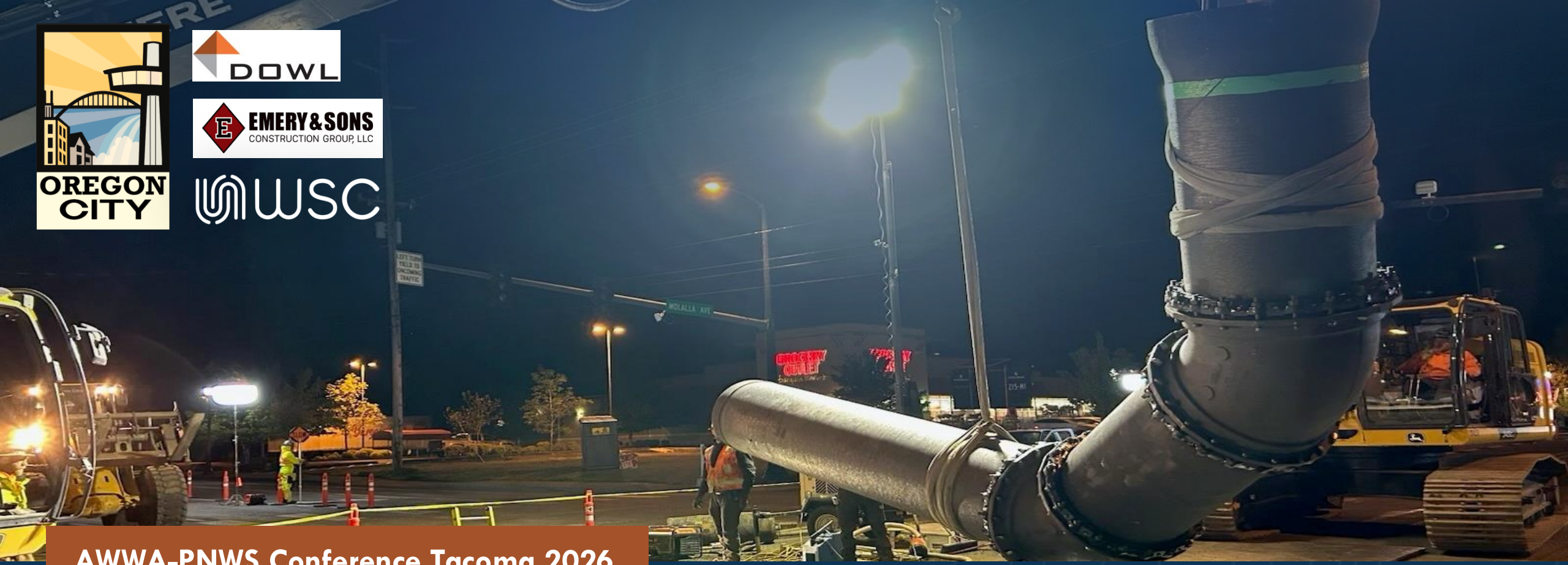


AWWA-PNWS Conference Tacoma 2026

Creative Approach to Construct Water Mains in Major Arterial

May 8th, 2026

Agenda



1. Project Journey: Funding, Goals, and Objectives
2. Unique Design Approach
3. Risk Mitigation During Construction
4. Questions & Discussion

Presenting Today



Scott Duren

Engineer of Record



Patty Nelson

Oregon City Project Manager



Jason Kelly

Construction Manager

Project Journey

Patty



Oregon City

OREGON CITY FACTS & FIGURES

- Oldest city west of Mississippi – Founded 1829
- Population: 38,000
- Water Distribution Only
  – Approx 11,000 customers

FUNDING SOURCES

- Water Rates
- Water System Development Charges





Water System Improvements Needed



CRITICAL INFRASTRUCTURE NEEDED

- Water Master Plan - $81million water system improvements
- Large projects deferred
- Focus on Transmission improvements, Storage and Pipe Upgrade and Replacement



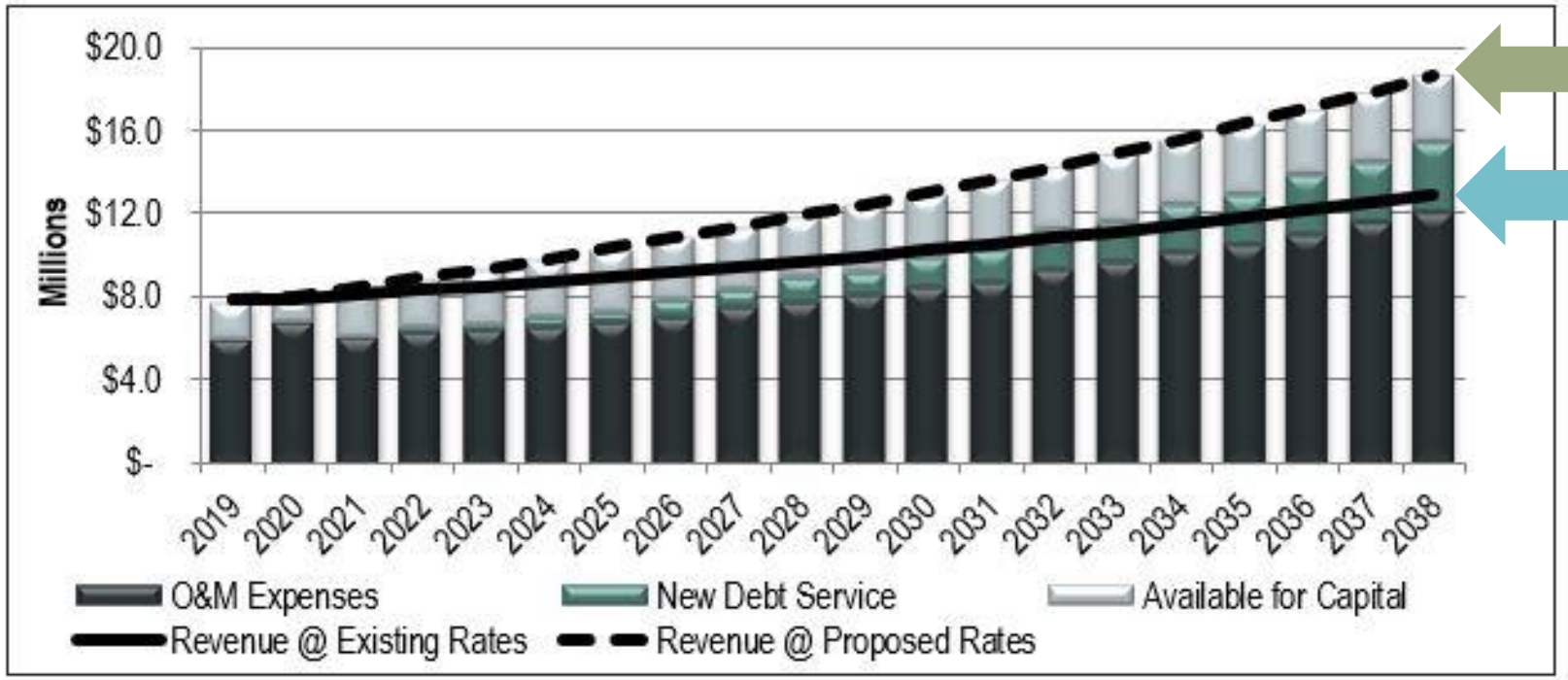
FUNDING CHALLENGES

- City Charter Limitations for Water System Funding:
  - Annual Rate Increase 3% without voter approval
  - No Borrowing without voter approval

- Rate Study – Calls for rate increase above 3% limit

Financing—Debt Supported Option

Table 6. Debt Supported Revenue Requirement



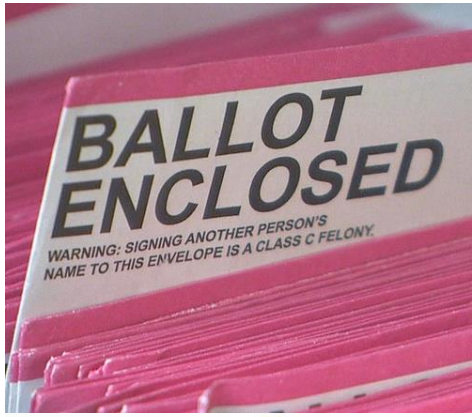
4% for 6 Years + $38 Million Debt Sufficient

3% Charter Limit Insufficient

Borrowing Requires Rate Increase Greater than 3% Allowed by Charter

Financing—Voter Approval Needed

- **November 2, 2021 Election**
- **Ballot Measures:**
  - **Measure 3-567 – Authorizes the City to borrow funds for water system improvements**
  - **Measure 3-578 - Authorizes temporary water rate increase above the 3% annual charter limit**





Financing—Federal Funding

Water Infrastructure Finance and Innovation Act (WIFIA)

- **Favorable Financing Options**
  - Flexible repayment plan to match revenues
  - Loan repayment up to 35 years
  - Deferred payments – up to 5 years after construction
- **Requirements:** $20 million package + 51% Match
- **Letter of Interest** (LOI) June 2021 – Proactive Approach



No Rate Increase – Now What?

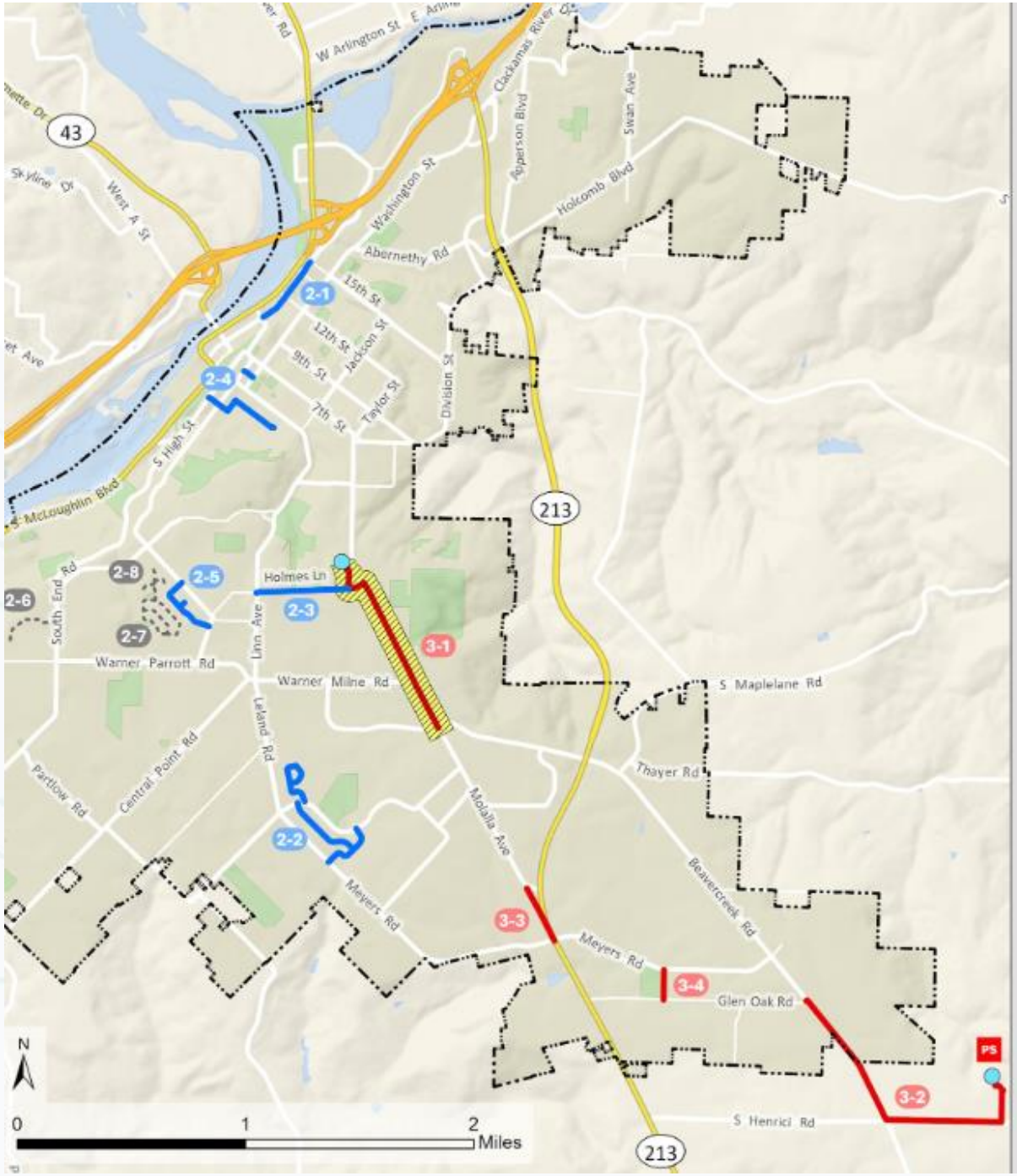
- **Updated Project Estimates**
  - COVID Effect: Increased Costs
  - ARPA Funds – Made $5.6 Million available
- **Scope Refinement - Right Sized Package:**
  - Project Priorities – Transmission Capacity
  - Project Size & Cash Flow for Delivery
- **WIFIA Loan**
  - Closed July 20, 2023
  - Borrow up to $16 million for $33,000,000 improvements
  - Interest Rate: 3.94%
  - Substantial Completion by June 30, 2028



WIFIA Project Package

Project	Project Description		Scope
WIFIA 1	SCADA Isolation	$ 104,000	Separate SCADA from Business Network
WIFIA 2	Pipe Rehabilitation Program	$ 7,300,000	Replace aging undersized mains
WIFIA 3	Upper System Transmission Improvements	$ 25,600,000	Increase transmission capacity to meet needs
TOTAL		**$33 Million**	

Current Status WIFIA Projects



WIFIA PROGRAM MAP

WIFIA Funded Water Projects

WATER REHABILITATION PROJECT (WIFIA PROJECT 2)

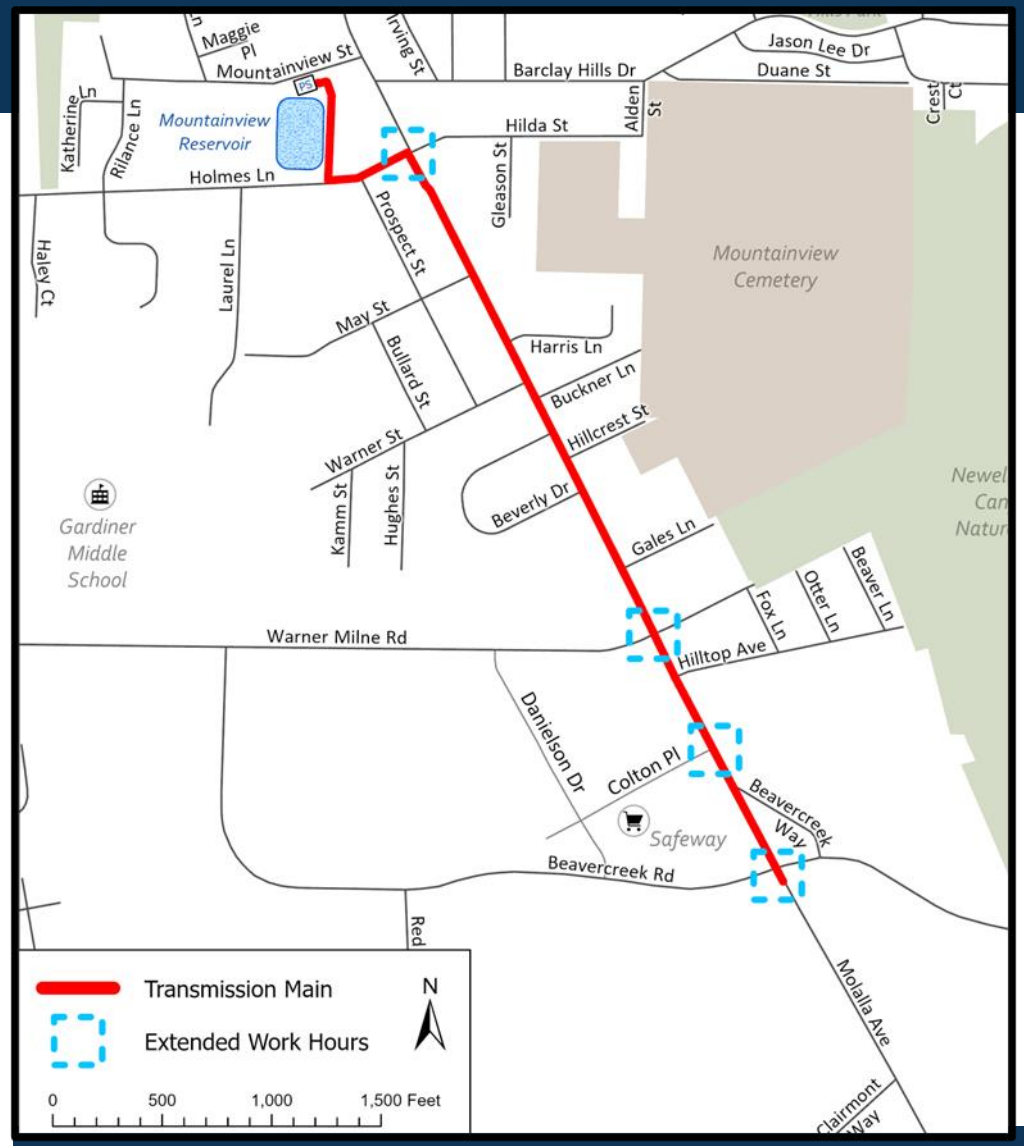
- 2-1 MAIN STREET WATER IMPROVEMENT (CI 21-007) — *COMPLETED WINTER 2023*
- 2-2 CLAIRMONT WATER REPLACEMENT (CI 22-010) — *COMPLETED SUMMER 2024*
- 2-3 HOLMES LANE WATER REPLACEMENT (CI 24-002) — *COMPLETED APRIL 2025*
- 2-4 MCLOUGHLIN NEIGHBORHOOD WATER REPLACEMENT — *CONSTRUCTION 2026*
- 2-5 CANEMAH COURT WATER REPLACEMENT — *CONSTRUCTION 2027*
- 2-6 2-7 2-8 *UNFUNDED PROJECTS*

WATER TRANSMISSION IMPROVEMENT PROJECT (WIFIA PROJECT 3)

- 3-1 MOLALLA AVENUE TRANSMISSION MAIN (CI 22-014) — *CONSTRUCTION SPRING 2025-SUMMER 2026*
- 3-2 HENRICI PUMP STATION & TRANSMISSION IMPROVEMENTS (CI 24-004) — *CONSTRUCTION 2026-2027*
- 3-3 MOLALLA AVENUE 18" TRANSMISSION MAIN — *CONSTRUCTION 2027*
- 3-4 HIGH SCHOOL LANE 16" TRANSMISSION MAIN — *CONSTRUCTION 2027*

- Water Rehabilitation Projects
- Water Transmission Improvement Projects
- Unfunded Projects
- Current Construction
- PS New Pump Station
- Reservoir

Molalla Ave Transmission WIFIA 3-1



- **Highest Priority Transmission Project**
- **4,580 LF Transmission Main 30 – 16-inch**
- **4,500 LF 8-inch Distribution Main**
- **Replace 32 services**

- **WIFIA Requirements**
  - **American Iron & Steel/Buy America Build America**
    Obtained a waiver for BABA requirements
  - **Environmental Federal Cross-cutters:**
    Coordination with Confederate Tribes of Grand Ronde
  - **Archeological Report & Construction Phase Monitoring**

Project Constraints & Challenges





Unique Design Approach

Scott



OREGON CITY

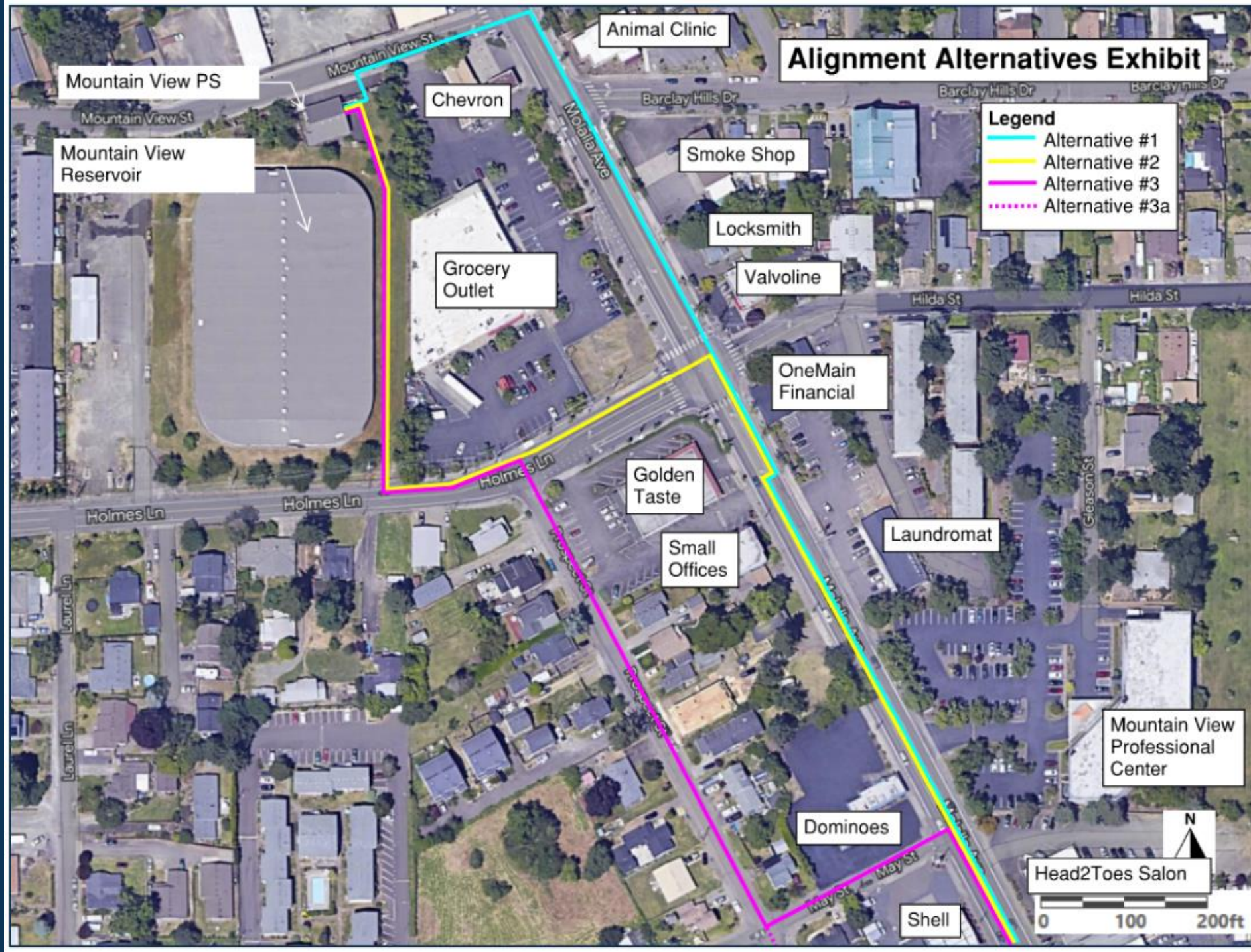
DOWL

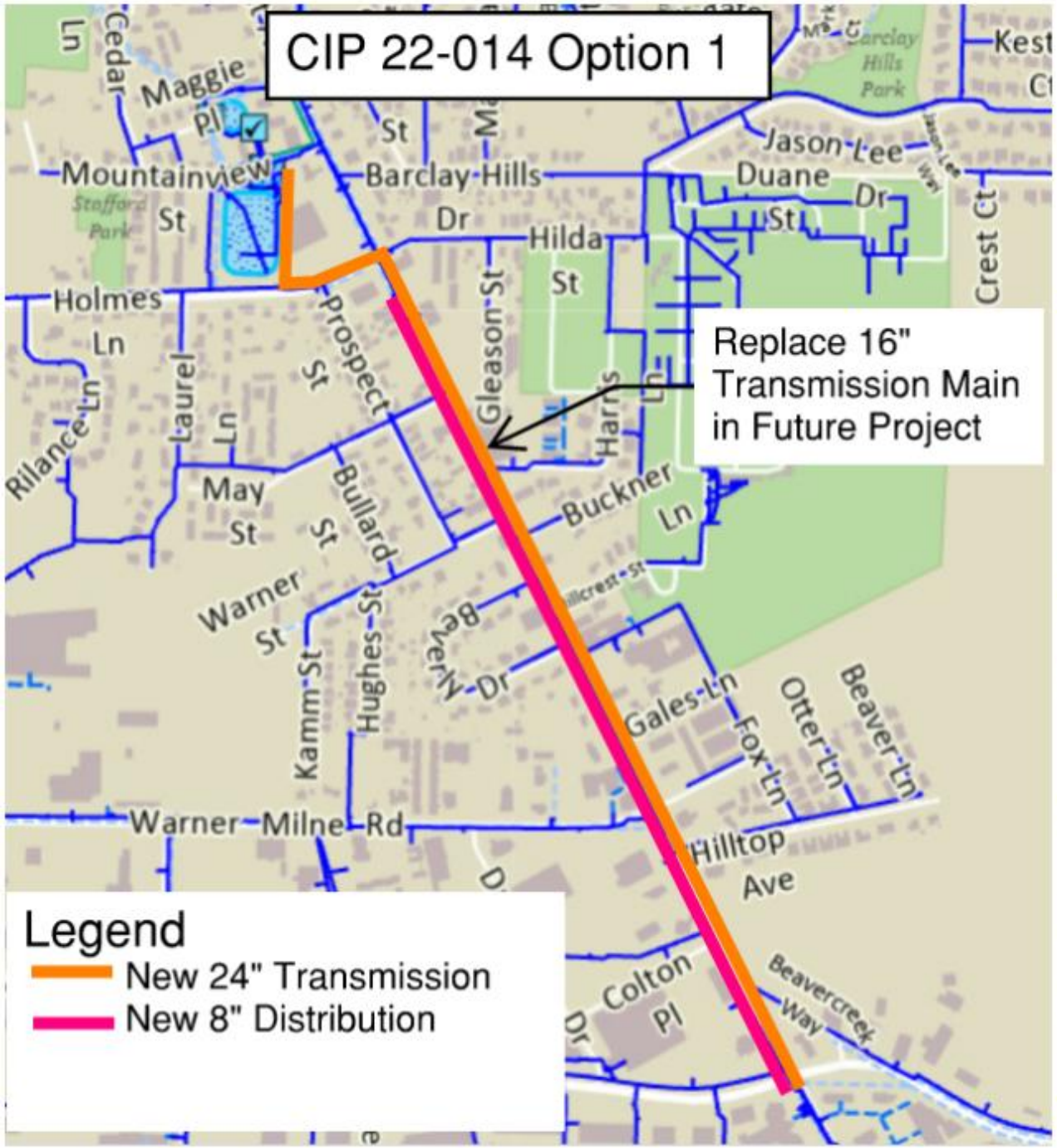
EMERY & SONS CONSTRUCTION GROUP, LLC

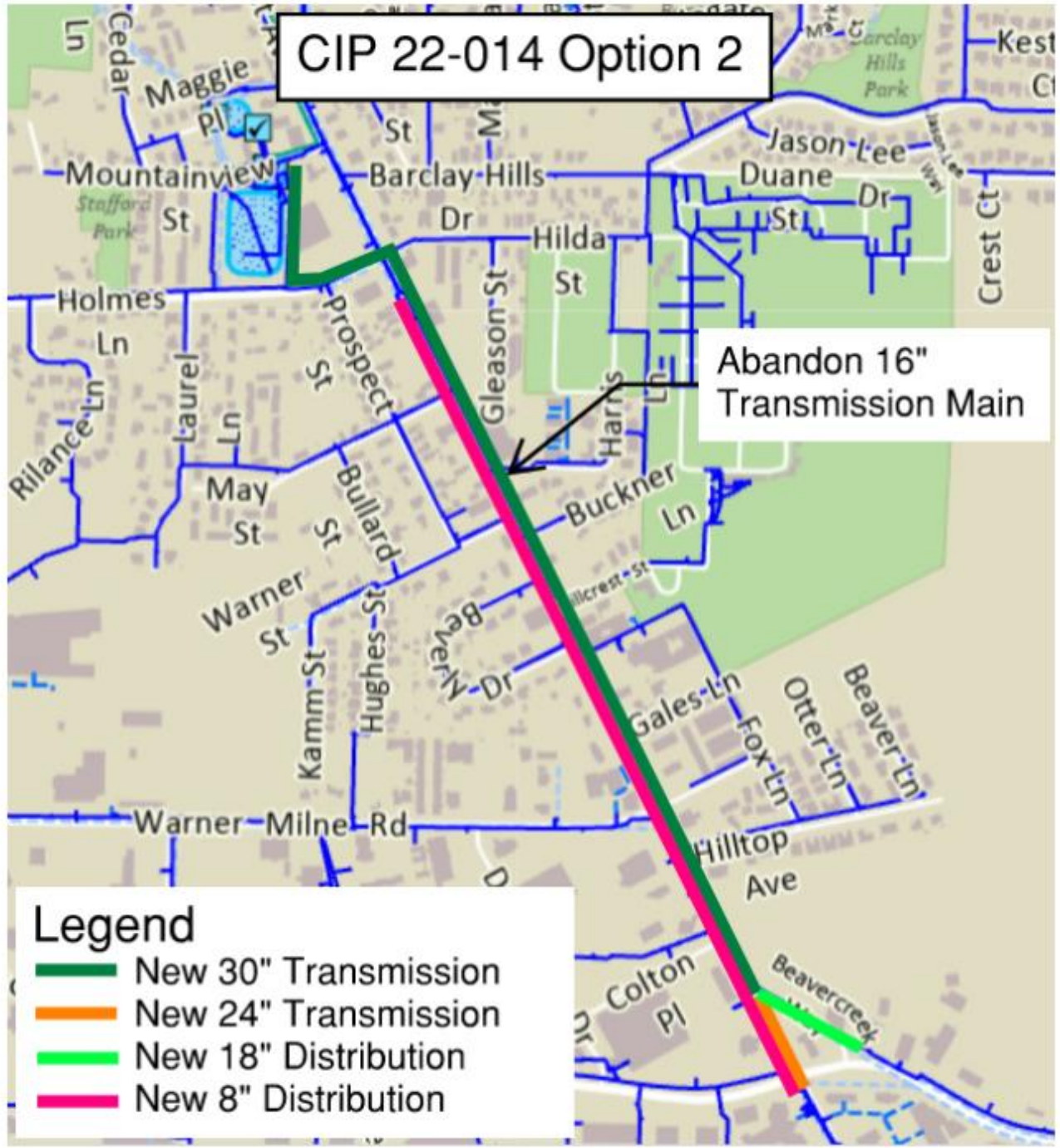
WSC

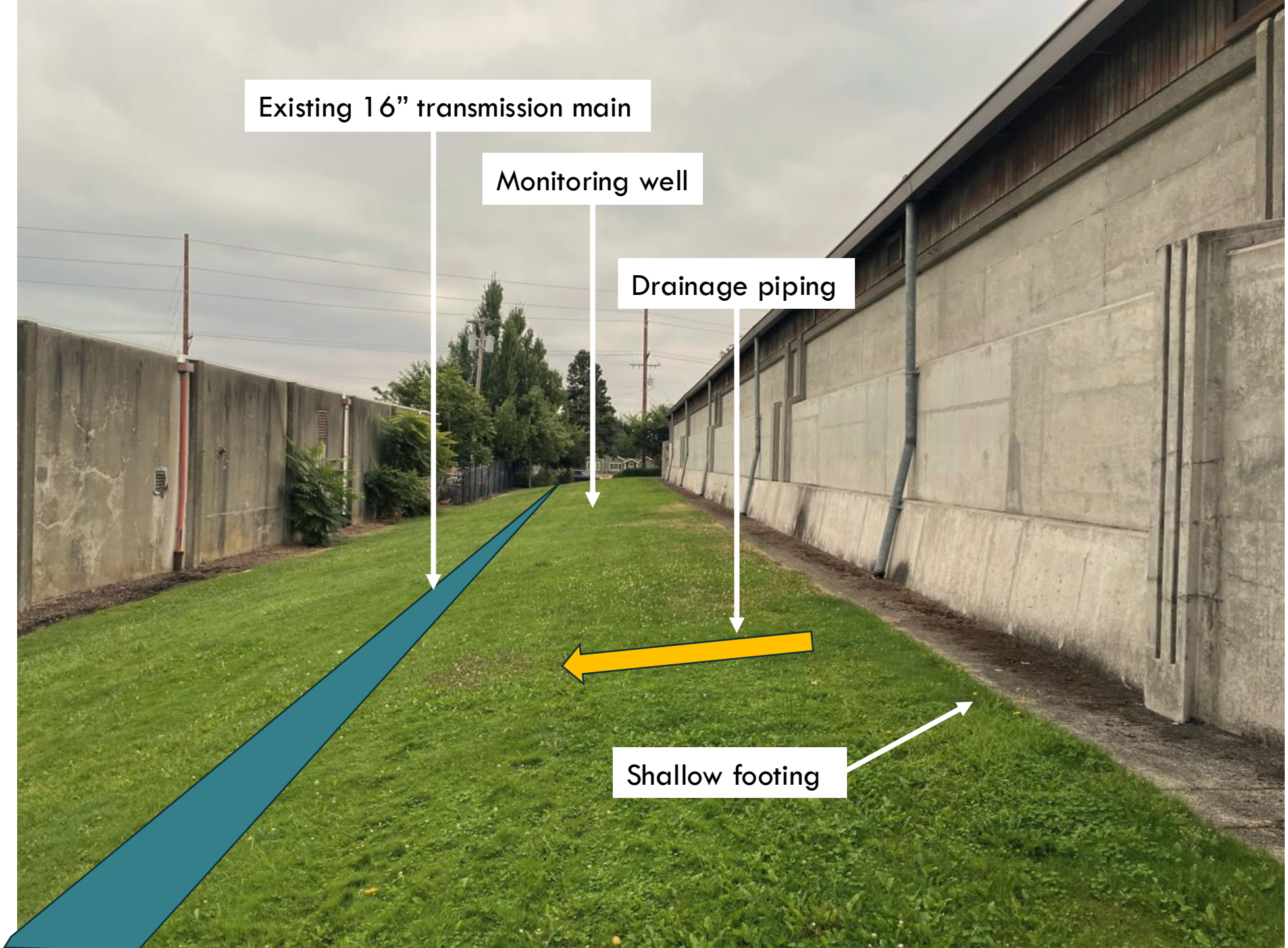
Alignments evaluated on weighted criteria:

- Construction Risk
- Cost
- Additional Opportunities
- Operational Ease
- Community Impacts

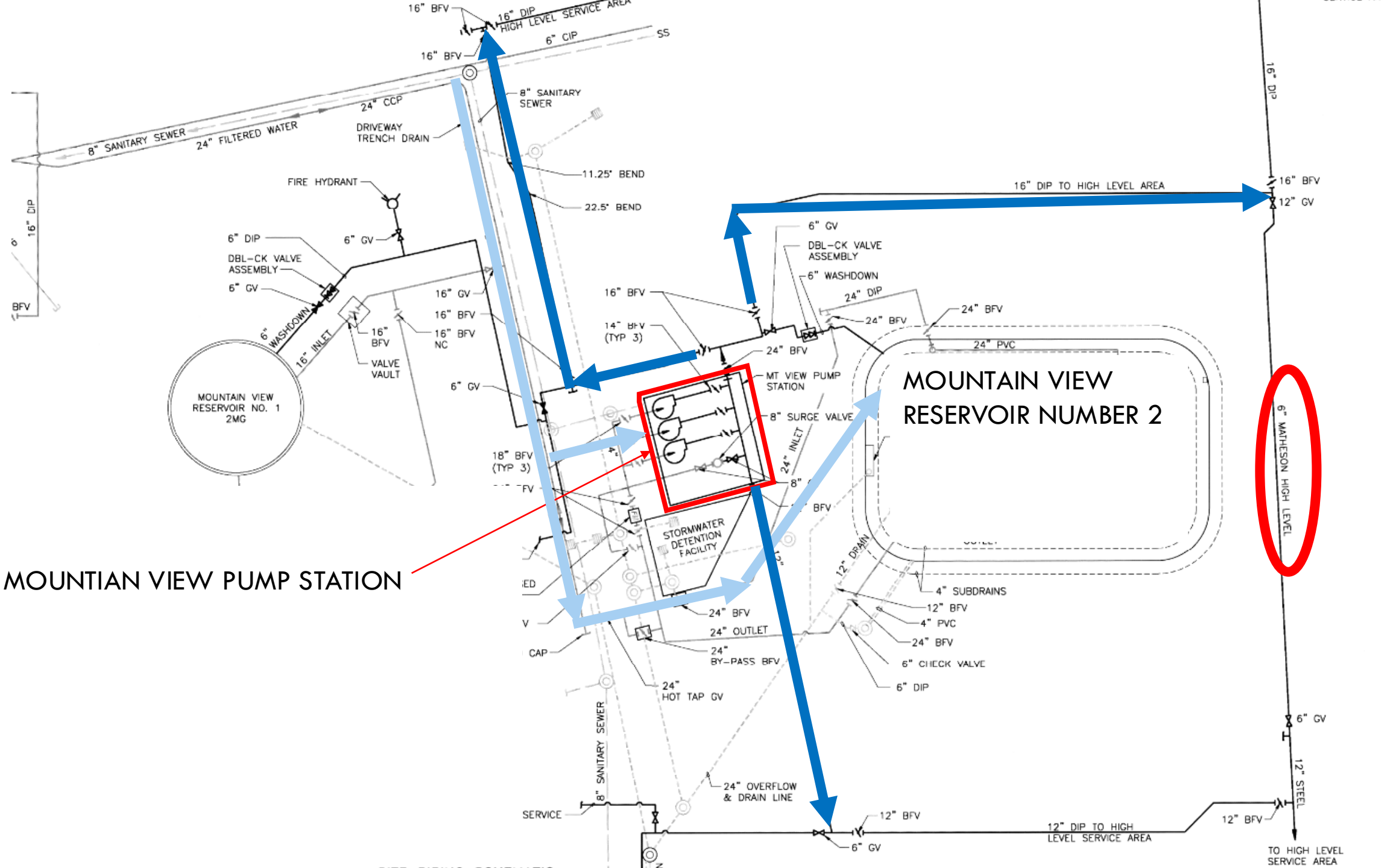



CIP 22-014 Option 1
Replace 16" Transmission Main in Future Project
Legend
New 24" Transmission
New 8" Distribution
Maggie Pl
Mountainview St
Barclay Hills Dr
Jason Lee Duane Dr
Hilda St
Holmes Ln
Prospect St
Gleason St
Crest Ct
Laurel Ln
Rilance Ln
May St
Bullard St
Buckner Ln
Warner St
Kamm St
Hughes St
Beverly Dr
Gales Ln
Fox Ln
Otter Ln
Beaver Ln
Warner Milne Rd
Hilltop Ave
Colton Pl
Beavercreek Way
Barclay Hills Park
Stafford Park

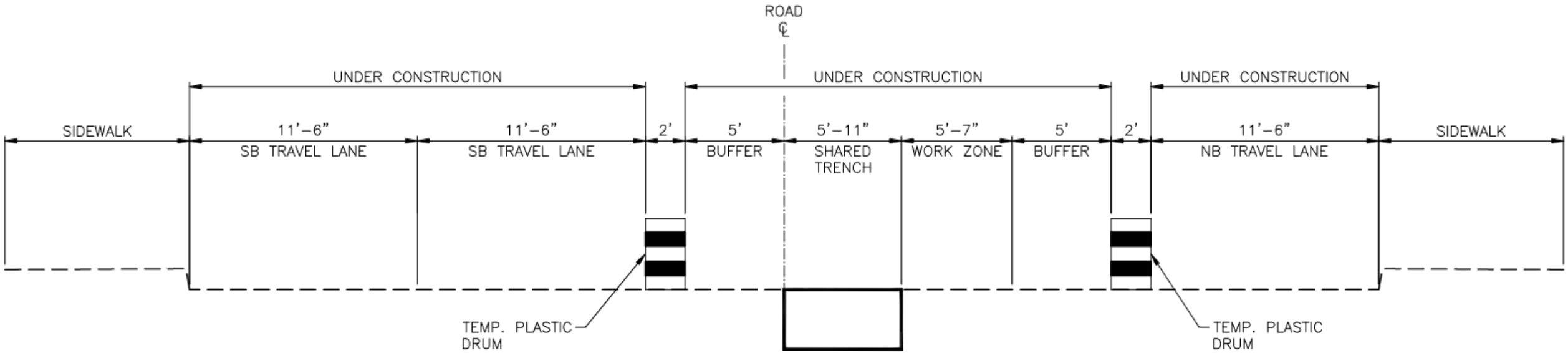

CIP 22-014 Option 2
Abandon 16" Transmission Main
Legend
New 30" Transmission
New 24" Transmission
New 18" Distribution
New 8" Distribution
Maggie Pl
Mountainview St
Barclay Hills Dr
Jason Lee Duane Dr
Hilda St
Holmes Ln
Prospect St
Gleason St
Crest Ct
Laurel Ln
Rilance Ln
May St
Bullard St
Buckner Ln
Warner St
Kamm St
Hughes St
Beverly Dr
Gales Ln
Fox Ln
Otter Ln
Beaver Ln
Warner Milne Rd
Hilltop Ave
Colton Pl
Beavercreek
Barclay Hills Park
Stafford Park


Existing 16” transmission main
Monitoring well
Drainage piping
Shallow footing

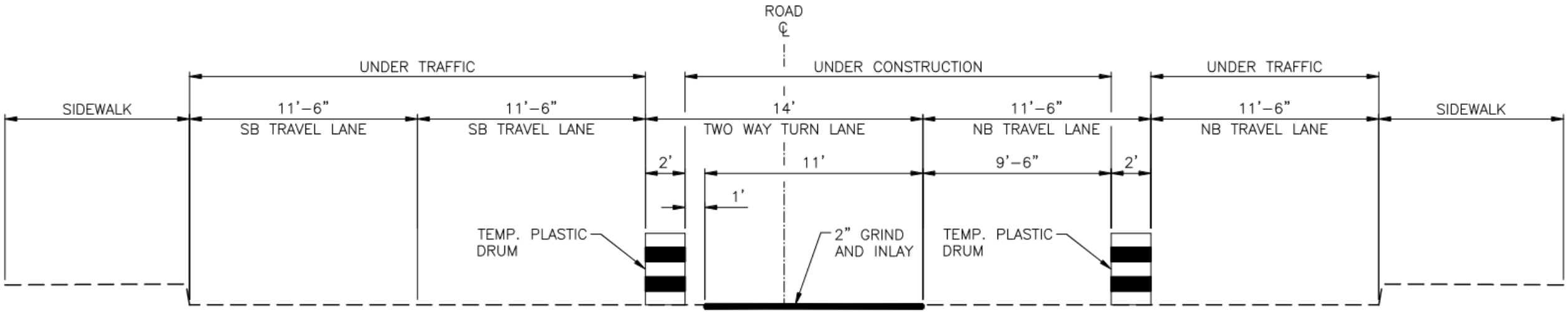

ESS


MOUNTIAN VIEW PUMP STATION
MOUNTAIN VIEW RESERVOIR NUMBER 2
MOUNTAIN VIEW RESERVOIR NO. 1 2MG
MT VIEW PUMP STATION
STORMWATER DETENTION FACILITY
16" DIP HIGH LEVEL SERVICE AREA
16" BFV
6" CIP
SS
8" SANITARY SEWER
24" CCP
24" FILTERED WATER
DRIVEWAY TRENCH DRAIN
11.25° BEND
22.5° BEND
FIRE HYDRANT
6" GV
6" DIP
DBL-CK VALVE ASSEMBLY
6" WASHDOWN
16" INLET
16" BFV
16" BFV NC
VALVE VAULT
16" DIP TO HIGH LEVEL AREA
12" GV
14" BFV (TYP 3)
24" BFV
24" DIP
24" PVC
8" SURGE VALVE
18" BFV (TYP 3)
24" INLET
4" SUBDRAINS
12" BFV
4" PVC
24" OUTLET
24" BY-PASS BFV
6" CHECK VALVE
24" HOT TAP GV
12" DRAIN
8" SANITARY SEWER SERVICE
24" OVERFLOW & DRAIN LINE
12" DIP TO HIGH LEVEL SERVICE AREA
6" MATHESON HIGH LEVEL
12" STEEL
TO HIGH LEVEL SERVICE AREA

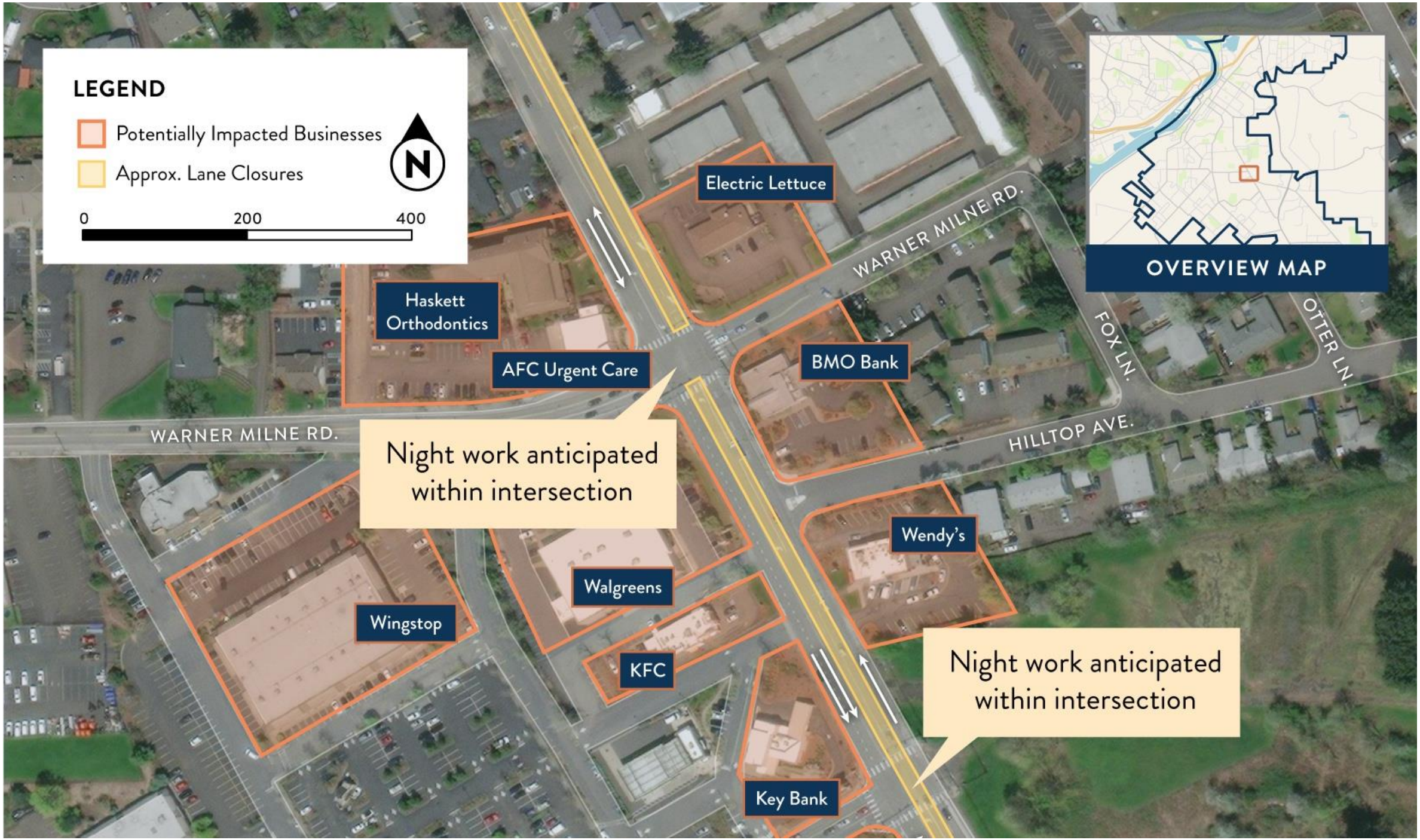

KUBOTA
HILTI
Connection Point



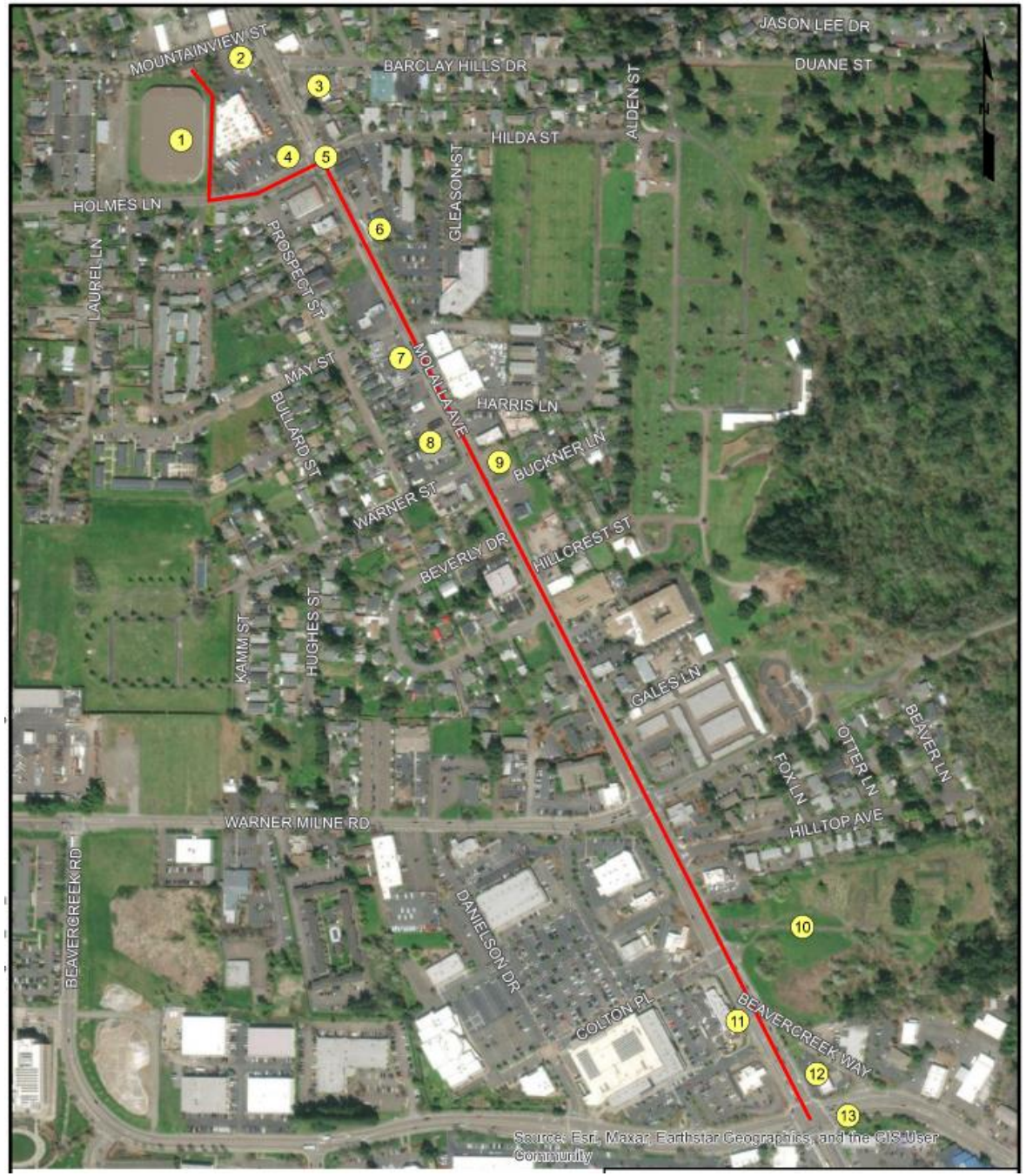
SECTION A–A (WATERLINE CONSTRUCTION)

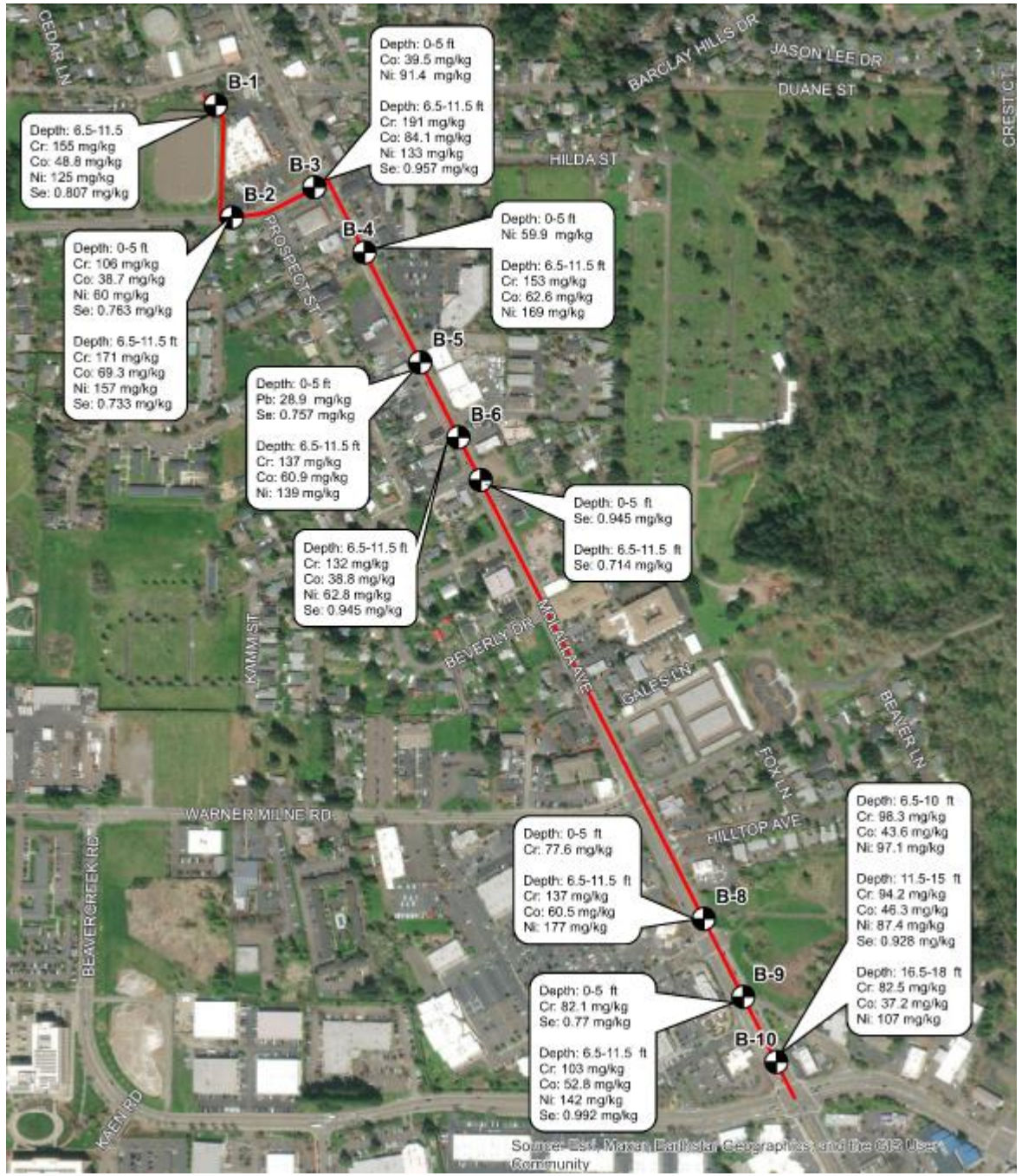


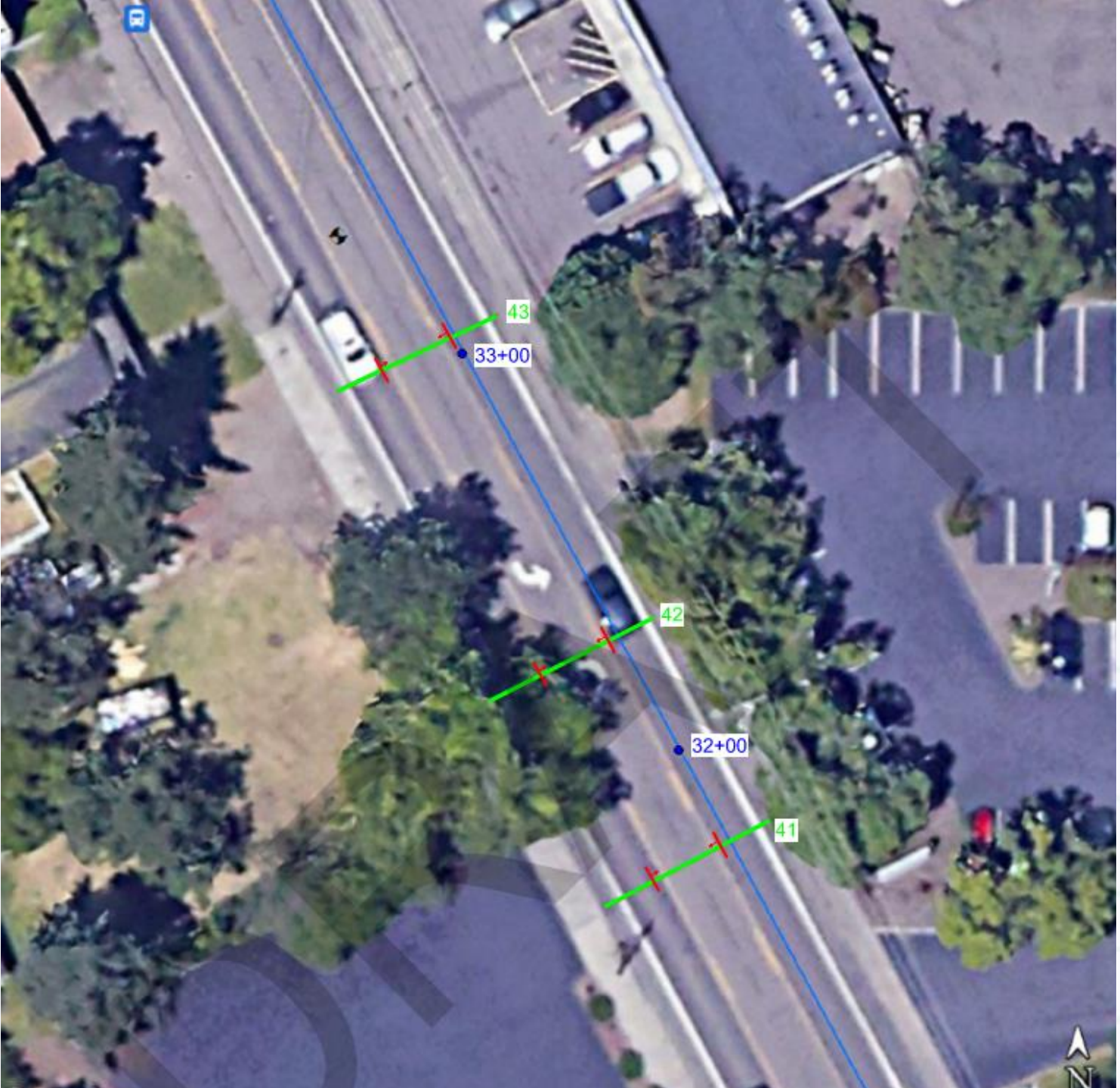
SECTION B–B (ROADWAY RESTORATION)


LEGEND
Potentially Impacted Businesses
Approx. Lane Closures
0
200
400
N
OVERVIEW MAP
Electric Lettuce
Haskett Orthodontics
AFC Urgent Care
BMO Bank
WARNER MILNE RD.
FOX LN.
OTTER LN.
HILLTOP AVE.
WARNER MILNE RD.
Night work anticipated within intersection
Wendy's
Walgreens
Wingstop
KFC
Night work anticipated within intersection
Key Bank

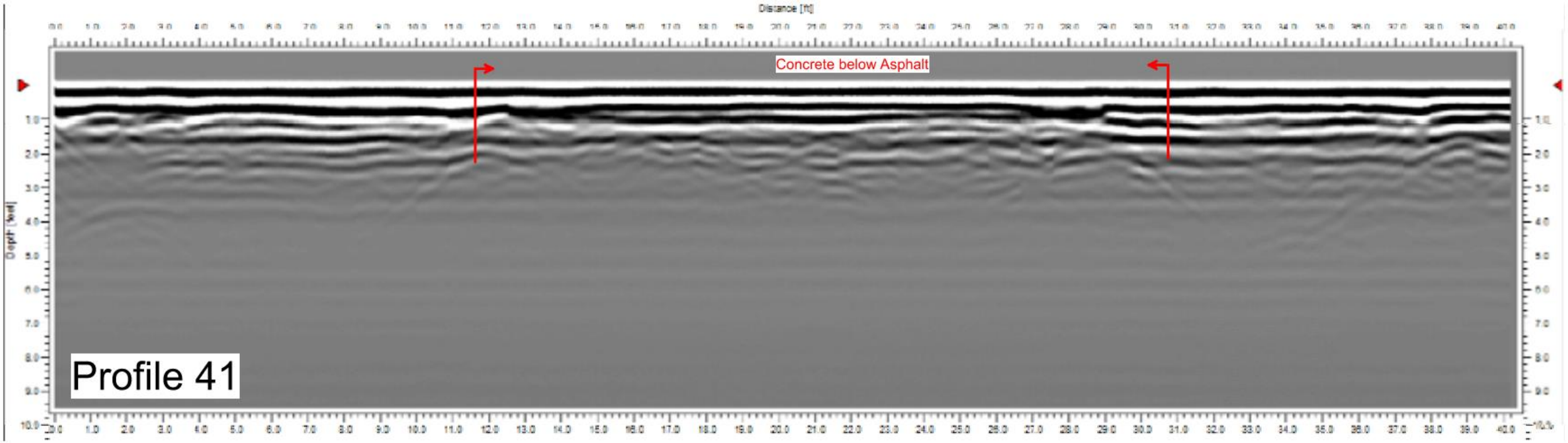

Molalla Av
RED SOILS PROFESSIONAL PLAZA
FOR LEASE
274.0211
US bank

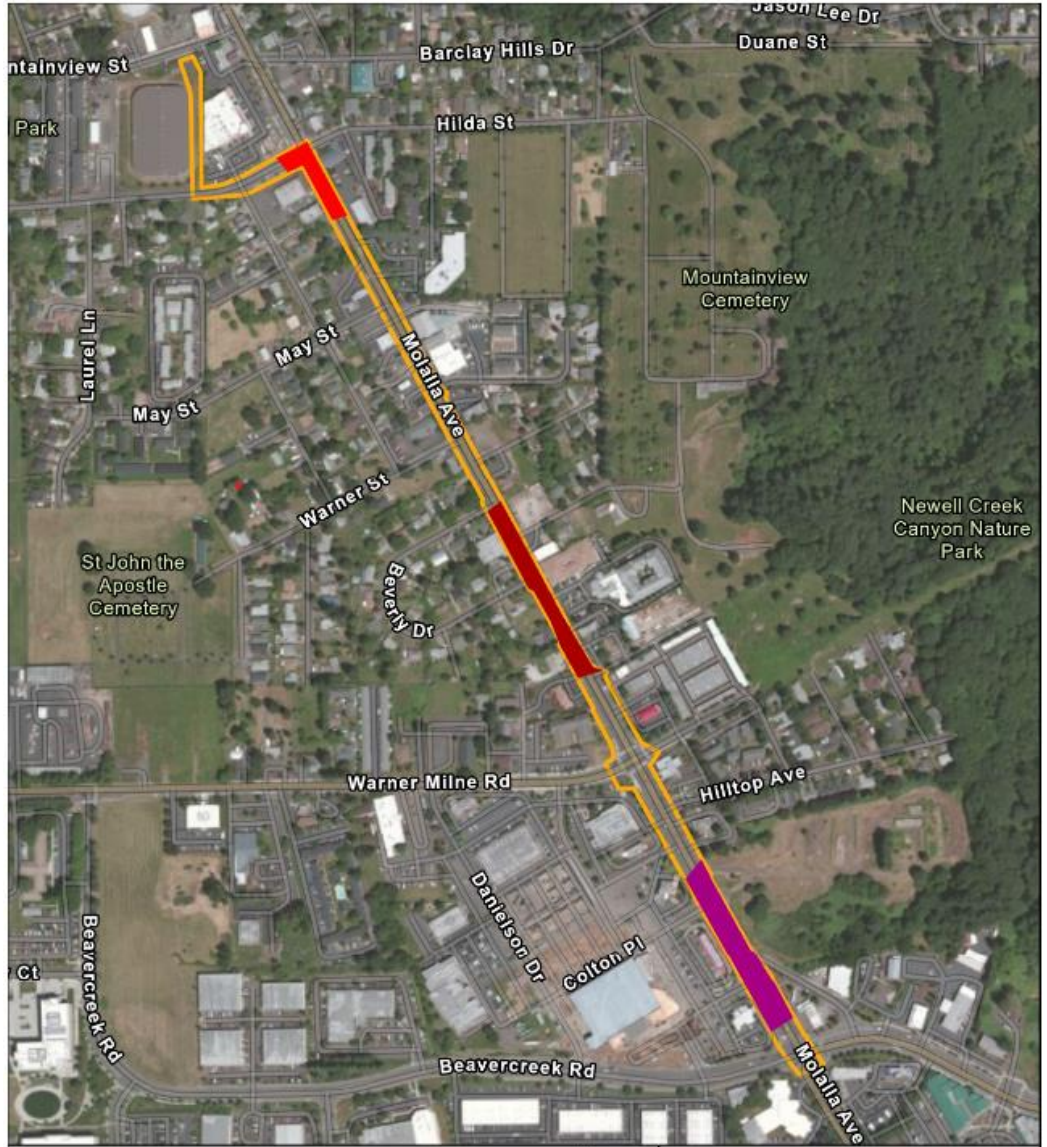

MOUNTAINVIEW ST
BARCLAY HILLS DR
JASON LEE DR
DUANE ST
ALDEN ST
HILDA ST
HOLMES LN
LAUREL LN
PROSPECT ST
GLEASON ST
MAY ST
BULLARD ST
MOLALLA AVE
HARRIS LN
BUCKNER LN
WARNER ST
BEVERLY DR
HILLCREST ST
KAMM ST
HUGHES ST
GALES LN
FOX LN
OTTER LN
BEAVER LN
WARNER MILNE RD
HILLTOP AVE
BEAVERCREEK RD
DANIELSON DR
COLTON PL
BEAVERCREEK WAY
1
2
3
4
5
6
7
8
9
10
11
12
13
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


CEDAR LN
BARCLAY HILLS DR
JASON LEE DR
DUANE ST
CREST CT
HILDA ST
PROSPECT ST
KAMM ST
BEVERLY DR
MOLALLA AVE
GALES LN
FOX LN
BEAVER LN
WARNER MILNE RD
HILLTOP AVE
BEAVERCREEK RD
KAEMI RD
B-1
B-2
B-3
B-4
B-5
B-6
B-8
B-9
B-10
Depth: 6.5-11.5
Cr: 155 mg/kg
Co: 48.8 mg/kg
Ni: 125 mg/kg
Se: 0.807 mg/kg
Depth: 0-5 ft
Co: 39.5 mg/kg
Ni: 91.4 mg/kg
Depth: 6.5-11.5 ft
Cr: 191 mg/kg
Co: 84.1 mg/kg
Ni: 133 mg/kg
Se: 0.957 mg/kg
Depth: 0-5 ft
Cr: 106 mg/kg
Co: 38.7 mg/kg
Ni: 60 mg/kg
Se: 0.763 mg/kg
Depth: 6.5-11.5 ft
Cr: 171 mg/kg
Co: 69.3 mg/kg
Ni: 157 mg/kg
Se: 0.733 mg/kg
Depth: 0-5 ft
Ni: 59.9 mg/kg
Depth: 6.5-11.5 ft
Cr: 153 mg/kg
Co: 62.6 mg/kg
Ni: 169 mg/kg
Depth: 0-5 ft
Pb: 28.9 mg/kg
Se: 0.757 mg/kg
Depth: 6.5-11.5 ft
Cr: 137 mg/kg
Co: 60.9 mg/kg
Ni: 139 mg/kg
Depth: 6.5-11.5 ft
Cr: 132 mg/kg
Co: 38.8 mg/kg
Ni: 62.8 mg/kg
Se: 0.945 mg/kg
Depth: 0-5 ft
Se: 0.945 mg/kg
Depth: 6.5-11.5 ft
Se: 0.714 mg/kg
Depth: 0-5 ft
Cr: 77.6 mg/kg
Depth: 6.5-11.5 ft
Cr: 137 mg/kg
Co: 60.5 mg/kg
Ni: 177 mg/kg
Depth: 6.5-10 ft
Cr: 96.3 mg/kg
Co: 43.6 mg/kg
Ni: 97.1 mg/kg
Depth: 11.5-15 ft
Cr: 94.2 mg/kg
Co: 46.3 mg/kg
Ni: 87.4 mg/kg
Se: 0.928 mg/kg
Depth: 16.5-18 ft
Cr: 82.5 mg/kg
Co: 37.2 mg/kg
Ni: 107 mg/kg
Depth: 0-5 ft
Cr: 82.1 mg/kg
Se: 0.77 mg/kg
Depth: 6.5-11.5 ft
Cr: 103 mg/kg
Co: 52.8 mg/kg
Ni: 142 mg/kg
Se: 0.992 mg/kg
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



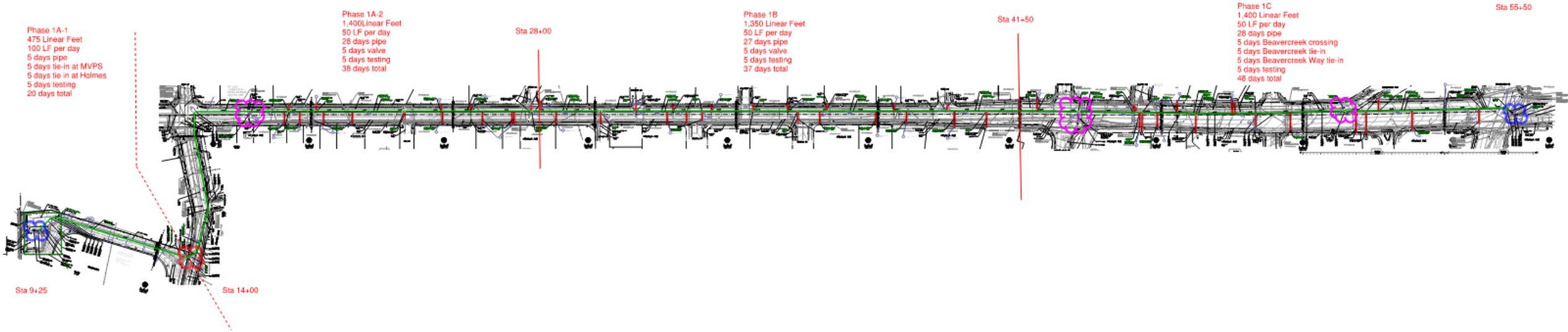
Ground Penetrating Radar used to identify extents of historic “Farm to Market” Road


Distance [ft]
Concrete below Asphalt
Depth [feet]
Profile 41

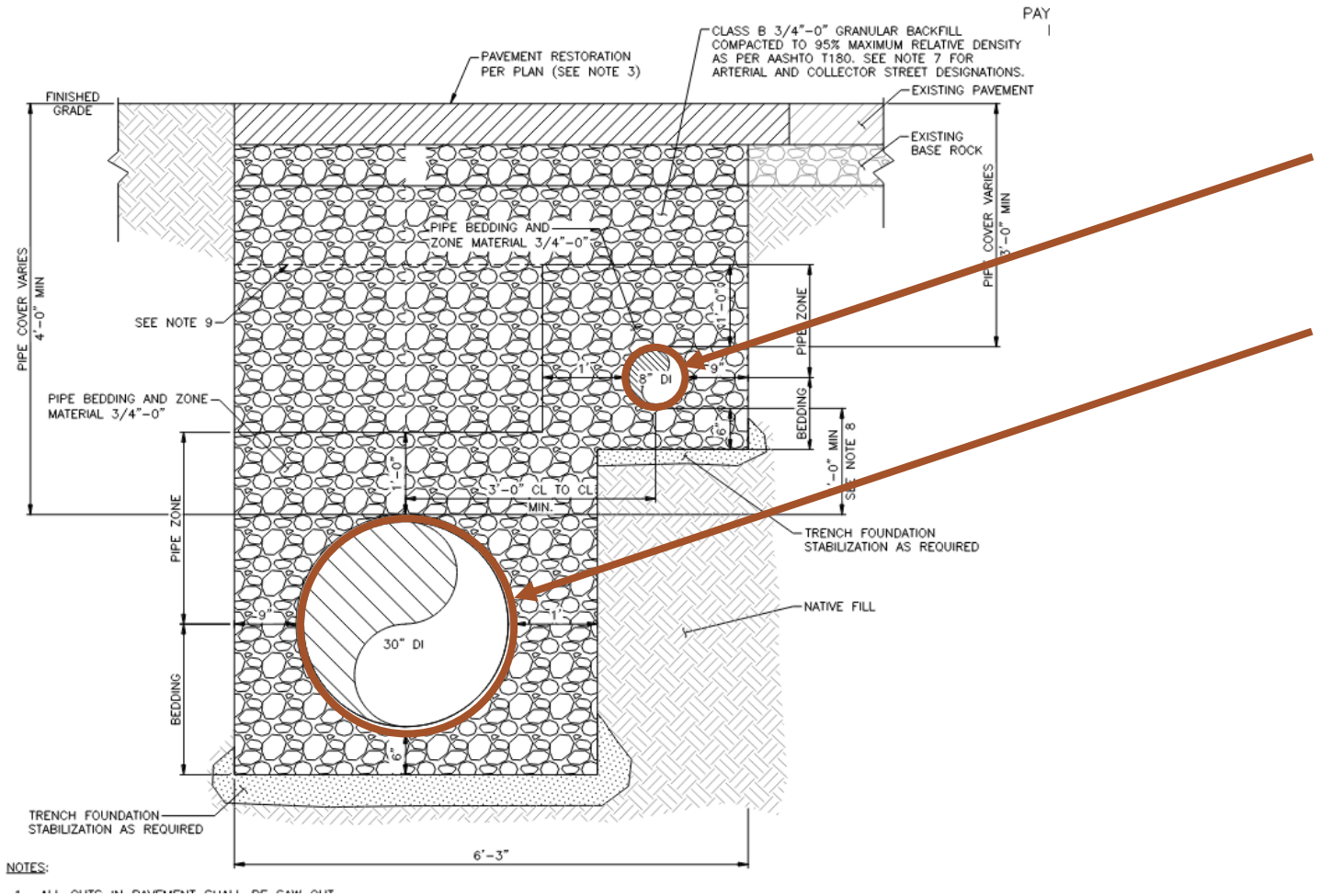

Jason Lee Dr
Barclay Hills Dr
Duane St
ntainview St
Park
Hilda St
Mountainview Cemetery
Laurel Ln
May St
May St
Molalla Ave
Warner St
Newell Creek Canyon Nature Park
St John the Apostle Cemetery
Beverly Dr
Warner Milne Rd
Hilltop Ave
Danielson Dr
Colton Pl
Beavercreek Rd
Ct
Beavercreek Rd
Molalla Ave
MOLALLA 24-INCH TRANSMISSION MAIN
WIFIA 3-1
OREGON CITY
CLACKAMAS COUNTY, OREGON
Project Location
N
0
400
m
ft
0
1:6,827
1,100
T3S, R2E;
Section 5
Willamette Meridian
USGS Topographic 7.5 Minute
Oregon City, OR (2017) Quadrangle Map
USGS Topoview (https://ngmdb.usgs.gov/topoview)
Hybrid Reference Layer: Esri Community Maps Contributors, Oregon Metro, Oregon State Parks, State of Oregon GEO, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA,
Figure MP-1 (Tetra, 4/19/2024)
Area of Potential Ground Disturbance
Name
A
B
C



Scheduling and Sequencing



Shared Trench to Minimize Disruption



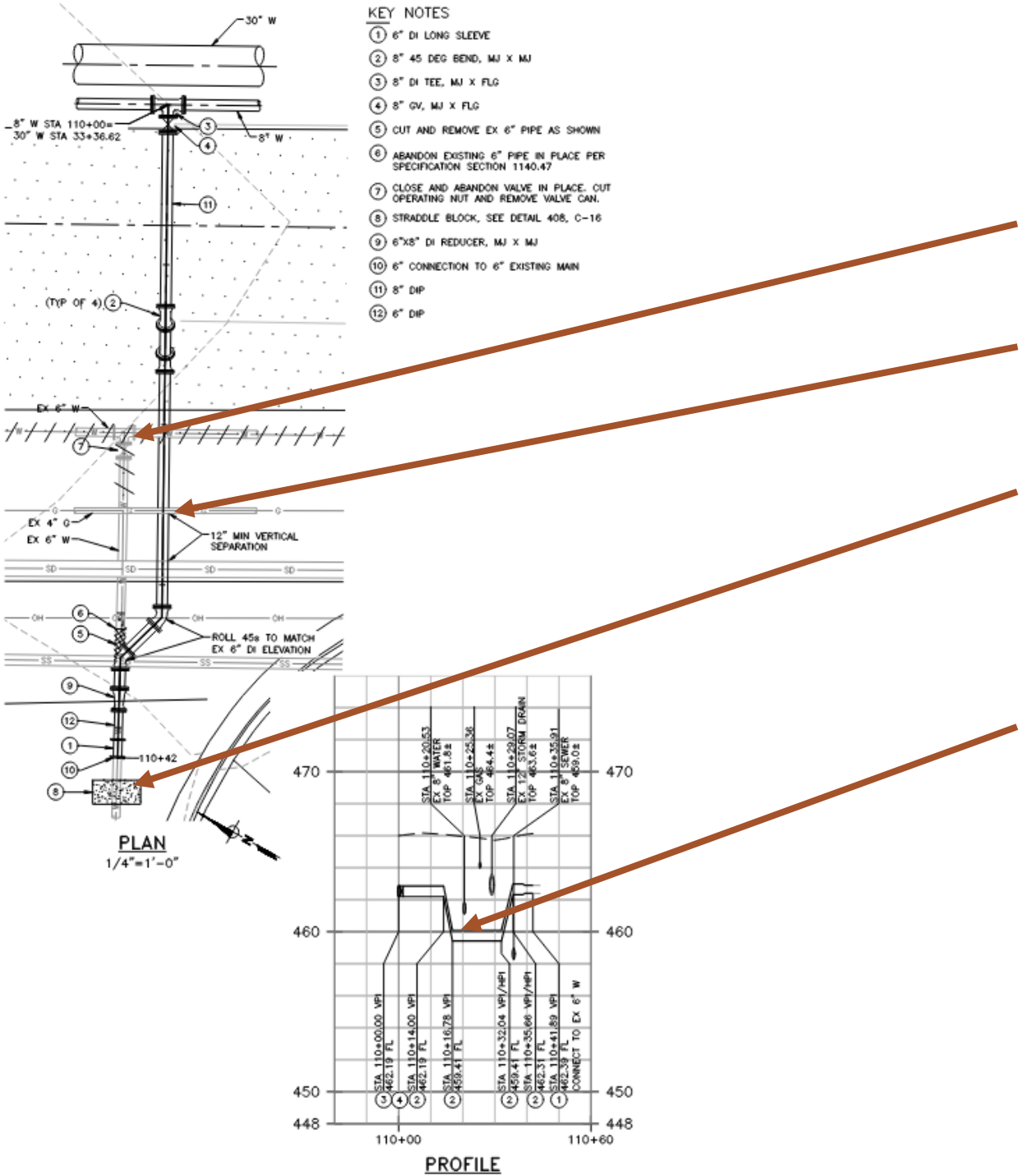
Shallow distribution piping allows for side street connections, hydrants, and services

Deeper transmission main avoided utility conflicts and crossings

Shared pipeline stationing saved design time and staking costs







Surveys to valve nuts identified water main depths

Strategic potholing of parallel utilities identified typical depths for crossings

Straddle blocks for protecting existing piping

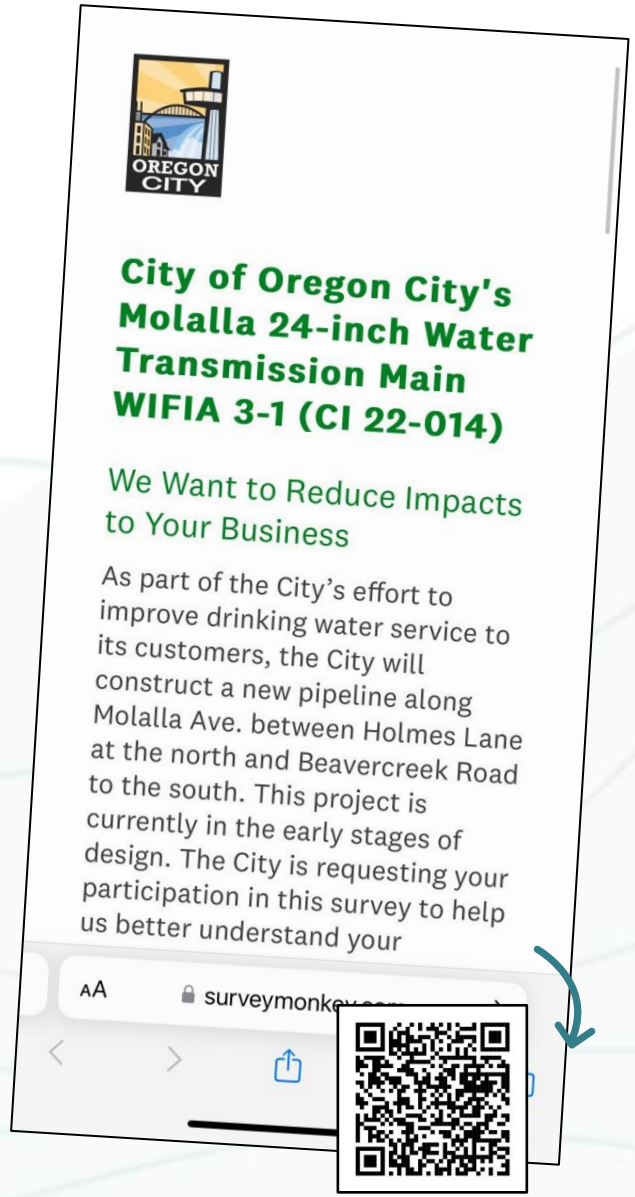
Contractor prepared with small diameter fittings to make connections with minimal traffic impacts

Quick Survey

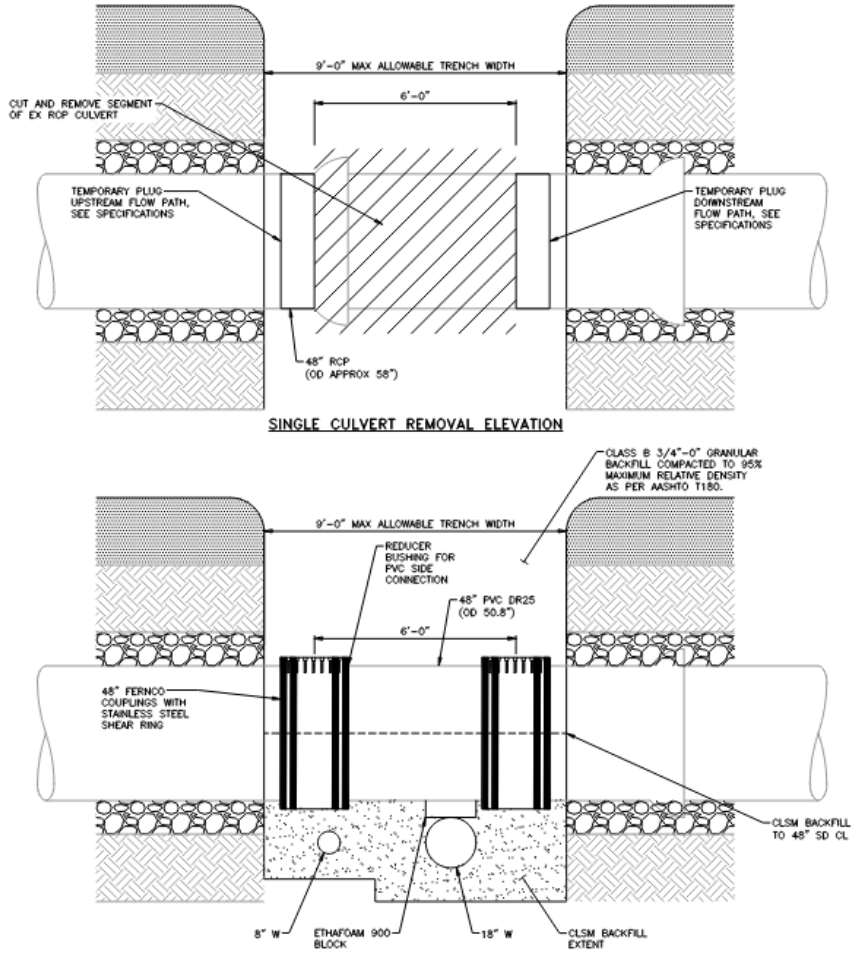
- We want to work with businesses to reduce construction impacts to the degree possible.
- Take a 5-minute survey to give the City the information needed to help do that.

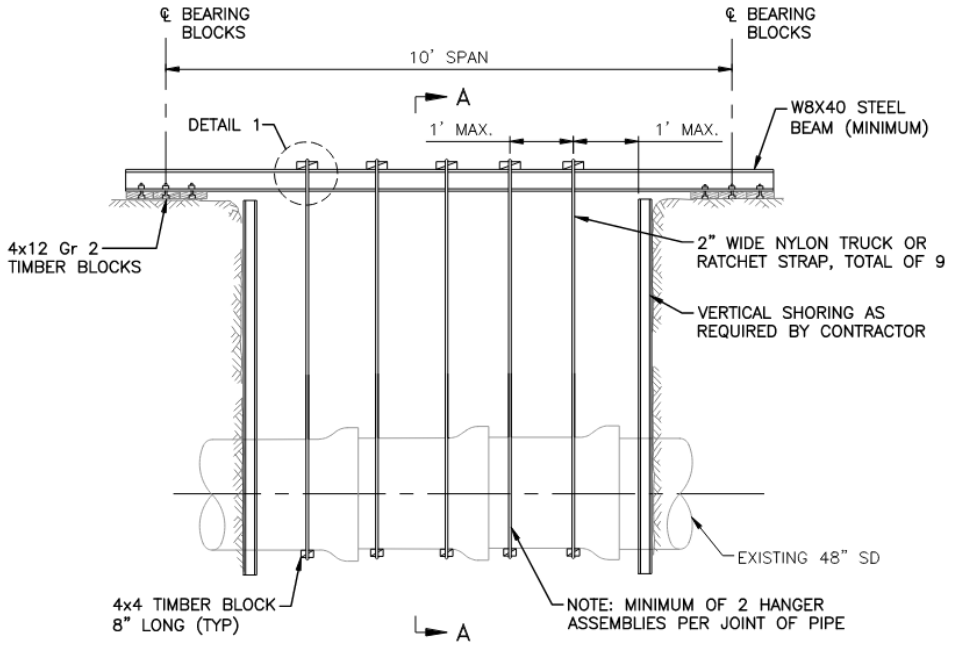
TABLE 1170.41.B Services Potentially Impacted During Distribution Connections

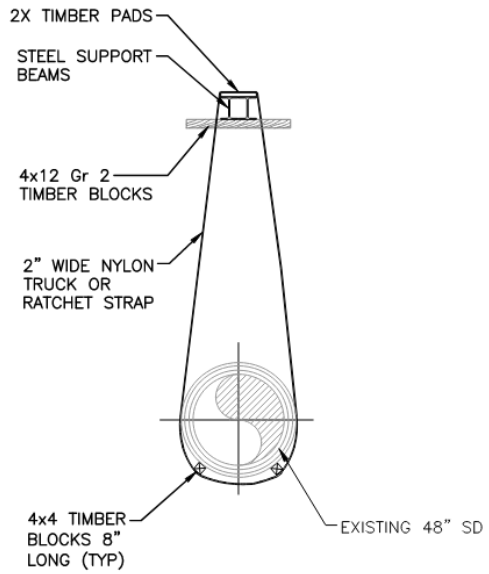
Connection Location Causing Outage	Potentially Impacted Service Address	Scheduling Constraints
Holmes Ln	618-620 Holmes Ln	Residential
Holmes Ln	904 Prospect St	Residential
May St	403 May St	Residential
May St	404 May St	Residential
May St	952-956 Molalla Ave	Dominoes Pizza: M-F 10:30AM-12AM, Sat-Sun 10:30AM-1AM
Harris Ln	1015 Molalla Ave	Pacwest Drywall, Apex Motosports: 7 Days/Week 8AM-8PM El Papalote: Hours unknown
Harris Ln	1017 Molalla Ave	Summit Suites Businesses: Cascade Smiles, Crossroads Insurance, Connection Wellness M-F 8AM-5PM



Culvert Crossing in Beavercreek Road







Pre-Bid Outreach Produced Competitive Results

MOLALLA TRANSMISSION MAIN WIFIA 3-1 (CI 22-014)
Bid Opening : NOVEMBER 13, 2024, 2 PM
Engineer's Estimate $7.3 million

Bids	Company	Total Amount	Rank	First Tier
1	Interlaken, Inc.	$8,355,798.50	7	✓
2	Trench Line Excavation, Inc.	$7,376,087.33	4	✓
3	Nutter Corporation	$8,273,306.50	6	✓
4	JW Fowler	$8,590,500.00	9	✓
5	Canby Excavating	$7,697,425.23	5	✓
6	Icon Construction & Dev.	$10,821,250.00	10	
7	K&E Excavating	$7,278,195.00	3	✓
8	Emery & Sons	$7,011,261.00	1	✓
9	Rotschy Inc.	$7,076,671.00	2	✓
10	Moore Excavation	$8,428,971.50	8	✓

Winning Bid – Emery & Sons $7,011, 261

Second Bid within 1% of winning bid

Top Four bids within 5% of winning bid and under Engineer's Opinion of Probable Construction Costs

Risk Mitigation During Construction

Jason



OREGON CITY

DOWL

EMERY&SONS CONSTRUCTION GROUP, LLC

WSC

Contaminated Media

SHANNON & WILSON

Table 1: Metals in Soil Analytical Results

Lab Sample ID						L1667395-01		L1667395-02		L1667395-03	
Client Sample ID						B-1-0-5		B-1-6.5-11.5		B-2-0-5	
Date Collected						10/12/2023		10/12/2023		10/12/2023	
Method	Analyte	Units	OR DEQ Clean Fill Screening Levels for Metals - Portland Basin (June 2019)	OR Construction Worker Soil Ingestion Dermal Contact and Inhalation RBC June 2023	OR Excavation Worker Soil Ingestion Dermal Contact and Inhalation RBC June 2023	Result	Qualifier	Result	Qualifier	Result	Qualifier
6020B	ARSENIC	mg/kg	8.8	15	420	3.22		1.17	J	4.04	
6020B	BARIUM	mg/kg	790	69,000	NE	95		254		233	
6020B	CADMIUM	mg/kg	0.63	350	9,700	<0.104		<0.132		<0.116	
6020B	CHROMIUM	mg/kg	76	NE	NE	32.2		**155**		**106**	
6010D	CHROMIUM	mg/kg	NE	NE	NE			<0.100		<0.100	
6020B	COPPER	mg/kg	34	14,000	390,000	31		**48.8**		**38.7**	
6020B	LEAD	mg/kg	28	800	800	8.59		3.37		9.83	
6020B	NICKEL	mg/kg	47	7,000	190,000	24.7		**125**		**60**	
6020B	SELENIUM	mg/kg	0.71	NE	NE	0.486	J	**0.807**	J	**0.763**	J
6020B	SILVER	mg/kg	0.82	1,800	49,000	<0.105		<0.133		<0.117	
6020B	ZINC	mg/kg	180	NE	NE	138		115		45.2	
7471B	MERCURY	mg/kg	0.23	110	2,900	<0.0218		<0.0277		<0.0244	

NOTES:

- Analyte detected

BOLD - Analyte detected exceeds criteria

Not analyzed by method

J: The identification of the analyte is acceptable; the reported value is an estimate.

J3: The associated batch QC was outside the established quality control range for precision.

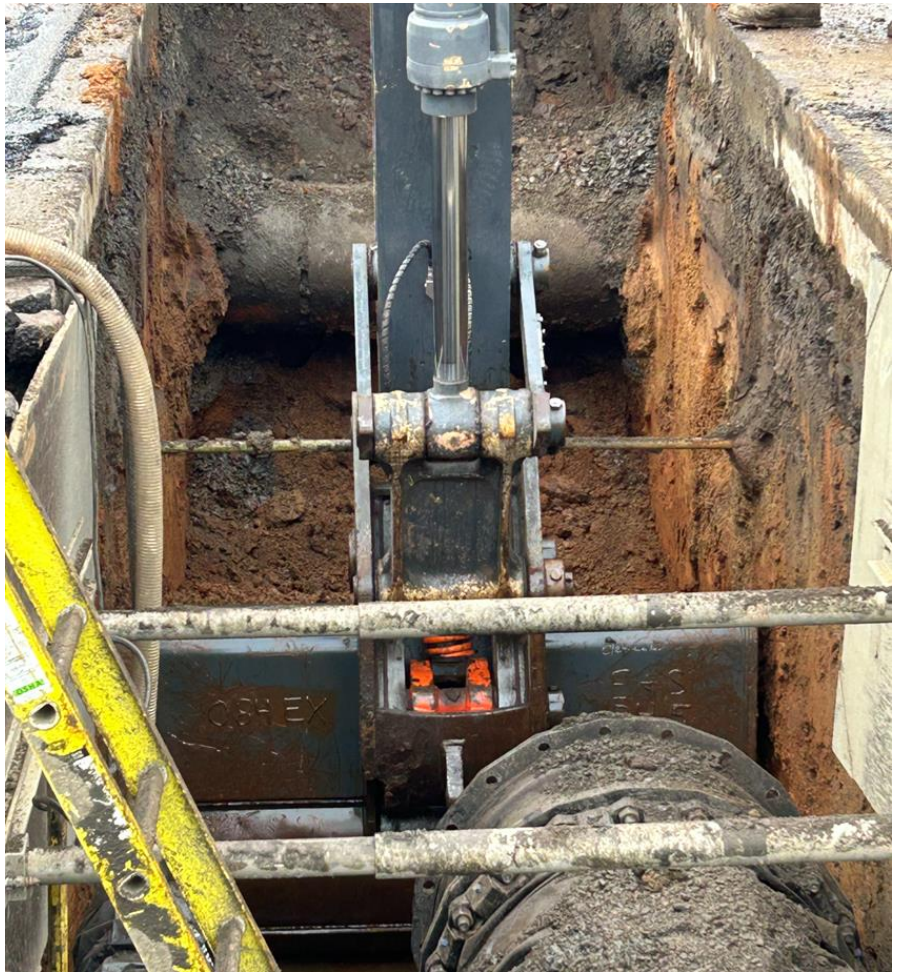
J5: The sample matrix interfered with the ability to make any accurate determination; spike value is high

J6: The sample matrix interfered with the ability to make any accurate determination; spike value is low

O1: The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.

NE - Not established

Non-detected values are reported based on their method-detection limit



Boulder and Rock Excavation



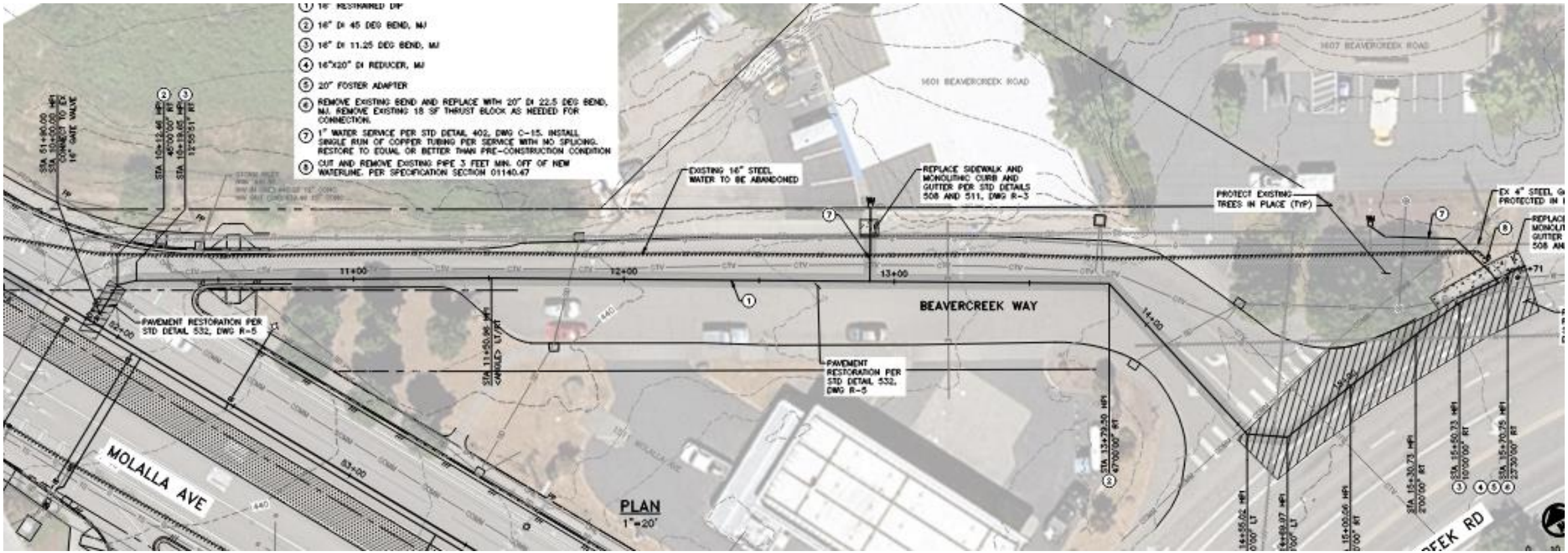


Beavercreek Way





Beavercreek Way



Beavercreek Road Culvert Support



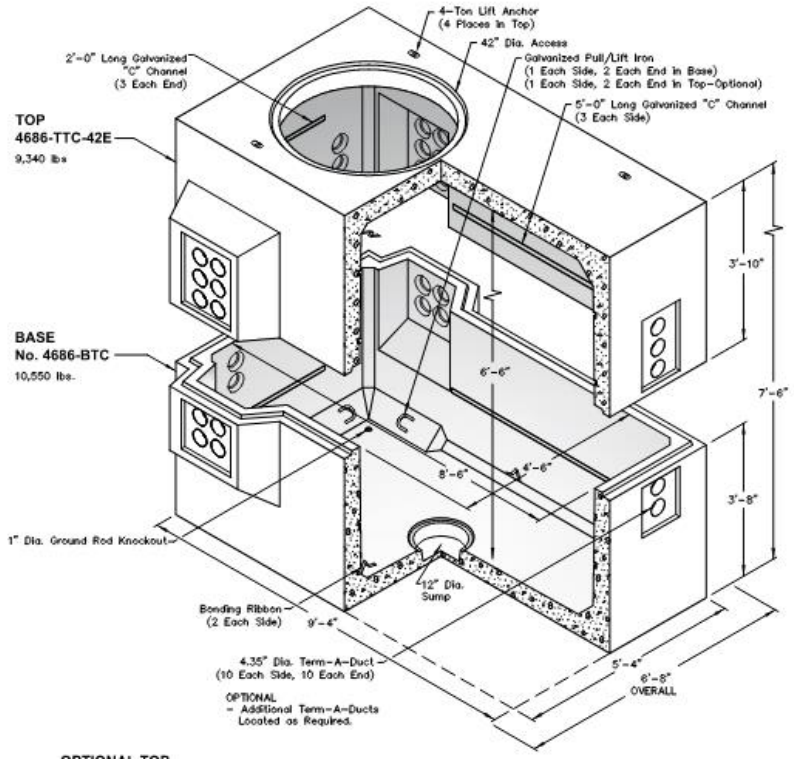


Services – Horizontal Directional Drilling



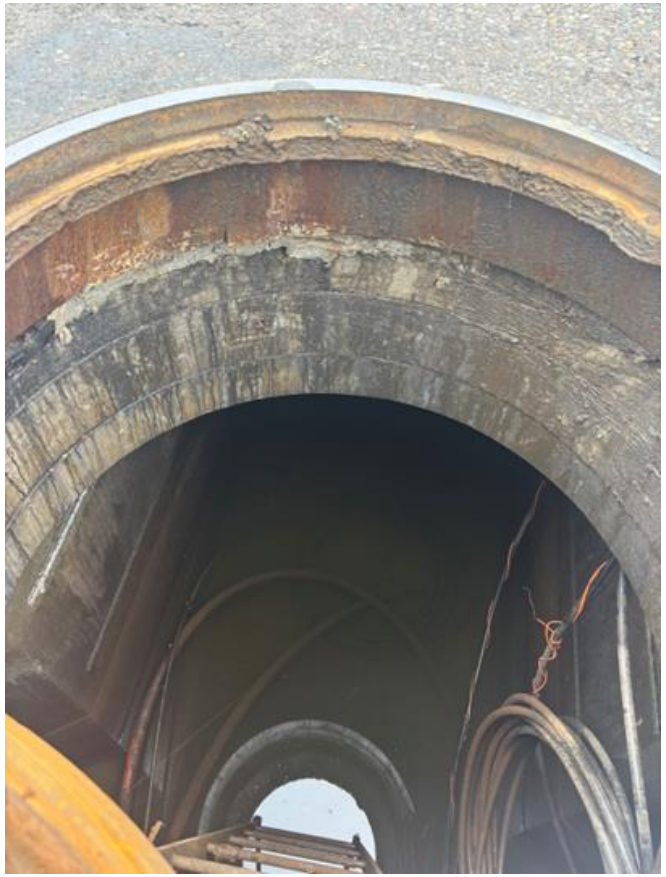


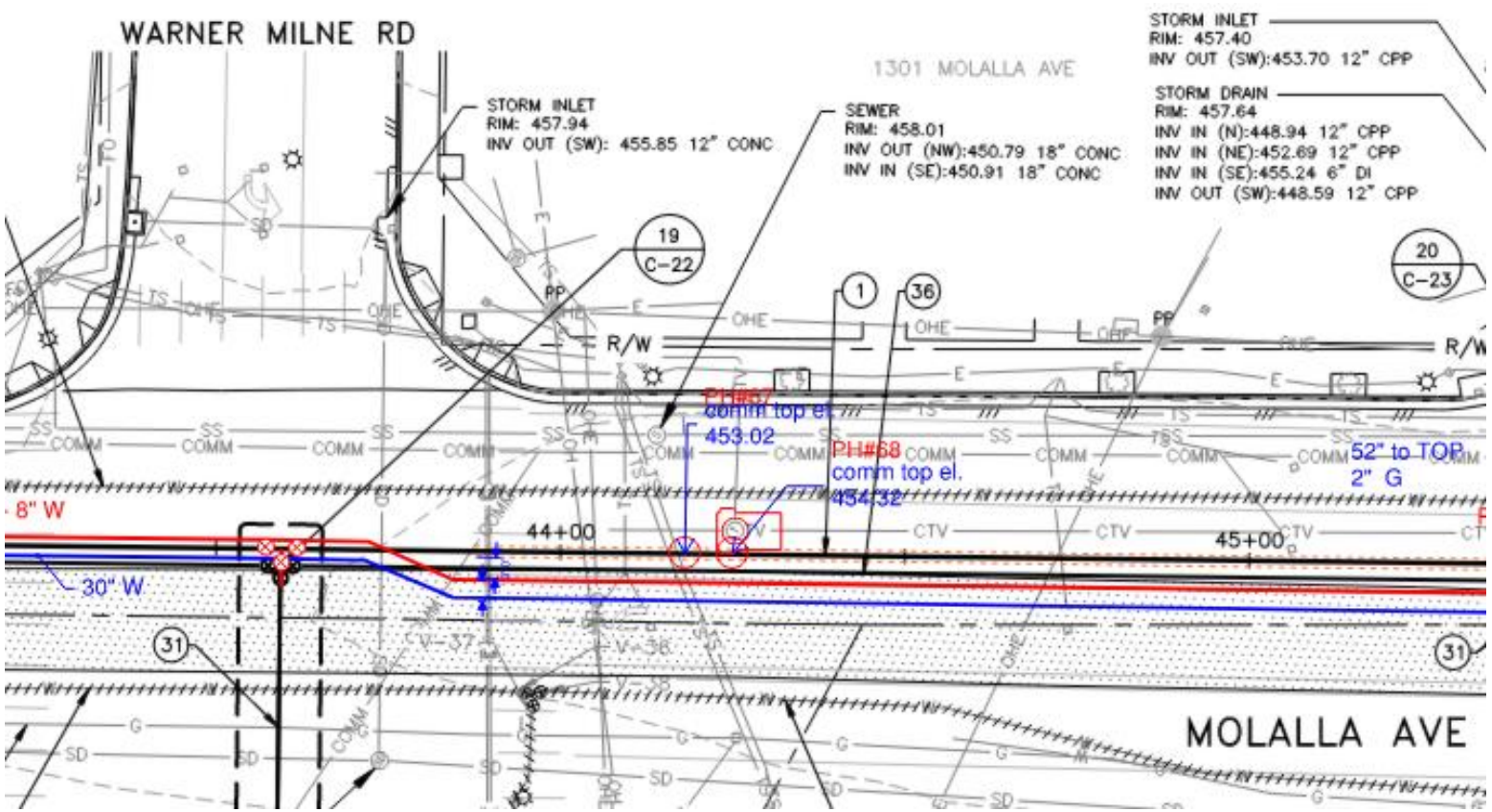
Vault Conflict





Vault Conflict





Staging Area Permitting





Flushing and Testing





Tie-in to Mountainview





Lessons Learned

- Good utility research and strategic field investigation reduced risk
- Helpful to have extra details for connections – showed complexity of crossing multiple utilities
- Phase 2 Sampling: Make sure you have enough sampling to characterize entire alignment.
- 1200-C Erosion and Sedimentation Permit: Now requires contractor procured staging areas. Better to transfer permit to Contractor to deal with changes
- Focus on highest risks improved bid results and traffic impacts
- Engineered traffic control plans informed alignment and required night work
- Public outreach to businesses informed project constraints for service outages



Questions?

