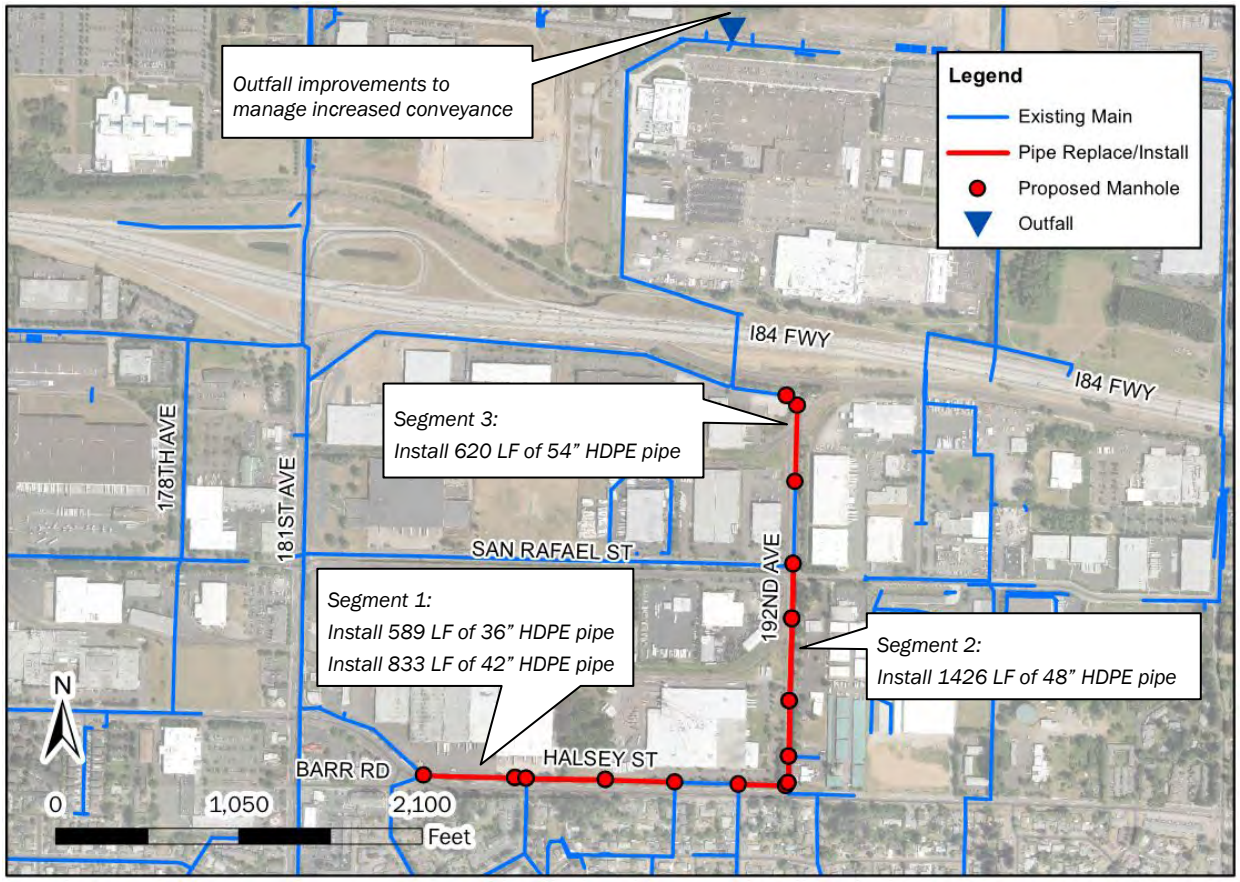
Appendix E: CIP Fact Sheets



Project Identifier	**CIP: WG-2-C**
Detailed Location	NE Halsey Street, between NE 183rd Ave and NE 192nd Ave. Segment 1: Structures M2849-W-9024 to M2849-W-9027 Segment 2: Structures M2849-W-9022 to M2849-W-9018 Segment 3: Structures M2849-W-9017 to M2849-W-9016
Model File	Model WG_2_FU02_v02-1.xp
Objective(s) Addressed	Flooding

Project Background

The main drainage line along NE Halsey Street is undersized and the City has reported flooding at this location. This location has been flagged in previous drainage master plans and a previous version of this project is in the adopted CIP for fiscal years 2019-2023, listed as "Unfunded and Future Project 912200".

Project Description

This project includes replacing three segments of the piped storm system: Segment 1, along NE Halsey Street, and Segments 2 and 3, along NE 192nd Avenue. Along NE Halsey the existing pipes range in diameter from 2.25' to 3.5', while Segment 2 pipes are 2.25', and Segment 3 pipes are 4' in diameter. Manholes will likely have to be replaced throughout this stretch of proposed pipes, as currently available GIS information lists manholes as 48" diameter and larger diameter manholes would be needed. An alternatives evaluation included taking a look at including a water quality/infiltration facility in Kirk Park and whether this could reduce the need for pipe replacements. This alternative is described in the CIP fact sheet for WG-2-C-WQ.

Design Considerations

- Preliminary calculations were performed to identify conceptual pipe sizing. Design should be conducted to verify pipe capacity needs and pipe alignment.
- Location and coordination with other utilities should be conducted prior to construction.
- Traffic control will be required for this project.
- According to the City of Gresham's 2035 Transportation System Plan future project #9 is planned along NE Halsey. This project is listed on the 20-year street corridor project list. When this project is constructed, consider using permeable pavement to provide a water quality benefit.

Planning-level Cost Estimate

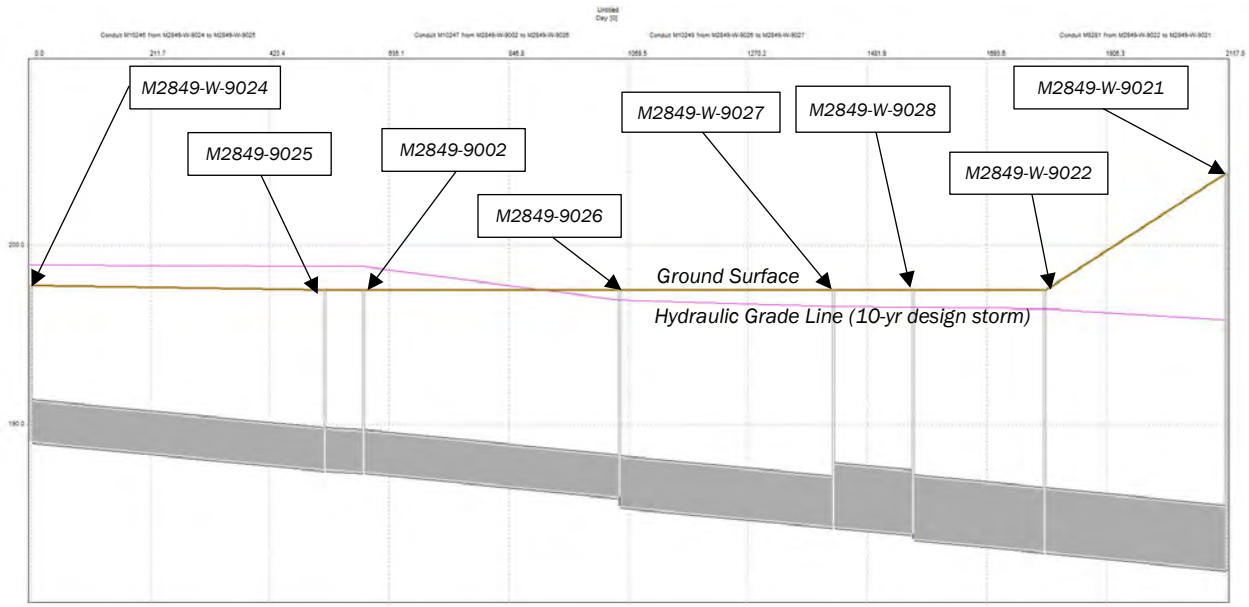
Construction	$2,224,000
Site Acquisition	N/A
Contingency (30%)	$667,200
Capital Expense Total (including contingency)	$2,891,000
Design/Construction Administration (30%)	$867,300
Permitting (5%)	$144,550
Administration (14%)	$404,740
Capital Project Implementation Cost Total*	**$4,308,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

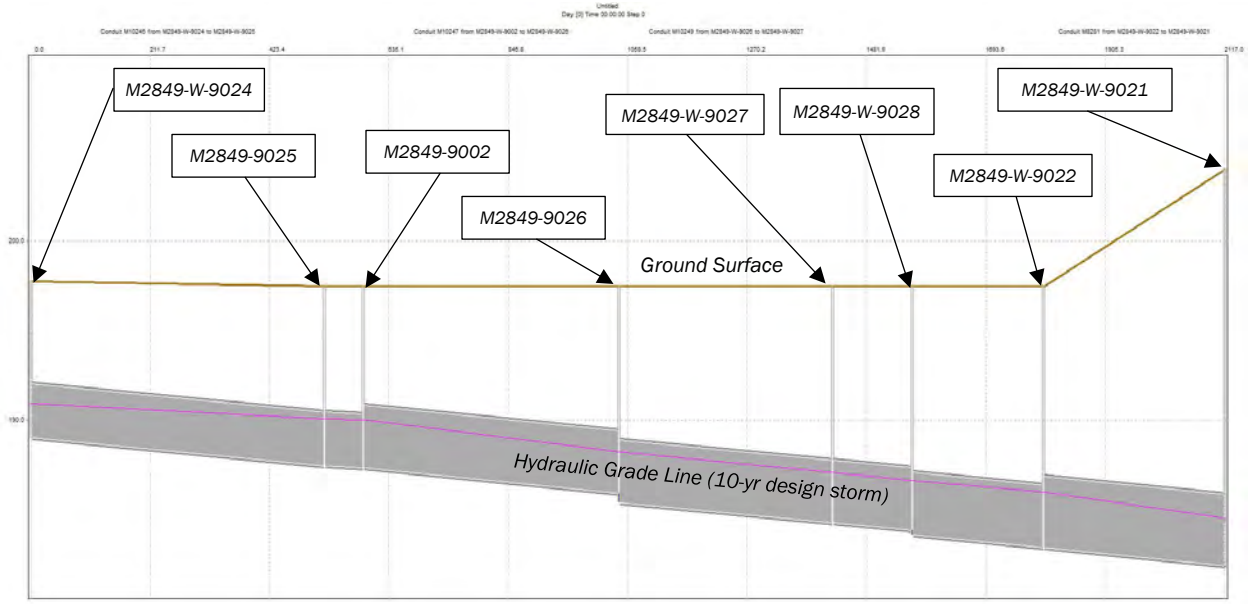
Additional Project Information

See following pages for pipe segment cross sections.

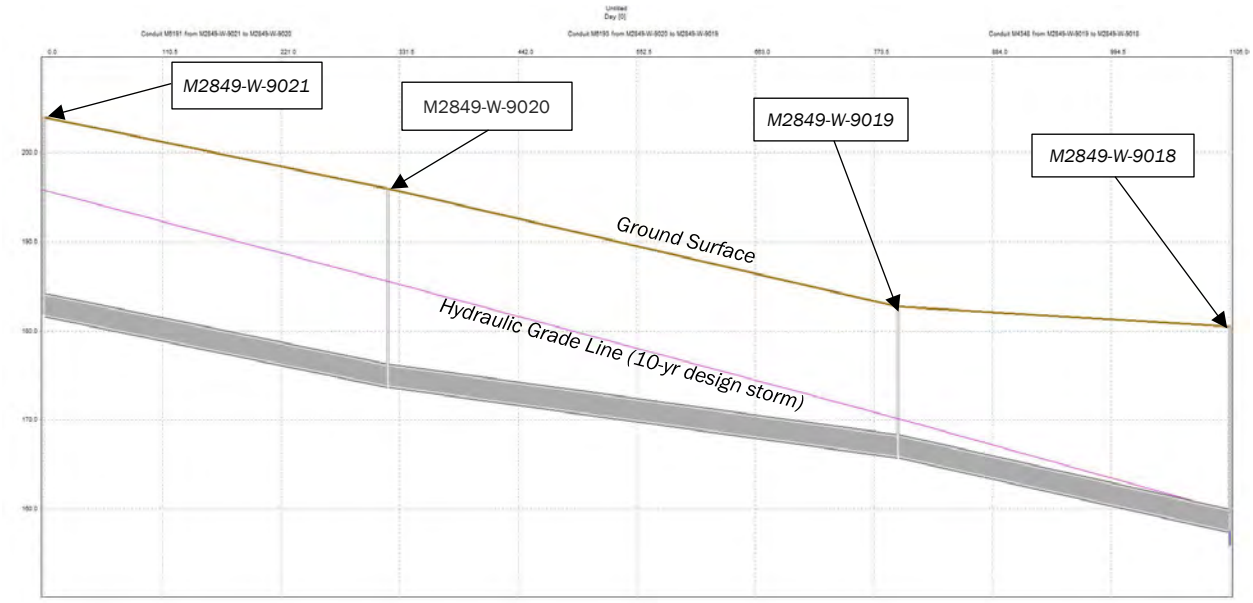
Existing Pipe Cross-section, Segment 1:



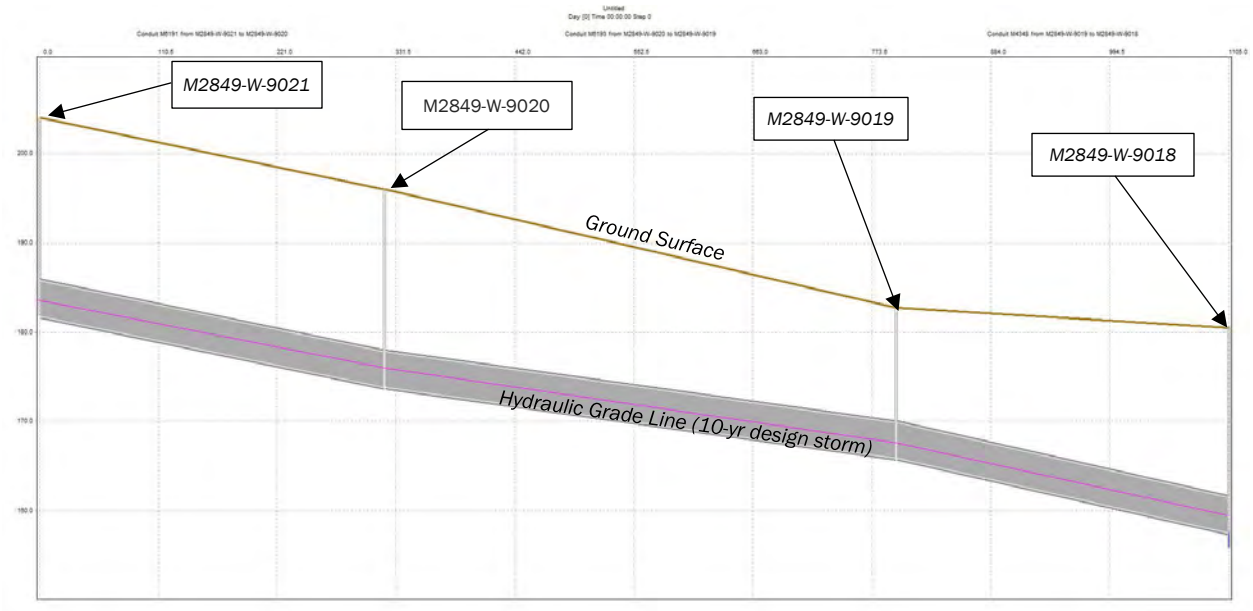
Proposed Pipe Cross-section, Segment 1:



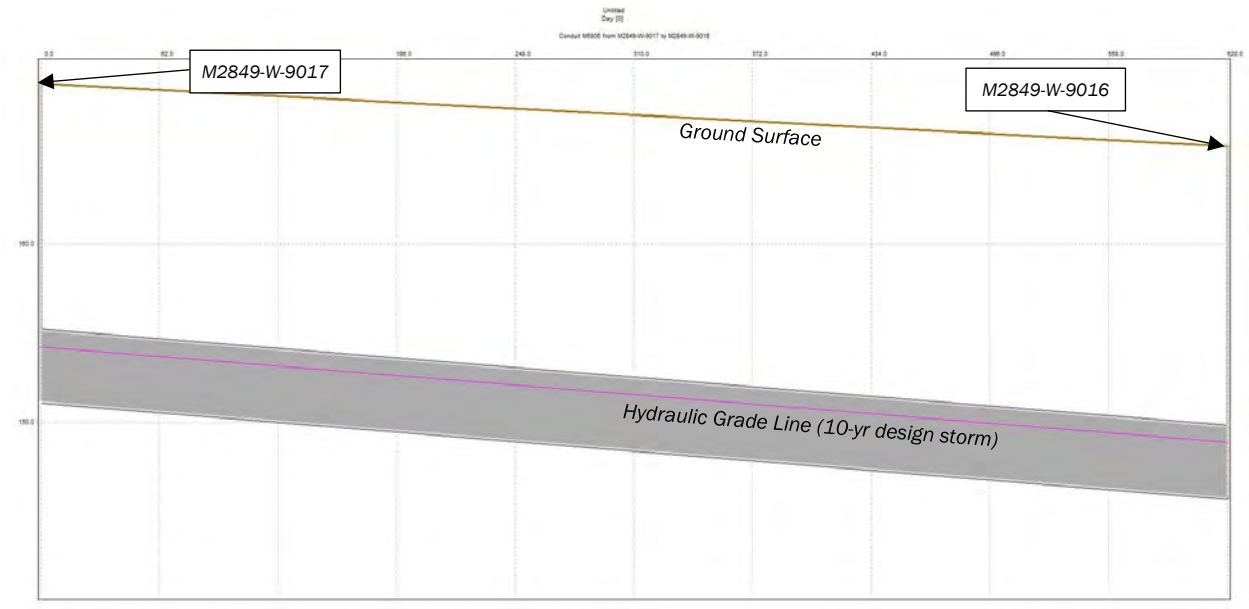
Existing Pipe Cross-section, Segment 2:



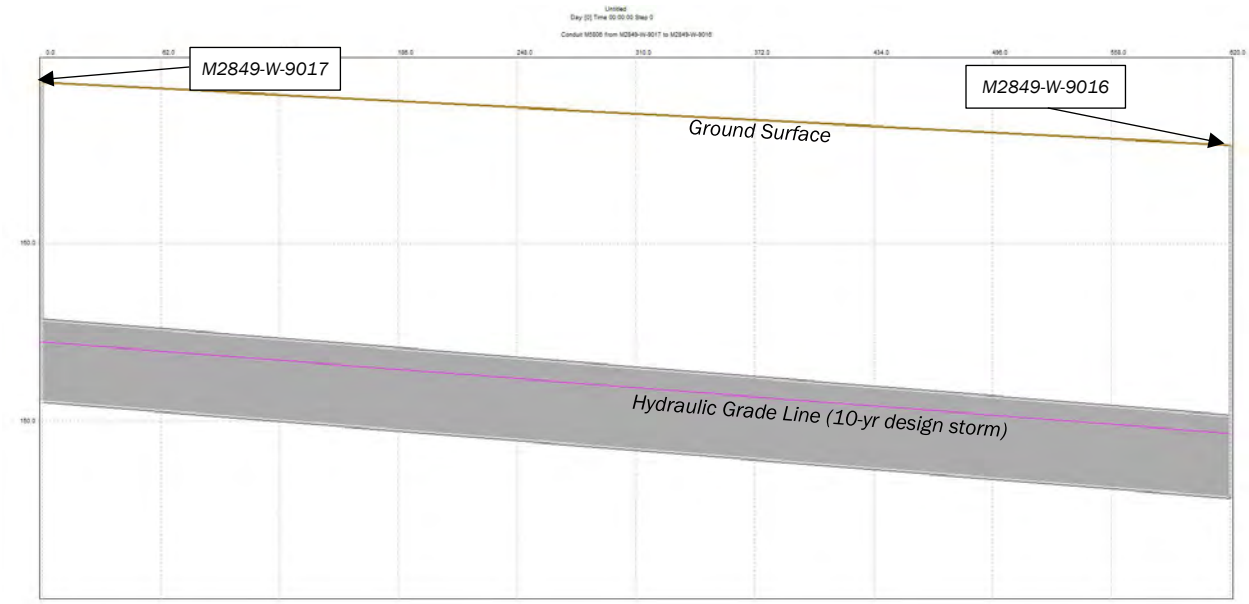
Proposed Pipe Cross-section, Segment 2:

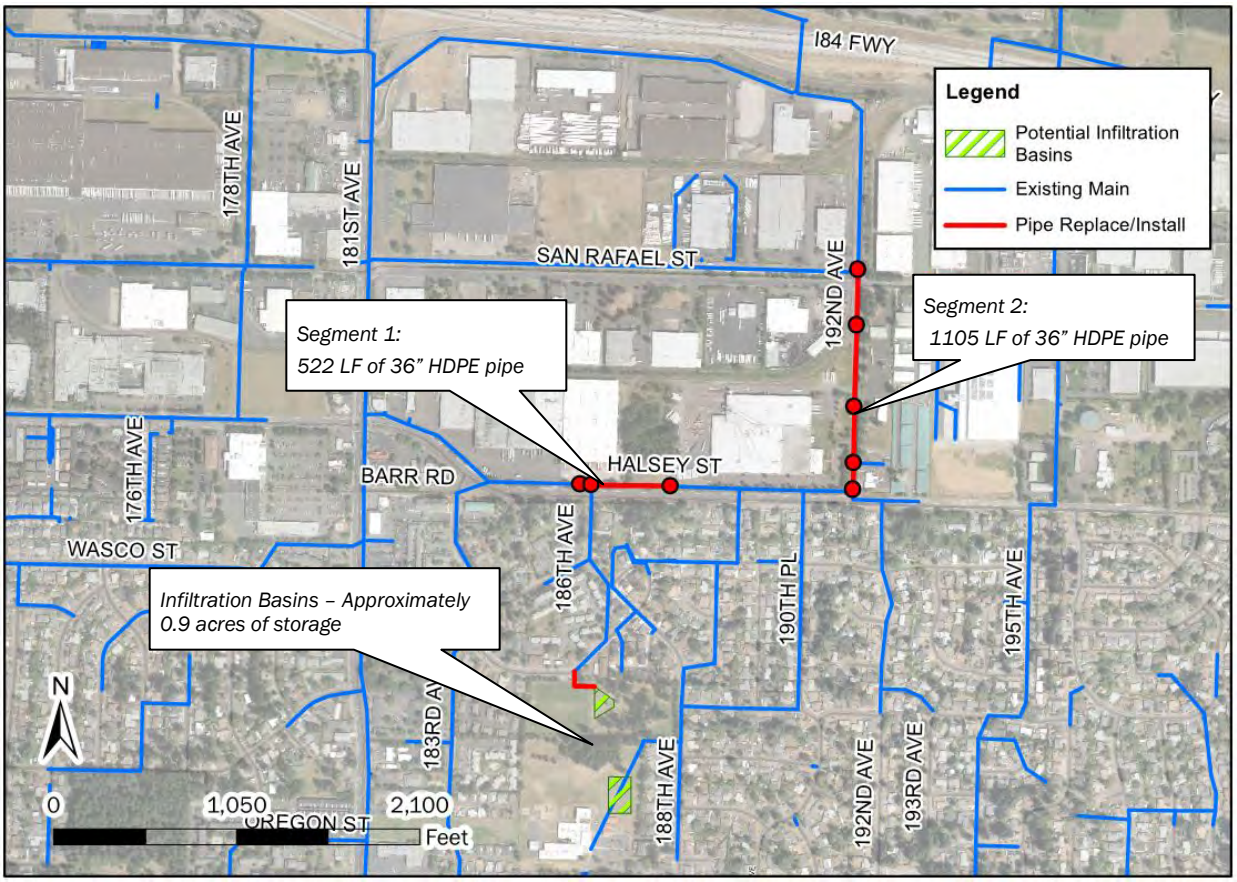


Existing Pipe Cross-section, Segment 3:



Proposed Pipe Cross-section, Segment 3:





Project Identifier	**CIP: WG-2-C-WQ**
Detailed Location	**Halsey Street and Kirk Park / Hartley Elementary School**
Model File	**Model WG_2_Alt1_FU02_v02-1_Infiltration.xp**
Objective(s) Addressed	**Capacity / Water Quality**

Project Background

Kirk Park and Hartley Elementary school were identified as possible locations for water quality/infiltration facilities to alleviate flows and reduce expected flooding in pipes along NE Halsey. Initial analysis of the system showed the need for significant pipe upsizing, and so an analysis of the system assuming an upstream infiltrating water quality facility was conducted to estimate whether any of the pipe upgrade needs identified in CIP WG-C-2 could be reduced or eliminated.

Project Description

This project includes the installation of two water quality/infiltration basins on the properties of Kirk Park and Hartley Elementary School. An infiltration rate of 2"/hr was assumed for this facility. CIP WG-C-2 was then resized to take into account the benefits of this facility in reducing flows. The two areas shown above were identified as the potential locations for the water quality/infiltration facilities, and if implemented together could provide a storage area of approximately 0.9 acres.

Design Considerations

- Preliminary desktop analysis was performed to identify size of available storage. Site constraints need to be evaluated at each potential location to assess viability of site and feasibility of connecting areas to the existing stormwater infrastructure.
- An in-depth hydrologic assessment for each feature will be needed for design, as well as modeling to ensure tie-ins to existing infrastructure can accommodate any additional flows.
- Test pits will be required to confirm in-situ soil conditions.
- Location and coordination with other utilities should be conducted prior to construction.
- Traffic control will be required for this project.
- According to the City of Gresham's 2035 Transportation System Plan future project #9 is planned along NE Halsey. This project is listed on the 20-year street corridor project list. When this project is constructed, consider using permeable pavement to provide a water quality benefit.

Planning-level Cost Estimate

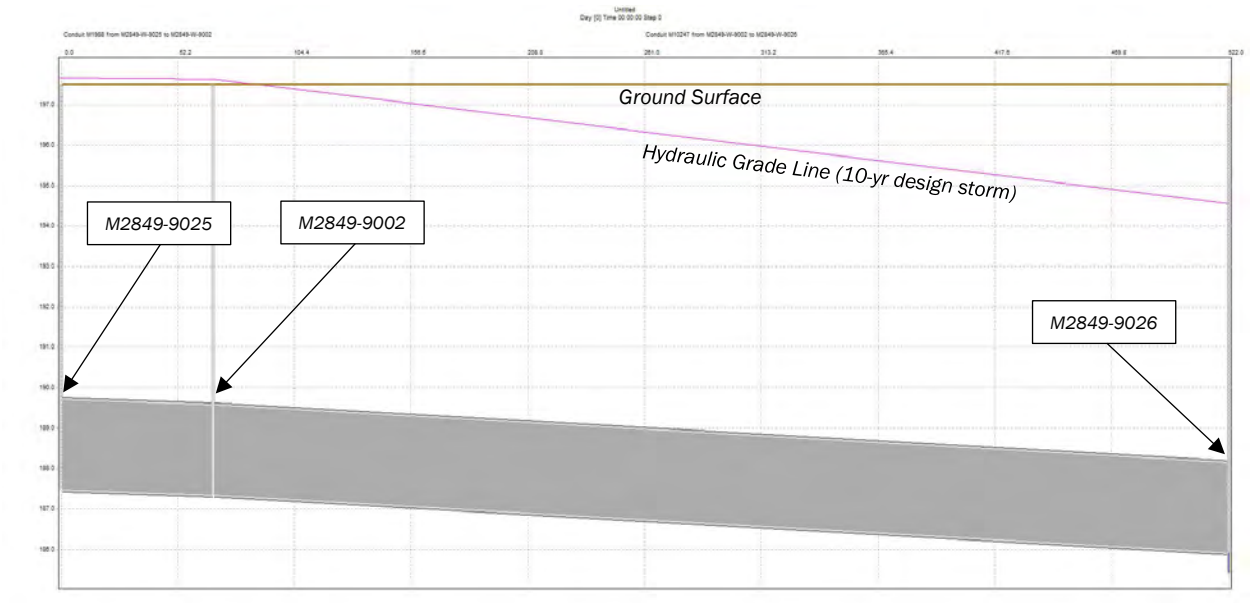
Construction	$1,141,000
Site Acquisition	N/A
Contingency (30%)	$342,300
Capital Expense Total (including contingency)	$1,483,00
Design/Construction Administration (30%)	$444,900
Permitting (5%)	$74,150
Administration (14%)	$207,620
Capital Project Implementation Cost Total*	**$2,210,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

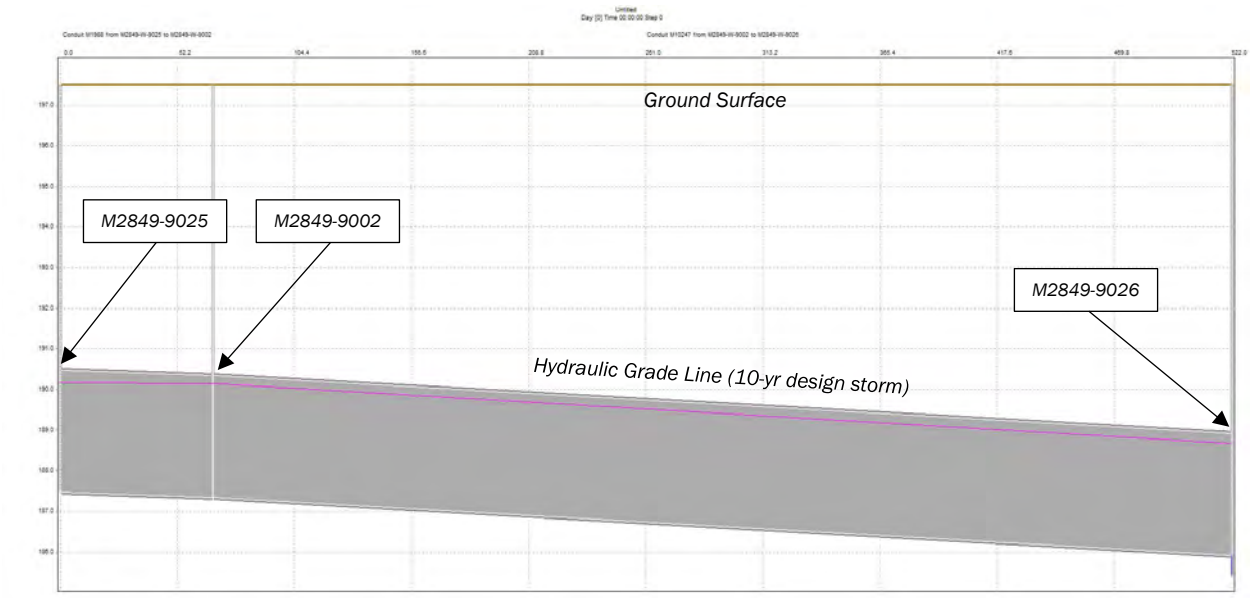
Additional Project Information

See following pages for pipe segment cross sections.

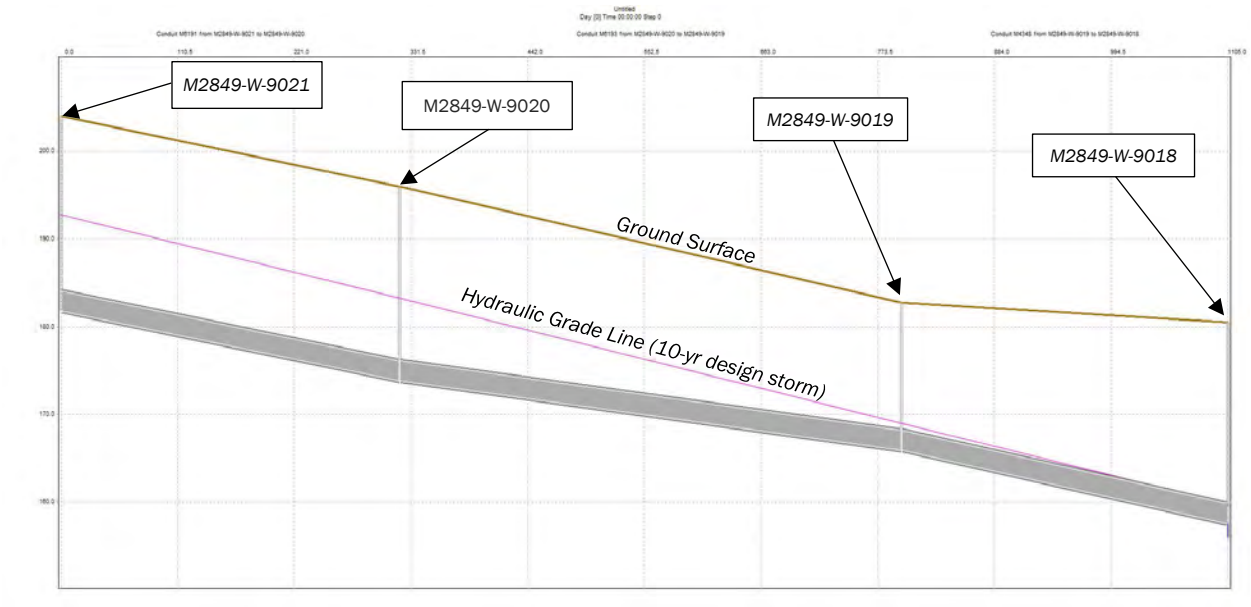
Existing Pipe Cross-section, Segment 1:



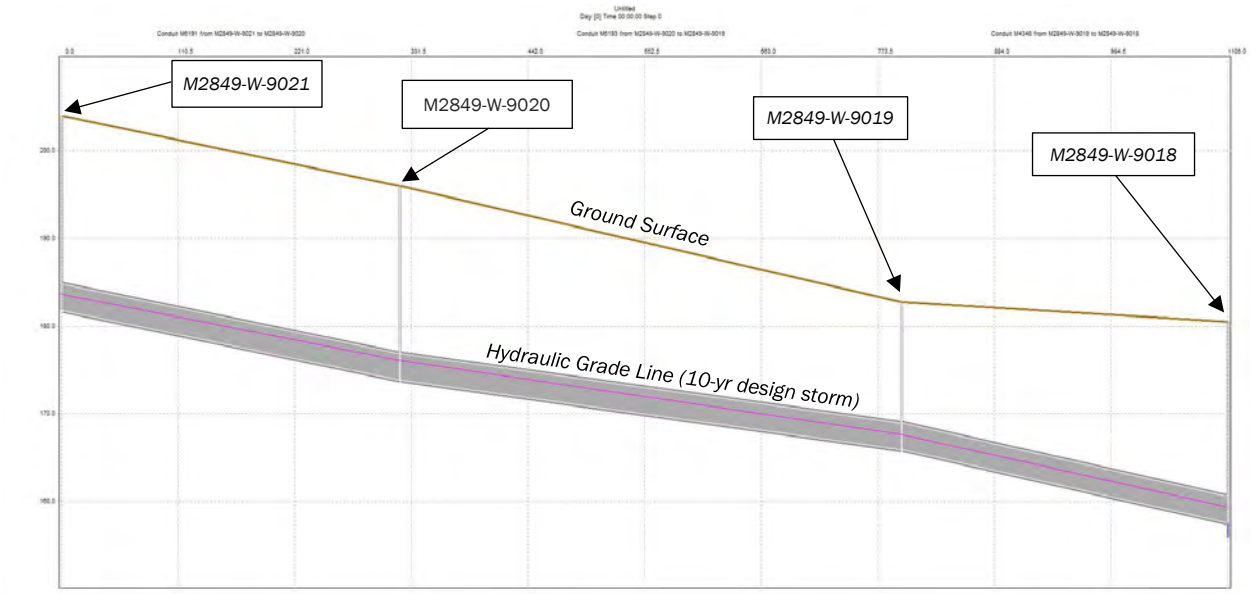
Proposed Pipe Cross-section, Segment 1:



Existing Pipe Cross-section, Segment 2:



Proposed Pipe Cross-section, Segment 2:



Project Identifier	**CIP: WG-WQ-2**
Detailed Location	Kirk Park / Hartley Elementary School
Model File	Model WG_2_Alt1_FU02_v02-1.xp
Objective(s) Addressed	Water Quality

Project Background

Kirk Park and Hartley Elementary school were identified as possible locations for storage/detention facilities to alleviate flows and eliminate expected flooding in pipes along NE Halsey. Upon analysis of this system, flood detention alone was not found to be sufficient to eliminate the need for pipe replacements, but this site does offer an opportunity to address water quality. Proposed here are two sites for treating the water quality event. If water quality facilities could also infiltrate, some flow alleviation would be also be provided (see WG-2B-INF).

Project Description

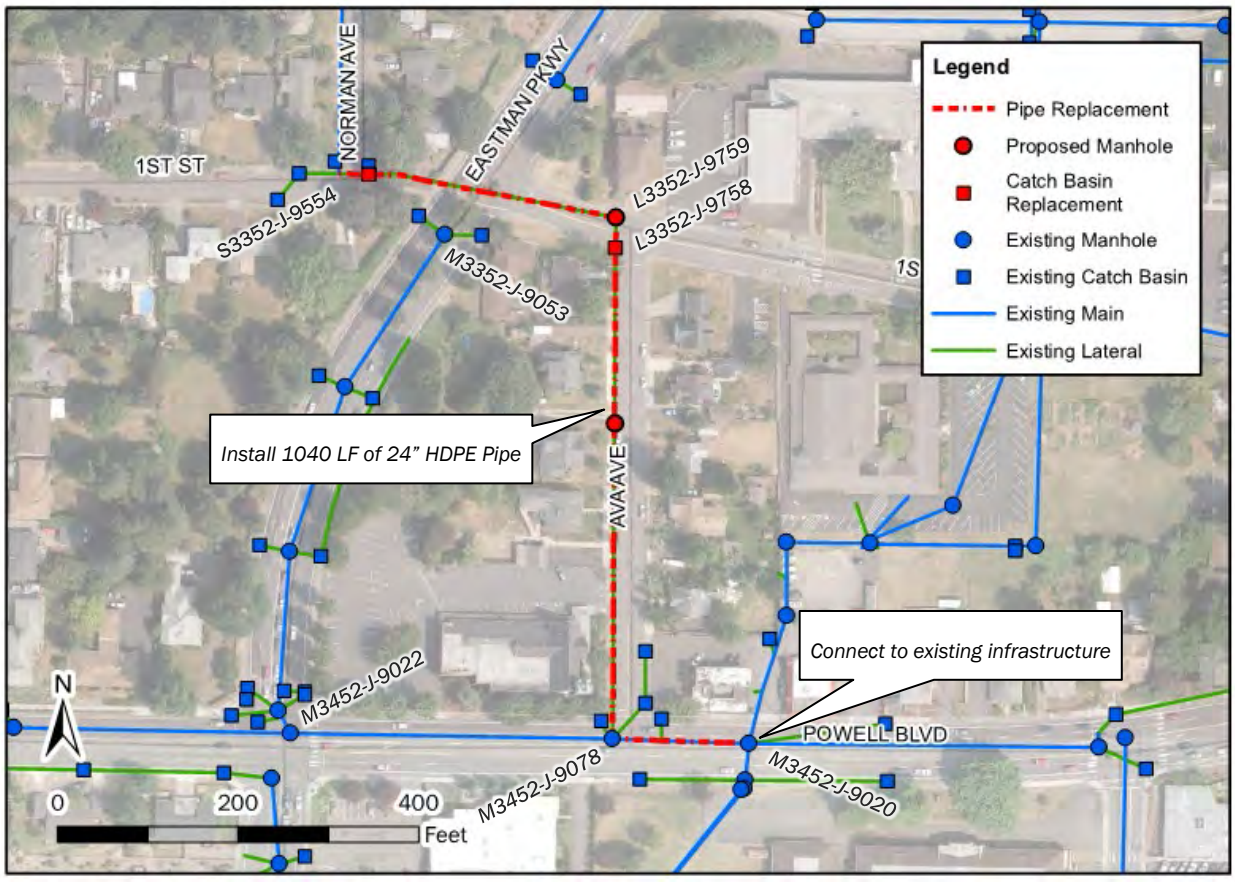
This project recommends placing several water quality facilities on the properties of Kirk Park and Hartley Elementary School. The four areas above were identified as potential locations for a facility, and if implemented together could provide a storage area of approximately 1.8 acres.

Design Considerations

- Preliminary desktop analysis was performed to identify size of available storage. Site constraints need to be evaluated at each potential location to assess viability of site and feasibility of connecting areas to the existing stormwater infrastructure.
- Storage requirements are calculated based off the water quality rainfall event over a watershed that can feasibly be rerouted to these features. An in-depth hydrologic assessment for each feature will be needed for design.
- Location and coordination with other utilities should be conducted prior to construction.
- Traffic control will be required for this project.

Planning-level Cost Estimate	
Construction	$344,000
Site Acquisition	N/A
Contingency (30%)	$103,200
Capital Expense Total (including contingency)	$447,000
Design/Construction Administration (30%)	$134,100
Permitting (5%)	$22,350
Administration (14%)	$62,580
Capital Project Implementation Cost Total*	**$666,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*



Project Identifier	**CIP: JC-1-C**
Detailed Location	NW 1st St. and Ava Ave. Structures S3352-J-9554 to M3452-J-9020
Model File	Model ALT03.xp
Objective(s) Addressed	Flooding

Project Background

The segment of stormwater piping along NW 1st St. and Ava Ave. is undersized and causes flooding at the northern catch basin (L3352-J-9759) located at the intersection of NW 1st St. and Ava Ave. Historically this catch basin has overflowed and caused street flooding along 1st St. prior to draining into the adjacent catch basin to the south (L3352-J-9758). The current pipe system in this area is old and contains minimal pipe cover.

Project Description

The existing 12" and 15" lateral pipes along NW 1st St. and Ava Ave. and the existing 18" main pipe along Powell Blvd. will be replaced with 24" HDPE pipes. The proposed alignment will follow the existing piping, but with lower pipe invert elevations along NW 1st St. to improve hydraulics and comply with current Public Works Pipe Cover Standards (minimum 30" from the top of pipe to finished grade in paved areas). A new manhole is proposed along Ava Ave to comply with Public Works Manhole spacing requirements (maximum 500 ft.). The new 24" piping will tie into the existing stormwater main line along Powell Blvd. at two existing manholes (M3452-J-9078 & M3452-J-9020). This new pipe system is proposed to alleviate pipe surcharging and surface flooding during the 10-yr design storm. The existing piping is to be removed to allow space for the replacement piping along the alignment.

Design Considerations

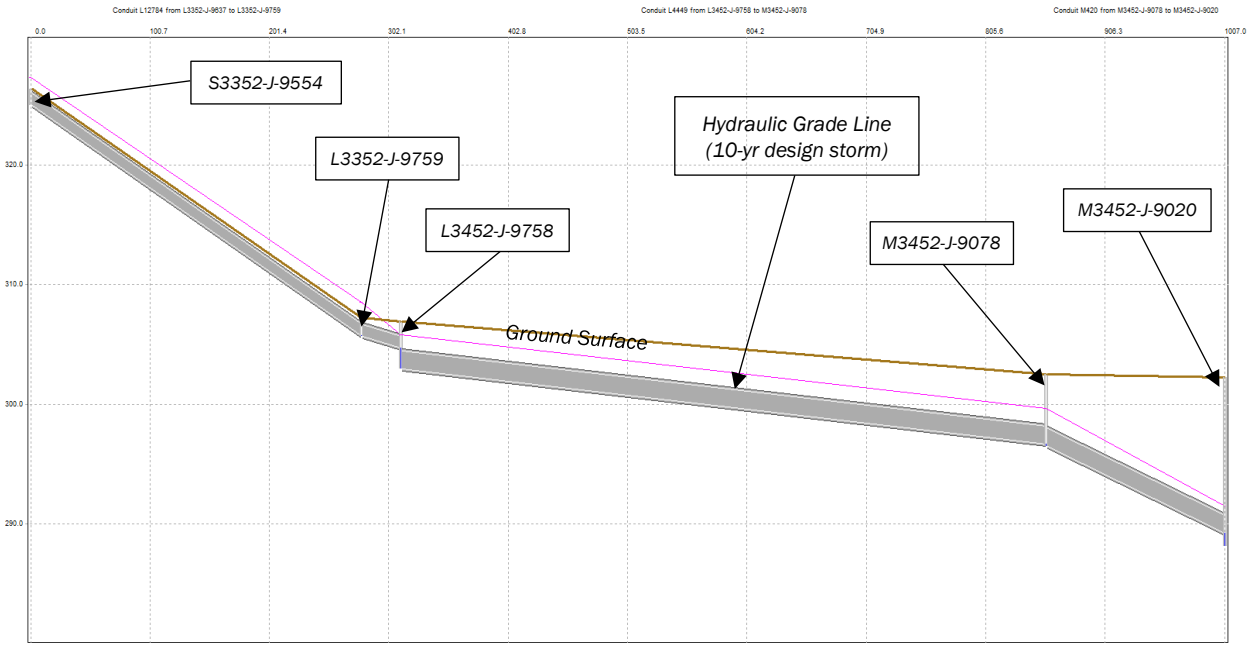
- Preliminary calculations were performed to identify conceptual pipe sizing. Design should be conducted to verify pipe capacity needs and pipe alignment.
- The proposed pipe segment from Node S3352-J-9554 to Node L3352-J-9759 contains a steep (7%) slope which corresponds with a predicted max flow velocity of over 12 ft/sec for the 10-yr design storm.
- Location and coordination with other utilities should be conducted prior to construction. The current pipe alignment at the intersection of NW 1st Ave. and Ava Ave. crosses a PWB water line running west to east.
- An alternative pipe alignment for this project was also evaluated. This alignment would instead connect from Node S3352-J-9554 (intersection of Normandie Ave. and 1st St.) to the manhole to the southeast on Eastman Pkwy. before heading south along Eastman Pkwy. Similar to JC-1-C presented in this fact sheet, upsizing of existing pipe along this alternative alignment would also be required. A pipe cross-section of this alternative alignment is shown below in the Additional Project Information This alternative pipe alignment was not as effective in terms of enhancing capacity of the system and it did not eliminate surcharging for the 10-yr design storm (see the downstream end of the hydraulic grade line in the profile provided).

Planning-level Cost Estimate	
Construction	$392,000
Site Acquisition	N/A
Contingency (30%)	$117,600
Capital Expense Total (including contingency)	$510,000
Design/Construction Administration (30%)	$153,000
Permitting (5%)	$25,500
Administration (14%)	$71,400
Capital Project Implementation Cost Total*	**$760,000**

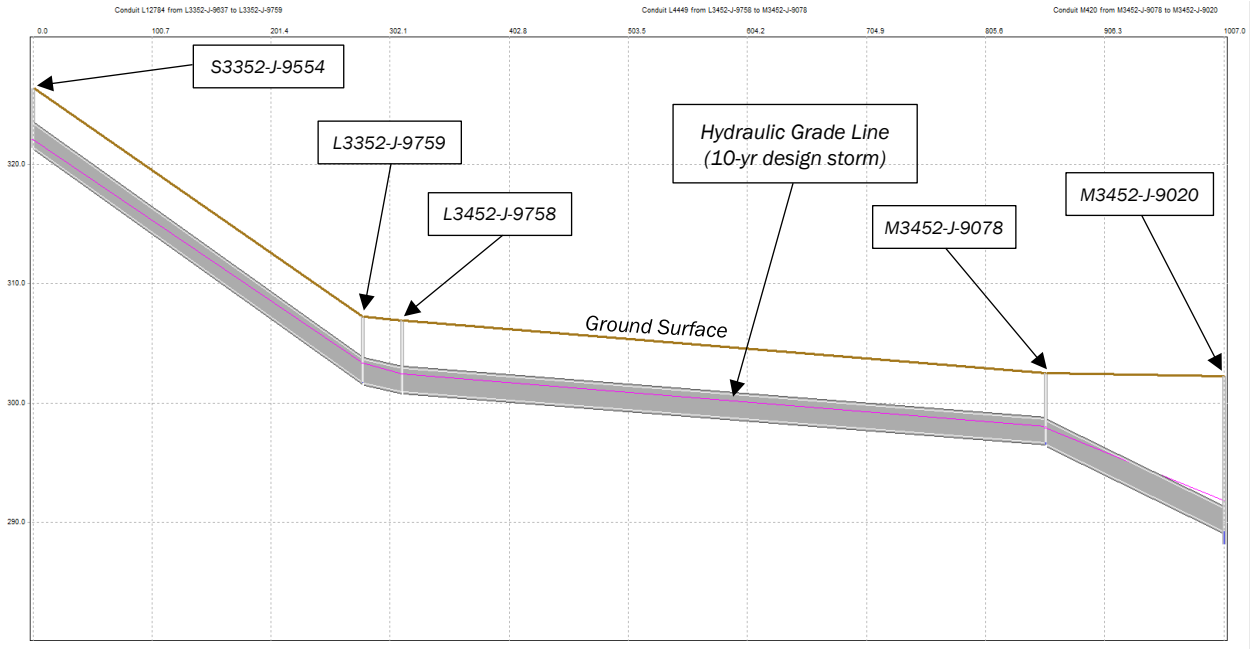
**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

Additional Project Information

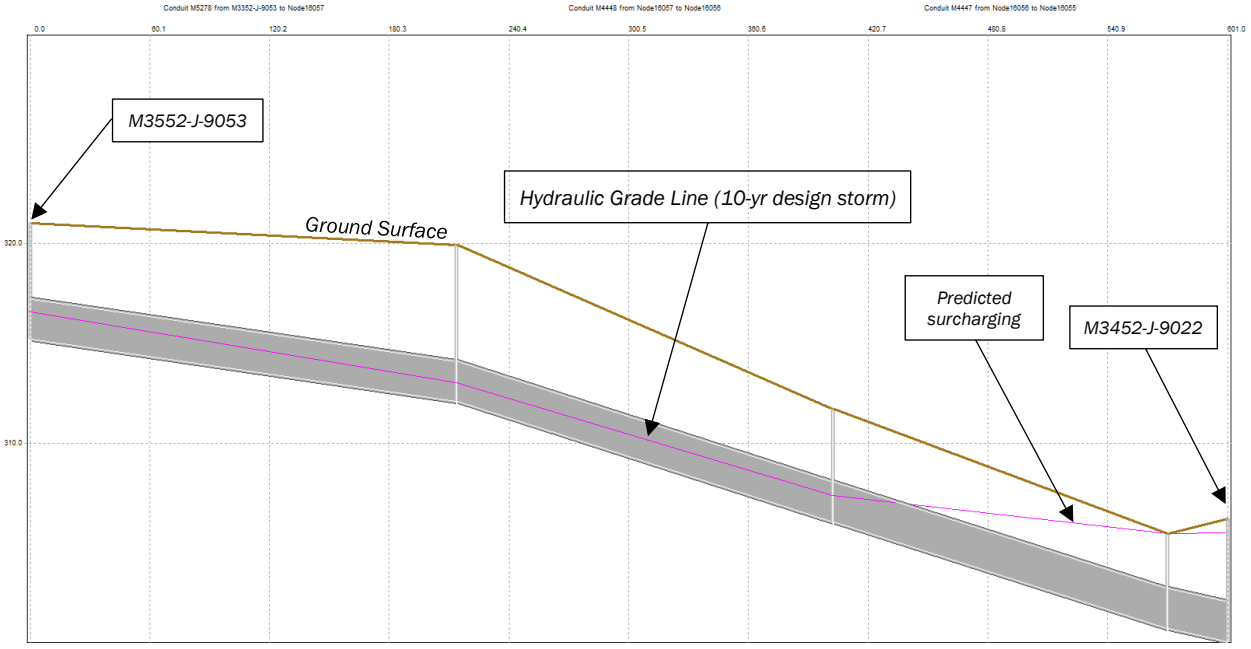
Existing Pipe Cross-section:

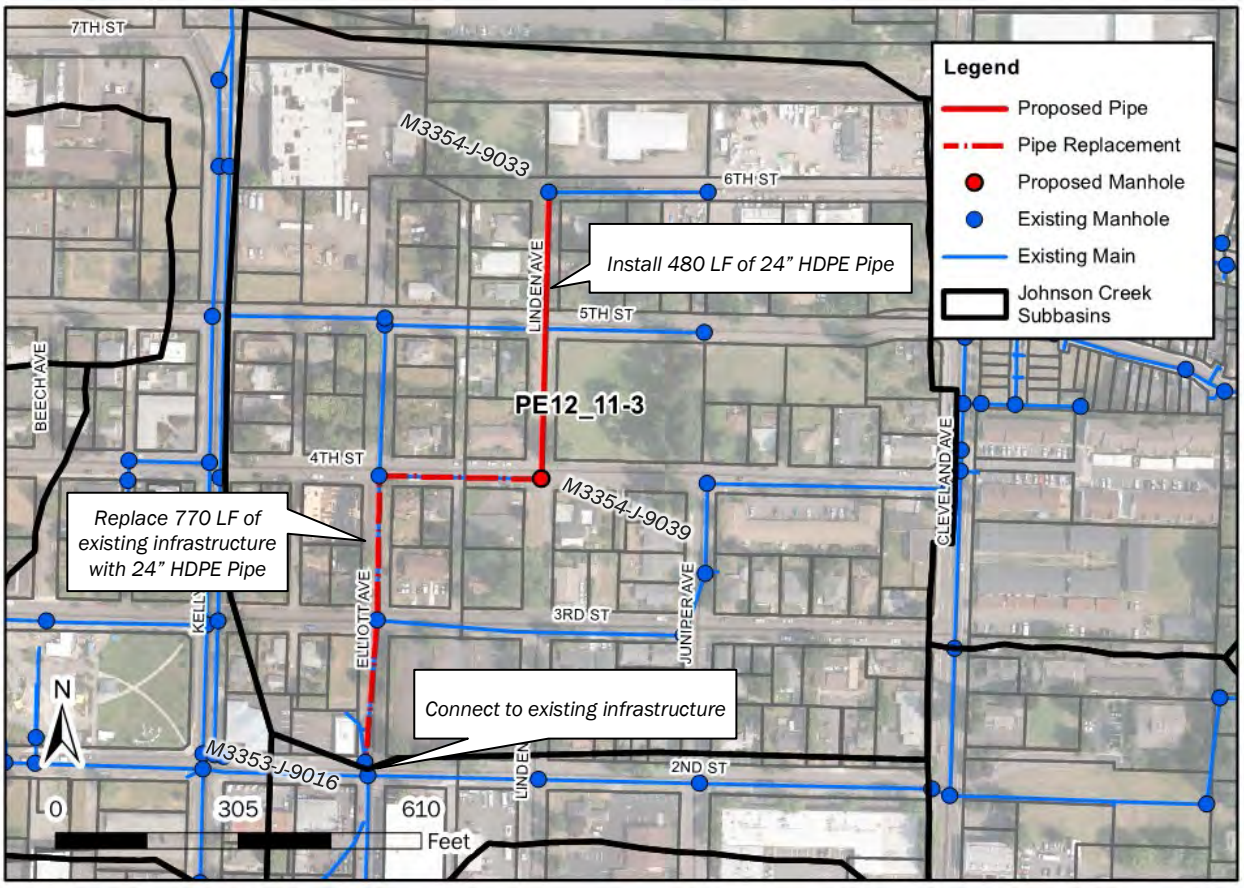


Proposed Pipe Cross-section:



Alternative Alignment Pipe Cross-section (along Eastman Pkwy.):





Project Identifier	**CIP: JC-11-C**
Detailed Location	**Elliot Ave.** **Structures M3354-J-9033 to M3353-J-9016**
Model File	**Model ALT03.xp**
Objective(s) Addressed	**Flooding, Debris Accumulation**

Project Background

This area along 6th St. has a history of surface flooding due to debris accumulation at inlets and outfalls adjacent to the industrial and commercial properties along 6th St. This location currently has a combination of public and private infrastructure, with unclear drainage patterns.

Johnson Creek subbasin PE12_11-3 was further subdivided to more accurately model proposed stormwater infrastructure. The subbasin was split into the areas north (12.1 Ac.) and south (19.3 Ac.) of 5th St. The northern portion was simulating as draining to the new infrastructure along Linden Ave., while the southern portion was simulated to drain to the system along Elliot Ave.

Project Description

New stormwater infrastructure is proposed along the Linden Ave. right-of-way to convey stormwater to the south and away from the observed flooding area. Approximately 480 LF of 24" HDPE pipe will connect the existing manhole on 6th St. (M3354-J-033) to a proposed manhole at the intersection of Linden Ave and 4th St. Existing 12" and 18" piping along 4th St and Elliot Ave. is proposed for replacement with approximately 770 LF of new 24" HDPE pipe. This pipe replacement will help to alleviate predicted surcharging during the 10-year storm event for the existing pipe segment. The replacement piping along Elliot Ave. reconnects with existing infrastructure at manhole (M3353-J-9016) at the intersection of 2nd St. before discharging to the south to Johnson Creek. This project also includes the replacement of the existing inlet structure at 5th and Elliot to help alleviate current debris accumulation issues.

Design Considerations

- Preliminary calculations were performed to identify conceptual pipe sizing. Design should be conducted to verify pipe capacity needs and pipe alignment.
- According to the City's 2035 Transportation System Plan future project #24 is planned along 5th Street from Cleveland Ave. to Main Ave. This project is listed on the 20-year street corridor project list. When this project is constructed, consider using permeable pavement to provide a water quality benefit.
- A separate water quality CIP was also developed for this location, JC-11-WQ. Refer to CIP: JC-11-WQ for project description and cost estimate.
- While implementation of JC-11-WQ would reduce the peak flow and max water surface elevation to benefit project JC-11-C, it is not estimated to be a significant enough difference to warrant modification to the planning level pipe sizing for this CIP. Modeling results for the construction of JC-11-WQ which assumed removal of 2.6 Ac. of drainage are estimated to result in a 0.06" reduction in water surface elevation and a 0.11 cfs reduction in peak flow at node M3353-J-9016 for the 10-year storm event.
- An alternative pipe alignment for this project was also evaluated but estimated to have a similar capacity benefit and cost estimate. This alignment heads west on 5th St (instead of 4th St.) before continuing south along Elliot Ave. Similar to JC-11-C presented in this fact sheet, upsizing of existing pipe along this alternative alignment would also be required.

Planning-level Cost Estimate	
Construction	$445,000
Site Acquisition	N/A
Contingency (30%)	$133,500
Capital Expense Total (including contingency)	$579,000
Design/Construction Administration (30%)	$173,700
Permitting (5%)	$28,950
Administration (14%)	$81,060
Capital Project Implementation Cost Total*	**$863,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

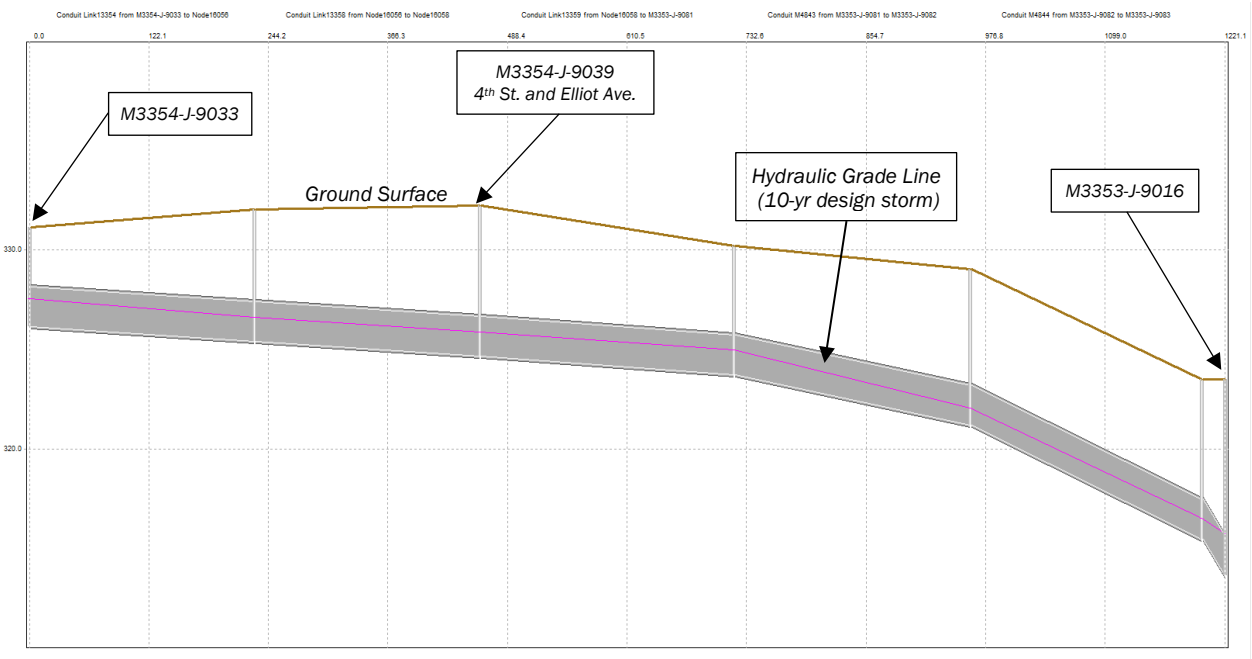
Additional Project Information

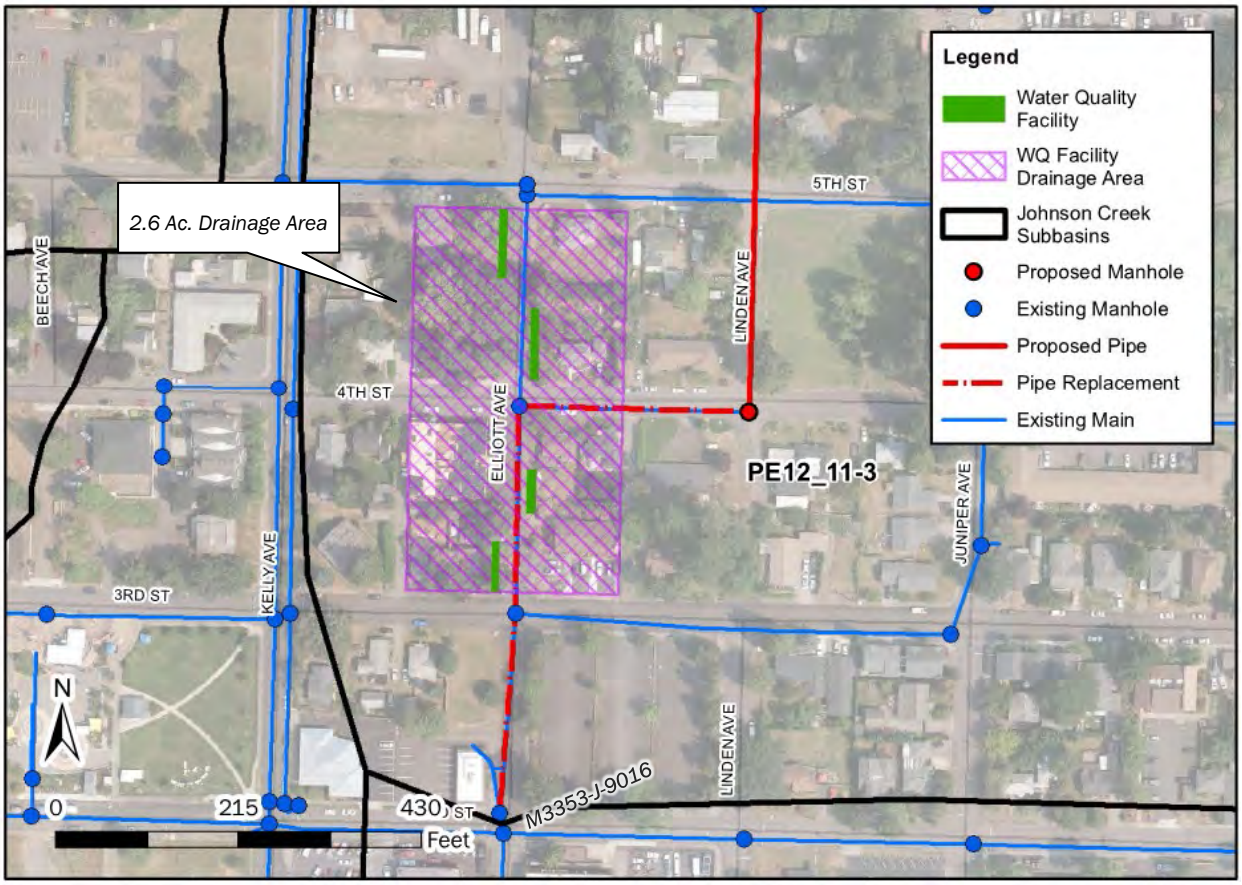
The photographs below show images of the project location

Inlet at 5th and Elliot

Debris accumulation at outfall located at 6th and Linden Ave.

Proposed Pipe Cross-section:





Project Identifier	CIP: JC-11-WQ
Detailed Location	Elliot Ave.
Model File	NA
Objective(s) Addressed	Water Quality

Project Background

This area has a history of surface flooding, caused by debris accumulation at inlets and outfalls to the north (see JC-11 project background).

A water quality opportunity exists in this area to provide stormwater treatment to runoff that currently does not receive any treatment prior to discharge to Johnson Creek.

Project Description

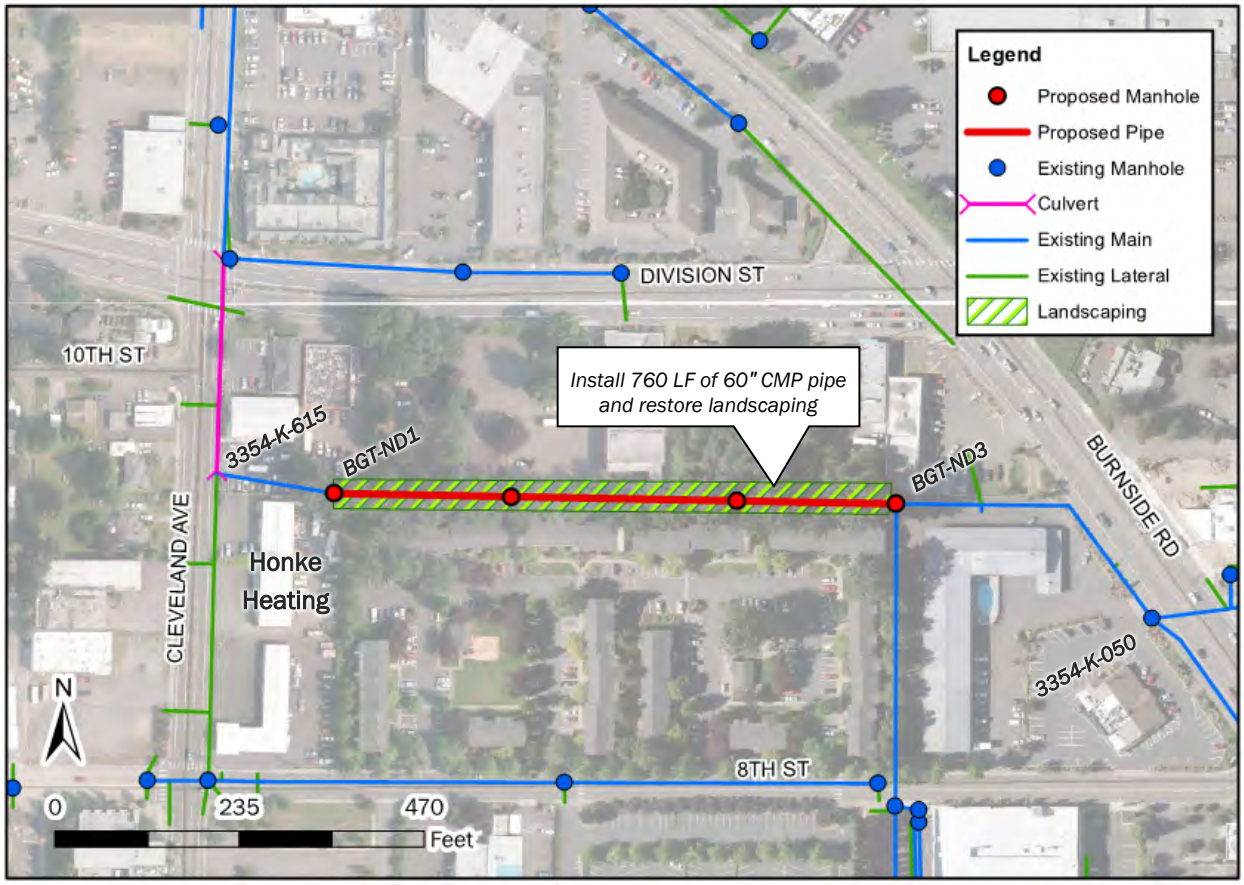
The proposed project provides 2,800 SF of stormwater water quality facilities along Elliot Ave from 3rd St. to 5th St. These facilities will provide stormwater treatment for residential properties located on both sides of Elliot Ave. As part of this project 940 LF of curbing will also be needed for this unimproved section of Elliot Ave. Each facility will include two curb inlets, one to convey drainage into the facilities, and the other to function as an outlet overflow. Overflow from these facilities will return to the street and be collected in the trunk line via curb and gutter system.

Design Considerations

- Stormwater planters were designed in accordance with the Simple Method for water quality outlined in the Stormwater Management Manual. This simple method sizes stormwater planters based on a 5% sizing factor on the impervious area managed by each facility.
- According to the City's 2035 Transportation System Plan future project #24 is planned along 5th Street from Cleveland Ave. to Main Ave. This project is currently listed on the 20-year street corridor project list. When this project is constructed, consider using permeable pavement to provide a water quality benefit.
- While implementation of JC-11-WQ reduces the peak flow and max water surface elevation to JC-11-C, it is not a significant difference to warrant modification to the planning level pipe sizing. Modeling results for the construction of JC-11-WQ (assumes removal of 2.6 Ac. of drainage) estimates an approximate 0.06" reduction in water surface elevation and a 0.11 cfs reduction in peak flow at node M3353-J-9016 for the 10-year storm event.

Planning-level Cost Estimate	
Construction	$176,000
Site Acquisition	N/A
Contingency (30%)	$52,800
Capital Expense Total (including contingency)	$229,000
Design/Construction Administration (30%)	$68,700
Permitting (5%)	$11,450
Administration (14%)	$32,060
Capital Project Implementation Cost Total*	**$341,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*



Project Name	**CIP: KC-2-C**
Detailed Location	NE Cleveland Avenue and NE Division Street Structures BGT-ND3 to BGT-ND1
Model File	Model ALT06.xp
Objective(s) Addressed	Flooding, Debris Accumulation

Project Background

The open channel parallel to Division Street and east of Cleveland Avenue flows from east to west into a piped system behind Honke Heating (840 NE Cleveland Avenue). This channel is approximately 5 ft. deep with near vertical side walls and runs between businesses to the north and apartments to the south. City staff have reported this is a location where trash collects (from dumping) and there is debris in the channel. The inlet pipe at the west end of the open channel is a protruding corrugated metal pipe with poor safeguards to prevent blockage. Debris accumulates at this existing inlet pipe.

This area experienced significant flooding during the December 2015 storm event (see photo images below). Water levels overtopped the banks of the open channel and flooded nearby businesses and a portion of the roadway along Division Street.

Project Description

The open channel will be replaced by a 60-inch CMP pipe to alleviate flooding. Piping this entire section will decrease energy losses associated with transitions between the open channel and piped network and significantly reduce the possibility of blockage. Some excavation will be necessary for the pipe alignment that will follow the existing open channel alignment. Four new manholes will be installed along the new pipe along with an additional 2 ft. of fill over the pipe alignment.

While this project helps to reduce surface flooding, it does not meet the current Public Works Standards for pipe design. Since drainage to this location is greater than 250 acres, the pipe should be designed for the 50-yr design storm without allowing surcharging. Since this project location is constrained by existing infrastructure on the upstream and downstream ends, compliance with this design criteria is not feasible for a project in this location. This pipe was instead sized to maximize capacity within the site constraints which resulted in adequate conveyance of the 50-yr design storm, despite pipe surcharging.

Design Considerations

- Only preliminary calculations have been made to identify conceptual pipe sizing. Design should verify pipe capacity needs.
- Permitting and mitigation costs will be required for in-water work, therefore, for this project, permitting costs were increased to 15% from the 5% that has been applied to other projects.
- Bolt-down manholes should be considered due to expected pipe surcharging during the 50-yr design event.
- The acquisition of easements or property is needed for construction access as the channel is surrounded by private property.
- According to the City's 2035 Transportation System Plan future project #31 is planned along Burnside Rd. from Wallula Ave. to Hogan Rd (upstream of KC-2). This project is currently listed on the 20-yr street corridor project list. When this project is constructed, consider using permeable pavement to provide an additional water quality benefit.

Planning-level Cost Estimate	
Construction	$779,000
Site Acquisition	N/A
Contingency (30%)	$233,700
Capital Expense Total (including contingency)	$1,013,000
Design/Construction Administration (30%)	$303,900
Permitting (15%)*	$151,950
Administration (14%)	$141,820
Capital Project Implementation Cost Total**	**$1,611,000**

**Permitting cost increased from typical 5% due to instream project work.*

***Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

Additional Project Information

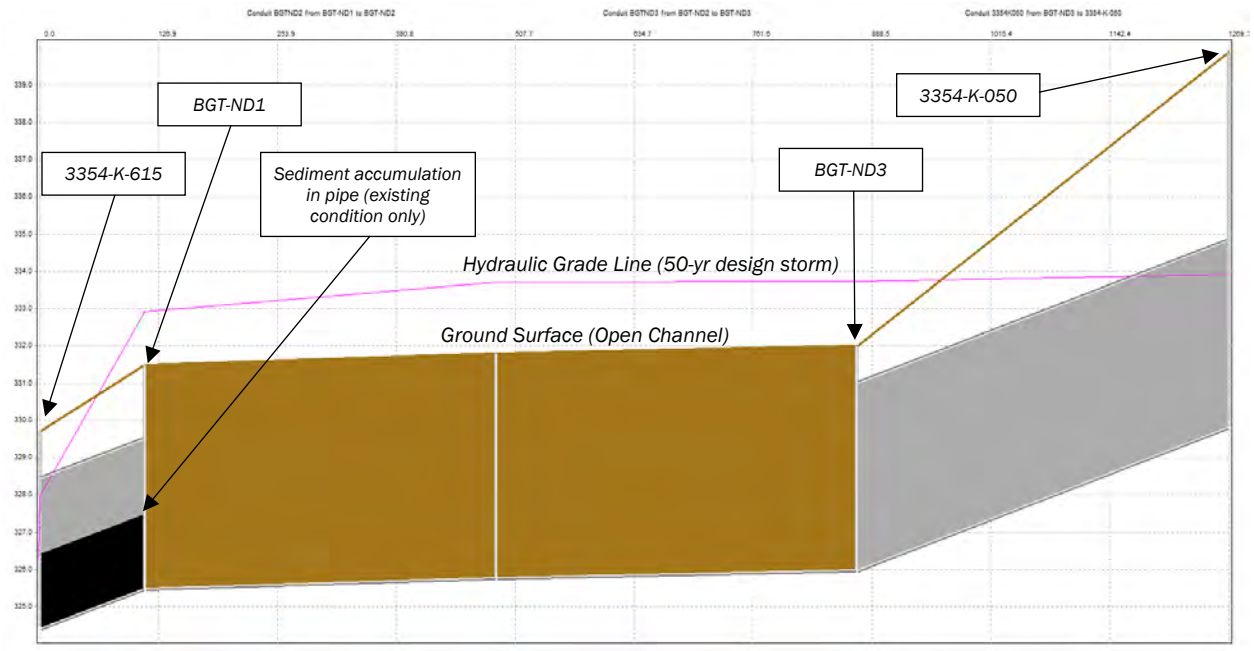
The photographs below show images of the project location.

Flooding of nearby businesses and the roadway on Division Street

Open channel behind businesses on Division Street

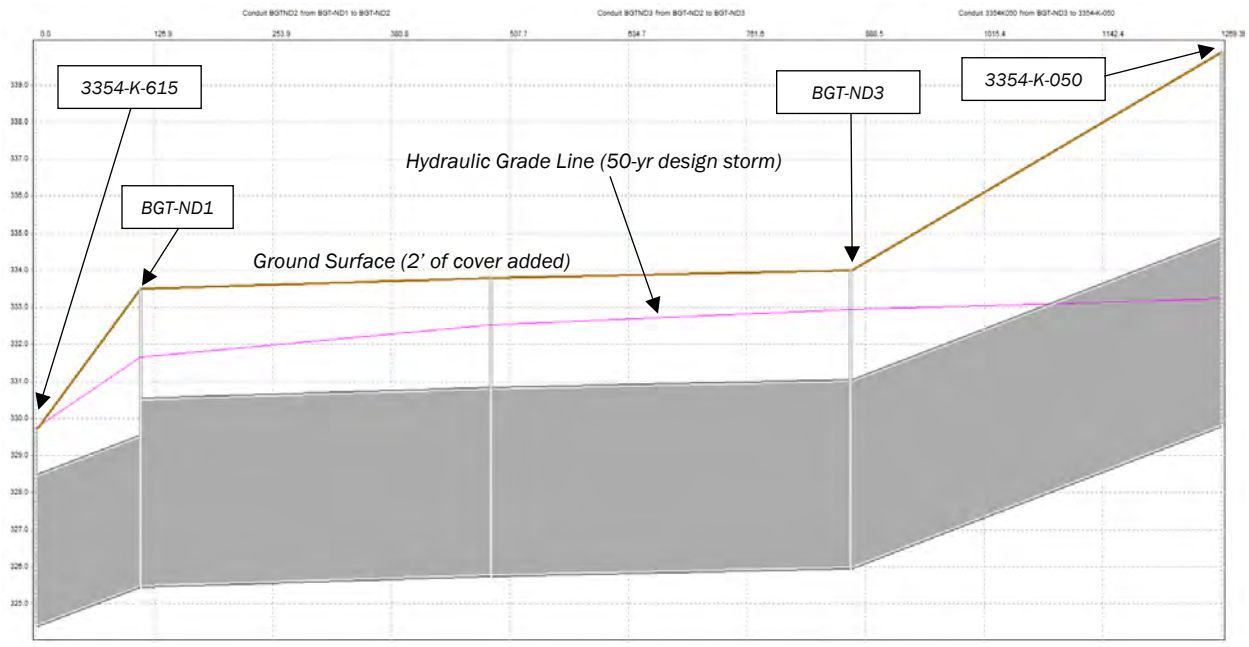
Existing Pipe Cross-section:

50-yr design storm predicts surface flooding



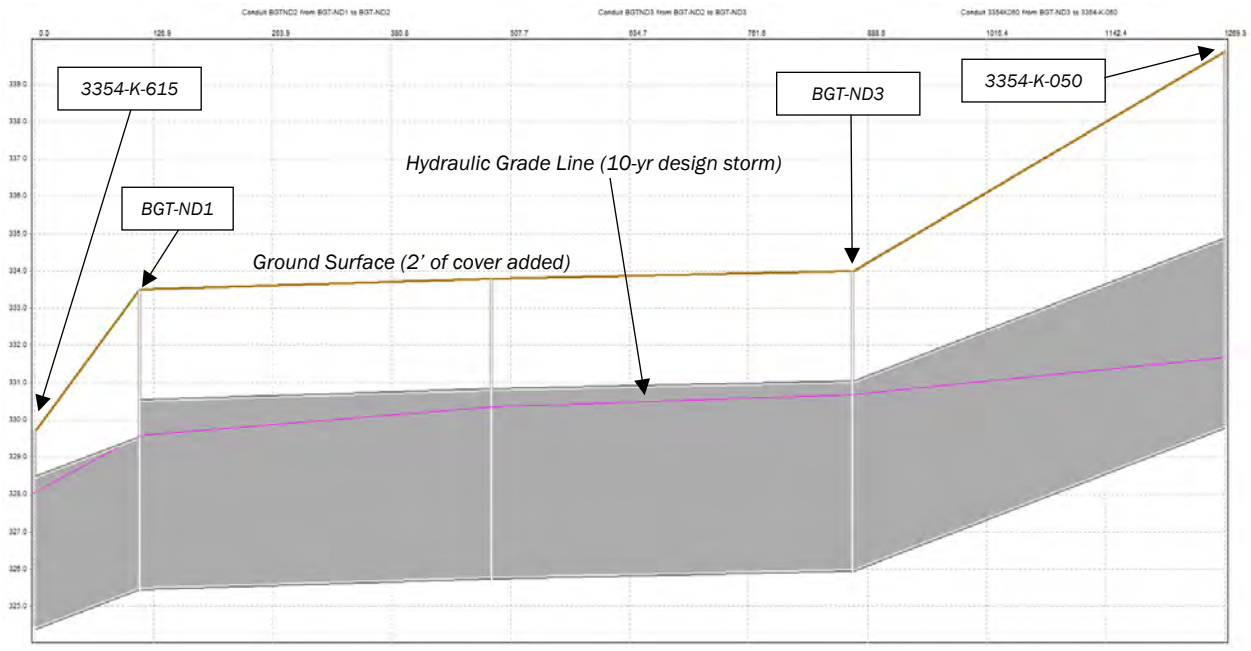
Proposed Pipe Cross-section:

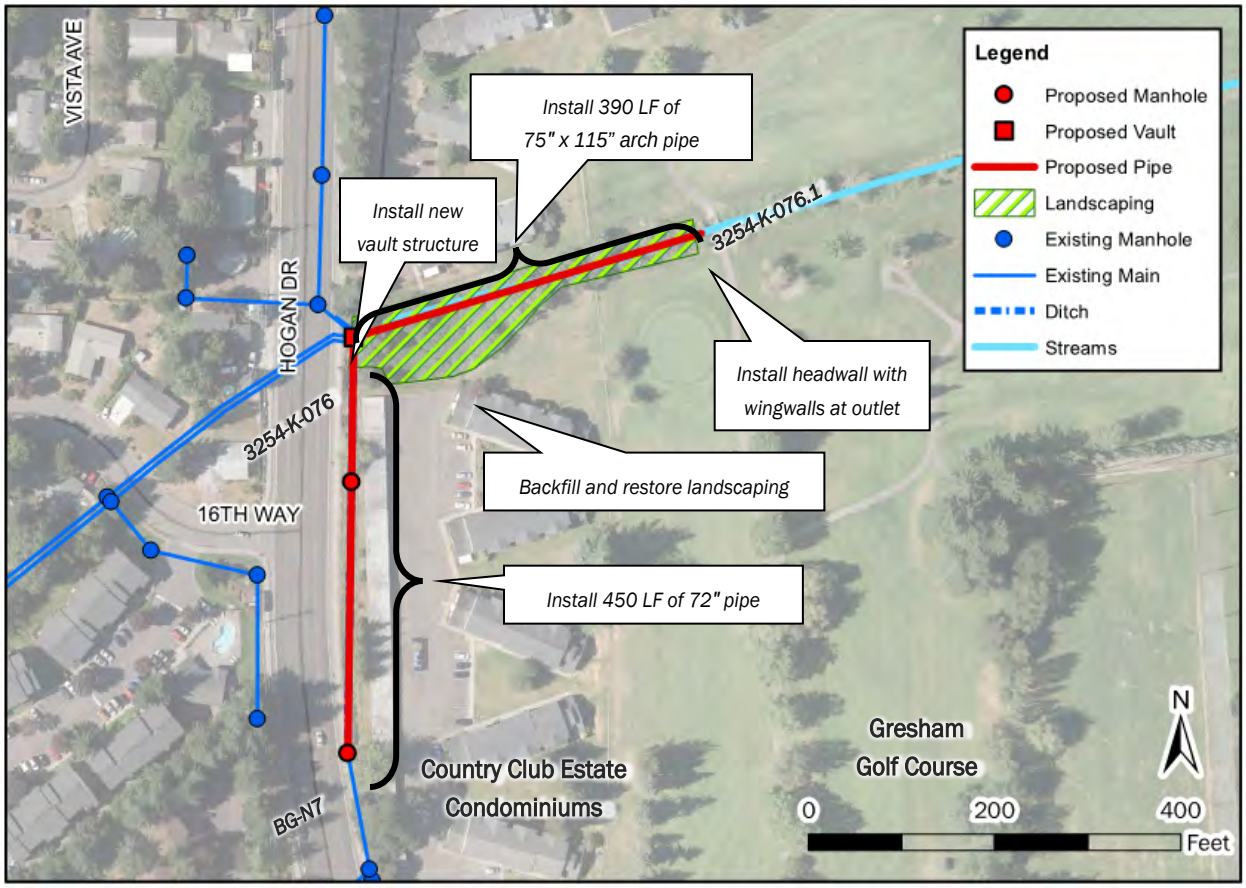
50-yr design storm predicts no surface flooding but pipe surcharging



Proposed Pipe Cross-section:

10-yr design storm predicts no surface flooding nor pipe surcharging





Project Name	**CIP: KC-10-C**
Detailed Location	**16th Way and Hogan Drive** **Structures BG-N7 to 3254-K-076.1**
Model File	**Model ALT06.xp**
Objective(s) Addressed	**Flooding**

Project Background

Burlingame Creek exits the piped system along the east side of Hogan Road and discharges into an open channel adjacent to the Country Club Estate Condominiums. This channel has some signs of erosion where rock had been placed along the channel bottom. At the northern end of this ditch, three pipes discharge into an open channel that drains east between the Country Club Estate Condominiums. This open channel continues flowing east through the Gresham Golf Course. This area of the channel has had significant sediment deposition which has stabilized due to vegetation.

Nearby residents have experienced repeated flooding of the wetlands area adjacent to structures. During the December 2015 storm event, the water level reached Hogan Road, covering one lane of the roadway.

Project Description

The proposed project would include piping of open channel flow beginning at the existing ditch on the east side of Hogan Road. This ditch has not experienced flooding, however piping this section would increase hydraulic efficiency of the stormwater system. The drainage ditch would be replaced with a 72" pipe which would connect to a new vault structure, as shown on the image above. The structure will be required to accommodate several large pipes. From the new structure to the outfall on the Gresham Golf course, the open channel will be replaced with a 75" by 115" arch pipe or equivalent. An additional 2 ft. of fill will be placed over the arch pipe alignment and a wingwall structure with headwalls is to be installed at the outlet (3254-K-076.1).

The existing sedimentation between NE Hogan Road and the golf course will need to be excavated to remove invasive vegetation, and replanted with appropriate riparian/wetlands vegetation once backfilled to cover the pipe.

While this project helps to reduce surface flooding at this location (i.e., flooding experienced by Country Club Estates), it does not meet the current Public Works Standards for pipe design. Since drainage to this location is greater than 250 acres, the pipe should be designed for the 50-yr design storm without allowing surcharging. Since this project location is constrained by existing infrastructure on the upstream and downstream end, compliance with this design criteria is not feasible for a project in this location alone. This pipe was instead sized to maximize capacity and minimize future surface flooding at the junction along Hogan Dr. (3254-K-076) given the site constraints.

Design Considerations

- Preliminary calculations have been performed to identify conceptual pipe sizing. Design should verify pipe capacity needs, pipe alignment, and outfall location.
- The proposed pipe layout runs through an existing FEMA regulated floodplain area, which will require additional permitting (including potentially wetland mitigation and floodplain mitigation). Therefore, the permitting cost for this project was increased to 15% of the cost as opposed to the 5% that was applied to other projects.
- The project will require coordination between neighboring properties (Gresham Golf Course and Country Club Estate Condominiums).
- A separate water quality CIP was also developed for this location, KC-10-WQ. Refer to CIP: KC-10-WQ for a project description and cost estimate.
- According to the City's 2035 Transportation System Plan future project #32a is planned along Hogan Rd. in this area. This project is listed on the 50-year street corridor project list. When this project is constructed, consider using permeable pavement to provide a water quality benefit.
- While implementation of KC-10-WQ reduces the peak flow and max water surface elevation to KC-10-C, it is not a significant enough difference to warrant modification to the planning level pipe sizing. Modeling results for the construction of KC-10-WQ (assumes removal of 6.3 Ac. of drainage) predicts an approximate 0.50" reduction in the water surface elevation and a 2.4 cfs reduction in peak flow at node 3254-K-076 for the 50-year storm event.
- This project has the potential to include acquisition which was not included in the cost estimate.

Planning-level Cost Estimate

Construction	$1,136,000
Site Acquisition***	N/A
Contingency (30%)	$340,800
Capital Expense Total (including contingency)	$1,477,000
Design/Construction Administration (30%)	$443,100
Permitting (15%)*	$221,550
Administration (14%)	$206,780
Capital Project Implementation Cost Total**	**$2,348,000**

**Permitting cost increased from typical 5% due to instream project work.*

***Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

****This project has the potential to include some site acquisition which was not included in the cost estimate.*

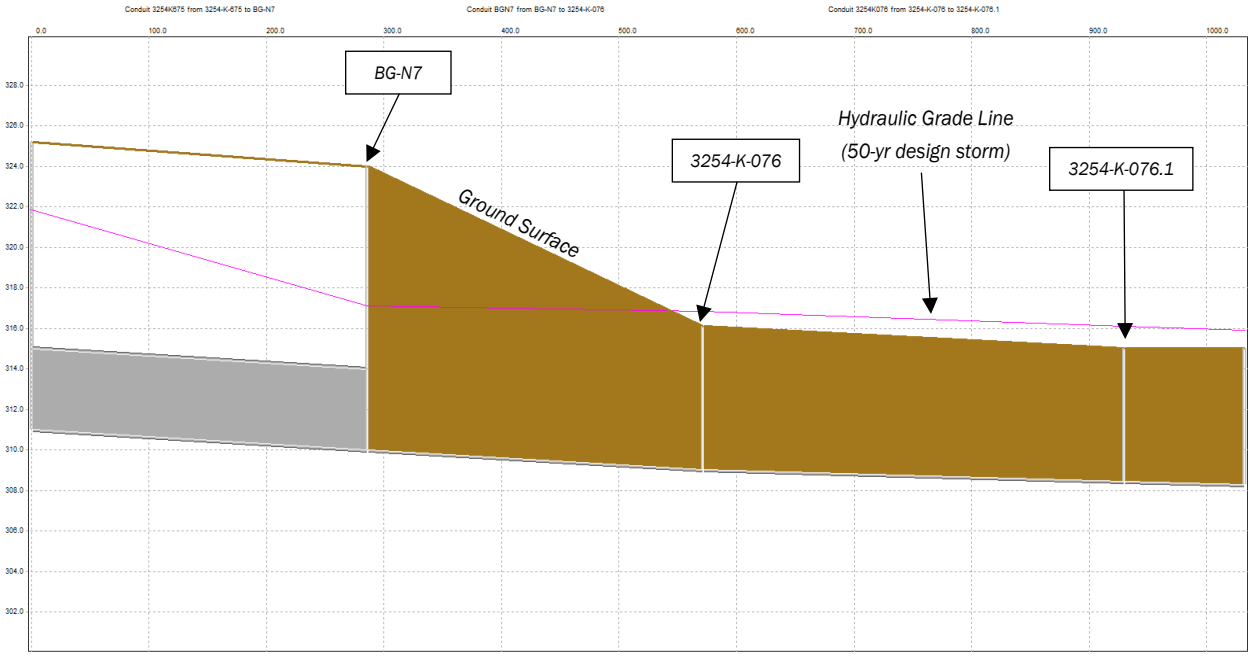
Additional Project Information

The photographs below show images of the project location.

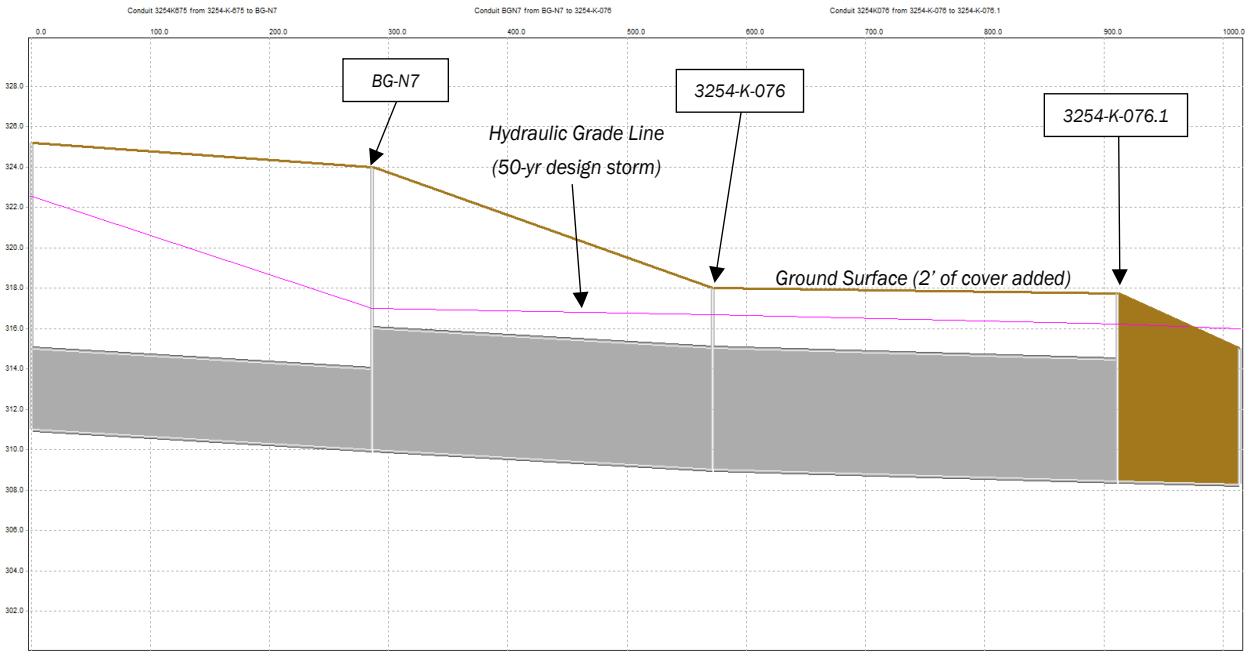
Open channel through wetlands area near Country Club Estate Condominiums

Flooding near Country Club Estate Condominiums

Existing Pipe Cross-section:

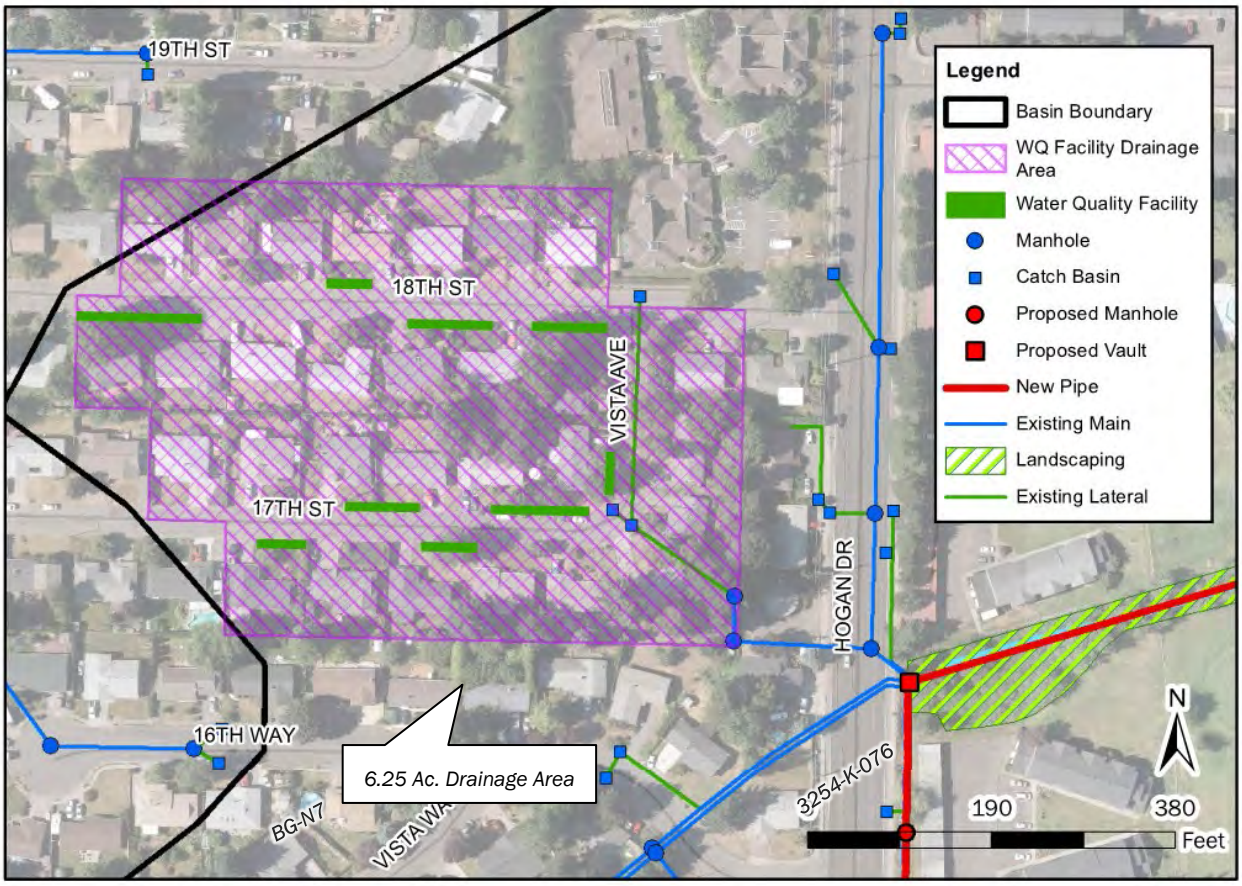


Proposed Pipe Cross-section:



2D Modeling results for Hogan Drive Outfall Extension at Country Club Estates:

50-year existing-conditions flood extents (blue) overlaid with potential project flood extents (red).



Project Name	**CIP: KC-10-WQ**
Detailed Location	**NE 17th and 18th St.**
Model File	**NA**
Objective(s) Addressed	**Water Quality**

Project Background

The residential neighborhood northwest of KC-10 (Hogan Dr. at the Country Club Estates Condominiums) drains to the open channel section of Burlingame Creek that flows east through the Gresham Golf course. This area has historically had flooding issues, especially during the December 2015 storm event, where the water level overtopped Hogan Dr. This residential neighborhood provides an opportunity to reduce the amount of drainage to this downstream capacity deficiency and provide a water quality benefit through treatment and infiltration.

Project Description

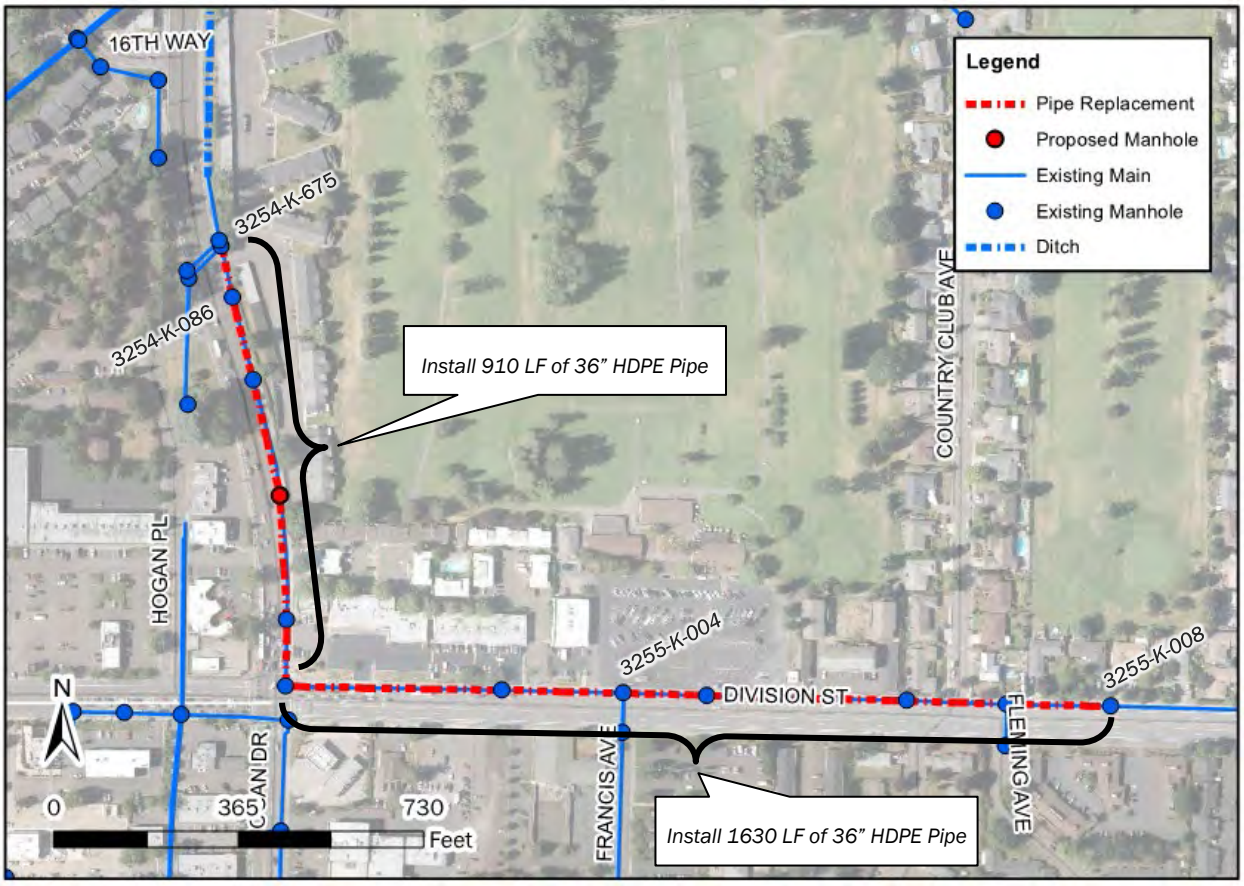
The proposed project provides 6,800 SF of stormwater water quality facilities within the residential neighborhood on 17th and 18th Street. These facilities will provide stormwater treatment for drainage prior to entering Burlingame Creek. Each facility will include two curb inlets, one to convey drainage into the facilities, and the other to function as an outlet overflow.

Design Considerations

- Stormwater planters were designed in accordance with the Simple Method for water quality outlined in the Stormwater Management Manual. This simple method sizes stormwater planters based on a 5% sizing factor on the impervious area managed by each facility.
- While implementation of KC-10-WQ reduces the peak flow and max water surface elevation to KC-10-C, it is not a significant enough difference to warrant modification to the planning level pipe sizing. Modeling results for the construction of KC-10-WQ (assumes removal of 6.3 Ac. of drainage) estimates an approximate 0.50" reduction in water surface elevation and a 2.4 cfs reduction in the peak flow at node 3254-K-076 for the 50-year storm event.

Planning-level Cost Estimate	
Construction	$332,000
Site Acquisition	N/A
Contingency (30%)	$99,600
Capital Expense Total (including contingency)	$432,000
Design/Construction Administration (30%)	$129,600
Permitting (5%)	$21,600
Administration (14%)	$60,480
Capital Project Implementation Cost Total*	**$644,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*



Project Identifier	**CIP: KC-12-C**
Detailed Location	**Division St.** **Structures 3254-K-675 to 3255-K-008**
Model File	**Model ALT06.xp**
Objective(s) Addressed	**Flooding**

Project Background

This piped system along Hogan Dr. and Division St. has previously been identified as having insufficient capacity in the previous Master Plan. The model predicts pipe surcharging and flooding at manhole (3255-K-004) at the intersection of Francis and Division.

Project Description

The existing 15" and 24" pipes along Division St. and Hogan are proposed to be replaced with new upsized HDPE piping. The new piped system will consist of 2540 LF of 36" pipe and connect to existing manhole structures (US: 3255-K-008, DS: 3254-K-675). Revised pipe invert elevations are proposed to maintain a consistent 1% slope along the majority of the piping run. This was simulated to eliminate the minimal slope (>0.5%) of select pipes within the existing alignment along Division St. An additional manhole is proposed along Hogan Dr. per Public Works Structure Standards (manholes shall be located at all changes in pipe alignment). This new pipe system is proposed to reduce surcharging and eliminate surface flooding during the 10-yr design storm. The existing piping is to be removed to allow space for the replacement piping along the alignment.

Design Considerations

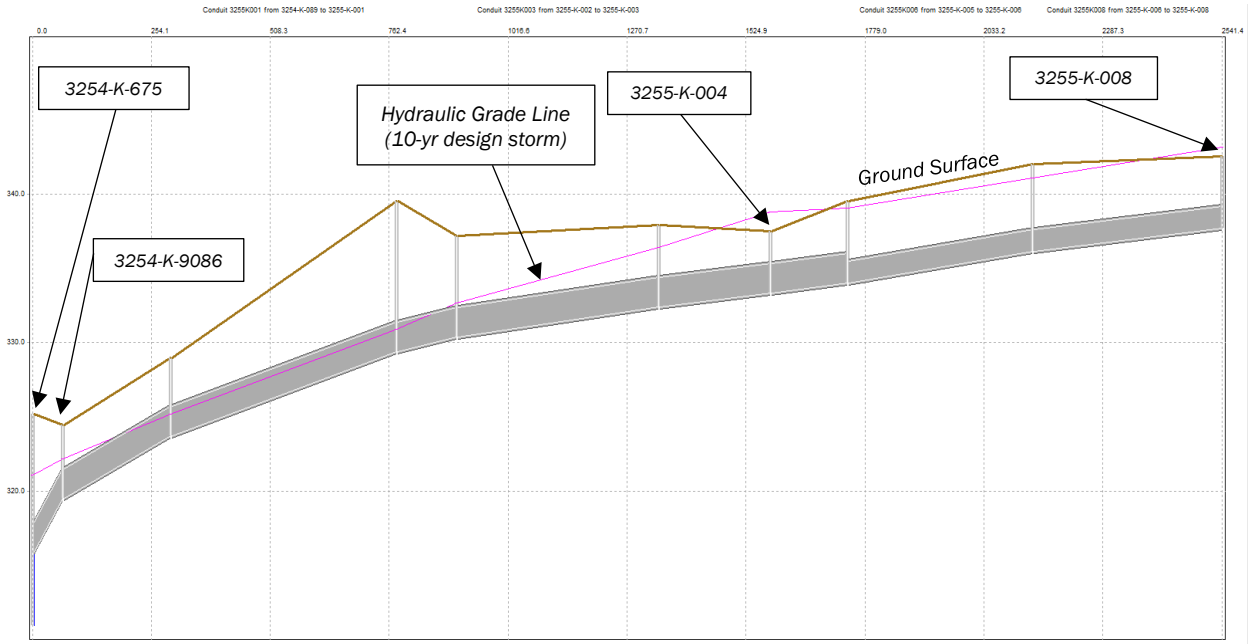
- Preliminary calculations were performed to identify conceptual pipe sizing. Design should be conducted to verify pipe capacity needs and pipe alignment.
- Consider installation of a bolt down manhole at Node 3254-K-086 to minimize any potential flooding impacts during a 50-yr storm event.
- Traffic control will be required for this project, along Division St. and Hogan Dr.
- According to the City's 2035 Transportation System Plan future project #32a is planned for Hogan Rd in this area. This project is listed on the 50-year street corridor project list. When this project is constructed, consider using permeable pavement to provide additional flow and water quality benefits.

Planning-level Cost Estimate	
Construction	$1,272,000
Site Acquisition	N/A
Contingency (30%)	$381,600
Capital Expense Total (including contingency)	$1,654,000
Design/Construction Administration (30%)	$496,200
Permitting (5%)	$82,700
Administration (14%)	$231,560
Capital Project Implementation Cost Total*	**$2,464,000**

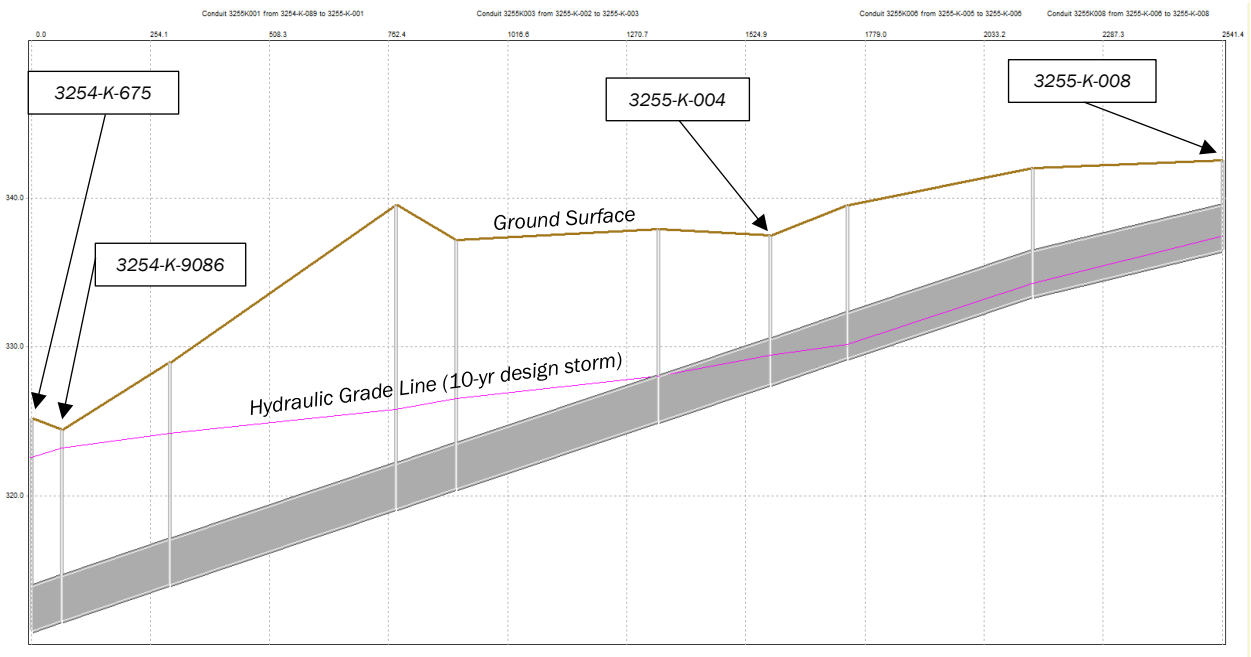
**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

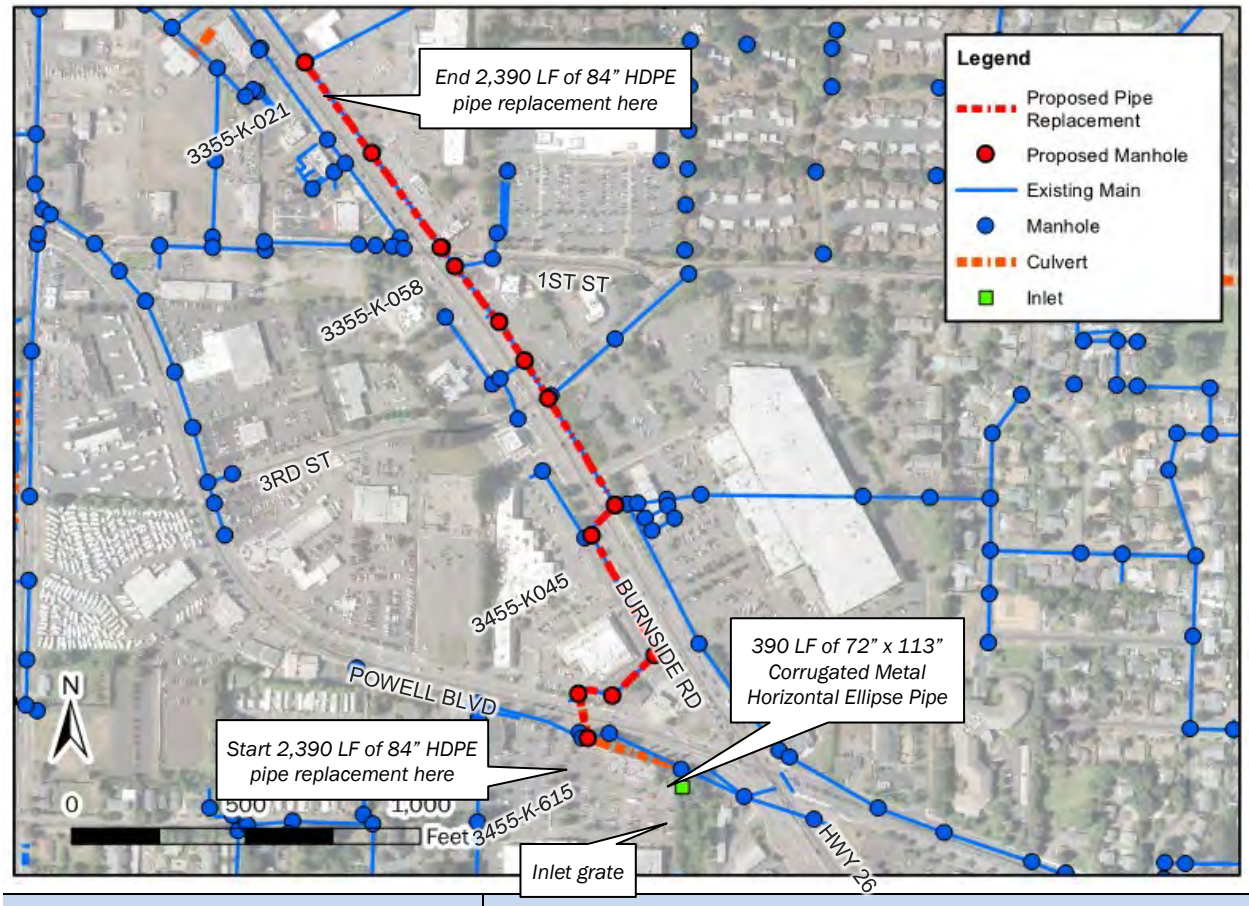
Additional Project Information

Existing Pipe Cross-section:



Proposed Pipe Cross-section:





Project Identifier	**CIP: KC-19-C**
Detailed Location	**Powell and Hwy 26 Pipe Improvements** **Structures 3455-K-615 to 3455-K-021**
Model File	**Model ALT06.xp**
Objective(s) Addressed	**Flooding**

Project Background

An open channel section of Burlingame Creek transitions to a piped system at Powell prior to continuing north along Hwy 26 (Burnside Rd.). This transition consists of a large inlet grate (approximately 20 ft long by 10 ft wide) to the east of Chang's Mongolian Grill. Historically this inlet and piped system that conveys flows north across Powell has been a bottleneck and resulted in reported issues at this intersection. Modeling of the Burlingame system has indicated that the downstream pipe system (along Hwy 26) of this problem area becomes surcharged during storm events, resulting in the predicted flooding indicated at Powell and Hwy 26. This location receives drainage from approximately 750 acres. of the Burlingame Creek watershed.

CIP KC-19 was developed after an evaluation of several alternatives. Most of these alternatives provided no significant capacity benefit (minimal reduction in water surface elevation and/or flooding duration) and thus were removed from consideration. A brief summary of these alternatives is outlined below

- Alternative A: Inline Detention upstream of inlet grate
  - Utilize existing open channel upstream of Powell and Hwy 26 intersection to provide detention to problem area.
- Alternative B: Reduce total drainage area to Powell and Hwy 26 intersection
  - Redirect drainage from sub basins southeast of Powell and Hwy 26 to flow north on the east side of Powell Blvd. prior to connecting to trunk line.
- Alternative C: Upsize the existing culvert underneath Powell Blvd. from 5 ft to 6 ft (US Node: 3455-K-045, DS Node: 3455-K-063).
- Alternative D: Alternative C plus upsize existing pipes from 6' to 7' (US Node: 3455-K-615, DS Node: 3455-K-058).
- Alternative E: Alternative D plus realign pipe slopes for consistency between (US Node: 3455-K-615, DS Node: 3455-K-058).

Project Description

This project provides capacity relief to the Powell and Hwy 26 intersection by upsizing a portion of the downstream piped system. Upsizing includes the installation of 2,390 LF of 84" HDPE pipe within the existing pipe alignment (US Node: 3455-K-615, DS Node: 3355-K-021). With the installation of larger diameter pipe, installation of replacement manholes along this alignment will be required.

Note that while this project improves surcharging during the 10-yr event and eliminates the predicted flooding at node 3455-K-615, this project does not meet the current Public Works Standards for pipe design. Since drainage to this location is greater than 250 acres, the pipe should be designed for the 50-yr design storm without allowing surcharging.

Design Considerations

- Preliminary calculations were performed to identify conceptual pipe sizing. Design should be conducted to verify pipe capacity needs and pipe alignment.
- Revised pipe alignment along Burnside Rd. requires some increased pipe depths in comparison to existing depths. This should be considered when managing conflicts with other utilities.
- According to the City of Gresham's 2035 Transportation System Plan future project #34 is planned along Burnside Rd. from Hogan Rd. to Powell Blvd. This project is listed on the 20-year street corridor project list. When this project is constructed, consider using permeable pavement to provide a water quality benefit.

Planning-level Cost Estimate	
Construction	$3,691,000
Site Acquisition	N/A
Contingency (30%)	$1,107,300
Capital Expense Total (including contingency)	$4,798,000
Design/Construction Administration (30%)	$1,439,400
Permitting (5%)	$239,950
Administration (14%)	$671,720
Capital Project Implementation Cost Total*	**$7,149,000**

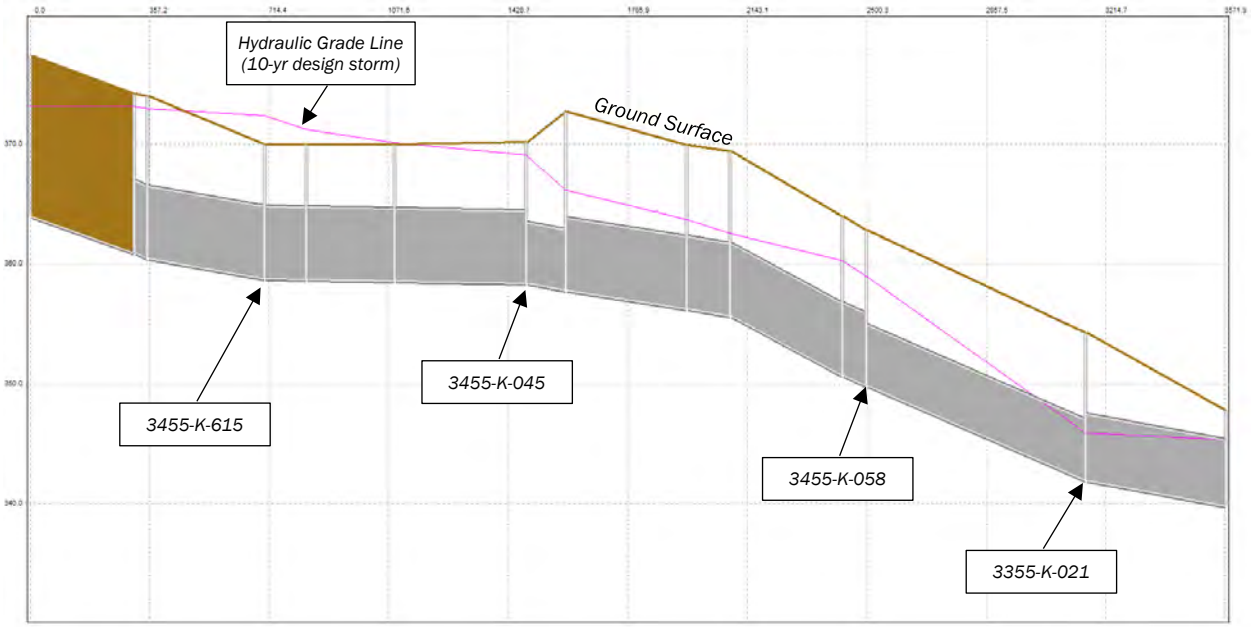
**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

Additional Project Information

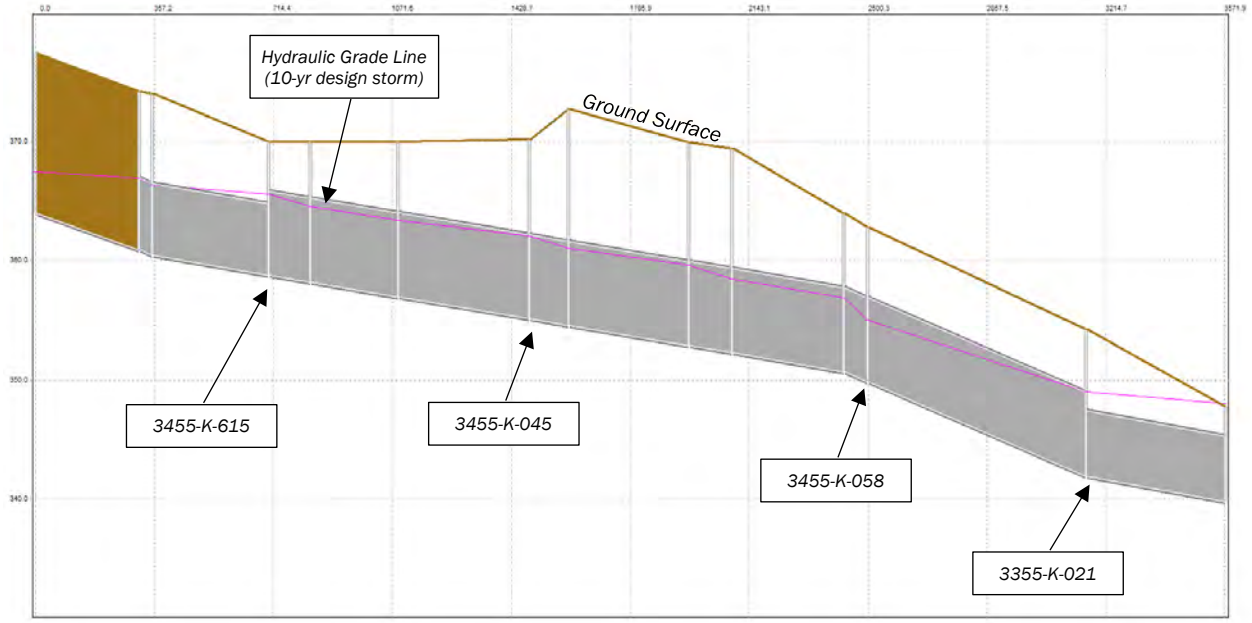
The photograph below shows an image of the project location.

Inlet grate at transition from open channel to pipe section at Chang's Mongolian Grill.

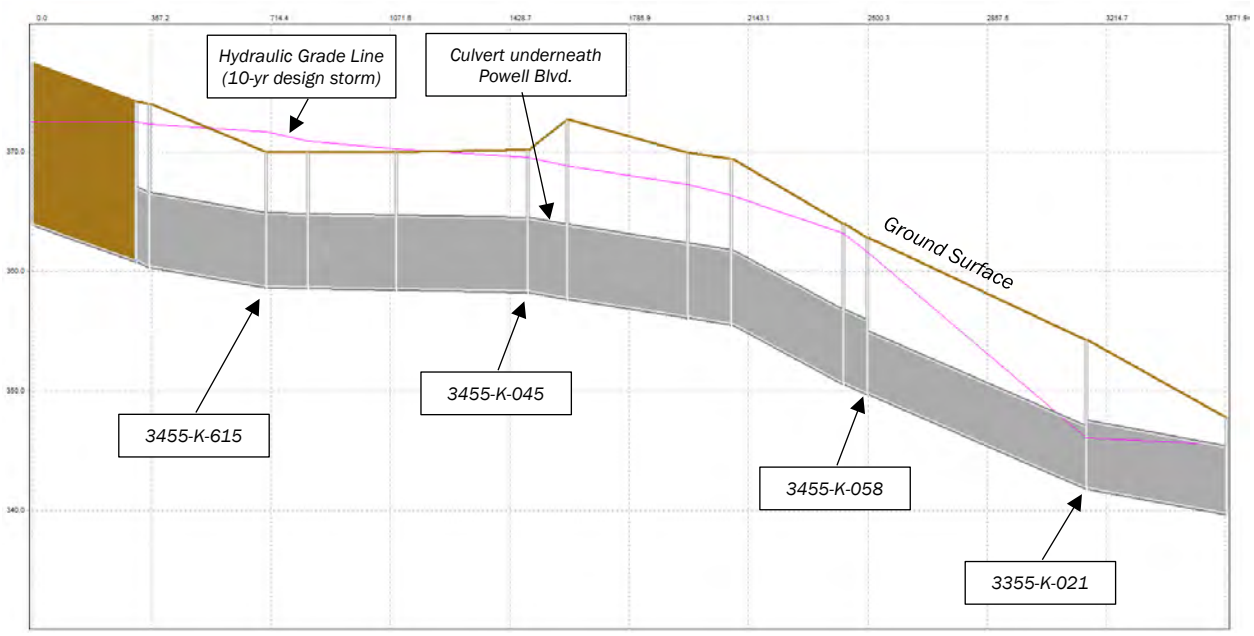
Existing Pipe Cross-section:



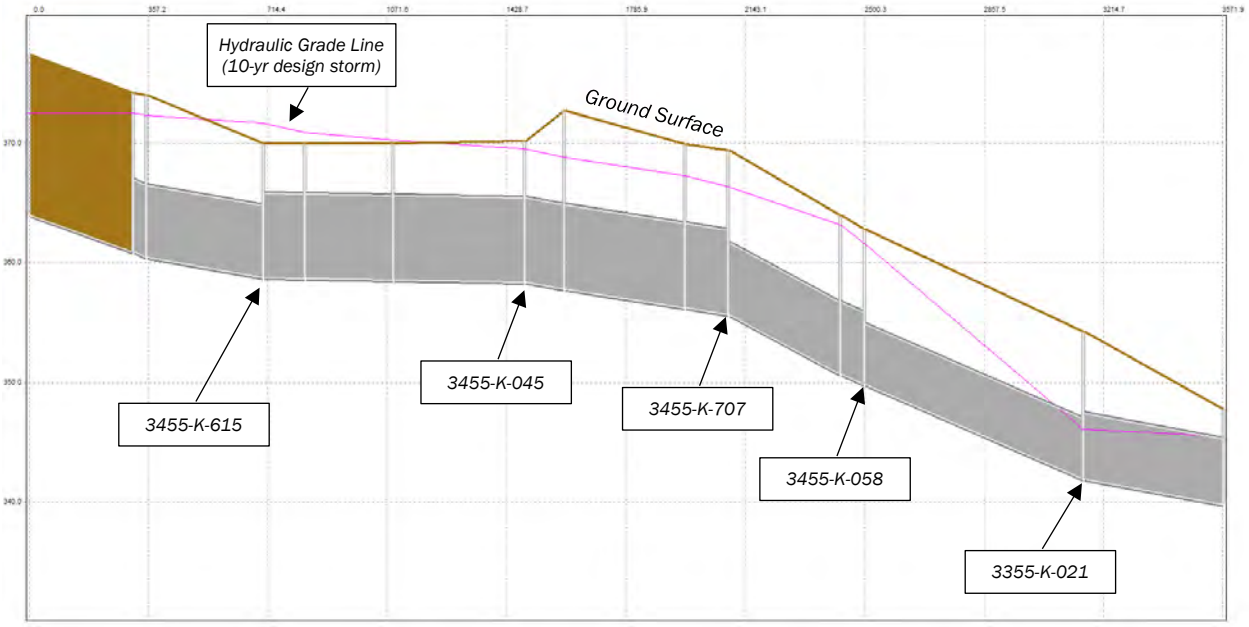
Proposed Pipe Cross-section:



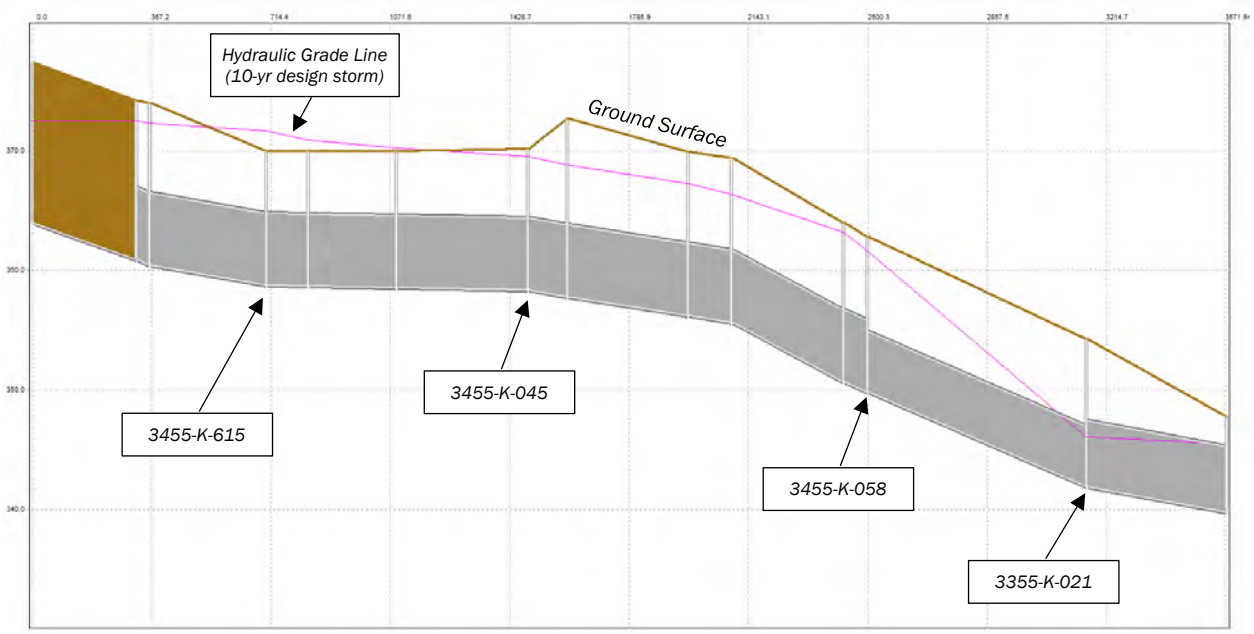
Pipe Cross-section Alternative C:

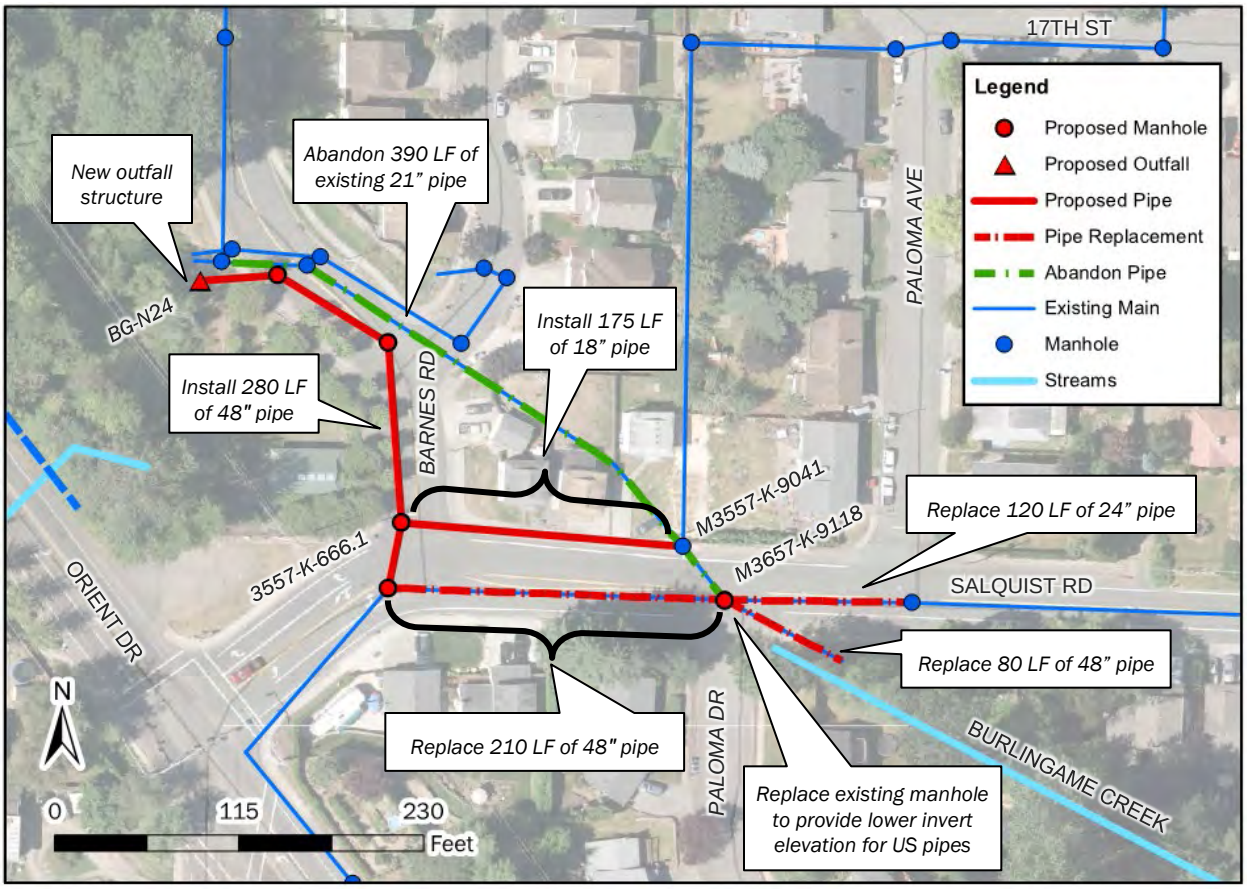


Pipe Cross-section Alternative D:



Pipe Cross-section Alternative E:





Project Identifier	**CIP: KC-24-C**
Detailed Location	Piped Systems at SE Salquist Rd. Nodes M3657-K-9118 to BG-N25
Model File	Model ALT06.xp
Objective(s) Addressed	Flooding

Project Background

The intersection of Salquist Rd. and Paloma Dr. is a previously identified capacity deficiency within the Burlingame Creek system. This capacity issue is further exacerbated due to this intersection being a confluence of several piped systems and a localized low spot. This intersection has had a history of flooding/ponding (see image in Additional Project Information Section). Flooding at this intersection causes water to back up in the two piped systems (from the East and North) that enter the Burlingame Creek system at this location.

Project Description

This project consists of new and replacement pipe infrastructure to separate and reroute flows from the piped systems that currently all converge underneath Salquist Rd. The existing 21" pipe that currently conveys flows to the northwest is undersized, runs through private property and is proposed to be abandoned. Flow from the Salquist Rd piped system and Burlingame Creek will now continue west beyond Paloma Dr. with the replacement of 120 LF of 24" HDPE pipe, 80 LF of 48" HDPE pipe, and 210 LF of 48" HDPE pipe. This flow will continue north at the intersection of Salquist Rd. and Barnes Rd. before discharging at a new outfall structure adjacent to the existing outfall. The pipe system from the north (Paloma Ave.) will tie into this section of 48" pipe at manhole 3557-K-666.1 via a new 15" HDPE pipe section.

This project eliminates predicted surface flooding in the model for the 10-yr design storm, however it does not meet the current Public Works Standards as surcharging within these pipes is still predicted.

Design Considerations

- Preliminary calculations were performed to identify conceptual pipe sizing. Design should be conducted to verify pipe capacity needs and pipe alignment.
- During design of this project, consider potential need to relocate the stormwater pipe that currently runs south through residents' backyards (connects to system at Node M3557-K-9041) to move it into the public right-of-way. This line could be relocated within the Paloma Ave. ROW. This would add additional costs to the project described here.
- A separate water quality CIP was also developed for this location, KC-24-WQ. Refer to CIP: KC-24-WQ for project description and cost estimate.
- According to the City's 2035 Transportation System Plan future project #47 is planned for Salquist Rd in this area. This project is listed on the 50-year street corridor project list. When this project is constructed, consider using permeable pavement to provide additional flow and water quality benefits.
- While implementation of KC-24-WQ would reduce the peak flow and max water surface elevation at KC-24-C, it is not a significant enough difference to warrant modification to the planning level pipe sizing. Modeling results for the construction of KC-24-WQ (assumes removal of 5.4 Ac. of drainage) estimated an approximate 1.5" reduction in water surface elevation and a 0.1 cfs reduction in peak flow at node M3357-K-9041 for the 10-year storm event.

Planning-level Cost Estimate

Construction	$516,000
Site Acquisition	N/A
Contingency (30%)	$154,800
Capital Expense Total (including contingency)	$671,000
Design/Construction Administration (30%)	$201,300
Permitting (5%)	$33,550
Administration (14%)	$93,940
Capital Project Implementation Cost Total*	**$1,000,000**

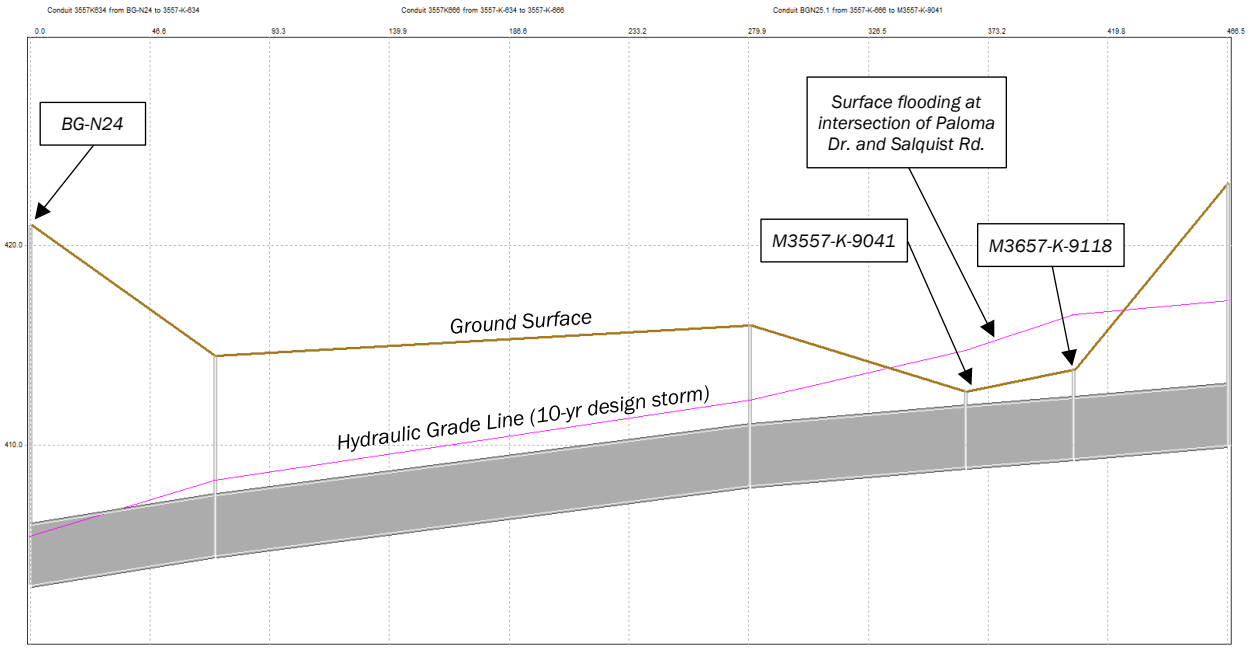
**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

Additional Project Information

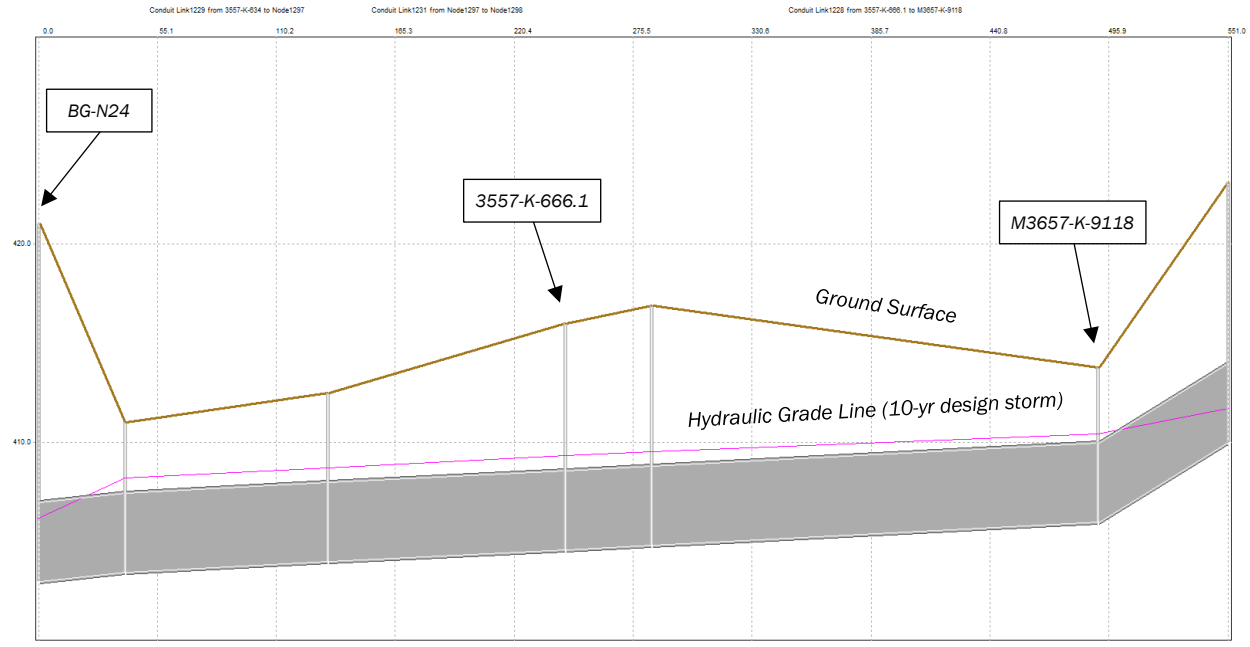
The photograph below shows an image of the project location.

Flooding at SE Paloma Dr. and Salquist Rd. during the December 2015 storm event.

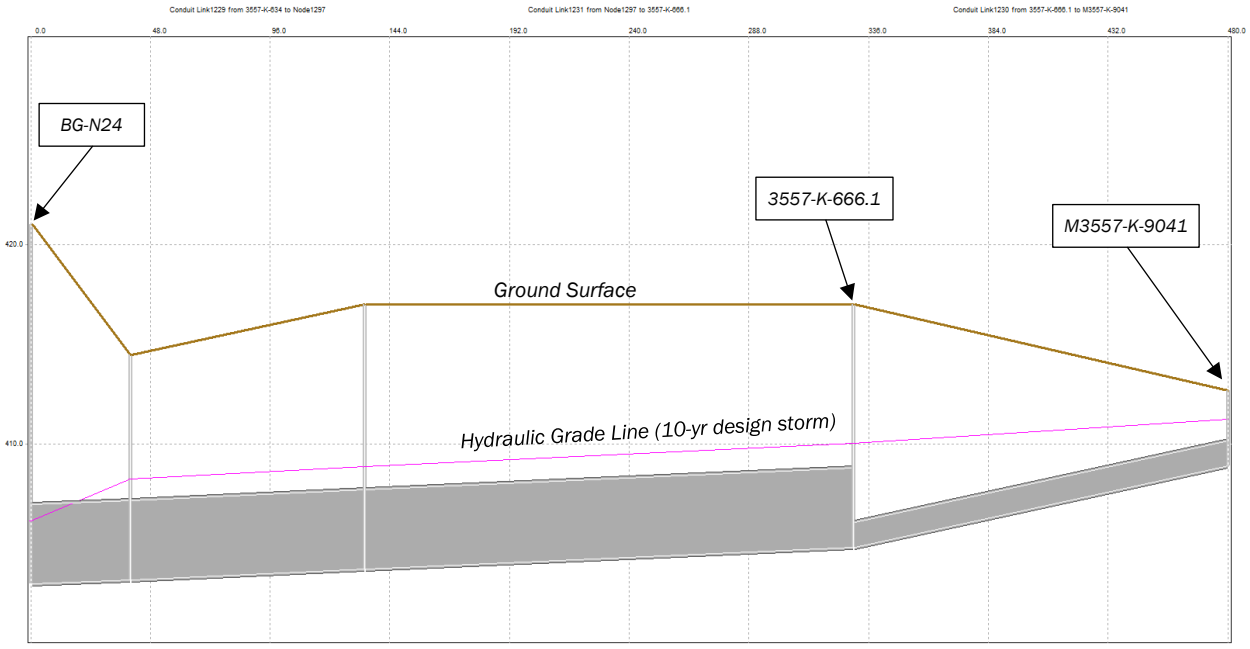
Existing Pipe Cross-section:

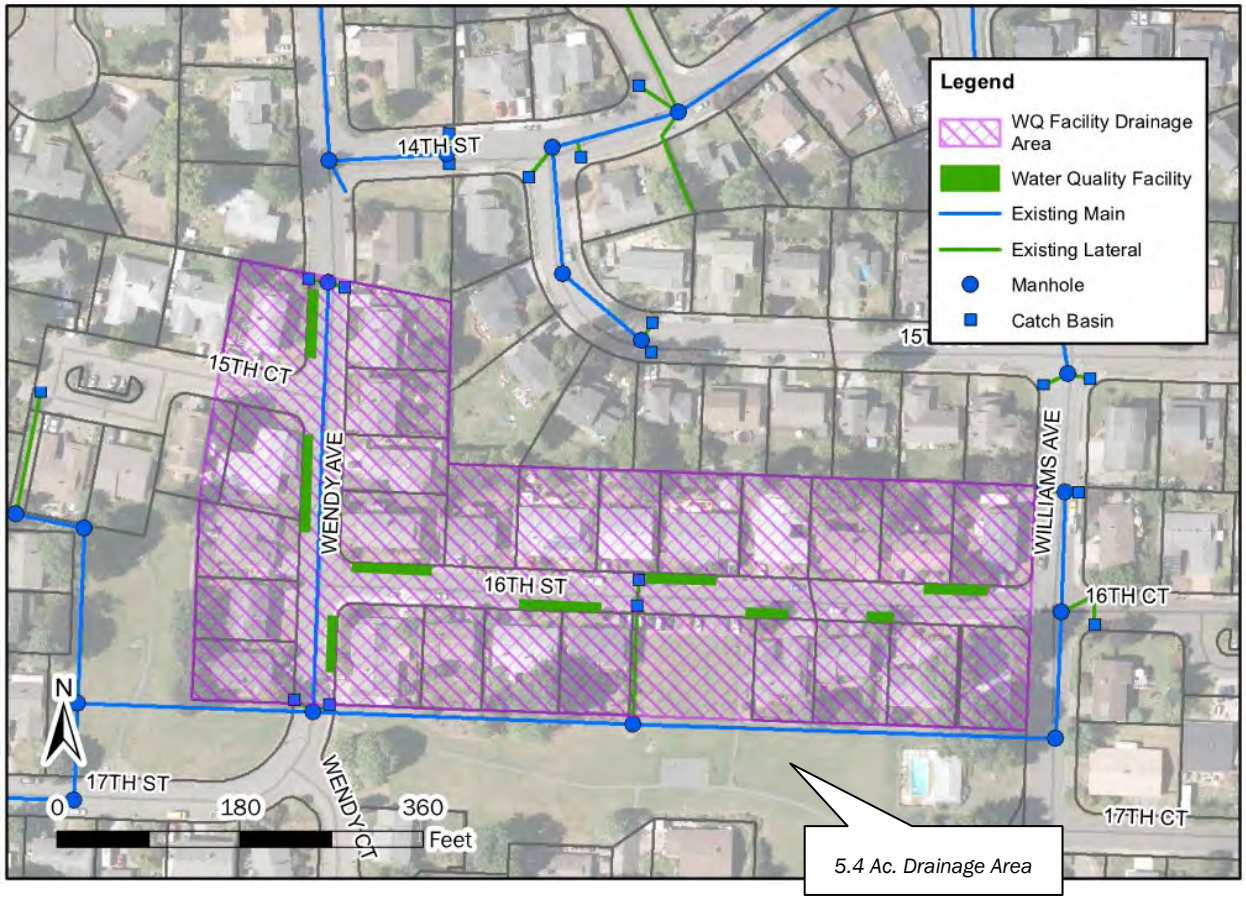


Proposed Pipe Cross-section:



Proposed Pipe Cross-section:





Project Identifier	**CIP: KC-24-WQ**
Detailed Location	**Wendy Ave. and 16th St.**
Model File	**NA**
Objective(s) Addressed	**Water Quality**

Project Background

The residential neighborhood along Wendy Ave. and 16th St. is upstream from an observed capacity issue at Burlingame Creek (KC-24-C). This capacity issue is located at the confluence of two piped systems that enter a piped section of Burlingame Creek at Salquist Rd. A water quality opportunity exists in this neighborhood to provide treatment and flow reduction downstream.

Project Description

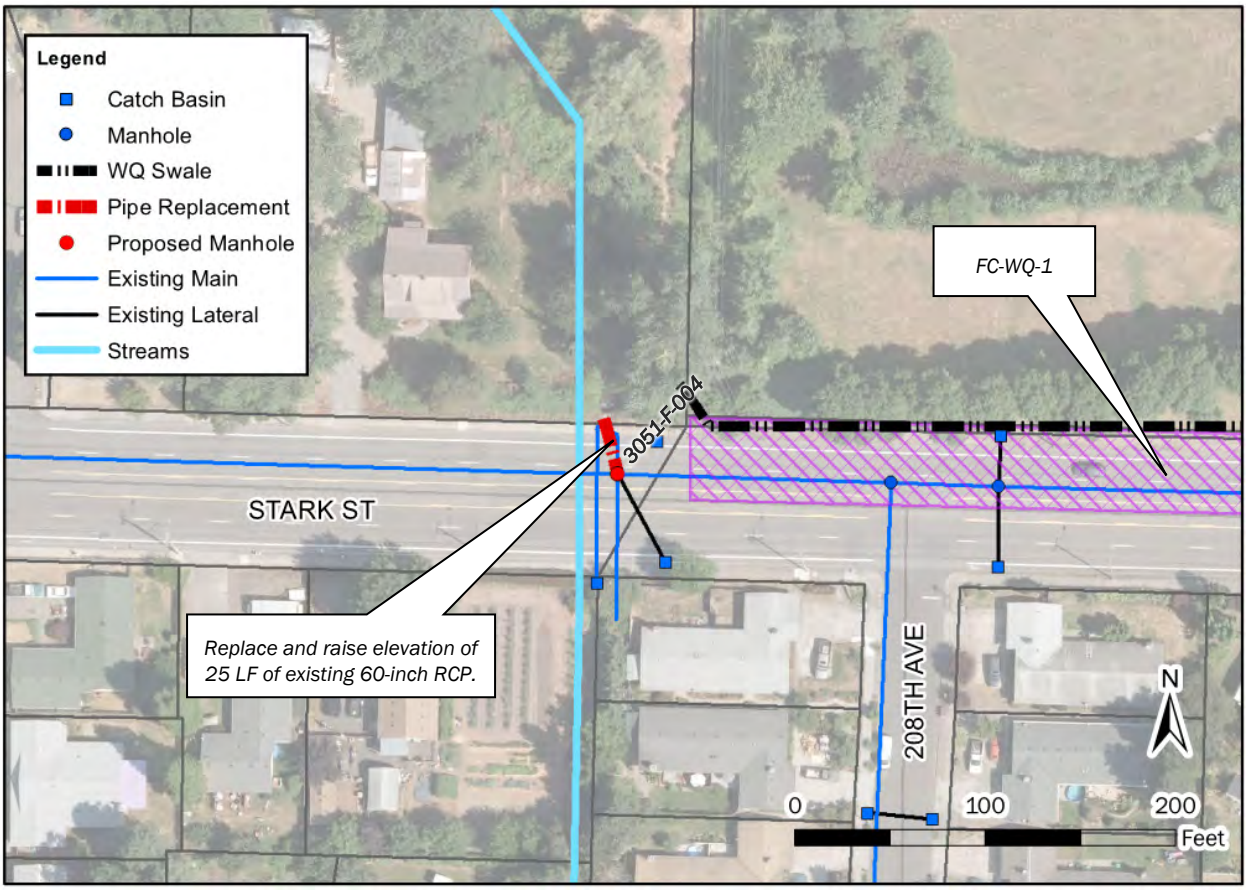
The proposed project provides 5,800 SF of stormwater water quality facilities within the residential neighborhood along 16th St. and Wendy Ave. These facilities will provide stormwater treatment for drainage prior to entering Burlingame Creek. Each facility will include two curb inlets, one to convey drainage into the facilities, and the other to function as an outlet overflow.

Design Considerations

- Stormwater planters were designed in accordance with the Simple Method for water quality outlined in the Stormwater Management Manual. This simple method sizes stormwater planters based on a 5% sizing factor on the impervious area managed by each facility.
- While implementation of KC-24-WQ reduces the peak flow and max water surface elevation to KC-24-C, it is not a significant enough difference to warrant modification to the planning level pipe sizing. Modeling results for the construction of KC-24-WQ (assumes removal of 5.4 Ac. of drainage) estimates an approximate 1.5" reduction in water surface elevation and a 0.1 cfs reduction in peak flow at node M3357-K-9041 for the 10-year storm event.

Planning-level Cost Estimate	
Construction	$287,000
Site Acquisition	N/A
Contingency (30%)	$86,100
Capital Expense Total (including contingency)	$373,000
Design/Construction Administration (30%)	$111,900
Permitting (5%)	$18,650
Administration (14%)	$52,220
Capital Project Implementation Cost Total*	**$556,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*



Project Identifier	**CIP: FC-C-1**
Detailed Location	Stark Street
Model File	CIP07
Objective(s) Addressed	Backwater conditions

Project Background

City staff have observed standing water in the stormwater conveyance system for several hundred feet to the east and west of the existing 60" diameter Stark Street Culvert.

Fairview creek crosses under Stark Street in an 82 ft long, 3 ft tall by 8 ft wide concrete box culvert with an upstream invert elevation of 239.07 ft and a downstream invert elevation of 238.44 ft. A parallel 60" diameter culvert receives flow from the storm pipe in Stark Street at manhole M3051-F-9004 (Old ID 3051-F-004) and discharges to Fairview Creek immediately to the east of the box culvert. The parallel culvert is 20 ft long with an upstream invert elevation of 231.40 ft and a downstream invert elevation of 230.91 ft. This culvert discharges below the bottom elevation of Fairview Creek and accumulates sediment, which causes standing water in the surrounding system. The channel invert elevation at the culvert has not been verified by survey.

Project Description

The proposed project involves replacing the existing 20-ft long, 60" diameter culvert with a 25 ft long, 60" diameter culvert with an upstream invert elevation of 233.70 ft and a downstream invert elevation of 233.45 ft. This project would raise the downstream invert elevation by 2.54 ft, but still result in a downstream invert elevation 4.99 ft below the downstream invert elevation in the box culvert. The project also includes costs for a headwall to prevent future channel erosion from blocking the outfall and to facilitate maintenance. The existing channel invert elevation and culvert elevations should be verified by survey prior to proceeding with this project. If the channel invert elevation remains above the proposed downstream invert elevation of 233.45 ft, the project should be reconsidered. The goal of the project is to maintain a clear flow path from the stormdrain in Stark Street to Fairview Creek.

Design Considerations

- Elevations and existing utility locations to be verified. Inspect MH 3051-F-9004 (old ID 3051-F-004) to verify incoming storm drain elevations. The reasoning for the existing 60" culvert elevation is unknown.
- Water quality project FC-1-WQ removes some flow from this system via the proposed swale on the north side of Stark Street.
- No street restoration projects are planned in this area according to the City's 2035 Transportation System Plan.
- If fish passage is required in this location by Oregon Department of Fish and Wildlife, an alternative to this project would be to also replace the main culvert under Stark as it is currently perched.

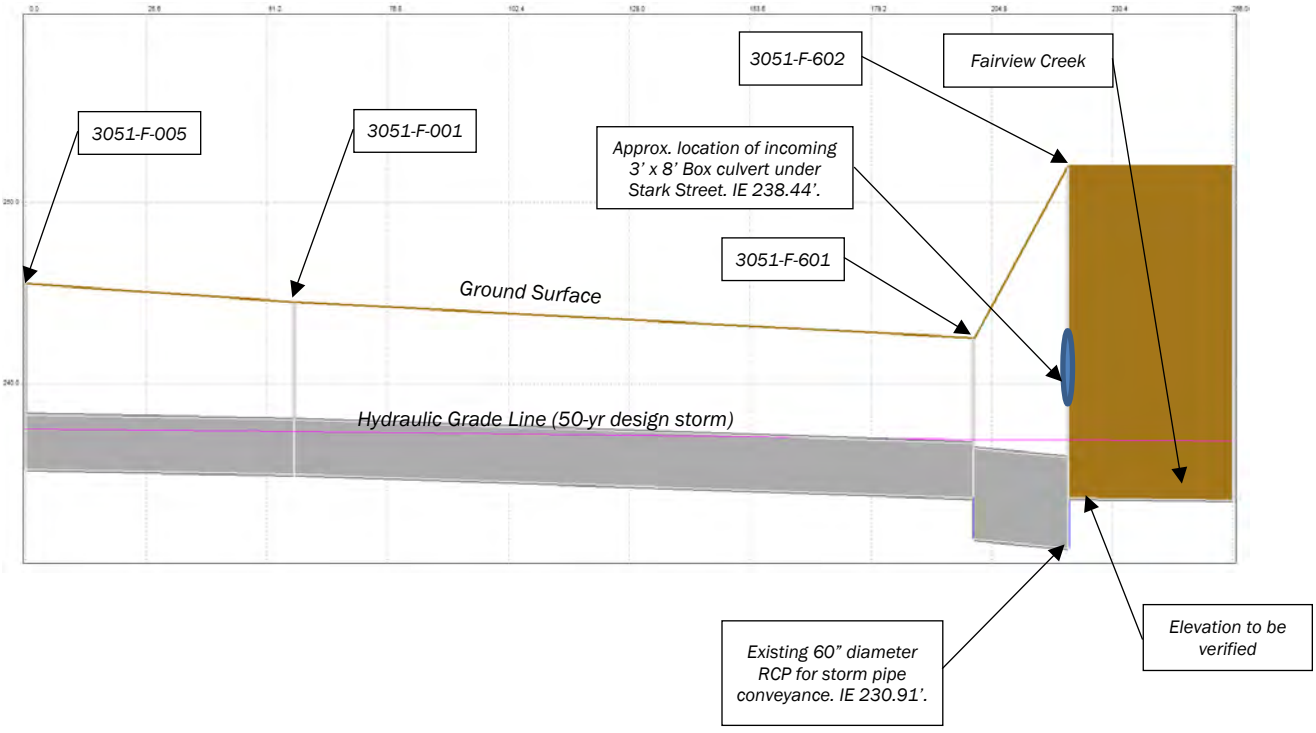
Planning-level Cost Estimate	
Construction	$194,000
Site Acquisition	$0
Contingency (30%)	$58,200
Capital Expense Total (including contingency)	$252,000
Design/Construction Administration (30%)	$75,600
Permitting (15%)*	$37,800
Administration (14%)	$35,280
Capital Project Implementation Cost Total**	**$401,000**

**Permitting increased to 15% for instream work.*

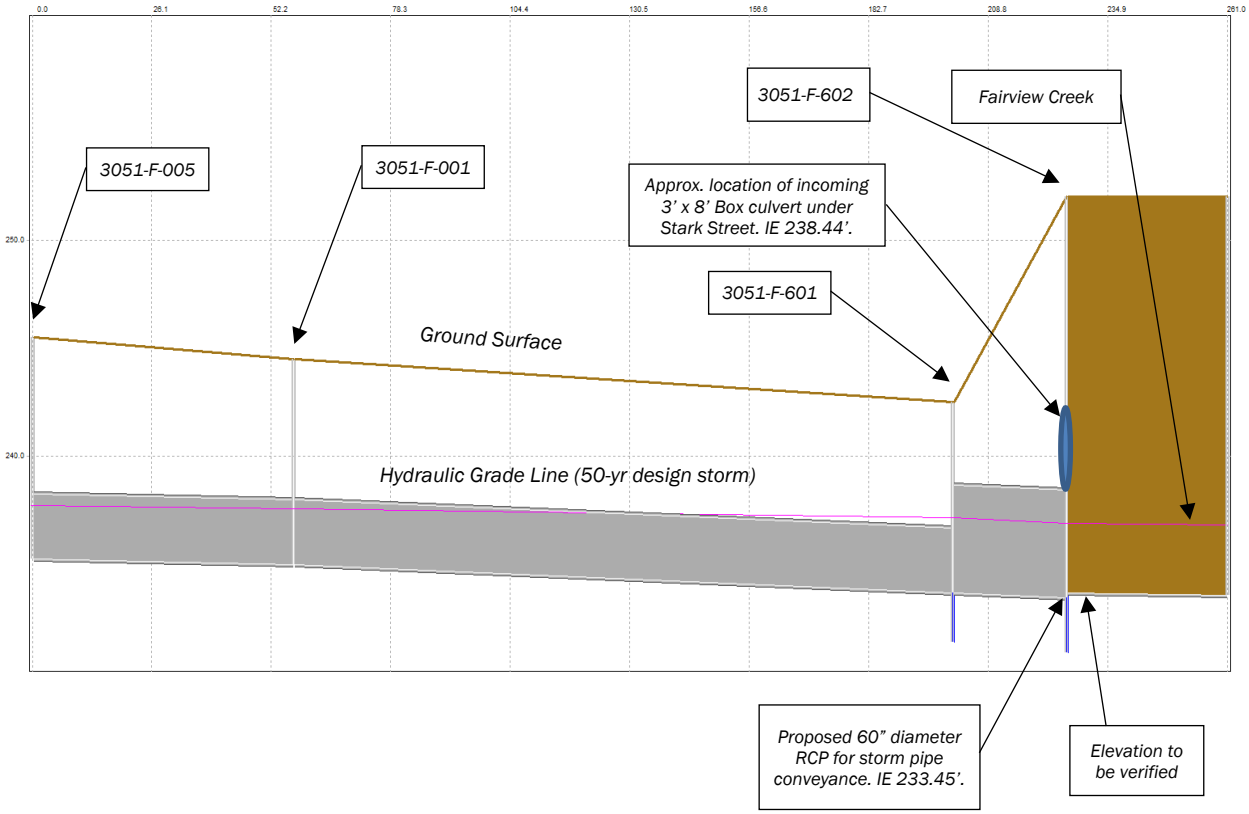
***Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

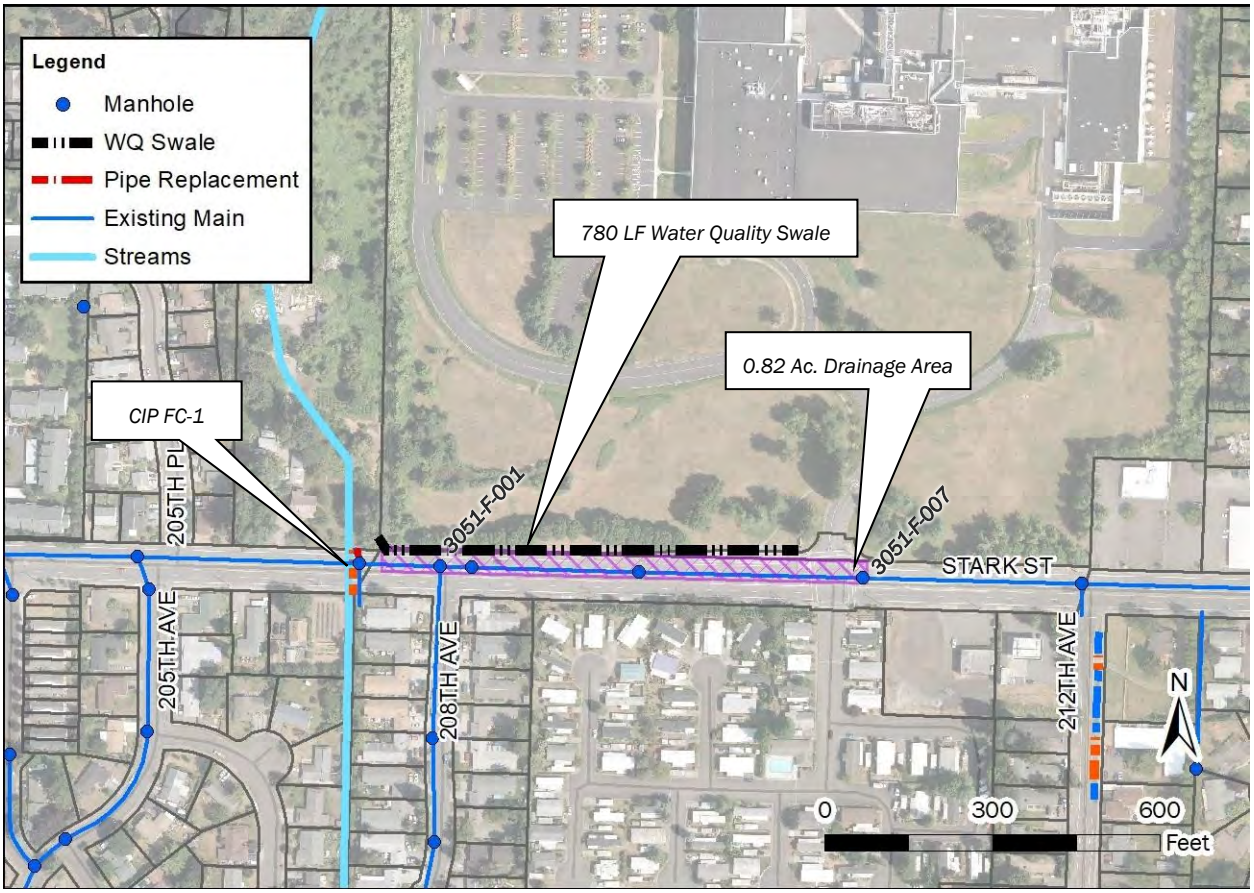
Additional Project Information

Existing Hydraulic Profile:



Proposed Hydraulic Profile:





Project Identifier	**CIP: FC-1-WQ**
Detailed Location	**Stark Street**
Model File	**N/A**
Objective(s) Addressed	**Water Quality**

Project Background

Runoff from Stark Street within the Fairview Creek basin currently does not receive water quality treatment.

Project Description

The proposed project involves installing a shallow 780 foot water quality swale on the north side of Stark Street along the frontage of tax lot 1N3E33-01300. The project would provide water quality treatment to runoff from the west bound lanes of Stark Street and remove some flow from the existing 36" storm drain which has standing water due to the elevation of the storm drain system relative to Fairview Creek. See CIP FC-1-C to address the storm drain elevation.

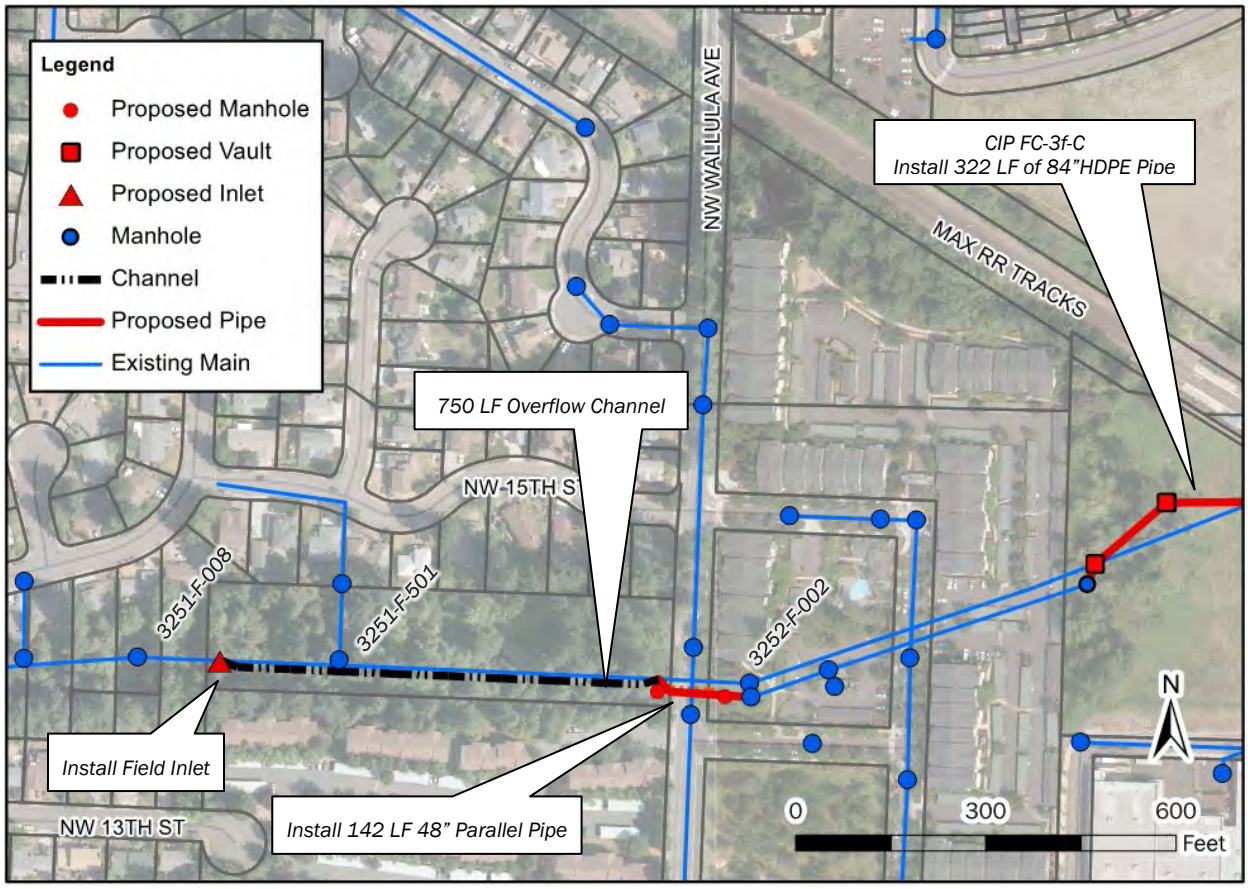
Design Considerations

- Elevations and existing utility locations to be verified.
- Location of existing mature trees on the southern edge of tax lot 1N3E33-01300 to be verified. Tree removal is not anticipated as a part of this project.
- No street restoration projects are planned in this area according to the City 's 2035 Transportation System Plan.

Planning-level Cost Estimate	
Construction	$58,000
Site Acquisition	$0
Contingency (30%)	$17,400

Capital Expense Total (including contingency)	$75,000
Design/Construction Administration (30%)	$22,500
Permitting (5%)	$11,250
Administration (14%)	$10,500
Capital Project Implementation Cost Total*	**$119,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*



Project Identifier	**CIP: FC-3a-C**
Detailed Location	**Wallula Avenue between 13th and 15th Street**
Model File	**CIP07**
Objective(s) Addressed	**Flooding**

Project Background

FC-3 covers a large segment of the City's storm drain system from Red Sunset Park down to the Birdsdale Water Quality Facility. One challenge with addressing capacity limitations in this area is that many of the pipes shown to be at or over capacity in the model are located on private property and have low burial depths.

This CIP addresses the lower portion of this storm drain system that is subject to the 50-year design storm event. Minor flooding was indicated at manhole 3251-F-501 in the future condition scenario model, which is located in the sidewalk on the southeast corner of the Trimet Tracks and NW Civic Drive. A CIP was developed at this location because upstream projects including CIP FC-3f-C at Civic Drive and CIP-3g-C at K-Mart and projects FC-3b-C and FC-3c-C farther upstream will alleviate upstream flooding by increasing peak flow capacity, thereby increasing peak flows in this location. Additionally, the Civic Drive private development project proposes to lower the rim elevation of manhole 3252-F-003 from 302 ft. to 297 ft. per draft design drawings provided by the City.

Project Description

This project includes installation of a parallel 48-inch pipe from manhole 3252-F-106 to a new manhole on the west side of NW Wallula Avenue. This project also includes an engineered overflow channel to convey flow through the natural area from the new manhole to a new inlet 190 linear feet to the west of existing manhole 3251-F-501. The overflow channel is 750 linear feet in length and designed with a 3 foot bottom width, 3:1 side slopes and 3 foot minimum depth.

Design Considerations

- The ground elevation of manhole 3252-F-003 should be lowered no further than 298 feet to prevent flooding during the 50-yr design storm. Due to the 2003 project to raise the Birdsdale Water Quality Facility high flow weir at 270 ft. it is difficult to lower the water surface elevation in the storm conveyance system downstream of this manhole. It is assumed that this project was completed to reduce flooding downstream in Fairview Creek, as the weir was set at the 100-yr water surface elevation per HDR design drawings provided by the City.
- Preliminary calculations were performed to identify conceptual pipe sizing. Design should be conducted to verify pipe capacity needs and pipe alignment.
- Field verification of the overflow channel alignment should be conducted during preliminary design.
- Location and coordination with other utilities should be conducted prior to construction.

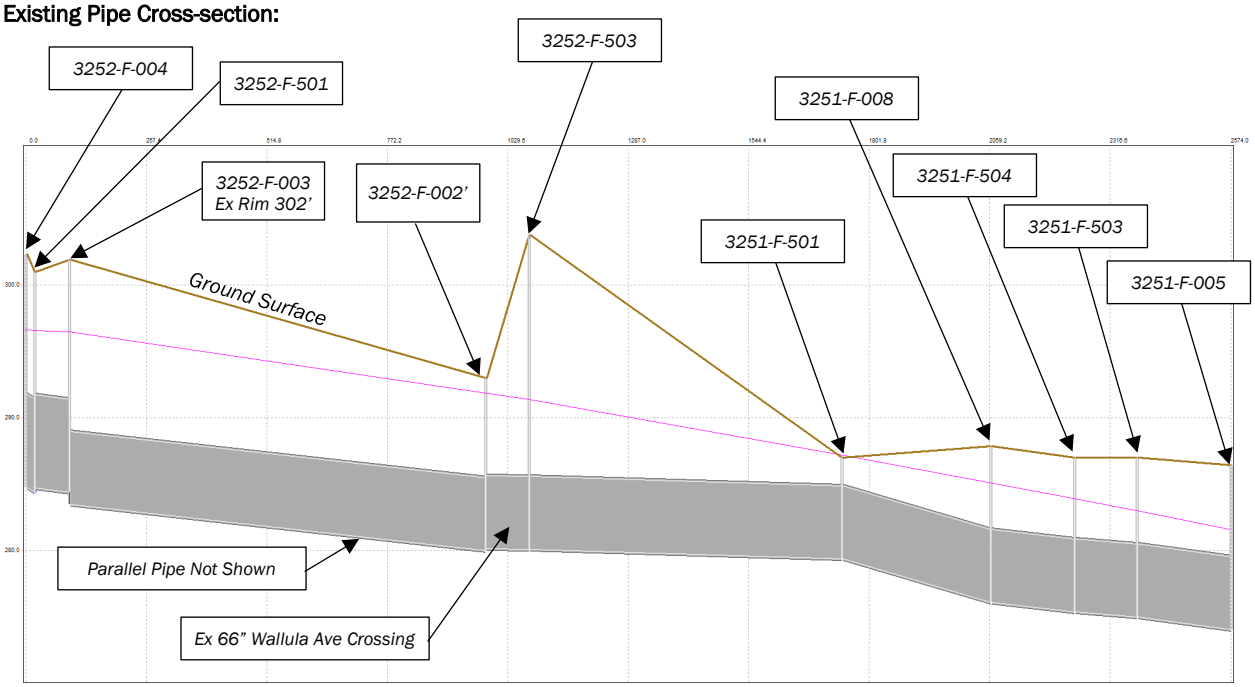
Planning-level Cost Estimate	
Construction	$346,000
Site Acquisition	$0
Contingency (30%)	$103,800
Capital Expense Total (including contingency)	$450,000
Design/Construction Administration (30%)	$135,000
Permitting (5%)	$22,500
Administration (14%)	$63,000
Capital Project Implementation Cost Total*	**$671,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

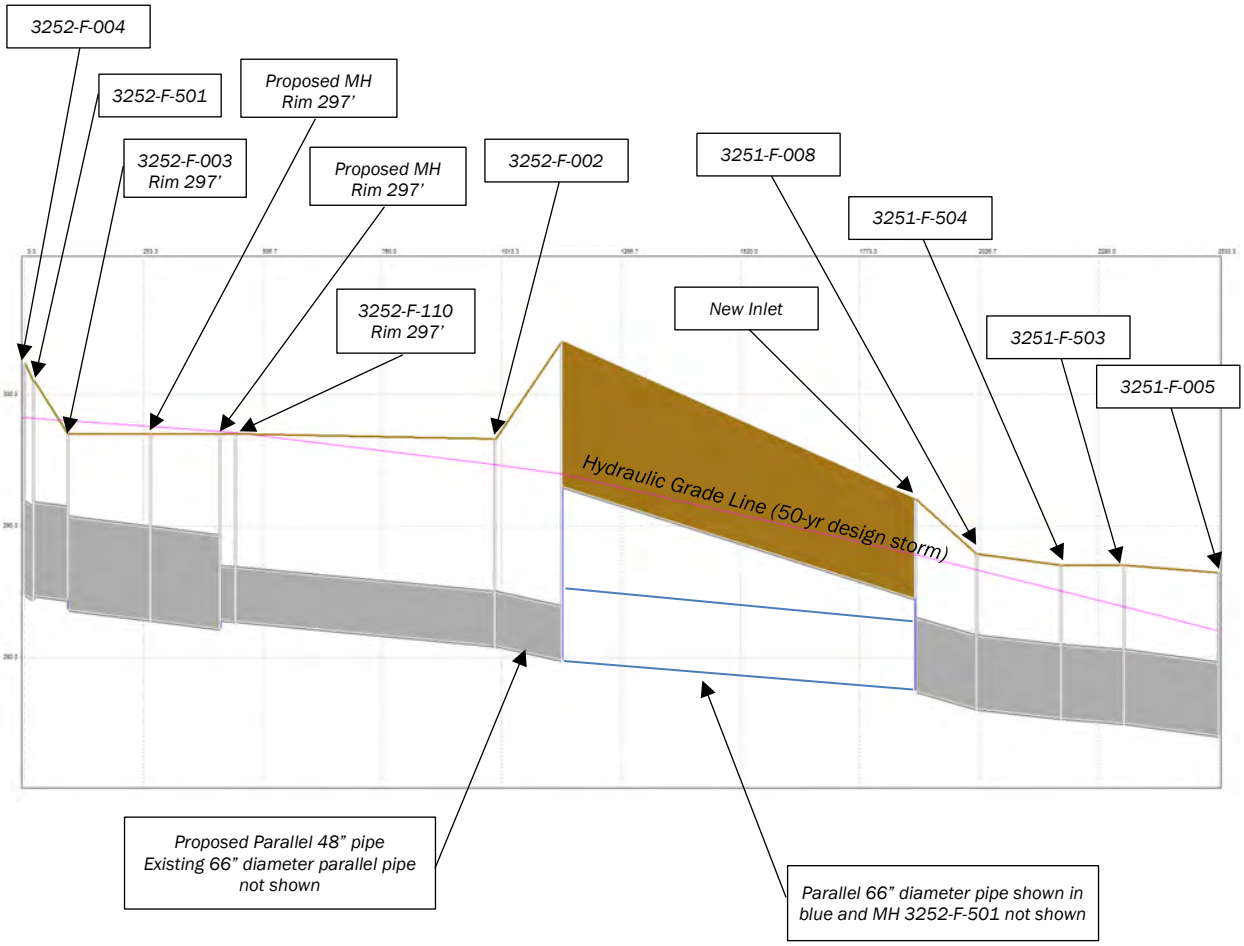
Additional Project Information

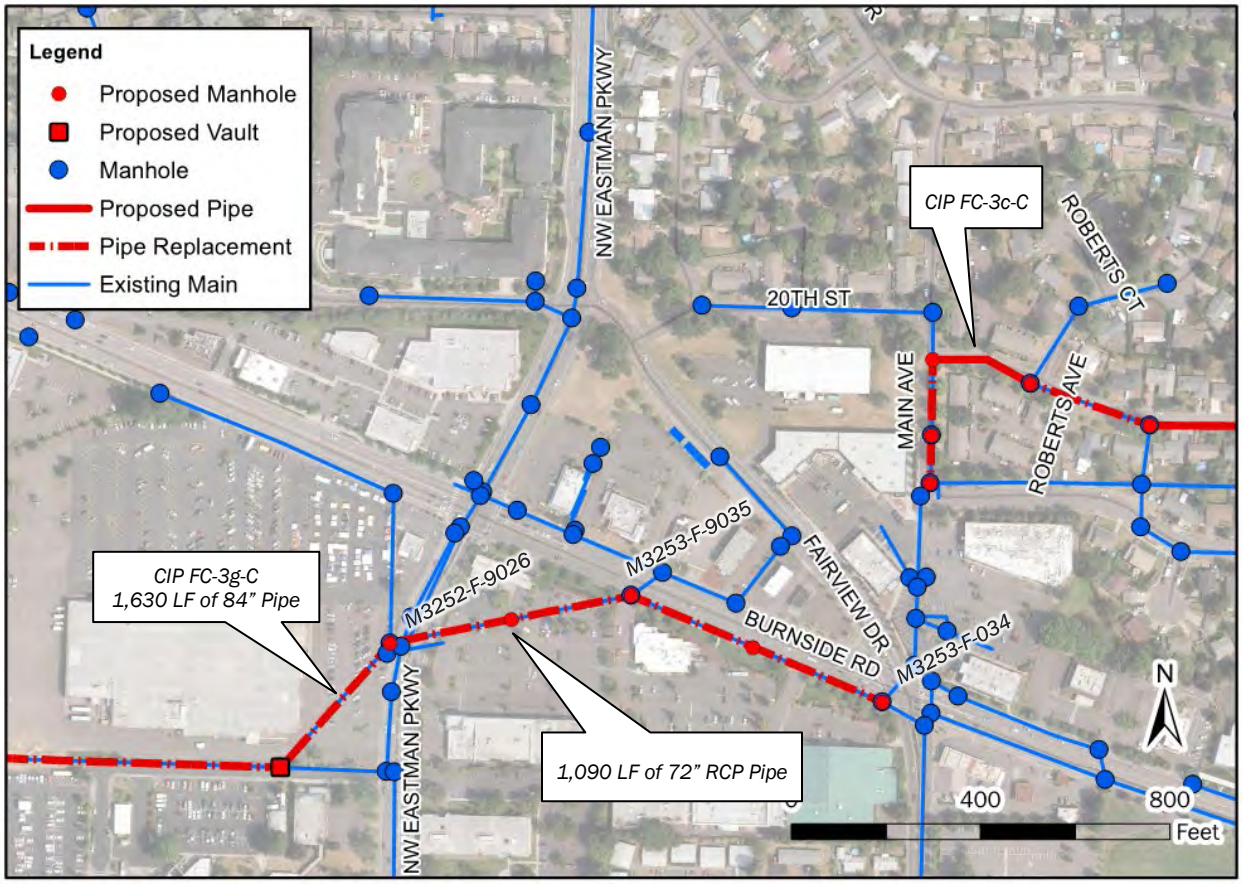
Project 19 identifies Wallula Avenue as a 50-year project in the City's Transportation System Plan.

Existing Pipe Cross-section:



Proposed Pipe Cross-section (when combined with Civic Dr Private Development, K-mart redevelopment, FC-3f, and FC-3g)





Project Identifier	**CIP: FC-3b-C**
Detailed Location	NE Burnside Rd from NW Fairview Dr to NW Eastman Pkwy Structures
Model File	CIP07
Objective(s) Addressed	Flooding

Project Background

FC-3 covers a large segment of the City's storm drain system from Red Sunset Park down to the Birdsdale Water Quality Facility. One challenge with addressing capacity limitations in this area is that many of the pipes shown to be at or over capacity in the model are located through private property and have low burial depths.

This CIP addresses the middle portion of this storm drain system that is subject to the 50-year design storm event. The flooding occurs at manhole 3253-F-034 at the southwest corner of the intersection of NE Burnside Road and NW Fairview Drive and in the existing K-mart parking lot just west of NW Eastman Parkway at manholes 3252-F-026 and 3252-F-025. This is a model identified flooding problem and City staff do not recall receiving many flooding complaints in this area.

Project Description

This project includes replacing 1,090 LF of existing 48" diameter pipe from manhole 3253-F-034 to manhole 3252-F-9026 with 72" diameter pipe.

The project includes installation of three manholes along the right-hand eastbound lane of NE Burnside Road and one manhole at NW Eastman Parkway to meet the minimum 500 ft. spacing.

Design Considerations

- Preliminary calculations were performed to identify conceptual pipe sizing. Design should be conducted to verify pipe capacity needs and pipe alignment.
- Location and coordination with other utilities should be conducted prior to construction.
- Downstream pipe replacement projects including FC-3a and noted private development projects should be completed prior to implementation of this project.
- According to the City's 2035 Transportation System Plan future project #31 is planned along NE Burnside Rd. in this area. This project is listed on the 20-year street corridor project list. When this project is constructed, consider using permeable pavement to provide a water quality benefit.

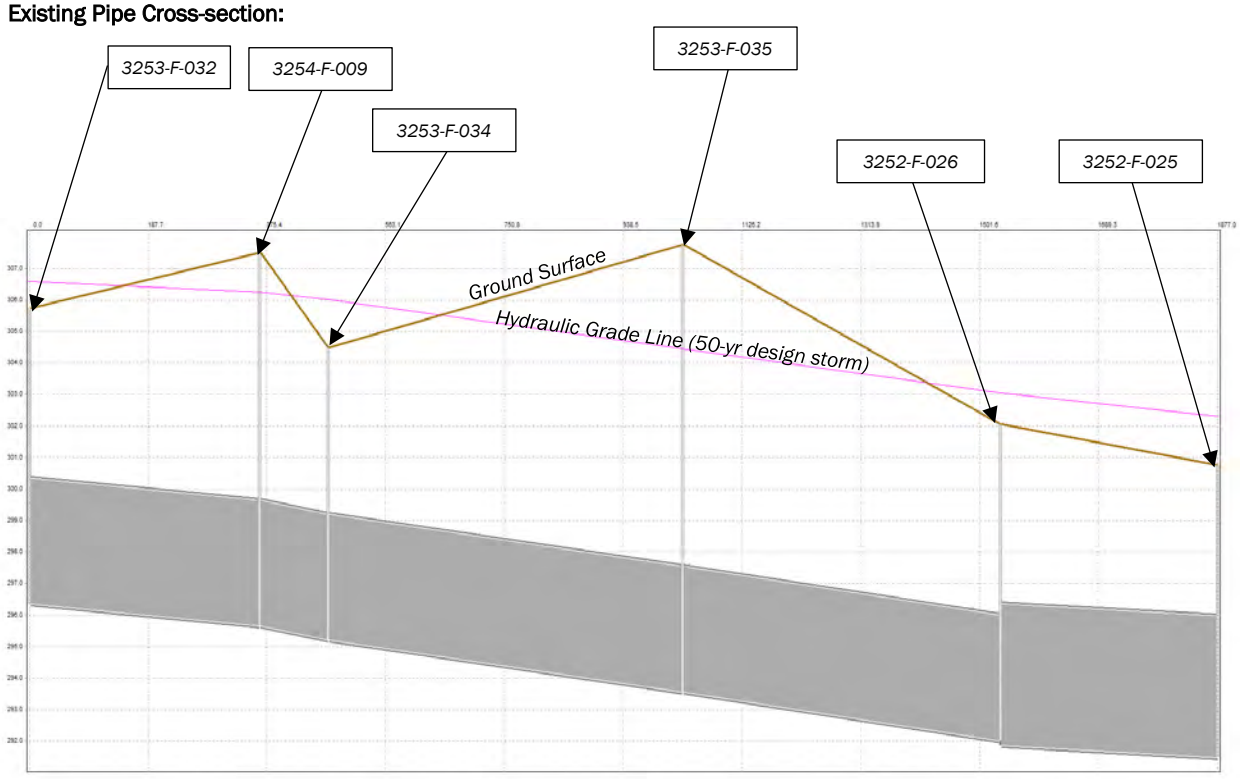
Planning-level Cost Estimate

Construction	$1,818,000
Site Acquisition	$0
Contingency (30%)	$545,400
Capital Expense Total (including contingency)	$2,363,000
Design/Construction Administration (30%)	$708,900
Permitting (5%)	$118,150
Administration (14%)	$330,820
Capital Project Implementation Cost Total*	**$3,521,000**

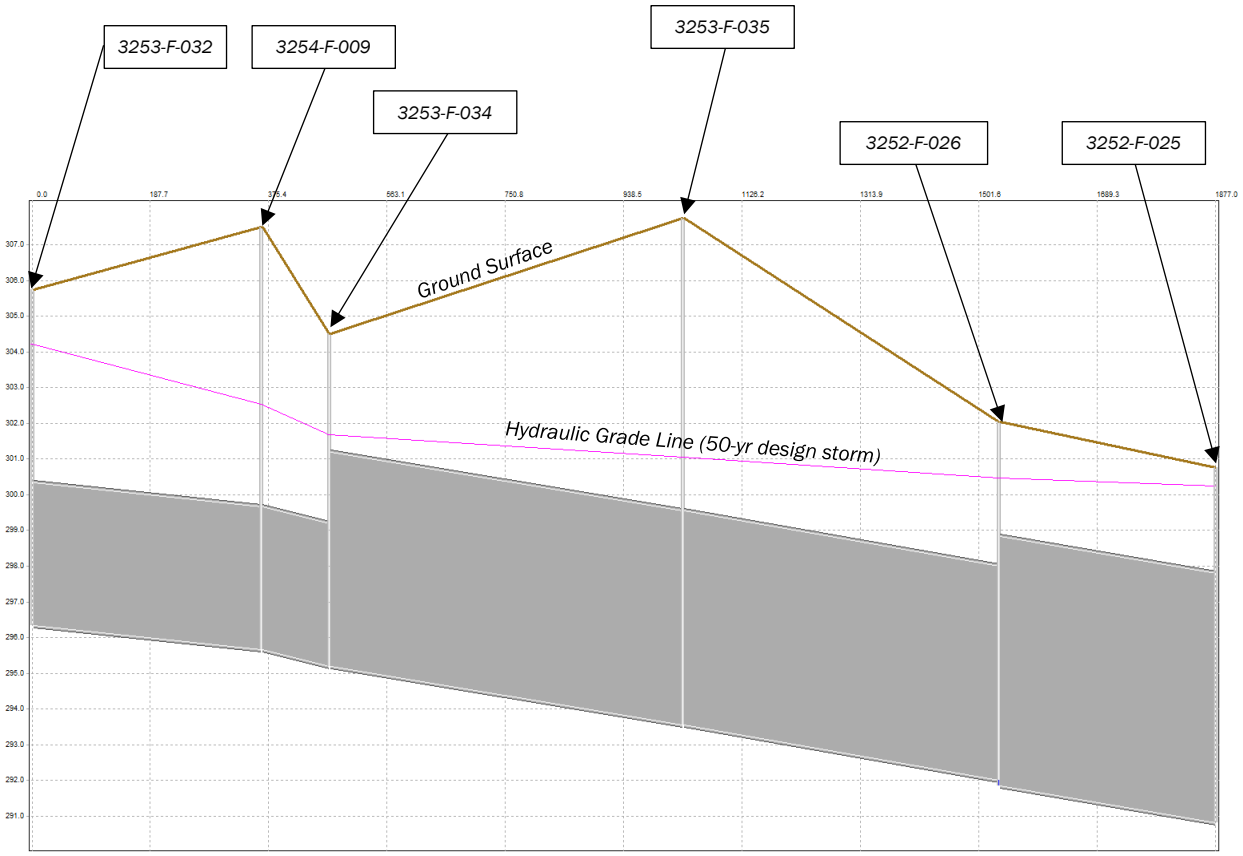
**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

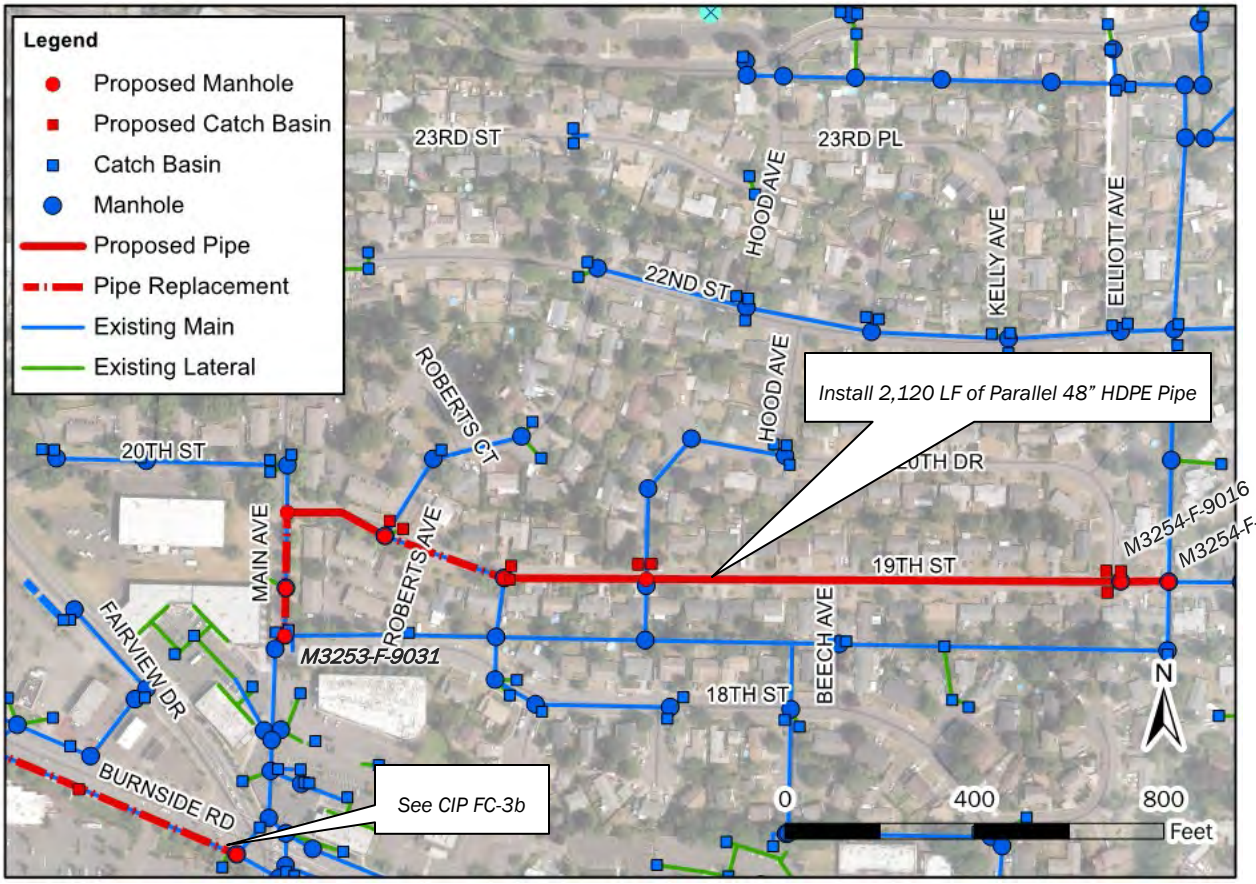
Additional Project Information

Existing Pipe Cross-section:



Proposed Pipe Cross-section (when combined with downstream improvements)





Project Identifier	**CIP: FC-3c-C**
Detailed Location	NE 19th from N Main to NE 20th Structures
Model File	CIP07
Objective(s) Addressed	Flooding

Project Background

FC-3 covers a large segment of the City's storm drain system from Red Sunset Park down to the Birdsdale Water Quality Facility. One challenge with addressing capacity limitations in this area is that many of the pipes shown to be at or over capacity in the model are located through private property and have low burial depths.

This CIP addresses the uppermost portion of this storm drain system that is subject to the 50-year design storm event. The flooding addressed by this CIP occurs in backyards between N Main Avenue to just past NE 20th Drive and also near NW 22nd Street. The most significant flooding occurs in the model where the storm drain crosses NE Beech Ave.

City staff do not recall receiving many flooding complaints in this area. An alternative to alleviate capacity constraints could include volume reduction through widespread UIC installation upstream of manhole M3154-F-9041. A non-capital alternative could also include monitoring water surface elevation in this pipeline to verify modeled water surface elevations.

Project Description

The existing 48" pipe will remain in place and a 48" parallel pipe will be installed from Manhole 3254-F-009 on NE 19th Street for 1,900 feet to the intersection of NE Main Ave and NE 19th Street. Install a new manhole at this location at the existing 18" main M1479. Replace 220 feet of existing 18" pipe with 48" to manhole M3253-F-9031 at the intersection of N Main Avenue and NE 18th Street.

The project includes installation of four manholes along NE 19th Street, two to meet the minimum 500 foot spacing requirement, one to collect local drainage from NE Hood Ct and one to collect local drainage from NE Roberts Avenue.

The project also includes installation of a new manhole at N Main Ave and NE 19th Street and a new manhole at the intersection of N Main Avenue and NE 18th Street.

Design Considerations

- Preliminary calculations were performed to identify conceptual pipe sizing. Design should be conducted to verify pipe capacity needs and pipe alignment.
- Location and coordination with other utilities should be conducted prior to construction.
- Downstream pipe replacement projects including FC-3a-C, FC-3b-C, FC-3f-C and FC3g-C should be completed prior to implementation of this project.
- According to the City of Gresham's 2035 Transportation System Plan there are no future projects indicated along this alignment.

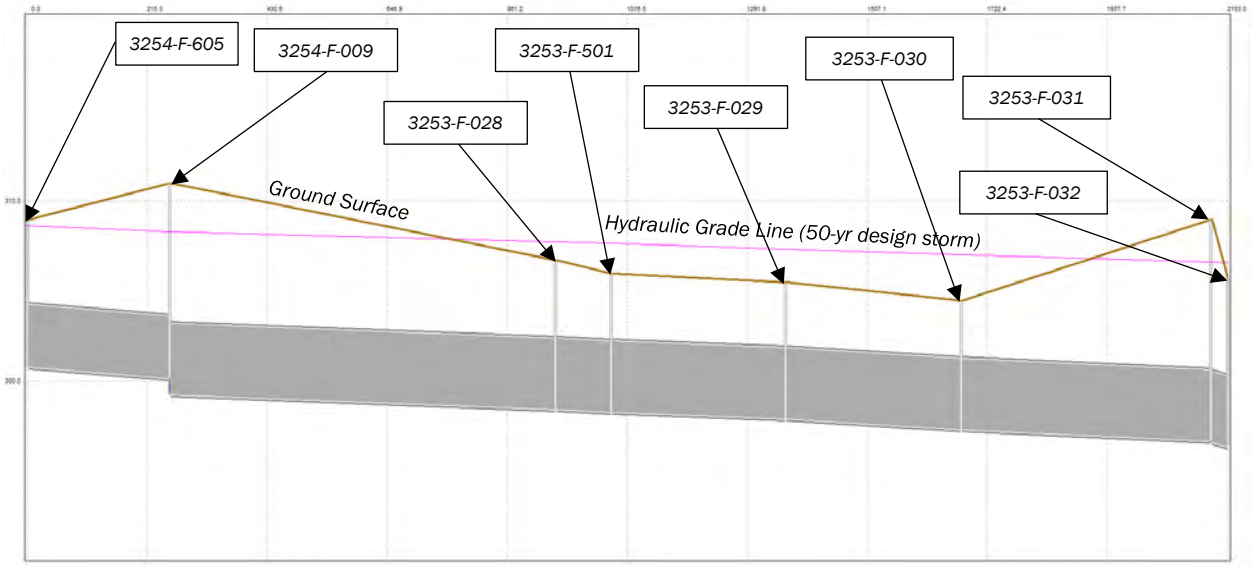
Planning-level Cost Estimate	
Construction	$1,134,000
Site Acquisition	$0
Contingency (30%)	$340,200
Capital Expense Total (including contingency)	$1,474,000
Design/Construction Administration (30%)	$442,200
Permitting (5%)	$73,700
Administration (14%)	$206,360
Capital Project Implementation Cost Total*	**$2,196,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

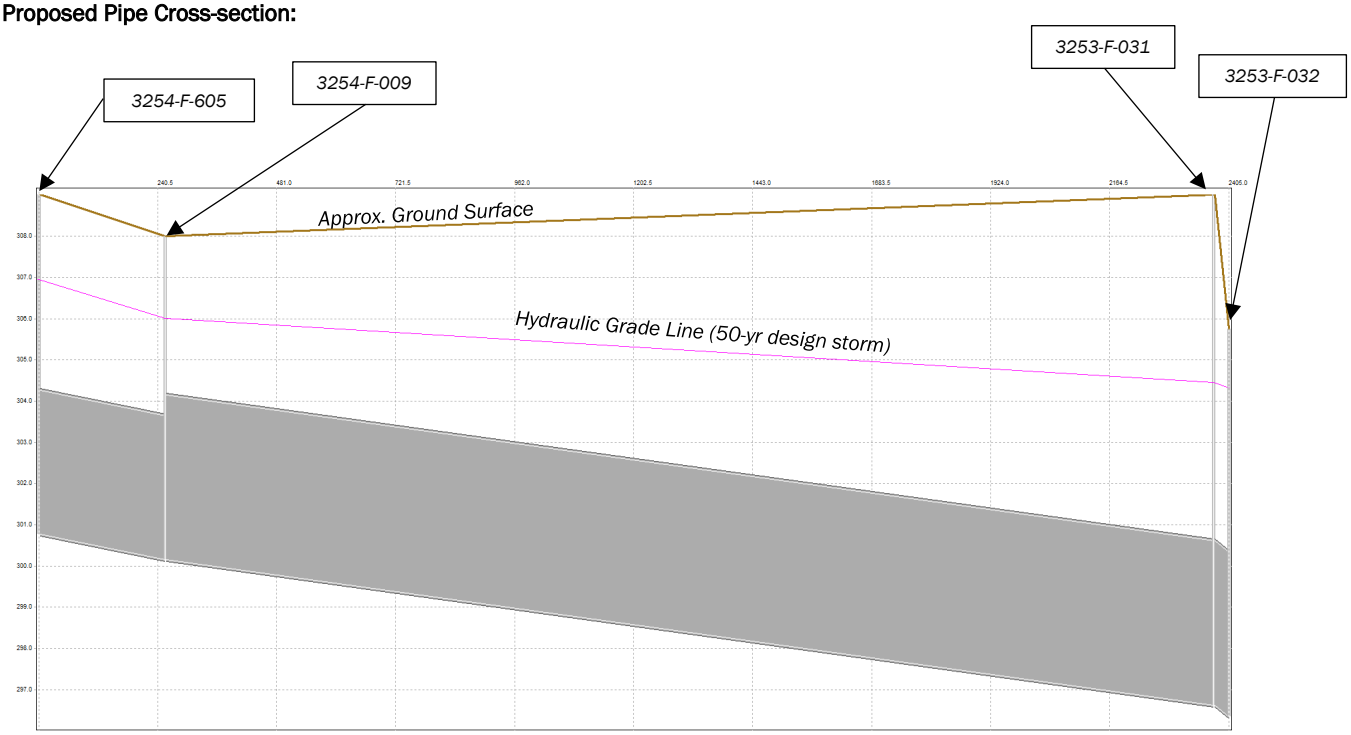
Additional Project Information

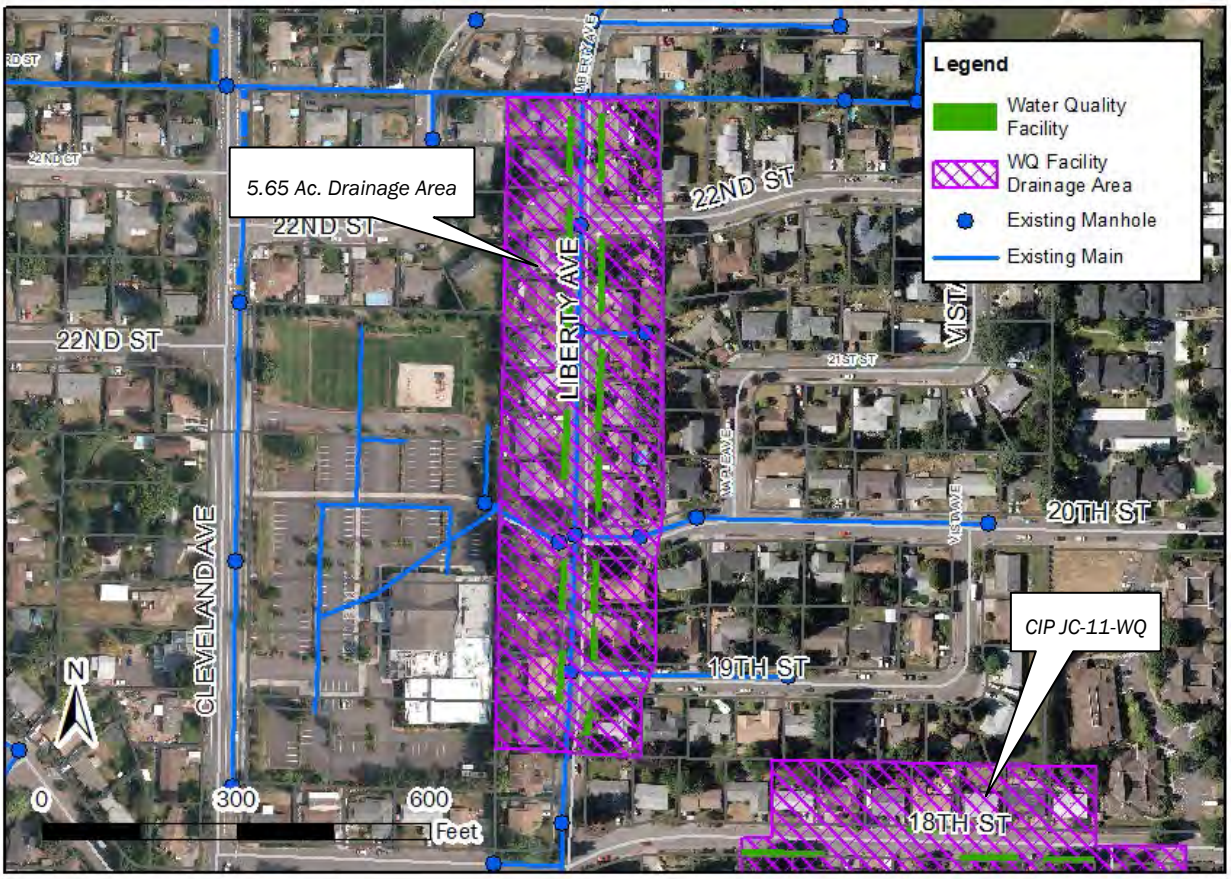
No road improvements were identified within the alignment of this project in the City's Transportation System Plan.

Existing Pipe Cross-section:



Proposed Pipe Cross-section:





Project Identifier	CIP: FC-3e-WQ
Detailed Location	Liberty Avenue, 19th to 23rd Street
Model File	NA
Objective(s) Addressed	Water Quality

Project Background

The model predicts flooding along the 18" storm drain in Liberty Avenue between 19th Street and 23rd Street. Given localized nature of flooding and flooding in the 42" main that this system flows to, a combined water quality and volume reduction strategy is proposed. This area currently does not receive any treatment or volume reduction.

Project Description

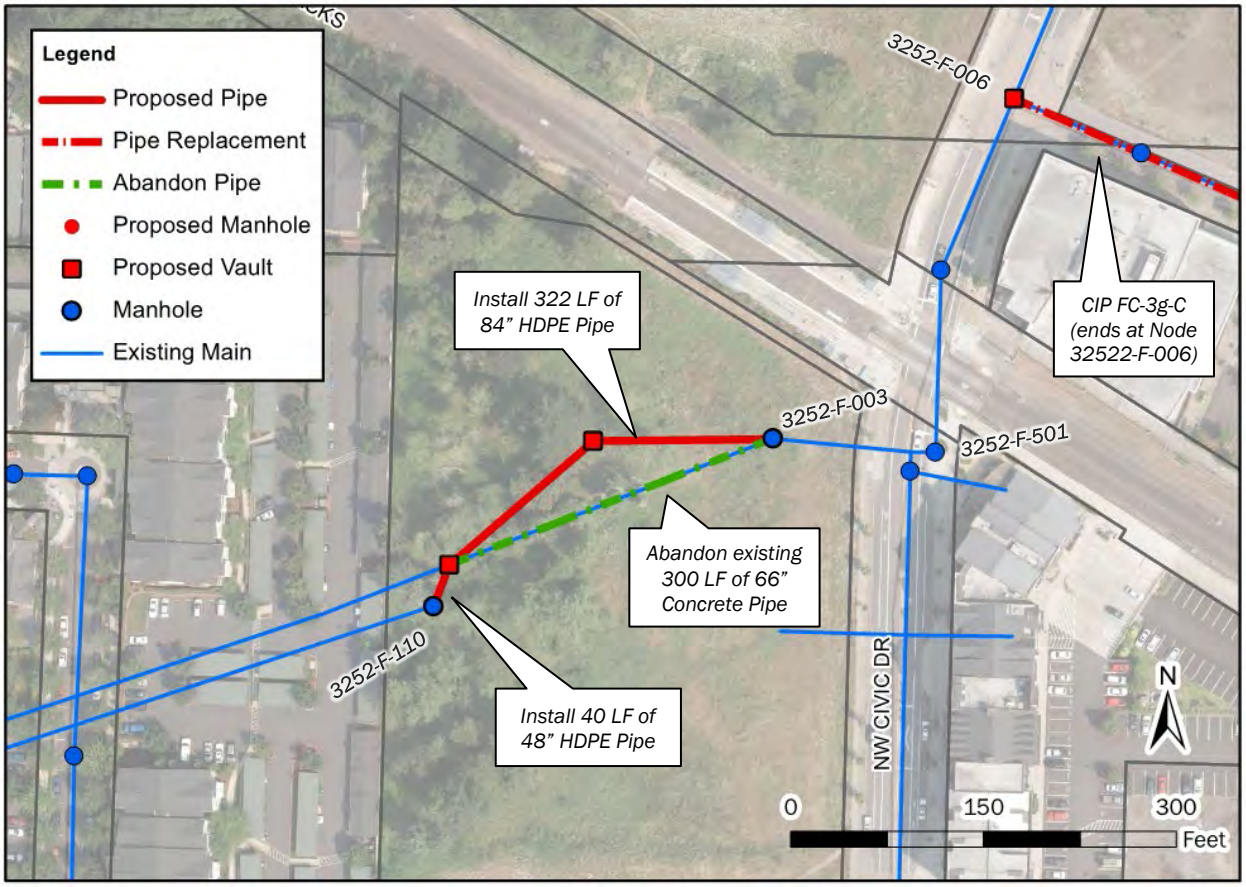
The proposed project provides 4,000 SF of stormwater water quality facilities along Liberty Avenue from 19th Street to 23rd Street within existing grassed planter strips between the existing sidewalk and curb. The existing planter strips are approximately 4 ft. wide and there is 500 LF of available space on each side of the street once existing driveways are accounted for. This project opportunistically utilizes available space.

Design Considerations

- Stormwater planters were designed opportunistically based on available space. 4,000 SF of stormwater planters in this area would treat approximately 1.84 acres of impervious surface in accordance with the Simple Method for water quality outlined in the Stormwater Management Manual. This simple method sizes stormwater planters based on a 5% sizing factor on the impervious area managed by each facility. This design treats 65 percent of the impervious surface within the water quality drainage area footprint shown in the figure above.
- Construction of this water quality project would provide a flow reduction benefit for downstream capacity deficiency FC-3.
- No street restoration projects are planned in this area according to the City of Gresham's 2035 Transportation System Plan.

Planning-level Cost Estimate	
Construction	$261,000
Site Acquisition	$0
Contingency (30%)	$78,300
Capital Expense Total (including contingency)	$339,000
Design/Construction Administration (30%)	$101,700
Permitting (5%)	$16,950
Administration (14%)	$47,460
Capital Project Implementation Cost Total*	**$505,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*



Project Identifier	**CIP: FC-3f-C**
Detailed Location	Vacant property west of NW Civic Dr. Structures 3252-F-003 to 3252-F-110
Model File	CIP07
Objective(s) Addressed	Flooding

Project Background

FC-3 covers a large segment of the City's storm drain system from Red Sunset Park down to the Birdsdale Water Quality Facility. One challenge with addressing capacity limitations in this area is that many of the pipes shown to be at or over capacity in the model are located on private property and have low burial depths.

This CIP addresses the lower portion of this storm drain system that is subject to the 50-year design storm event. This project is within close proximity of two other Fairview Creek CIPs; downstream is FC-3a-C (Wallula Avenue) and upstream is FC-3b-C (NE Burnside Road). The combination of these projects helps to alleviate upstream flooding by increasing peak flow capacity.

Project Description

This project includes the installation of 322 LF of 84" HDPE pipe to bypass a portion of an existing 66" concrete pipe that crosses a currently vacant property. The 300 LF of existing 66" pipe will be abandoned, and the current public drainage easement is to be vacated. On the downstream connection of the proposed 84" HDPE pipe, a vault structure will be installed to connect to the parallel 48" pipes that continue to the southwest. The vault structure will tie directly into the northern 48" pipe and tie into the southern 48" pipe via 40 LF of new 48" HDPE pipe.

Design Considerations

- The ground elevation of manhole 3252-F-003 should be lowered no further than 298 feet to prevent flooding during the 50-yr design storm. Due to the 2003 project to raise the Birdsdale Water Quality Facility high flow weir at 270 ft. it is difficult to lower the water surface elevation in the storm conveyance system downstream of this manhole. It is assumed that this project was completed to reduce flooding downstream in Fairview Creek, as the weir was set at the 100-yr water surface elevation per HDR design drawings provided by the City.
- Preliminary calculations were performed to identify conceptual pipe sizing. Design should be conducted to verify pipe capacity needs and pipe alignment.
- Field verification of the overflow channel alignment should be conducted during preliminary design.
- Location and coordination with other utilities should be conducted prior to construction.

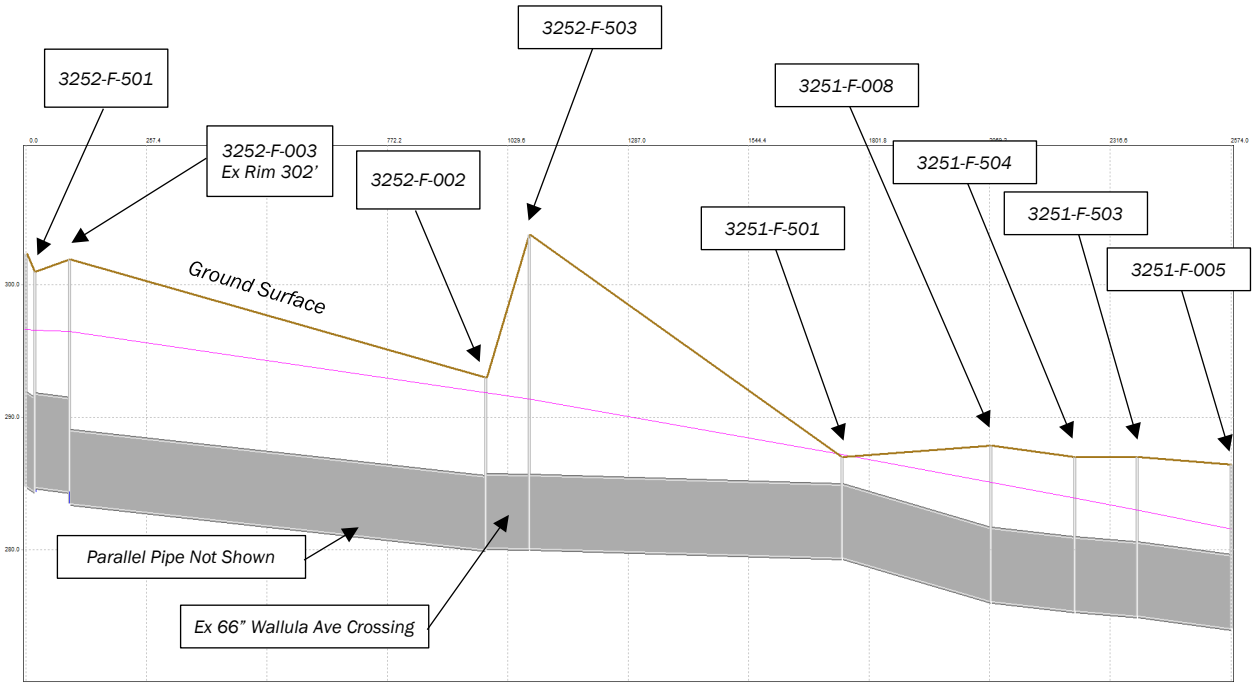
Planning-level Cost Estimate

Construction	$528,000
Site Acquisition	$0
Contingency (30%)	$158,400
Capital Expense Total (including contingency)	$686,000
Design/Construction Administration (30%)	$205,800
Permitting (5%)	$34,300
Administration (14%)	$96,040
Capital Project Implementation Cost Total*	**$1,022,000**

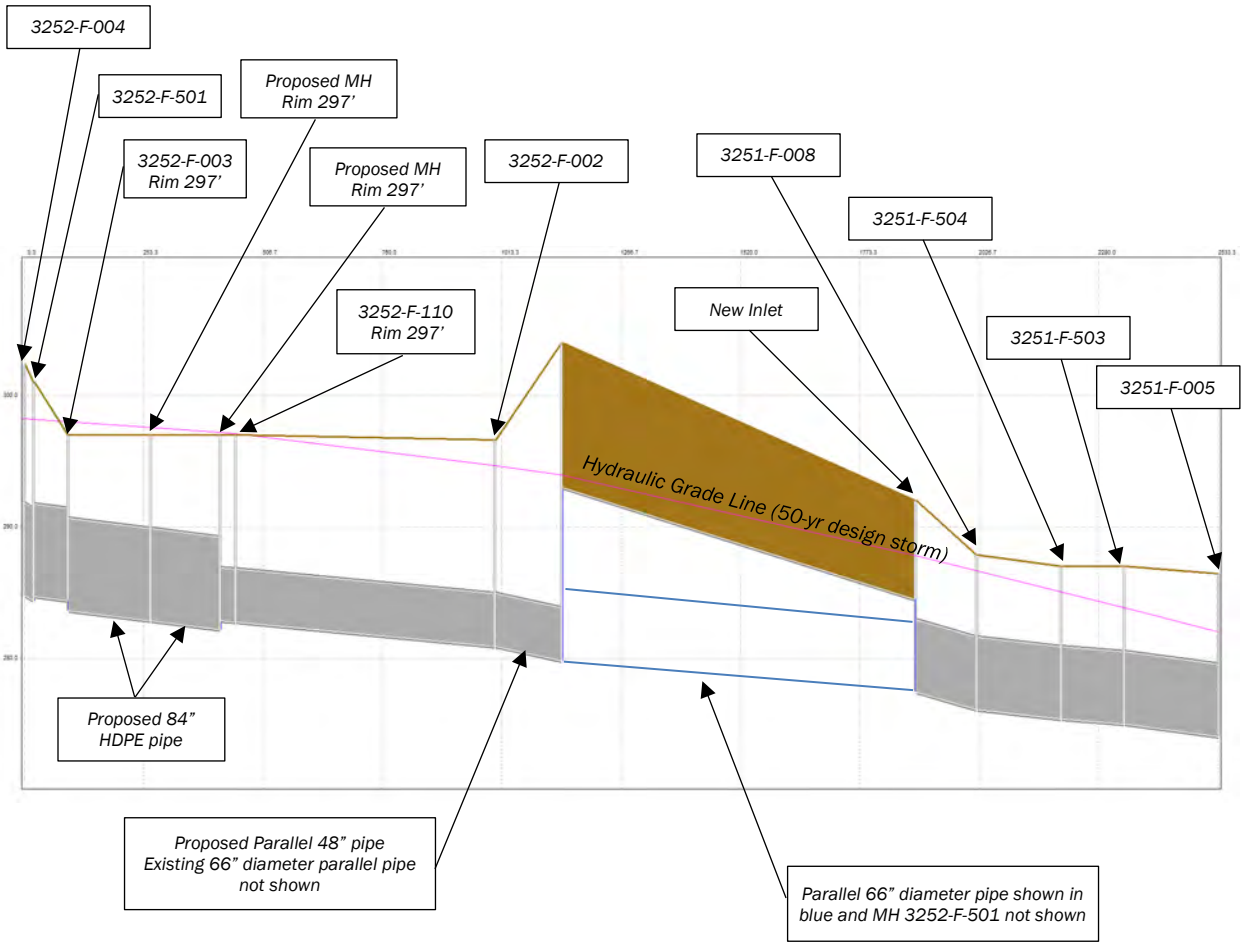
**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

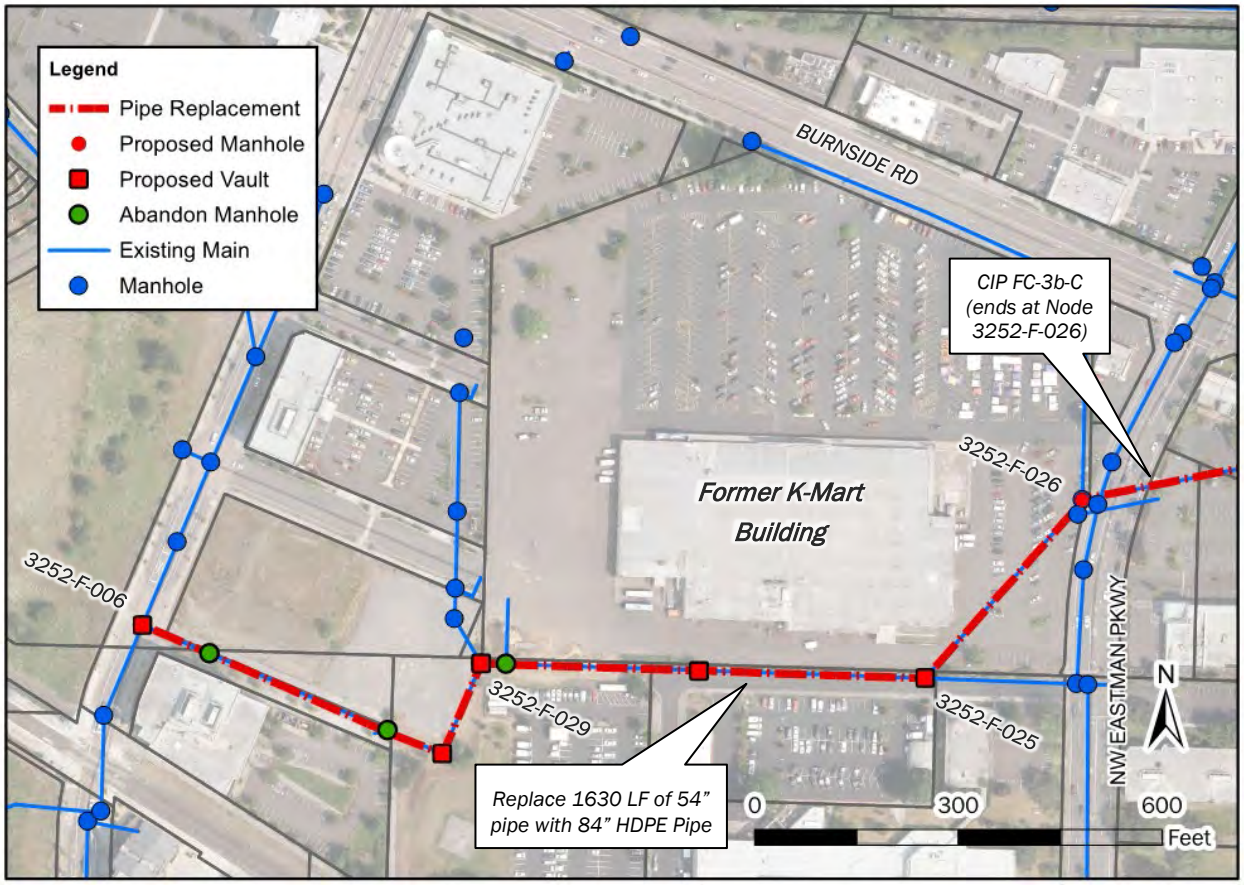
Additional Project Information

Existing Pipe Cross-section:



Proposed Pipe Cross-section (when combined with Civic Dr Private Development, K-mart redevelopment, FC-3f, and FC-3g)





Project Identifier	**CIP: FC-3g-C**
Detailed Location	Former K-Mart property at intersection of NW Eastman Pkwy. and Burnside Rd. Structures 3252-F-026 to 3252-F-006
Model File	CIP07
Objective(s) Addressed	Flooding

Project Background

FC-3 covers a large segment of the City's storm drain system from Red Sunset Park down to the Birdsdale Water Quality Facility. One challenge with addressing capacity limitations in this area is that many of the pipes shown to be at or over capacity in the model are located through private property and have low burial depths.

This CIP addresses the middle portion of this storm drain system that is subject to the 50-year design storm event. The existing 54" piping from manhole 3252-F-026 to 3252-F-006 is undersized with predicted surcharging and flooding during the 50-year storm event. While the model indicates this area as a flooding problem, City staff do not recall receiving flooding complaints for this area.

Project Description

This project includes replacing 1,630 LF of existing 54" diameter pipe from manhole 3253-F-026 to manhole 3252-F-006 with 84" diameter pipe. Replacement and upsizing of this existing pipe helps to reduce predicted surface flooding, although surcharging for this alignment is still predicted for the 50-year event.

The project includes installation of five manhole vaults along the alignment to accommodate the increased pipe size.

Design Considerations

- Preliminary calculations were performed to identify conceptual pipe sizing. Design should be conducted to verify pipe capacity needs and pipe alignment.
- Location and coordination with other utilities should be conducted prior to construction.
- Downstream pipe replacement projects including should be completed prior to implementation of this project.

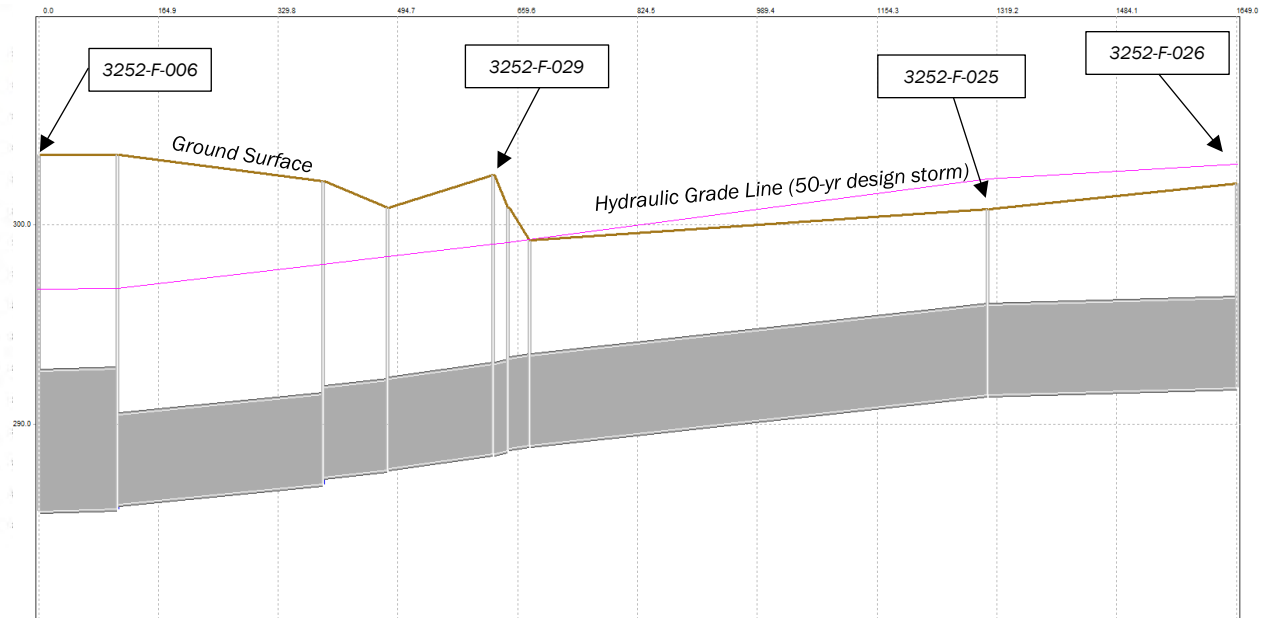
Planning-level Cost Estimate

Construction	$2,490,000
Site Acquisition	$0
Contingency (30%)	$747,000
Capital Expense Total (including contingency)	$3,237,000
Design/Construction Administration (30%)	$971,100
Permitting (5%)	$161,850
Administration (14%)	$453,180
Capital Project Implementation Cost Total*	**$4,823,000**

**Planning level cost estimates estimated in 2019 dollars, rounded to the nearest thousand.*

Additional Project Information

Existing Pipe Cross-section:



Proposed Pipe Cross-section (when combined with downstream improvements)