



ENGINEERING

Monthly Report

March 2016

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FROM THE DIRECTOR

It is a great honor, and I am pleased to report, that the City of Bend received three nominations for the Oregon Concrete and Aggregate Producers Association Excellence in Concrete Awards. The Bridge Creek Surface Water Project, Reed Market Project and Murphy Crossing (ODOT) Project were each recognized for extensive or innovative use of concrete and overall project excellence.

Over 70 projects from all over the state of Oregon were submitted and judged for best-of-category from a wide range of classifications ranging from bridges and residential to transportation, paving and public facilities. Projects were rigorously judged in 17 different categories and three finalists were chosen in each category. It is highly unusual for one organization to have multiple projects competing for the award, so it is even more exciting that the City of Bend has two finalists.

The Bridge Creek Surface Water Improvement Project is a contender in the Utility category and the Reed Market Project in the Paving category. The Excellence In Concrete awards are well known and carry a great deal of prestige throughout the industry. Winners will be announced at the awards banquet April 22, 2016 in Salem and recognized in the Portland *Daily Journal of Commerce*. Look for an update in the next month’s report.

The Southeast Interceptor Project was acknowledged in the National Association of Trenchless Technologies (NASTT) *Pacific Northwest Trenchless Review*. Please see the article in the Executive Summary.

Tom Hickmann PE
EIPD Director
541 317-3029

Financial Impact Review: Review by Finance Director, Sharon Wojda, determined no significant change to previously published financial information at this time. Future budget adjustments may be needed for projects with significant changes in scope and schedule, but estimates are unknown at this time.

Operational Impact Review: Review by Utility Director, Paul Rheault, determined operational impacts are in line with achieving greater efficiency in our systems.

Executive Summary

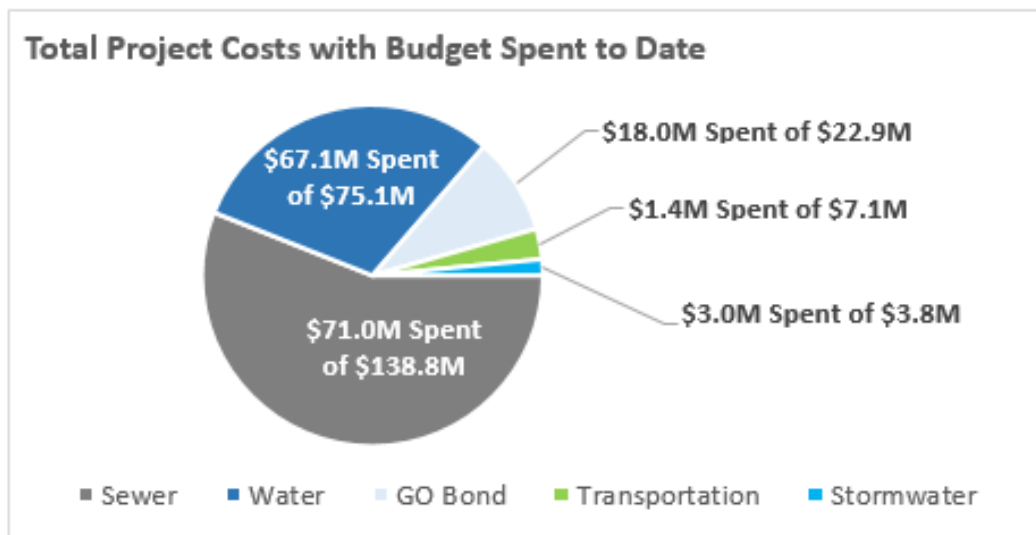
CIP Numbers Snapshot

- **1 Initiated** Riverhouse Lift Station Hydraulic Upgrade

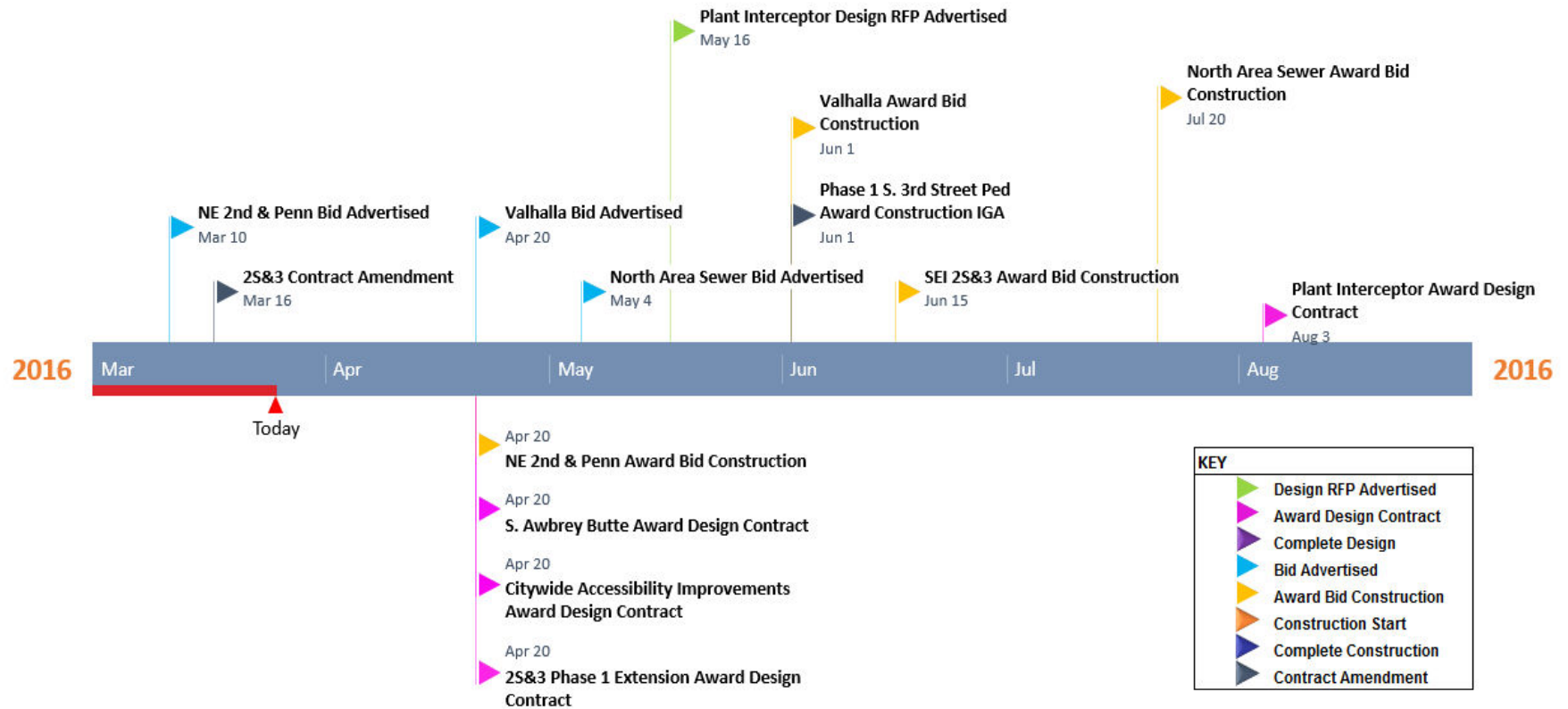
The table below shows the status of projects in the current CIP Plan as of February 29, 2016.

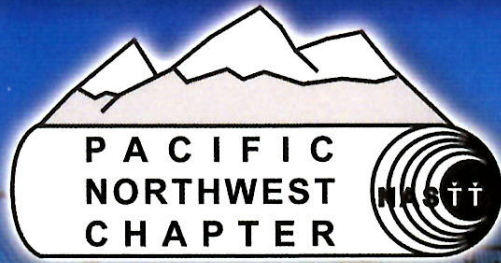
Status	CIP	R&R
Open (Active): In planning, design or construction phase	22	1
Substantially Complete (Active): Asset transferred to Operations and City has beneficial use	5	0
Closed (Not Active): Completed 1-2 yr. warranty; Cancelled; Transferred project to Ops	8	3
Pending (Not Active): Scheduled to start within 5-Year CIP Plan	26	41
Total	61	45

The graph below shows the total value of the active projects in the 5-year CIP Plan and total budgets spent to date. Repair and Replacement projects are not included.



EIPD Procurement Timeline





Pacific Northwest Trenchless Review

2016

Remote- Controlled Boring in Bend, Oregon

Also Inside:

- A Trio of Trenchless Crossings
- Sliplining at Challenging Sites
- NASTT's 2016 No-Dig Show!



New Trenchless Boring Method Successful in Oregon Crossing

In Bend, Oregon, local contractor Stadel Boring & Tunneling had a unique set of circumstances for a new gravity sewer interceptor designed by engineer CH2M. Stadel had a contract with general contractor Taylor NW to furnish and install 323 feet of 36-inch steel casing under live railroad tracks. Line and grade were crucial on the project, and the rocky conditions limited their trenchless boring options.

Diana Worthen
CH2M

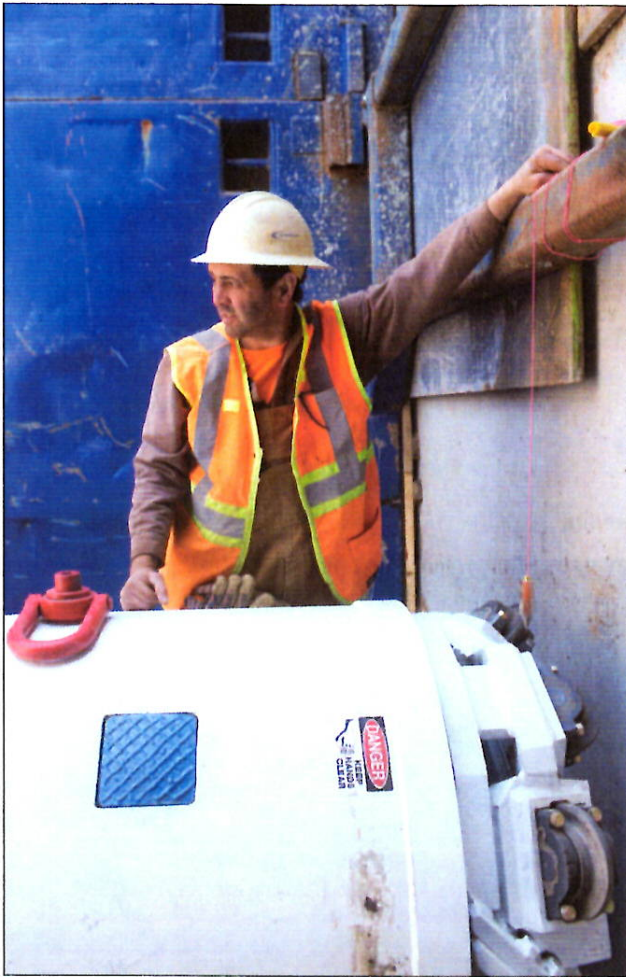
Desiree Willis
The Robbins Company

Larry Stadel
Stadel Boring & Tunneling

The job required a tunneling system that could handle hard, blocky, abrasive rock, and with a high precision for line and grade, at a small diameter range. This paper discusses the design and successful completion



The Robbins 36-inch-diameter SBU-RC was launched at a jobsite in Bend, Oregon, for contractor Stadel Boring & Tunneling in April 2015.



The Stadeli crew lines up the SBU-RC in the launch pit to bore a 323-foot-long crossing for a new gravity sewer interceptor.

of this tunnel using an advanced prototype machine to meet these specific requirements.

PROJECT BACKGROUND

With its nearby access to mountains, rivers, and pine forests, central Oregon is attracting more residents by the year, and the City of Bend needed to expand its infrastructure to accommodate the growing demand. The City is constructing a new gravity sewer pipeline that will provide service to rapidly developing areas east and southeast of the city's core area.

The pipeline, named the Bend Southeast Interceptor, ranges in diameter from 24 inches to 30 inches and extends about six miles along the eastern edge of the city from the existing plant interceptor in northeast Bend. The alignment includes a 323-foot-long, 36-inch-diameter trenchless crossing of the Burlington Northern Santa Fe (BNSF) railroad in southeast Bend.

The pipeline crosses the railroad tracks at a location where the ground surface adjacent to the railroad transitions from a cut in a

surface projection of basalt rock, which is roughly 10 feet high on the west side of the tracks, to a relatively flat open area that is undeveloped on the east side of the tracks.

GROUND CONDITIONS

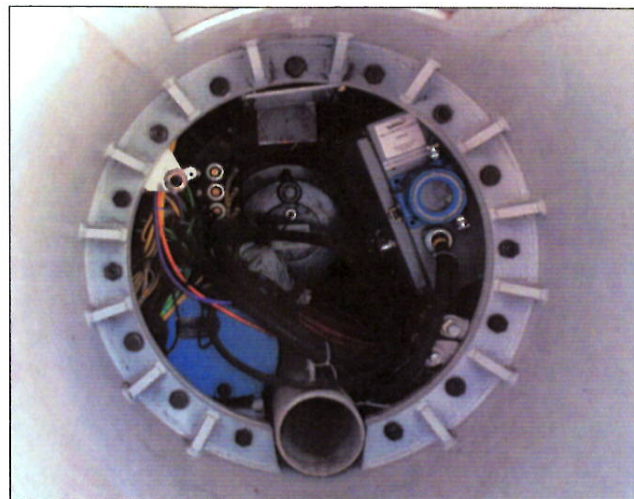
During the geotechnical investigation, two exploratory borings were drilled near the crossing alignment, one on either side of the BNSF tracks. Rock was encountered in both borings at 2.5 to four feet below the ground surface, and both borings were completed using rock coring techniques to depths approximately 10 feet below the tunnel alignment. No groundwater was encountered in this investigation. Based on observations from nearby past projects, groundwater in the region is approximately 200 to 400 feet deep, well below the tunnel alignment.

The rock encountered in the borings was hard, gray vesicular basalt with significant void space. The unconfined compressive strength (UCS) of the basalt within the tunnel alignment typically ranged from 3,000 to 5,000 psi; however, it was baselined up to 15,000 psi because of the variability of this rock and the results of UCS tests on rock encountered in nearby borings.

The RQD of the rock encountered within the tunnel horizon was baselined between 70 and 100 percent, and the rock was considered blocky. The abrasivity index of the rock was baselined at 4.0, indicating hard rock abrasiveness. The rock's high strength, high abrasivity, and blocky, void-filled nature were significant features to consider for the design and construction of this tunnel.

DESIGN CONSIDERATIONS

The 24-inch pipeline crossing of the BNSF tracks was cased using a 36-inch Permalok steel casing pipe to support the tunnel,



The compact SBU-RC operates using an in-shield drive motor for torque. View shows the inside of the SBU-RC with drive motor.

meet BNSF requirements, and facilitate installation.

In the absence of groundwater, CH2M required auger boring for the crossing. However, the UCS of the basalt bedrock was considered by machine manufacturers to be too great for excavation by traditional auger boring using conventional rock heads, such as a "Christmas tree" head. Given the gravity nature of the carrier pipe, the control of line and grade was critical for this crossing. The use of a standard small boring unit (SBU-A) or steerable, motorized small boring unit (SBU-M) with disc cutters was required to maintain the design line and grade.

Tunneling contractor Stadeli Boring and Tunneling teamed with The Robbins Company to determine the best machine for the rock conditions and line-and-grade requirements. They felt a typical SBUA or SBUM lacked the precision guidance system needed for dependable results. They selected a Robbins 36-inch prototype machine known as the SBU-RC (for "remote-controlled small boring unit") which had been tested on one job previously in Oman.

The SBU-RC is controlled from an operator's station at the ground surface. It is equipped with a smart guidance system, by TACS, and using pinpoint software the guidance system shows the operator projections of the future bore path so steering corrections can be made in real time to stay on line and grade. An inshield drive motor provides torque to the cutterhead, while a pipejacking frame or standard auger boring machine provides thrust and installs 20-foot sections of steel casing pipe behind the SBURC.

Much like other small boring units, the new machine uses a mixed ground cutterhead fitted with 6.5-inch disc cutters to efficiently chip rock from the excavation face in the same mechanism used by larger TBMs. And while the SBURC method is



Spoils are removed from behind the SBU-RC cutterhead directly to the surface using a vacuum truck.

similar to microtunnel boring machines (MTBM) in many ways, it differs significantly in its spoil removal system. MTBMs require a slurry to pump the spoils back to the surface, and the slurry must be cleaned and treated at a spoils plant, which can be time-consuming, messy, and expensive. In this case, the significant void space and fractures in the rock would have made it difficult to maintain slurry circulation with an MTBM. The SBURC used a vacuum system for muck removal, connecting a vacuum truck to a six-inch suction line, which pulled material to the surface from behind the cutterhead. The launch pit remains clean and dry as the spoils are contained in the vacuum truck.

TUNNEL CONSTRUCTION

Robbins delivered the SBU-RC to the Bend site on April 14, 2015, and Stadeli crews lowered it into a 26-foot-deep launch pit. In the beginning stages of tunnel construction, some modifications were made to the system. In the first few feet of tunneling, the crew quickly identified that rock particles larger than four inches could not pass through the vacuum line, and the machine was retracted for modifications to the cutterhead, including grill bars, to restrict the size of the spoils allowed to enter the vacuum system.

As tunneling progressed, the capability of the 4,000-cfm vacuum truck to clear spoils from the line slowly dwindled, until finally at about 100 feet of advancement it was no longer effective and the rock spoils clogged the vacuum line. This truck was replaced with a 6,000-cfm vacuum truck, increasing the suction by 50 percent. After crews replaced the clogged lines, this truck was suitable for the remainder of the 323-foot tunnel. Additionally, the new truck had a larger tank capacity, allowing the installation of



The Robbins SBU-RC broke through two weeks ahead of schedule on May 5, 2015. The blocky basalt subsurface conditions are seen here at the exit pit.

an entire 20-foot casing before the tank had to be emptied, eliminating the need to disconnect the truck and stop production between the placement of casing pipes.

While the cutterhead performed well in the highly abrasive rock, the vacuum line required replacement and repair in several locations, especially at curves in the line. Reducing curves in the line and using abrasiveresistant vacuum pipe materials were important modifications for success.

The machine bored through basalt rock full of fissures, fractures, and rubble pockets between 5,000 and 7,000 psi UCS. While the start-up presented challenges, crews soon achieved rates of 20 feet per day after the modifications to the cutterhead and vacuum system. As the crew became accustomed to the machine, advance rates increased to 40 feet per

day, with a record day of 50 feet of advancement. The crew holed through on line and grade two weeks ahead of schedule.

The early tunnel completion delighted the City of Bend and all those involved, as the two weeks saved resulted in cost savings for all parties.

With the SBU-RC success in Oregon, Robbins will now lease the machine for other applicable projects and expand their offerings. The modifications required in Bend will be incorporated on all future models, including cutterhead grill bars, and the requirement for larger vacuum trucks will be communicated to contractors. This project success demonstrated the SBU-RC is the ideal equipment for contractors looking to bore long crossings at small diameter in hard rock or mixed ground, while maintaining strict line and grade control.

City of Bend 2016 - 2020 Capital Improvement Program Project List

Project Name & Number	Project Start	Estimated Substantial Completion	Project Stage	Cost Estimate Classification	Total Project Budgeted	Total Project Spent to Date	2015-16 Adopted Budget	2016-17 Adopted Budget	2017-18 Proposed Budget	2018-19 Proposed Budget	2019-20 Proposed Budget	Current 5-Year CIP Planned Budgets	Budget Revisions	Percent Budget Spent
ADA Construction														
AA11FA South 3rd Street Pedestrian Improvements	2011	3/31/17	Design	3	435,309	157,953	355,000	-	-	-	-	355,000		36%
AA14DA Summit Drive Curb Ramps	2015	10/9/15	Sub.Complete	1	910,000	900,320	393,000	-	-	-	-	393,000	1	99%
AA16AA Citywide Accessibility Projects	2016	2017	Pending	5	350,000	-	100,000	250,000	-	-	-	350,000	4	0%
Total ADA Construction Projects					1,695,309	1,058,273	848,000	250,000	-	-	-	1,098,000		
BURA - Murphy Crossing Construction														
ST15MA Murphy & Parrell Roundabout	2015	7/29/16	Construction	1	1,800,038	78,644	1,755,022	-	-	-	-	1,755,022	2	4%
Total BURA Projects					1,800,038	78,644	1,755,022	-	-	-	-	1,755,022		
Transportation Construction														
ST11GA Galveston Corridor Improvements	2011	2017	Design	5	626,099	231,188	250,000	50,000	-	-	-	300,000		37%
ST14CA Sidewalk Design and Projects	2014	2018	Pending	5	1,396,097	32,306	350,000	970,000	20,000	-	-	1,340,000		2%
ST14DA Neff and Purcell Sidewalks	2016	2017	Pending	5	800,000	-	300,000	500,000	-	-	-	800,000		0%
ST14EA Citywide Safety Improvements	2016	9/30/18	Design	5	3,344,000	59,454	360,000	-	-	-	-	360,000		2%
ST15NA Phase 2 South 3rd Street Striping	2016	6/30/16	Design	5	30,000	-	30,000	-	-	-	-	30,000		0%
Total Transportation Projects					6,196,196	322,947	1,290,000	1,520,000	20,000	-	-	2,830,000		
GO Bond														
ST12CB Empire/18th Roundabout	2012	10/15/15	Complete	1	2,647,809	2,645,834	10,200	-	-	-	-	10,200		100%
ST12CC Simpson/Mt. Washington Roundabout	2012	10/15/15	Complete	1	2,181,647	2,181,659	20,000	-	-	-	-	20,000		100%
ST12CD Powers/Brookwood Roundabout	2012	10/15/15	Complete	1	2,147,600	2,147,703	1,000	-	-	-	-	1,000		100%
ST12CE Reed Mkt: Newberry to 27th	2012	10/15/15	Sub.Complete	1	4,841,330	4,820,763	20,000	-	-	-	-	20,000		100%
ST12CJ Reed Mkt: 3rd to Newberry	2012	11/13/15	Sub.Complete	1	14,145,450	13,123,540	4,234,610	-	-	-	-	4,234,610		93%
ST12CH 27th Street Reconstruction	2017	2017	Pending	5	1,049,300	-	-	1,049,300	-	-	-	1,049,300		0%
ST12CK 14th St. Reconstruction	2016	2017	Design	5	3,888,950	6,280	2,732,050	1,149,300	-	-	-	3,881,350		0.16%
Total GO Bond Projects					30,902,086	24,925,780	7,017,860	2,198,600	-	-	-	9,216,460		
Water														
WA0902 Bridge Creek Intake and Pipeline	2008	6/30/16	Construction	1	73,954,698	67,073,284	17,713,500	-	-	-	-	17,713,500	3	91%
WA12AA 18th Street Waterline Extension (JR)	2012	4/30/16	Pending	2	485,063	25,063	460,000	-	-	-	-	460,000		5%
WA15BA Water SDC Methodology Study	2016	6/30/16	Pending	N/A	60,000	578	60,000	-	-	-	-	60,000		1%
WA15FA Firerock Bridge & Waterline	-	-	Transferred	-	450,000	-	-	-	-	-	-	-	5	0%
WA15GA South 3rd Street Pedestrian - Water portion	2017	3/31/17	Design	3	70,000	-	70,000	-	-	-	-	70,000		0%
WA15HA Water Master Plan Update	2016	6/30/16	Pending	N/A	500,000	-	500,000	-	-	-	-	500,000		0%
WA15JA Phase 2 South 3rd St. - Water portion	2016	6/30/16	Design	5	1,100,000	-	1,100,000	-	-	-	-	1,100,000		0%
WA16AA Westwood Reservoir Maintenance	-	-	Transferred	-	345,000	-	-	-	-	-	-	-	5	0%
WA20AX Awbrey Well Supply Expansion	2020	2020	Pending	5	1,944,000	-	-	-	-	-	1,944,000	1,944,000		0%
WA20BX Lafayette Pipe Enlargement	2020	2020	Pending	5	241,000	-	-	-	-	-	241,000	241,000		0%
WA20CX College Parallel Pipe Study	2020	2020	Pending	N/A	1,169,000	-	-	-	-	-	1,169,000	1,169,000		0%
WA20DX Valves Operational System Study	2020	2020	Pending	N/A	75,000	-	-	-	-	-	75,000	75,000		0%
Total Water Projects					80,393,761	67,098,924	19,903,500	-	-	-	-	3,429,000		

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Sewer - Water Reclamation														
SW0802 Secondary Expansion	2009	12/30/17	Construction	1	49,835,881	39,098,793	6,148,000	1,102,000	-	-	-	7,250,000		78%
SW14CA Headworks Upgrade	2016	10/1/17	Pending	1	1,720,492	176,018	1,000,000	-	-	-	-	1,000,000		10%
SW16AA Solids Handling (Secondary Expansion)	2017	2020	Pending	1	4,000,000	-	-	250,000	1,750,000	1,000,000	1,000,000	4,000,000		0%
SW0707 Southeast Interceptor Phase 1	2007	12/31/17	Construction	3	57,000,000	21,633,854	16,163,000	7,925,000	7,185,000	-	-	31,273,000		38%
SW0707 SEI Phase II North	2020	2025	Pending	5	16,500,000	-	-	-	-	-	5,737,000	5,737,000		0%
SW11BA Valhalla Sewer Relocation	2011	10/16/16	Design	3	1,860,370	259,655	1,746,000	-	-	-	-	1,746,000		14%
SW12AA Collection System Master Plan Update	2012	12/30/14	Sub.Complete	5	3,791,557	3,916,337	506,000	-	-	-	-	506,000		103%
SW13DA North Area Sewer Capacity Improvements	2013	11/1/16	Design	3	6,547,522	819,184	5,909,300	-	-	-	-	5,909,300		13%
SW13EA Colorado Pump Station and Sewer Mains	2013	1/10/17	Construction	1	13,620,132	5,210,578	11,321,400	-	-	-	-	11,321,400		38%
SW14BA Deschutes Brewery Sewer	-	-	Cancelled	-	300,000	-	170,000	-	-	-	-	170,000		0%
SW15AA Plant Interceptor Rehabilitation	2015	6/30/17	Planning	5	5,738,000	21,495	5,718,000	-	-	-	-	5,718,000		0.4%
SW15DA N.E. 2nd & Penn Sewer Line Realignment	2016	5/27/16	Design	2	300,000	12,250	100,000	200,000	-	-	-	300,000		4.1%
SW15GA Wood River Village Lift Station/Vacuum Evaluation	2016	3/11/16	Design	N/A	50,000	33,665	50,000	-	-	-	-	50,000		67%
SW15IA Bend South Sewer Evaluation	2016	3/11/16	Design	N/A	50,000	26,763	50,000	-	-	-	-	50,000		54%
1S021 Riverhouse Lift Station Hydraulic Upgrade	2016	6/30/17	Planning	5	-	-	-	-	-	-	-	-		-
SW15JA WRF Treatment Plant Upgrades	2016	On-Going	Transferred	5	700,000	-	-	-	-	-	-	-	5	0%
SW17AA WRF Facilities Plan Update	2018	2018	Pending	5	500,000	-	-	-	500,000	-	-	500,000		0%
SW18BX Parallel Sewer on Olney Avenue	2018	2018	Pending	5	581,000	-	-	-	581,000	-	-	581,000		0%
SW15KA WRF Evaporation Percolation Ponds	2019	2019	Pending	5	1,567,000	-	-	-	-	1,567,000	-	1,567,000		0%
SW19AX Amethyst/Mahogany Street Sewer	2019	2019	Pending	5	679,000	-	-	-	-	679,000	-	679,000		0%
SW19BX Mahogany Street/Hwy 97 Sewer	2019	2019	Pending	5	999,000	-	-	-	-	999,000	-	999,000		0%
SW18AA WRF Support Facilities Upgrade	2020	2020	Pending	5	2,400,000	-	-	-	-	-	2,400,000	2,400,000		0%
SW20AX Odor Control Master Plan	2020	2020	Pending	5	1,000,000	-	-	-	-	-	1,000,000	1,000,000		0%
SW20BX Sewer Storage - Land Acquisition	2020	2020	Pending	5	700,000	-	-	-	-	-	700,000	700,000		0%
SW20EX Plant Interceptor Condition Assessment	2020	2020	Pending	5	600,000	-	-	-	-	-	600,000	600,000		0%
SW20FX Collection System Master Plan (Years 6-10)	2020	2020	Pending	5	1,000,000	-	-	-	-	-	1,000,000	1,000,000		0%
SW20GX Gravity Pipe Condition Assessment Improvements	2020	2020	Pending	5	200,000	-	-	-	-	-	200,000	200,000		0%
Total Water Reclamation (Sewer) Projects					172,239,954	71,208,594	48,881,700	9,477,000	10,016,000	4,245,000	12,637,000	85,256,700		
Stormwater														
SR0802 Drake and Dohema Pump Station	-	-	Transferred	-	404,686	241,939	-	-	-	-	-	-	5	60%
SR09AA Third Street Underpass	2009	10/30/15	Sub.Complete	1	2,999,008	2,964,938	55,000	-	-	-	-	55,000		99%
SR14AA Phase 2 3rd Street - Stormwater portion	2016	6/30/16	Planning	5	400,000	-	400,000	-	-	-	-	400,000		0%
SR15AA South Awbrey Butte Drainage Study	2016	12/26/16	Design	5	250,000	518	150,000	100,000	-	-	-	250,000		0%
SR15BA South 3rd Street - Stormwater portion	2016	3/31/17	Design	3	150,000	-	150,000	-	-	-	-	150,000		0%
SR15CA Newport Pipe Replacement Design	2018	2019	Pending	5	425,000	-	-	-	-	425,000	-	425,000		0%
Total Stormwater Projects					4,628,694	3,207,395	755,000	100,000	-	425,000	-	1,280,000		
Total Capital Improvement Program Projects					297,856,038	167,900,556	80,451,082	13,545,600	10,036,000	4,670,000	16,066,000	124,768,682		

Budget Revisions:
 1 - \$75,000 budget adjustment approved 11/18/2015
 2 - \$455,022 prior FY carryforward approved 11/18/2015
 3 - \$3,382,000 prior FY carryforward approved 11/18/2015
 4 - Project initiated early, moved \$100,000 to current FY 12/23/2015
 5-\$1,667,000 tranferred to Utility Opeations

Phase I - S. 3rd St. Pedestrian Improvements

Project is a collaboration with ODOT to provide continuous pedestrian facilities along the 3rd Street corridor between Wilson Avenue and Powers Road by repairing existing facilities that are either non-compliant or deteriorated. In addition, the project will also construct pedestrian facilities where none currently exist. The project is being coordinated with several other projects (water, stormwater, streets) within the corridor.

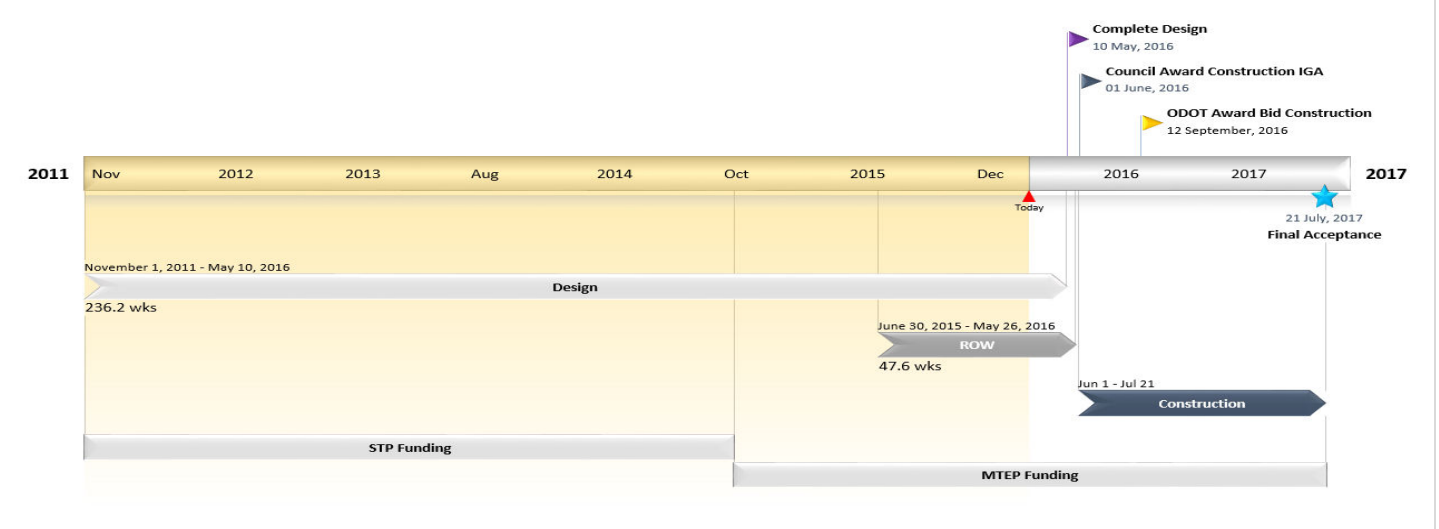


Project Engineer: Jason Suhr | jsuhr@bendoregon.gov

Scope	Schedule	Cost
Design, right of way acquisition, and construction of sidewalks, curb ramps that is coordinated with other infrastructure for water, stormwater, and streets. Stormwater scope increased to now include catch basin and drill hole vault replacement.	Start Date: 11/1/2011 Substantial Completion: 7/21/2017 Final Closeout: 7/21/2018	Total Estimated: \$655,309 Spent to Date: \$157,953 % Spent to Estimated: 24% Three Projects: ADA \$435,309, Water \$70,000, Stormwater \$150,000
Status: On Scope	Status: On Schedule	Status: Potential Cost Increase
Adjustments: No change from prior month	Adjustments: No change from prior month	Adjustments: Cost increase likely due to additional scope. Cost estimate will be updated upon design completion

Status Update: Design continues and progressing toward final plan specification and estimates. Coordinating with ODOT to hire a construction management firm.

Cost Estimate Classification: 3



Phase 2 - S. 3rd Street Improvements

Phase 2 projects are capital improvement projects and address maintenance issues. The timing is being driven to occur in advance of the street preservation work within 3rd Street that is planned for the summer of 2017. Due to the impacts to the 3rd Street roadway, it is imperative that they occur prior to the grind and inlay preservation work.



Project Engineer: Jason Suhr | jsuhr@bendoregon.gov

Scope	Schedule	Cost
Includes design and construction for streets, water, and stormwater. This work will include an analysis of the drainage basin to assess the condition of the existing stormwater facilities; creation of a striping and paving plan; replace existing 2-inch sub-standard waterlines with 8-inch pipelines.	Start Date: 10/1/2015 Substantial Completion: 6/30/2017 Final Closeout: 7/1/2018	Total Estimated: \$1,455,000 Spent to Date: \$0 % Spent to Estimated: 0% Three Projects: Water \$1,100,000, Stormwater \$325,000 , Streets \$30,000
Status: On Scope	Status: On Schedule	Status: Cost Adjustment
Adjustments: No change from prior month	Adjustments: No change from prior month	Adjustments: Cost estimate decreased by \$75,000 due to reduction in scope

Status Update: Design contract awarded for the Stormwater drill hole improvements and striping plan.

Cost Estimate Classification: 5



Citywide Accessibility Improvements

Through the help of dedicated volunteers on the City of Bend Accessibility Advisory Committee (COBAAC) and the Central Oregon Coalition for Access (COCA), key corridors and neighborhoods across the city have been prioritized for accessibility improvements. This project will design, construct, or repair these curb ramps and sidewalks including those identified through the City's Barrier Removal Request process.



Project Engineer: Rory Rowan | rrowan@bendoregon.gov

Scope

Survey, design, and construction of accessibility improvements, as funding allows, in the Wells Acres, Bear Creek, Division, Downtown & Old Mill and Brookwood/Southwest neighborhoods.

Schedule

Start Date: 3/1/16
 Substantial Completion: 9/28/2018
 Final Closeout: 09/28/2019

Cost

Total Estimated: \$750,000
 Spent to Date: \$0
 % Spent to Estimated: 0%

Status: On Scope

Status: On Schedule

Status: On Budget

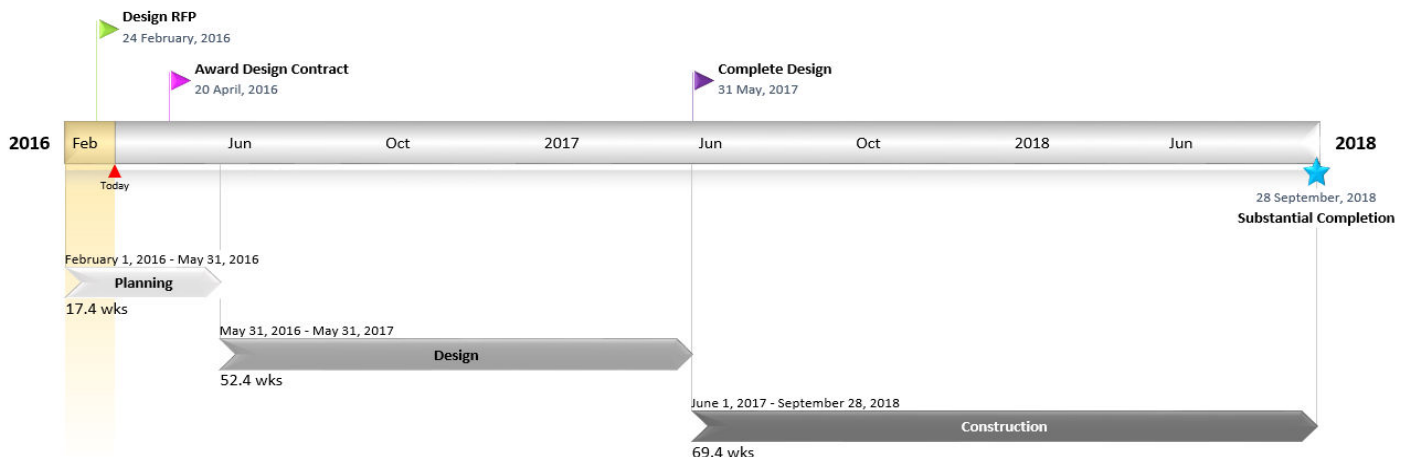
Adjustments: Project initiated

Adjustments: Project Initiated

Adjustments: Project Initiated

Status Update: Request for proposal for design services advertised and due on March 17, 2016.

Cost Estimate Classification: 5



Murphy & Parrell Roundabout

This project will finalize the extension of Murphy Road on the east side as a part of the Murphy Overcrossing Project and make the intersection safer for vehicles, pedestrians and bicycles.



Project Engineer: Ryan Oster | roster@bendoregon.gov

Scope

Construct a portion of Segment 6 of the SE Interceptor. Construct a roundabout, landscaping, stormwater facilities, illumination, signs and striping to current City standards. Design was completed as part of the Murphy overpass and extension project.

Schedule

Start Date: 5/1/2015
 Substantial Completion: 7/29/2016
 Final Closeout: 7/29/2019*
 * 1 Year warranty and 2 years additional for plant establishment

Cost

Total Estimated: \$2,000,000
 Spent to Date: \$78,644
 % Spent to Estimated: 4%

Status: On Scope

Status: On Schedule

Status: On Budget

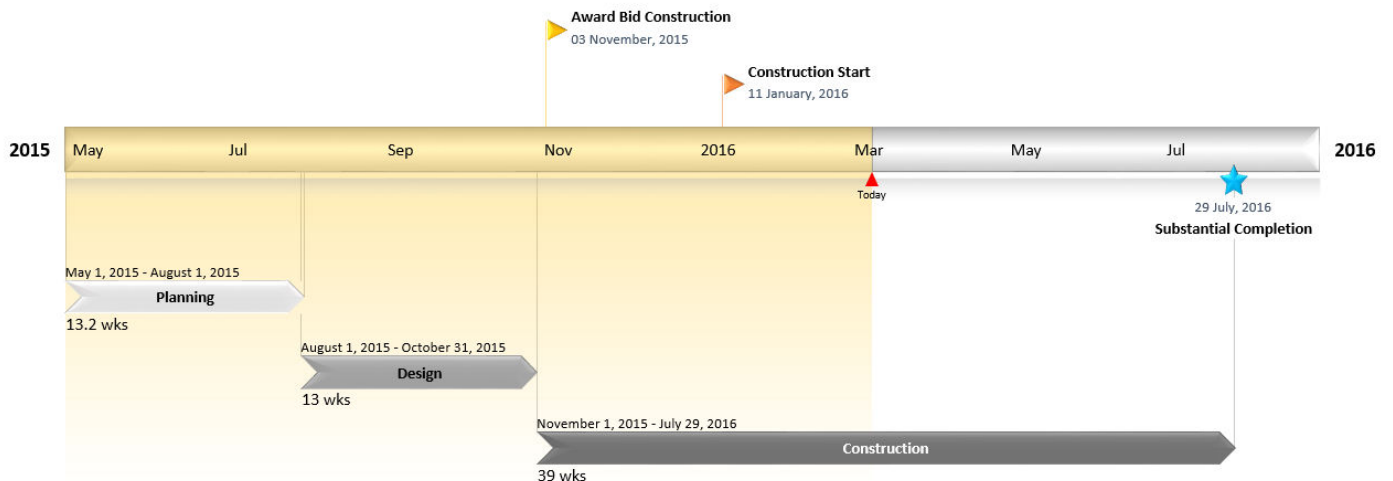
Adjustments: No change from prior month

Adjustments: No change from prior month

Adjustments: No change from prior month

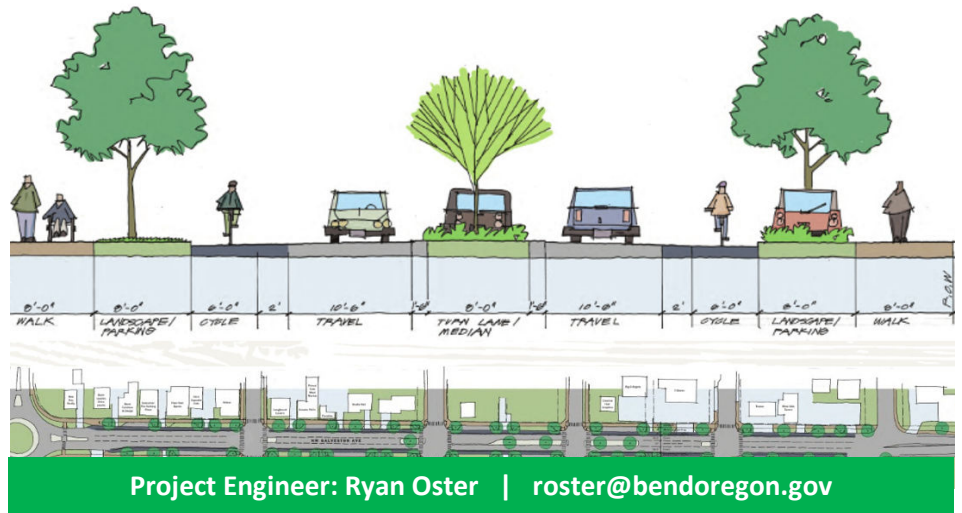
Status Update: Parrell Road sewerlines installed and beginning installation of Murphy Road sewerlines. Ongoing franchise utility relocations. Intersection will be closed until substantial completion in July.

Cost Estimate Classification: 1



Galveston Corridor Improvements

The project is the highest ranked Traffic Safety Advisory Committee (TSAC) arterial and collector street safety project to improve vehicle, bicycle, and pedestrian safety, access, and connectivity. It also continues the bike and pedestrian improvements on Galveston from 14th to Lindsey Ct. The project will improve bicycle and pedestrian safety, access, stormwater system, and parking.



Scope

Study to improve safety, access, and connectivity for vehicles, bicycles, and pedestrians. Also to improve the streetscape along a newly emerging mixed use corridor. A collaborative process has formed between City staff and property/business owners with a taskforce to devise project concepts and designs. **At 30% design project will be brought to council to decide the Stormwater and other elements to be carried forward.**

Schedule

Start Date: 06/01/2011
 Substantial Completion: TBD
 Final Closeout: TBD

Cost

Total Estimated: \$2,700,000
 Spent to Date: \$231,188*
 % Spent to Estimated: 9%

* Includes planning. At 30% design cost estimates will be updated to account for water, stormwater and sewer utility projects.

Status: On Scope

Adjustments: No change from prior month

Status: On Schedule

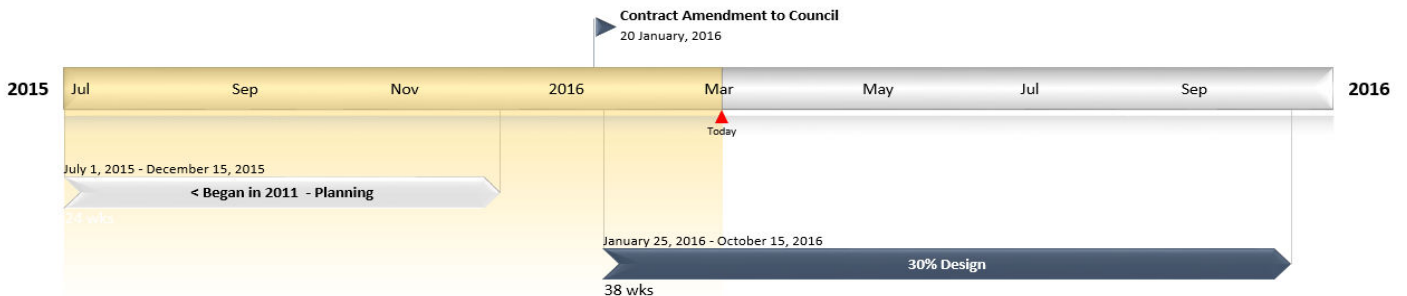
Adjustments: No change from prior month

Status: On Budget

Adjustments: No change from prior month

Status Update: Notice to proceed for design issued. Topographical survey scheduled for late March or early April. This will allow the engineer to get a base map of the existing conditions to prepare the design documents.

Cost Estimate Classification: 5



Citywide Safety Improvements

With the help of the community and a prior safety study, the city has identified multiple locations across the city where there have been a high number of crashes. Several treatments are proposed to make these locations safer for people walking, riding bicycles, and driving. This project will further develop the design of these treatments and construct them with additional community input.



Project Engineer: Rory Rowan | rrowan@bendoregon.gov

Scope	Schedule	Cost
Survey, design, traffic analysis, public involvement, and construction of safety improvements at the following locations: 3rd St at Hawthorne, Franklin, Roosevelt, and Reed Market, Colorado Ave & Bend Pkwy (US Hwy 97) interchange, Neff Rd at Williamson Blvd, 27th St at Conners Ave, Brosterhous Road railroad underpass.	Start Date: 10/1/2014 Substantial Completion: 9/30/2018 Final Closeout: 9/30/2019	Total Estimated: \$3,344,000 Spent to Date: \$59,454 % Spent to Estimated: 2%
Status: On Scope	Status: On Schedule	Status: On Budget
Adjustments: No change from prior month	Adjustments: No change from prior month	Adjustments: No change from prior month

Status Update: Public education campaign on safety is being developed. Coordinating with City of Bend ADA Office to prioritize projects. Once projects have been prioritized milestones will be identified on the timeline.

Cost Estimate Classification: 5



14th Street Reconstruction

Improve safety of corridor from SW Colorado Avenue to NW Newport Avenue for all modes of transportation. Project is part of voter approved General Obligation Bond and will focus on an up updated roadway configuration to include surfacing, striping, bike lanes, sidewalks and streetscape. Design will attempt to tie-in with suggested changes being made to the Galveston Corridor Improvements.

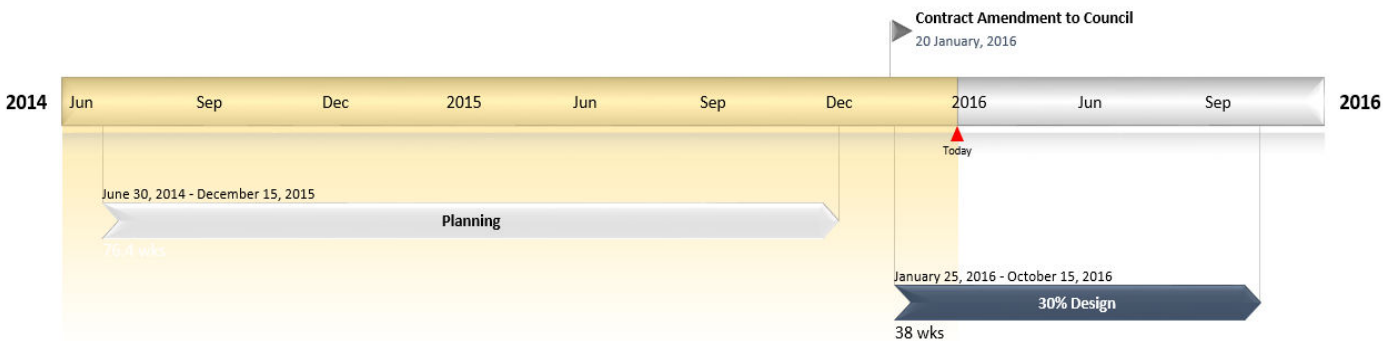


Project Engineer: Ryan Oster | roster@bendoregon.gov

Scope	Schedule	Cost
Upgrade to City standard to include but not limited to: roadway, surface, curbs, sidewalks, and striping. Final scope to be determined at 30% concept level, but will include safety improvements for bicycles, pedestrians and vehicles.	Start Date: 06/30/2014 Substantial Completion: TBD Final Closeout: TBD	Total Estimated: \$3,888,950* Spent to Date: \$6,280 % Spent to Estimated: 0.16% *Corridor extension construction cost not included in Total Cost Estimate. At 30% design cost estimates will be updated to account for water, stormwater and sewer utility projects.
Status: On Scope	Status: On Schedule	Status: On Budget
Adjustments: No change from prior month	Adjustments: No change from prior month	Adjustments: No change from prior month

Status Update: Notice to proceed for design issued. Topographical survey scheduled for late March or early April. This will allow the engineer to get a base map of the existing conditions to prepare the design documents.

Cost Estimate Classification: 5



Bridge Creek Intake, Pipeline & Treatment

Replace pipeline to reduce risk of transmission main failure to secure a dual water supply source. Membrane treatment for surface water to meet federal treatment requirements to treat for Cryptosporidium will also protect Bend's surface water in the event of a fire in the watershed. Intake does not meet current building code, and lacks fish screens. New intake allows remote monitoring and operation of the facilities.



Project Engineer: Heidi Lansdowne | hansdowne@bendoregon.gov

Scope

Feasibility study of alternative water supplies; design and construction to replace transmission lines, intake, flow control, fish screens, membrane filtration, construction management, and inspection services. These costs also include all costs related to legal.

Schedule

Start Date: 4/1/2008
Substantial Completion: 06/30/2016
Final Closeout: 06/30/2017

Cost

Total Estimated: \$73,954,698
Spent to Date: \$67,073,284
% Spent to Estimated: 91%

Status: On Scope

Status: Ahead of Schedule

Status: On Budget

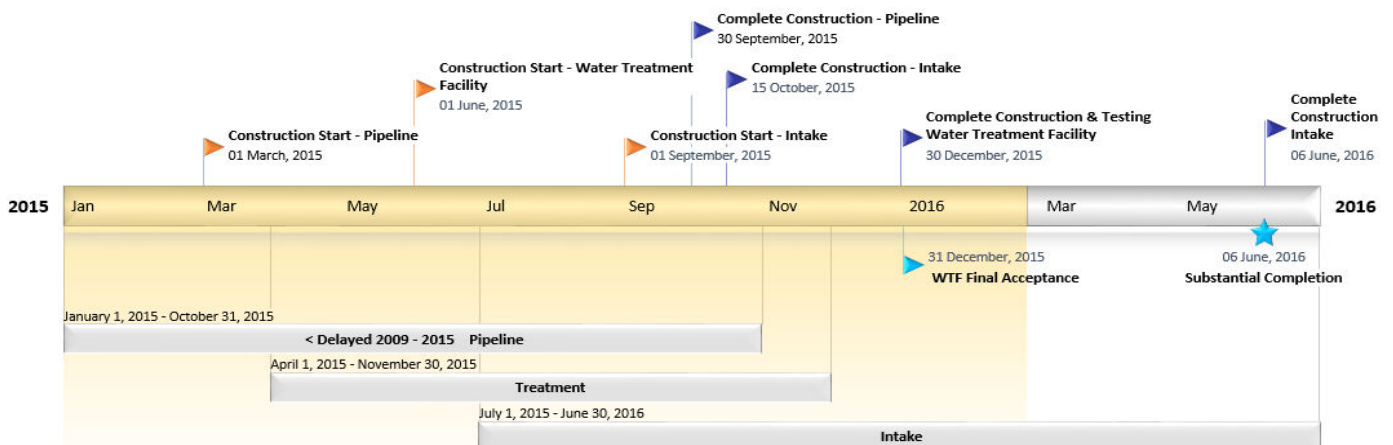
Adjustments: No change from prior month

Adjustments: Project completion estimated early May

Adjustments: No change from prior month

Status Update: No change from prior month. The Water Treatment Facility is fully operational and staff are currently managing and operating the facility. The intake structure will be conveying water in April.

Cost Estimate Classification: 1



Water Rec. Facility Secondary Expansion

Provides additional treatment capacity at the Water Reclamation Facility (WRF) in order to ensure the City continues to meet the needs of the community and DEQ permit requirements. Treatment capacity increases from 6.5 MGD to 8.5 MGD when complete with greater flexibility in the future to increase capacity at a much lower cost.



Project Engineer: Jeff England | jengland@bendoregon.gov

Scope

The project adds a primary clarifier, aeration basin, blower facilities, UV and sodium hypochlorite disinfection improvements, and various piping modifications.

Schedule

Start Date: 4/1/2009
 Substantial Completion: Feb. 2016*
 Final Closeout: Spring 2017*
 * Actual dates TBD

Cost

Total Estimated: \$60,000,000*
 Spent to Date: \$39,098,793
 % Spent to Estimated: 65%
 * Includes Facilities Plan, pre-design, final design, services during construction, and construction.

Status: Reduced Scope

Adjustments: No change from prior month

Status: Behind Schedule

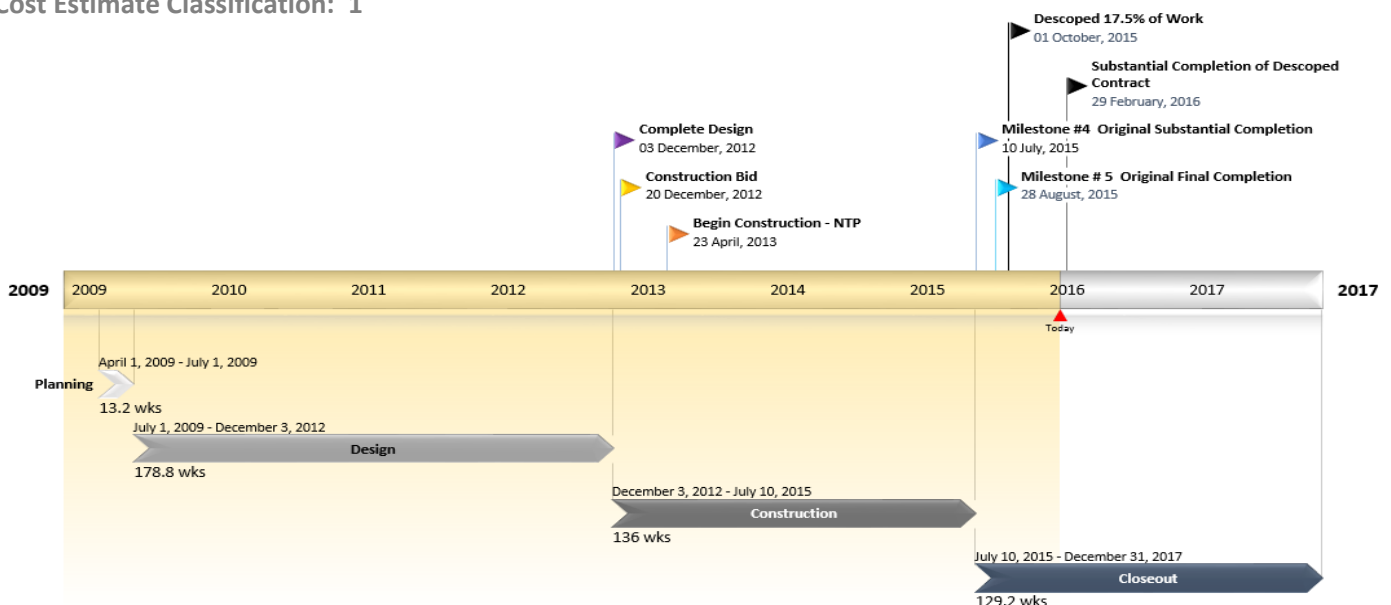
Adjustments: Schedule revision is necessary due to change in scope and overall project delay.

Status: Potential Cost Increase

Adjustments: Project cost increase likely. Cost estimate and budgets will be updated in Spring 2016.

Status Update: Continue winding down on construction and demobilizing on-site contractors. Working on plans to bring Clarifier 3 online in April followed by Aeration Basin 4 mid-year.

Cost Estimate Classification: 1



Southeast Interceptor Phase I

Large diameter gravity sewer pipeline extending from the southwest quadrant to the northeast quadrant of the City, approximately 4 ½ miles in length. This project reroutes or intercepts a significant volume of sewage away from the downtown and central sewer systems to the east side of the City in accordance with the Collection System Master Plan completed in 2014. Segment 2S&3 indicates the 2.5 mile stretch of 27th Street between Neff and Reed Market Rd.



Project Engineer: Eric Forster | eforster@bendoregon.gov

Scope

Design and construction of gravity sewer, from South 3rd street to the Neff Road interim connection. Phase 1 Extension Project, approved in January 2016, adds approximately 3,000 feet of sewer main work.

Schedule

Start Date: 7/1/2006
Sewer Completion: 12/31/2017
Street Completion: 07/31/2018
Final Closeout: 7/30/2019

Cost

Total Estimated: **\$68,000,000**
Spent to Date: \$21,633,854
% Spent to Estimated: 36%

Status: **Increased Scope**

Status: **On Schedule**

Status: **Cost Increase**

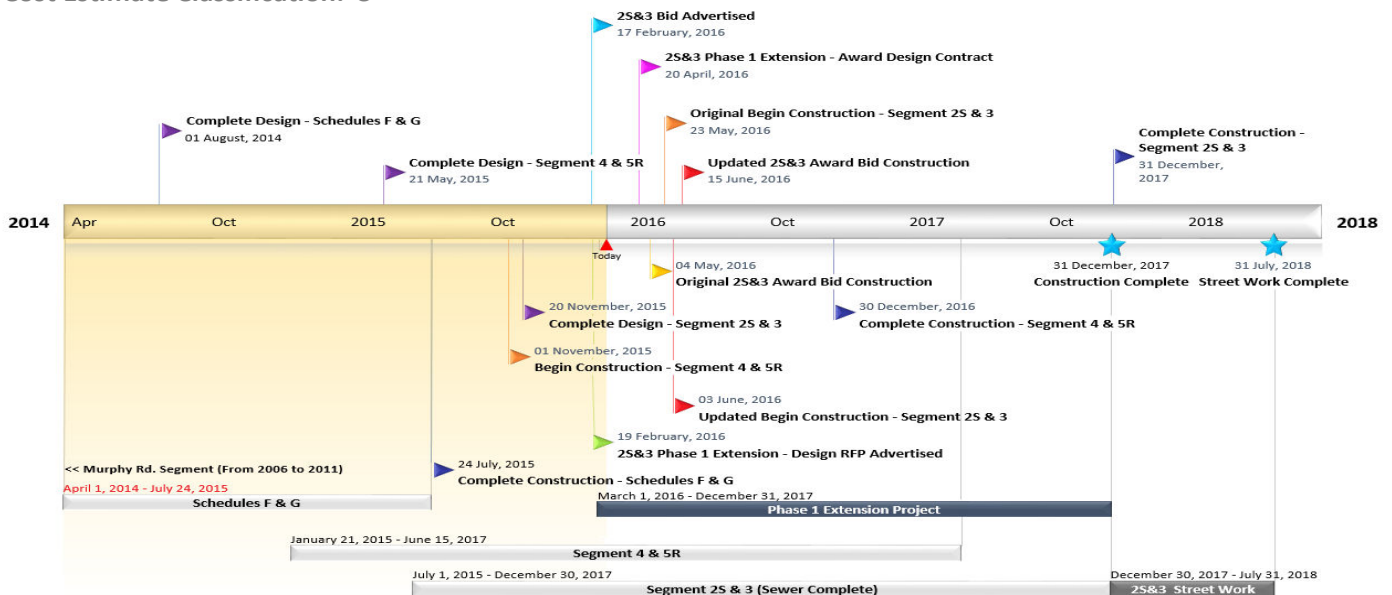
Adjustments: No change from prior month

Adjustments: **Procurement schedule for 27th Street delayed in order to allow additional time for proposing.**

Adjustments: **Overall project cost estimates have increased \$8 million to include the Phase I Extension. Contract spending is within budget.**

Status Update: Construction in King's Forest is progressing as anticipated with completion scheduled in December. Construction on 27th St. will significantly impact the community and public outreach on the project continues.

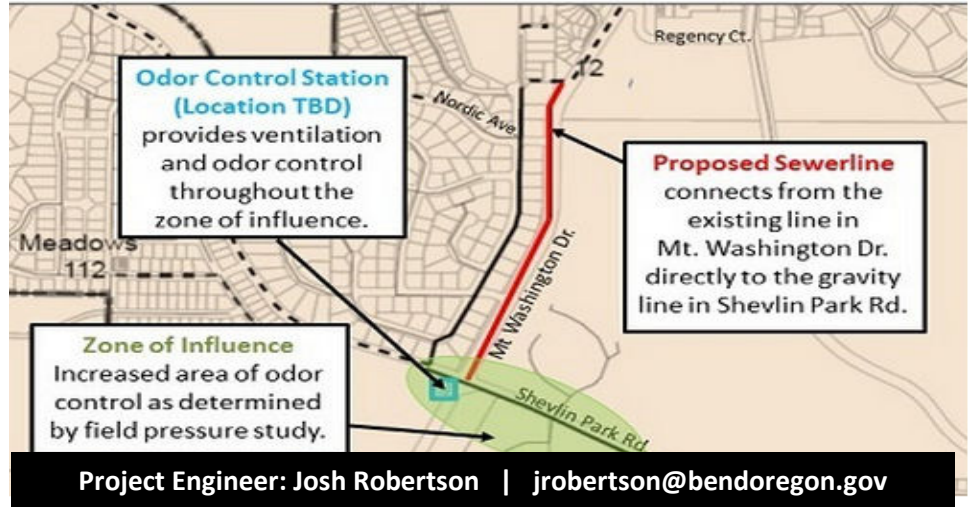
Cost Estimate Classification: 3



Valhalla Odor Control & Sewer Relocation

The Awbrey Glen lift station currently pumps into the sewage collections system located within the Valhalla neighborhood. A large wet well and long force main causes odorous air discharge. The project will mitigate odor and capacity issues in the neighborhood. This will eliminate neighborhood complaints and allow for the sewage pump station to run more efficiently reducing staff time and operating costs.

PROPOSED SEWER IMPROVEMENT PROJECT MAP



Scope

Design and construction of a sewer main to direct sewage around the Valhalla neighborhood and install new odor control systems. Project includes paving restoration.

Schedule

Start Date: 1/24/11
Substantial Completion: 11/14/2016
Final Closeout: 11/14/2017

Cost

Total Estimated: \$1,860,370
Spent to Date: \$259,655
% Spent to Estimated: 14%

Status: On Scope

Adjustments: No change from prior month

Status: On Schedule

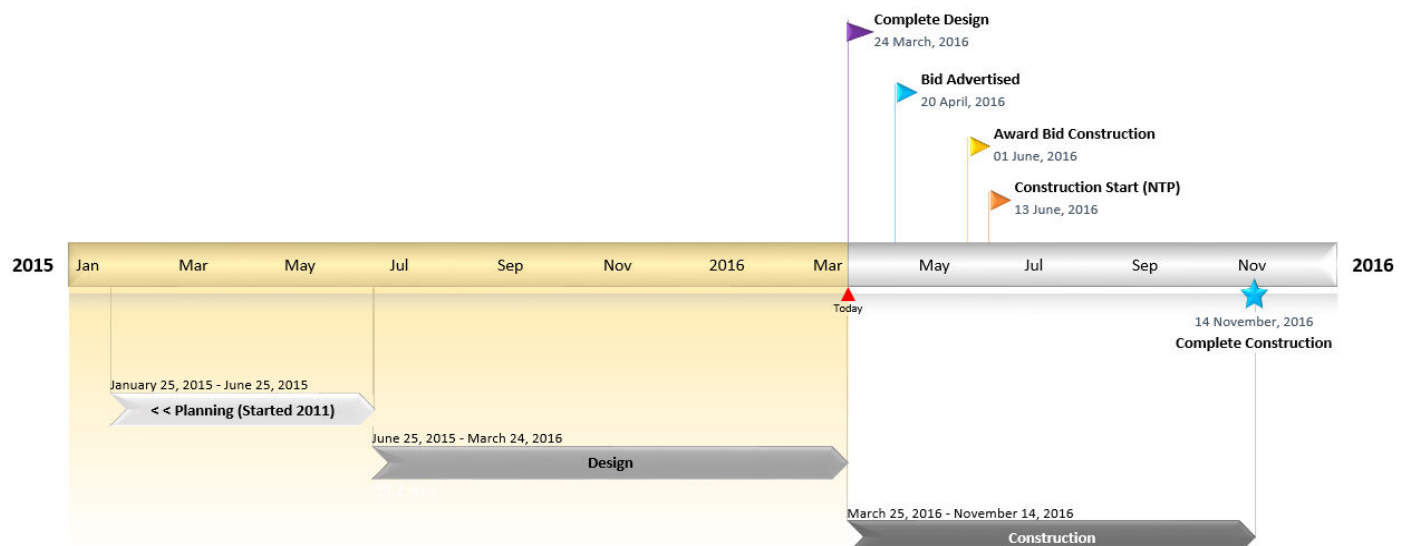
Adjustments: No change from prior month

Status: Potential Cost Increase

Adjustments: Project cost increase likely due to changes in scope and schedule. Cost estimate and budgets will be updated after bid closes.

Status Update: The 95% plans and specifications submitted to the City for review.

Cost Estimate Classification: 3



North Area Sewer Capacity Improvements

This project will increase the capacity of the gravity main downstream of the multiple force main discharge point at manhole 3157 and reroute the force main discharge from several lift stations and the NE 3rd Street pressure sewer. It will also reconfigure the structure at Mervin Sampels Bypass and include modifications to both the Sawyer and Riverhouse lift stations.



Project Engineer: George Franklet | gfranklet@bendoregon.gov

Scope

Analysis of alternatives for pipeline route and construction methods for crossing of irrigation canals and railroad tracks; design and construction of gravity and force mains, pump station modifications, and flow bypass optimization.

Schedule

Start Date: 10/1/2013
 Substantial Completion: 11/1/2016
 Final Closeout: 11/1/2017

Cost

Total Estimated: \$6,547,522
 Spent to Date: \$819,184
 % Spent to Estimated: 13%

Status: On Scope

Adjustments: No change from prior month

Status: Behind Schedule

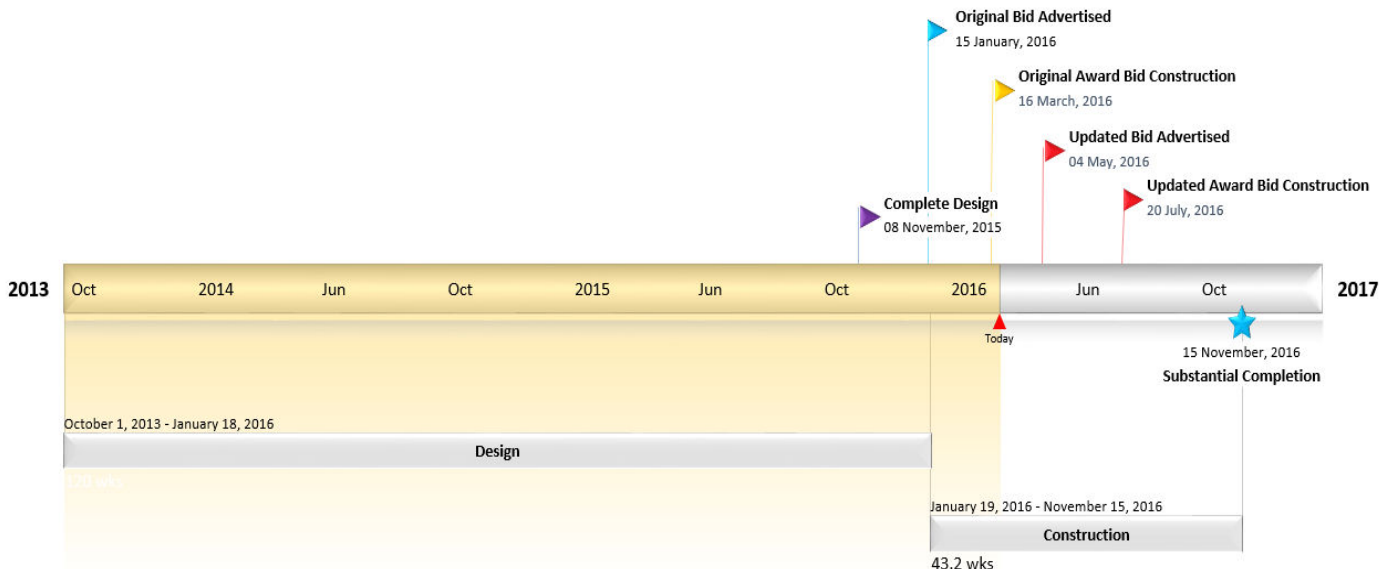
Adjustments: **Procurement schedule updated. Construction schedule will be updated when bid documents are received in May.**

Status: Potential Budget Adjustment

Adjustments: No impact to total cost estimate, however budget adjustment likely due to change in timing of project spending

Status Update: Finalizing easement negotiations with private land owners. Council authorized the City Manager to attempt to negotiate the purchase of these easements and failing that, exercise the power of eminent domain.

Cost Estimate Classification: 3



Colorado Pump Station and Sewer Mains

This project includes the design and construction of a new lift station and new gravity and force mains to divert flows from the existing Columbia Street sewer line to an existing trunk line east of the Deschutes River. This new lift station will provide service to future developments on the City's west side, allows decommissioning of an aging sewer lift station with access, capacity, and odor issue, and defer capacity-related improvements at Westside Lift Station.



Project Engineer: George Franklet | gfranklet@bendoregon.gov

Scope

Analysis of service area, flows, capacities, alternatives for pump station sizing, siting, and pipeline route; design and construction of pump station, odor control facility, and gravity and force mains; decommissioning pump station.

Schedule

Start Date: 2/1/2013
 Substantial Completion: 01/10/2017
 Final Closeout: 01/10/2018

Cost

Total Estimated: \$13,620,132
 Spent to Date: \$5,210,578
 % Spent to Estimated: 38%

Status: On Scope

Adjustments: No change from prior month

Status: On Schedule

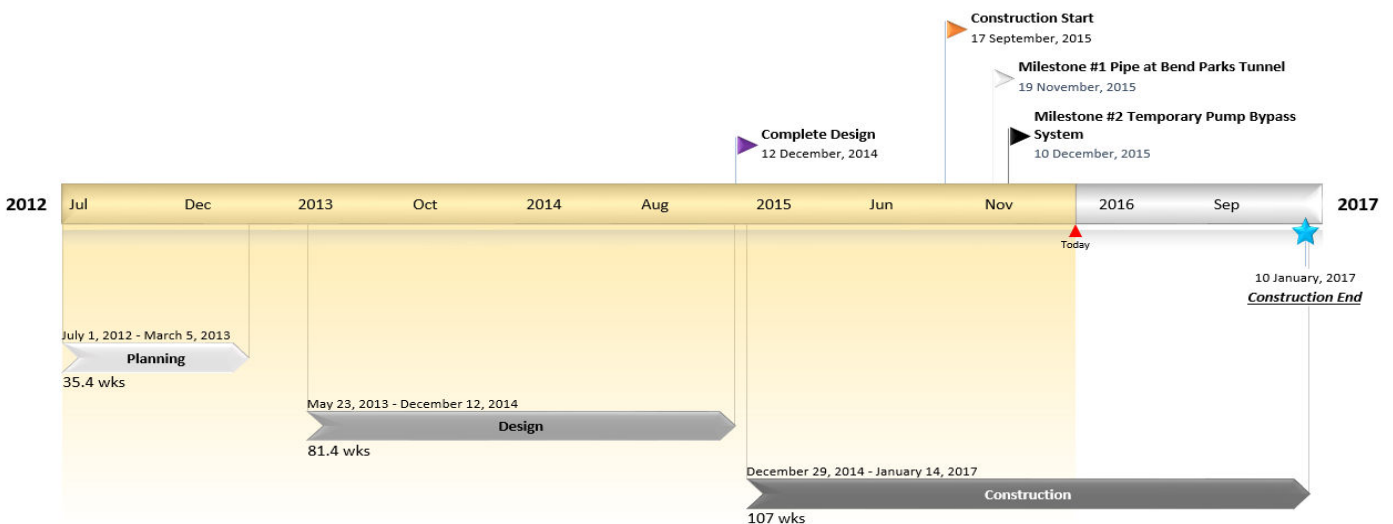
Adjustments: No change from prior month

Status: On Budget

Adjustments: No change from prior month

Status Update: Foundation poured on the pump station building and the forming for the sub-grade walls is nearly complete. Installation of both force mains has proceeded eastward on Arizona Ave to the Hwy 97 bypass. Coordinating contractor operations with Bend Parks and Recreation McKay Park project. Public outreach campaign relating to the pump station construction is scheduled from March through May.

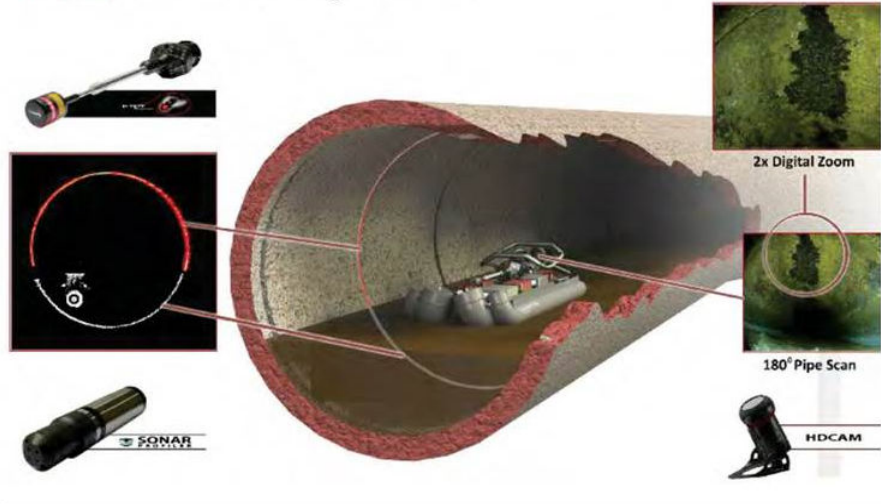
Cost Estimate Classification: 1



Plant Interceptor Rehabilitation

The existing plant interceptor conveys all of the City's sewage to the WRF. The concrete pipeline is deteriorating due to age as well as the sulfides breaking down the concrete wall. This project will rehabilitate the plant interceptor by designing and constructing a Cured-In-Place Pipe (CIPP) liner on the pipe segments in the worst structural condition to lengthen the operational life of the pipeline. All project aspects were previously identified in the Plant Interceptor Condition Assessment and incorporated into the CSMP projects list.

HDProfiler System



Project Engineer: Jason Suhr | jsuhr@bendoregon.gov

Scope

Rehabilitate all Pipeline Assessment Certification Program (PACP) graded 4 and 5 pipe segments with a Cured-In-Place Pipe (CIPP) liner, replace the existing siphon junction box, and clean the double barreled siphons.

Schedule

Start Date: 3/1/2015
 Substantial Completion: 6/30/2017
 Final Closeout: 6/30/2018

Cost

Total Estimated: \$5,738,000
 Spent to Date: \$21,495
 % Spent to Estimated: 0.37%

Status: On Scope

Status: On Schedule

Status: On Budget

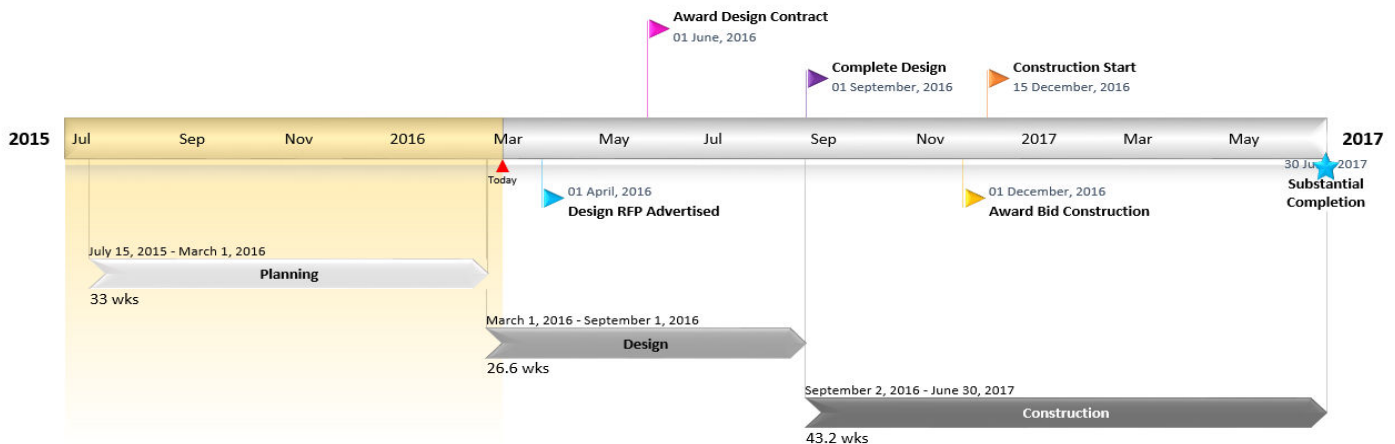
Adjustments: No change from prior month

Adjustments: No change from prior month

Adjustments: No change from prior month

Status Update: Contract in place for archaeological survey to assess environmental impact in accordance with DEQ Clean Water State Revolving Fund (CWSRF) loan requirements. Timeline for design and construction phases will be updated when design contract is awarded in June.

Cost Estimate Classification: 5



NE 2nd & Penn Sewer Line Realignment

The sewer main of interest currently intersects two (2) private property parcels and exceeds the hydraulic requirements for the serviced catchment area. The purpose of this project is to design an alternate route, within the City of Bend Right of Way which meets current standards.

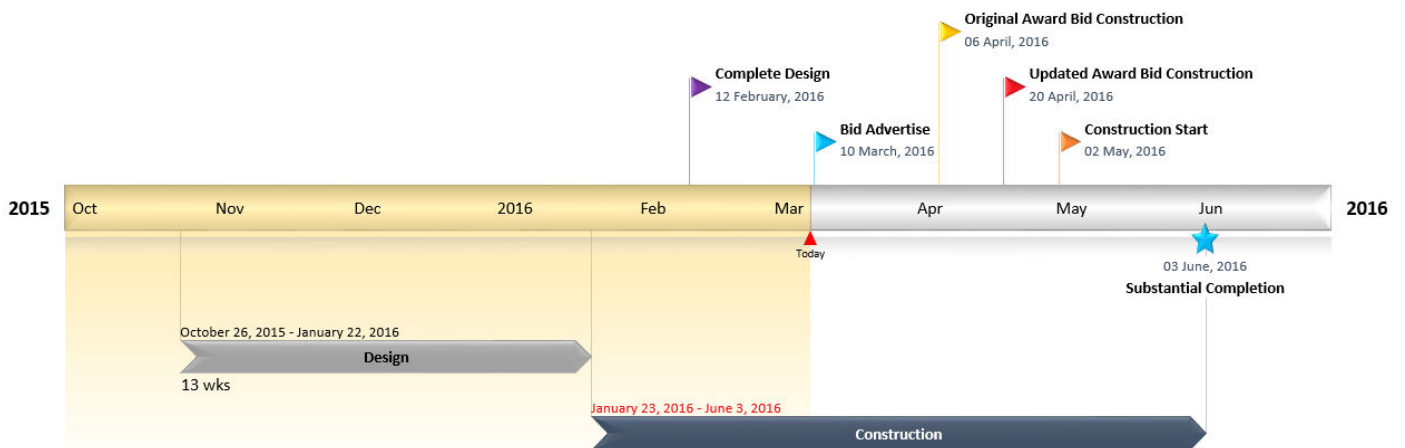


Project Engineer: Garrett Sabourin | gsabourin@bendoregon.gov

Scope	Schedule	Cost
Design and construct a section of gravity sewer main to provide an alternative conveyance route within the City of Bend Right of Way.	Start Date: 11/18/2015 Substantial Completion: 6/3/2016 Final Closeout: 6/3/2017	Total Estimated: \$300,000 Spent to Date: \$12,250 % Spent to Estimated: 4%
Status: On Scope	Status: On Schedule	Status: On Budget
Adjustments: No change from prior month	Adjustments: No change from prior month	Adjustments: No change from prior month

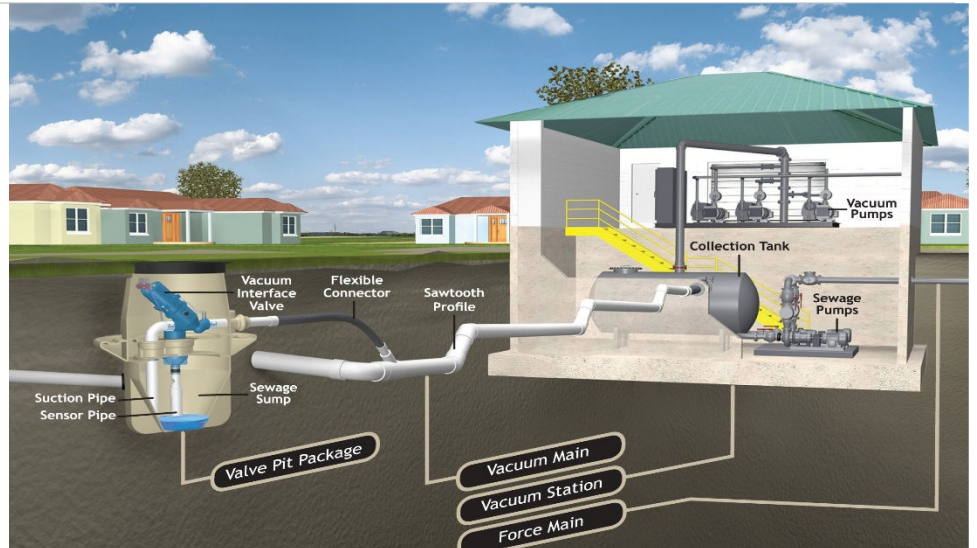
Status Update: Advertised invitation to bid and construction start planned early May.

Cost Estimate Classification: 2



Wood River Village Lift Station & Vacuum Eval.

Evaluate existing system conditions in order to determine existing and future capacity as well as future development potential within the area.

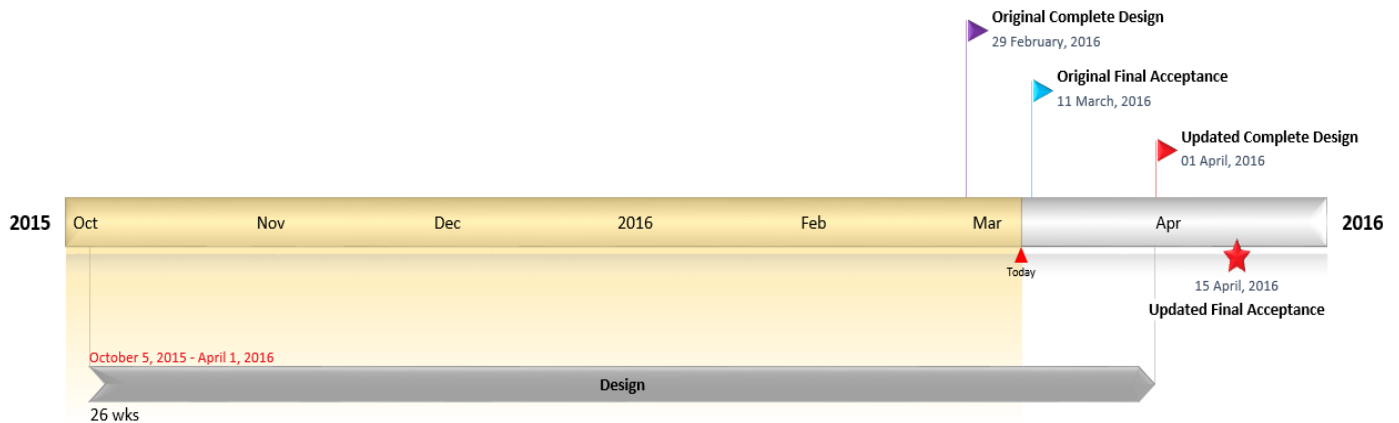


Project Engineer: Garrett Sabourin | gsabourin@bendoregon.gov

Scope	Schedule	Cost
Complete a sewer system analysis and develop three (3) preliminary design solutions for a longstanding replacement and/or upgrade to the Wood River Village development's collection system.	Start Date: 9/1/2015 Substantial Completion: 4/1/2016 Final Closeout: 4/1/2016	Total Estimated: \$50,000 Spent to Date: \$33,665 % Spent to Estimated: 67%
Status: On Scope	Status: Schedule Baseline Revision	Status: On Budget
Adjustments: Scope change on Bend South Sewer Evaluation Project only	Adjustments: Tied to Bend South Sewer Evaluation Project scope increase	Adjustments: No anticipated impact to cost due to scope revision

Status Update: Contract for professional services includes Bend South Sewer Evaluation and Wood River Village Sewer Evaluation. Increased scope of work on Bend South pushed this timeline out.

Cost Estimate Classification: N/A



Riverhouse Lift Station Hydraulic Upgrade

This project was identified in the Collection System Master Plan as a project to be partially funded by the hotel/developer. The City received an in-lieu of payment from the developer to complete the work of downsizing the mechanical pump components to match required capacity for peak wet-weather flow and will coordinate the work in conjunction with the North Area Sewer Capacity Improvements project.



Project Engineer: George Franklet | gfranklet@bendoregon.gov

Scope

Downsize of mechanical pumping and/or electrical components to decrease hydraulic capacity to closer to required capacity. Rehabilitation and, where required, replacement of deteriorating lift station components where Utility Department condition assessment indicated poor condition: wet well, pumps, motors and electrical equipment

Schedule

Start Date: 2/25/2016
 Substantial Completion: 6/30/2017
 Final Closeout: 6/30/2018

Cost

Total Estimated: \$500,000
 Spent to Date: \$0
 % Spent to Estimated: 0%

Status Update: Project initiated

Cost Estimate Classification: 5



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