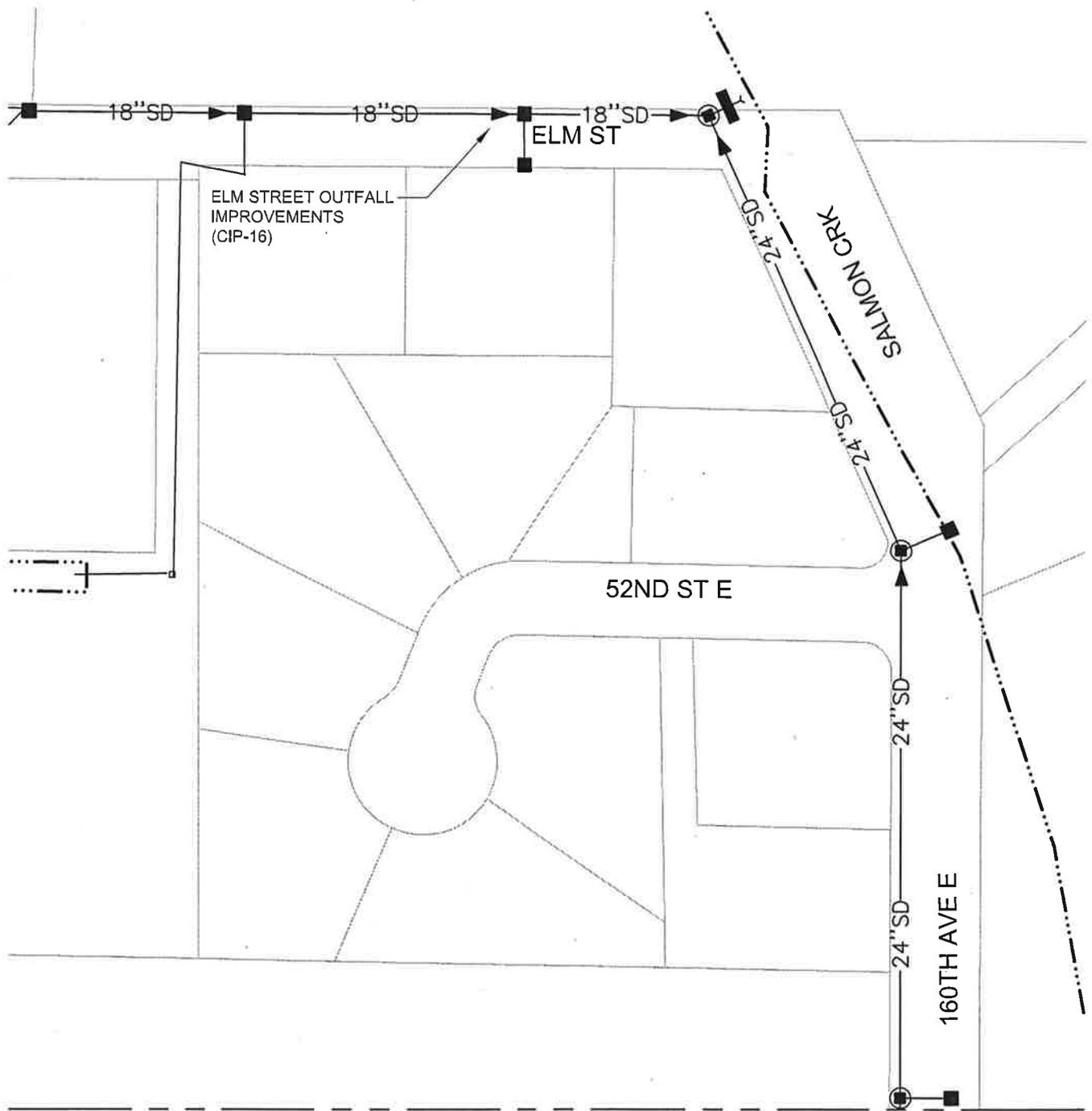
INSTALL APPROX 720 LF 12" DIA SD PIPE
 INSTALL APPROX 255 LF 18" DIA SD PIPE
 INSTALL 8 TYPE I CB

OBJECTIVE:

ALLEVIATE FLOODING DUE TO INADEQUATE CONVEYANCE.



**Figure CIP-11
 South 160th Avenue E
 Improvements**



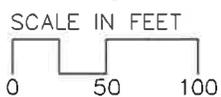
MATCHLINE SEE FIGURE CIP-12B

IMPROVEMENTS:

- INSTALL APPROX 70 LF 12" DIA SD PIPE
- INSTALL APPROX 690 LF 24" DIA SD PIPE
- INSTALL 2 TYPE I CB
- INSTALL 2 - 48" TYPE II CB

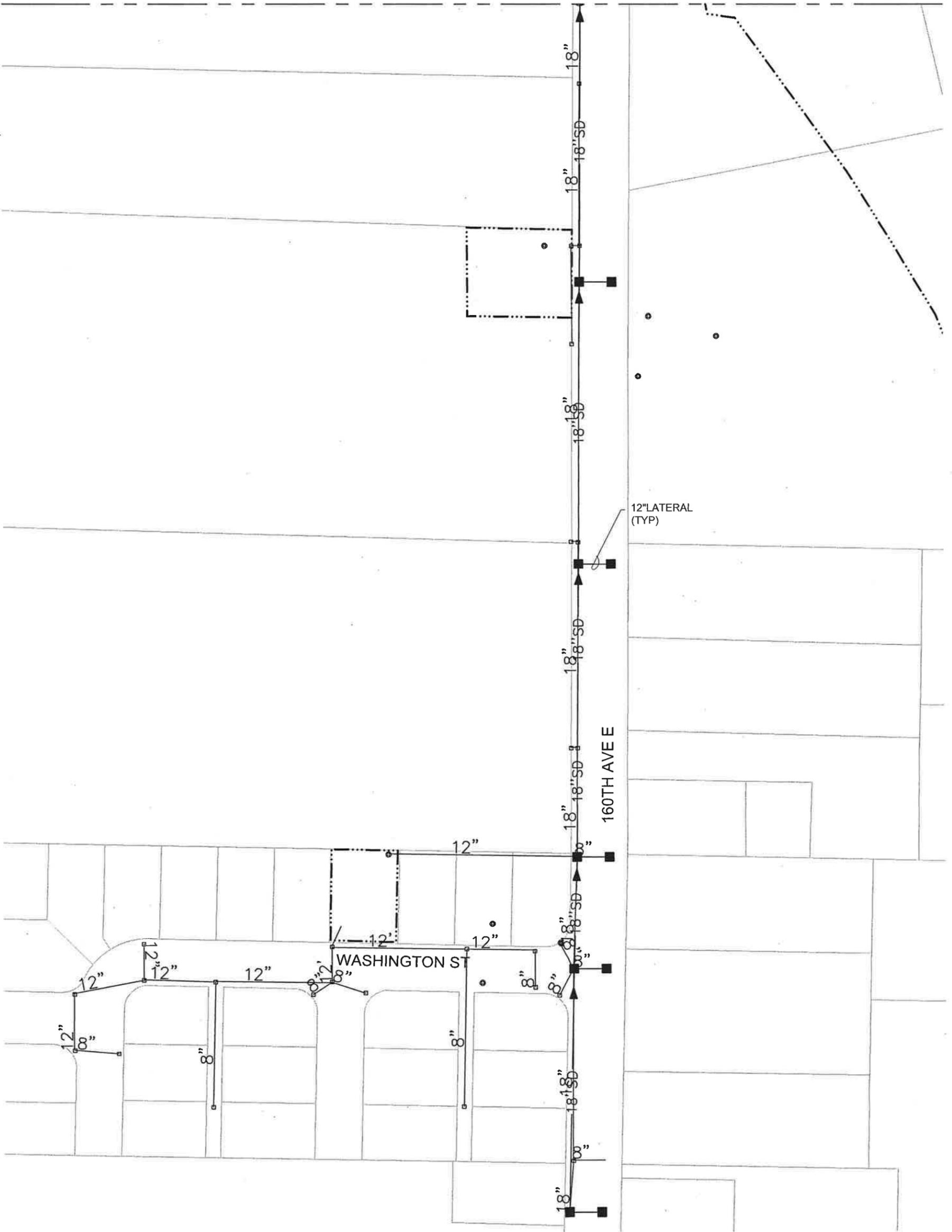
OBJECTIVE:

MINIMIZE FLOODING DUE TO INADEQUATE CONVEYANCE.



**Figure CIP-12A
North 160th Avenue E
Improvements**

MATCHLINE SEE FIGURE CIP-12A



IMPROVEMENTS:

REMOVE APPROX 1290 LF 18" DIA SD PIPE
INSTALL APPROX 175 LF 12" DIA SD PIPE
INSTALL APPROX 1290 LF 18" DIA SD PIPE
INSTALL 10 TYPE I CB

OBJECTIVE:

MINIMIZE FLOODING DUE TO INADEQUATE
CONVEYANCE.

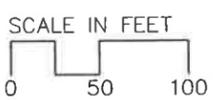


Figure CIP-12B
North 160th Avenue E
Improvements

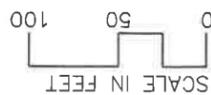
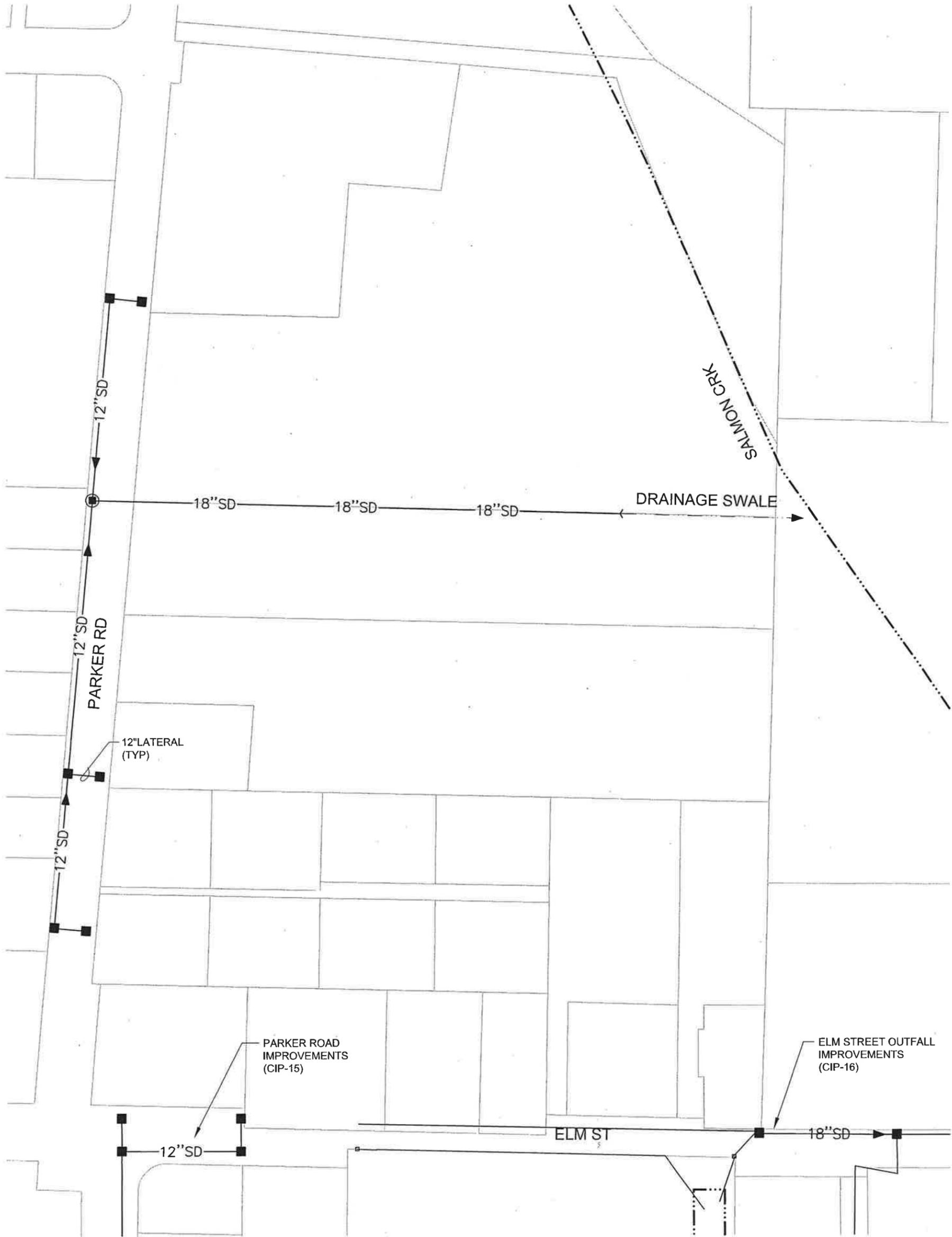


Figure CIP-13
Elm Street Interceptor

- IMPROVEMENTS:**
- INSTALL APPROX 140 LF 12" DIA SD PIPE
 - INSTALL APPROX 600 LF 18" DIA SD PIPE
 - INSTALL APPROX 610 LF 24" DIA SD PIPE
 - INSTALL 6 TYPE I CB
 - INSTALL 2 - 48" TYPE II CB

OBJECTIVE:
ALLEVATE FLOODING ON ELM STREET DUE TO
LACK OF CONVEYANCE.





IMPROVEMENTS:

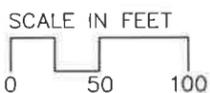
INSTALL APPROX 610 LF 12" DIA SD PIPE
 INSTALL APPROX 440 LF 18" DIA SD PIPE
 INSTALL 7 TYPE I CB
 INSTALL APPROX 200 LF SWALE

OBJECTIVE:

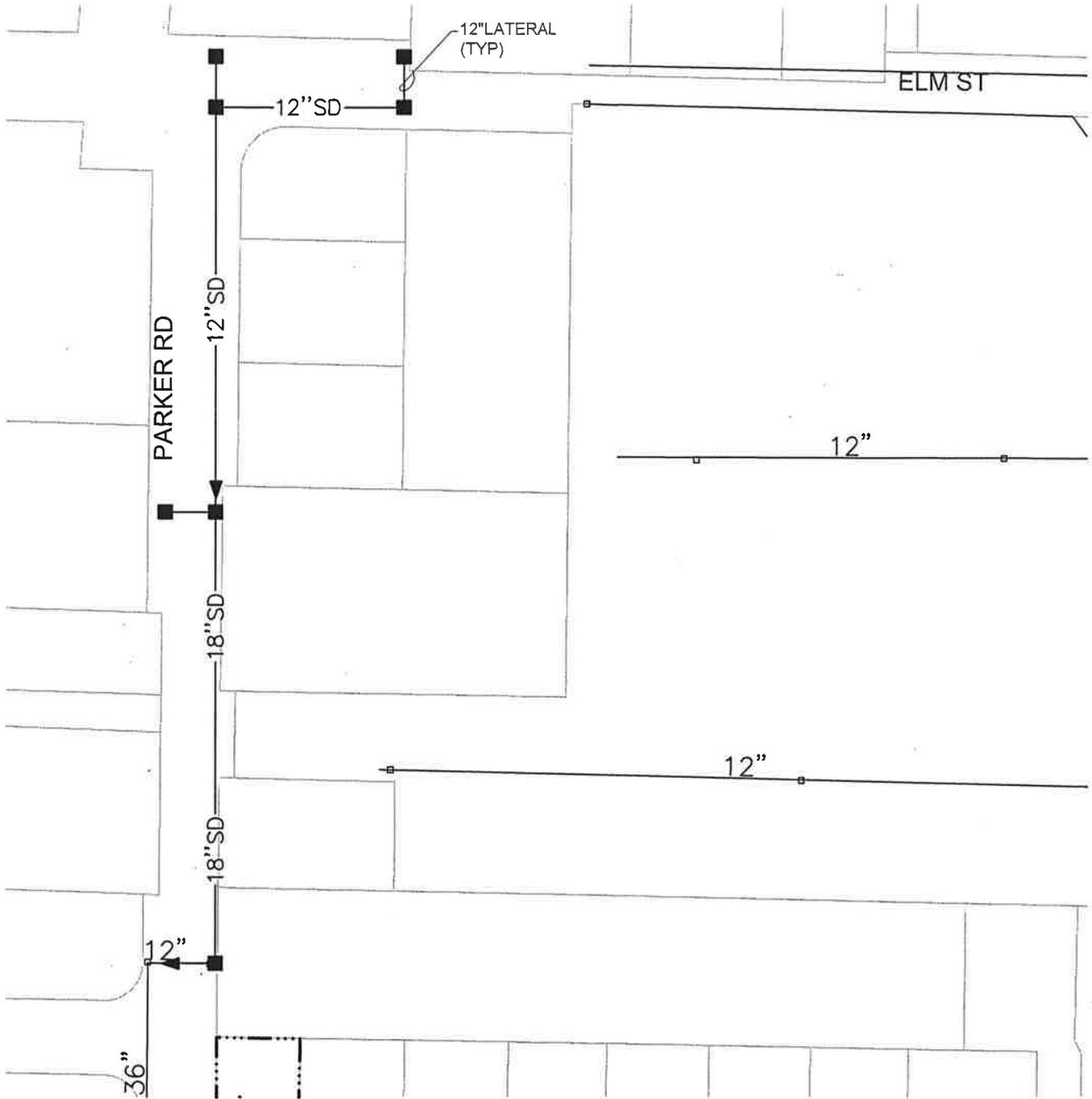
ELIMINATE FLOODING DUE TO LACK OF CONVEYANCE.

NOTE:

EASEMENTS WILL BE REQUIRED TO INSTALL THE 18" DIA SD AND CONSTRUCT THE BIOSWALE.



**Figure CIP-14
 North Parker Road
 Improvements**



IMPROVEMENTS:

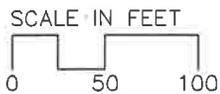
INSTALL APPROX 1095 LF 12" DIA SD PIPE
 INSTALL 14 TYPE I CB

NOTE:

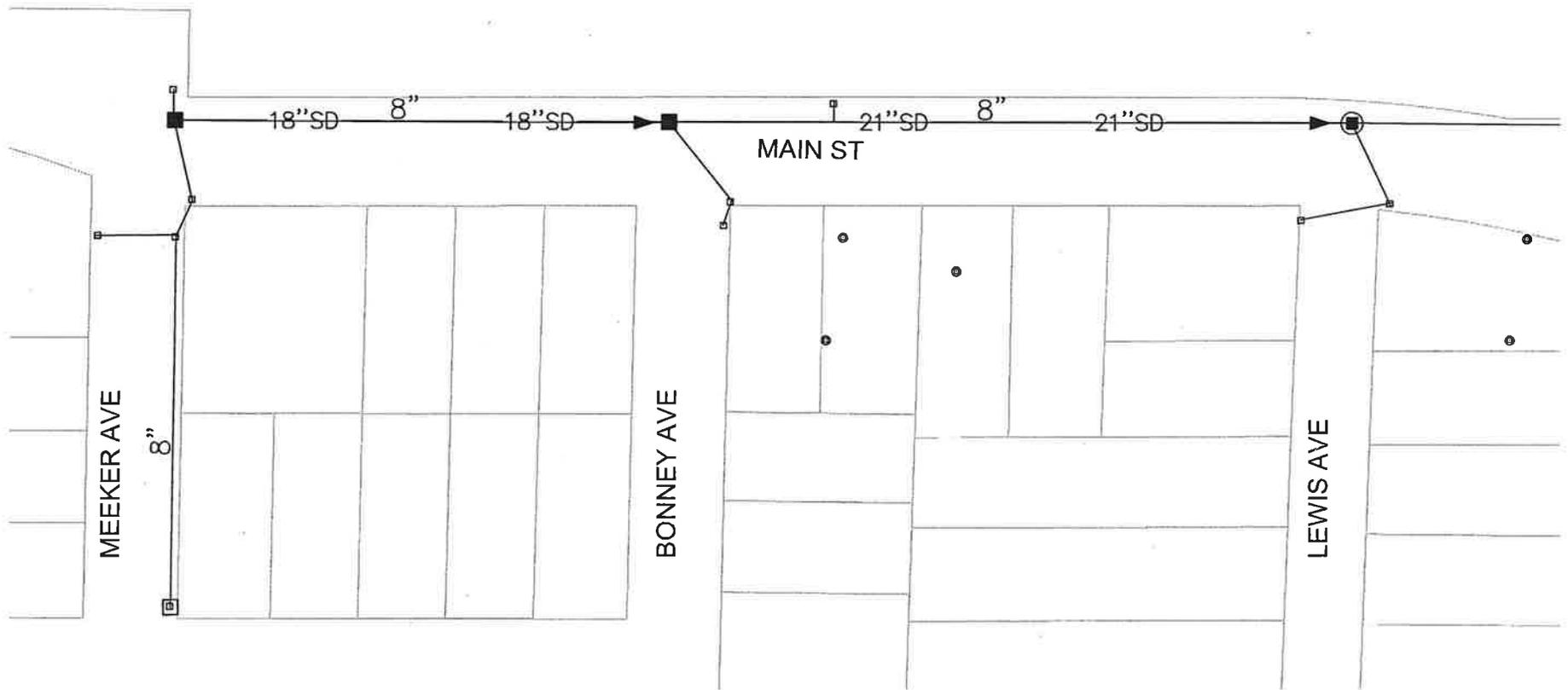
THIS PROJECT INCLUDES INSTALLING APPROXIMATELY 245 LF 12" DIA SD PIPE AND 7 TYPE I CATCH BASINS FOR LATERAL/CATCH BASIN REPLACEMENT BETWEEN DAFFODIL STREET CT E AND MAIN STREET TO ACCOMMODATE WIDENING OF PARKER ROAD (IMPROVEMENTS REQUIRED AS A RESULT OF STREET WIDENING ARE NOT SHOWN ON THIS FIGURE).

OBJECTIVE:

ELIMINATE FLOODING DUE TO LACK OF CONVEYANCE. REPLACE EXISTING TYPE I CATCH BASINS AND LATERALS BETWEEN DAFFODIL STREET CT E AND MAIN STREET TO IMPROVE DRAINAGE.



**Figure CIP-15
 Parker Road
 Improvements**

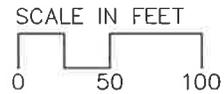


IMPROVEMENTS:

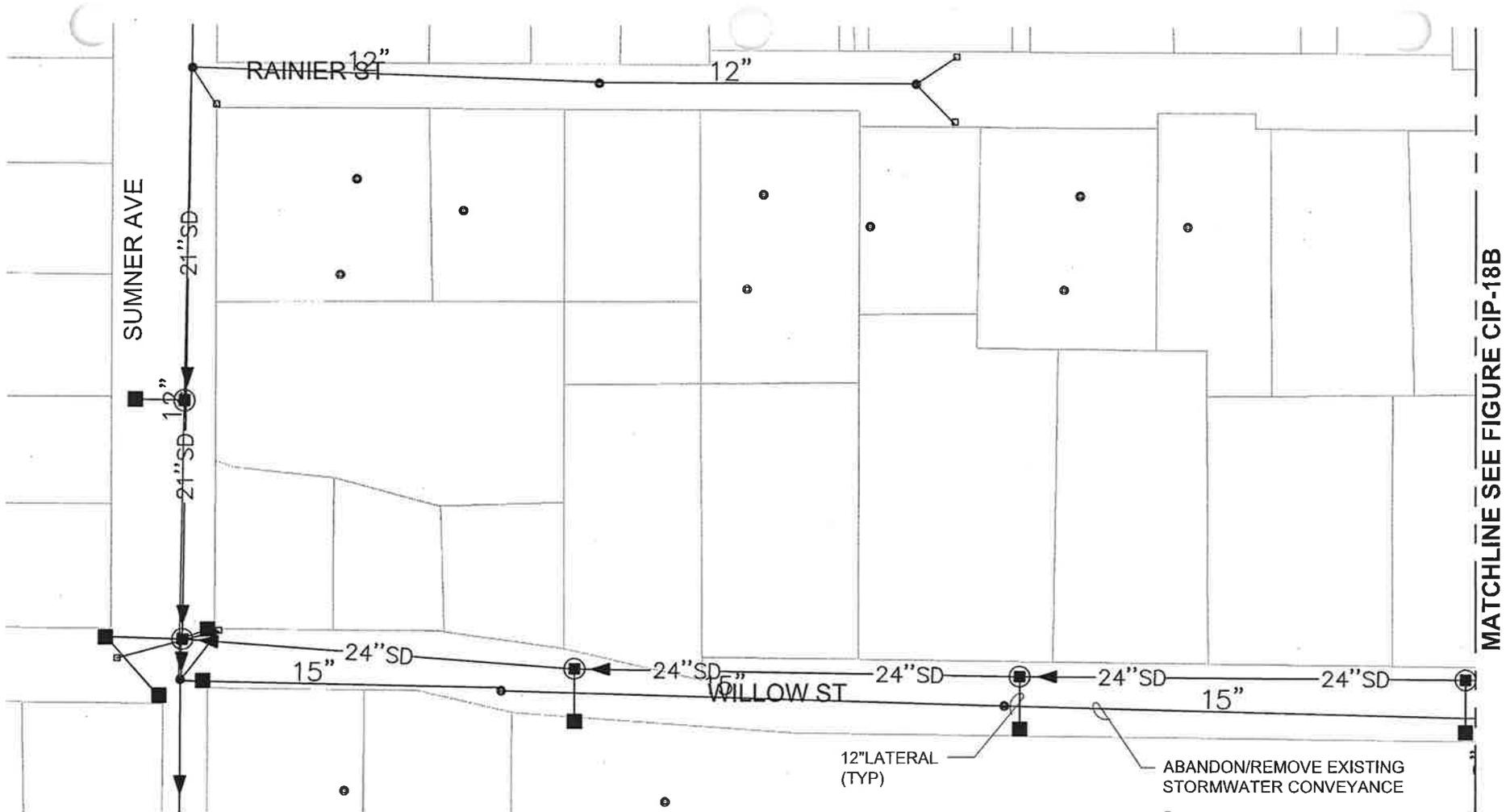
REMOVE APPROX 750 LF 8" DIA SD PIPE
 INSTALL APPROX 320 LF 18" DIA SD PIPE
 INSTALL APPROX 430 LF 21" DIA SD PIPE
 INSTALL 2 TYPE I CB
 INSTALL 1 - 48" TYPE II CB

OBJECTIVE:

UPSIZING STORMWATER CONVEYANCE
 ON MAIN STREET TO INCREASE HYDRAULIC CAPACITY



**Figure CIP-17
 Main Street Improvements**



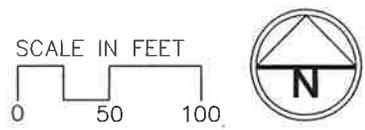
MATCHLINE SEE FIGURE CIP-18B

IMPROVEMENTS:

- REMOVE APPROX 280 LF 12" DIA SD (SUMNER AVE)
- ABANDON APPROX 880 LF 15" DIA SD (WILLOW ST)
- INSTALL APPROX 230 LF 12" DIA SD PIPE
- INSTALL APPROX 385 LF 21" DIA SD PIPE
- INSTALL APPROX 865 LF 24" DIA SD PIPE
- INSTALL 8 TYPE I CB
- INSTALL 5 - 48" TYPE II CB

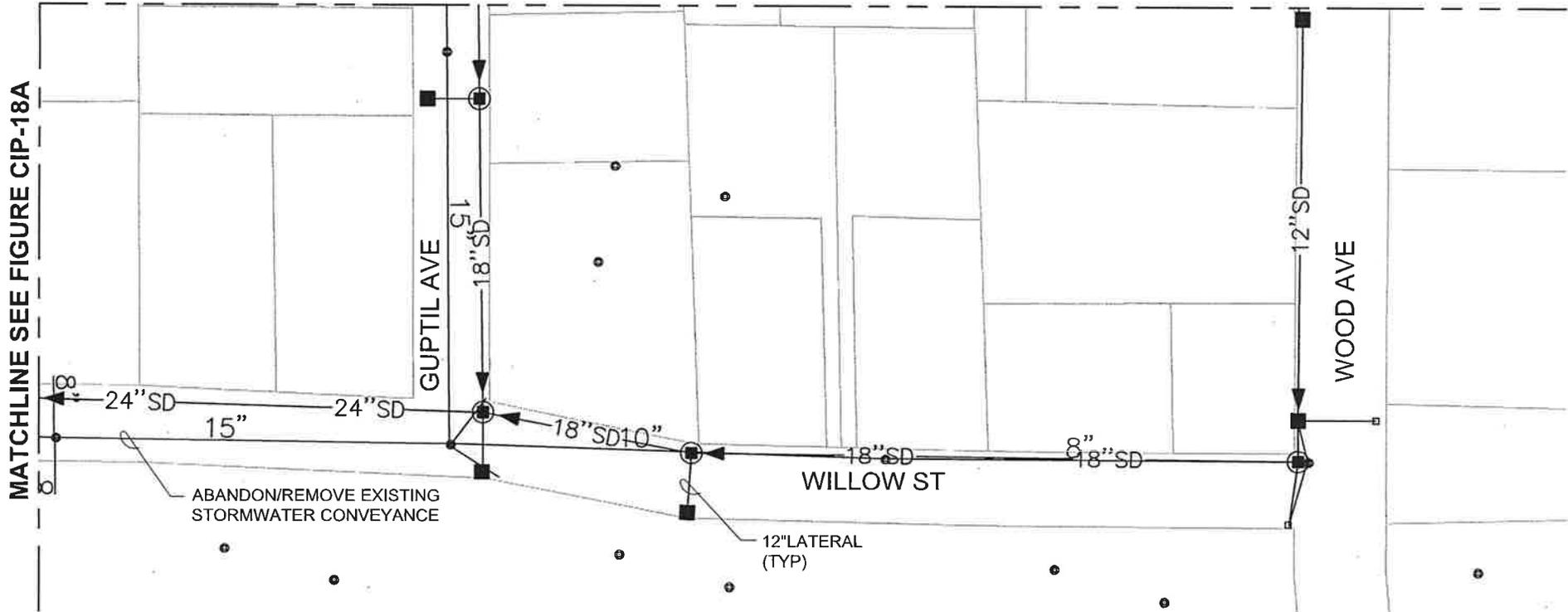
OBJECTIVE:

ALLEVIATE SURCHARGE UPSTREAM OF THE 48-INCH OUTFALL TO THE PUYALLUP RIVER.



**Figure CIP-18A
Willow Street Interceptor
& Tributary Improvements**

MATCHLINE SEE FIGURE CIP-18C



IMPROVEMENTS:

- ABANDON APPROX 160 LF 10" DIA SD (WILLOW ST)
- ABANDON APPROX 280 LF 15" DIA SD (WILLOW ST)
- ABANDON APPROX 285 LF 15" DIA SD (GUPTIL AVE)
- REMOVE APPROX 340 LF 8" DIA SD PIPE (WILLOW ST)
- REMOVE APPROX 130 LF 10" DIA SD PIPE (WILLOW ST)
- INSTALL APPROX 445 LF 12" DIA SD PIPE
- INSTALL APPROX 805 LF 18" DIA SD PIPE
- INSTALL APPROX 305 LF 24" DIA SD PIPE
- INSTALL 5 TYPE I CB
- INSTALL 4 - 48" TYPE II CB

OBJECTIVE:

ALLEVIATE SURCHARGE IN THE 42-INCH OUTFALL TO THE PUYALLUP RIVER.
ELIMINATE PONDING ON WOOD AVENUE DUE TO LACK OF CONVEYANCE.

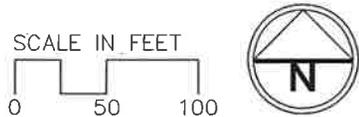
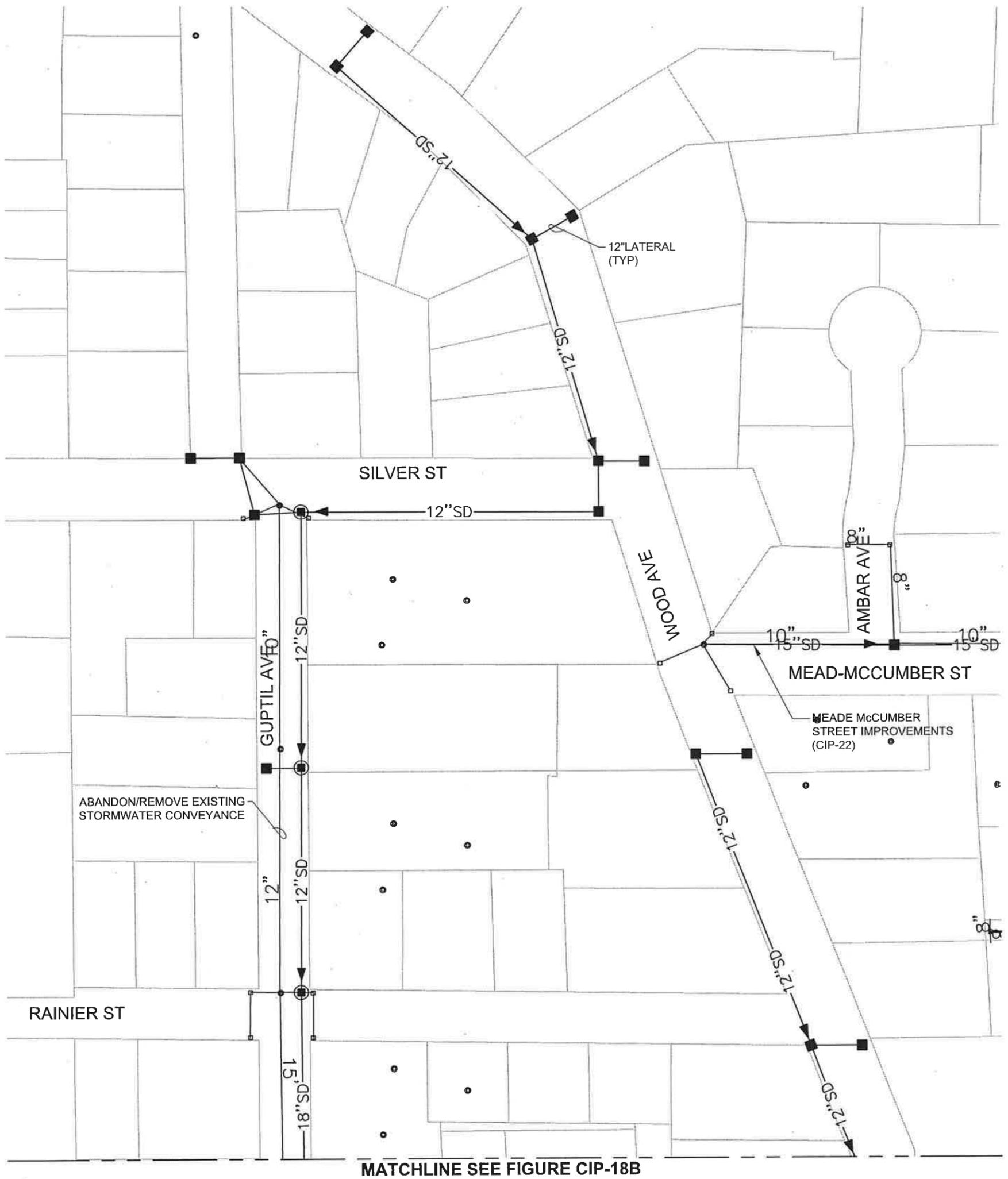


Figure CIP-18B
Willow Street Interceptor
& Tributary Improvements

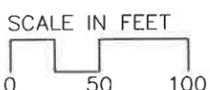


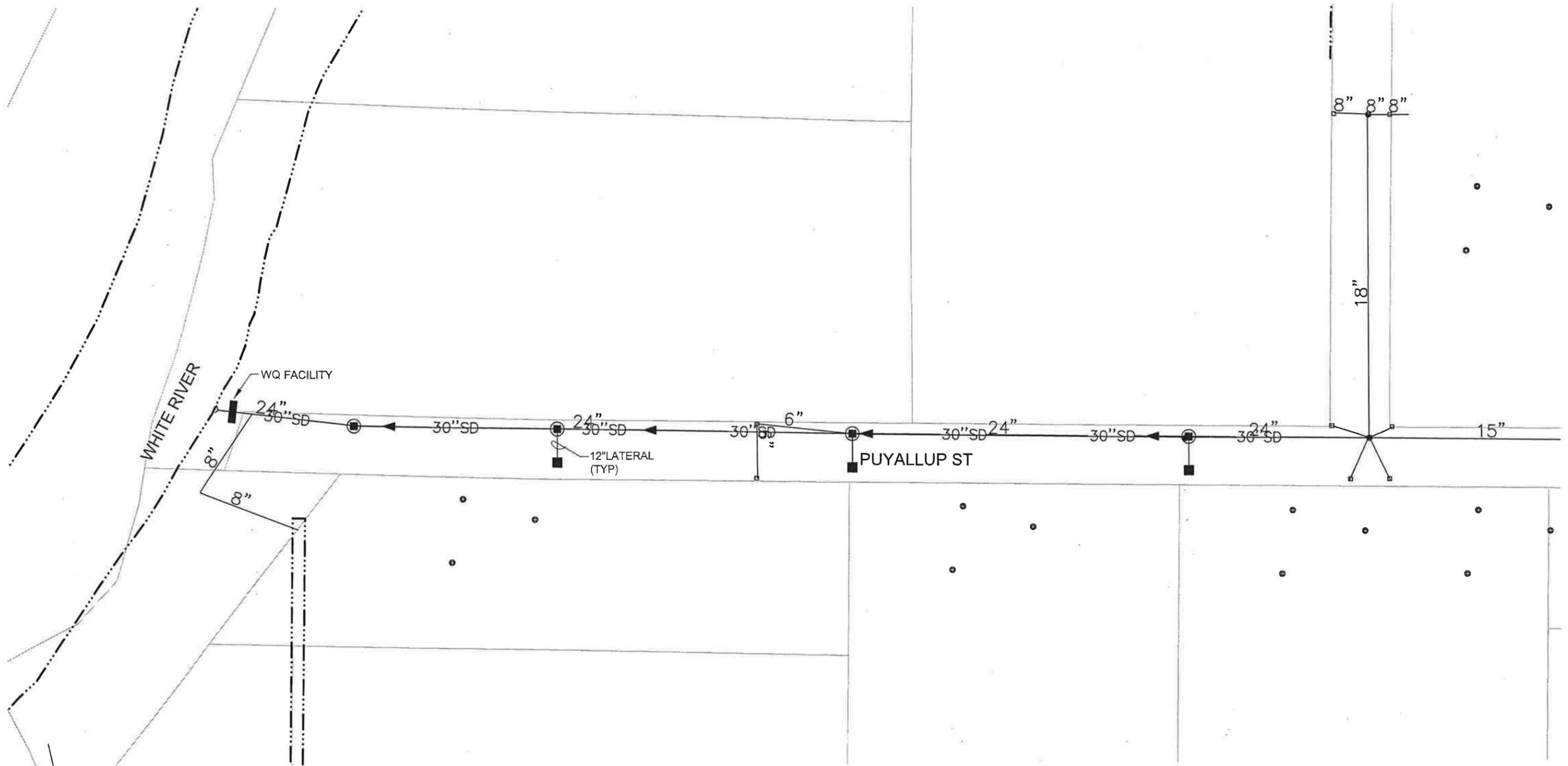
IMPROVEMENTS:

- ABANDON APPROX 240 LF 10" DIA SD (GUPTIL AVE)
- ABANDON APPROX 230 LF 12" DIA SD (GUPTIL AVE)
- ABANDON APPROX 160 LF 15" DIA SD (GUPTIL AVE)
- INSTALL APPROX 1950 LF 12" DIA SD PIPE
- INSTALL APPROX 160 LF 18" DIA SD PIPE
- INSTALL 15 TYPE I CB
- INSTALL 3 - 48" TYPE II CB

OBJECTIVE:

ELIMINATE PONDING ON WOOD AVENUE DUE TO LACK OF CONVEYANCE.



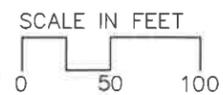


IMPROVEMENTS:

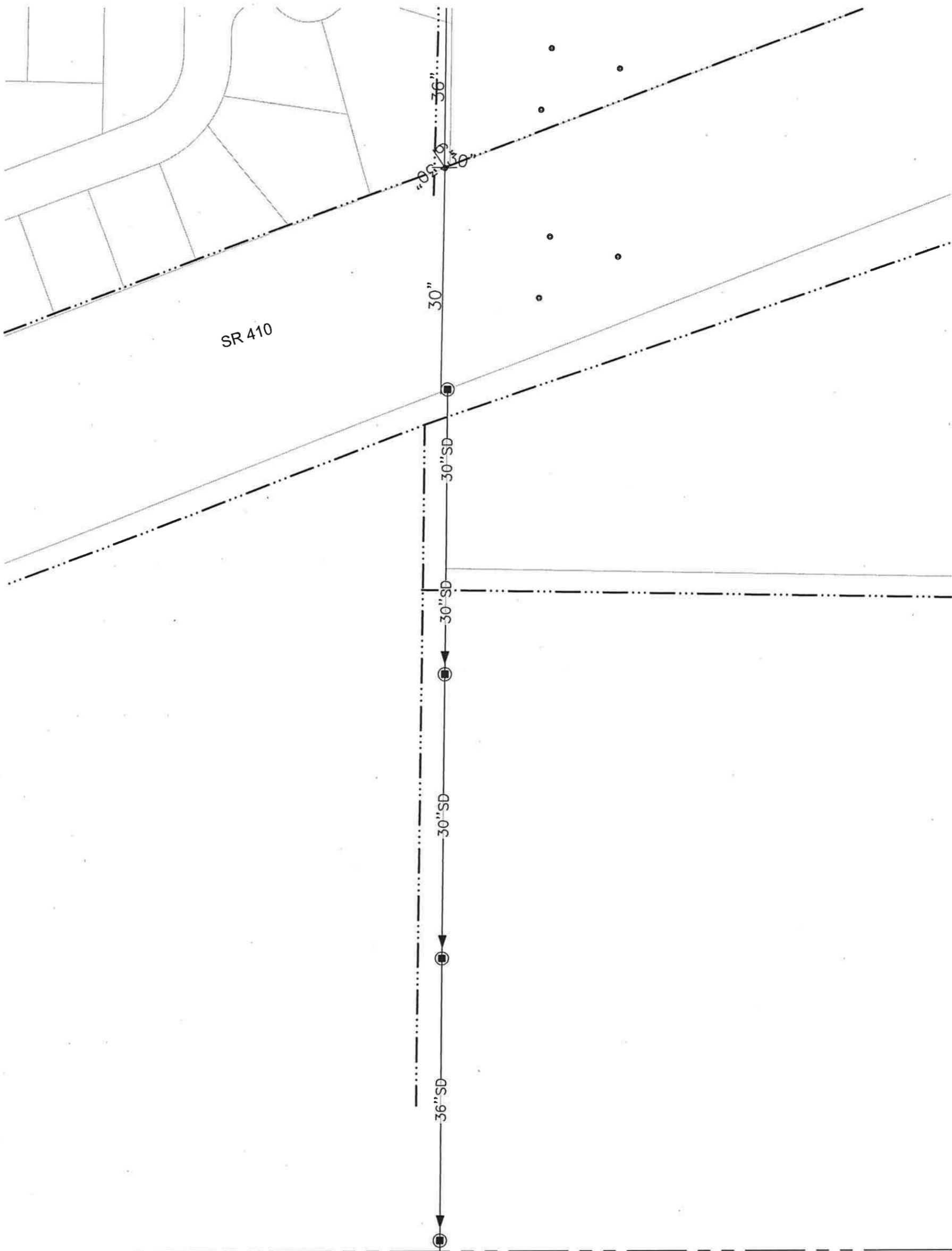
- REMOVE APPROX 1175 LF 24" DIA SD PIPE
- INSTALL APPROX 120 LF 12" DIA SD PIPE
- INSTALL APPROX 1175 LF 30" DIA SD PIPE
- INSTALL 3 TYPE I CB
- INSTALL 4 - 48" TYPE II CB
- INSTALL WQ FACILITY PRIOR TO OUTFALL

OBJECTIVE:

ALLEVIATE SURCHARGING IN EXISTING OUTFALL TO THE WHITE RIVER.



**Figure CIP-19
Puyallup Street Outfall
Improvements**



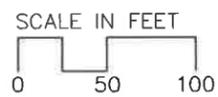
MATCHLINE SEE FIGURE CIP-21B

IMPROVEMENTS:

INSTALL APPROX 600 LF 30" DIA SD PIPE
 INSTALL APPROX 300 LF 36" DIA SD PIPE
 INSTALL 4 - 48" TYPE II CB

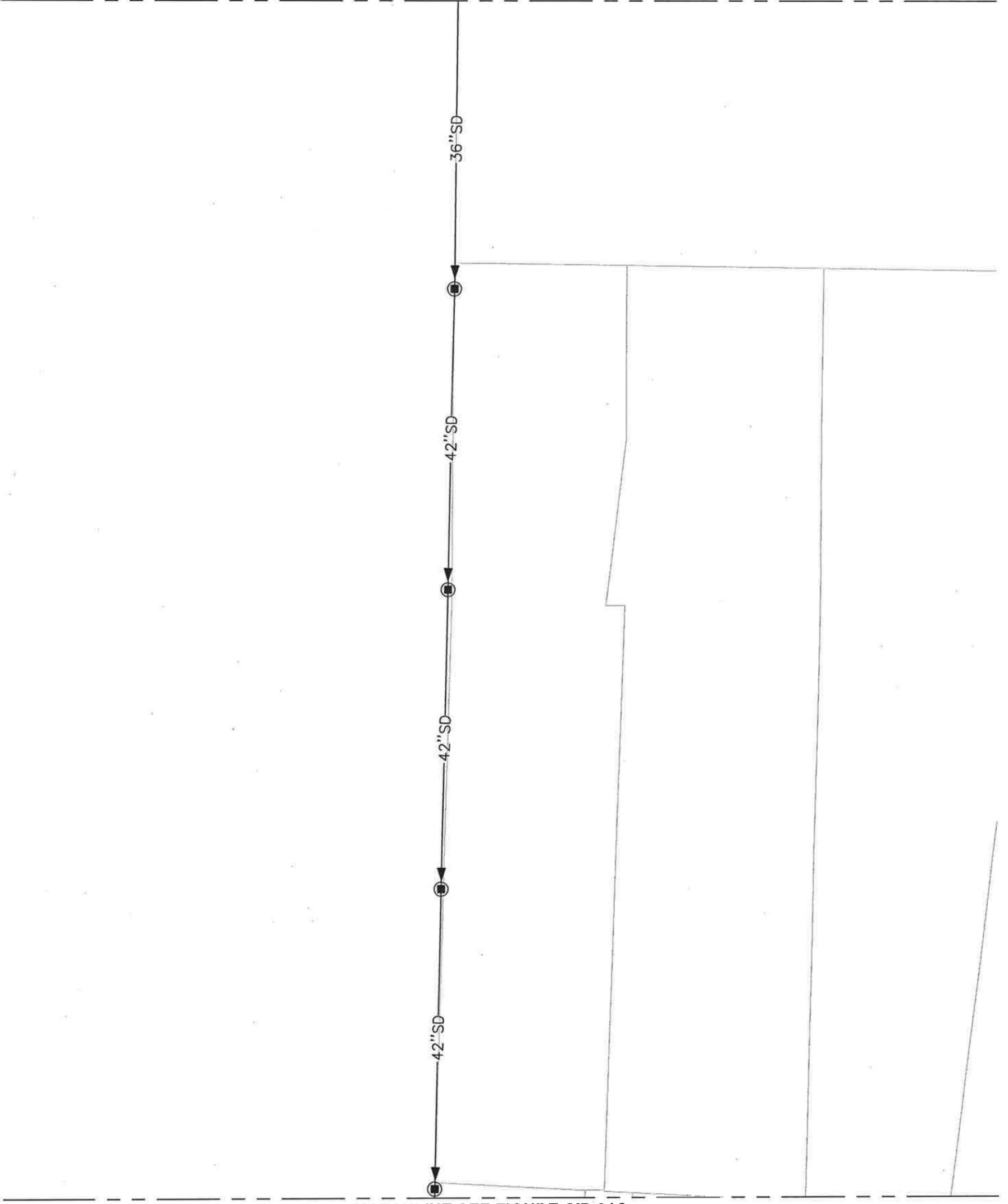
OBJECTIVE:

ALLEVIATE FLOODING SOUTH OF SR-410 AND SURCHARGE IN EXISTING 36" CULVERT UNDER SR-410. REDUCE DEMAND OF CONVEYANCE DOWNSTREAM OF DISTRICT 11 OUTFALL TO SALMON CREEK.



**Figure CIP-21A
 South SR-410
 Diversion Interceptor**

MATCHLINE SEE FIGURE CIP-21A



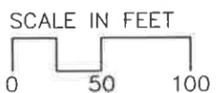
MATCHLINE SEE FIGURE CIP-21C

IMPROVEMENTS:

INSTALL APPROX 300 LF 36" DIA SD PIPE
INSTALL APPROX 900 LF 42" DIA SD PIPE
INSTALL 4 - 54" TYPE II CB

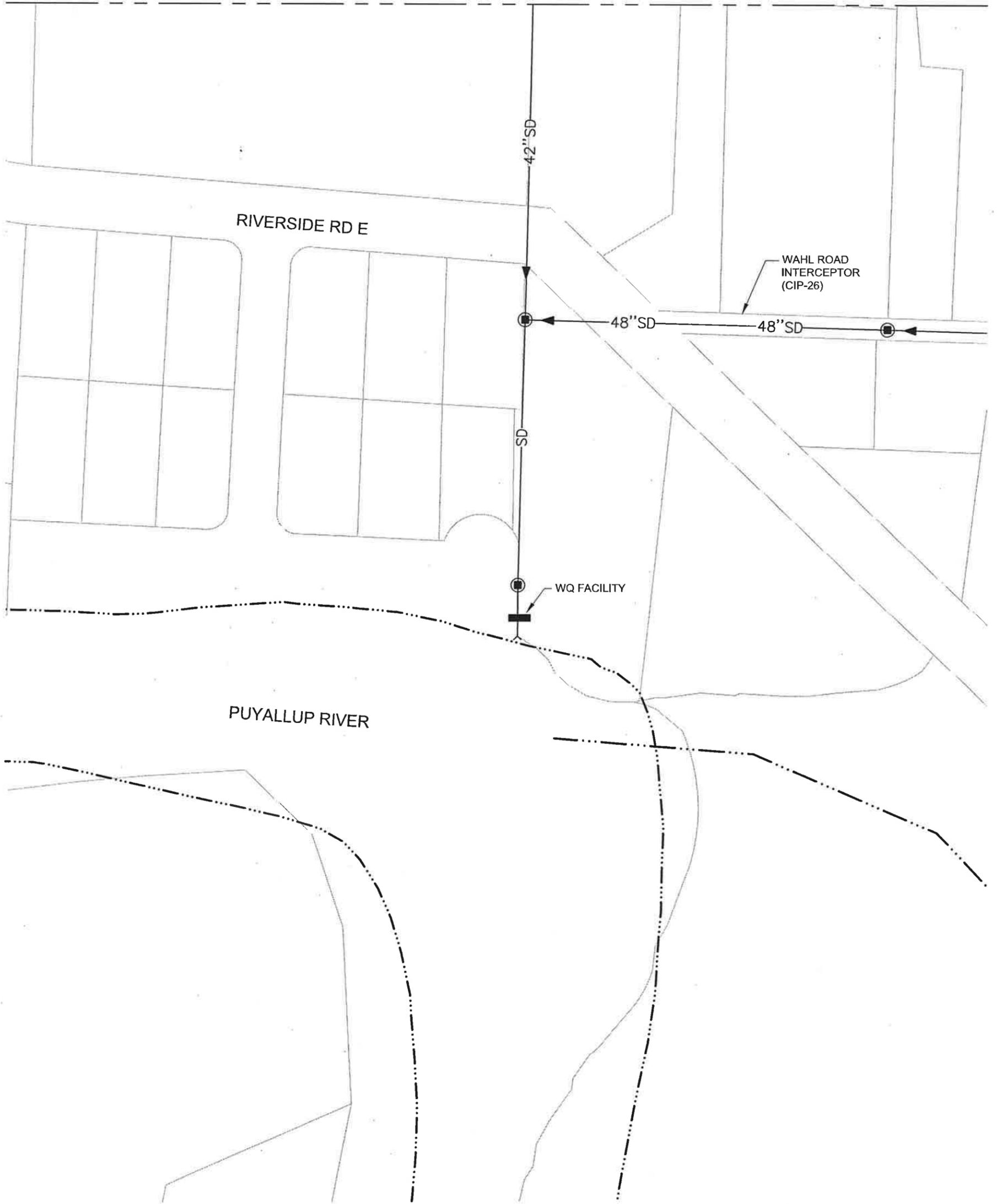
OBJECTIVE:

ALLEVIATE FLOODING SOUTH OF SR-410 AND SURCHARGE IN EXISTING 36" CULVERT UNDER SR-410. REDUCE DEMAND OF CONVEYANCE DOWNSTREAM OF DISTRICT 11 OUTFALL TO SALMON CREEK.



**Figure CIP-21B
South SR-41
Diversion Interceptor**

MATCHLINE SEE FIGURE CIP-21B



IMPROVEMENTS:

- INSTALL APPROX 330 LF 42" DIA SD PIPE
- INSTALL APPROX 350 LF 60" DIA SD PIPE
- INSTALL 2 - 72" TYPE II CB
- INSTALL WQ TREATMENT PRIOR TO OUTFALL

OBJECTIVE:

ALLEVIATE FLOODING SOUTH OF SR-410 AND SURCHARE IN EXISTING 36" CULVERT UNDER SR-410. REDUCE DEMAND OF CONVEYANCE DOWNSTREAM OF DISTRICT 11 OUTFALL TO SALMON CREEK.

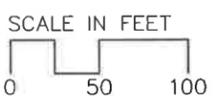
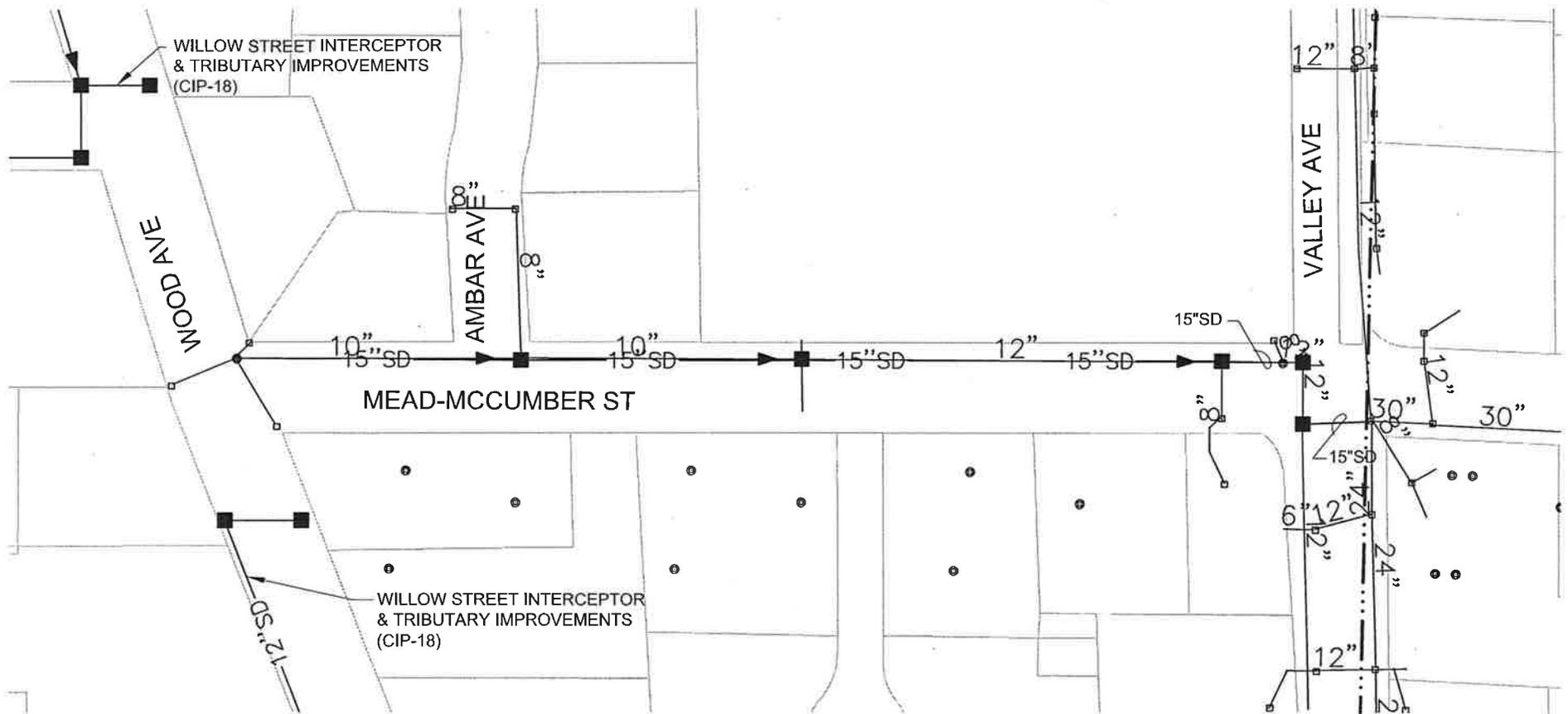


Figure CIP-21C
South SR-410
Diversion Interceptor

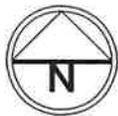
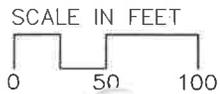


IMPROVEMENTS:

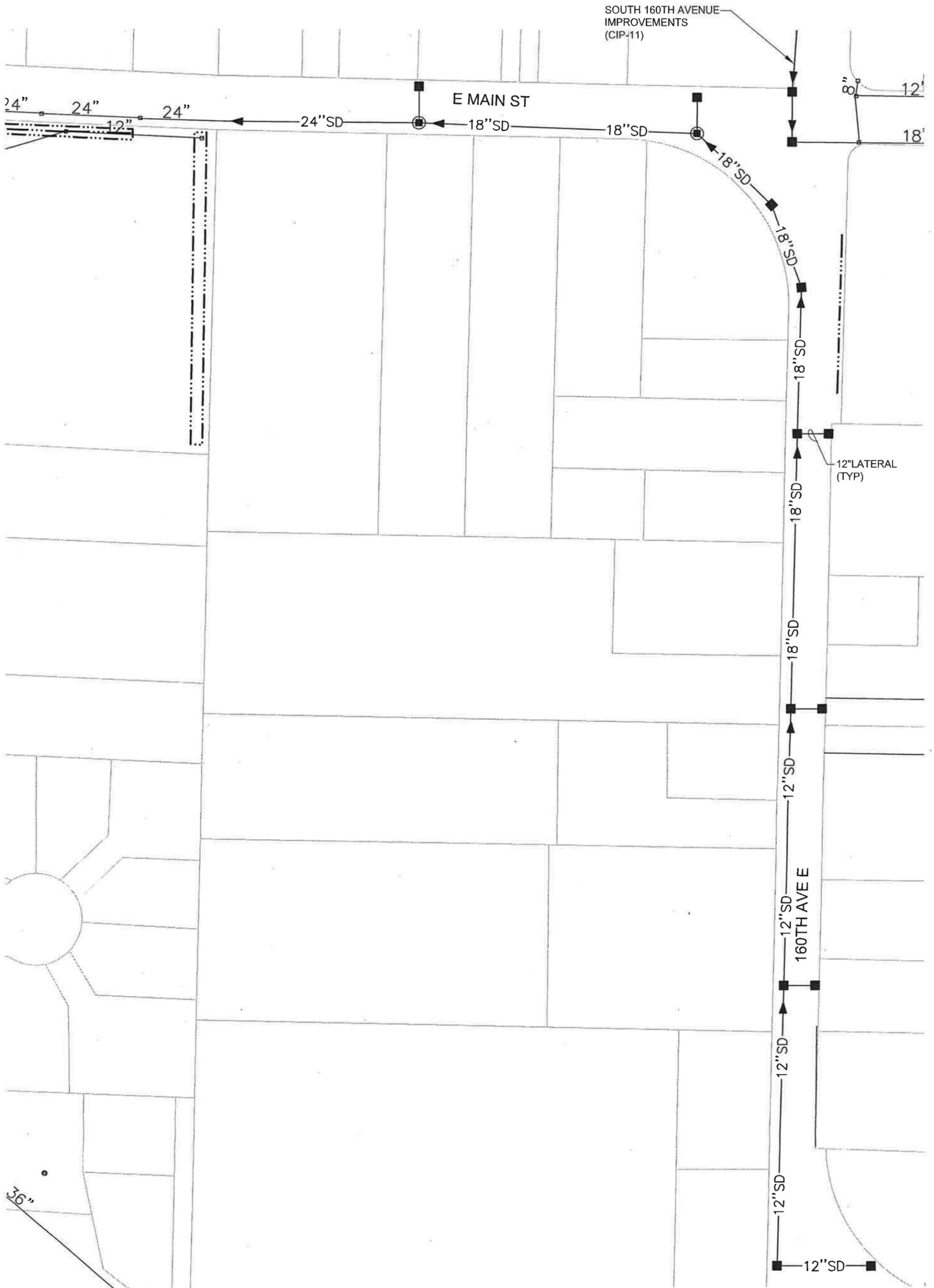
REMOVE APPROX 370 LF 10" DIA SD PIPE
 REMOVE APPROX 420 LF 12" DIA SD PIPE
 INSTALL APPROX 790 LF 15" DIA SD PIPE
 INSTALL 5 TYPE I CB

OBJECTIVE:

ELIMINATE FLOODING DUE TO INADEQUATE AND UNDERSIZED CONVEYANCE.



**Figure CIP-22
 Mead McCumber Street
 Improvements**

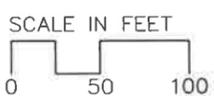


IMPROVEMENTS:

- INSTALL APPROX 895 LF 12" DIA SD PIPE
- INSTALL APPROX 970 LF 18" DIA SD PIPE
- INSTALL APPROX 210 LF 24" DIA SD PIPE
- INSTALL 12 TYPE I CB
- INSTALL 2 - 48" TYPE II CB

OBJECTIVE:

ELIMINATE PONDING ON MAIN STREET AND 160TH AVENUE EAST DUE TO INADEQUATE CONVEYANCE.



**Figure CIP-24
East Main Street/160th
Avenue E Improvements**

MATCHLINE SEE FIGURE CIP-25B



IMPROVEMENTS:

- INSTALL APPROX 140 LF 12" DIA SD PIPE
- INSTALL APPROX 900 LF 24" DIA SD PIPE
- INSTALL APPROX 300 LF 30" DIA SD PIPE
- INSTALL 4 TYPE I CB
- INSTALL 5 - 48" TYPE II CB

OBJECTIVE:

ELIMINATE PONDING DUE TO INADEQUATE CONVEYANCE ALONG POOLE ROAD NORTH OF MAIN STREET.

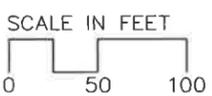
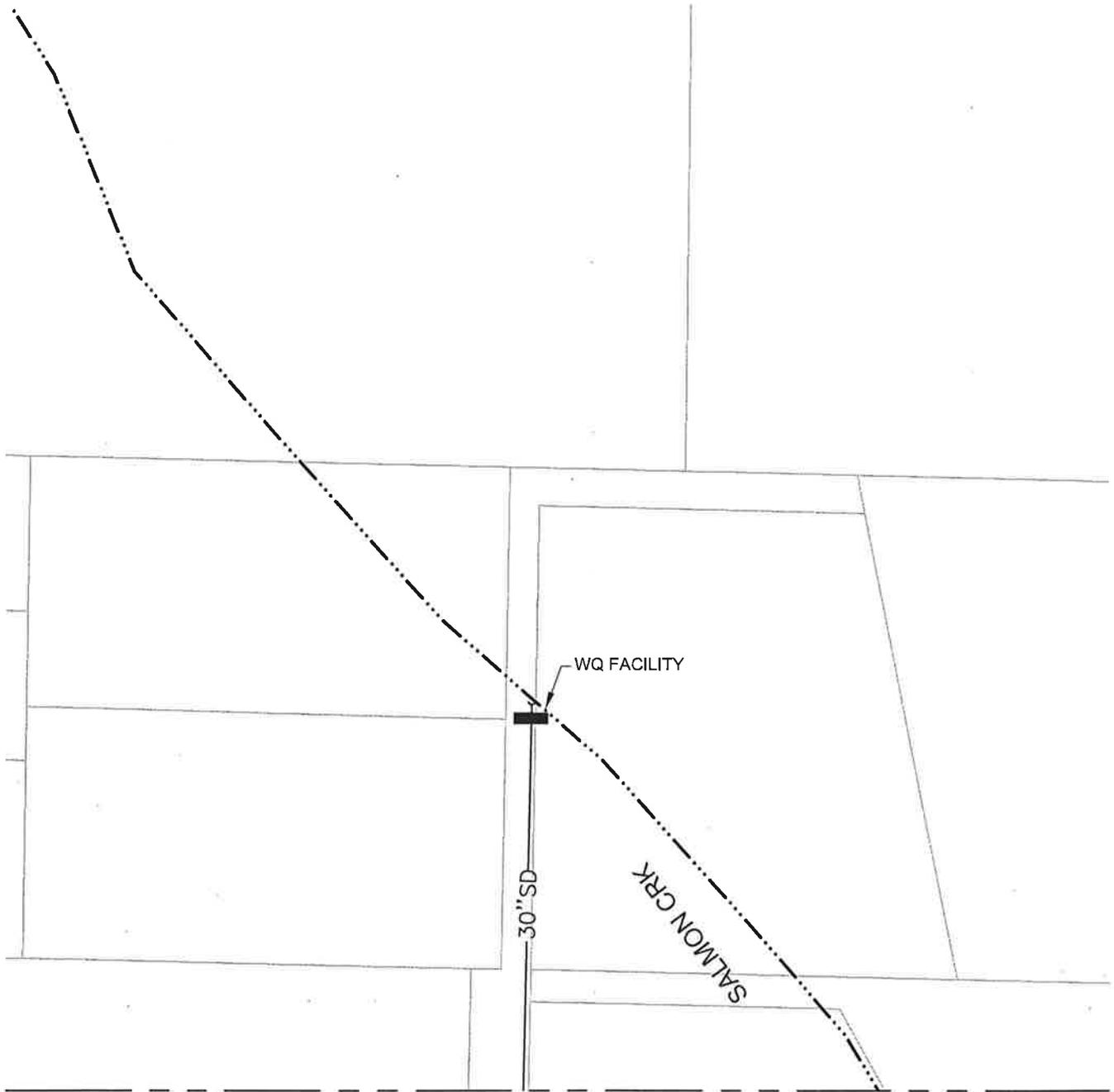


Figure CIP-25A
Poole Road Outfall
Improvements



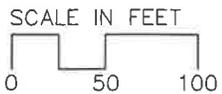
MATCHLINE SEE FIGURE CIP-25A

IMPROVEMENTS:

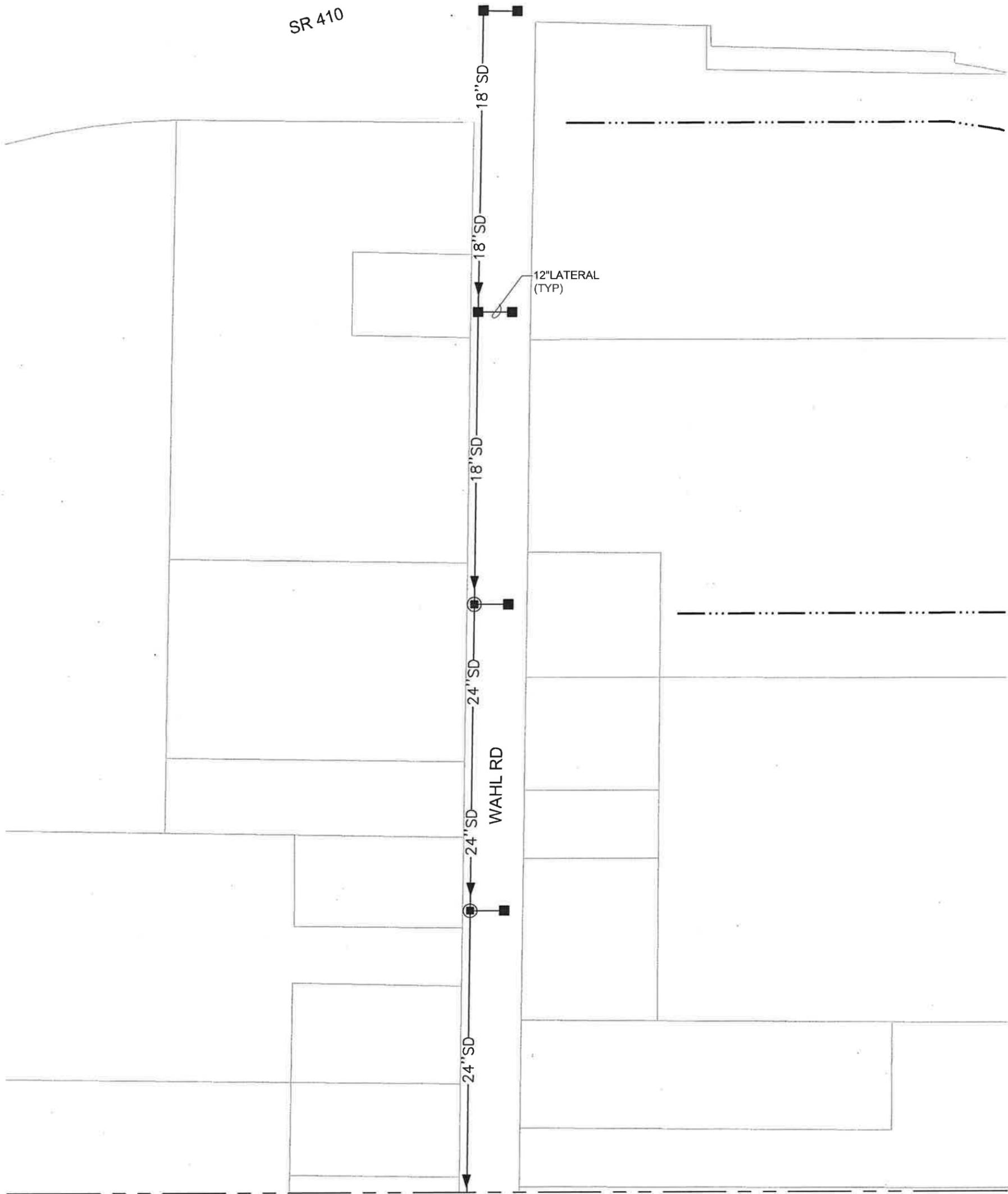
INSTALL APPROX 270 LF 30" DIA SD PIPE
 INSTALL WQ FACILITY PRIOR TO OUTFALL

OBJECTIVE:

ELIMINATE PONDING DUE TO INADEQUATE
 CONVEYANCE ALONG POOLE RD N OF MAIN.



**Figure CIP-25B
 Poole Road Outfall
 Improvements**



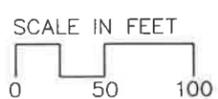
MATCHLINE SEE FIGURE CIP-26B

IMPROVEMENTS:

- INSTALL APPROX 140 LF 12" DIA SD PIPE
- INSTALL APPROX 600 LF 18" DIA SD PIPE
- INSTALL APPROX 600 LF 24" DIA SD PIPE
- INSTALL 6 TYPE I CB
- INSTALL 2 - 48" TYPE II CB

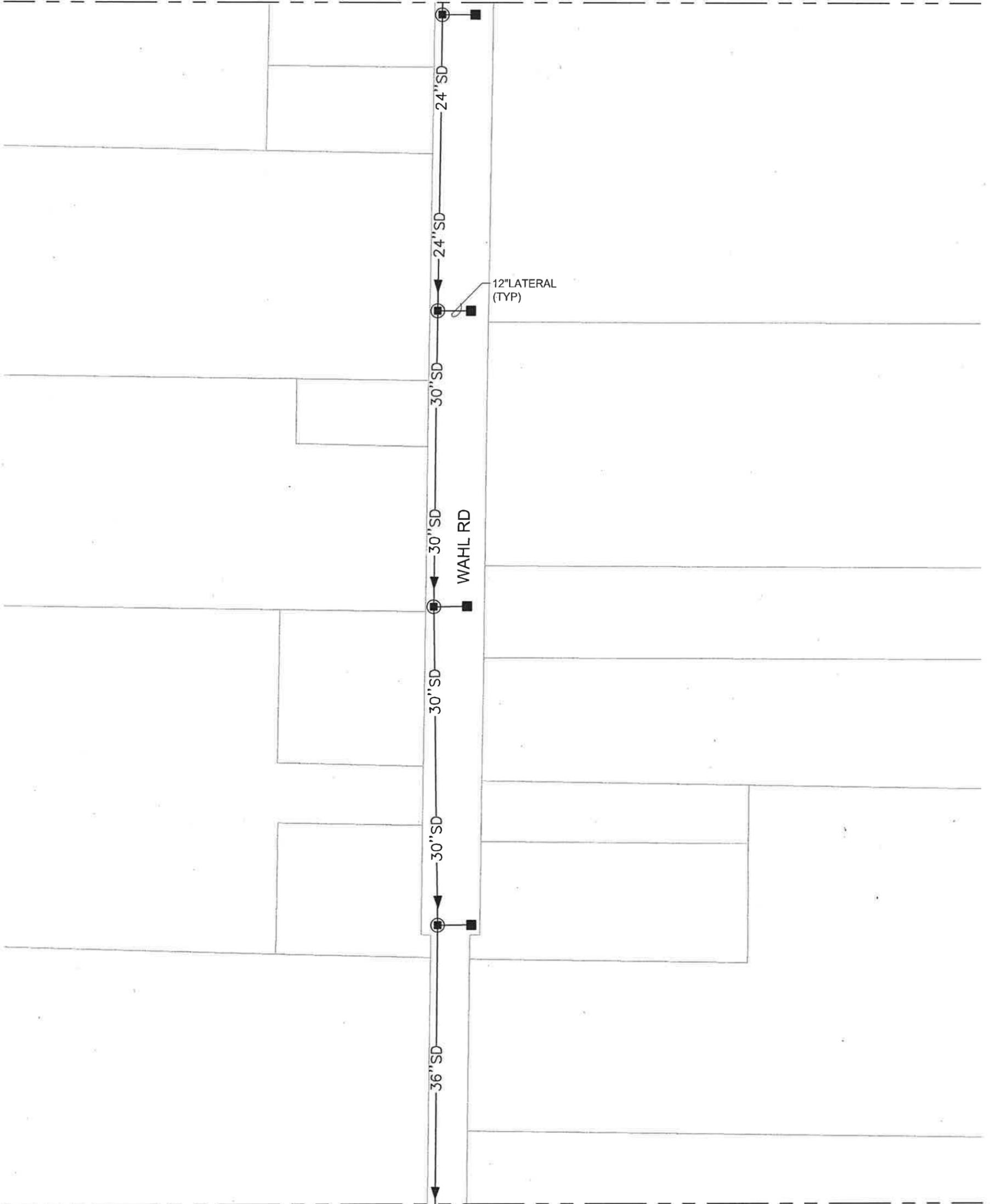
OBJECTIVE:

- ALLEVIATE FLOODING ON WAHL ROAD. REDUCE SURCHARGE IN EXISTING 36" CULVERT UNDER SR-410.
- REDUCE SURCHARGE IN SALMON CREEK NORTH OF SR-410.



**Figure CIP-26A
Wahl Road Interceptor**

MATCHLINE SEE FIGURE CIP-26A



MATCHLINE SEE FIGURE CIP-26C

IMPROVEMENTS:

- INSTALL APPROX 140 LF 12" DIA SD PIPE
- INSTALL APPROX 300 LF 24" DIA SD PIPE
- INSTALL APPROX 620 LF 30" DIA SD PIPE
- INSTALL APPROX 300 LF 36" DIA SD PIPE
- INSTALL 4 TYPE I CB
- INSTALL 4 - 48" TYPE II CB

OBJECTIVE:

- ALLEVIATE FLOODING ON WAHL ROAD. REDUCE SURCHARGE IN EXISTING 36" CULVERT UNDER SR-410.
- REDUCE SURCHARGE IN SALMON CREEK NORTH OF SR-410.

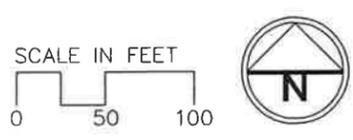


Figure CIP 26-B
Wahl Road Interceptor

MATCHLINE SEE FIGURE CIP-26B

MATCHLINE SEE FIGURE CIP-26E



MATCHLINE SEE FIGURE CIP-26D

IMPROVEMENTS:

- INSTALL APPROX 140 LF 12" DIA SD PIPE
- INSTALL APPROX 300 LF 18" DIA SD PIPE
- INSTALL APPROX 310 LF 24" DIA SD PIPE
- INSTALL APPROX 660 LF 36" DIA SD PIPE
- INSTALL APPROX 600 LF 48" DIA SD PIPE
- INSTALL 4 TYPE I CB
- INSTALL 4 - 48" TYPE II CB
- INSTALL 3 - 60" TYPE II CB

OBJECTIVE:

- ALLEVIATE FLOODING ON WAHL ROAD. REDUCE SURCHARGE IN EXISTING 36" CULVERT UNDER SR-410.
- REDUCE SURCHARGE IN SALMON CREEK NORTH OF SR-410.

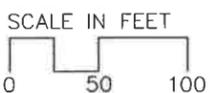
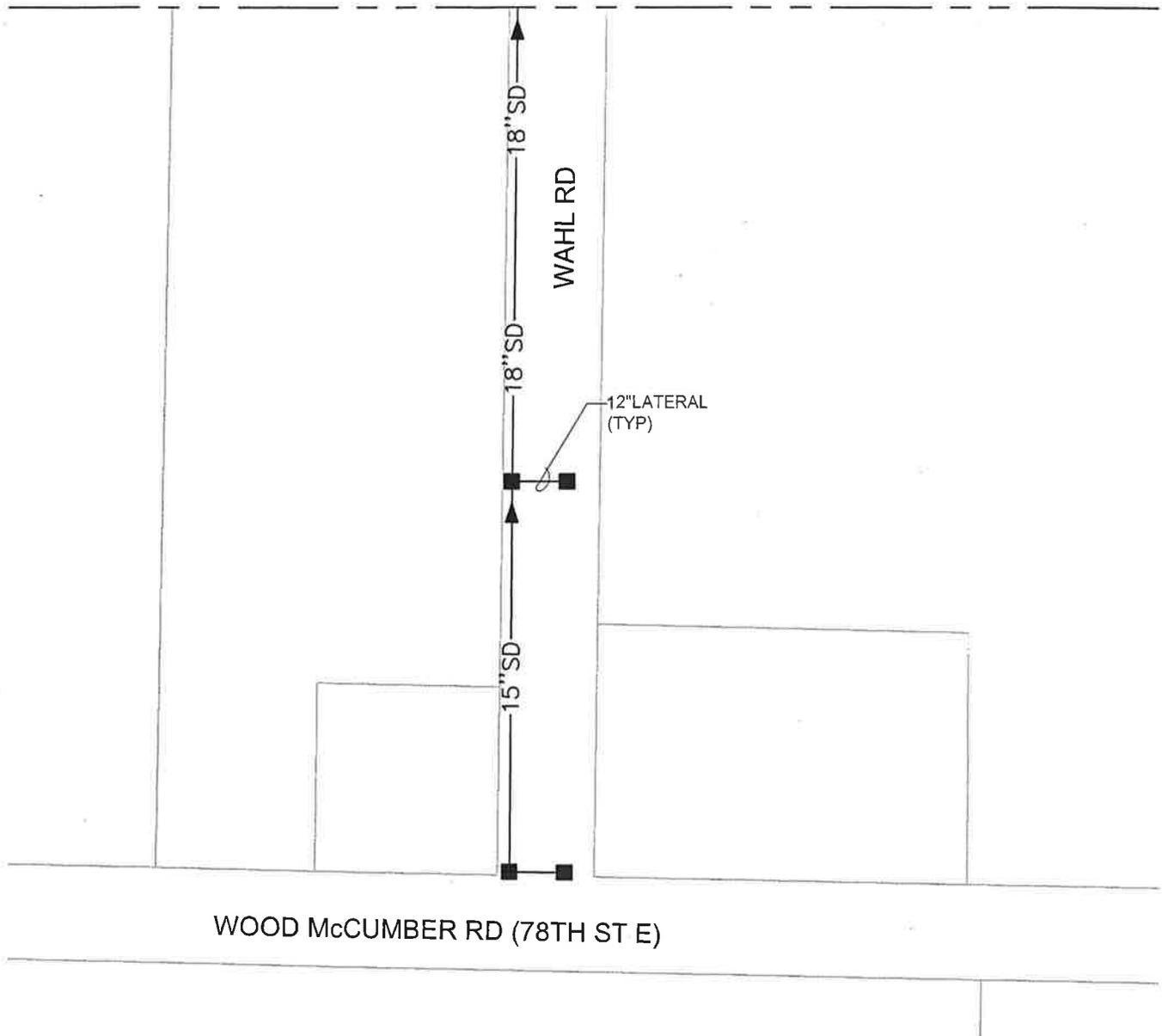


Figure CIP-26C
Wahl Road Interceptor

MATCHLINE SEE FIGURE CIP-21C



IMPROVEMENTS:

INSTALL APPROX 70 LF 12" DIA SD PIPE
INSTALL APPROX 250 LF 15" DIA SD PIPE
INSTALL APPROX 300 LF 18" DIA SD PIPE
INSTALL 4 TYPE I CB

OBJECTIVE:

ALLEVIATE FLOODING ON WAHL ROAD. REDUCE SURCHARGE IN EXISTING 36" CULVERT UNDER SR-410.
REDUCE SURCHARGE IN SALMON CREEK NORTH OF SR-410.

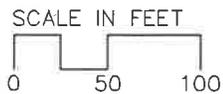
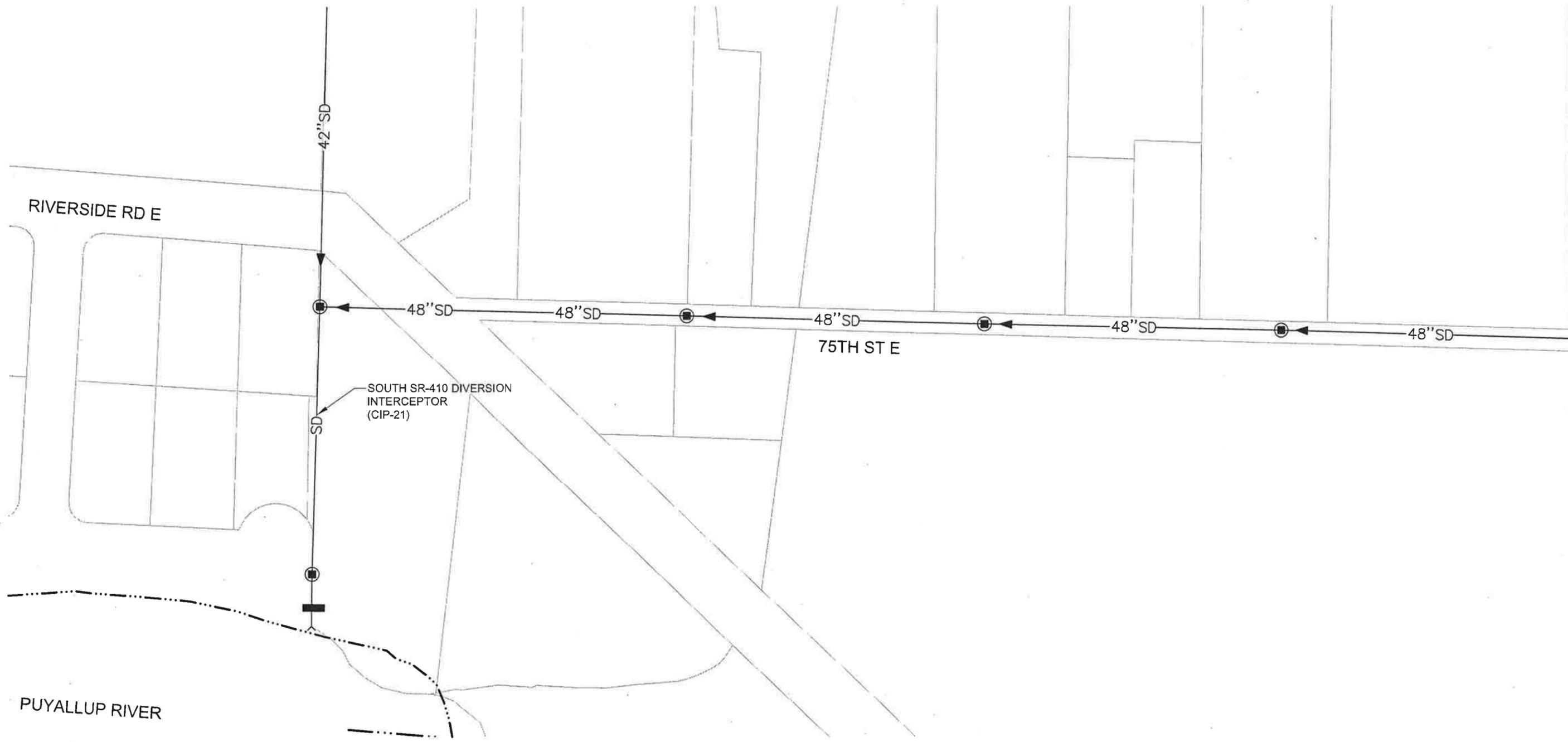


Figure CIP-26D
Wahl Road Interceptor



IMPROVEMENTS:

INSTALL APPROX 1270 LF 48" DIA SD PIPE
 INSTALL 4 - 60" TYPE II CB

OBJECTIVE:

ALLEVIATE FLOODING ON WAHL ROAD. REDUCE SURCHARGE IN EXISTING 36" CULVERT UNDER SR-410. REDUCE SURCHARGE IN SALMON CREEK NORTH OF SR-410.

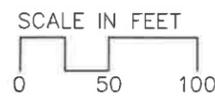


Figure CIP-26E
 Wahl Road Interceptor



IMPROVEMENTS:

INSTALL APPROX 240 LF 12" DIA SD PIPE
 INSTALL 12 TYPE I CB

OBJECTIVE:

REPLACE CATCH BASINS AND LATERALS
 DURING STREET RECONSTRUCTION TO
 IMPROVE SURFACE DRAINAGE.

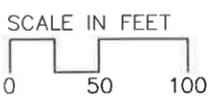
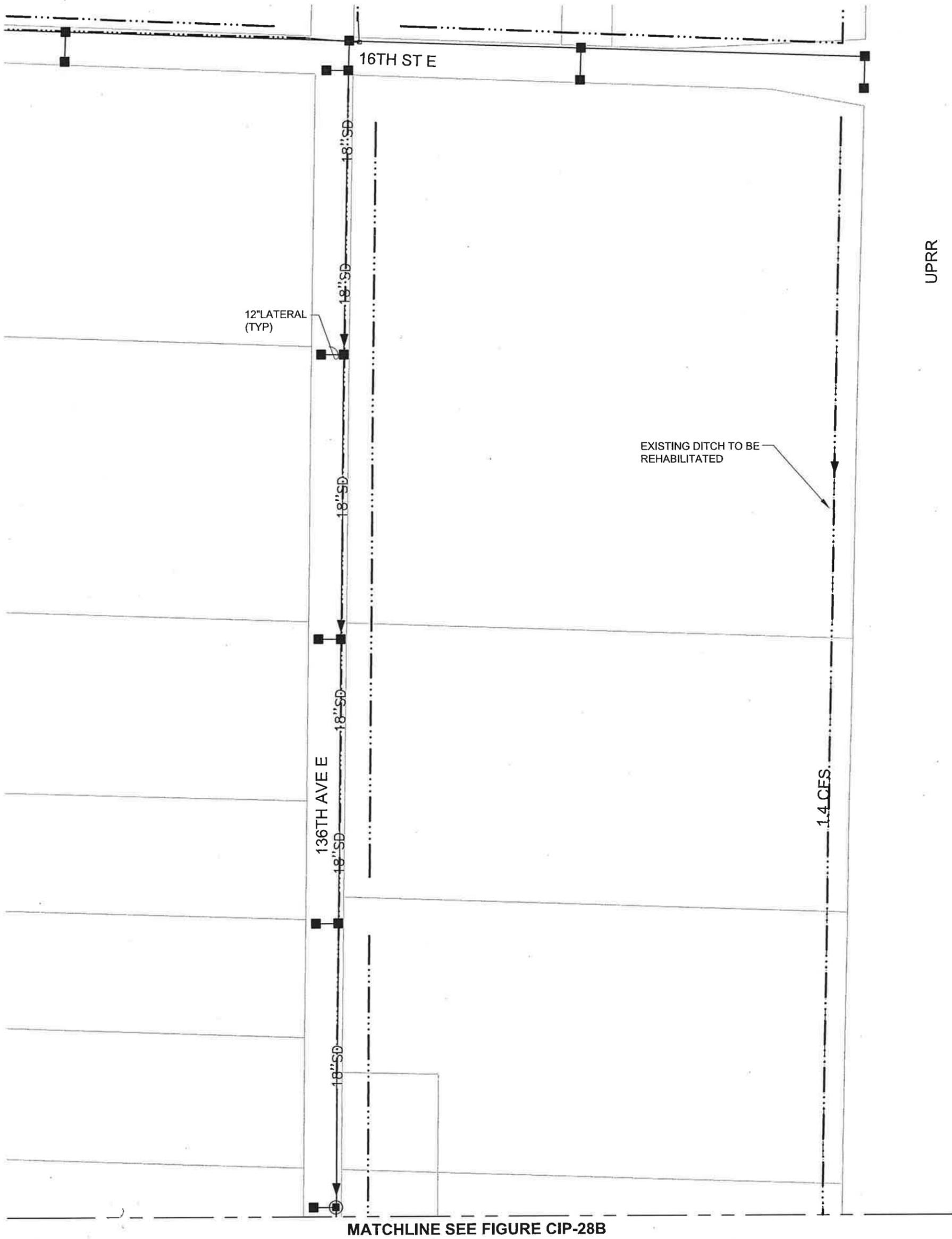


Figure CIP-27
South Parker Road
Improvements



IMPROVEMENTS:

- REMOVE APPROX 460 LF EX 12" DIA SD PIPE
- INSTALL APPROX 175 LF 12" DIA SD PIPE
- INSTALL APPROX 1200 LF 18" DIA SD PIPE
- INSTALL 9 TYPE I CB
- INSTALL 1 - 48" TYPE II CB
- REHABILITATE APPROX 1150 LF EX DITCHLINE

OBJECTIVE:

ELIMINATE PONDING ON 136TH AVENUE E AND 24TH STREET E DUE TO INADEQUATE CONVEYANCE.

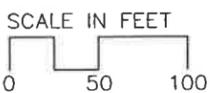
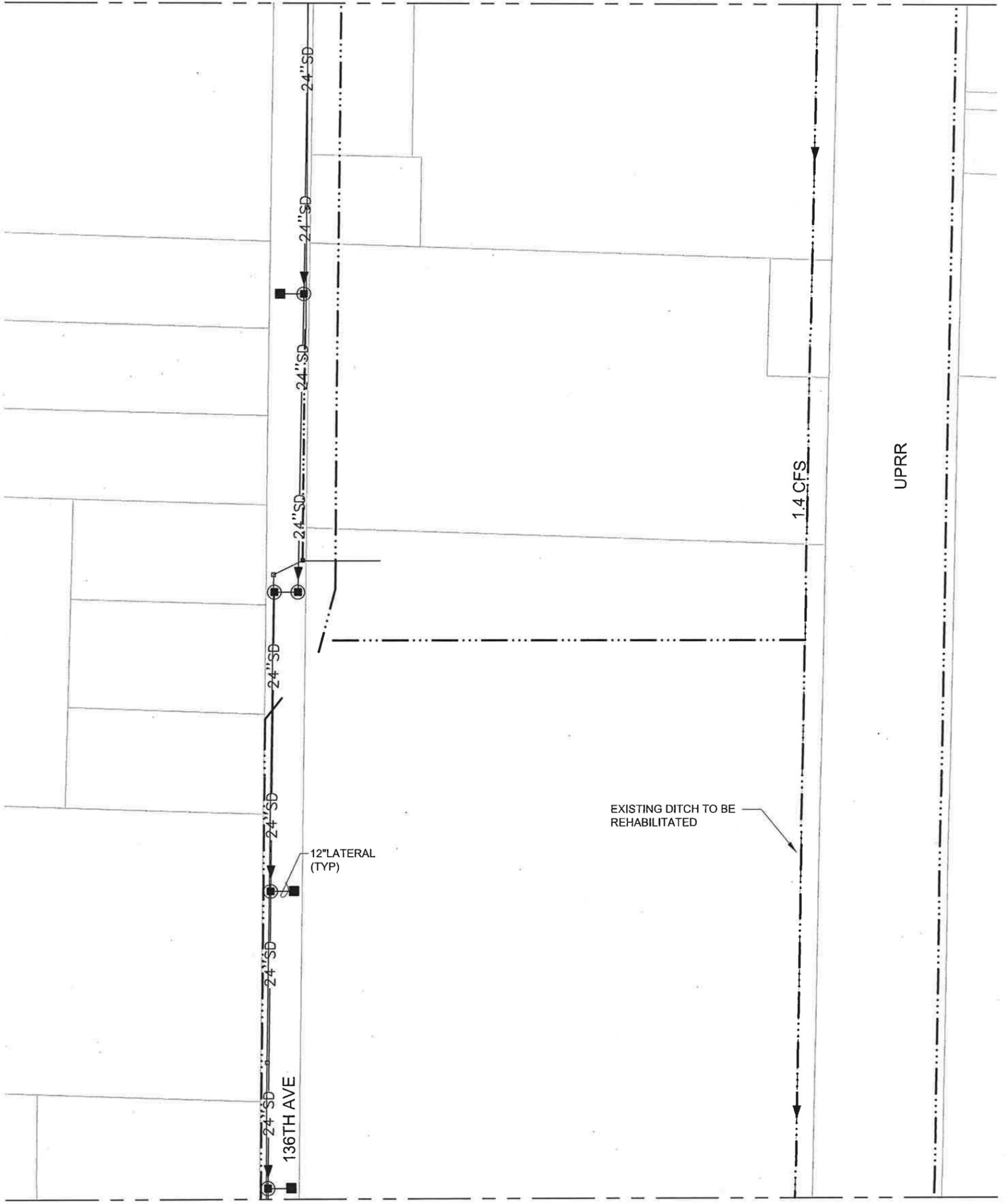


Figure CIP-28A
136th Avenue E
Improvements

MATCHLINE SEE FIGURE CIP-28A



MATCHLINE SEE FIGURE CIP-28C

IMPROVEMENTS:

- REMOVE APPROX 855 LF EX 18" SD PIPE
- INSTALL APPROX 105 LF 12" DIA SD PIPE
- INSTALL APPROX 1220 LF 24" DIA SD PIPE
- INSTALL 3 TYPE I CB
- INSTALL 5 - 48" TYPE II CB
- REHABILITATE APPROX 1200 LF EX DITCHLINE

OBJECTIVE:

ELIMINATE PONDING ON 136TH AVENUE E AND 24TH STREET E DUE TO INADEQUATE CONVEYANCE.

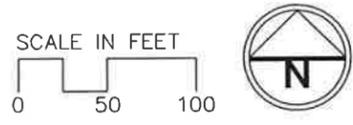


Figure CIP-28B
136th Avenue E
Improvements

MATCHLINE SEE FIGURE CIP-28B



IMPROVEMENTS:

- REMOVE APPROX 350 LF EX 18" SD PIPE
- INSTALL APPROX 35 LF 12" DIA SD PIPE
- INSTALL APPROX 350 LF 24" DIA SD PIPE
- INSTALL 1 TYPE I CB
- INSTALL 1 - 48" TYPE II CB
- REHABILITATE APPROX 355 LF EX DITCHLINE

OBJECTIVE:

ELIMINATE PONDING ON 136TH AVENUE E AND 24TH STREET E
DUE TO INADEQUATE CONVEYANCE.

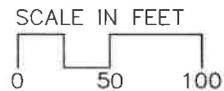
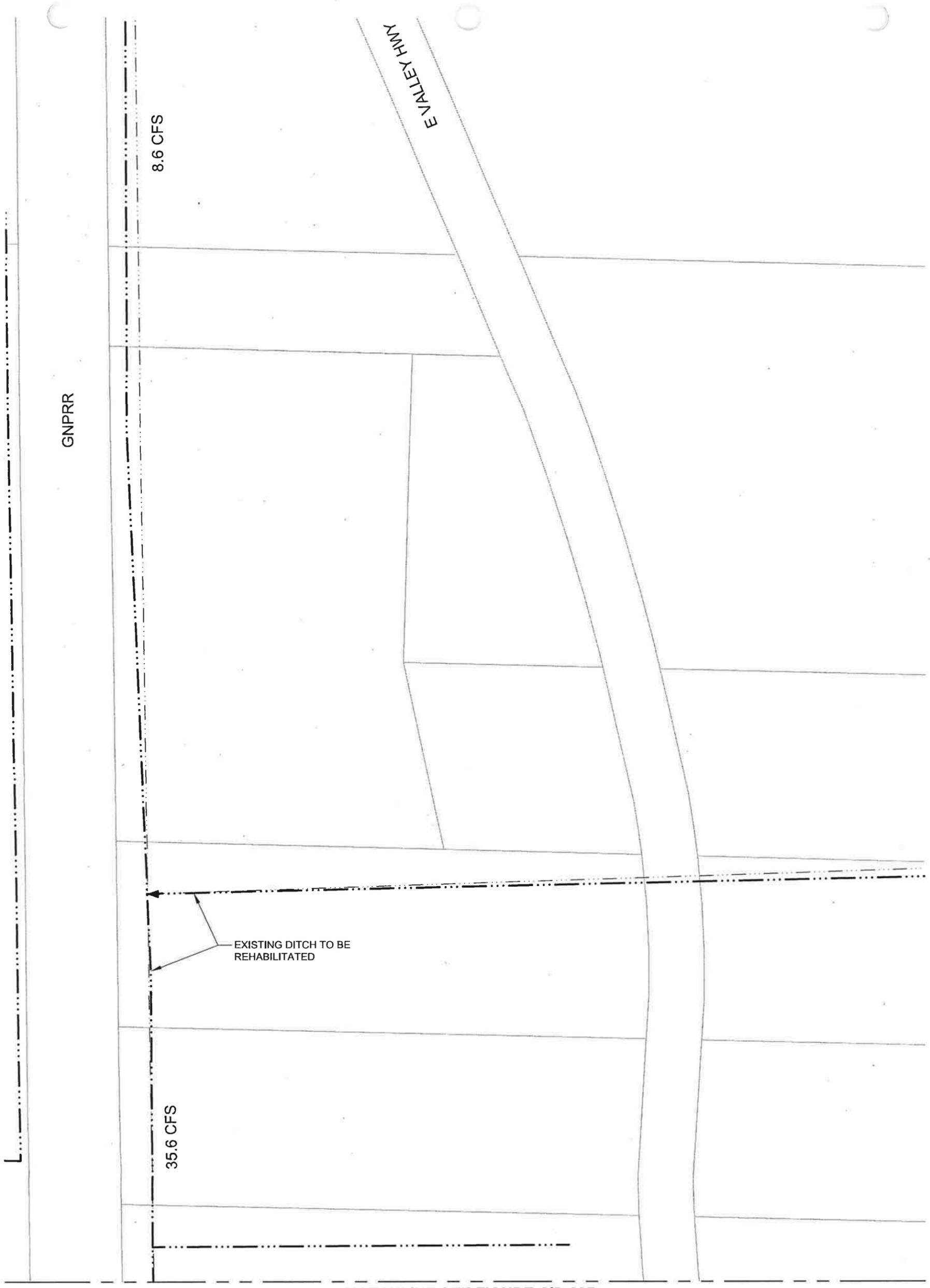


Figure CIP-28C
136th Avenue E
Improvements



MATCHLINE SEE FIGURE CIP-29B

IMPROVEMENTS:

REHABILITATE APPROX 2220 LF EX DITCHLINE

OBJECTIVE:

ALLEVIATE FLOODING ALONG UPRR DUE TO UNMAINTAINED DRAINAGE CHANNELS AND ALONG 148TH DUE TO LACK OF CONVEYANCE.

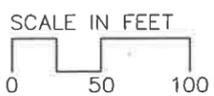
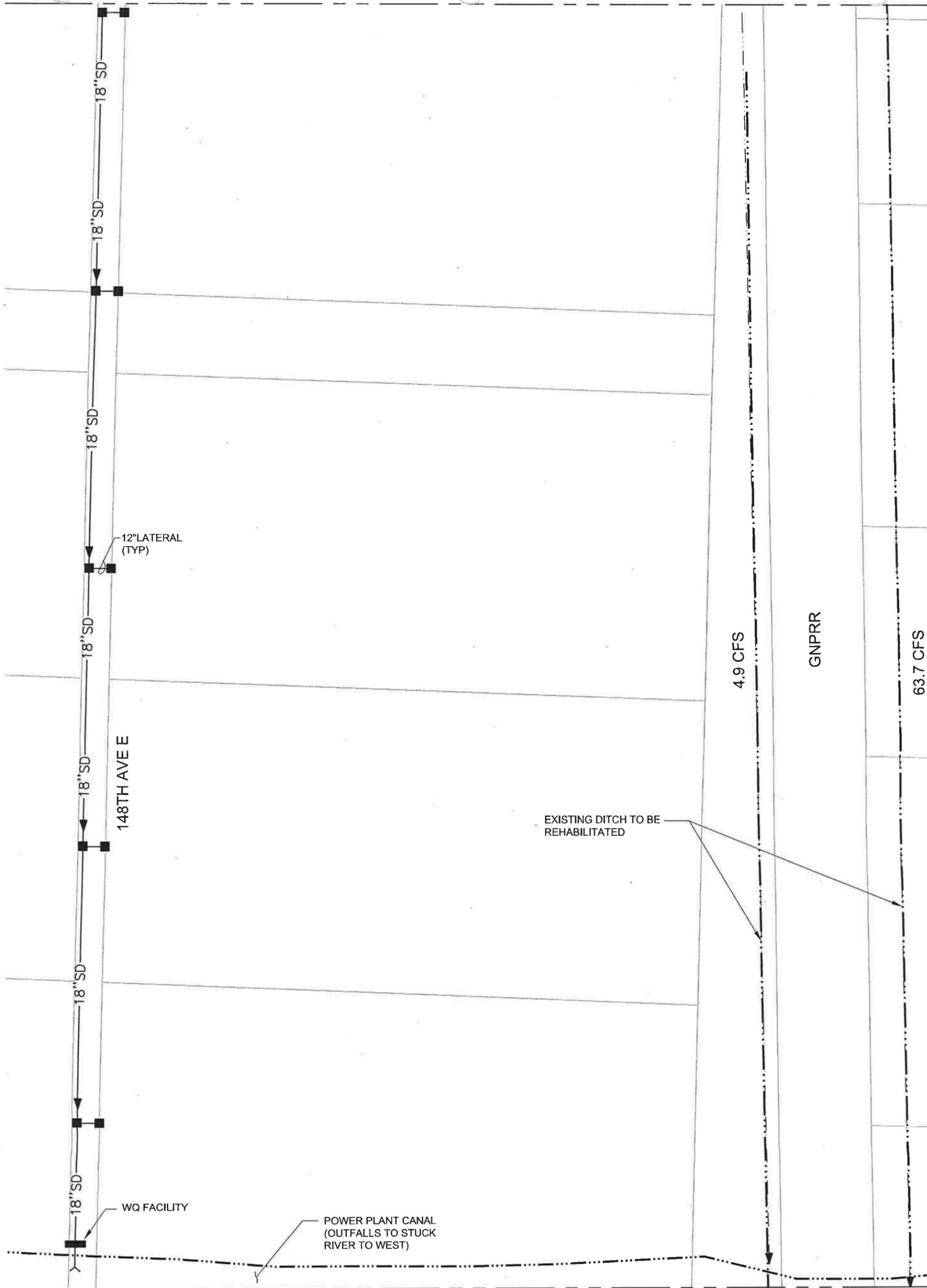


Figure CIP-29A
Puget Sound Power and
Light Canal Drainage



12" LATERAL (TYP)

148TH AVE E

WQ FACILITY

POWER PLANT CANAL (OUTFALLS TO STUCK RIVER TO WEST)

EXISTING DITCH TO BE REHABILITATED

4.9 CFS

GNP RR

63.7 CFS

MATCHLINE SEE FIGURE CIP-29C

IMPROVEMENTS:

- INSTALL APPROX 150 LF 12" DIA SD PIPE
- INSTALL APPROX 1360 LF 18" DIA SD PIPE
- INSTALL 10 TYPE I CB
- REHABILITATE APPROX 2720 LF EX DITCHLINE
- INSTALL WQ TREATMENT PRIOR TO OUTFALL

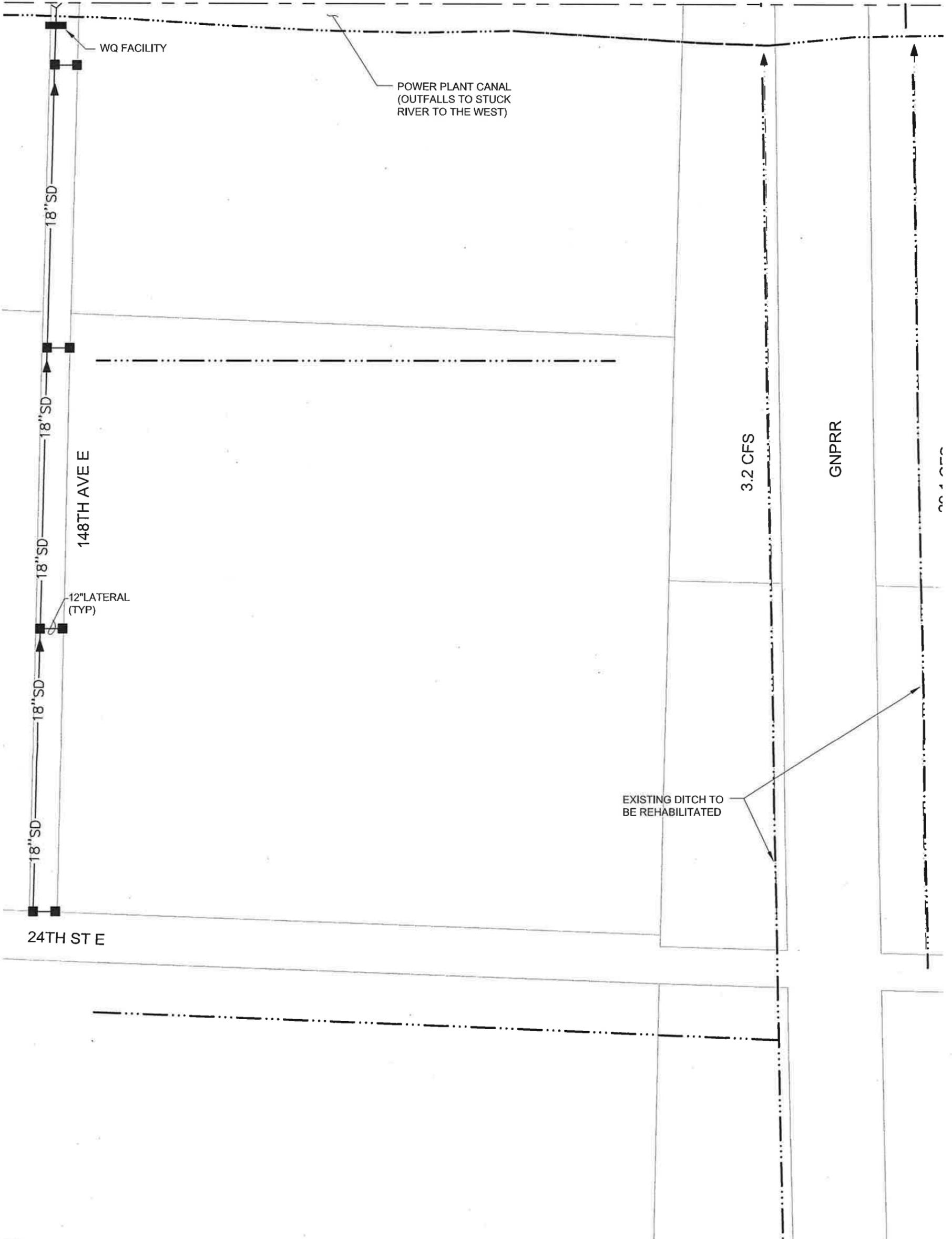
OBJECTIVE:

ALLEVIATE FLOODING ALONG UPRR DUE TO UNMAINTAINED DRAINAGE CHANNELS AND ALONG 148TH DUE TO LACK OF CONVEYANCE.



**Figure CIP-29B
Puget Sound Power and
Light Canal Drainage**

MATCHLINE SEE FIGURE CIP-29B

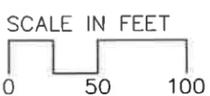


IMPROVEMENTS:

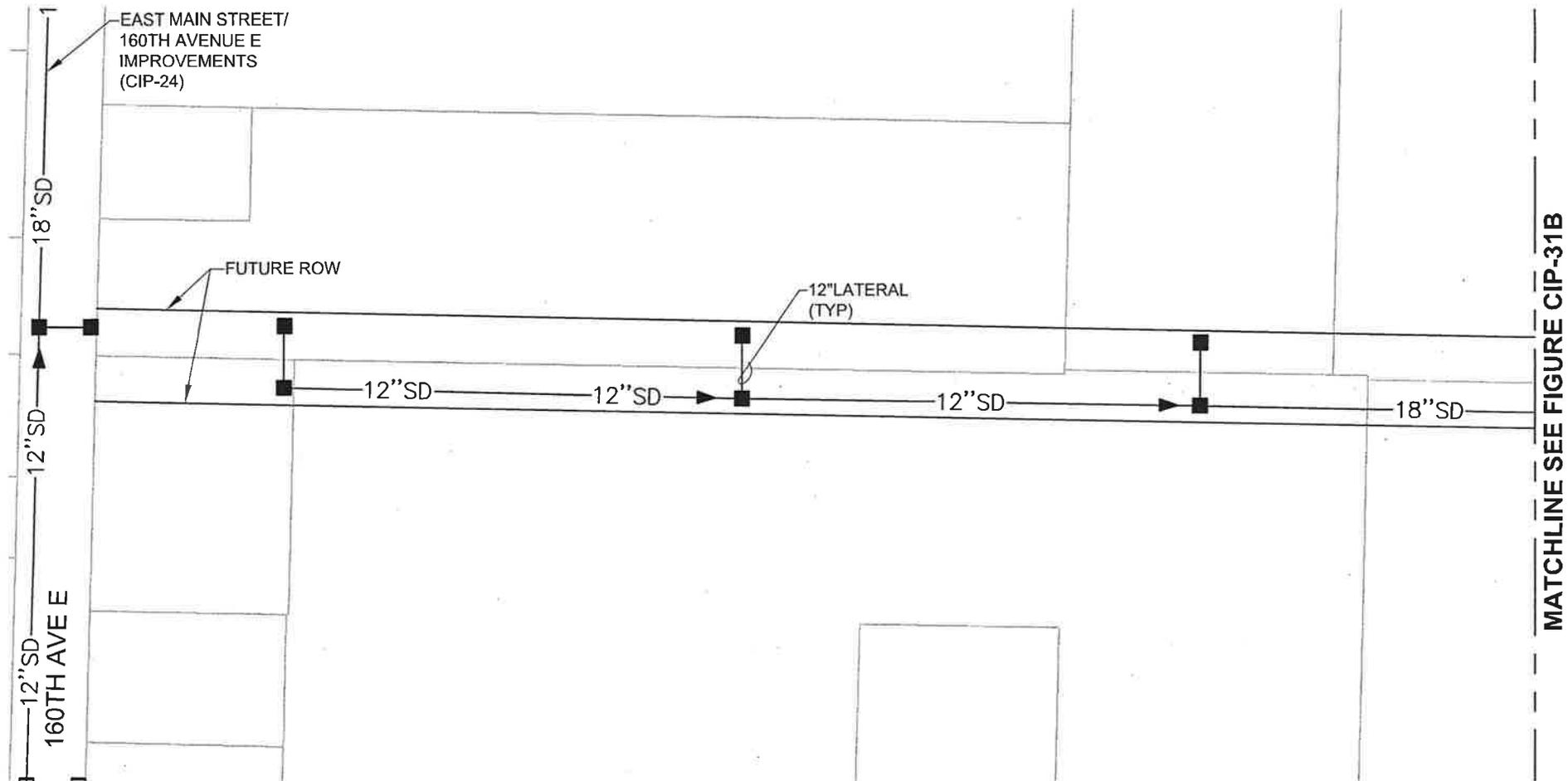
- INSTALL APPROX 120 LF 12" DIA SD PIPE
- INSTALL APPROX 960 LF 18" DIA SD PIPE
- INSTALL 8 TYPE I CB
- REHABILITATE APPROX 1920 LF EX DITCHLINE
- INSTALL WQ TREATMENT PRIOR TO OUTFALL

OBJECTIVE:

ALLEVIATE FLOODING ALONG UPRR DUE TO UNMAINTAINED DRAINAGE CHANNELS AND ALONG 148TH DUE TO LACK OF CONVEYANCE.



**Figure CIP-29C
Puget Sound Power and
Light Canal Drainage**

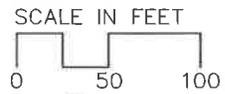


IMPROVEMENTS:

- INSTALL APPROX 705 LF 12" DIA SD PIPE
- INSTALL APPROX 215 LF 18" DIA SD PIPE
- INSTALL 6 TYPE I CB

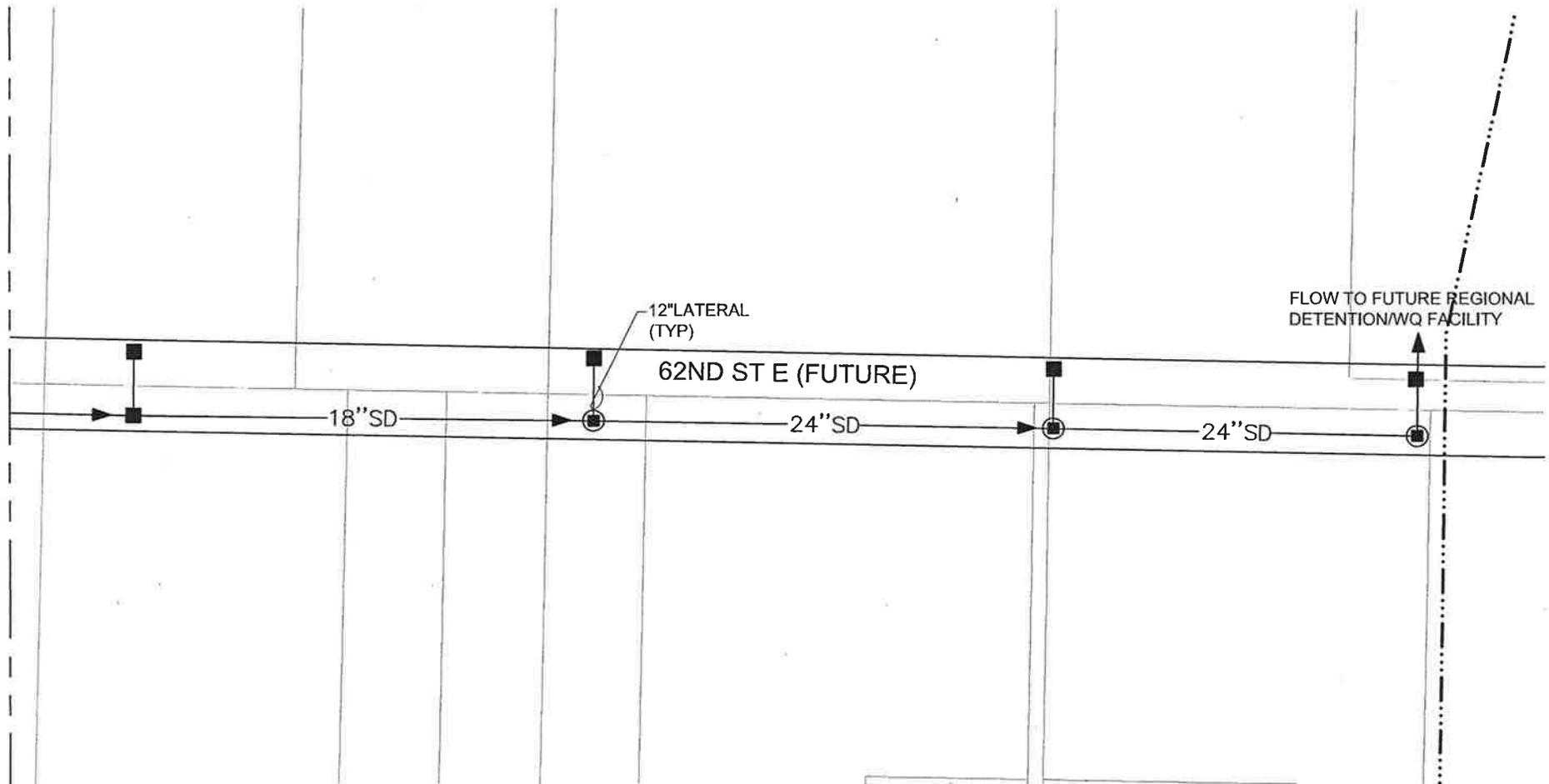
OBJECTIVE:

PROVIDE STORMWATER INFRASTRUCTURE FOR FUTURE 62ND STREET E EXTENSION.



**Figure CIP-31A
62nd Street E**

MATCHLINE SEE FIGURE CIP-31A



IMPROVEMENTS:

- INSTALL APPROX 140 LF 12" DIA SD PIPE
- INSTALL APPROX 380 LF 18" DIA SD PIPE
- INSTALL APPROX 540 LF 24" DIA SD PIPE
- INSTALL 5 TYPE I CB
- INSTALL 3 - 48" TYPE II CB

OBJECTIVE:

PROVIDE STORMWATER INFRASTRUCTURE FOR FUTURE 62ND STREET E EXTENSION.

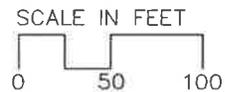


Figure CIP-31B
62nd Street E

APPENDIX B
Recommended Capital Improvement Project
Preliminary Cost Opinions

**CITY OF SUMNER
Capital Improvement Plan Schedule**

Project No. - Description	Project Priority	Total Cost Year 2010 (\$)	HIGH					MEDIUM					LOW
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 - 2030
Projected ENR Construction Cost Index for Seattle		8714	9,135	9,313	9,491	9,669	9,847	10,025	10,203	10,381	10,559	10,737	11,716
Capital Improvement Projects													
CIP No. 1 - Alder Avenue High Flow Bypass	LOW	\$5,566,000											\$7,483,700
CIP No. 2 - Gary Street Improvements	HIGH	\$291,000				\$322,900							
CIP No. 4 - Railroad Street Improvements	LOW	\$80,000											\$107,600
CIP No. 6 - River Street Improvements	LOW	\$179,000											\$240,700
CIP No. 7 - 151st Avenue E & 152nd Avenue E Improvements	HIGH	\$408,000				\$452,800							
CIP No. 8 - 63rd Street Ct E Improvements	HIGH	\$485,000					\$548,100						
CIP No. 10 - 64th Street E Outfall Improvements	HIGH	\$196,000	\$205,500										
CIP No. 11 - South 160th Avenue E Improvements	HIGH	\$107,000				\$118,800							
CIP No. 12 - North 160th Avenue E Improvements	HIGH	\$293,000			\$319,200								
CIP No. 13 - Elm Street Interceptor	HIGH	\$278,000			\$302,800								
CIP No. 14 - N Parker Road Improvements	HIGH	\$184,000			\$200,500								
CIP No. 15 - Parker Road Improvements	HIGH	\$335,000			\$364,900								
CIP No. 17 - Main Street Improvements	LOW	\$169,000											\$227,300
CIP No. 18 - Willow Street Interceptor & Tributary Improvements	HIGH	\$1,195,000					\$1,350,400						
CIP No. 19 - Puyallup Street Outfall Improvements	HIGH	\$1,803,000					\$2,037,500						
CIP No. 21 - South SR-410 Diversion Interceptor	LOW	\$11,641,000											\$15,651,800
CIP No. 22 - Meade McCumber Street Improvements	LOW	\$146,000											\$196,400
CIP No. 24 - E Main Street / 160th Avenue E Improvements	HIGH	\$251,000			\$273,400								
CIP No. 25 - Poole Road Outfall Improvements	HIGH	\$402,000		\$429,700									
CIP No. 26 - Wahl Road Interceptor	LOW	\$1,424,000											\$1,914,700
CIP No. 27 - South Parker Rd Improvements	HIGH	\$77,000			\$83,900								
CIP No. 28 - 136th Avenue E Improvements	HIGH	\$726,000		\$776,000									
CIP No. 29 - Puget Sound Power & Light Canal Drainage	LOW	\$591,000											\$794,700
CIP No. 31 - 62nd Street East	HIGH	\$244,000			\$265,800								
CIP No. 33 - REI / Railroad Culvert Improvements (CEG Sites A, B)	LOW	\$207,000											\$278,400
CIP No. 34 - Parker Road Culvert Improvements (CEG Site C)	HIGH	\$84,000	\$88,100										
CIP No. 35 - Puyallup Watershed Access Culvert Improvements (CEG Site D)	HIGH	\$76,000	\$79,700										
CIP No. 36 - 47th Street Ct E Culvert Improvements (CEG Site E)	HIGH	\$75,000		\$80,200									
CIP No. 37 - 160th Avenue E Culvert Improvements (CEG Sites F, G, H, I, 106th Ave. E.)	HIGH	\$667,000			\$726,500								
CIP No. 38 - 162nd Avenue E Culvert Improvements (CEG Sites J, K, L)	HIGH	\$183,000				\$203,100							
CIP No. 39 - E Main Street Culvert Improvements (CEG Site M)	HIGH	\$28,000					\$31,700						
CIP No. 40 - Salmon Creek Restoration (incorporates CEG Sites N, O)	HIGH	\$291,000				\$322,900							
CIP No. 41 - 64th Street E Culvert Improvements	HIGH	\$350,000			\$381,300								
CIP No. 43 - East Valley Highway Improvements - Detention Pond w/Bioswale	HIGH	\$2,063,000		\$1,102,500	\$1,123,500								
CIP No. 44 - East Valley Highway Improvements	HIGH	\$934,000	\$240,000	\$370,900	\$378,000								
CIP No. 45 - West Valley Highway Improvements - Detention Pond w/Bioswale	LOW	\$534,000											\$718,000
CIP No. 46 - 16th Street E Improvements	LOW	\$472,000											\$634,700
CIP No. 47 - White River Levee Improvements	HIGH	\$2,988,000			\$3,254,500								
CIP No. 49 - Golf Course Culvert Improvements	HIGH	\$247,000	\$259,000										
CIP No. 50 - Development Rights Relinquished by City	HIGH	\$1,524,600		\$1,629,500									

**CITY OF SUMNER
Capital Improvement Plan Schedule**

Project No. - Description	Project Priority	Total Cost Year 2010 (\$)	HIGH					MEDIUM				LOW	
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 - 2030
Projected ENR Construction Cost Index for Seattle		8714	9,135	9,313	9,491	9,669	9,847	10,025	10,203	10,381	10,559	10,737	11,716
CIP No. 51 - 24th Street Setback Levee	HIGH; LOW	\$16,000,000			\$450,000								\$20,907,600
CIP No. 52 - Number 9 Ditch and Forest Canyon Class III Habitat Improvements	LOW	\$651,000											\$875,300
CIP No. 53 - Rivergrove Puyallup River Improvements	HIGH	\$12,268,000	\$3,215,300	\$3,277,900	\$3,340,600	\$3,403,200							
SITE A.2 - 48-Inch Outfall Water Quality Facility	HIGH	\$1,633,000			\$1,778,700								
SITE D - Stormwater mitigation site	HIGH	\$1,466,000		\$1,566,800									
SITE J - Water Quality Treatment	MED	\$383,000					\$440,700						
TOTAL - CAPITAL ASSET FUNDS (Includes inflation) (City Funded Only - Exclude Developer or LID Funded Projects)		\$70,195,600	\$4,087,600	\$9,233,500	\$13,243,600	\$4,823,700	\$3,967,700	\$440,700	\$0	\$0	\$0	\$0	\$50,030,900

Notes:

1. Priority for implementation based on the following:

- High Priority: construction in 0 - 5 years
- Medium Priority: construction in 6 - 10 years
- Low Priority: construction in 11 - 20 years

2. The following projects were identified in the 2004 Draft Plan but are no longer carried forward as a CIP as noted below:

- CIP 3, 42-Inch Puyallup River Outfall Improvements - Completed
- CIP 5, Sessler Outfall High Flow Bypass - Completed
- CIP 9, Bock Avenue Improvements - Completed
- CIP 16, Elm Street Outfall Improvements - Completed
- CIP 20, Valley Avenue East Improvements - Completed
- CIP 23, 64th Street East Improvements - Completed
- CIP 30, Zehnder Street Improvements - Completed
- CIP 32, Valley Avenue Improvements - Completed
- CIP 42, 8th Street East Corridor Improvements - to be completed in 2010
- CIP 48, Milwaukee Ditch Regional Facility - to be completed in 2010
- Site A.1, 42-inch Outfall Water Quality Facility - to be completed in 2010
- Site C - no longer carried forward due to technical or other factors
- Site E - no longer carried forward due to technical or other factors
- Site H - no longer carried forward due to technical or other factors
- Site I - no longer carried forward due to technical or other factors

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:		CIP No. 1 - Alder Avenue High Flow Bypass			
Prepared By:		AJP; NM			
Checked by:		JLC			
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$135,000.00	\$135,000.00
2	20	DAY	Traffic Control	\$700.00	\$14,000.00
3	1	LS	Trench Safety	\$28,000.00	\$28,000.00
4	1	LS	Erosion/Sedimentation Control	\$1,500.00	\$1,500.00
5	100	LF	Saw Cutting	\$2.50	\$250.00
6	10	CY	CSTC	\$30.00	\$300.00
7	16	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$1,360.00
8	100	LF	Schedule A Storm Sewer Pipe, 36-Inch Diam.	\$100.00	\$10,000.00
9	1	EA	Butterfly Valve, 36-inch Diam.	\$5,000.00	\$5,000.00
10	1	EA	25,000 gpm Pump Station	\$2,500,000.00	\$2,500,000.00
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
				Subtotal =	\$2,695,410
			Contingency	30.0%	\$808,623
			Sales Tax	9.3%	\$250,673
			Planning Level Construction Cost =		\$3,754,700
			Administration	5.0%	\$187,735
			Engineering/Construction Management	25.0%	\$938,675
	7642	Seattle CCI (April 2003)	TOTAL (2003 \$) =		\$4,881,000
	8761	Seattle CCI (August 2008)	TOTAL (2008 \$) =		\$5,596,000
	8714	Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$5,566,000

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project:	CIP No. 2 - Gary Street Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$7,000.00	\$7,000.00
2	13	DAY	Traffic Control	\$560.00	\$7,280.00
3	1	LS	Trench Safety	\$1,500.00	\$1,500.00
4	1	LS	Erosion/Sedimentation Control	\$750.00	\$750.00
5	2000	LF	Saw Cutting	\$2.50	\$5,000.00
6	191	CY	CSTC	\$30.00	\$5,730.00
7	299	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$25,415.00
8	1415	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$49,525.00
9	515	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$23,175.00
10	12	EA	Catch Basin Type I	\$950.00	\$11,400.00
11	1	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$3,500.00
12					
13					
14					
15					
16					
17					
18					
19					
20					
				Subtotal =	\$140,275
			Contingency	30.0%	\$42,083
			Sales Tax	9.3%	\$13,046
			Planning Level Construction Cost =		\$195,400
			Administration	5.0%	\$9,770
			Engineering/Construction Management	25.0%	\$48,850
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$254,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$292,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$291,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 4 - Railroad Street Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$1,900.00	\$1,900.00
2	3	DAY	Traffic Control	\$560.00	\$1,680.00
3	1	LS	Trench Safety	\$1,000.00	\$1,000.00
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500.00
5	450	LF	Saw Cutting	\$2.50	\$1,125.00
6	43	CY	CSTC	\$30.00	\$1,290.00
7	67	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$5,695.00
8	435	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$19,575.00
9	2	EA	Catch Basin Type I	\$950.00	\$1,900.00
10	1	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$3,500.00
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
				Subtotal =	\$38,165
			Contingency	30.0%	\$11,450
			Sales Tax	9.3%	\$3,549
			Planning Level Construction Cost =		\$53,200
			Administration	5.0%	\$2,660
			Engineering/Construction Management	25.0%	\$13,300
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$69,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$80,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$80,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 6 - River Street Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$4,300.00	\$4,300.00
2	5	DAY	Traffic Control	\$560.00	\$2,800.00
3	1	LS	Trench Safety	\$1,000.00	\$1,000.00
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500.00
5	1000	LF	Saw Cutting	\$2.50	\$2,500.00
6	79	CY	CSTC	\$30.00	\$2,370.00
7	124	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$10,540.00
8	800	LF	Schedule A Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$48,000.00
9	4	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$14,000.00
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
				Subtotal =	\$86,010
			Contingency	30.0%	\$25,803
			Sales Tax	9.3%	\$7,999
			Planning Level Construction Cost =		\$119,800
			Administration	5.0%	\$5,990
			Engineering/Construction Management	25.0%	\$29,950
	7642	Seattle CCI (April 2003)	TOTAL (2003 \$) =		\$156,000
	8761	Seattle CCI (August 2008)	TOTAL (2008 \$) =		\$179,000
	8714	Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$179,000

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project:	CIP No. 7 - 151 st Avenue E & 152 nd Avenue E Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$10,000.00	\$10,000.00
2	15	DAY	Traffic Control	\$560.00	\$8,400.00
3	1	LS	Trench Safety	\$2,000.00	\$2,000.00
4	1	LS	Erosion/Sedimentation Control	\$850.00	\$850.00
5	2500	LF	Saw Cutting	\$2.50	\$6,250.00
6	226	CY	CSTC	\$30.00	\$6,780.00
7	354	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$30,090.00
8	1675	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$58,625.00
9	610	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$27,450.00
10	23	EA	Catch Basin Type I	\$950.00	\$21,850.00
11	1640	LF	Cement Conc. Barrier Curb and Gutter	\$15.00	\$24,600.00
12					
13					
14					
15					
16					
17					
18					
19					
20					
				Subtotal =	\$196,895
			Contingency	30.0%	\$59,069
			Sales Tax	9.3%	\$18,311
			Planning Level Construction Cost =		\$274,300
			Administration	5.0%	\$13,715
			Engineering/Construction Management	25.0%	\$68,575
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$357,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$410,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$408,000

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project:	CIP No. 8 - 63 rd Street Ct E Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$11,700.00	\$11,700.00
2	19	DAY	Traffic Control	\$560.00	\$10,640.00
3	1	LS	Trench Safety	\$2,400.00	\$2,400.00
4	1	LS	Erosion/Sedimentation Control	\$1,100.00	\$1,100.00
5	4000	LF	Saw Cutting	\$2.50	\$10,000.00
6	281	CY	CSTC	\$30.00	\$8,430.00
7	411	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$37,485.00
8	1095	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$38,325.00
9	570	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$25,650.00
10	1180	LF	SDR 35 PVC, 6-Inch Diam.	\$30.00	\$35,400.00
11	34	EA	Cleanout, 6-Inch Diam.	\$250.00	\$8,500.00
12	13	EA	Catch Basin Type I	\$950.00	\$12,350.00
13	1	EA	Catch Basin Type II, 54-Inch Diam	\$4,500.00	\$4,500.00
14	1455	LF	Cement Conc. Barrier Curb and Gutter	\$15.00	\$21,825.00
15	130	SY	Cement Concrete Sidewalk	\$45.00	\$5,850.00
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				Subtotal =	\$234,155
			Contingency	30.0%	\$70,247
			Sales Tax	9.3%	\$21,776
			Planning Level Construction Cost =		\$326,200
			Administration	5.0%	\$16,310
			Engineering/Construction Management	25.0%	\$81,550
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$424,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$487,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$485,000

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project: CIP No. 10 - 64th Street E Outfall Improvements

Prepared By: AJP; NM

Checked by: JLC

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$4,800.00	\$4,800.00
2	5	DAY	Traffic Control	\$560.00	\$2,800.00
3	1	LS	Trench Safety	\$1,000.00	\$1,000.00
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500.00
5	920	LF	Saw Cutting	\$2.50	\$2,300.00
6	67	CY	CSTC	\$30.00	\$2,010.00
7	93	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$7,905.00
8	90	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$3,150.00
9	720	LF	Schedule A Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$43,200.00
10	2	EA	Catch Basin Type I	\$950.00	\$1,900.00
11	4	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$14,000.00
12	735	LF	Cement Conc. Barrier Curb and Gutter	\$15.00	\$11,025.00
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				Subtotal =	\$94,590
			Contingency	30.0%	\$28,377
			Sales Tax	9.3%	\$8,797
			Planning Level Construction Cost =		\$131,800
			Administration	5.0%	\$6,590
			Engineering/Construction Management	25.0%	\$32,950
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$171,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$197,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$196,000

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project: CIP No. 11 - South 160th Avenue E Improvements

Prepared By: AJP; NM

Checked by: JLC

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$2,600.00	\$2,600.00
2	5	DAY	Traffic Control	\$560.00	\$2,800.00
3	1	LS	Trench Safety	\$1,000.00	\$1,000.00
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500.00
5	720	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$25,200.00
6	255	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$11,475.00
7	8	EA	Catch Basin Type I	\$950.00	\$7,600.00
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				Subtotal =	\$51,175
			Contingency	30.0%	\$15,353
			Sales Tax	9.3%	\$4,759
			Planning Level Construction Cost =		\$71,300
			Administration	5.0%	\$3,565
			Engineering/Construction Management	25.0%	\$17,825
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$93,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$107,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$107,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 12 - North 160 th Avenue E Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$7,100.00	\$7,100.00
2	11	DAY	Traffic Control	\$560.00	\$6,160.00
3	1	LS	Trench Safety	\$1,400.00	\$1,400.00
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500.00
5	245	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$8,575.00
6	1290	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$58,050.00
7	690	LF	Schedule A Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$41,400.00
8	12	EA	Catch Basin Type I	\$950.00	\$11,400.00
9	2	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$7,000.00
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				Subtotal =	\$141,585
			Contingency	30.0%	\$42,476
			Sales Tax	9.3%	\$13,167
			Planning Level Construction Cost =		\$197,200
			Administration	5.0%	\$9,860
			Engineering/Construction Management	25.0%	\$49,300
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$256,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$294,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$293,000

CITY OF SUMNER
Preliminary Opinion of Probable Cost

Project: CIP No. 13 - Elm Street Interceptor

Prepared By: AJP; NM

Checked by: JLC

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$6,700.00	\$6,700.00
2	4	DAY	Traffic Control	\$560.00	\$2,240.00
3	1	LS	Trench Safety	\$1,350.00	\$1,350.00
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500.00
5	140	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$4,900.00
6	600	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$27,000.00
7	610	LF	Schedule A Storm Scwcr Pipe, 24 Inch Diam.	\$60.00	\$36,600.00
8	6	EA	Catch Basin Type I	\$950.00	\$5,700.00
9	2	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$7,000.00
10	1.79	AC	Flow Control Facility	\$23,000.00	\$41,184.57
11	40	CY	Swale Excavation, Incl. Haul	\$18.50	\$740.00
12	150	SY	Fine Grade/Hydroseed & Mulch	\$1.00	\$150.00
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				Subtotal =	\$134,065
				Contingency 30.0%	\$40,220
				Sales Tax 9.3%	\$12,468
				Planning Level Construction Cost =	\$186,800
				Administration 5.0%	\$9,340
				Engineering/Construction Management 25.0%	\$46,700
7642		Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$243,000
8761		Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$279,000
8714		Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$278,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 14 - N Parker Road Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$4,400.00	\$4,400.00
2	3	DAY	Traffic Control	\$560.00	\$1,680.00
3	1	LS	Trench Safety	\$1,000.00	\$1,000.00
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500.00
5	610	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$21,350.00
6	440	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$19,800.00
7	7	EA	Catch Basin Type I	\$950.00	\$6,650.00
8	0.63	AC	Water Quality Facility	\$29,000.00	\$18,374.66
9	0.63	AC	Flow Control Facility	\$23,000.00	\$14,573.00
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				Subtotal =	\$88,328
			Contingency	30.0%	\$26,498
			Sales Tax	9.3%	\$8,215
			Planning Level Construction Cost =		\$123,000
			Administration	5.0%	\$6,150
			Engineering/Construction Management	25.0%	\$30,750
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$160,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$184,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$184,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:		CIP No. 15 - Parker Road Improvements			
Prepared By:		AJP; NM			
Checked by:		JLC			
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$8,000.00	\$8,000.00
2	4	DAY	Traffic Control	\$560.00	\$2,240.00
3	1	LS	Trench Safety	\$1,650.00	\$1,650.00
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500.00
5	750	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$26,250.00
6	345	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$15,525.00
7	14	EA	Catch Basin Type I	\$950.00	\$13,300.00
8	3.99	AC	Flow Control Facility	\$23,000.00	\$91,873.28
9	110	CY	Swale Excavation, Incl. Haul	\$18.50	\$2,035.00
10	270	SY	Fine Grade/Hydroseed & Mulch	\$1.00	\$270.00
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				Subtotal =	\$161,643
				Contingency	30.0% \$48,493
				Sales Tax	9.3% \$15,033
				Planning Level Construction Cost =	\$225,200
				Administration	5.0% \$11,260
				Engineering/Construction Management	25.0% \$56,300
7642	Seattle CCI (April 2003)			TOTAL (2003 \$) =	\$293,000
8761	Seattle CCI (August 2008)			TOTAL (2008 \$) =	\$336,000
8714	Seattle CCI (November 2010)			TOTAL (2010 \$) =	\$335,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 17 - Main Street Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$4,000.00	\$4,000.00
2	5	DAY	Traffic Control	\$560.00	\$2,800.00
3	1	LS	Trench Safety	\$1,000.00	\$1,000.00
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500.00
5	750	LF	Saw Cutting	\$2.50	\$1,875.00
6	111	CY	CSTC	\$30.00	\$3,330.00
7	155	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$13,175.00
8	320	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$14,400.00
9	430	LF	Schedule A Storm Sewer Pipe, 21-Inch Diam.	\$55.00	\$23,650.00
10	2	EA	Catch Basin Type I	\$950.00	\$1,900.00
11	1	EA	Catch Basin Type II, 48-Inch Diam.	\$3,000.00	\$3,000.00
12	750	LF	Cement Conc. Barrier Curb and Gutter	\$15.00	\$11,250.00
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				Subtotal =	\$80,880
			Contingency	30.0%	\$24,264
			Sales Tax	9.3%	\$7,522
			Planning Level Construction Cost =		\$112,700
			Administration	5.0%	\$5,635
			Engineering/Construction Management	25.0%	\$28,175
	7642	Seattle CCI (April 2003)	TOTAL (2003 \$) =		\$147,000
	8761	Seattle CCI (August 2008)	TOTAL (2008 \$) =		\$169,000
	8714	Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$169,000

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project: CIP No. 18 - Willow Street Interceptor & Tributary Improvements

Prepared By: AJP; NM

Checked by: JLC

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$29,000.00	\$29,000.00
2	34	DAY	Traffic Control	\$560.00	\$19,040.00
3	1	LS	Trench Safety	\$6,000.00	\$6,000.00
4	1	LS	Erosion/Sedimentation Control	\$3,000.00	\$3,000.00
5	6000	LF	Saw Cutting	\$2.50	\$15,000.00
6	508	CY	CSTC	\$30.00	\$15,240.00
7	797	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$67,745.00
8	2625	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$91,875.00
9	965	LF	RC Storm Sewer Pipe, 18-Inch Diam.	\$60.00	\$57,900.00
10	385	LF	Schedule A Storm Sewer Pipe, 21-Inch Diam.	\$55.00	\$21,175.00
11	1170	LF	RC Storm Sewer Pipe, 24-Inch Diam.	\$70.00	\$81,900.00
12	1	LS	Abandon Existing Storm Sewer Pipe	\$2,000.00	\$2,000.00
13	28	EA	Catch Basin Type I	\$950.00	\$26,600.00
14	12	EA	Catch Basin Type II, 48-Inch Diam.	\$4,500.00	\$54,000.00
15	2850	LF	Cement Conc. Barrier Curb and Gutter	\$15.00	\$42,750.00
16	1000	SY	Cement Concrete Sidewalk	\$45.00	\$45,000.00
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20					
				Subtotal =	\$578,225
			Contingency	30.0%	\$173,468
			Sales Tax	9.3%	\$53,775
			Planning Level Construction Cost =		\$805,500
			Administration	5.0%	\$40,275
			Engineering/Construction Management	25.0%	\$201,375
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$1,047,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$1,201,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$1,195,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:		CIP No. 19 - Puyallup Street Outfall Improvements			
Prepared By:		AJP; NM			
Checked by:		JLC			
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$50,000.00	\$50,000.00
2	3	DAY	Traffic Control	\$560.00	\$1,680.00
3	1	LS	Trench Safety	\$10,000.00	\$10,000.00
4	1	LS	Erosion/Sedimentation Control	\$80,000.00	\$78,000.00
5	1400	LF	Saw Cutting	\$2.50	\$3,500.00
6	64	CY	CSTC	\$30.00	\$1,920.00
7	90	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$7,650.00
8	435	LF	Schedule A Storm Sewer Pipe, 24-Inch Diam.	\$75.00	\$32,625.00
9	3	EA	Catch Basin Type II, 48-Inch Diam.	\$7,500.00	\$22,500.00
10	1	EA	Catch Basin Type II, 96-Inch Diam.	\$10,000.00	\$10,000.00
11	1	EA	Catch Basin Type II, 96-Inch Diam. w/ int. baffle/weir	\$12,500.00	\$12,500.00
12	1215	LF	Cement Conc. Barrier Curb and Gutter	\$15.00	\$18,225.00
13	175	SY	Cement Concrete Sidewalk	\$45.00	\$7,875.00
14	208	EA	Media Cartridge System (Stormfilter)	\$3,410.00	\$709,280.00
15	200	SF	Property/Easement Acquisition	\$10.00	\$2,000.00
16	1	LS	Flow Measurement System	\$10,000.00	\$10,000.00
17	1	LS	Electrical System, Complete	\$5,000.00	\$5,000.00
18	1	LS	Tideflex Valve	\$5,000.00	\$5,000.00
19					
				Subtotal =	\$987,755
			Contingency	30.0%	\$296,327
			Sales Tax	9.3%	\$91,861
			Planning Level Construction Cost =		\$1,375,900
			Environmental Permitting and Documentation		\$15,000
			Administration	5.0%	\$68,795
			Engineering/Construction Management	25.0%	\$343,475
	8714	Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$1,803,000

CITY OF SUMNER
Preliminary Opinion of Probable Cost

Project:	CIP No. 21 - South SR-410 Diversion Interceptor				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$280,000.00	\$280,000.00
2	1	LS	Trench Safety	\$55,000.00	\$55,000.00
3	1	LS	Erosion/Sedimentation Control	\$28,000.00	\$28,000.00
4	600	LF	RC Storm Sewer Pipe, 30-Inch Diam.	\$110.00	\$66,000.00
5	600	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$78,000.00
6	1230	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$155.00	\$190,650.00
7	350	LF	RC Storm Sewer Pipe, 60-Inch Diam.	\$200.00	\$70,000.00
8	4	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$14,000.00
9	4	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$18,000.00
10	2	EA	Catch Basin Type III, 72-Inch Diam.	\$6,000.00	\$12,000.00
11	165.53	AC	Water Quality Facility	\$29,000.00	\$4,800,312.00
12	1000	SF	Property/Easement Acquisition	\$10.00	\$10,000.00
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				Subtotal =	\$5,621,962
			Contingency	30.0%	\$1,686,589
			Sales Tax	9.3%	\$522,842
			Planning Level Construction Cost =		\$7,831,400
			Environmental Permitting and Documentation		\$30,000
			Administration	5.0%	\$391,570
			Engineering/Construction Management	25.0%	\$1,955,350
	7642	Seattle CCI (April 2003)	TOTAL (2003 \$) =		\$10,208,000
	8761	Seattle CCI (August 2008)	TOTAL (2008 \$) =		\$11,703,000
	8714	Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$11,641,000

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project:	CIP No. 22 - Meade McCumber Street Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$3,500.00	\$3,500.00
2	5	DAY	Traffic Control	\$560.00	\$2,800.00
3	1	LS	Trench Safety	\$1,000.00	\$1,000.00
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500.00
5	800	LF	Saw Cutting	\$2.50	\$2,000.00
6	78	CY	CSTC	\$30.00	\$2,340.00
7	122	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$10,370.00
8	790	LF	Schedule A Storm Sewer Pipe, 15-Inch Diam.	\$40.00	\$31,600.00
9	5	EA	Catch Basin Type I	\$950.00	\$4,750.00
10	750	LF	Cement Conc. Barrier Curb and Gutter	\$15.00	\$11,250.00
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				Subtotal =	\$70,110
			Contingency	30.0%	\$21,033
			Sales Tax	9.3%	\$6,520
			Planning Level Construction Cost =		\$97,700
			Administration	5.0%	\$4,885
			Engineering/Construction Management	25.0%	\$24,425
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$127,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$146,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$146,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 24 - E Main Street / 160th Avenue E Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$6,000.00	\$6,000.00
2	10	DAY	Traffic Control	\$560.00	\$5,600.00
3	1	LS	Trench Safety	\$1,300.00	\$1,300.00
4	1	LS	Erosion/Sedimentation Control	\$600.00	\$600.00
5	895	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$31,325.00
6	970	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$43,650.00
7	210	LF	Schedule A Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$12,600.00
8	12	EA	Catch Basin Type I	\$950.00	\$11,400.00
9	2	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$7,000.00
10	70	CY	Swale Excavation, Incl. Haul	\$18.50	\$1,295.00
11	200	SY	Fine Grade/Hydroseed & Mulch	\$1.00	\$200.00
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				Subtotal =	\$120,970
			Contingency	30.0%	\$36,291
			Sales Tax	9.3%	\$11,250
			Planning Level Construction Cost =		\$168,500
			Administration	5.0%	\$8,425
			Engineering/Construction Management	25.0%	\$42,125
	7642	Seattle CCI (April 2003)	TOTAL (2003 \$) =		\$219,000
	8761	Seattle CCI (August 2008)	TOTAL (2008 \$) =		\$252,000
	8714	Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$251,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 25 - Poole Road Outfall Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$9,500.00	\$9,500.00
2	8	DAY	Traffic Control	\$560.00	\$4,480.00
3	1	LS	Trench Safety	\$2,000.00	\$2,000.00
4	1	LS	Erosion/Sedimentation Control	\$1,000.00	\$1,000.00
5	140	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$4,900.00
6	900	LF	Schedule A Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$54,000.00
7	570	LF	Schedule A Storm Sewer Pipe, 30-Inch Diam.	\$65.00	\$37,050.00
8	4	EA	Catch Basin Type I	\$950.00	\$3,800.00
9	5	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$17,500.00
10	1.72	AC	Water Quality Facility	\$29,000.00	\$49,931.13
11	200	SF	Property/Easement Acquisition	\$10.00	\$2,000.00
12					
13					
14					
15					
16					
17					
18					
19					
20					
				Subtotal =	\$186,161
			Contingency	30.0%	\$55,848
			Sales Tax	9.3%	\$17,313
			Planning Level Construction Cost =		\$259,300
			Environmental Permitting and Documentation		\$15,000
			Administration	5.0%	\$12,965
			Engineering/Construction Management	25.0%	\$64,825
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$352,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$404,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$402,000

CITY OF SUMNER
Preliminary Opinion of Probable Cost

Project:	CIP No. 26 - Wahl Road Interceptor				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$35,000.00	\$35,000.00
2	44	DAY	Traffic Control	\$560.00	\$24,640.00
3	1	LS	Trench Safety	\$6,500.00	\$6,500.00
4	1	LS	Erosion/Sedimentation Control	\$3,500.00	\$3,500.00
5	6000	LF	Saw Cutting	\$2.50	\$15,000.00
6	652	CY	CSTC	\$30.00	\$19,560.00
7	1023	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$86,955.00
8	490	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$17,150.00
9	250	LF	Schedule A Storm Sewer Pipe, 15-Inch Diam.	\$40.00	\$10,000.00
10	1200	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$54,000.00
11	1210	LF	Schedule A Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$72,600.00
12	620	LF	Schedule A Storm Sewer Pipe, 30-Inch Diam.	\$65.00	\$40,300.00
13	960	LF	Schedule A Storm Sewer Pipe, 36-Inch Diam.	\$70.00	\$67,200.00
14	1870	LF	Schedule A Storm Sewer Pipe, 48-Inch Diam.	\$80.00	\$149,600.00
15	18	EA	Catch Basin Type I	\$950.00	\$17,100.00
16	10	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$35,000.00
17	7	EA	Catch Basin Type II, 60-Inch Diam.	\$5,000.00	\$35,000.00
18					
19					
20					
				Subtotal =	\$689,105
			Contingency	30.0%	\$206,732
			Sales Tax	9.3%	\$64,087
			Planning Level Construction Cost =		\$959,900
			Administration	5.0%	\$47,995
			Engineering/Construction Management	25.0%	\$239,975
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$1,248,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$1,431,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$1,424,000

**CITY OF SUMNER
Preliminary Opinion of Probable Cost**

Project: CIP No. 27 - South Parker Rd Improvements
Prepared By: AJP; NM
Checked by: JLC

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$1,900.00	\$1,900.00
2	2	DAY	Traffic Control	\$560.00	\$1,120.00
3	1	LS	Trench Safety	\$1,000.00	\$1,000.00
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500.00
5	240	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$50.00	\$12,000.00
6	12	EA	Catch Basin Type I	\$1,100.00	\$13,200.00
7	0.29	AC	Flow Control Facility	\$23,000.00	\$6,671.37
8	20	CY	Swale Excavation, Incl. Haul	\$40.00	\$800.00
9	100	SY	Fine Grade/Hydroseed & Mulch	\$1.00	\$100.00
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
				Subtotal =	\$37,291
				Contingency 30.0%	\$11,187
				Sales Tax 9.3%	\$3,468
				Planning Level Construction Cost =	\$51,900
				Administration 5.0%	\$2,595
				Engineering/Construction Management 25.0%	\$12,975
7642	Seattle CCI (April 2003)			TOTAL (2003 \$) =	\$67,000
8761	Seattle CCI (August 2008)			TOTAL (2008 \$) =	\$77,000
8714	Seattle CCI (November 2010)			TOTAL (2010 \$) =	\$77,000

ASSUMPTIONS:

Mobilization equals approximately 5 percent of Subtotal
 Traffic Control based on installing 100 LF pipe/day
 Trench Safety equals approximately 1 percent of Subtotal (\$1000 minimum)
 Erosion/Sedimentation Control equals approximately 0.5 percent of Subtotal (\$500 minimum)
 Pipe size is estimated only. Modeling will need to be conducted during final design to verify pipe diameters.
 Storm conveyance will be installed as part of a street improvement project. Therefore, ACP sawcutting and pavement restoration are not included in this estimate.

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project:	CIP No. 28 - 136 th Avenue E Improvements					
Prepared By:	AJP; NM					
Checked by:	JLC					
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	
1	1	LS	Mobilization	\$19,000.00	\$19,000.00	
2	18	DAY	Traffic Control	\$560.00	\$10,080.00	
3	24,108	SF	Shoring or Extra Excavation Class B	\$0.30	\$7,232.40	
4	1	LS	Erosion/Sedimentation Control	\$5,000.00	\$5,000.00	
5	400	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$14,000.00	
6	1,626	LF	Schedule A Storm Sewer Pipe, 30-Inch Diam.	\$65.00	\$105,690.00	
7	1,595	LF	Schedule A Storm Sewer Pipe, 36-Inch Diam.	\$80.00	\$127,600.00	
8	8	EA	Catch Basin Type I	\$950.00	\$7,600.00	
9	7	EA	Catch Basin Type II, 54-Inch Diam.	\$3,500.00	\$24,500.00	
10	6	EA	Catch Basin Type II, 60-Inch Diam.	\$4,000.00	\$24,000.00	
11	5,122	CY	Structure Excavation Class B including haul	\$10.00	\$51,220.00	
12						
13						
14						
15						
16						
17						
18						
19						
20						
				Subtotal =	\$395,922	
				Contingency	30.0%	\$118,777
				Sales Tax	9.3%	\$36,821
				Planning Level Construction Cost =		\$551,500
				Administration	5.0%	\$27,575
				Engineering/Construction Management	25.0%	\$137,875
	8625	Seattle CCI (September 2007)		TOTAL (2007 \$) =	\$717,000	
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$729,000	
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$726,000	

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project:	CIP No. 29 - Puget Sound Power & Light Canal Drainage				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$13,500.00	\$13,500.00
2	13	DAY	Traffic Control	\$560.00	\$7,280.00
3	1	LS	Trench Safety	\$2,600.00	\$2,600.00
4	1	LS	Erosion/Sedimentation Control	\$1,300.00	\$1,300.00
5	270	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$9,450.00
6	2320	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$104,400.00
7	18	EA	Catch Basin Type I	\$950.00	\$17,100.00
8	6860	LF	Existing Ditch Rehab	\$2.50	\$17,150.00
9	3.20	AC	Water Quality Facility	\$29,000.00	\$92,672.18
10	400	SF	Property/Easement Acquisition	\$10.00	\$4,000.00
11					
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20					
				Subtotal =	\$269,452
			Contingency	30.0%	\$80,836
			Sales Tax	9.3%	\$25,059
			Planning Level Construction Cost =		\$375,300
			Environmental Permitting and Documentation		\$30,000
			Administration	5.0%	\$18,765
			Engineering/Construction Management	25.0%	\$93,825
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$518,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$594,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$591,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 31 - 62nd Street East				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$6,000.00	\$6,000.00
2	1	LS	Trench Safety	\$1,200.00	\$1,200.00
3	1	LS	Erosion/Sedimentation Control	\$600.00	\$600.00
4	845	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$29,575.00
5	595	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$26,775.00
6	540	LF	Schedule A Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$32,400.00
7	11	EA	Catch Basin Type I	\$950.00	\$10,450.00
8	3	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$10,500.00
9					
10					
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12					
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16					
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18					
19					
20					
				Subtotal =	\$117,500
			Contingency	30.0%	\$35,250
			Sales Tax	9.3%	\$10,928
			Planning Level Construction Cost =		\$163,700
			Administration	5.0%	\$8,185
			Engineering/Construction Management	25.0%	\$40,925
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$213,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$245,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$244,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:		CIP No. 33 - REI / Railroad Culvert Improvements (CEG Sites A, B)			
Prepared By:		Cosmopolitan Engineering Group (CEG), 1999			
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization (8%)	\$5,139.44	\$5,139.44
2	1	LS	TESC (2.64%)	\$1,696.02	\$1,696.02
3	1	LS	Temp Flow Diversion (1.74%)	\$1,117.83	\$1,117.83
4	1	LS	Temp Access (0.86%)	\$552.49	\$552.49
5		SITE	Remove and Dispose of Concrete Retaining Wall	\$2,000.00	\$0.00
6		SITE	Remove and Dispose of Wood Beams	\$500.00	\$0.00
7		LS	Remove and Dispose of Cinderblock Bridge	\$1,500.00	\$0.00
8		LF	Remove and Replace Chainlink Fence	\$10.00	\$0.00
9		LF	Remove and Replace Wood Fence	\$12.00	\$0.00
10		SITE	Adjust Power and Telephone	\$2,500.00	\$0.00
11		EACH	Remove and Replace SS thru Sheet Pile	\$3,000.00	\$0.00
12		EACH	Remove and Replace Water Thru Sheet Pile	\$2,000.00	\$0.00
13		EACH	Remove and Replace Gas Line Thru Sheet Pile	\$2,000.00	\$0.00
14	45	LF	10'x8' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$450.00	\$20,250.00
15		LF	10'x5' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$440.00	\$0.00
16		LF	10'x5' Precast Concrete Box Culvert-Materials/Delivery	\$435.00	\$0.00
17		LF	10'x3' Precast Concrete Box Culvert-Materials/Delivery	\$430.00	\$0.00
18	8	EACH	Precast Conc. Wingwall/Footings-Materials/Delivery	\$1,800.00	\$14,400.00
19	45	LF	Install 10'x8' 3-Sided Conc. Box Culv. W/Footings	\$165.00	\$7,425.00
20		LF	Install 10'x5' 3-Sided Conc. Box Culv. W/Footings	\$150.00	\$0.00
21		LF	Install 10'x5' Precast Concrete Box Culvert	\$120.00	\$0.00
22		LF	Install 10'x3' Precast Concrete Box Culvert	\$105.00	\$0.00
23	8	EACH	Install Precast Concrete Wingwall/Footings	\$650.00	\$5,200.00
24		LF	10' High Sheet Pile Wall	\$100.00	\$0.00
25	113	TON	Channel Rock	\$12.00	\$1,356.00
26	43	TON	Foundation Rock for Box Culverts	\$10.00	\$430.00
27	571	TON	Structural Fill	\$10.00	\$5,710.00
28		TON	Crushed Surfacing Top Course	\$10.00	\$0.00
29		TON	Asphalt Concrete Pavement, Class B	\$50.00	\$0.00
30	1	EACH	Extend Ex Storm Drain Thru New Wingwall	\$2,000.00	\$2,000.00
31		EACH	Wier Structure @ 160th Ave.	\$4,000.00	\$0.00
32		LF	Guard Rail Along 160th Ave.	\$10.00	\$0.00
33	24	TON	3/4" Minus Crushed Rock	\$15.00	\$360.00
34	136	CY	Channel Excavation	\$12.00	\$1,632.00
35		TON	Rip Rap Armoring	\$20.00	\$0.00
36	680	SY	Hydroseeding	\$1.00	\$680.00
37		SY	Turf Reinforcing Mat	\$5.00	\$0.00
38	3200	SF	Landscape Restoration	\$1.50	\$4,800.00
				Subtotal =	\$72,749
CCI, Contingencies and other Cost Factors				Inflated Subtotal (Per ENR CCI) =	\$80,166
Prepared by:	AJP, JLC				
Checked by:	NM			Contingency	50.0% \$40,083
				Sales Tax	9.3% \$7,455
				Planning Level Construction Cost =	\$127,700
				Environmental Permitting and Documentation	\$15,000
				Administration	5.0% \$6,385
				Engineering/Construction Management	25.0% \$31,925
7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$181,000	
8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$208,000	
8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$207,000	

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project:	CIP No. 34 - Parker Road Culvert Improvements (CEG Site C)				
Prepared By:	Cosmopolitan Engineering Group (CEG), 1999				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization (8%)	\$1,784.88	\$1,784.88
2	1	LS	TESC (2.64%)	\$589.01	\$589.01
3	1	LS	Temp Flow Diversion (1.74%)	\$388.21	\$388.21
4	1	LS	Temp Access (0.86%)	\$191.87	\$191.87
5		SITE	Remove and Dispose of Concrete Retaining Wall	\$2,000.00	\$0.00
6		SITE	Remove and Dispose of Wood Beams	\$500.00	\$0.00
7		LS	Remove and Dispose of Cinderblock Bridge	\$1,500.00	\$0.00
8		LF	Remove and Replace Chainlink Fence	\$10.00	\$0.00
9		LF	Remove and Replace Wood Fence	\$12.00	\$0.00
10	1	SITE	Adjust Power and Telephone	\$2,500.00	\$2,500.00
11		EACH	Remove and Replace SS thru Sheet Pile	\$3,000.00	\$0.00
12		EACH	Remove and Replace Water Thru Sheet Pile	\$2,000.00	\$0.00
13		EACH	Remove and Replace Gas Line Thru Sheet Pile	\$2,000.00	\$0.00
14		LF	10'x8' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$450.00	\$0.00
15		LF	10'x5' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$440.00	\$0.00
16	25	LF	10'x5' Precast Concrete Box Culvert-Materials/Delivery	\$435.00	\$10,875.00
17		LF	10'x3' Precast Concrete Box Culvert-Materials/Delivery	\$430.00	\$0.00
18		EACH	Precast Conc. Wingwall/Footings-Materials/Delivery	\$1,800.00	\$0.00
19		LF	Install 10'x8' 3-Sided Conc. Box Culv. W/Footings	\$165.00	\$0.00
20		LF	Install 10'x5' 3-Sided Conc. Box Culv. W/Footings	\$150.00	\$0.00
21	25	LF	Install 10'x5' Precast Concrete Box Culvert	\$120.00	\$3,000.00
22		LF	Install 10'x3' Precast Concrete Box Culvert	\$105.00	\$0.00
23		EACH	Install Precast Concrete Wingwall/Footings	\$650.00	\$0.00
24		LF	10' High Sheet Pile Wall	\$100.00	\$0.00
25	38	TON	Channel Rock	\$12.00	\$456.00
26	18	TON	Foundation Rock for Box Culverts	\$10.00	\$180.00
27	142	TON	Structural Fill	\$10.00	\$1,420.00
28		TON	Crushed Surfacing Top Course	\$10.00	\$0.00
29		TON	Asphalt Concrete Pavement, Class B	\$50.00	\$0.00
30		EACH	Extend Ex Storm Drain Thru New Wingwall	\$2,000.00	\$0.00
31		EACH	Wier Structure @ 160th Ave.	\$4,000.00	\$0.00
32		LF	Guard Rail Along 160th Ave.	\$10.00	\$0.00
33	5	TON	3/4" Minus Crushed Rock	\$15.00	\$75.00
34	56	CY	Channel Excavation	\$12.00	\$672.00
35		TON	Rip Rap Armoring	\$20.00	\$0.00
36	233	SY	Hydroseeding	\$1.00	\$233.00
37	100	SY	Turf Reinforcing Mat	\$5.00	\$500.00
38	1600	SF	Landscape Restoration	\$1.50	\$2,400.00
				Subtotal =	\$25,265
CCI, Contingencies and other Cost Factors				Inflated Subtotal (Per ENR CCI) =	\$27,841
Prepared by:	AJP, JLC				
Checked by:	NM				
			Contingency	50.0%	\$13,920
			Sales Tax	9.3%	\$2,589
			Planning Level Construction Cost =		\$44,300
			Environmental Permitting and Documentation		\$15,000
			Administration	5.0%	\$2,215
			Engineering/Construction Management	25.0%	\$11,075
	7642		Seattle CCI (April 2003)		TOTAL (2003 \$) = \$73,000
	8761		Seattle CCI (August 2008)		TOTAL (2008 \$) = \$84,000
	8714		Seattle CCI (November 2010)		TOTAL (2010 \$) = \$84,000

CITY OF SUMNER						
Preliminary Opinion of Probable Cost						
Project:	CIP No. 35 - Puyallup Watershed Access Culvert Improvements (CEG Site D)					
Prepared By:	Cosmopolitan Engineering Group (CEG), 1999					
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	
1	1	LS	Mobilization (8%)	\$1,584.88	\$1,584.88	
2	1	LS	TESC (2.64%)	\$523.01	\$523.01	
3	1	LS	Temp Flow Diversion (1.74%)	\$344.71	\$344.71	
4	1	LS	Temp Access (0.86%)	\$170.37	\$170.37	
5		SITE	Remove and Dispose of Concrete Retaining Wall	\$2,000.00	\$0.00	
6		SITE	Remove and Dispose of Wood Beams	\$500.00	\$0.00	
7		LS	Remove and Dispose of Cinderblock Bridge	\$1,500.00	\$0.00	
8		LF	Remove and Replace Chainlink Fence	\$10.00	\$0.00	
9		LF	Remove and Replace Wood Fence	\$12.00	\$0.00	
10		SITE	Adjust Power and Telephone	\$2,500.00	\$0.00	
11		EACH	Remove and Replace SS thru Sheet Pile	\$3,000.00	\$0.00	
12		EACH	Remove and Replace Water Thru Sheet Pile	\$2,000.00	\$0.00	
13		EACH	Remove and Replace Gas Line Thru Sheet Pile	\$2,000.00	\$0.00	
14		LF	10'x8' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$450.00	\$0.00	
15		LF	10'x5' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$440.00	\$0.00	
16	25	LF	10'x5' Precast Concrete Box Culvert-Materials/Delivery	\$435.00	\$10,875.00	
17		LF	10'x3' Precast Concrete Box Culvert-Materials/Delivery	\$430.00	\$0.00	
18		EACH	Precast Conc. Wingwall/Footings-Materials/Delivery	\$1,800.00	\$0.00	
19		LF	Install 10'x8' 3-Sided Conc. Box Culv. W/Footings	\$165.00	\$0.00	
20		LF	Install 10'x5' 3-Sided Conc. Box Culv. W/Footings	\$150.00	\$0.00	
21	25	LF	Install 10'x5' Precast Concrete Box Culvert	\$120.00	\$3,000.00	
22		LF	Install 10'x3' Precast Concrete Box Culvert	\$105.00	\$0.00	
23		EACH	Install Precast Concrete Wingwall/Footings	\$650.00	\$0.00	
24		LF	10' High Sheet Pile Wall	\$100.00	\$0.00	
25	38	TON	Channel Rock	\$12.00	\$456.00	
26	18	TON	Foundation Rock for Box Culverts	\$10.00	\$180.00	
27	142	TON	Structural Fill	\$10.00	\$1,420.00	
28		TON	Crushed Surfacing Top Course	\$10.00	\$0.00	
29		TON	Asphalt Concrete Pavement, Class B	\$50.00	\$0.00	
30		EACH	Extend Ex Storm Drain Thru New Wingwall	\$2,000.00	\$0.00	
31		EACH	Wier Structure @ 160th Ave.	\$4,000.00	\$0.00	
32		LF	Guard Rail Along 160th Ave.	\$10.00	\$0.00	
33	5	TON	3/4" Minus Crushed Rock	\$15.00	\$75.00	
34	56	CY	Channel Excavation	\$12.00	\$672.00	
35		TON	Rip Rap Armoring	\$20.00	\$0.00	
36	233	SY	Hydroseeding	\$1.00	\$233.00	
37	100	SY	Turf Reinforcing Mat	\$5.00	\$500.00	
38	1600	SF	Landscape Restoration	\$1.50	\$2,400.00	
				Subtotal =	\$22,434	
CCI, Contingencies and other Cost Factors				Inflated Subtotal (Per ENR CCI) =	\$24,721	
Prepared by:	AJP, JLC					
Checked by:	NM		Contingency	50.0%	\$12,361	
			Sales Tax	9.3%	\$2,299	
				Planning Level Construction Cost =	\$39,400	
				Environmental Permitting and Documentation	\$15,000	
				Administration	5.0%	\$1,970
				Engineering/Construction Management	25.0%	\$9,850
	7642	Seattle CCI (April 2003)	TOTAL (2003 \$) =		\$66,000	
	8761	Seattle CCI (August 2008)	TOTAL (2008 \$) =		\$76,000	
	8714	Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$76,000	

CITY OF SUMNER
Preliminary Opinion of Probable Cost

Project: CIP No. 36 - 47th Street Ct E Culvert Improvements (CEG Site E)
Prepared By: Cosmopolitan Engineering Group (CEG), 1999

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization (8%)	\$1,533.12	\$1,533.12
2	1	LS	TESC (2.64%)	\$505.93	\$505.93
3	1	LS	Temp Flow Diversion (1.74%)	\$333.45	\$333.45
4	1	LS	Temp Access (0.86%)	\$164.81	\$164.81
5	1	SITE	Remove and Dispose of Concrete Retaining Wall	\$2,000.00	\$2,000.00
6		SITE	Remove and Dispose of Wood Beams	\$500.00	\$0.00
7		LS	Remove and Dispose of Cinderblock Bridge	\$1,500.00	\$0.00
8	30	LF	Remove and Replace Chainlink Fence	\$10.00	\$300.00
9		LF	Remove and Replace Wood Fence	\$12.00	\$0.00
10		SITE	Adjust Power and Telephone	\$2,500.00	\$0.00
11		EACH	Remove and Replace SS thru Sheet Pile	\$3,000.00	\$0.00
12		EACH	Remove and Replace Water Thru Sheet Pile	\$2,000.00	\$0.00
13		EACH	Remove and Replace Gas Line Thru Sheet Pile	\$2,000.00	\$0.00
14		LF	10'x8' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$450.00	\$0.00
15		LF	10'x5' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$440.00	\$0.00
16	20	LF	10'x5' Precast Concrete Box Culvert-Materials/Delivery	\$435.00	\$8,700.00
17		LF	10'x3' Precast Concrete Box Culvert-Materials/Delivery	\$430.00	\$0.00
18		EACH	Precast Conc. Wingwall/Footings-Materials/Delivery	\$1,800.00	\$0.00
19		LF	Install 10'x8' 3-Sided Conc. Box Culv. W/Footings	\$165.00	\$0.00
20		LF	Install 10'x5' 3-Sided Conc. Box Culv. W/Footings	\$150.00	\$0.00
21	20	LF	Install 10'x5' Precast Concrete Box Culvert	\$120.00	\$2,400.00
22		LF	Install 10'x3' Precast Concrete Box Culvert	\$105.00	\$0.00
23		EACH	Install Precast Concrete Wingwall/Footings	\$650.00	\$0.00
24		LF	10' High Sheet Pile Wall	\$100.00	\$0.00
25	30	TON	Channel Rock	\$12.00	\$360.00
26	15	TON	Foundation Rock for Box Culverts	\$10.00	\$150.00
27	164	TON	Structural Fill	\$10.00	\$1,640.00
28		TON	Crushed Surfacing Top Course	\$10.00	\$0.00
29		TON	Asphalt Concrete Pavement, Class B	\$50.00	\$0.00
30		EACH	Extend Ex Storm Drain Thru New Wingwall	\$2,000.00	\$0.00
31		EACH	Wier Structure @ 160th Ave.	\$4,000.00	\$0.00
32		LF	Guard Rail Along 160th Ave.	\$10.00	\$0.00
33	11	TON	3/4" Minus Crushed Rock	\$15.00	\$165.00
34	17	CY	Channel Excavation	\$12.00	\$204.00
35		TON	Rip Rap Armoring	\$20.00	\$0.00
36	345	SY	Hydroseeding	\$1.00	\$345.00
37	100	SY	Turf Reinforcing Mat	\$5.00	\$500.00
38	1600	SF	Landscape Restoration	\$1.50	\$2,400.00
				Subtotal =	\$21,701
CCI, Contingencies and other Cost Factors				Inflated Subtotal (Per ENR CCI) =	\$23,913
Prepared by:	AJP, JLC				
Checked by:	NM				
			Contingency	50.0%	\$11,957
			Sales Tax	9.3%	\$2,224
				Planning Level Construction Cost =	\$38,100
			Environmental Permitting and Documentation		\$15,000
			Administration	5.0%	\$1,905
			Engineering/Construction Management	25.0%	\$9,525
7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =		\$65,000
8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =		\$75,000
8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =		\$75,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 37 - 160 th Avenue E Culvert Improvements (CEG Sites F, G, H, I, 106th Ave. E.)				
Prepared By:	Cosmopolitan Engineering Group (CEG), 1999				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization (8%)	\$17,473.76	\$17,473.76
2	1	LS	TESC (2.64%)	\$5,766.34	\$5,766.34
3	1	LS	Temp Flow Diversion (1.74%)	\$3,800.54	\$3,800.54
4	1	LS	Temp Access (0.86%)	\$1,878.43	\$1,878.43
5	1	SITE	Remove and Dispose of Concrete Retaining Wall	\$2,000.00	\$2,000.00
6		SITE	Remove and Dispose of Wood Beams	\$500.00	\$0.00
7		LS	Remove and Dispose of Cinderblock Bridge	\$1,500.00	\$0.00
8		LF	Remove and Replace Chainlink Fence	\$10.00	\$0.00
9	60	LF	Remove and Replace Wood Fence	\$12.00	\$720.00
10		SITE	Adjust Power and Telephone	\$2,500.00	\$0.00
11	3	EACH	Remove and Replace SS thru Sheet Pile	\$3,000.00	\$9,000.00
12	3	EACH	Remove and Replace Water Thru Sheet Pile	\$2,000.00	\$6,000.00
13	1	EACH	Remove and Replace Gase Line Thru Sheet Pile	\$2,000.00	\$2,000.00
14		LF	10'x8' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$450.00	\$0.00
15		LF	10'x5' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$440.00	\$0.00
16	195	LF	10'x5' Precast Concrete Box Culvert-Materials/Delivery	\$435.00	\$84,825.00
17		LF	10'x3' Precast Concrete Box Culvert-Materials/Delivery	\$430.00	\$0.00
18		EACH	Precast Conc. Wingwall/Footings-Materials/Delivery	\$1,800.00	\$0.00
19		LF	Install 10'x8' 3-Sided Conc. Box Culv. W/Footings	\$165.00	\$0.00
20		LF	Install 10'x5' 3-Sided Conc. Box Culv. W/Footings	\$150.00	\$0.00
21	195	LF	Install 10'x5' Precast Concrete Box Culvert	\$120.00	\$23,400.00
22		LF	Install 10'x3' Precast Concrete Box Culvert	\$105.00	\$0.00
23		EACH	Install Precast Concrete Wingwall/Footings	\$650.00	\$0.00
24	475	LF	10' High Sheet Pile Wall	\$100.00	\$47,500.00
25	516	TON	Channel Rock	\$12.00	\$6,192.00
26	172	TON	Foundation Rock for Box Culverts	\$10.00	\$1,720.00
27	719	TON	Structural Fill	\$10.00	\$7,190.00
28	95	TON	Crushed Surfacing Top Course	\$10.00	\$950.00
29	45	TON	Asphalt Concrete Pavement, Class B	\$50.00	\$2,250.00
30		EACH	Extend Ex Storm Drain Thru New Wingwall	\$2,000.00	\$0.00
31	1	EACH	Wier Structure @ 160th Ave.	\$4,000.00	\$4,000.00
32	235	LF	Guard Rail Along 160th Ave.	\$10.00	\$2,350.00
33	5	TON	3/4" Minus Crushed Rock	\$15.00	\$75.00
34	470	CY	Channel Excavation	\$12.00	\$5,640.00
35	46	TON	Rip Rap Armoring	\$20.00	\$920.00
36	840	SY	Hydroseeding	\$1.00	\$840.00
37	460	SY	Turf Reinforcing Mat	\$5.00	\$2,300.00
38	5700	SF	Landscape Restoration	\$1.50	\$8,550.00
				Subtotal =	\$247,341
CCI, Contingencies and other Cost Factors				Inflated Subtotal (Per ENR CCI) =	\$272,557
Prepared by:	AJP, JLC				
Checked by:	NM				
			Contingency	50.0%	\$136,278
			Sales Tax	9.3%	\$25,348
				Planning Level Construction Cost =	\$434,200
			Environmental Permitting and Documentation		\$20,000
			Administration	5.0%	\$21,710
			Engineering/Construction Management	25.0%	\$108,550
	7642	Seattle CCI (April 2003)	TOTAL (2003 \$) =		\$584,000
	8761	Seattle CCI (August 2008)	TOTAL (2008 \$) =		\$670,000
	8714	Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$667,000

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project:	CIP No. 38 - 162 nd Avenue E Culvert Improvements (CEG Sites J, K, L)				
Prepared By:	Cosmopolitan Engineering Group (CEG), 1999				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization (8%)	\$4,469.12	\$4,469.12
2	1	LS	TESC (2.64%)	\$1,474.81	\$1,474.81
3	1	LS	Temp Flow Diversion (1.74%)	\$972.03	\$972.03
4	1	LS	Temp Access (0.86%)	\$480.43	\$480.43
5		SITE	Remove and Dispose of Concrete Retaining Wall	\$2,000.00	\$0.00
6	1	SITE	Remove and Dispose of Wood Beams	\$500.00	\$500.00
7	1	LS	Remove and Dispose of Cinderblock Bridge	\$1,500.00	\$1,500.00
8		LF	Remove and Replace Chainlink Fence	\$10.00	\$0.00
9		LF	Remove and Replace Wood Fence	\$12.00	\$0.00
10		SITE	Adjust Power and Telephone	\$2,500.00	\$0.00
11		EACH	Remove and Replace SS thru Sheet Pile	\$3,000.00	\$0.00
12		EACH	Remove and Replace Water Thru Sheet Pile	\$2,000.00	\$0.00
13		EACH	Remove and Replace Gas Line Thru Sheet Pile	\$2,000.00	\$0.00
14		LF	10'x8' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$450.00	\$0.00
15		LF	10'x5' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$440.00	\$0.00
16		LF	10'x5' Precast Concrete Box Culvert-Materials/Delivery	\$435.00	\$0.00
17	70	LF	10'x3' Precast Concrete Box Culvert-Materials/Delivery	\$430.00	\$30,100.00
18		EACH	Precast Conc. Wingwall/Footings-Materials/Delivery	\$1,800.00	\$0.00
19		LF	Install 10'x8' 3-Sided Conc. Box Culv. W/Footings	\$165.00	\$0.00
20		LF	Install 10'x5' 3-Sided Conc. Box Culv. W/Footings	\$150.00	\$0.00
21		LF	Install 10'x5' Precast Concrete Box Culvert	\$120.00	\$0.00
22	70	LF	Install 10'x3' Precast Concrete Box Culvert	\$105.00	\$7,350.00
23		EACH	Install Precast Concrete Wingwall/Footings	\$650.00	\$0.00
24		LF	10' High Sheet Pile Wall	\$100.00	\$0.00
25	106	TON	Channel Rock	\$12.00	\$1,272.00
26	51	TON	Foundation Rock for Box Culverts	\$10.00	\$510.00
27	357	TON	Structural Fill	\$10.00	\$3,570.00
28		TON	Crushed Surfacing Top Course	\$10.00	\$0.00
29		TON	Asphalt Concrete Pavement, Class B	\$50.00	\$0.00
30		EACH	Extend Ex Storm Drain Thru New Wingwall	\$2,000.00	\$0.00
31		EACH	Wier Structure @ 160th Ave.	\$4,000.00	\$0.00
32		LF	Guard Rail Along 160th Ave.	\$10.00	\$0.00
33	20	TON	3/4" Minus Crushed Rock	\$15.00	\$300.00
34	106	CY	Channel Excavation	\$12.00	\$1,272.00
35		TON	Rip Rap Armoring	\$20.00	\$0.00
36	790	SY	Hydroseeding	\$1.00	\$790.00
37	300	SY	Turf Reinforcing Mat	\$5.00	\$1,500.00
38	4800	SF	Landscape Restoration	\$1.50	\$7,200.00
				Subtotal =	\$63,260
CCI, Contingencies and other Cost Factors				Inflated Subtotal (Per ENR CCI) =	\$69,709
Prepared by:	AJP, JLC				
Checked by:	NM				
				Contingency	50.0% \$34,855
				Sales Tax	9.3% \$6,483
				Planning Level Construction Cost =	\$111,000
				Environmental Permitting and Documentation	\$15,000
				Administration	5.0% \$5,550
				Engineering/Construction Management	25.0% \$27,750
7642	Seattle CCI (April 2003)				TOTAL (2003 \$) = \$159,000
8761	Seattle CCI (August 2008)				TOTAL (2008 \$) = \$183,000
8714	Seattle CCI (November 2010)				TOTAL (2010 \$) = \$183,000

**CITY OF SUMNER
Preliminary Opinion of Probable Cost**

Project:	CIP No. 39 - E Main Street Culvert Improvements (CEG Site M)					
Prepared By:	Cosmopolitan Engineering Group (CEG), 1999					
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	
1	1	LS	Mobilization (8%)	\$285.60	\$285.60	
2	1	LS	TESC (2.64%)	\$94.25	\$94.25	
3	1	LS	Temp Flow Diversion (1.74%)	\$62.12	\$62.12	
4	1	LS	Temp Access (0.86%)	\$30.70	\$30.70	
5		SITE	Remove and Dispose of Concrete Retaining Wall	\$2,000.00	\$0.00	
6		SITE	Remove and Dispose of Wood Beams	\$500.00	\$0.00	
7		LS	Remove and Dispose of Cinderblock Bridge	\$1,500.00	\$0.00	
8		LF	Remove and Replace Chainlink Fence	\$10.00	\$0.00	
9		LF	Remove and Replace Wood Fence	\$12.00	\$0.00	
10		SITE	Adjust Power and Telephone	\$2,500.00	\$0.00	
11		EACH	Remove and Replace SS thru Sheet Pile	\$3,000.00	\$0.00	
12		EACH	Remove and Replace Water Thru Sheet Pile	\$2,000.00	\$0.00	
13		EACH	Remove and Replace Gase Line Thru Sheet Pile	\$2,000.00	\$0.00	
14		LF	10'x8' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$450.00	\$0.00	
15		LF	10'x5' 3-Sided Conc. Box Culv. W/Footings-Material/Delivery	\$440.00	\$0.00	
16		LF	10'x5' Precast Concrete Box Culvert-Materials/Delivery	\$435.00	\$0.00	
17		LF	10'x3' Precast Concrete Box Culvert-Materials/Delivery	\$430.00	\$0.00	
18		EACH	Precast Conc. Wingwall/Footings-Materials/Delivery	\$1,800.00	\$0.00	
19		LF	Install 10'x8' 3-Sided Conc. Box Culv. W/Footings	\$165.00	\$0.00	
20		LF	Install 10'x5' 3-Sided Conc. Box Culv. W/Footings	\$150.00	\$0.00	
21		LF	Install 10'x5' Precast Concrete Box Culvert	\$120.00	\$0.00	
22		LF	Install 10'x3' Precast Concrete Box Culvert	\$105.00	\$0.00	
23		EACH	Install Precast Concrete Wingwall/Footings	\$650.00	\$0.00	
24		LF	10' High Sheet Pile Wall	\$100.00	\$0.00	
25		TON	Channel Rock	\$12.00	\$0.00	
26		TON	Foundation Rock for Box Culverts	\$10.00	\$0.00	
27		TON	Structural Fill	\$10.00	\$0.00	
28		TON	Crushed Surfacing Top Course	\$10.00	\$0.00	
29		TON	Asphalt Concrete Pavement, Class B	\$50.00	\$0.00	
30		EACH	Extend Ex Storm Drain Thru New Wingwall	\$2,000.00	\$0.00	
31		EACH	Wier Structure @ 160th Ave.	\$4,000.00	\$0.00	
32		LF	Guard Rail Along 160th Ave.	\$10.00	\$0.00	
33		TON	3/4" Minus Crushed Rock	\$15.00	\$0.00	
34	105	CY	Channel Excavation	\$12.00	\$1,260.00	
35		TON	Rip Rap Armoring	\$20.00	\$0.00	
36	160	SY	Hydroseeding	\$1.00	\$160.00	
37	160	SY	Turf Reinforcing Mat	\$5.00	\$800.00	
38	900	SF	Landscape Restoration	\$1.50	\$1,350.00	
				Subtotal =	\$4,043	
CCI, Contingencies and other Cost Factors				Inflated Subtotal (Per ENR CCI) =	\$4,455	
Prepared by:	AJP, JLC					
Checked by:	NM					
			Contingency	50.0%	\$2,228	
			Sales Tax	9.3%	\$414	
				Planning Level Construction Cost =	\$7,100	
			Environmental Permitting and Documentation		\$15,000	
			Administration	5.0%	\$355	
			Engineering/Construction Management	25.0%	\$1,775	
	7642	Seattle CCI (April 2003)	TOTAL (2003 \$) =		\$24,000	
	8761	Seattle CCI (August 2008)	TOTAL (2008 \$) =		\$28,000	
	8714	Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$28,000	

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 40 - Salmon Creek Restoration (incorporates CEG Sites N, O)				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$5,500.00	\$5,500.00
2	1	LS	Trench Safety	\$1,200.00	\$1,200.00
3	1	LS	Erosion/Sedimentation Control	\$550.00	\$550.00
4	60	LF	Saw Cutting	\$2.50	\$150.00
5	3230	CY	Stream Channel Excavation Incl. Haul	\$18.50	\$59,755.00
6	11	CY	CSTC	\$30.00	\$330.00
7	25	CY	Ballast Material for Culvert Bedding	\$30.00	\$750.00
8	55	CY	Structural Backfill	\$20.00	\$1,100.00
9	70	CY	Channel Rock	\$30.00	\$2,100.00
10	12	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$1,020.00
11	50	LF	10 ft x 5 ft Precast Concrete Box Culvert	\$610.50	\$30,525.00
12	1500	SY	Fine Grade/Hydroseed & Mulch	\$1.00	\$1,500.00
13	1	LS	Remove Existing 24-Inch Diam. Culvert	\$2,000.00	\$2,000.00
14	1	LS	Streambank restoration	\$20,000.00	\$20,000.00
15					
16					
17					
18					
19					
20					
				Subtotal =	\$126,480
				Contingency	30.0% \$37,944
				Sales Tax	9.3% \$11,763
				Planning Level Construction Cost =	\$176,200
				Environmental Permitting and Documentation	\$25,000
				Administration	5.0% \$8,810
				Engineering/Construction Management	25.0% \$44,050
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$254,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$292,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$291,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 41 - 64 th Street E Culvert Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$8,000.00	\$8,000.00
2	8	DAY	Traffic Control	\$560.00	\$4,480.00
3	1	LS	Trench Safety	\$1,700.00	\$1,700.00
4	1	LS	Erosion/Sedimentation Control	\$800.00	\$800.00
5	400	LF	Saw Cutting	\$2.50	\$1,000.00
6	140	CY	CSTC	\$30.00	\$4,200.00
7	70	CY	Ballast Material for Culvert Bedding	\$30.00	\$2,100.00
8	112	CY	Channel Rock	\$30.00	\$3,360.00
9	70	CY	Structural Backfill	\$20.00	\$1,400.00
10	210	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$17,850.00
11	150	LF	10 ft x 5 ft Precast Concrete Box Culvert	\$610.50	\$91,575.00
12	2	EA	Precast Concrete Wing Wall	\$3,000.00	\$6,000.00
13	1	LS	Stream Bank Restoration	\$7,500.00	\$7,500.00
14	50	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$155.00	\$7,750.00
15	1	LS	Abandon Existing 36-Inch Diam. Culvert	\$3,000.00	\$3,000.00
16					
17					
18					
19					
20					
				Subtotal =	\$160,715
			Contingency	30.0%	\$48,215
			Sales Tax	9.3%	\$14,946
			Planning Level Construction Cost =		\$223,900
			Environmental Permitting and Documentation		\$15,000
			Administration	5.0%	\$11,195
			Engineering/Construction Management	25.0%	\$55,975
	7642	Seattle CCI (April 2003)	TOTAL (2003 \$) =		\$306,000
	8761	Seattle CCI (August 2008)	TOTAL (2008 \$) =		\$351,000
	8714	Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$350,000

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project: CIP No. 43 - East Valley Highway Improvements - Detention Pond w/Bioswale
(8th Street East to Forest Canyon Road)

Prepared By: AJP; NM

Checked by: JLC

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$52,000.00	\$52,000.00
2	38	DAY	Traffic Control	\$560.00	\$21,280.00
3	1	LS	Trench Safety	\$10,000.00	\$10,000.00
4	1	LS	Erosion/Sedimentation Control	\$5,000.00	\$5,000.00
5	390	CY	Swale Excavation, Incl. Haul	\$18.50	\$7,215.00
6	12800	CY	Pond Excavation, Incl. Haul	\$15.00	\$192,000.00
7	8460	SY	Fine Grade/Hydroseed & Mulch	\$1.00	\$8,460.00
8	1	EA	Control Structure	\$5,000.00	\$5,000.00
9	3550	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$124,250.00
10	2000	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$90,000.00
11	2000	LF	Schedule A Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$120,000.00
12	35	EA	Catch Basin Type I	\$950.00	\$33,250.00
13	8	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$28,000.00
14	1	LS	Property Acquisition	\$338,000.00	\$338,000.00
15					
16					
17					
18					
19					
20					
				Subtotal =	\$1,034,455
			Contingency	30.0%	\$310,337
			Sales Tax	9.3%	\$96,204
			Planning Level Construction Cost =		\$1,441,000
			Environmental Permitting and Documentation		\$20,000
			Administration	5.0%	\$72,050
			Engineering/Construction Management	25.0%	\$275,750
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$1,809,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$2,074,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$2,063,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	CIP No. 44 - East Valley Highway Improvements				
Prepared By:	AJP; NM (Forest Canyon Road to Salmon Creek)				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$23,000.00	\$23,000.00
2	38	DAY	Traffic Control	\$560.00	\$21,280.00
3	1	LS	Trench Safety	\$5,000.00	\$5,000.00
4	1	LS	Erosion/Sedimentation Control	\$2,500.00	\$2,500.00
5	1	EA	Control Structure	\$5,000.00	\$5,000.00
6	3550	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$124,250.00
7	2000	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$90,000.00
8	2000	LF	Schedule A Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$120,000.00
9	35	EA	Catch Basin Type I	\$950.00	\$33,250.00
10	8	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$28,000.00
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
				Subtotal =	\$452,280
			Contingency	30.0%	\$135,684
			Sales Tax	9.3%	\$42,062
			Planning Level Construction Cost =		\$630,000
			Administration	5.0%	\$31,500
			Engineering/Construction Management	25.0%	\$157,500
	7642	Seattle CCI (April 2003)	TOTAL (2003 \$) =		\$819,000
	8761	Seattle CCI (August 2008)	TOTAL (2008 \$) =		\$939,000
	8714	Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$934,000

**CITY OF SUMNER
Preliminary Opinion of Probable Cost**

Project: CIP No. 45 - West Valley Highway Improvements - Detention Pond w/Bioswale

Prepared By: AJP; NM

Checked by: JLC

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$13,000.00	\$13,000.00
2	12	DAY	Traffic Control	\$560.00	\$6,720.00
3	1	LS	Trench Safety	\$2,500.00	\$2,500.00
4	1	LS	Erosion/Sedimentation Control	\$1,250.00	\$1,250.00
5	80	CY	Swale Excavation, Incl. Haul	\$18.50	\$1,480.00
6	2300	CY	Pond Excavation, Incl. Haul	\$15.00	\$34,500.00
7	1830	SY	Fine Grate/Hydroseed & Mulch	\$1.00	\$1,830.00
8	1	EA	Control Structure	\$5,000.00	\$5,000.00
9	1350	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$47,250.00
10	1000	LF	Schedule A Storm Sewer Pipe, 18-Inch Diam.	\$45.00	\$45,000.00
11	20	EA	Catch Basin Type I	\$950.00	\$19,000.00
12	1	LS	Property Acquisition	\$80,300.00	\$80,300.00
13					
14					
15					
16					
17					
18					
19					
20					
				Subtotal =	\$257,830
			Contingency	30.0%	\$77,349
			Sales Tax	9.3%	\$23,978
			Planning Level Construction Cost =		\$359,200
			Environmental Permitting and Documentation		\$20,000
			Administration	5.0%	\$17,960
			Engineering/Construction Management	25.0%	\$69,725
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$467,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$536,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$534,000

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project:	CIP No. 46 - 16th Street E Improvements				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$13,000.00	\$13,000.00
2	15	DAY	Traffic Control	\$560.00	\$8,400.00
3	1	LS	Trench Safety	\$2,500.00	\$2,500.00
4	1	LS	Erosion/Sedimentation Control	\$1,250.00	\$1,250.00
5	1950	LF	Saw Cutting	\$2.50	\$4,875.00
6	673	CY	CSTC	\$30.00	\$20,190.00
7	1056	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$89,760.00
8	2270	LF	Schedule A Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$79,450.00
9	19	EA	Catch Basin Type I	\$950.00	\$18,050.00
10	1	LS	WQ Vault	\$20,000.00	\$20,000.00
11					
12					
13					
14					
15					
16					
17					
18					
19					
				Subtotal =	\$257,475
			Contingency	30.0%	\$77,243
			Sales Tax	9.3%	\$23,945
			Planning Level Construction Cost =		\$358,700
			Administration	5.0%	\$17,935
			Engineering/Construction Management	25.0%	\$89,675
	8625	Seattle CCI (September 2007)		TOTAL (2007 \$) =	\$466,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$474,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$472,000

CITY OF SUMNER						
Preliminary Opinion of Probable Cost						
Project:	CIP No. 47 - White River Levee Improvements					
Prepared By:	AJP; NM					
Checked by:	JLC					
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	
1	1	LS	Mobilization	\$160,000.00	\$160,000.00	
2	1	LS	Erosion/Sedimentation Control	\$16,000.00	\$16,000.00	
3	50	EA	Selective Tree Removal	\$260.00	\$13,000.00	
4	6530	CY	Structural Backfill	\$35.00	\$228,550.00	
5	3500	CY	Bentonite Core	\$150.00	\$525,000.00	
6	1490	TON	Spalls	\$30.00	\$44,700.00	
7	7900	SY	Fine Grade/Hydroseed & Mulch	\$1.00	\$7,900.00	
8	400	CY	CSTC	\$30.00	\$12,000.00	
9					\$0.00	
10	1	LS	Riparian Zone Plantings/Restoration	\$60,000.00	\$60,000.00	
11					\$0.00	
12	36000	SF	ROW Acquisition	\$15.00	\$540,000.00	
13						
14						
15						
16						
				Subtotal =	\$1,607,150	
				Contingency	30.0%	\$482,145
				Sales Tax	9.3%	\$149,465
				Planning Level Construction Cost =	\$2,238,800	
				Environmental Permitting		\$70,000
				FEMA floodplain modeling, Letter of Map Revision	5.0%	\$111,940
				Administration	5.0%	\$111,940
				Engineering/Construction Management	25.0%	\$424,700
	8625	Seattle CCI (September 2007)		TOTAL (2007 \$) =	\$2,957,000	
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$3,004,000	
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$2,988,000	

CITY OF SUMNER						
Preliminary Opinion of Probable Cost						
Project:	CIP No. 49 - Golf Course Culvert Improvements					
Prepared By:	AJP; NM					
Checked by:	JLC					
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	
1	1	LS	Mobilization	\$10,000.00	\$10,000.00	
2	1	LS	TESC	\$2,500.00	\$2,500.00	
3	30	LF	10'x5' 3-Sided Conc. Box Culv.	\$3,000.00	\$90,000.00	
4	2	EACH	Precast Conc. Wingwall/Footings	\$3,500.00	\$7,000.00	
5	50	TON	Channel Rock	\$35.00	\$1,750.00	
6	25	TON	Foundation Rock for Box Culverts	\$16.00	\$400.00	
7	55	TON	Structural Fill	\$18.00	\$990.00	
8	6	TON	3/4" Minus Crushed Rock	\$32.00	\$192.00	
9	70	CY	Channel Excavation	\$20.00	\$1,400.00	
10	20	TON	Rip Rap Armoring	\$100.00	\$2,000.00	
11	300	SY	Hydroseeding	\$2.50	\$750.00	
12	100	SY	Turf Reinforcing Mat	\$15.00	\$1,500.00	
13	1600	SF	Landscape Restoration	\$1.50	\$2,400.00	
14						
15						
				Subtotal =	\$120,882	
				Contingency	30.0%	\$36,265
				Sales Tax	9.3%	\$11,242
				Planning Level Construction Cost =	\$168,400	
				Environmental Permitting and Documentation		\$25,000
				Administration	5.0%	\$8,420
				Engineering/Construction Management	25.0%	\$42,100
8625	Seattle CCI (September 2007)			TOTAL (2007 \$) =	\$244,000	
8761	Seattle CCI (August 2008)			TOTAL (2008 \$) =	\$248,000	
8714	Seattle CCI (November 2010)			TOTAL (2010 \$) =	\$247,000	

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:		CIP No. 52 - Number 9 Ditch and Forest Canyon Class III Habitat Improvements			
Prepared By:		AJP; NM			
Checked by:		JLC			
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$27,000.00	\$27,000.00
2	1	LS	Erosion/Sedimentation Control	\$3,500.00	\$3,500.00
3	1340	CY	Excavation Incl. Haul	\$16.00	\$21,440.00
4	6700	SY	Fine Grade/Hydroseed & Mulch	\$1.00	\$6,700.00
5	1	LS	Plantings/Restoration	\$100,000.00	\$100,000.00
6					
7	120	LF	42 In. Diam Culvort	\$1,500.00	\$180,000.00
8					
9					
10					
11					
				Subtotal =	\$338,640
				Contingency	30.0%
				Sales Tax	9.3%
				Planning Level Construction Cost =	\$471,700
				Environmental Permitting	\$30,000
				Administration	5.0%
				Engineering/Construction Management	25.0%
					\$117,925
8625	Seattle CCI (September 2007)			TOTAL (2007 \$) =	\$643,000
8761	Seattle CCI (August 2008)			TOTAL (2008 \$) =	\$654,000
8714	Seattle CCI (November 2010)			TOTAL (2010 \$) =	\$651,000

CITY OF SUMNER						
Preliminary Opinion of Probable Cost						
Project:	CIP No. 53 - Rivergrove Puyallup River Improvements					
Prepared By:	AJP					
Checked by:	JLC					
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	
1	1	LS	Mobilization	\$700,000.00	\$700,000.00	
2	1	LS	Erosion/Sedimentation Control	\$85,000.00	\$85,000.00	
3	4150	LF	Cast-in-Place Concrete Wall	\$175.00	\$726,250.00	
4	4150	LF	Sheet Pile Wall	\$975.00	\$4,046,250.00	
5	83000	SF	Property Acquisition/Permanent Easements	\$8.00	\$664,000.00	
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
				Subtotal =	\$6,221,500	
				Contingency	30.0%	\$1,866,450
				Sales Tax	9.3%	\$578,600
				Planning Level Construction Cost =	\$8,666,550	
				Environmental Permitting	10.0%	\$800,255
				FEMA floodplain modeling, Letter of Map Revision	5.0%	\$400,127
				Administration	5.0%	\$400,127
				Engineering/Construction Management	25.0%	\$2,000,637
8714		Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$12,268,000	
ASSUMPTIONS:						
Mobilization equals approximately 8 percent of Subtotal						
Erosion/Sedimentation Control equals approximately 1.0 percent of Subtotal (\$500 minimum)						
Average wall height is 3.5-ft						
Cast-in-Place Concrete Wall based on 18-in thick wall (surrounding sheet pile) @ \$50/SF						
Sheet pile wall would function as a cut-off wall below grade and floodwall above grade						

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:	SITE A.2 - 48-Inch Outfall Water Quality Facility				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$90,000.00	\$90,000.00
2	1	LS	Erosion/Sedimentation Control	\$90,000.00	\$90,000.00
3	0.3	AC	Clearing and Grubbing	\$7,500.00	\$2,250.00
4	335	CY	Structure Excavation, Class B Incl. Haul	\$15.00	\$5,025.00
5	460	LF	Schedule A Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$34,500.00
6	3	EA	Catch Basin Type II, 48-Inch Diam.	\$2,500.00	\$7,500.00
7	1	FA	Catch Basin Type II, 96-Inch Diam.	\$10,000.00	\$10,000.00
8	1	EA	Catch Basin Type II, 96-Inch Diam. w/ int baffle/weir	\$12,500.00	\$12,500.00
9	1	LS	Flow Measurement System	\$10,000.00	\$10,000.00
10	1	LS	Electrical System, Complete	\$5,000.00	\$5,000.00
11	176	EA	Media Cartridge System (per Cartridge)	\$3,410.00	\$600,160.00
12	1	LS	Tideflex Valve at Outfall	\$10,000.00	\$10,000.00
13					
14					
15					
16					
17					
18					
19					
20					
21					
				Subtotal =	\$876,935
			Contingency	30.0%	\$263,081
			Sales Tax	9.3%	\$81,555
			Planning Level Construction Cost =		\$1,221,600
			Environmental Permitting and Documentation		\$45,000
			Administration	5.0%	\$61,080
			Engineering/Construction Management	25.0%	\$305,400
8714		Seattle CCI (November 2010)	TOTAL (2010 \$) =		\$1,633,000

CITY OF SUMNER

Preliminary Opinion of Probable Cost

Project:	SITE D - Stormwater mitigation site				
Prepared By:	AJP; NM				
Checked by:	JLC				
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$28,000.00	\$28,000.00
2	1	LS	Erosion/Sedimentation Control	\$3,700.00	\$3,700.00
3	28900	CY	Pond Excavation, Incl. Haul	\$16.00	\$462,400.00
4	20720	SY	Fine Grade/Hydroseed & Mulch	\$1.00	\$20,720.00
5	1	EA	Outfall Structure	\$3,500.00	\$3,500.00
6	1	EA	Overflow Structure	\$5,000.00	\$5,000.00
7	150	LF	Schedule A Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$9,000.00
8	1100	CY	Swale Excavation, Incl. Haul	\$18.50	\$20,350.00
9	1	LS	Property Acquisition	\$168,300.00	\$168,300.00
10					
11					
12					
13					
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17					
18					
19					
20					
21					
				Subtotal =	\$720,970
			Contingency	30.0%	\$216,291
			Sales Tax	9.3%	\$67,050
			Planning Level Construction Cost =		\$1,004,300
			Environmental Permitting and Documentation		\$20,000
			Administration	5.0%	\$50,215
			Engineering/Construction Management	25.0%	\$209,000
	7642	Seattle CCI (April 2003)		TOTAL (2003 \$) =	\$1,284,000
	8761	Seattle CCI (August 2008)		TOTAL (2008 \$) =	\$1,473,000
	8714	Seattle CCI (November 2010)		TOTAL (2010 \$) =	\$1,466,000

CITY OF SUMNER					
Preliminary Opinion of Probable Cost					
Project:		SITE J - Water Quality Treatment			
Prepared By:		AJP; NM			
Checked by:		JLC			
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	\$13,500.00	\$13,500.00
2	1	LS	Erosion/Sedimentation Control	\$850.00	\$850.00
3	1	EA	Catch Basin Type III, 96-Inch Diam.	\$12,000.00	\$12,000.00
4	1	EA	Catch Basin Type III, 96-Inch Diam. w/flow splitter	\$18,000.00	\$18,000.00
5	80	LF	Schedule A Storm Sewer Pipe, 42-Inch Diam.	\$200.00	\$16,000.00
6	1	EA	Vortechs 7000	\$36,400.00	\$36,400.00
7	1	EA	Vortechs 16000	\$71,500.00	\$71,500.00
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
				Subtotal =	\$168,250
				Contingency 30.0%	\$50,475
				Sales Tax 9.3%	\$15,647
				Planning Level Construction Cost =	\$234,400
				Environmental Permitting and Documentation	\$30,000
				Administration 5.0%	\$11,720
				Engineering/Construction Management 25.0%	\$58,600
7642	Seattle CCI (April 2003)			TOTAL (2003 \$) =	\$335,000
8761	Seattle CCI (August 2008)			TOTAL (2008 \$) =	\$385,000
8714	Seattle CCI (November 2010)			TOTAL (2010 \$) =	\$383,000

APPENDIX C
Flow Control/Water Quality Treatment Sizing

Western Washington Hydrology Model
PROJECT REPORT

Project Name: SITE A2
Site Address: Sumner
City: Sumner
Report Date: 8/26/2010
Gage: McMillin
Data Start: 10/01/1948
Data End: 09/30/1996
Precip Scale: 1.00
WWHM3 Version:

PREDEVELOPED LAND USE

Name: Site A2 - B1-B4
Bypass: No

GroundWater: No

<u>Pervious Land Use</u>	<u>Acres</u>
A B, Lawn, Flat	50.64
C, Lawn, Flat	3.78

<u>Impervious Land Use</u>	<u>Acres</u>
ROADS FLAT	97.82

11,948 AC-FT
INFILTRATED

Element Flows To:

Surface Interflow Groundwater

Name: Site A2 - B1-B4
Bypass: No

GroundWater: No

<u>Pervious Land Use</u>	<u>Acres</u>
A B, Lawn, Flat	50.64
C, Lawn, Flat	3.78

<u>Impervious Land Use</u>	<u>Acres</u>
ROADS FLAT	97.82

Element Flows To:

Surface Interflow Groundwater
POND-Site A2, POND-Site A2,

Name: POND-Site A2
Bottom Length: 500ft.
Bottom Width: 250ft.
Depth: 4ft.
Volume at riser head: 8.6726ft.
Infiltration On
Infiltration rate: 10
Infiltration safety factor: 1
Side slope 1: 0 To 1
Side slope 2: 0 To 1
Side slope 3: 0 To 1

Side slope 4: 0 To 1
Discharge Structure
 Riser Height: 3 ft.
 Riser Diameter: 24 in.

Effluent Flows To:
 Outlet 1 Outlet 2

Pond Hydraulic Table

Stage(ft)	Area(acr)	Volume(acr-ft)	Dschrg(cfs)	Infilt(cfs)
0.000	2.870	0.000	0.000	0.000
0.044	2.870	0.128	0.000	28.94
0.089	2.870	0.255	0.000	28.94
0.133	2.870	0.383	0.000	28.94
0.178	2.870	0.510	0.000	28.94
0.222	2.870	0.638	0.000	28.94
0.267	2.870	0.765	0.000	28.94
0.311	2.870	0.893	0.000	28.94
0.356	2.870	1.020	0.000	28.94
0.400	2.870	1.148	0.000	28.94
0.444	2.870	1.275	0.000	28.94
0.489	2.870	1.403	0.000	28.94
0.533	2.870	1.530	0.000	28.94
0.578	2.870	1.658	0.000	28.94
0.622	2.870	1.786	0.000	28.94
0.667	2.870	1.913	0.000	28.94
0.711	2.870	2.041	0.000	28.94
0.756	2.870	2.168	0.000	28.94
0.800	2.870	2.296	0.000	28.94
0.844	2.870	2.423	0.000	28.94
0.889	2.870	2.551	0.000	28.94
0.933	2.870	2.678	0.000	28.94
0.978	2.870	2.806	0.000	28.94
1.022	2.870	2.933	0.000	28.94
1.067	2.870	3.061	0.000	28.94
1.111	2.870	3.188	0.000	28.94
1.156	2.870	3.316	0.000	28.94
1.200	2.870	3.444	0.000	28.94
1.244	2.870	3.571	0.000	28.94
1.289	2.870	3.699	0.000	28.94
1.333	2.870	3.826	0.000	28.94
1.378	2.870	3.954	0.000	28.94
1.422	2.870	4.081	0.000	28.94
1.467	2.870	4.209	0.000	28.94
1.511	2.870	4.336	0.000	28.94
1.556	2.870	4.464	0.000	28.94
1.600	2.870	4.591	0.000	28.94
1.644	2.870	4.719	0.000	28.94
1.689	2.870	4.846	0.000	28.94
1.733	2.870	4.974	0.000	28.94
1.778	2.870	5.102	0.000	28.94
1.822	2.870	5.229	0.000	28.94
1.867	2.870	5.357	0.000	28.94
1.911	2.870	5.484	0.000	28.94
1.956	2.870	5.612	0.000	28.94
2.000	2.870	5.739	0.000	28.94
2.044	2.870	5.867	0.000	28.94
2.089	2.870	5.994	0.000	28.94
2.133	2.870	6.122	0.000	28.94
2.178	2.870	6.249	0.000	28.94
2.222	2.870	6.377	0.000	28.94
2.267	2.870	6.504	0.000	28.94
2.311	2.870	6.632	0.000	28.94
2.356	2.870	6.760	0.000	28.94
2.400	2.870	6.887	0.000	28.94
2.444	2.870	7.015	0.000	28.94
2.489	2.870	7.142	0.000	28.94
2.533	2.870	7.270	0.000	28.94

2.578	2.870	7.397	0.000	28.94
2.622	2.870	7.525	0.000	28.94
2.667	2.870	7.652	0.000	28.94
2.711	2.870	7.780	0.000	28.94
2.756	2.870	7.907	0.000	28.94
2.800	2.870	8.035	0.000	28.94
2.844	2.870	8.162	0.000	28.94
2.889	2.870	8.290	0.000	28.94
2.933	2.870	8.418	0.000	28.94
2.978	2.870	8.545	0.000	28.94
3.022	2.870	8.673	0.065	28.94
3.067	2.870	8.800	0.335	28.94
3.111	2.870	8.928	0.721	28.94
3.156	2.870	9.055	1.195	28.94
3.200	2.870	9.183	1.742	28.94
3.244	2.870	9.310	2.354	28.94
3.289	2.870	9.438	3.024	28.94
3.333	2.870	9.565	3.749	28.94
3.378	2.870	9.693	4.523	28.94
3.422	2.870	9.820	5.344	28.94
3.467	2.870	9.948	6.209	28.94
3.511	2.870	10.08	7.117	28.94
3.556	2.870	10.20	8.066	28.94
3.600	2.870	10.33	9.053	28.94
3.644	2.870	10.46	10.08	28.94
3.689	2.870	10.59	11.14	28.94
3.733	2.870	10.71	12.23	28.94
3.778	2.870	10.84	13.36	28.94
3.822	2.870	10.97	14.52	28.94
3.867	2.870	11.10	15.72	28.94
3.911	2.870	11.22	16.94	28.94
3.956	2.870	11.35	18.19	28.94
4.000	2.870	11.48	19.48	28.94
4.044	2.870	11.61	20.79	28.94

MITIGATED LAND USE

ANALYSIS RESULTS

Flow Frequency Return Periods for Predeveloped. POC #1

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	28.582991
5 year	38.454849
10 year	45.495259
25 year	54.982702
50 year	62.491087
100 year	70.386177

Flow Frequency Return Periods for Mitigated. POC #1

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	11.421082
5 year	15.317667
10 year	18.089978
25 year	21.818803
50 year	24.764922
100 year	27.858752

Yearly Peaks for Predeveloped and Mitigated. POC #1

<u>Year</u>	<u>Predeveloped</u>	<u>Mitigated</u>
1950	22.397	0.000
1951	29.955	0.000
1952	40.492	0.000
1953	17.338	0.000
1954	32.071	0.000
1955	28.427	0.000
1956	20.852	0.000
1957	26.300	0.000

1958	61.515	0.000
1959	23.522	0.000
1960	24.528	0.000
1961	75.306	0.000
1962	23.684	0.000
1963	20.910	0.000
1964	51.481	0.000
1965	24.914	0.000
1966	39.235	0.000
1967	39.713	0.000
1968	25.899	0.000
1969	34.972	0.000
1970	50.408	0.000
1971	22.298	0.000
1972	24.103	0.000
1973	24.155	0.000
1974	30.509	0.000
1975	41.267	0.000
1976	21.228	0.000
1977	27.999	0.000
1978	17.254	0.000
1979	40.346	0.000
1980	38.353	0.000
1981	26.559	0.000
1982	39.643	0.000
1983	29.327	0.000
1984	40.841	0.000
1985	26.447	0.000
1986	16.656	0.000
1987	26.411	0.000
1988	38.492	0.000
1989	30.135	0.000
1990	28.909	0.000
1991	19.577	0.000
1992	35.287	0.000
1993	23.401	0.000
1994	20.644	0.000
1995	17.267	0.000
1996	38.064	0.000
1997	28.623	0.000

Ranked Yearly Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	75.3062	0.0000
2	61.5148	0.0000
3	51.4808	0.0000
4	50.4080	0.0000
5	41.2667	0.0000
6	40.8408	0.0000
7	40.4922	0.0000
8	40.3457	0.0000
9	39.7128	0.0000
10	39.6429	0.0000
11	39.2350	0.0000
12	38.4918	0.0000
13	38.3531	0.0000
14	38.0641	0.0000
15	35.2868	0.0000
16	34.9723	0.0000
17	32.0714	0.0000
18	30.5087	0.0000
19	30.1345	0.0000
20	29.9553	0.0000
21	29.3271	0.0000
22	28.9089	0.0000
23	28.6229	0.0000
24	28.4269	0.0000
25	27.9991	0.0000
26	26.5587	0.0000
27	26.4469	0.0000
28	26.4111	0.0000

29	26.3901	0.0000
30	25.8985	0.0000
31	24.9140	0.0000
32	24.5276	0.0000
33	24.1545	0.0000
34	24.1026	0.0000
35	23.6840	0.0000
36	23.5221	0.0000
37	23.4012	0.0000
38	22.3966	0.0000
39	22.2978	0.0000
40	21.2275	0.0000
41	20.9099	0.0000
42	20.8523	0.0000
43	20.6437	0.0000
44	19.5767	0.0000
45	17.3383	0.0000
46	17.2669	0.0000
47	17.2544	0.0000
48	16.6561	0.0000

POC #1

The Facility PASSED

The Facility PASSED.

Flow(CFS)	Predev	Dev	Percentage	Pass/Fail
0.0000	420768	420768	100	Pass
1.0101	32332	0	0	Pass
2.0202	21139	0	0	Pass
3.0303	14798	0	0	Pass
4.0404	10334	0	0	Pass
5.0505	7607	0	0	Pass
6.0606	5748	0	0	Pass
7.0707	4262	0	0	Pass
8.0808	3280	0	0	Pass
9.0909	2499	0	0	Pass
10.1010	1680	0	0	Pass
11.1111	1262	0	0	Pass
12.1212	997	0	0	Pass
13.1313	753	0	0	Pass
14.1414	615	0	0	Pass
15.1515	486	0	0	Pass
16.1616	368	0	0	Pass
17.1717	289	0	0	Pass
18.1818	246	0	0	Pass
19.1919	202	0	0	Pass
20.2020	159	0	0	Pass
21.2121	129	0	0	Pass
22.2222	107	0	0	Pass
23.2323	85	0	0	Pass
24.2424	71	0	0	Pass
25.2525	62	0	0	Pass
26.2626	54	0	0	Pass
27.2727	45	0	0	Pass
28.2828	41	0	0	Pass
29.2929	34	0	0	Pass
30.3030	26	0	0	Pass
31.3131	25	0	0	Pass
32.3232	23	0	0	Pass
33.3333	22	0	0	Pass
34.3434	21	0	0	Pass
35.3535	19	0	0	Pass
36.3636	18	0	0	Pass
37.3737	17	0	0	Pass
38.3838	15	0	0	Pass
39.3939	13	0	0	Pass
40.4040	9	0	0	Pass
41.4141	6	0	0	Pass
42.4242	6	0	0	Pass

43.4343	6	0	0	Pass
44.4444	6	0	0	Pass
45.4545	6	0	0	Pass
46.4646	6	0	0	Pass
47.4747	6	0	0	Pass
48.4848	6	0	0	Pass
49.4949	5	0	0	Pass
50.5051	4	0	0	Pass
51.5152	3	0	0	Pass
52.5253	3	0	0	Pass
53.5354	3	0	0	Pass
54.5455	3	0	0	Pass
55.5556	2	0	0	Pass
56.5657	2	0	0	Pass
57.5758	2	0	0	Pass
58.5859	2	0	0	Pass
59.5960	2	0	0	Pass
60.6061	2	0	0	Pass
61.6162	1	0	0	Pass
62.6263	1	0	0	Pass
63.6364	1	0	0	Pass
64.6465	1	0	0	Pass
65.6566	1	0	0	Pass
66.6667	1	0	0	Pass
67.6768	1	0	0	Pass
68.6869	1	0	0	Pass
69.6970	1	0	0	Pass
70.7071	1	0	0	Pass
71.7172	1	0	0	Pass
72.7273	1	0	0	Pass
73.7374	1	0	0	Pass
74.7475	1	0	0	Pass
75.7576	0	0	0	Pass
76.7677	0	0	0	Pass
77.7778	0	0	0	Pass
78.7879	0	0	0	Pass
79.7980	0	0	0	Pass
80.8081	0	0	0	Pass
81.8182	0	0	0	Pass
82.8283	0	0	0	Pass
83.8384	0	0	0	Pass
84.8485	0	0	0	Pass
85.8586	0	0	0	Pass
86.8687	0	0	0	Pass
87.8788	0	0	0	Pass
88.8889	0	0	0	Pass
89.8990	0	0	0	Pass
90.9091	0	0	0	Pass
91.9192	0	0	0	Pass
92.9293	0	0	0	Pass
93.9394	0	0	0	Pass
94.9495	0	0	0	Pass
95.9596	0	0	0	Pass
96.9697	0	0	0	Pass
97.9798	0	0	0	Pass
98.9899	0	0	0	Pass
100.0000	0	0	0	Pass

Water Quality BMP Flow and Volume for POC 1.

On-line facility volume: 10.894 acre-feet

On-line facility target flow: ~~0.01~~ cfs. 15.148

Adjusted for 15 min: 15.148 cfs.

C line facility target flow: 7.8471 cfs.

Adjusted for 15 min: 8.8419 cfs.

Flow Frequency Return Periods for Redeveloped. POC #2

Return Period	Flow(cfs)
2 year	30.527137
5 year	41.047709
10 year	48.547583

CITY OF SUMNER	
FY 2011 SWRLID Grants	
Water Quality BMP calculations for Media Cartridge Systems	
	Site A.2 Outfall
Alternative:	B - Partial
Level of Treatment:	Basic
	Contech
Approach:	Stormfilter Media System
Contributing area, acres	152.24
Off-line Water Quality Treatment Flow Rate, cfs(1)	8.84
Required Treatment flow rate, gpm	3,969
Cartridge height, inches	18
Treatment flow rate per cartridge, gpm(2)	7.5
Required Number of Cartridges	529
Provided Number of Cartridges	176
Provided flow rate, cfs	2.94
Vault footprint per cartridge, sf/cartridge(3)	3.15
Required Vault footprint, sq ft	554
Number of Vaults, rounded up	3
Total Vault footprint required, sf	576
Treat entire contributing area?	No
Proportional contributing area, percentage(4)	33%
Proportional contributing area, acres	51
Notes:	
1. From WWHM3 calculations, 15-minute time step	
2. Per Washington State Department of Ecology's General Use Level Designation	
3. Based on Contech Stormfilter precast vault, 8-ft x 24-ft ID for 61 cartridges.	

Infiltration safety factor : 1

Side slope 1: 0 To 1

Side slope 2: 0 To 1

Side slope 3: 0 To 1

Side slope 4: 0 To 1

Recharge Structure

Riser Height: 3 ft.

Riser Diameter: 24 in.

Element Flows To:

Outlet 1

Outlet 2

Pond Hydraulic Table

Stage(ft)	Area(acr)	Volume(acr-ft)	Dschrg(cfs)	Infilt(cfs)
0.000	11.25	0.000	0.000	0.000
0.044	11.25	0.500	0.000	113.4
0.089	11.25	1.000	0.000	113.4
0.133	11.25	1.500	0.000	113.4
0.178	11.25	2.000	0.000	113.4
0.222	11.25	2.500	0.000	113.4
0.267	11.25	3.000	0.000	113.4
0.311	11.25	3.500	0.000	113.4
0.356	11.25	4.000	0.000	113.4
0.400	11.25	4.500	0.000	113.4
0.444	11.25	4.999	0.000	113.4
0.489	11.25	5.499	0.000	113.4
0.533	11.25	5.999	0.000	113.4
0.578	11.25	6.499	0.000	113.4
0.622	11.25	6.999	0.000	113.4
0.667	11.25	7.499	0.000	113.4
0.711	11.25	7.999	0.000	113.4
0.756	11.25	8.499	0.000	113.4
0.800	11.25	8.999	0.000	113.4
0.844	11.25	9.499	0.000	113.4
0.889	11.25	9.999	0.000	113.4
0.933	11.25	10.50	0.000	113.4
0.978	11.25	11.00	0.000	113.4
1.022	11.25	11.50	0.000	113.4
1.067	11.25	12.00	0.000	113.4
1.111	11.25	12.50	0.000	113.4
1.156	11.25	13.00	0.000	113.4
1.200	11.25	13.50	0.000	113.4
1.244	11.25	14.00	0.000	113.4
1.289	11.25	14.50	0.000	113.4
1.333	11.25	15.00	0.000	113.4
1.378	11.25	15.50	0.000	113.4
1.422	11.25	16.00	0.000	113.4
1.467	11.25	16.50	0.000	113.4
1.511	11.25	17.00	0.000	113.4
1.556	11.25	17.50	0.000	113.4
1.600	11.25	18.00	0.000	113.4
1.644	11.25	18.50	0.000	113.4
1.689	11.25	19.00	0.000	113.4
1.733	11.25	19.50	0.000	113.4
1.778	11.25	20.00	0.000	113.4
1.822	11.25	20.50	0.000	113.4
1.867	11.25	21.00	0.000	113.4
1.911	11.25	21.50	0.000	113.4
1.956	11.25	22.00	0.000	113.4
2.000	11.25	22.50	0.000	113.4
2.044	11.25	23.00	0.000	113.4
2.089	11.25	23.50	0.000	113.4
2.133	11.25	24.00	0.000	113.4
2.178	11.25	24.50	0.000	113.4
2.222	11.25	25.00	0.000	113.4
2.267	11.25	25.50	0.000	113.4
2.311	11.25	26.00	0.000	113.4
2.356	11.25	26.50	0.000	113.4

2.400	11.25	27.00	0.000	113.4
2.444	11.25	27.50	0.000	113.4
2.489	11.25	28.00	0.000	113.4
2.533	11.25	28.50	0.000	113.4
2.578	11.25	29.00	0.000	113.4
2.622	11.25	29.50	0.000	113.4
2.667	11.25	30.00	0.000	113.4
2.711	11.25	30.50	0.000	113.4
2.756	11.25	31.00	0.000	113.4
2.800	11.25	31.50	0.000	113.4
2.844	11.25	32.00	0.000	113.4
2.889	11.25	32.50	0.000	113.4
2.933	11.25	33.00	0.000	113.4
2.978	11.25	33.50	0.000	113.4
3.022	11.25	34.00	0.065	113.4
3.067	11.25	34.50	0.335	113.4
3.111	11.25	35.00	0.721	113.4
3.156	11.25	35.50	1.195	113.4
3.200	11.25	36.00	1.742	113.4
3.244	11.25	36.50	2.354	113.4
3.289	11.25	37.00	3.024	113.4
3.333	11.25	37.50	3.749	113.4
3.378	11.25	38.00	4.523	113.4
3.422	11.25	38.50	5.344	113.4
3.467	11.25	39.00	6.209	113.4
3.511	11.25	39.50	7.117	113.4
3.556	11.25	40.00	8.066	113.4
3.600	11.25	40.50	9.053	113.4
3.644	11.25	41.00	10.08	113.4
3.689	11.25	41.50	11.14	113.4
3.733	11.25	42.00	12.23	113.4
3.778	11.25	42.50	13.36	113.4
3.822	11.25	43.00	14.52	113.4
3.867	11.25	43.50	15.72	113.4
3.911	11.25	44.00	16.94	113.4
3.956	11.25	44.50	18.19	113.4
4.000	11.25	45.00	19.48	113.4
4.044	11.25	45.50	20.79	113.4

Name : Site J-Ultimate
Bypass: No

GroundWater: No

<u>Pervious Land Use</u>	<u>Acres</u>
A B, Lawn, Flat	34.5
C, Lawn, Flat	230.79

<u>Impervious Land Use</u>	<u>Acres</u>
ROADS FLAT	335.85

Element Flows To:
Surface Interflow Groundwater

Name : Site J-Ultimate
Bypass: No

GroundWater: No

<u>Pervious Land Use</u>	<u>Acres</u>
A B, Lawn, Flat	34.5
C, Lawn, Flat	230.79

<u>Impervious Land Use</u>	<u>Acres</u>
ROADS FLAT	335.85

VOL INFILT. = 53,293.91
ACFT

Element Flows To:
 Surface Interflow Groundwater
 1-Site J-Ultimate, Pond-Site J-Ultimate,

Name : Pond-Site J-Ultimate
 Bottom Length: 700ft.
 Bottom Width: 675ft.
 Depth : 4ft.
 Volume at riser head : 32.7824ft.
 Infiltration On
 Infiltration rate : 10
 Infiltration safety factor : 1
 Side slope 1: 0 To 1
 Side slope 2: 0 To 1
 Side slope 3: 0 To 1
 Side slope 4: 0 To 1
Discharge Structure
 Riser Height: 3 ft.
 Riser Diameter: 24 in.

Element Flows To:
 Outlet 1 Outlet 2

Pond Hydraulic Table

Stage(ft)	Area(acr)	Volume(acr-ft)	Dschrg(cfs)	Infilt(cfs)
0.000	10.85	0.000	0.000	0.000
0.044	10.85	0.482	0.000	109.4
0.089	10.85	0.964	0.000	109.4
0.133	10.85	1.446	0.000	109.4
0.178	10.85	1.928	0.000	109.4
0.222	10.85	2.410	0.000	109.4
0.267	10.85	2.893	0.000	109.4
0.311	10.85	3.375	0.000	109.4
0.356	10.85	3.857	0.000	109.4
0.400	10.85	4.339	0.000	109.4
0.444	10.85	4.821	0.000	109.4
0.489	10.85	5.303	0.000	109.4
0.533	10.85	5.785	0.000	109.4
0.578	10.85	6.267	0.000	109.4
0.622	10.85	6.749	0.000	109.4
0.667	10.85	7.231	0.000	109.4
0.711	10.85	7.713	0.000	109.4
0.756	10.85	8.196	0.000	109.4
0.800	10.85	8.678	0.000	109.4
0.844	10.85	9.160	0.000	109.4
0.889	10.85	9.642	0.000	109.4
0.933	10.85	10.12	0.000	109.4
0.978	10.85	10.61	0.000	109.4
1.022	10.85	11.09	0.000	109.4
1.067	10.85	11.57	0.000	109.4
1.111	10.85	12.05	0.000	109.4
1.156	10.85	12.53	0.000	109.4
1.200	10.85	13.02	0.000	109.4
1.244	10.85	13.50	0.000	109.4
1.289	10.85	13.98	0.000	109.4
1.333	10.85	14.46	0.000	109.4
1.378	10.85	14.94	0.000	109.4
1.422	10.85	15.43	0.000	109.4
1.467	10.85	15.91	0.000	109.4
1.511	10.85	16.39	0.000	109.4
1.556	10.85	16.87	0.000	109.4

1.600	10.85	17.36	0.000	109.4
1.644	10.85	17.84	0.000	109.4
1.689	10.85	18.32	0.000	109.4
1.733	10.85	18.80	0.000	109.4
1.778	10.85	19.28	0.000	109.4
1.822	10.85	19.77	0.000	109.4
1.867	10.85	20.25	0.000	109.4
1.911	10.85	20.73	0.000	109.4
1.956	10.85	21.21	0.000	109.4
2.000	10.85	21.69	0.000	109.4
2.044	10.85	22.18	0.000	109.4
2.089	10.85	22.66	0.000	109.4
2.133	10.85	23.14	0.000	109.4
2.178	10.85	23.62	0.000	109.4
2.222	10.85	24.10	0.000	109.4
2.267	10.85	24.59	0.000	109.4
2.311	10.85	25.07	0.000	109.4
2.356	10.85	25.55	0.000	109.4
2.400	10.85	26.03	0.000	109.4
2.444	10.85	26.52	0.000	109.4
2.489	10.85	27.00	0.000	109.4
2.533	10.85	27.48	0.000	109.4
2.578	10.85	27.96	0.000	109.4
2.622	10.85	28.44	0.000	109.4
2.667	10.85	28.93	0.000	109.4
2.711	10.85	29.41	0.000	109.4
2.756	10.85	29.89	0.000	109.4
2.800	10.85	30.37	0.000	109.4
2.844	10.85	30.85	0.000	109.4
2.889	10.85	31.34	0.000	109.4
2.933	10.85	31.82	0.000	109.4
2.978	10.85	32.30	0.000	109.4
3.022	10.85	32.78	0.065	109.4
3.067	10.85	33.26	0.335	109.4
3.111	10.85	33.75	0.721	109.4
3.156	10.85	34.23	1.195	109.4
3.200	10.85	34.71	1.742	109.4
3.244	10.85	35.19	2.354	109.4
3.289	10.85	35.67	3.024	109.4
3.333	10.85	36.16	3.749	109.4
3.378	10.85	36.64	4.523	109.4
3.422	10.85	37.12	5.344	109.4
3.467	10.85	37.60	6.209	109.4
3.511	10.85	38.09	7.117	109.4
3.556	10.85	38.57	8.066	109.4
3.600	10.85	39.05	9.053	109.4
3.644	10.85	39.53	10.08	109.4
3.689	10.85	40.01	11.14	109.4
3.733	10.85	40.50	12.23	109.4
3.778	10.85	40.98	13.36	109.4
3.822	10.85	41.46	14.52	109.4
3.867	10.85	41.94	15.72	109.4
3.911	10.85	42.42	16.94	109.4
3.956	10.85	42.91	18.19	109.4
4.000	10.85	43.39	19.48	109.4
4.044	10.85	43.87	20.79	109.4

MITIGATED LAND USE

ANALYSIS RESULTS

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	113.058294
5 year	156.266025
10 year	187.724314
25 year	230.814051
50 year	265.405855

F₁ Frequency Return Periods for Predeveloped. POC #1

100 year

302.189435

Flow Frequency Return Periods for Mitigated. POC #1

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	11.421082
5 year	15.317667
10 year	18.089978
25 year	21.818803
50 year	24.764922
100 year	27.858752

Yearly Peaks for Predeveloped and Mitigated. POC #1

<u>Year</u>	<u>Predeveloped</u>	<u>Mitigated</u>
1950	93.303	0.000
1951	121.677	0.000
1952	174.023	0.000
1953	62.069	0.000
1954	131.389	0.000
1955	117.657	0.000
1956	73.371	0.000
1957	93.436	0.000
1958	226.891	0.000
1959	92.399	0.000
1960	97.174	0.000
1961	339.973	0.000
1962	98.244	0.000
1963	83.478	0.000
1964	233.279	0.000
1965	98.410	0.000
1966	139.605	0.000
1967	186.365	0.000
1968	101.023	0.000
1969	133.385	0.000
1970	179.695	0.000
1971	86.917	0.000
1972	97.518	0.000
1973	93.219	0.000
1974	107.757	0.000
1975	192.535	0.000
1976	76.422	0.000
1977	118.113	0.000
1978	60.652	0.000
1979	175.407	0.000
1980	140.468	0.000
1981	112.214	0.000
1982	172.401	0.000
1983	112.462	0.000
1984	159.637	0.000
1985	100.173	0.000
1986	62.565	0.000
1987	108.404	0.000
1988	146.371	0.000
1989	119.670	0.000
1990	120.814	0.000
1991	83.067	0.000
1992	142.715	0.000
1993	91.555	0.000
1994	85.550	0.000
1995	65.443	0.000
1996	136.456	0.000
1997	119.310	0.000

Ranked Yearly Peaks for Predeveloped and Mitigated. POC #1

<u>Rank</u>	<u>Predeveloped</u>	<u>Mitigated</u>
1	339.9730	0.0000
2	233.2790	0.0000
3	226.8910	0.0000
4	192.5350	0.0000
5	186.3650	0.0000

6	179.6950	0.0000
7	175.4070	0.0000
8	174.0230	0.0000
9	172.4010	0.0000
10	159.6370	0.0000
11	146.3710	0.0000
12	142.7150	0.0000
13	140.4680	0.0000
14	139.6050	0.0000
15	136.4560	0.0000
16	133.3850	0.0000
17	131.3890	0.0000
18	121.6770	0.0000
19	120.8140	0.0000
20	119.6700	0.0000
21	119.3100	0.0000
22	118.1130	0.0000
23	117.6570	0.0000
24	112.4620	0.0000
25	112.2140	0.0000
26	108.4040	0.0000
27	107.7570	0.0000
28	101.0230	0.0000
29	100.1730	0.0000
30	98.4098	0.0000
31	98.2439	0.0000
32	97.5177	0.0000
33	97.1739	0.0000
34	93.4362	0.0000
35	93.3028	0.0000
36	93.2193	0.0000
37	92.3985	0.0000
38	91.5549	0.0000
39	86.9172	0.0000
40	85.5503	0.0000
41	83.4784	0.0000
42	83.0671	0.0000
43	76.4223	0.0000
44	73.3710	0.0000
45	65.4430	0.0000
46	62.5647	0.0000
47	62.0689	0.0000
48	60.6522	0.0000

POC #1
The Facility PASSED

The Facility PASSED.

Flow(CFS)	Predev	Dev	Percentage	Pass/Fail
0.0000	420768	420768	100	Pass
3.5354	45022	0	0	Pass
7.0707	26555	0	0	Pass
10.6061	18089	0	0	Pass
14.1414	12749	0	0	Pass
17.6768	9421	0	0	Pass
21.2121	7098	0	0	Pass
24.7475	5365	0	0	Pass
28.2828	4085	0	0	Pass
31.8182	3194	0	0	Pass
35.3535	2393	0	0	Pass
38.8889	1795	0	0	Pass
42.4242	1375	0	0	Pass
45.8586	1093	0	0	Pass
49.2929	847	0	0	Pass
53.0303	683	0	0	Pass
56.5657	541	0	0	Pass
60.1010	443	0	0	Pass
63.6364	354	0	0	Pass
67.1717	284	0	0	Pass

70.7071	243	0	0	Pass
74.2424	207	0	0	Pass
77.7778	174	0	0	Pass
81.3131	152	0	0	Pass
84.8485	129	0	0	Pass
88.3838	112	0	0	Pass
91.9192	91	0	0	Pass
95.4545	75	0	0	Pass
98.9899	61	0	0	Pass
102.5253	55	0	0	Pass
106.0606	51	0	0	Pass
109.5960	45	0	0	Pass
113.1313	42	0	0	Pass
116.6667	41	0	0	Pass
120.2020	33	0	0	Pass
123.7374	30	0	0	Pass
127.2727	25	0	0	Pass
130.8081	24	0	0	Pass
134.3434	21	0	0	Pass
137.8788	20	0	0	Pass
141.4141	18	0	0	Pass
144.9495	16	0	0	Pass
148.4848	14	0	0	Pass
152.0202	14	0	0	Pass
155.5556	12	0	0	Pass
159.0909	12	0	0	Pass
162.6263	11	0	0	Pass
166.1616	11	0	0	Pass
169.6970	11	0	0	Pass
173.2323	10	0	0	Pass
176.7677	8	0	0	Pass
180.3030	7	0	0	Pass
183.8384	7	0	0	Pass
187.3737	6	0	0	Pass
190.9091	6	0	0	Pass
194.4444	5	0	0	Pass
197.9798	5	0	0	Pass
201.5152	5	0	0	Pass
205.0505	5	0	0	Pass
208.5859	5	0	0	Pass
212.1212	5	0	0	Pass
215.6566	5	0	0	Pass
219.1919	5	0	0	Pass
222.7273	5	0	0	Pass
226.2626	5	0	0	Pass
229.7980	3	0	0	Pass
233.3333	2	0	0	Pass
236.8687	2	0	0	Pass
240.4040	2	0	0	Pass
243.9394	1	0	0	Pass
247.4747	1	0	0	Pass
251.0101	1	0	0	Pass
254.5455	1	0	0	Pass
258.0808	1	0	0	Pass
261.6162	1	0	0	Pass
265.1515	1	0	0	Pass
268.6869	1	0	0	Pass
272.2222	1	0	0	Pass
275.7576	1	0	0	Pass
279.2929	1	0	0	Pass
282.8283	1	0	0	Pass
286.3636	1	0	0	Pass
289.8990	1	0	0	Pass
293.4343	1	0	0	Pass
296.9697	1	0	0	Pass
300.5051	1	0	0	Pass
304.0404	1	0	0	Pass
307.5758	1	0	0	Pass
311.1111	1	0	0	Pass
314.6465	1	0	0	Pass
318.1818	1	0	0	Pass
321.7172	1	0	0	Pass

325.2525	1	0	0	Pass
328.7879	1	0	0	Pass
332.3232	1	0	0	Pass
335.8586	1	0	0	Pass
339.3939	1	0	0	Pass
342.9293	0	0	0	Pass
346.4646	0	0	0	Pass
349.0000	0	0	0	Pass

Water Quality BMP Flow and Volume for POC 1.

On-line facility volume: 46.03 acre-feet
 On-line facility target flow: 0.01 cfs. 47.84
 Adjusted for 15 min: 51.581 cfs.
 Off-line facility target flow: 27.34 cfs.
 Adjusted for 15 min: 29.475 cfs.

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	Flow(cfs)
2 year	108.260942
5 year	149.032952
10 year	178.626391
25 year	219.062991
50 year	251.455705
100 year	285.843172

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	Flow(cfs)
2 year	30.527137
5 year	41.047709
10 year	48.547583
25 year	58.650799
50 year	66.644165
100 year	75.047278

Yearly Peaks for Predeveloped and Mitigated. POC #2

Year	Predeveloped	Mitigated
1950	88.302	0.000
1951	116.146	0.000
1952	161.171	0.000
1953	60.587	0.000
1954	125.553	0.000
1955	112.644	0.000
1956	71.669	0.000
1957	91.250	0.000
1958	221.204	0.000
1959	88.785	0.000
1960	93.160	0.000
1961	326.207	0.000
1962	93.034	0.000
1963	80.210	0.000
1964	215.119	0.000
1965	94.651	0.000
1966	136.309	0.000
1967	171.631	0.000
1968	96.205	0.000
1969	129.839	0.000
1970	175.469	0.000
1971	83.517	0.000
1972	93.107	0.000
1973	90.559	0.000
1974	105.257	0.000
1975	180.825	0.000
1976	72.958	0.000
1977	110.131	0.000
1978	59.255	0.000
1979	160.705	0.000
1980	136.986	0.000
1981	105.650	0.000
1982	163.902	0.000
1983	109.375	0.000
1984	154.616	0.000
1985	97.297	0.000
1986	60.359	0.000
1987	102.837	0.000
1988	142.506	0.000
1989	114.853	0.000
1990	115.240	0.000
1991	77.641	0.000
1992	136.650	0.000
1993	97.922	0.000

1994	79.849	0.000
1995	63.433	0.000
1996	133.193	0.000
1997	112.895	0.000

Ranked Yearly Peaks for Predeveloped and Mitigated. POC #2

Rank	Predeveloped	Mitigated
1	326.2070	0.0000
2	221.2040	0.0000
3	215.1190	0.0000
4	180.8250	0.0000
5	175.4690	0.0000
6	171.6310	0.0000
7	163.9020	0.0000
8	161.1710	0.0000
9	160.7050	0.0000
10	154.6160	0.0000
11	142.5060	0.0000
12	136.9860	0.0000
13	136.6500	0.0000
14	136.3090	0.0000
15	133.1930	0.0000
16	129.8390	0.0000
17	125.5530	0.0000
18	116.1460	0.0000
19	115.2400	0.0000
20	114.8530	0.0000
21	112.8950	0.0000
22	112.6440	0.0000
23	110.1310	0.0000
24	109.3750	0.0000
25	105.6500	0.0000
26	105.2570	0.0000
27	102.8370	0.0000
28	97.2966	0.0000
29	96.2048	0.0000
30	94.6508	0.0000
31	93.1596	0.0000
32	93.1074	0.0000
33	93.0341	0.0000
34	91.2495	0.0000
35	90.5594	0.0000
36	88.7849	0.0000
37	88.3020	0.0000
38	87.9320	0.0000
39	83.5169	0.0000
40	80.2098	0.0000
41	79.8489	0.0000
42	77.6407	0.0000
43	72.9579	0.0000
44	71.6688	0.0000
45	63.4331	0.0000
46	60.5866	0.0000
47	60.3589	0.0000
48	59.2551	0.0000

POC #2
The Facility PASSED

The Facility PASSED.

Flow(CFS)	Predev	Dev	Percentage	Pass/Fail
0.0000	420768	420768	100	Pass
3.5354	40587	0	0	Pass
7.0707	24346	0	0	Pass
10.6061	16797	0	0	Pass
14.1414	11752	0	0	Pass
17.6768	8680	0	0	Pass
21.2121	6471	0	0	Pass
24.7475	4864	0	0	Pass
28.2828	3703	0	0	Pass
31.8182	2842	0	0	Pass
35.3535	2090	0	0	Pass
38.8889	1549	0	0	Pass
42.4242	1189	0	0	Pass
45.9596	926	0	0	Pass
49.4949	730	0	0	Pass
53.0303	586	0	0	Pass
56.5657	464	0	0	Pass
60.1010	368	0	0	Pass
63.6364	295	0	0	Pass

67.1717	242	0	0	Pass
70.7071	210	0	0	Pass
74.2424	176	0	0	Pass
77.7778	148	0	0	Pass
81.3131	127	0	0	Pass
84.8485	105	0	0	Pass
88.8838	85	0	0	Pass
92.9192	73	0	0	Pass
95.4545	62	0	0	Pass
98.9899	50	0	0	Pass
102.5253	48	0	0	Pass
106.0606	43	0	0	Pass
109.5960	41	0	0	Pass
113.1313	34	0	0	Pass
116.6667	29	0	0	Pass
120.2020	25	0	0	Pass
123.7374	24	0	0	Pass
127.2727	23	0	0	Pass
130.8081	20	0	0	Pass
134.3434	19	0	0	Pass
137.8788	15	0	0	Pass
141.4141	15	0	0	Pass
144.9495	14	0	0	Pass
148.4848	13	0	0	Pass
152.0202	12	0	0	Pass
155.5556	11	0	0	Pass
159.0909	11	0	0	Pass
162.6263	9	0	0	Pass
166.1616	8	0	0	Pass
169.6970	8	0	0	Pass
173.2323	7	0	0	Pass
176.7677	6	0	0	Pass
180.3030	6	0	0	Pass
183.8384	5	0	0	Pass
187.3737	5	0	0	Pass
191.9091	5	0	0	Pass
195.4444	5	0	0	Pass
197.9798	5	0	0	Pass
201.5152	5	0	0	Pass
205.0505	5	0	0	Pass
208.5859	5	0	0	Pass
212.1212	5	0	0	Pass
215.6566	4	0	0	Pass
219.1919	4	0	0	Pass
222.7273	1	0	0	Pass
226.2626	1	0	0	Pass
229.7980	1	0	0	Pass
233.3333	1	0	0	Pass
236.8687	1	0	0	Pass
240.4040	1	0	0	Pass
243.9394	1	0	0	Pass
247.4747	1	0	0	Pass
251.0101	1	0	0	Pass
254.5455	1	0	0	Pass
258.0808	1	0	0	Pass
261.6162	1	0	0	Pass
265.1515	1	0	0	Pass
268.6869	1	0	0	Pass
272.2222	1	0	0	Pass
275.7576	1	0	0	Pass
279.2929	1	0	0	Pass
282.8283	1	0	0	Pass
286.3636	1	0	0	Pass
289.8990	1	0	0	Pass
293.4343	1	0	0	Pass
297.9697	1	0	0	Pass
300.5051	1	0	0	Pass
304.0404	1	0	0	Pass
307.5758	1	0	0	Pass
311.1111	1	0	0	Pass
314.6465	1	0	0	Pass
318.1818	1	0	0	Pass

321.7172	1	0	0	Pass
325.2525	1	0	0	Pass
328.7879	0	0	0	Pass
332.3232	0	0	0	Pass
335.8586	0	0	0	Pass
339.3939	0	0	0	Pass
343.9293	0	0	0	Pass
346.4646	0	0	0	Pass
350.0000	0	0	0	Pass

Water Quality BMP Flow and Volume for POC 2.
 On-line facility volume: 43.136 acre-feet
 On-line facility target flow: 0.01 cfs. **46.43**
 Adjusted for 15 min: 50.145 cfs.
 Off-line facility target flow: 26.714 cfs.
 Adjusted for 15 min: 28.854 cfs.

~~Flow Frequency Return Periods for Predeveloped. POC #3~~

Return Period	Flow(cfs)
2 year	108.260942
5 year	149.032952
10 year	178.626391
25 year	219.062991
50 year	251.455705
100 year	285.843172

~~Flow Frequency Return Periods for Mitigated. POC #3~~

Return Period	Flow(cfs)
2 year	108.260942
5 year	149.032952
10 year	178.626391
25 year	219.062991
50 year	251.455705
100 year	285.843172

~~Yearly Peaks for Predeveloped and Mitigated. POC #3~~

Year	Predeveloped	Mitigated
1950	88.302	0.000
1951	116.146	0.000
1952	161.171	0.000
1953	60.587	0.000
1954	125.553	0.000
1955	112.644	0.000
1956	71.669	0.000
1957	91.250	0.000
1958	221.204	0.000
1959	88.785	0.000
1960	93.160	0.000
1961	326.207	0.000
1962	93.034	0.000
1963	80.210	0.000
1964	215.119	0.000
1965	94.651	0.000
1966	136.309	0.000
1967	171.631	0.000
1968	96.205	0.000
1969	129.839	0.000
1970	175.469	0.000
1971	83.517	0.000
1972	93.107	0.000
1973	90.559	0.000
1974	105.257	0.000
1975	180.825	0.000
1976	72.958	0.000
1977	110.131	0.000
1978	59.255	0.000
1979	160.705	0.000
1980	136.986	0.000
1981	105.650	0.000
1982	163.902	0.000
1983	109.375	0.000
1984	154.616	0.000
1985	97.297	0.000
1986	60.359	0.000
1987	102.837	0.000
1988	142.506	0.000
1989	114.853	0.000
1990	115.240	0.000
1991	77.641	0.000

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Ecology FY 2011 SWRLID Grant Program

Vortechs Hydraulic calculations for Site J Outfall

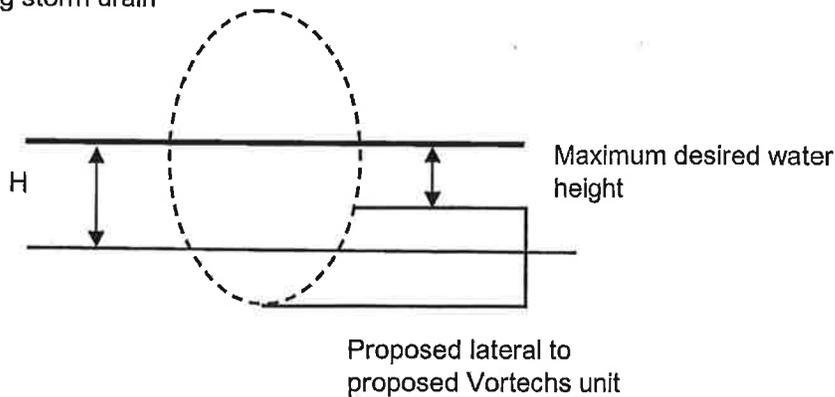
	Vortechs Unit 16000	Vortechs Unit 7000	
Maximum flow rate per unit, cfs	25	11	
Storm Drain main diameter	60	60	
Storm Drain main diameter, ft	5	5	
Total WQ Q per unit	8.8	3.9	From Ecology's GULD
100-yr Q	305	305	
Inlet Pipe Diameter, in	18	12	
Inlet Pipe Diameter, ft	1.5	1	
Height Available for High Flow Bypass	3.5	4	
20% of WQ Q	1.76	0.78	
Cd	0.56	0.56	From Contech resources
Orifice Diameter, ft	0.71	0.44	GOAL SEEK so that flow is 20% of WQ Q and lateral pipe is full
Orifice Diameter, in	8.48	5.34	
Weir Area, sq ft	0.3918	0.1552	
H, orifice head, ft	1	1.25	From center of orifice, half the pipe diameter + Maximum desired water height above pipe crown
g	32.2	32.2	
Qorifice	1.76	0.78	$Cd * A * \sqrt{2 * g * H}$
Qremaining to High Flow Weir	7.04	3.12	
Cd	3.37	3.37	From Contech resources
L, Weir Length, ft	2.09	0.93	
W, Weir Height, ft	1.00	1.00	
Qweir, cfs	7.04	3.12	$Cd * L * H^{(3/2)}$

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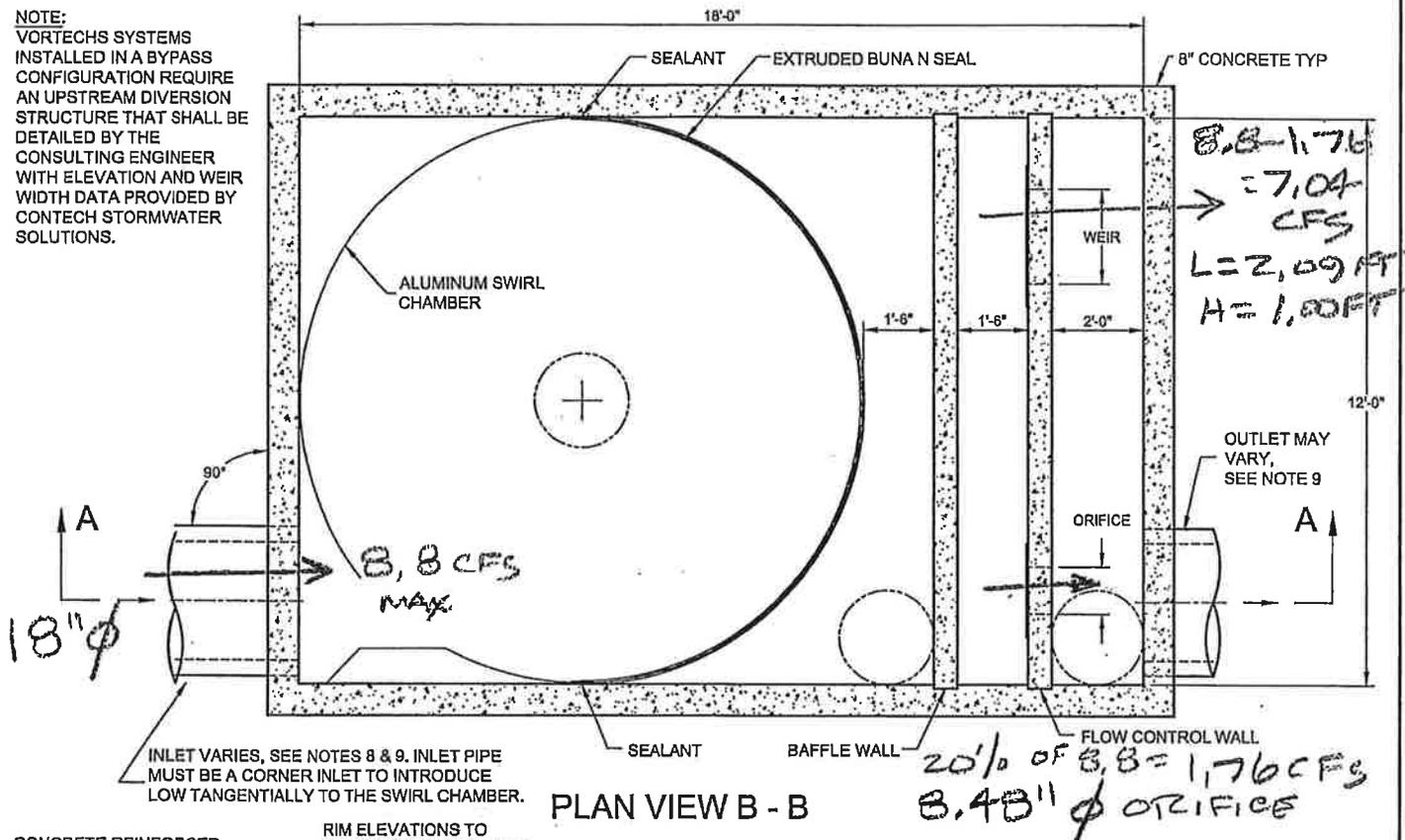
Pipe Diameter Sizing for Laterals to Vortechs Units for Site J Outfall

	Pipe to Vortechs 16000	Pipe to Vortechs 7000	Comment
Design flow rate per unit, cfs	8.8	3.9	From Ecology's General Use Level Designation
Pipe Diameter, in	18	12	
Pipe Diameter, ft	1.5	1	Pipe diameter / 12
Pipe Area, sq ft	1.7671	0.7854	$\text{PI} \cdot (\text{D}/2)^2$
Cd	0.62	0.62	Orifice coefficient
g, ft/sec ²	32.2	32.2	Gravitational constant
Maximum desired water height above pipe crown, ft	0.25	0.75	
H, orifice head, ft	1	1.25	From center of orifice, half the pipe diameter + Maximum desired water height above pipe crown
Q per pipe, cfs	8.8	4.4	$\text{Cd} \cdot \text{A} \cdot \text{sqrt}(2 \cdot \text{g} \cdot \text{H})$

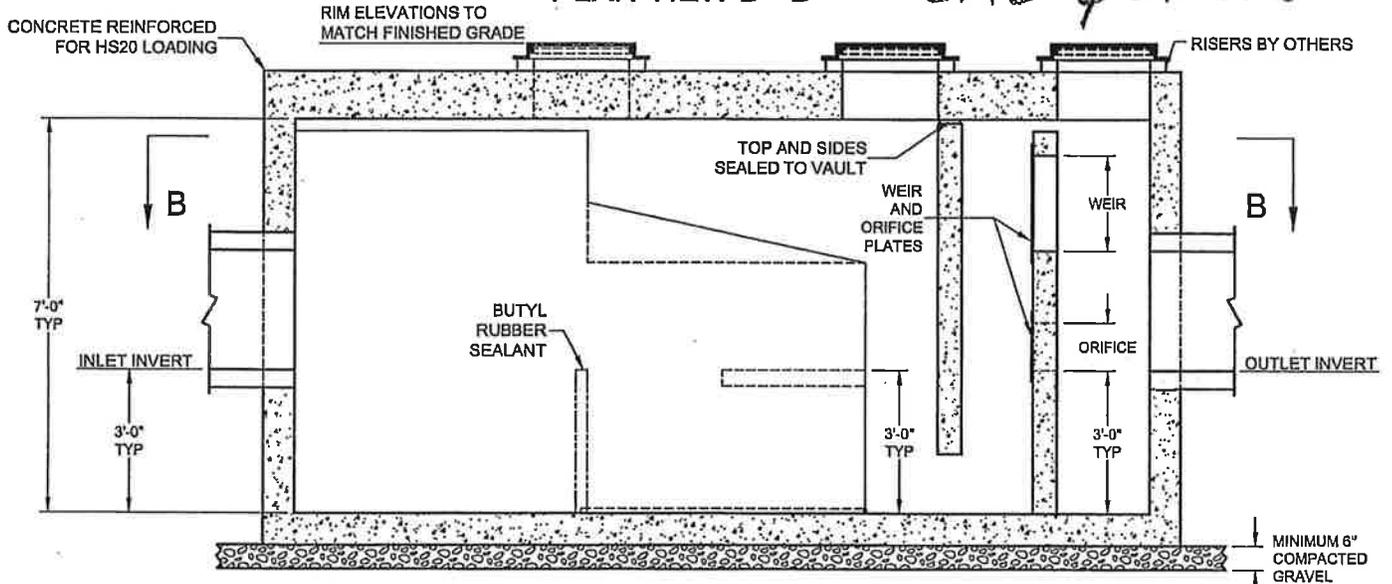
Existing storm drain



NOTE:
 VORTECHS SYSTEMS
 INSTALLED IN A BYPASS
 CONFIGURATION REQUIRE
 AN UPSTREAM DIVERSION
 STRUCTURE THAT SHALL BE
 DETAILED BY THE
 CONSULTING ENGINEER
 WITH ELEVATION AND WEIR
 WIDTH DATA PROVIDED BY
 CONTECH STORMWATER
 SOLUTIONS.



PLAN VIEW B - B



SECTION A - A

NOTES:

- STORMWATER TREATMENT SYSTEM (SWTS) SHALL HAVE:
 PEAK TREATMENT CAPACITY: 25 CFS ← *8.8 CFS FOR ECOLOGY CONSULT*
 SEDIMENT STORAGE: 7.1 CU YD
 SEDIMENT CHAMBER DIA: 12' MIN
- SWTS SHALL BE CONTAINED IN ONE RECTANGULAR STRUCTURE
- SWTS REMOVAL EFFICIENCY SHALL BE DOCUMENTED BASED ON PARTICLE SIZE
- SWTS SHALL RETAIN FLOATABLES AND TRAPPED SEDIMENT UP TO AND INCLUDING PEAK TREATMENT CAPACITY
- SWTS INVERTS IN AND OUT ARE TYPICALLY AT THE SAME ELEVATION
- SWTS SHALL NOT BE COMPROMISED BY EFFECTS OF DOWNSTREAM TAILWATER
- SWTS SHALL HAVE NO INTERNAL COMPONENTS THAT OBSTRUCT MAINTENANCE ACCESS
- INLET PIPE MUST BE PERPENDICULAR TO THE STRUCTURE
- PIPE ORIENTATION MAY VARY; SEE SITE PLAN FOR SIZE AND LOCATION
- PURCHASER SHALL NOT BE RESPONSIBLE FOR ASSEMBLY OF UNIT
- MANHOLE FRAMES AND PERFORATED COVERS SUPPLIED WITH SYSTEM, NOT INSTALLED
- PURCHASER TO PREPARE EXCAVATION AND PROVIDE CRANE FOR OFF-LOADING AND SETTING AT TIME OF DELIVERY
- VORTECHS SYSTEMS BY CONTECH STORMWATER SOLUTIONS; PORTLAND, OR (800)548-4667; SCARBOROUGH, ME (877) 907-8676; ELK RIDGE, MD (866) 740-3318.

PROPRIETARY INFORMATION - NOT TO BE USED FOR CONSTRUCTION PURPOSES

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contechstormwater.com

STANDARD DETAIL
 STORMWATER TREATMENT SYSTEM
 VORTECHS® MODEL 16000

U.S. PATENT No. 5,759,415

DATE: 4/5/06

SCALE: NONE

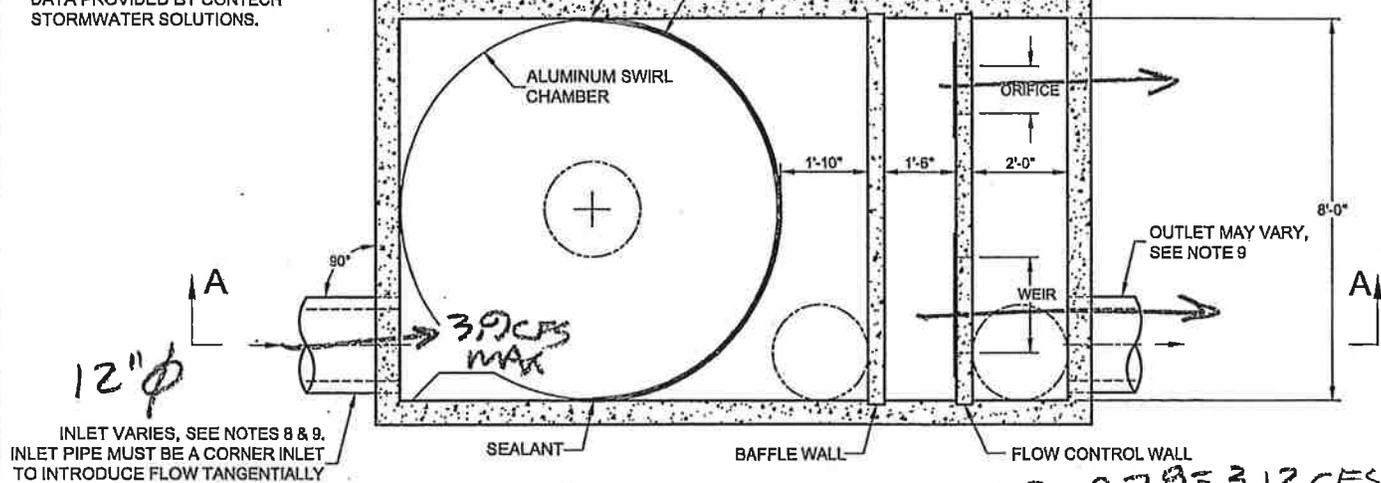
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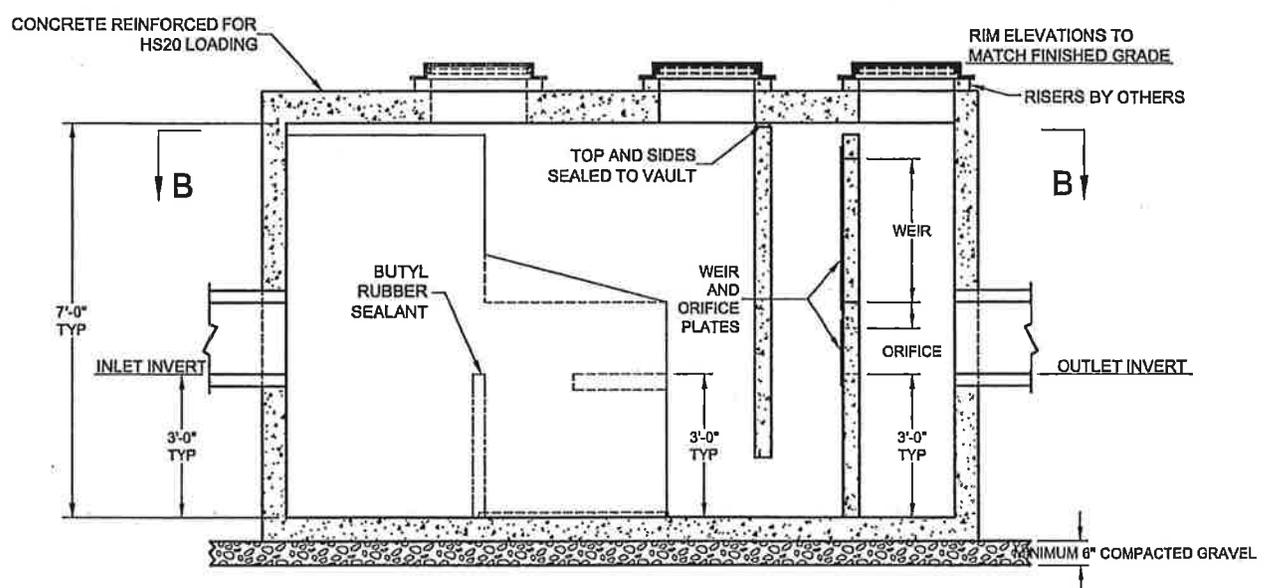
NOTE:
 VORTECHS SYSTEMS INSTALLED
 IN A BYPASS CONFIGURATION
 REQUIRE AN UPSTREAM
 DIVERSION STRUCTURE THAT
 SHALL BE DETAILED BY THE
 CONSULTING ENGINEER WITH
 ELEVATION AND WEIR WIDTH
 DATA PROVIDED BY CONTECH
 STORMWATER SOLUTIONS.

20% OF 3.9 CFS
 = 0.78 CFS
 5.34" ORIFICE ϕ



PLAN VIEW B - B

$3.9 - 0.78 = 3.12 \text{ CFS}$
 $L = 0.93 \text{ FT}$
 $H = 1.00 \text{ FT}$



SECTION A - A

NOTES:

- STORMWATER TREATMENT SYSTEM (SWTS) SHALL HAVE:
 PEAK TREATMENT CAPACITY: 11 CFS $\leftarrow 3.9 \text{ CFS MAX PER ECOLOGY GULD}$
 SEDIMENT STORAGE: 4 CU YD
 SEDIMENT CHAMBER DIA: 8' MIN
- SWTS SHALL BE CONTAINED IN ONE RECTANGULAR STRUCTURE
- SWTS REMOVAL EFFICIENCY SHALL BE DOCUMENTED BASED ON PARTICLE SIZE
- SWTS SHALL RETAIN FLOATABLES AND TRAPPED SEDIMENT UP TO AND INCLUDING PEAK TREATMENT CAPACITY
- SWTS INVERTS IN AND OUT ARE TYPICALLY AT THE SAME ELEVATION
- SWTS SHALL NOT BE COMPROMISED BY EFFECTS OF DOWNSTREAM TAILWATER
- SWTS SHALL HAVE NO INTERNAL COMPONENTS THAT OBSTRUCT MAINTENANCE ACCESS
- INLET PIPE MUST BE PERPENDICULAR TO THE STRUCTURE
- PIPE ORIENTATION MAY VARY; SEE SITE PLAN FOR SIZE AND LOCATION
- PURCHASER SHALL NOT BE RESPONSIBLE FOR ASSEMBLY OF UNIT
- MANHOLE FRAMES AND PERFORATED COVERS SUPPLIED WITH SYSTEM, NOT INSTALLED
- PURCHASER TO PREPARE EXCAVATION AND PROVIDE CRANE FOR OFF-LOADING AND SETTING AT TIME OF DELIVERY
- VORTECHS SYSTEMS BY CONTECH STORMWATER SOLUTIONS; PORTLAND, OR (800)648-4667; SCARBOROUGH, ME (877) 907-8876; ELKRIDGE, MD (888) 740-3318.

PROPRIETARY INFORMATION - NOT TO BE USED FOR CONSTRUCTION PURPOSES

This CADD file is for the purpose of specifying stormwater treatment equipment to be furnished by CONTECH Stormwater Solutions and may only be transferred to other documents exactly as provided by CONTECH Stormwater Solutions. Title block information, excluding the CONTECH Stormwater Solutions logo and the Vortechs Stormwater Treatment System designation and patent number, may be deleted if necessary. Revisions to any part of this CADD file without prior coordination with CONTECH Stormwater Solutions shall be considered unauthorized use of proprietary information.



STANDARD DETAIL
 STORMWATER TREATMENT SYSTEM
 VORTECHS® MODEL 7000

U.S. PATENT No. 5,759,415

contechstormwater.com

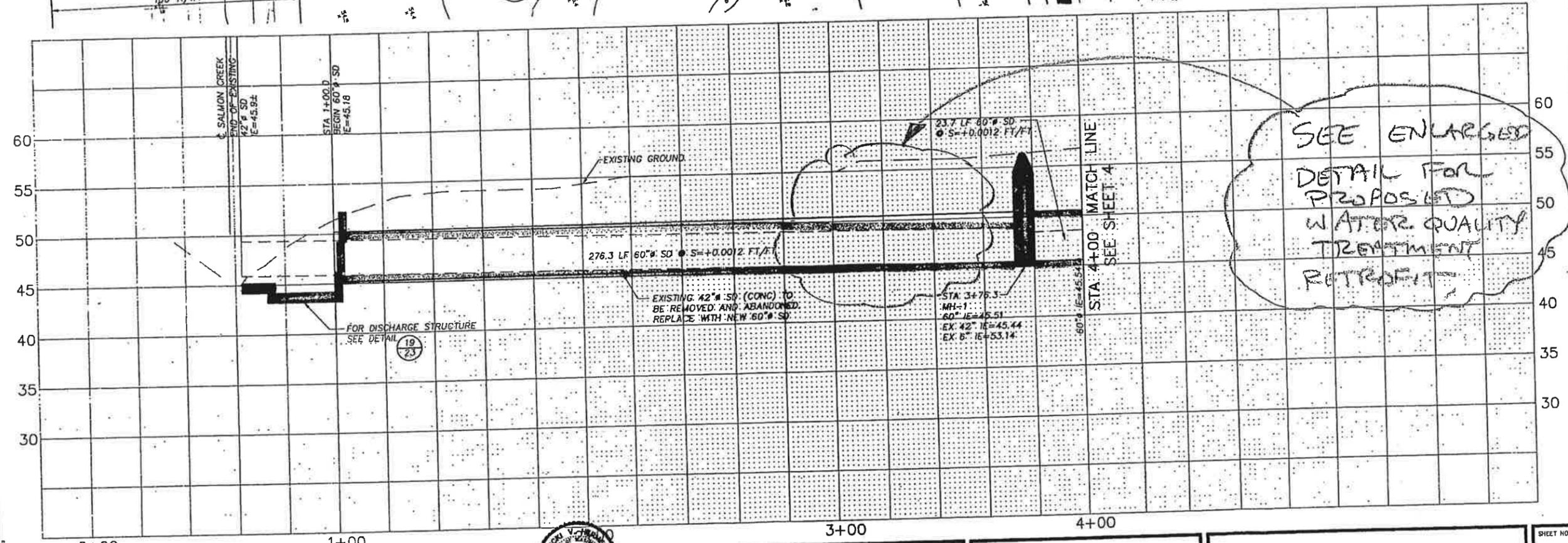
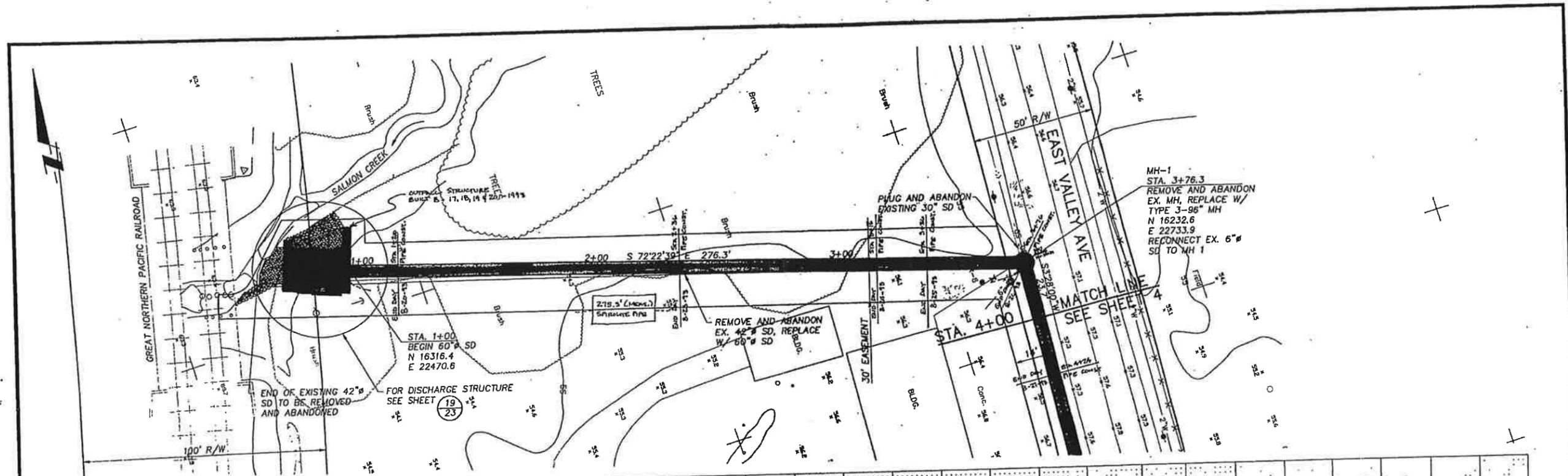
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SEE ENLARGED
 DETAIL FOR
 PROPOSED
 WATER QUALITY
 TREATMENT
 RETROFIT

NO.	REVISIONS	DATE	BY	DESIGNED	DRAWN	CHECKED	APPROVED
				R. HERMES	J. MOORE		

1" = 20' H
 1" = 5' V

DATE: JUNE 1993

EXPIRES: 11-14-94

Parametrix, Inc.

WASHINGTON: Sumner, Bramerton, Kirkland
 OREGON: Portland
 HAWAII: Honolulu

PROJECT NAME: EAST SUMNER STORM DRAINAGE TRUNK SYSTEM, SUMNER, WASHINGTON

JOB NO.: 21-1527-28

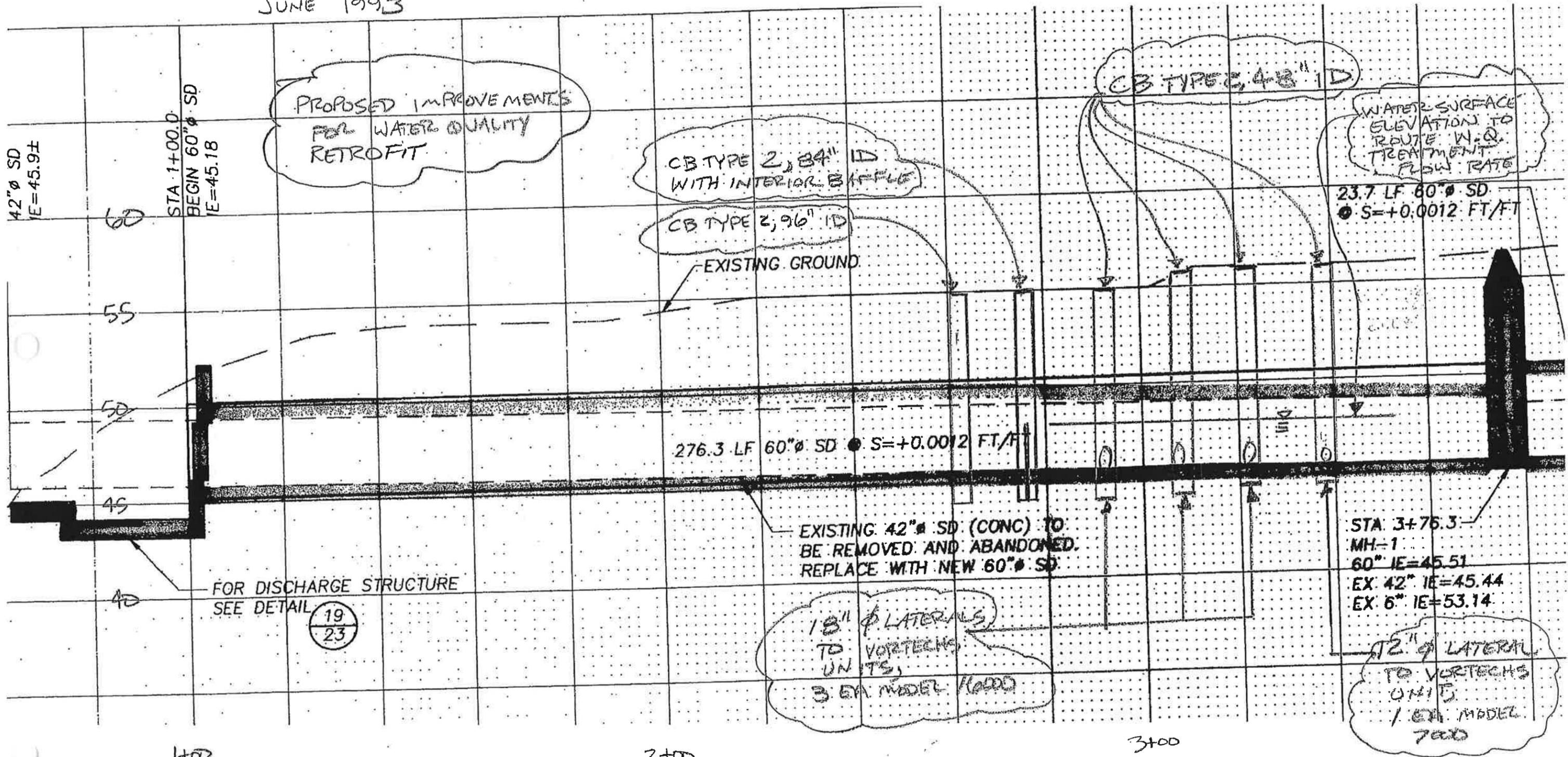
FILE NAME: 15272810

STORM DRAIN PLAN AND PROFILE
 STA. 0+00 TO STA. 4+00

SHEET NO.
 3
 23

EXCERPT FROM
 EAST SUMNER STORM DRAINAGE TRUNK SYSTEM
 STORM DRAIN PLAN AND PROFILE
 STA 0+00 TO STA 4+00
 SHEET 3/23
 JUNE 1993

SITE J STORMWATER
 TREATMENT RETROFIT
 ECOLOGY 2011 SWRLID
 GRANT FUNDING PROGRAM



214-1527-051 (02/107)

AUGUST 2010

CITY OF SUMNER															
Stormwater Capital Improvement Plan Update															
Biofiltration Swale Calculations															
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Flow rates for all other biofiltration swales based on ratios of impervious area.															
Calculations assume biofiltration swales are on-line and upstream of flow control facilities.															
	CIP 13		CIP 15		CIP 24		CIP 27		CIP 45		Site D				
Variable	Typ. design	Alt. design for residence time to maximize velocity	Typ. design	Alt. design for residence time to maximize velocity	Typ. design	Alt. design for residence time to maximize velocity	Typ. design	Alt. design for residence time to maximize velocity	Typ. design	Alt. design for residence time to maximize velocity	Typ. design	Alt. design for residence time to maximize velocity	Units	Comment	Equation
Treatment design															
Q-design	0.24	0.24	0.55	0.55	0.34	0.34	0.05	0.05	0.45	0.45	4.18	4.18	cfs	WWHM3 6-month 15 minute on-line flow rate	
Upstream IE	N/A			To be determined during final design											
Downstream IE	N/A			To be determined during final design											
Length	N/A			To be determined during final design											
s	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	ft/ft	Assumed. 0.5% minimum longitudinal slope. Underdrain required if less than 1.5%	
Average Grass Height	N/A	N/A	in	Assumed. 6 - 10 for Moderate degree of retardance.											
ybio-inches	4	4	4	4	4	4	4	4	4	4	4	4	in	Design water depth for infrequent mowing	
ybio-feet	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	ft	Design water depth for infrequent mowing	ybio-inches / 12
n	0.3	0.30	0.3	0.30	0.3	0.30	0.3	0.30	0.3	0.30	0.3	0.30		Manning's coefficient for infrequent mowing	
Swale Shape	Trapezoidal	Trapezoidal													
Z	3	3	3	3	3	3	3	3	3	3	3	3		Side slopes; 3H:1V maximum; 4H:1V preferred, or flatter	
b	6.52	0.30	16.36	2.00	9.87	0.88	0.00	0.00	13.19	1.45	130.78	21.80	ft	Bottom width; DELETE 2.5 IF SBUH IS USED. Try to get V<=1.0 fps	$[(2.5*Q*n) / (1.49*y^{1.67}*s^{0.5})] - [Z*y]$
T	8.52	2.30	18.36	4.00	11.87	2.88	2.00	2.00	15.19	3.45	132.78	23.80	ft	Top width	$b + (2 * y * Z)$
Abio	2.51	0.43	5.79	1.00	3.62	0.63	0.33	0.33	4.73	0.82	43.93	7.60	sq ft	Cross-sectional Area	$(b * y) + (Z * y^2)$
P-2yr	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0			
P-design	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		6-month 24-hr precipitation	0.72*P-2yr
V	1.80	1.8	1.80	1.8	1.80	1.8	1.80	1.8	1.80	1.8	1.80	1.8	fps	k = 1 if SBUH is used Velocity, 1 fps maximum	$k * (Q / A)$
t	0.17	0.99	0.17	0.99	0.17	0.99	0.27	0.27	0.17	0.99	0.17	0.99	minutes	Hydraulic residence time for continuous inflow	
L	9	9	9	9	9	9	9	9	9	9	9	9	ft	Calculated minimum swale length	$V * t * 60$
Bioswale bottom area	92.50	535	92.50	534	92.50	534	147.01	147	92.50	535	92.50	535	sq ft		
	603.44	161.31	1,513.52	1,071.56	913.01	471.16	0.00	0.00	1,219.70	777.65	12,096.38	11,654.28	ft		$L * b$
Stability Check															
Q-100yr		1.88		4.34		2.72		0.40		2.98		37.68	cfs	WWHM3 100-yr Q * 1.6	
Coverage		Fair		Assumed coverage for first swale event											
Average grass height		2 - 6		2 - 6		2 - 6		2 - 6		2 - 6		2 - 6	in	Assumed grass height for first swale event; low degree of retardance	
n		0.043		0.043		0.043		0.043		0.043		0.043	fps	Manning's coefficient. Selected from Figure 9.7, Ecology 2005 SMMWW Volume V. Adjust so that VR-appx varies so that VR-act / VR-appx = 0.95 to 1.05	
Vmax		3		3		3		3		3		3	fps	Maximum allowable velocity	
VR-appx.		2.30		2.30		2.30		2.30		2.30		2.30	sq ft / sec	Input from Figure 9.7, Ecology 2005 SMMWW Volume V based on n selected above	
R		0.77		0.77		0.77		0.77		0.77		0.77	ft	Hydraulic radius, first approximation	$VR\text{-appx} / V_{max}$
VR-act		2.23		2.23		2.23		2.23		2.23		2.23			$(1.49 / n) * R_{appx}^{1.6667} * s^{0.5}$
VR-act / VR-appx		0.97		0.97		0.97		0.97		0.97		0.97	fps	0.95 to 1.05. If > 1.05, select a higher n value, which will lower VR-appx. If < 0.95, decrease the n value, which will increase VR-appx.	
V		2.90		2.90		2.90		2.90		2.90		2.90	ft	Depth; use Goal Seek so that Rcalc = R from above	$VR\text{-act} / R$
ystability		1.57		1.34		1.48		1.76		1.40		0.86	ft		
Rcalc		0.77		0.77		0.77		0.83		0.77		0.77	ft	Calculated hydraulic radius	$[(b * y) + (Z * y^2)] / [b + 2 * y * \text{SQRT}(Z^2 + 1)]$
Rcalc^0.6667		0.84		0.84		0.84		0.89		0.84		0.84	fps		
Vcalc		2.91		2.91		2.91		3.07		2.91		2.91	fps	Velocity	$(1.49 / n) * R^{0.6667} * s^{0.5}$
Vcalc * Rcalc		2.44		2.44		2.44		2.72		2.44		2.44	ft^2 / s		
Vcalc <= 3 fps?		Yes		Yes		Yes		No		Yes		Yes			
Astability		0.65		1.49		0.93		1.02		1.02		12.95	sq ft	Area	$Q\ 100\text{-yr} / V_{calc}$
Astability <= Abio?		No		No		No		Yes		No		No			
ybio	Freeboard for Qcap:	0.33	ft												

CITY OF SUMNER															
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Depth	0.93	1.27	1.17	1.50	1.04	1.37	0.54	0.88	1.01	1.34	1.66	1.99	ft	Greater of ybio or ystability + freeboard. Adjust Freeboard as needed so that Qcap > Q-100yr.	
Final Check															
Q100		1.88		4.34		2.72		0.40		2.98		37.68	cfs	WWHM3 100-yr Q * 1.6 to adjust to 15 minute time step.	
n		0.3		0.3		0.3		0.3		0.3		0.3		Manning's coefficient for Infrequent mowing	
b		0.30		2.00		0.88		0.00		1.45		21.80	ft	Bottom width	
Depth		1.27		1.50		1.37		0.88		1.34		1.99	ft	Greater of ybio or ystability + freeboard	
Z		3		3		3		3		3		3		Side slopes	
R		0.63		0.85		0.72		0.42		0.74		1.61	ft	Calculated hydraulic radius	$[(b * y) + (Z * y^2)] / [b + 2 * y * \text{SQRT}(Z^2 + 1)]$
A		5.20		9.76		6.86		2.31		7.36		55.29	sq ft	Area	$(b * y) + (Z * y^2)$
Qcap		1.89		4.35		2.73		0.64		2.99		37.69	cfs	Flow capacity	$1.49 * A * R^{0.6667} * s^{0.5} / n$
Qcap > Q-100yr?		Yes													
Top Width		7.91		11.01		9.11		5.26		9.51		33.75			
Velocity		0.363		0.445		0.398		0.277		0.406		0.682	fps	Velocity	Q / A
Excavation		2,782		5,218		3,665		340		3,934		29,560	cu ft	Final Check Area * Length	
Excavation		103		193		136		13		146		1,095	cu yd	cu ft / 27	

**CITY OF SUMNER
2011 Stormwater Capital Improvement Plan Update**

Calculations to pro-rate water quality treatment or flow control costs for Capital Improvement Projects requiring water quality treatment and/or flow control.

The amount of area routed to the water quality treatment and/or flow control facility is documented in the individual CIP cost opinion worksheet.

WATER QUALITY (data from FY 2011 Stormwater Retrofit and Low Impact Development Grant Applications)

Project	Basin Area (Ac.)	Media Cartridges	Outfall Size (in.)	Cost	\$/Acre	\$/Cartridge	Comments
Site A.2 - full area	152	176	42	\$1,223,531	\$8,050	\$6,952	Contech Stormwater Solutions Stormfilter
Site A.2 - partial area	50.16			\$1,223,531	\$24,393		33% of area is treated
CIP - 19	43	208	24	\$1,380,485	\$32,104	\$6,637	Contech Stormwater Solutions Stormfilter

AVERAGE = \$28,248

OPEN FLOW CONTROL POND (data from 2004 Draft Stormwater Comprehensive Plan)

Project	Pond Volume (CY)	Item	Outfall Size (in.)	Cost	\$/CY	Impervious Area (AC)	\$/AC
CIP-43	12,800	Excavation		\$192,000		8.26	
		Fine Grade/Hydroseed		\$8,460			
		Control Structure		\$5,000			
				\$205,460	\$16		\$24,860.66
CIP-45	2,300	Excavation		\$34,500		2.75	
		Fine Grade/Hydroseed		\$1,830			
		Control Structure		\$5,000			
				\$41,330	\$18		\$15,002.79
SITE - D	2,020	Excavation		\$462,400		13.30	(19 acres General Commercial - 70% imp.)
		Fine Grade/Hydroseed		\$20,720			
		Outfall Structure		\$3,500			
		Overflow Structure		\$5,000			
				\$491,620	\$243		
CIP-48 (estimate)	134,900	Excavation		\$1,079,200		81.00	(90 acres - 90% impervious)
		Fine Grade/Hydroseed		\$71,200			
		Control Structure		\$9,500			
				\$1,159,900	\$9		

AVERAGE = \$22,786.78

BIOFILTRATION SWALE FLOWS (data from 2004 Draft Stormwater Comprehensive Plan)

Project	Total Area, ac	Impervious Area, ac	% Impervious	6-month 15-minute flow rate, cfs	flow/impervious area, cfs/ac	100-yr flow rate, cfs	flow rate/impervious area, cfs/ac
CIP-45	2.99	2.53	84.62%	0.45	0.178	1.86	0.735
SITE - D	54.5	24.97	45.82%	4.18	0.167	23.55	0.943
SITE - J	557.42	305.2	54.75%	53.8	0.176	271.75	0.890

AVERAGE = 0.174 0.856

APPENDIX D
Potential Regional Facility Location
Photos, Sites A.2, D, and J



Site A.2 – Puyallup River Outfall
Vicinity of 48-inch-diameter outfall
West of Rainier Manor
Looking West



Site A.2 – Puyallup River Outfall
Vicinity of 48-inch-diameter outfall
City access



Site A.2 – Puyallup River Outfall
Vicinity of 48-inch-diameter outfall
City access



Site A.2 – Puyallup River Outfall
Flap valve on existing outfall



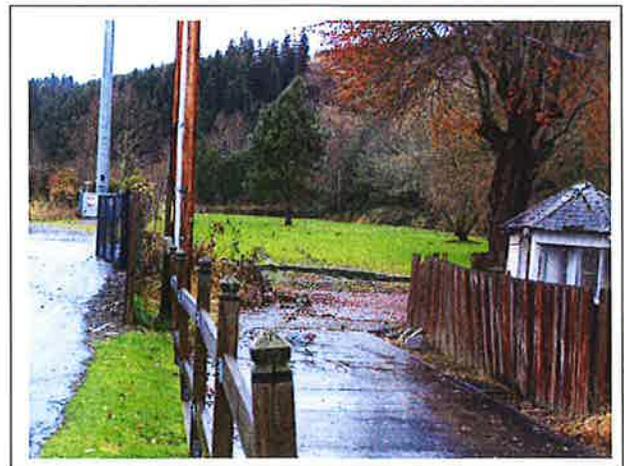
Site D – Salmon Creek Vicinity
South side of 60th Street East



Site D – Salmon Creek Vicinity
Heavy brush area along road and Salmon Creek
on south side of 60th Street East



Site D – Salmon Creek Vicinity
South side of 60th Street East



Site D – Salmon Creek Vicinity
North side of 64th Street East



Site D – Salmon Creek Vicinity
North side of 64th Street East



Site J – Salmon Creek Outfall
Looking northwest across East Valley Highway



Site J – Salmon Creek Outfall
Looking west across East Valley Highway



Site J – Salmon Creek Outfall
Looking south/southwest across East Valley Highway



Site J – Salmon Creek Outfall
Railroad trestle near outfall



Site J – Salmon Creek Outfall
Confluence of outfall and Salmon Creek



Site J – Salmon Creek Outfall
Outfall



Site J – Salmon Creek Outfall
Looking south/southeast across Site J from
outfall



Site J – Salmon Creek Outfall
Looking south/southeast across Site J towards
East Valley Highway

