



Flanders Crossing

Feasibility Study + Alternatives Analysis

PBOT Bridges and Structures
November 2015



PBOT
PORTLAND BUREAU OF TRANSPORTATION

Flanders Crossing

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NOVEMBER 2015

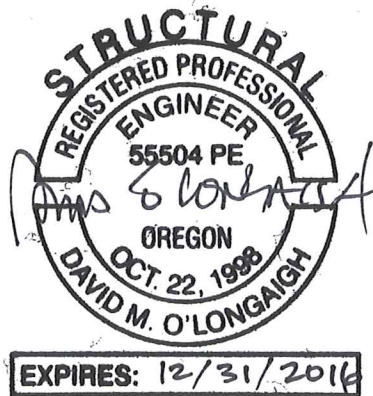


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Executive Summary

PBOT has undertaken a feasibility study and alternatives analysis for a new active pedestrian and bicycle bridge over I-405 at NW Flanders Street in Portland. The bridge is required to provide the residents of the NW District and the Pearl District a safer active crossing over I-405.

Six alternative designs were developed and assessed by both PBOT and Community stakeholders using the Sustainable Development principles of the Triple Bottom Line (TBL). This approach places equal emphasis on how the bridge design affects the equity of its constituents, the natural and built environment, and short and long term economics of the project. This approach is also known as balancing the needs of the 3 P's: People, Planet and Prosperity.

It was recognized that in addition to selecting a bridge design that best satisfies the established TBL criteria, the bridge should also be able to function as an alternate seismic resilient route for emergency vehicles following an earthquake.



Artist rendering of Flanders Crossing Preferred Alternative C

After analyzing the feedback from the multi-disciplined evaluation team, the preferred alternative was identified as ALTERNATIVE C – a 24 ft. wide, single span custom steel bridge as shown above, at an estimated project cost of \$6,009,656.

This bridge was generally seen as the ideal model for complying with Vision Zero safety principles, while also minimizing the disruptive impacts on the public during construction. The bridge also has the potential to be customized for local aesthetic appeal while still being relatively economical to build and maintain over the long term. Lastly, the configuration can be planned to allow for use by both active user and emergency vehicle responders during post-earthquake recovery operations.

Almost since the construction of the I-405 freeway in 1969, a safer connection for pedestrians and bicyclists from NW District to Pearl District was warranted. The existing crossings over I-405 at NW Everett St. and NW Glisan St. are highly congested at peak hours, do not provide adequate pedestrian and bicycle facilities, and are located in the heart of a busy freeway ramp network.

A map of a section of Portland, Oregon, centered around the intersection of Northwest Everett Street and West Burnside Street. A thick blue horizontal line runs across the middle of the map, representing the proposed crossing. An orange circle highlights the intersection point, with an orange arrow pointing down from it towards the text "PROPOSED FLANDERS CROSSING". The map shows several streets labeled: NW 25TH AVE, NW 21ST AVE, NW 18TH AVE, NW 15TH AVE, NW WEST OLYMPIA RD, NW CLATSOP ST, NW EVERETT ST, W BURNSIDE ST, SW PARK PL, SW COLUMBIA ST, SW SALMON ST, SW THIRD AVE, and TOPAWAY. A highway shield for I-5 is visible near the top center. The background features a grid of yellow street lines and green areas representing parks or undeveloped land.

An aerial photograph of a multi-lane highway, likely I-75 in Atlanta, Georgia. The highway has multiple lanes in both directions, separated by a median. A white circle is drawn on the right side of the highway, highlighting a specific area. The surrounding area includes various buildings, trees, and a bridge crossing the highway. The image is a screenshot from a Google Street View map.

Site Constraints

There are a number of unique challenges at this site that affect the type, size and location of the bridge design selected. The following constraints were identified early on in the scoping process to avoid the expenditure of time and resources on alternatives that would not be feasible:

- Proposed bridge crosses over interstate freeway with approximately 100,000 vehicles per day
- Traffic impacts during construction could adversely affect the freeway and local street users
- Site requires approximately 200 foot long bridge
- Required 17'-4" vertical clearance to freeway below limits structure types
- New bridge should be built to current seismic design standards
- Available "landing space" at NW 16th is limited for safe connections to transportation network
- Partial demolition of existing ODOT retaining walls will be required

Guiding Principles & Evaluation Criteria

In order to evaluate the proposed six bridge design alternatives, PBOT has used the guiding principles of Sustainable Development, which was first explored in 1987 by the United Nations in a report called Our Common Future. Initially defined as *development that meets the needs of the present without compromising the ability of future generations to meet their own needs*, sustainable development has evolved into the more defined Triple Bottom Line (TBL). The aim is to meet, with equal parity, the following:

- Equity of all constituents
- Environmental concerns
- Economic prosperity

They are presented in this study as the Three P's: People, Planet, and Prosperity. Where these three areas converge on an balanced solution, is likely to have a lasting sustainable design.

PEOPLE	PLANET	PROSPERITY
Alternatives evaluation will include factors that consider community safety and construction impacts	Environmental & aesthetic impacts will be considered during the alternatives evaluation process	Both short and long term costs and financial risks will be included in the evaluation criteria

The Triple Bottom Line criteria as outlined below, were used on this project as the basis for comparison and evaluation of alternatives, and the selection of the locally preferred alternative.

PEOPLE

Bridge type embraces Vision Zero transportation safety principles: PBOT aims to make Portland's transportation system the safest possible and to move towards zero traffic-related deaths or serious injuries. The Flanders Crossing Bridge should be designed to embrace Vision Zero principles by incorporating crosswalk strategies and alignments to protect the most vulnerable transportation users.

Bridge type reduces construction delays and impacts on community: Traffic disruptions during construction can increase travel times for users, as well as cause excessive noise and emissions locally. The project aims to reduce the impacts to the traveling public during construction of the bridge.

Bridge type provides positive user experience and/or valuable use of public space: The Flanders Crossing Bridge will not be designed for automobile use. It is desired that the design of this rare urban public space be enhanced for its users, rather than simply designed to convey bicyclists and pedestrians over the freeway.

PLANET

Bridge type provides aesthetic value: Not every bridge is considered equal when it comes to its appearance. The look and feel of the bridge and how it interacts with the surrounding environment is an important factor in alternatives development for the Flanders Crossing.

Bridge type limits carbon footprint and greenhouse gas emissions during construction: Alternatives will be evaluated against their relative carbon footprint and greenhouse gas emissions during construction. Materials selection and construction-induced congestion would have direct impacts to greenhouse gas emissions and project carbon footprint.

Bridge type preserves local character: The ability of the bridge to suit the context and existing character of the area is important. It should be designed and built to avoid incompatibility with character of the locale.

PROSPERITY

Bridge type limits initial construction cost and risk: Ultimately, the economic bottom line is an important factor in most transportation projects. As many transportation professionals aspire to design and build signature type bridge projects, it is important to balance the project cost with the need. Additionally, conventional design and construction methods generally result in lower risk to cost increases during construction.

Bridge type minimizes future operation and maintenance costs: The ever increasing costs to operate and maintain infrastructure assets to the end of their useful life is often not considered during the design phase. Given the reduced budgets for the operation and maintenance of bridges, the cost to perform such work should be considered during the alternatives evaluation process.

Bridge type provides capacity for sustainable growth: It is important that the bridge design selected have sufficient capacity to accommodate user growth over the next century of continual use, as people turn to active transportation to avoid the congestion of gridlocked streets.





Estimated Project Cost | \$4,046,606

Alternative A

16 FT WIDE SINGLE SPAN STANDARD TRUSS BRIDGE



Estimated Project Cost | \$4,166,155

ALTERNATIVE B

16 FT WIDE TWO SPAN CONCRETE BRIDGE



Estimated Project Cost | \$6,009,656

PREFERRED ALTERNATIVE

ALTERNATIVE C

24 FT WIDE SINGLE SPAN CUSTOM STEEL BRIDGE



Estimated Project Cost | \$6,917,414

ALTERNATIVE D

24 FT WIDE SINGLE SPAN CABLE-STAYED BRIDGE



Estimated Project Cost | \$6,493,151

ALTERNATIVE E

14 FT WIDE SINGLE SPAN PARALLEL TRUSS BRIDGES



Estimated Project Cost | \$8,123,937

ALTERNATIVE F

60 FT WIDE TWO SPAN CONCRETE PLAZA BRIDGE

ALTERNATIVE A

16 FT WIDE SINGLE SPAN STANDARD TRUSS BRIDGE

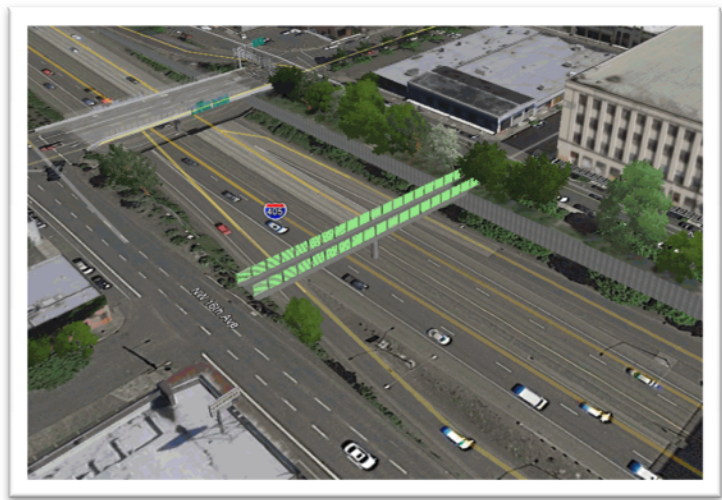
The relatively narrow single span 16 foot wide steel truss bridge consists of two steel trusses on the outside of the bridge. There are a number of examples of this bridge type around Portland, such as along the Springwater Corridor and at Chimney Park. These bridges are often made using weathering steel. This prefabricated bridge could be built quickly and at a low cost.



ALTERNATIVE B

16 FT WIDE TWO SPAN CONCRETE BRIDGE

The most common bridge type built in the region is a precast prestressed concrete girder bridge. These bridges can be built quickly and inexpensively. However, prestressed girder bridges are generally only adequate for shorter spans. Given this constraint, the Flanders Crossing Bridge would require a pier to be constructed in the freeway median below. The construction of the pier would be a major disruption to traffic on I-405.



ALTERNATIVE C

24 FT WIDE SINGLE SPAN CUSTOM STEEL BRIDGE

This alternative aims to provide the optimal target width for active users on the bridge and to clear span the freeway. The 24 foot wide configuration would allow for parallel 6 foot wide sidewalks on the outside of the bridge, and two 6 foot wide opposing bicycle lanes in the center of the bridge. The structure could be customized with aesthetic features or simple elegance to enhance its presence in the community.



ALTERNATIVE D

24 FT WIDE SINGLE SPAN CABLE-STAYED BRIDGE

A signature bridge with iconic aesthetic features can define the spirit of a location and provide inspiration to those who witness its grandeur. A cable stayed alternative is presented in this study as the most suitable signature bridge type given the project constraints. It would complement the new Tilikum Crossing. It would provide similar safety benefits to Alternative C.



ALTERNATIVE E

14 FT WIDE SINGLE SPAN PARALLEL TRUSS BRIDGES

The key feature to this alternative is the twin, or parallel, bridge concept. The two bridge configuration provides a directional separation of bicycles that would improve safety for all active users. Additionally, the proposed pedestrian area would line up with the approach sidewalks, which results in the most ADA compatible layout. The bridges could be off-the-shelf prefabricated bridges to reduce cost and construction time.



ALTERNATIVE F

60 FT WIDE TWO SPAN CONCRETE PLAZA BRIDGE

In an increasingly hectic world, accessible public spaces become even more valuable. The plaza alternative aims to provide a worthwhile public space in addition to a transportation facility. It is envisioned as a respite for the neighborhood members from the chaos of urban life. The 60 ft. width would provide ample room for a safe crossing for all active users.

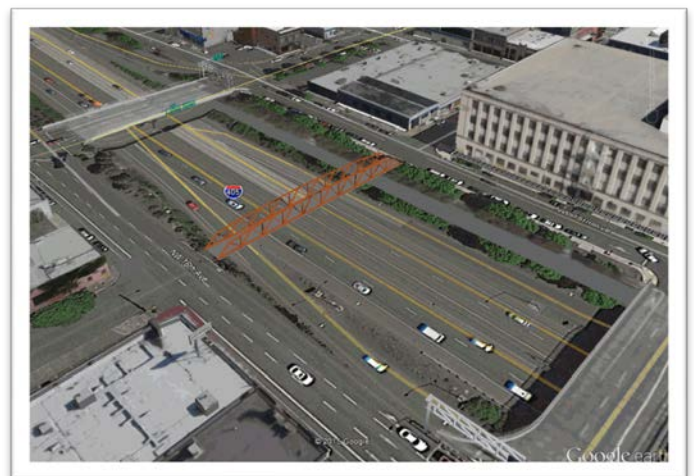
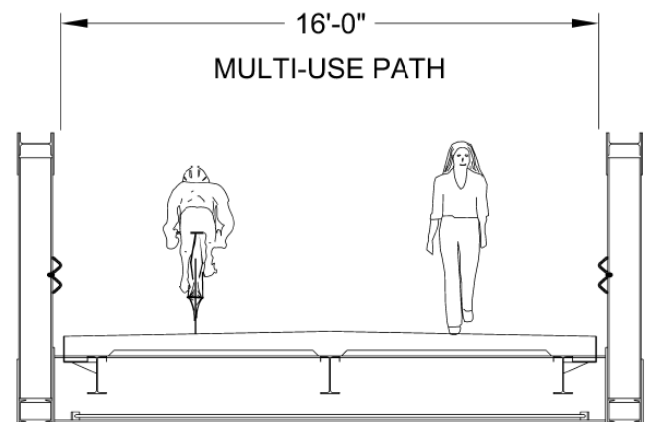
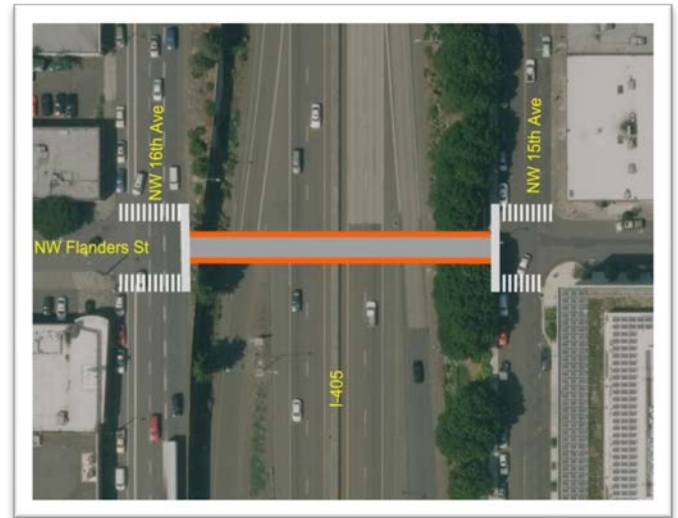


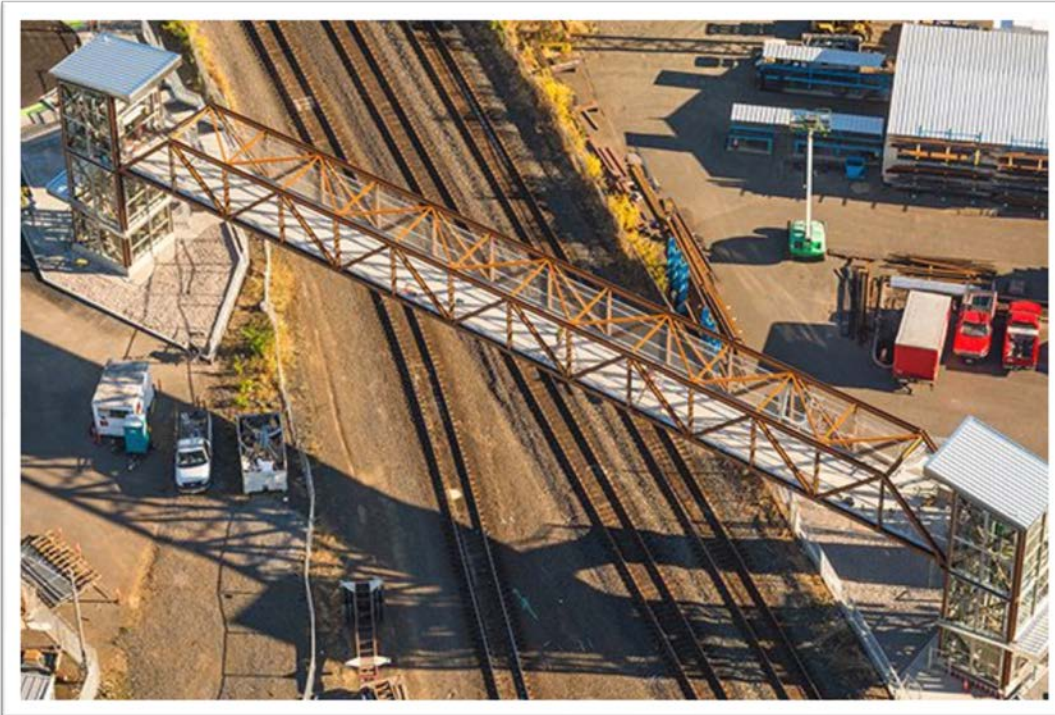
Flanders Crossing | Alternative A

16 FT WIDE SINGLE SPAN STANDARD TRUSS BRIDGE

ESTIMATED COST: \$4,046,606

EVALUATION CRITERIA		DETAILS
PEOPLE	Bridge type embraces Vision Zero public transportation principles	Narrowest facility studied. Combines bicycles and pedestrians in both directions.
	Bridge type reduces construction impacts on community (e.g. delays, congestion, emissions, and noise)	Prefabricated single span would have least amount of impacts during construction.
	Bridge type provides positive user experience and/or valuable use of public space	Provides little room for public use. Primarily a transportation facility.
PLANET	Bridge type provides aesthetic value	Industrial look and feel. Compatible with warehouses nearby. Conventional truss design.
	Bridge type limits carbon footprint and greenhouse gas emissions during construction	Small footprint. Steel material has low carbon footprint.
	Bridge type preserves local character	Smallest footprint considered. Open truss design.
PROSPERITY	Bridge type Limits initial project construction cost and risk	\$4,046,606 Conventional construction methods result in low risk.
	Bridge type minimizes future operation and maintenance costs	Re-painting of truss elements required every 30-40 years.
	Bridge type provides capacity for sustainable growth	Narrowest bridge alternative. Provides least capacity for users.





Example of a standard steel truss active user bridge at SE Lafayette Street in Portland, OR



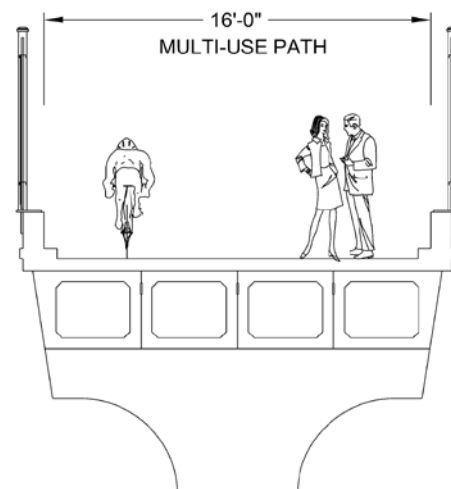
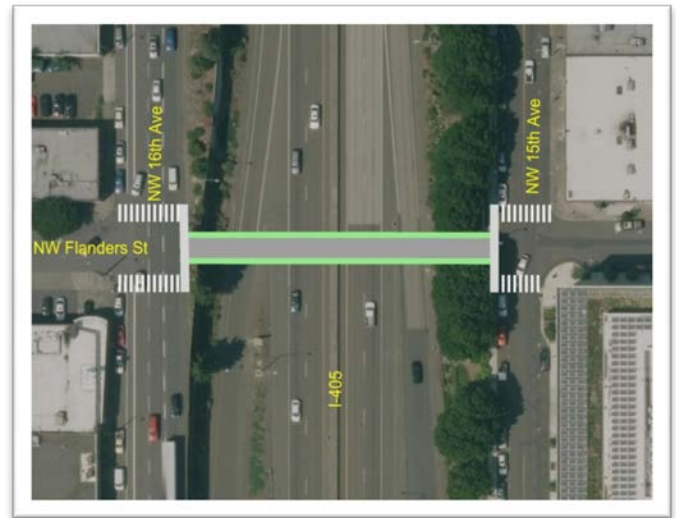
Typical user experience on a standard steel truss bridge with protective screen both sides.

Flanders Crossing | Alternative B

16 FT WIDE TWO SPAN CONCRETE BRIDGE

ESTIMATED COST: \$4,166,155

EVALUATION CRITERIA		DETAILS
PEOPLE	Bridge type embraces Vision Zero transportation safety principles	Narrowest facility studied. Combines bicycles and pedestrians in both directions.
	Bridge type reduces construction impacts on community (e.g. delays, congestion, emissions, and noise)	Requires pier construction in freeway median. Results in higher impact during construction.
	Bridge type provides positive user experience and/or valuable use of public space	Provides little room for public use. Primarily a transportation facility.
PLANET	Bridge type provides aesthetic value	Fits context of locale. Does not increase aesthetic value.
	Bridge type limits carbon footprint and greenhouse gas emissions during construction	Relatively small footprint limits greenhouse gas emissions.
	Bridge type preserves local character	Design similar to Everett and Glisan bridges nearby.
PROSPERITY	Bridge type Limits initial project construction cost and risk	\$4,166,155 Moderate risk due to unconventional construction methods needed to construct pier.
	Bridge type minimizes future operation and maintenance costs	Inspection would use routine methods. Maintenance costs would be low.
	Bridge type provides capacity for sustainable growth	Narrowest bridge alternative. Provides least capacity for users.





Existing concrete bridge on Burnside Street adjacent to proposed crossing



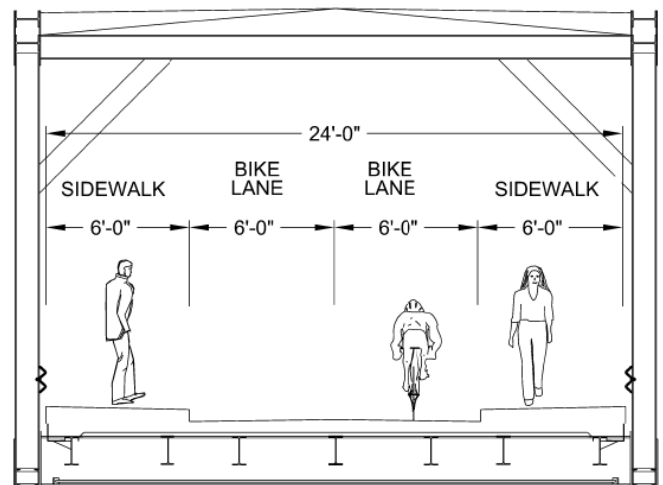
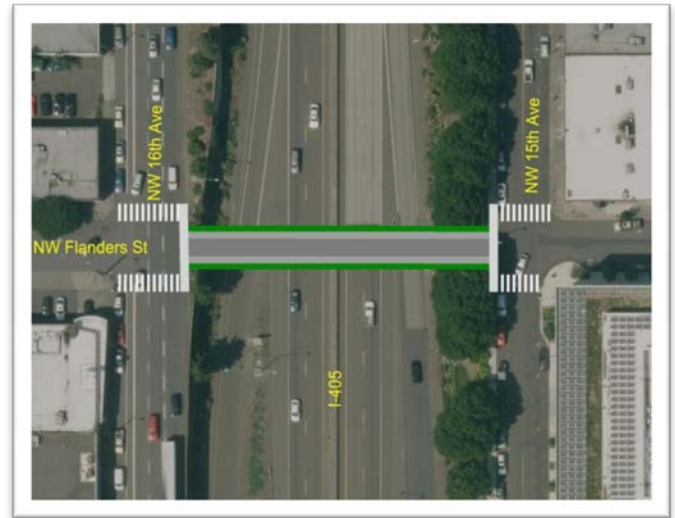
Typical protective Portland Screen installed on bridges over I-405

Flanders Crossing | Alternative C

24 FT WIDE SINGLE SPAN CUSTOM STEEL BRIDGE

ESTIMATED COST: \$6,009,656

EVALUATION CRITERIA		DETAILS
PEOPLE	Bridge type embraces Vision Zero transportation safety principles	Reduces conflicts by separating bicycles and pedestrians direction.
	Bridge type reduces construction impacts on community (e.g. delays, congestion, emissions, and noise)	Prefabricated single span would have least amount of impacts during construction.
	Bridge type provides positive user experience and/or valuable use of public space	Provides little room for public gathering space. Bracing members overhead diminish user experience.
PLANET	Bridge type provides aesthetic value	Semi-industrial look and feel. Compatible with warehouses nearby. Custom bridge options possible.
	Bridge type limits carbon footprint and greenhouse gas emissions during construction	Moderate footprint. Steel material has low carbon footprint.
	Bridge type preserves local character	Moderate footprint. Open structure design.
PROSPERITY	Bridge type Limits initial project construction cost and risk	\$6,009,656 Relatively low risk due to conventional construction methods.
	Bridge type minimizes future operation and maintenance costs	Re-painting of steel elements required every 30-40 years.
	Bridge type provides capacity for sustainable growth	Provides moderate capacity for future growth.





The custom steel bridge allows for artistic flare and improved aesthetics



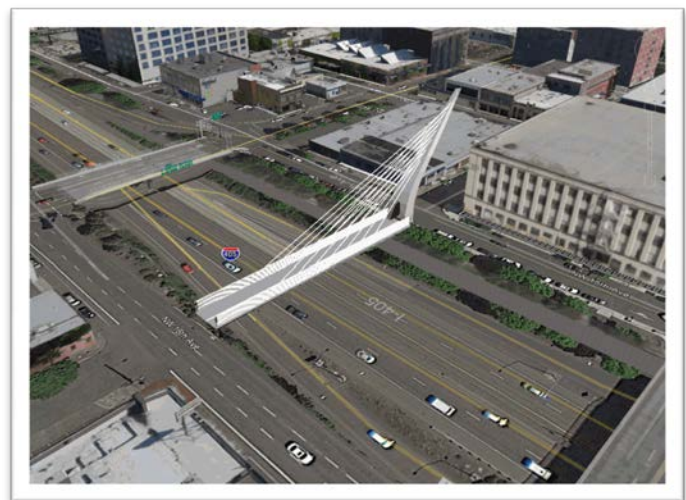
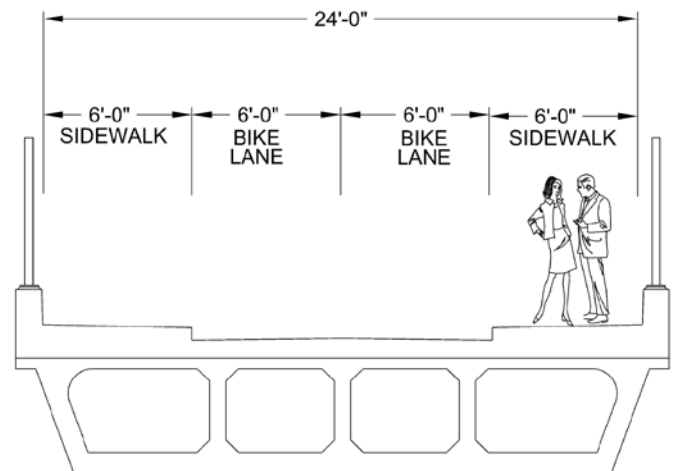
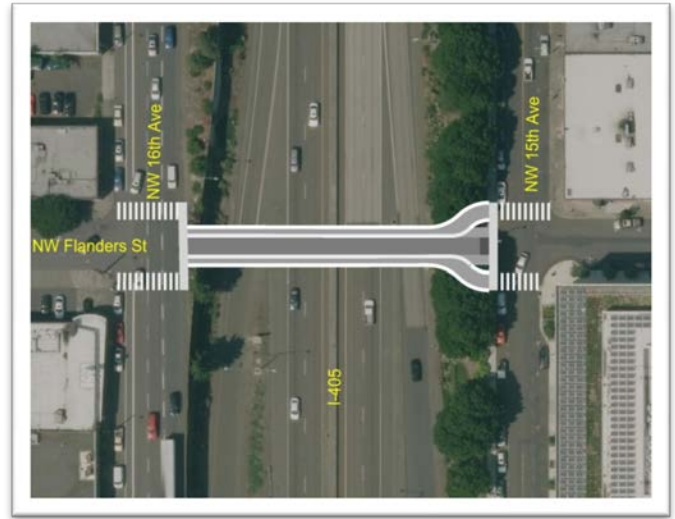
The proposed layout of Alternative C would separate bikes and pedestrians for safety

Flanders Crossing | Alternative D

24 FT WIDE SINGLE SPAN CABLE-STAYED BRIDGE

ESTIMATED COST: \$6,917,414

EVALUATION CRITERIA		DETAILS
PEOPLE	Bridge type embraces Vision Zero transportation safety principles	Reduces conflicts by separating bicycles and pedestrians each direction.
	Bridge type reduces construction impacts on community (e.g. delays, congestion, emissions, and noise)	Construction impacts would be relatively high given complexity and scale.
	Bridge type provides positive user experience and/or valuable use of public space	Provides little room for public use, but aesthetic appeal could serve as gathering point.
PLANET	Bridge type provides aesthetic value	Iconic design would provide aesthetic focal point for location.
	Bridge type limits carbon footprint and greenhouse gas emissions during construction	Materials quantities required would result in higher greenhouse gas emissions.
	Bridge type preserves local character	Bridge may distract from local character.
PROSPERITY	Bridge type Limits initial project construction cost and risk	\$6,917,414 High risk due to complex design & specialized contractor needed.
	Bridge type minimizes future operation and maintenance costs	Inspection of cables would require special inspection equipment and methods.
	Bridge type provides capacity for sustainable growth	Attractive design and moderate width could provide capacity for future growth.





Cable-Stayed Example | The recently built pedestrian bridge over I-5 in Eugene



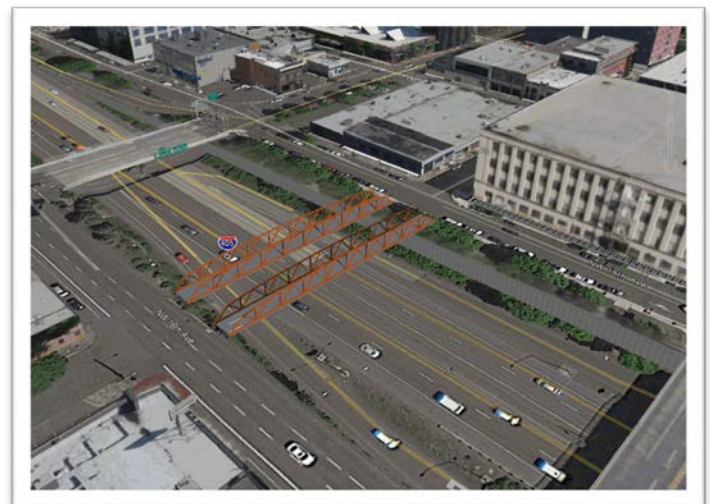
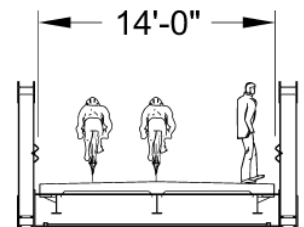
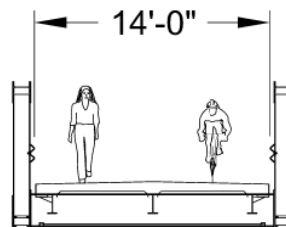
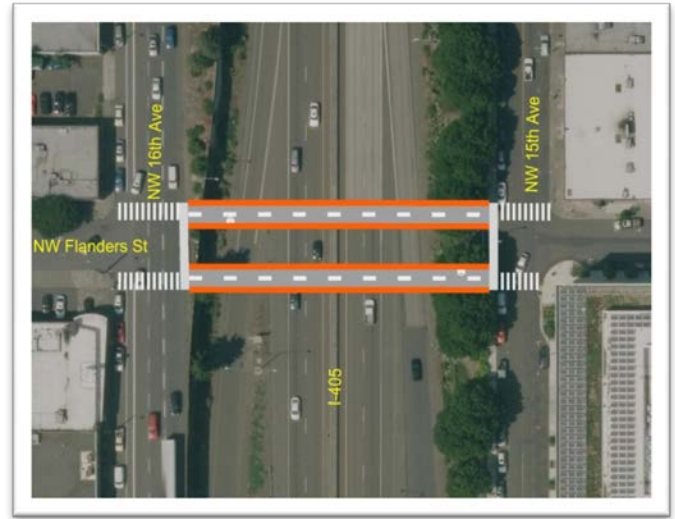
The look, feel and operation of Alternative D would be similar to the Tilikum Crossing: Bridge of the People

Flanders Crossing | Alternative E

14 FT WIDE SINGLE SPAN PARALLEL TRUSS BRIDGES

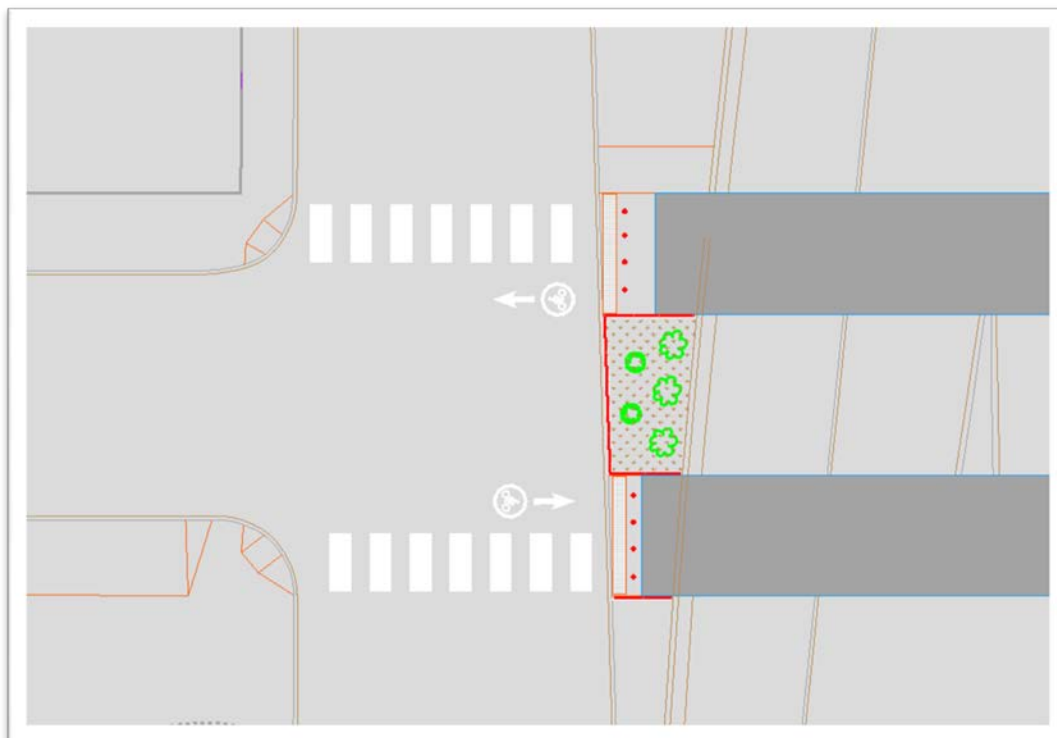
ESTIMATED COST: \$6,493,151

EVALUATION CRITERIA		DETAILS
PEOPLE	Bridge type embraces Vision Zero transportation safety principles	Separates bicycle traffic by direction. Safest alternative for users. Aligns with sidewalks each end.
	Bridge type reduces construction impacts on community (e.g. delays, congestion, emissions, and noise)	Construction impacts are moderate given dual bridge configuration.
	Bridge type provides positive user experience and/or valuable use of public space	Provides little room for public use. Primarily a transportation facility. No truss members overhead.
PLANET	Bridge type provides aesthetic value	Industrial look and feel. Compatible with warehouses nearby. Conventional truss design.
	Bridge type limits carbon footprint and greenhouse gas emissions during construction	Steel material has low carbon footprint. Dual bridge layout means twice the carbon footprint.
	Bridge type preserves local character	Dual bridges to be built rather than one. Open truss design.
PROSPERITY	Bridge type Limits initial project construction cost and risk	\$6,493,151 Conventional design concepts employed which reduce financial risk.
	Bridge type minimizes future operation and maintenance costs	Re-painting of truss elements required every 30-40 years.
	Bridge type provides capacity for sustainable growth	Provides enhanced capacity for future growth.





Artist rendering of the parallel bridges proposed for Alternative E, facing east



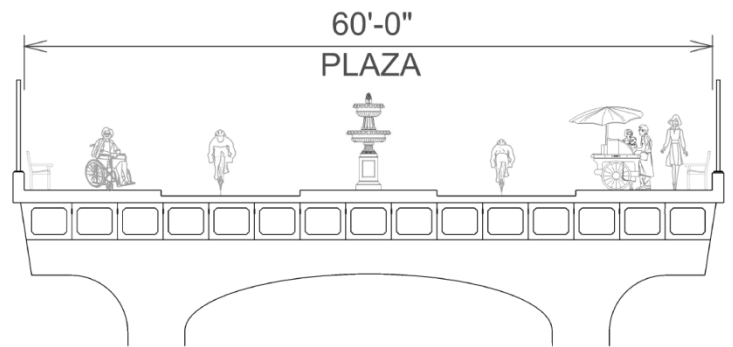
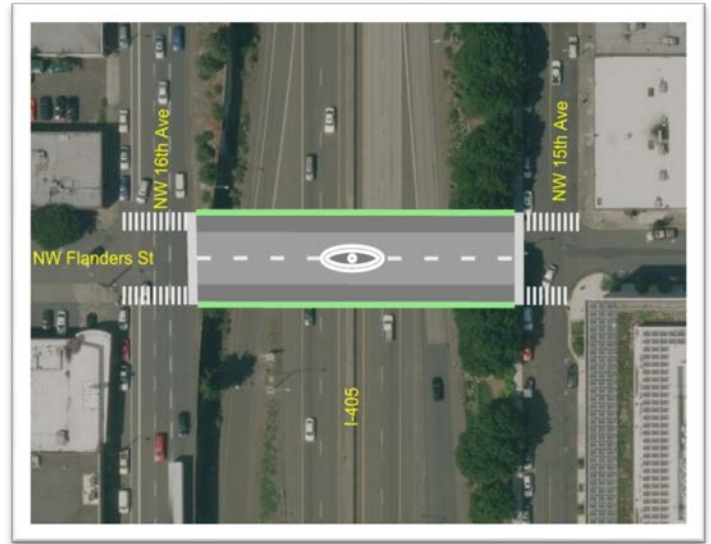
Sketch illustrating the ease of bridge alignment with connecting sidewalks for Alternative E

Flanders Crossing | Alternative F

60 FT WIDE TWO SPAN CONCRETE PLAZA BRIDGE

ESTIMATED COST: \$8,123,937

EVALUATION CRITERIA		DETAILS
PEOPLE	Bridge type embraces Vision Zero transportation safety principles	Separates bicycles and pedestrians. Could result in conflicts of event related traffic. Aligns with sidewalks each end.
	Bridge type reduces construction impacts on community (e.g. delays, congestion, emissions, and noise)	Construction impacts are very high due to pier in freeway below and overall width.
	Bridge type provides positive user experience and/or valuable use of public space	Provides public gathering space in addition to transportation use. Possible use for civic events.
PLANET	Bridge type provides aesthetic value	Fits context of locale. Potential for public art.
	Bridge type limits carbon footprint and greenhouse gas emissions during construction	Largest bridge alternative results in largest carbon footprint and greenhouse gas emissions.
	Bridge type preserves local character	Widest bridge changes current views. Overall design is similar to adjacent bridges.
PROSPERITY	Bridge type Limits initial project construction cost and risk	\$8,123,937 Substructure requires accelerated construction technology to limit community impacts.
	Bridge type minimizes future operation and maintenance costs	Inspection would use routine methods. Maintenance costs could be moderate due to size.
	Bridge type provides capacity for sustainable growth	Provides highest capacity for growth. Plaza feel may stimulate local development.





Artist rendering showing similar park or plaza concept over I-70 in Denver, CO



An example of community plaza use for Brunch on the Hawthorne Bridge in Portland

Cost Estimates

Estimated total project costs were generated for each of the six alternatives studied in order to inform stakeholders and project decision-makers of the anticipated bottom line. The cost estimates include the following components:

- Preliminary Engineering
- Construction
- Project Management
- Construction Engineering

The total project cost includes the cost to construct the bridge, in addition to estimated associated site development costs. Also included in the estimate are line items for a new traffic signal at NW 16th Ave. and a new rapid flash beacon at NW 14th Ave.

Preliminary Engineering figures were adjusted for the anticipated financial risk of each alternative considered. The base rate was based on the PBOT Civil Design Section's template.

Quantities were measured from the conceptual drawings developed during alternatives analysis.

Unit prices for construction were based on similar projects recently built, ODOT historic average bid prices, and the PBOT Civil Design Section's cost estimate template. Prefabricated truss costs were developed after consultation with a national truss manufacturer. Additionally, crane and rigging costs were created in consultation with a regional crane company.

See below for a summary of estimated total project costs for each alternative. A breakdown of each estimate is included in the Appendix.

Bridge Type	Cost Estimate
ALTERNATIVE A 16 FT WIDE SINGLE SPAN STANDARD TRUSS BRIDGE	\$4,046,606
ALTERNATIVE B 16 FT WIDE TWO SPAN CONCRETE BRIDGE	\$4,166,155
ALTERNATIVE C 24 FT WIDE SINGLE SPAN CUSTOM STEEL BRIDGE	\$6,009,656
ALTERNATIVE D 24 FT WIDE SINGLE SPAN CABLE-STAYED BRIDGE	\$6,917,414
ALTERNATIVE E 14 FT WIDE SINGLE SPAN PARALLEL TRUSS BRIDGES	\$6,493,151
ALTERNATIVE F 60 FT WIDE TWO SPAN CONCRETE PLAZA BRIDGE	\$8,123,937







Alternatives Evaluation Summary

PBOT assembled multi-disciplinary Technical and Citizen Advisory Committees to help evaluate the six bridge alternatives. These committees included transportation engineers and planners from both PBOT and ODOT, as well as community activists and property development professionals.

The Evaluation Criteria used by evaluators were based on the study's Guiding Principles and Objectives. An Alternatives Evaluation Worksheet (see Appendix) was developed for use in the evaluation of each alternative. The worksheet included all Evaluation Criteria and a summary of information for each bridge type. The scoring on the worksheet was based on a 5 point rating system as follows:

- 1 = Very Poor
- 2 = Poor
- 3 = Fair
- 4 = Good
- 5 = Very Good

During each evaluation meeting, participants were asked to complete the Alternatives Evaluation Worksheets, sum the rating scores for each alternative and report on the highest rated and lowest rated bridge alternative.

Bridge Type	1st Place Ranking Distribution
ALTERNATIVE A 16 FT WIDE SINGLE SPAN STANDARD TRUSS BRIDGE	3 
ALTERNATIVE B 16 FT WIDE TWO SPAN CONCRETE BRIDGE	0 
ALTERNATIVE C 24 FT WIDE SINGLE SPAN CUSTOM STEEL BRIDGE	17 
ALTERNATIVE D 24 FT WIDE SINGLE SPAN CABLE-STAYED BRIDGE	0 
ALTERNATIVE E 14 FT WIDE SINGLE SPAN PARALLEL TRUSS BRIDGES	4 
ALTERNATIVE F 60 FT WIDE TWO SPAN CONCRETE PLAZA BRIDGE	2 

Preferred Alternative

Comparing the results of the multi-disciplined evaluation team of internal and external stakeholders, the preferred bridge is **ALTERNATIVE C – 24 FT WIDE SINGLE SPAN CUSTOM STEEL BRIDGE**.

The preferred alternative combines optimal active user width (24 feet clear) a single span over the freeway and tried and true construction methods. The steel materials used in the primary bridge elements exhibit a generally low carbon footprint during construction. The bridge type limits impacts to the motoring public during construction, given the ability to set the bridge in place in one overnight over a limited term freeway closure. Additionally, the bridge can be customized to suit the aspirations of the local community and provide a pleasing aesthetic feature over an urban interstate. Lastly, the configuration can be planned to allow for shared vehicular traffic for emergency responders and active users during post-earthquake recovery operations.

SEISMIC RESILIENCY

The physical condition and status of bridges in the Portland area following an earthquake becomes a paramount factor in determining routes for emergency services, government operations, and the safe mobility of the general public. This recognition rings especially true for the Pearl District, bounded by the I-405 freeway. The bridges and overpasses that support or span I-405 were built prior to current seismic design standards. A new, seismically resilient crossing over I-405 could be achieved through the construction of the Flanders Crossing active bridge. The bridge could be designed to be used by vehicles after a seismic event. Each bridge alternative would function at different levels due to their type and geometry. See below for information on how each bridge alternative could be used after an earthquake.



Bridge Type	Earthquake Recovery Operation
ALTERNATIVE A 16 FT WIDE SINGLE SPAN STANDARD TRUSS BRIDGE	May accommodate only vehicles in earthquake recovery due to narrow width (16 ft). It does not appear likely that there is enough room for both emergency vehicles and active users.
ALTERNATIVE B 16 FT WIDE TWO SPAN CONCRETE BRIDGE	May accommodate only vehicles in earthquake recovery due to narrow width (16 ft). It does not appear likely that there is enough room for both emergency vehicles and active users. (Same as Alternative A)
ALTERNATIVE C 24 FT WIDE SINGLE SPAN CUSTOM STEEL BRIDGE	Will accommodate both active and vehicle use in earthquake recovery. Active users could share sidewalks, while vehicles use the 12 ft. clear space in the center of the bridge.
ALTERNATIVE D 24 FT WIDE SINGLE SPAN CABLE-STAYED BRIDGE	May not be able to accommodate vehicle use in earthquake recovery due to steel cable and concrete tower configuration.
ALTERNATIVE E 14 FT WIDE SINGLE SPAN PARALLEL TRUSS BRIDGES	Could accommodate both active users and vehicles in earthquake recovery. Modal splits between bridges are an option also.
ALTERNATIVE F 60 FT WIDE TWO SPAN CONCRETE PLAZA BRIDGE	Would provide the most space for active users and vehicles in earthquake recovery due to width (60 ft.). Two –way traffic for all modes could be safely accommodated.

APPENDIX

Additional information

Right of Way

It is anticipated that all temporary and permanent project actions will take place within the existing public right of way. The surrounding streets appear to be City of Portland right of way. It is understood at this time that the freeway and parallel retaining walls are located in ODOT right of way. The bridge ends would be located near the interface between PBOT and ODOT's rights of way. Further investigation will be necessary during future project phases to determine which parts of the bridge are proposed in City of Portland vs. ODOT right of way.

ODOT and FHWA: The majority of any bridge configuration would be built in ODOT's right of way. In these locations, it is understood that, at a minimum, a Maintenance Agreement would be necessary to identify which jurisdiction is responsible for maintenance and operations activities of each bridge component.

Additionally, ODOT has had preliminary conversations the local FHWA division office to determine whether or not FHWA approval is required for a bridge to be constructed over I-405 at this location. FHWA has initially determined that ODOT has the authority to approve the proposed bridge over I-405. FHWA's expectation is that ODOT and the City enter into an agreement that allows the use of the Interstate airspace for the purpose of a bicycle and pedestrian facility. The execution of the agreement by ODOT would be subject to FHWA's review.

Environmental Permitting

In many transportation projects, environmental concerns can be a central component of the project. Given the current planned scope for a new bridge at the project location and lack of natural environment resources, environmental impacts are anticipated to be relatively minor. However insignificant the impacts, the National Environmental Policy Act (NEPA) process may be required if a federal nexus is created. This typically happens by means of the funding source and/or required permits. Given that the federal-aid project funding is not currently being pursued and an FHWA interstate access permit approval does not appear to be required for the new crossing over the interstate, the NEPA process may not be necessary. It is generally a best practice to identify the need for NEPA as early in the project development as possible, given the duration of the process and the fact that coordination with multiple state and federal agencies is usually required. Several common federal/NEPA permits required for transportation projects are listed below. Based on the information available at this time, a description of possible permit effects on the project are described:

Potential Environmental Permits

Permit	Expected Applicability	Expected Outcome (if required)
NEPA	Not Likely	Categorical Exclusion
Endangered Species Act	Likely	No Effect
Section 106 (NHPA)	Not Likely	No Historic Properties Adversely Affected
Migratory Bird Treaty Act	Required	No Action
CWA Section 404	Not Likely	-
Oregon Removal-Fill Permit	Not Likely	-
COP Environmental Review	Not Likely	-

Zoning: The existing area surrounding the project site is largely developed and is zoned **EXdCC**. The meaning of the zoning symbols is as follows:

- **EX** stands for Central Employment and “allows mixed-uses,” according to the City of Portland’s zone code, Title 33. It continues to state that “the development standards are intended to allow new development which is similar in character to existing development.”
- **d** indicates that the project falls within a Design Overlay Zone. According to Title 33, “The Design Overlay Zone is applied to areas where design and neighborhood character are of special concern.” The project may be exempt from design review because it will not require a building or sign permit (33.420.045.J).
- **CC** shows at least part of the project is located in the Central City plan district. Subsequently, the regulation maps appear to show the east end of the project within the boundaries of the River District Plan.

Summary: Overall it appears that the permitting process for the project would be relatively straightforward. Lack of natural resources and the existing highly developed urban environment should result in a low risk for permits to impact any project goals or objectives.

Traffic + Mobility

The proposed Flanders Crossing would tie into the existing street network on NW 15th Ave. and NW 16th Ave. Given the new access point in the existing system, signal modification and installation would likely be necessary and may impact traffic flow and operations in the area.

NW 16th Avenue

To provide a safe crossing for bicycles and pedestrians to and from the bridge, a new traffic signal is proposed at NW 16th Ave. and NW Flanders St. The signal may have impacts on traffic patterns in the area, including the I-405 southbound off-ramp at NW Glisan St. The PBOT Traffic Design Section is analyzing the impacts and is consulting with ODOT on the signal warrant and operation. The findings of the signal analysis will be published separately from this study.

NW 15th Avenue

It is our understanding that traffic volumes are relatively low at the intersection of NW Flanders St. and NW 15th Ave. (east end of proposed bridge). While a crossing treatment and/or intersection control at this location may be warranted, it is unlikely that a signal of any kind is necessary. The PBOT Traffic Design Section is conducting an analysis of this intersection and will publish its findings separately from this study.

NW 14th Avenue

Additionally, a crossing treatment may be warranted at NW Flanders St. and NW 14th Ave. The PBOT Traffic Design Section is currently working to determine if a rapid flash beacon or full traffic signal is warranted at that location.

Roadway + Civil

The roadway portion of the project would be very limited in scope. The work would be confined to the general alignment of the bridge and local improvements required to accommodate bicycles and pedestrians.

Bridge Alignment: In order to best accommodate bicyclists and pedestrian expectations and safety, an alignment along the centerline of NW Flanders St. appears the most desirable for the majority of bridge alternatives. The centerline alignment would best accommodate bicycle movements which occur in the street. This would result in a small amount of out of direction travel for pedestrians in the narrower bridge concepts. However, if companion structures are built or the bridge is built out to the full width of the right of way, they can be separated and aligned closely with the sidewalks on NW Flanders St. to accommodate safer pedestrian crossings. This layout would not require any out of direction travel for pedestrians.

Bridge Grade: Based on preliminary data, the bridge longitudinal grade would be in the 2.0% to 2.75% range, depending on selected curb ramp style. This grade appears to meet requirements for stormwater conveyance/drainage and ADA standards.

Stormwater and Drainage: The stormwater would be transported across the bridge from west to east and discharged into the existing gutter on NW 15th Ave., or into a new stormwater facility if required. In preliminary discussions with BES, it was determined that a conventional swale or planter stormwater management facility would not be feasible in this location. If a facility is feasible, it would be lined due to its proximity to the existing ODOT retaining walls along I-405. If the facility is determined infeasible, an in-lieu of fee may be required by BES.

ADA Accessibility: All aspects of the project should comply with the Americans With Disabilities Act (ADA). The ADA most often applies to accessibility in the public right of way and affects curb ramp requirements. In terms of the bridge, the following project components are expected to be impacted by ADA:

- **Curb ramps:** Curb ramps will be required at each end of the bridge. The curb ramps need to be located and design with maximum grades which meet ADA requirements. The bridge concepts could incorporate said curb ramps into the design by means of a “driveway” section in the sidewalk. Future refinement will be required in consultation with PBOT’s ADA Coordinator to ensure that the design is in compliance with ADA standards.
- **Longitudinal grade:** The proposed longitudinal bridge grade in the 2% to 2.75% range is less than the maximum 5% grade recommended by the ADA; therefore, intermittent landings would not be required.
- **Bridge Width:** All bridge concepts provide an accessible surface wider than 60 inches and would meet any ADA clear throughway width requirements.
- **Alignment with existing sidewalks:** Further analysis is warranted to determine ideal location for curb ramps and any required mitigation to provide for appropriate crossing of NW 16th Ave. for sight impaired pedestrians. In general, the wider bridge options or companion structures appear to provide the most ideal alignments with existing sidewalks for the intents and purposes of ADA. Crosswalk alignment could be mitigated with the installation channelizing handrails that lead pedestrians to perpendicular curb ramps.

Flanders Crossing | Alternatives Evaluation Worksheet



BRIDGE TYPES	EVALUATION CRITERIA									TOTAL SCORE
	Bridge type embraces Vision Zero transportation safety principles	Bridge type reduces construction impacts on community (e.g. delays, congestion, emissions, and noise)	Bridge type provides positive user experience and/or valuable use of public space	Bridge type provides aesthetic value	Bridge type limits carbon footprint and greenhouse gas emissions during construction	Bridge type preserves local character	Bridge type Limits initial project construction cost and risk	Bridge type minimizes future operation and maintenance costs	Bridge type provides capacity for sustainable growth	
ALTERNATIVE A 16 FT WIDE SINGLE SPAN STANDARD TRUSS BRIDGE	Narrowest facility studied. Combines bicycles and pedestrians in both directions.	Prefabricated single span would have least amount of impacts during construction.	Provides little room for public use. Primarily a transportation facility..	Industrial look and feel. Compatible with warehouses nearby. Conventional truss design.	Small footprint. Steel material has low carbon footprint.	Smallest footprint considered. Open truss design.	\$4,046,606 Conventional construction methods result in low risk.	Re-painting of truss elements required every 30-40 years.	Narrowest bridge alternative. Provides least capacity for users.	
ALTERNATIVE B 16 FT WIDE TWO SPAN CONCRETE BRIDGE	Narrowest facility studied. Combines bicycles and pedestrians in both directions.	Requires pier construction in freeway median. Results in higher impact during construction.	Provides little room for public use. Primarily a transportation facility.	Fits context of locale. Does not increase aesthetic value.	Relatively small footprint limits greenhouse gas emissions.	Design similar to Everett and Glisan bridges nearby.	\$4,166,155 Moderate risk due to unconventional construction methods needed to construct pier.	Inspection would use routine methods. Maintenance costs would be low.	Narrowest bridge alternative. Provides least capacity for users.	
ALTERNATIVE C 24 FT WIDE SINGLE SPAN CUSTOM STEEL BRIDGE	Reduces conflicts by separating bicycles and pedestrians direction.	Prefabricated single span would have least amount of impacts during construction.	Provides little room for public gathering space. Bracing members overhead diminish user experience.	Semi-industrial look and feel. Compatible with warehouses nearby. Custom bridge options possible.	Moderate footprint. Steel material has low carbon footprint.	Moderate footprint. Open structure design.	\$6,009,656 Relatively low risk due to conventional construction methods.	Re-painting of steel elements required every 30-40 years.	Provides moderate capacity for future growth.	
ALTERNATIVE D 24 FT WIDE SINGLE SPAN CABLE-STAYED BRIDGE	Reduces conflicts by separating bicycles and pedestrians each direction.	Construction impacts would be relatively high given complexity and scale.	Provides little room for public use, but aesthetic appeal could serve as gathering point.	Iconic design would provide aesthetic focal point for location.	Materials quantities required would result in higher greenhouse gas emissions.	Bridge may distract from local character.	\$6,917,414 High risk due to complex design & specialized contractor needed.	Inspection of cables would require special inspection equipment and methods.	Attractive design and moderate width could provide capacity for future growth.	
ALTERNATIVE E 14 FT WIDE SINGLE SPAN PARALLEL TRUSS BRIDGES	Separates bicycle traffic by direction. Safest alternative for users. Aligns with sidewalks each end.	Construction impacts are moderate given dual bridge configuration.	Provides little room for public use. Primarily a transportation facility. No truss members overhead.	Industrial look and feel. Compatible with warehouses nearby. Conventional truss design.	Steel material has low carbon footprint. Dual bridge layout means twice the carbon footprint.	Dual bridges to be built rather than one. Open truss design.	\$6,493,151 Conventional design concepts employed which reduce financial risk.	Re-painting of truss elements required every 30-40 years.	Provides enhanced capacity for future growth.	
ALTERNATIVE F 60 FT WIDE TWO SPAN CONCRETE PLAZA BRIDGE	Separates bicycles and pedestrians. Could result in conflicts of event related traffic. Aligns with sidewalks each end.	Construction impacts are very high due to pier in freeway below and overall width.	Provides public gathering space in addition to transportation use. Possible use for civic events.	Fits context of locale. Potential for public art.	Largest bridge alternative results in largest carbon footprint and greenhouse gas emissions.	Widest bridge changes current views. Overall design is similar to adjacent bridges.	\$8,123,937 Substructure requires accelerated construction technology to limit community impacts.	Inspection would use routine methods. Maintenance costs could be moderate due to size.	Provides highest capacity for growth. Plaza feel may stimulate local development.	

Rate each criterion for each alternative based on the following rating scale:

1 = VERY POOR
2 = POOR
3 = FAIR
4 = GOOD
5 = VERY GOOD

Enter your SCORE in each box:

Add scores in each row for TOTAL SCORE

Evaluator Name _____



**CITY OF PORTLAND, OREGON
BUREAU OF TRANSPORTATION**

Date: November 17, 2015

By: C. Glasgow

FEASIBILITY STUDY ENGINEER'S ESTIMATE FOR THE IMPROVEMENT OF FLANDERS CROSSING - ALTERNATIVE "A" - 16 FT TRUSS BRIDGE

VALUES IN BLUE ARE PERCENT OF CONTRACT.

BID ITEMS

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	MOBILIZATION	0210	0100000A	n/a	LS	1.00	\$ 166,286.61	\$ 166,286.61
2	TEMPORARY PROTECTION & DIRECTION OF TRAFFIC	0225	0100000A	13	LS	1.00	\$ 33,257.32	\$ 33,257.32
	TEMPORARY TRAFFIC CONTROL DEVICES	225	Special		LS	1.00	\$ 100,000.00	\$ 100,000.00
22	TEMPORARY CL-6R CHAIN LINK FENCE	0270	0137000F	12	FOOT	360.00	\$ 17.60	\$ 6,336.00
23	EROSION CONTROL	0280	0100000A	11	LS	1.00	\$ 16,628.66	\$ 16,628.66
28	SEDIMENT FENCE, UNSUPPORTED	0280	0113000F	11	FOOT	280.00	\$ 2.50	\$ 700.00
29	INLET PROTECTION	0280	0114000E	11	EACH	12.00	\$ 88.00	\$ 1,056.00
30	POLLUTION CONTROL PLAN	0290	0100000A	12	LS	1.00	\$ 1,662.87	\$ 1,662.87
33	HASP/CMDP WORKPLANS	0291	1105000A	12	LS	1.00	\$ 1,000.00	\$ 1,000.00
43	REMOVAL OF STRUCTURES & OBSTRUCTIONS	0310	0106000A	1	LS	1.00	\$ 10,000.00	\$ 10,000.00
45	CLEARING AND GRUBBING	0320	0100000A	1	LS	1.00	\$ 20,000.00	\$ 20,000.00
49	GENERAL EXCAVATION	0330	0105000K	1	CUYD	50.00	\$ 35.00	\$ 1,750.00
66	TRENCH EXCAVATION, COMMON	0405	1101000K	1	CUYD	100.00	\$ 16.70	\$ 1,670.00
70	TRENCH BACKFILL, CLASS B	0405	1109000K	1	CUYD	75.00	\$ 33.00	\$ 2,475.00
82	10 INCH PIPE, HDPE ASTM F714 SDR 26 BEDDING TYPE:D, COMPLETE	0445	Special	1	FOOT	100.00	\$ 122.00	\$ 12,200.00
100	CONCRETE INLETS, TYPE G-2	0470	0315000E	1	EACH	2.00	\$ 1,770.00	\$ 3,540.00
112	CONNECTION TO EXISTING STRUCTURES	0490	0104000E	1	EACH	2.00	\$ 841.00	\$ 1,682.00
118	TRENCH RESURFACING	0495	0100000J	1	SQYD	33.33	\$ 109.00	\$ 3,632.97
	STRUCTURE DEMOLITION	0501	Special		LS	1.00	\$ 15,000.00	\$ 15,000.00
120	SHORING, CRIBBING AND COFFERDAMS	0510	0100000A	2	LS	1.00	\$ 5,000.00	\$ 5,000.00
121	STRUCTURE EXCAVATION	0510	0101000K	2	CUYD	40.00	\$ 48.30	\$ 1,932.00
123	GRANULAR STRUCTURAL BACKFILL	0510	0108000K	2	CUYD	50.00	\$ 50.00	\$ 2,500.00
	FURNISH DRILLING EQUIPMENT		Special		LS	1.00	\$ 30,000.00	\$ 30,000.00
	PERMANENT SHAFT CASINGS		Special		FOOT	200.00	\$ 500.00	\$ 100,000.00
	CSL TEST ACCESS TUBES	0512	0105000F		FOOT	600.00	\$ 8.00	\$ 4,800.00
	CSL TESTS	0512	0106000E		EACH	4.00	\$ 1,500.00	\$ 6,000.00
	DRILLED SHAFT EXC, 36 INCH DIA	0512	0110000F		FOOT	200.00	\$ 250.00	\$ 50,000.00
	DRILLED SHAFT CONCRETE	0512	Special		CUYD	55.00	\$ 500.00	\$ 27,500.00
	DRILLED SHAFT REINFORCEMENT	0530	Special		LB	20000.00	\$ 1.00	\$ 20,000.00
124	REINFORCEMENT	0530	0100000A	2	LS*	1.00	\$ 11,400.00	\$ 11,400.00
	FOUNDATION CONCRETE	0540	0111000K		CUYD	50.00	\$ 600.00	\$ 30,000.00
	DECK CONCRETE, CLASS HPC4000	0540	0207000K		CUYD	55.00	\$ 1,000.00	\$ 55,000.00
	GENERAL STRC CONCRETE, CLASS 4000	0540	0312000K		CUYD	40.00	\$ 1,500.00	\$ 60,000.00
	PREFABRICATED BRIDGE, DELIVERED	0561	Special		LS	1.00	\$ 763,198.00	\$ 763,198.00
	PREFABRICATED BRIDGE INSTALLATION	0561	Special		LS	1.00	\$ 30,000.00	\$ 30,000.00
	BRIDGE LIGHTING	0580	Special		LS	1	\$ 100,000.00	\$ 100,000.00
	2 INCH ELECTRICAL CONDUIT	0583	0105000F		FOOT	544	\$ 10.00	\$ 5,440.00
	EXPANSION JOINTS	0585	Special		FOOT	36	\$ 250.00	\$ 9,000.00
	ORNAMENTAL BRIDGE RAIL	0587	Special		FOOT	80.00	\$ 250.00	\$ 20,000.00
138	CONCRETE SLOPE PAVING	0599	0100000J	2	SQFT	350.00	\$ 11.25	\$ 3,937.08
143	AGGREGATE BASE	0640	0102000M	5	TON	10.00	\$ 36.90	\$ 369.00
154	16 INCH ASPHALT CONCRETE PAVEMENT REPAIR	0748	Special		SQYD	20.00	\$ 68.80	\$ 1,376.00
168	CONCRETE DRIVEWAYS	0759	0126000J	12	SQFT	400.00	\$ 8.40	\$ 3,360.00
170	CONCRETE WALKS	0759	0128000J	12	SQFT	100.00	\$ 7.40	\$ 740.00
179	DETECTABLE WARNING SURFACE	0759	1158000J	12	SQFT	240.00	\$ 42.30	\$ 10,152.00
193	REMOVABLE BOLLARDS	0815	0101000E	12	EACH	26.00	\$ 750.00	\$ 19,500.00
	FREEWAY SIGNS MOUNTED ON BRIDGE		Special		LS	1.00	\$ 18,000.00	\$ 18,000.00
	PERMANENT SIGNING AND STRIPING		Special		LS	1.00	\$ 7,500.00	\$ 7,500.00
238	POLE FOUNDATIONS	0970	0100000A	10	LS*	3.00	\$ 2,000.00	\$ 6,000.00
243	TRAFFIC SIGNAL INSTALLATION	0990	0101000A	10	LS*	1.00	\$ 120,000.00	\$ 120,000.00
245	FLASHING BEACON INSTALLATION	0990	Special		LS*	1.00	\$ 40,000.00	\$ 40,000.00
246	LOOP DETECTOR INSTALLATION	0990	0103000A	10	LS*	1.00	\$ 9,120.00	\$ 9,120.00
	LANDSCAPING		Special		LS	1.00	\$ 40,000.00	\$ 40,000.00

* Unit Price Shown is on Pound, Each, or Foot Basis as Applicable

TOTAL BID ITEMS

\$ 2,010,701.51

ANTICIPATED ITEMS

NO.	ITEMS OF WORK AND MATERIALS	REFERENCE	NUMBER	OF	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	RIGHT OF WAY MONUMENTATION				LS	0.00	\$ -	\$ -
2	RELOCATE WATER FACILITIES - FIRE HYDRANT				EACH	0.00	\$ 20,000.00	\$ -
3	RELOCATE WATER FACILITIES - METER				EACH	0.00	\$ 6,000.00	\$ -
4	STREET LIGHTING - UPGRADE LUMINAIRES				EACH	0.00	\$ 600.00	\$ -
5	STREET LIGHTING - INSTALL ARMS AND LUMINAIRES				EACH	0.00	\$ 5,000.00	\$ -
6	CONNECT CONTRACTOR INSTALLED TRAFFIC SIGNAL LOOPS TO CONTROLLER BY BOM				EACH	0.00	\$ 1,000.00	\$ -
7	STORMWATER PLANTINGS AND PLANT ESTABLISHMENT				SQFT	0.00	\$ 15.00	\$ -

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
8	STORMWATER OFFSITE MANAGEMENT FEE				SQFT	4120.00	\$ 3.70	\$ 15,244.00
9	ROCK EXCAVATION				CUYD	0.00	\$ 106.00	\$ -
10	RAILROAD PROTECTION SERVICES (ONE YEAR)				LS	0.00	\$ 100,000.00	\$ -
11	ASPHALT CEMENT ESCALATION				LS	1.00	\$ -	\$ -
12	FUEL ESCALATION				LS	1.00	\$ -	\$ -
13	TESTING CONTAMINATED MEDIA				LS	0.00	\$ 5,000.00	\$ -
14	BOLI FEE PAYMENT				LS	1.00	\$ 2,010.70	\$ 2,010.70
15	CONTRACT CONTINGENCY (REQUIREMENT TO ACCEPT BIDS UP TO 10% OVER ESTIMATE)				LS	1.00	\$ 201,070.15	\$ 201,070.15

TOTAL ANTICIPATED ITEMS

\$ 218,324.85

SCHEDULE SUMMARY

BID ITEMS							\$ 2,010,702
CONSTRUCTION CONTINGENCY						5% of Bid Items *	\$ 100,535
SUBTOTAL							\$ 2,111,237
ANTICIPATED ITEMS							\$ 218,325
TOTAL CONSTRUCTION							\$ 2,329,561
PROJECT MANAGEMENT						5% of Bid Items	\$ 100,535
DESIGN ENGINEERING						15% of Bid Items	\$ 301,605
CONSTRUCTION MANAGEMENT						15% of Bid Items	\$ 301,605
SUBTOTAL							\$ 703,745
PROJECT ENGINEERING & MANAGEMENT OVERHEAD						73.35% of PM, Eng, and CM	\$ 516,197
TOTAL PROJECT ENGINEERING & MANAGEMENT							\$ 1,219,942
RIGHT-OF-WAY LAND, IMPROVEMENTS, AND DAMAGES							\$ -
RIGHT-OF-WAY APPRAISAL, TITLE INSURANCE, AND NEGOTIATION							\$ -
RIGHT-OF-WAY CONTINGENCY						of Land, Improve, and Damages 30%	\$ -
TOTAL PROJECT RIGHT-OF-WAY							\$ -
INFLATION RATE ON CONTRACT					Years	Inflation	
INFLATION RATE ON PERSONNEL					1	4.5% of Construction	\$ 104,830
ESTIMATE CONTINGENCY FOR UNDEFINED OR CHANGE IN SCOPE					1	2.0% of Eng & Mgmt	\$ 24,399
						10% of Const, Eng & Mgmt, and Inflation	\$ 367,873
TOTAL PROJECT CONTINGENCY							\$ 497,102
TOTAL PROJECT ESTIMATE							\$ 4,046,606

**CITY OF PORTLAND, OREGON
BUREAU OF TRANSPORTATION**

Date: November 17, 2015

By: C. Glasgow

FEASIBILITY STUDY ENGINEER'S ESTIMATE FOR THE IMPROVEMENT OF FLANDERS CROSSING - ALTERNATIVE "B" - 16 FT CONCRETE 2-SPAN BRIDGE

VALUES IN BLUE ARE PERCENT OF CONTRACT.

BID ITEMS

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	MOBILIZATION	0210	0100000A	n/a	LS	1.00	\$ 137,682.01	\$ 137,682.01
2	TEMPORARY PROTECTION & DIRECTION OF TRAFFIC	0225	0100000A	13	LS	1.00	\$ 27,536.40	\$ 27,536.40
	TEMPORARY TRAFFIC CONTROL DEVICES	225	Special		LS	1.00	\$ 300,000.00	\$ 300,000.00
22	TEMPORARY CL-6R CHAIN LINK FENCE	0270	0137000F	12	FOOT	360.00	\$ 17.60	\$ 6,336.00
23	EROSION CONTROL	0280	0100000A	11	LS	1.00	\$ 13,768.20	\$ 13,768.20
28	SEDIMENT FENCE, UNSUPPORTED	0280	0113000F	11	FOOT	280.00	\$ 2.50	\$ 700.00
29	INLET PROTECTION	0280	0114000E	11	EACH	16.00	\$ 88.00	\$ 1,408.00
30	POLLUTION CONTROL PLAN	0290	0100000A	12	LS	1.00	\$ 1,376.82	\$ 1,376.82
33	HASP/CMDP WORKPLANS	0291	1105000A	12	LS	1.00	\$ 1,000.00	\$ 1,000.00
43	REMOVAL OF STRUCTURES & OBSTRUCTIONS	0310	0106000A	1	LS	1.00	\$ 10,000.00	\$ 10,000.00
45	CLEARING AND GRUBBING	0320	0100000A	1	LS	1.00	\$ 20,000.00	\$ 20,000.00
49	GENERAL EXCAVATION	0330	0105000K	1	CUYD	50.00	\$ 35.00	\$ 1,750.00
66	TRENCH EXCAVATION, COMMON	0405	1101000K	1	CUYD	100.00	\$ 16.70	\$ 1,670.00
70	TRENCH BACKFILL, CLASS B	0405	1109000K	1	CUYD	75.00	\$ 33.00	\$ 2,475.00
82	10 INCH PIPE, HDPE ASTM F714 SDR 26 BEDDING TYPE:D, COMPLETE	0445	Special	1	FOOT	100.00	\$ 122.00	\$ 12,200.00
100	CONCRETE INLETS, TYPE G-2	0470	0315000E	1	EACH	2.00	\$ 1,770.00	\$ 3,540.00
112	CONNECTION TO EXISTING STRUCTURES	0490	0104000E	1	EACH	2.00	\$ 841.00	\$ 1,682.00
118	TRENCH RESURFACING	0495	0100000J	1	SQYD	33.33	\$ 109.00	\$ 3,632.97
	STRUCTURE DEMOLITION	0501	Special		LS	1.00	\$ 15,000.00	\$ 15,000.00
120	SHORING, CRIBBING AND COFFERDAMS	0510	0100000A	2	LS	1.00	\$ 5,000.00	\$ 5,000.00
121	STRUCTURE EXCAVATION	0510	0101000K	2	CUYD	40.00	\$ 48.30	\$ 1,932.00
123	GRANULAR STRUCTURAL BACKFILL	0510	0108000K	2	CUYD	50.00	\$ 50.00	\$ 2,500.00
	FURNISH DRILLING EQUIPMENT		Special		LS	1.00	\$ 40,000.00	\$ 40,000.00
	PERMANENT SHAFT CASINGS		Special		FOOT	250.00	\$ 500.00	\$ 125,000.00
	CSL TEST ACCESS TUBES	0512	0105000F		FOOT	750.00	\$ 8.00	\$ 6,000.00
	CSL TESTS	0512	0106000E		EACH	5.00	\$ 1,500.00	\$ 7,500.00
	DRILLED SHAFT EXC, 36 INCH DIA	0512	0110000F		FOOT	250.00	\$ 250.00	\$ 62,500.00
	DRILLED SHAFT CONCRETE	0512	Special		CUYD	70.00	\$ 500.00	\$ 35,000.00
	DRILLED SHAFT REINFORCEMENT	0530	Special		LB	25000.00	\$ 1.00	\$ 25,000.00
124	REINFORCEMENT	0530	0100000A	2	LS*	1.00	\$ 20,000.00	\$ 20,000.00
	FOUNDATION CONCRETE	0540	0111000K		CUYD	50.00	\$ 600.00	\$ 30,000.00
	DECK CONCRETE, CLASS HPC4000	0540	0207000K		CUYD	90.00	\$ 1,500.00	\$ 135,000.00
	GENERAL STRC CONCRETE, CLASS 4000	0540	0312000K		CUYD	51.00	\$ 1,500.00	\$ 76,500.00
	BT 60 PRECAST PRESRESSTED GIRDERS	0550	Special		FOOT	591.00	\$ 300.00	\$ 177,300.00
	BRIDGE LIGHTING	0580	Special		LS	1	\$ 100,000.00	\$ 100,000.00
	2 INCH ELECTRICAL CONDUIT	0583	0105000F		FOOT	544	\$ 10.00	\$ 5,440.00
	EXPANSION JOINTS	0585	Special		FOOT	36	\$ 250.00	\$ 9,000.00
	ORNAMENTAL BRIDGE RAIL	0587	Special		FOOT	474.00	\$ 250.00	\$ 118,500.00
138	CONCRETE SLOPE PAVING	0599	0100000J	2	SQFT	350.00	\$ 11.25	\$ 3,937.08
143	AGGREGATE BASE	0640	0102000M	5	TON	10.00	\$ 36.90	\$ 369.00
154	16 INCH ASPHALT CONCRETE PAVEMENT REPAIR	0748	Special		SQYD	20.00	\$ 68.80	\$ 1,376.00
168	CONCRETE DRIVEWAYS	0759	0126000J	12	SQFT	400.00	\$ 8.40	\$ 3,360.00
170	CONCRETE WALKS	0759	0128000J	12	SQFT	100.00	\$ 7.40	\$ 740.00
179	DETECTABLE WARNING SURFACE	0759	1158000J	12	SQFT	240.00	\$ 42.30	\$ 10,152.00
193	REMOVABLE BOLLARDS	0815	0101000E	12	EACH	26.00	\$ 750.00	\$ 19,500.00
	FREEWAY SIGNS MOUNTED ON BRIDGE		Special		LS	1.00	\$ 18,000.00	\$ 18,000.00
	PERMANENT SIGNING AND STRIPING		Special		LS	1.00	\$ 7,500.00	\$ 7,500.00
238	POLE FOUNDATIONS	0970	0100000A	10	LS*	3.00	\$ 2,000.00	\$ 6,000.00
243	TRAFFIC SIGNAL INSTALLATION	0990	0101000A	10	LS*	1.00	\$ 120,000.00	\$ 120,000.00
245	FLASHING BEACON INSTALLATION	0990	Special		LS*	1.00	\$ 40,000.00	\$ 40,000.00
246	LOOP DETECTOR INSTALLATION	0990	0103000A	10	LS*	1.00	\$ 9,120.00	\$ 9,120.00
	LANDSCAPING		Special		LS	1.00	\$ 40,000.00	\$ 40,000.00
278	ORNAMENTAL PROTECTIVE SCREENING	1050	Special	12	FOOT	400.00	\$ 158.00	\$ 63,200.00

* Unit Price Shown is on Pound, Each, or Foot Basis as Applicable

TOTAL BID ITEMS

\$ 1,887,183.48

ANTICIPATED ITEMS

NO.	ITEMS OF WORK AND MATERIALS	REFERENCE	NUMBER	OF	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	RIGHT OF WAY MONUMENTATION				LS	0.00	\$ -	\$ -
2	RELOCATE WATER FACILITIES - FIRE HYDRANT				EACH	0.00	\$ 20,000.00	\$ -
3	RELOCATE WATER FACILITIES - METER				EACH	0.00	\$ 6,000.00	\$ -
4	STREET LIGHTING - UPGRADE LUMINAIRES				EACH	0.00	\$ 600.00	\$ -
5	STREET LIGHTING - INSTALL ARMS AND LUMINAIRES				EACH	0.00	\$ 5,000.00	\$ -
6	CONNECT CONTRACTOR INSTALLED TRAFFIC SIGNAL LOOPS TO CONTROLLER BY BOM				EACH	0.00	\$ 1,000.00	\$ -
7	STORMWATER PLANTINGS AND PLANT ESTABLISHMENT				SQFT	0.00	\$ 15.00	\$ -

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
8	STORMWATER OFFSITE MANAGEMENT FEE				SQFT	4120.00	\$ 3.70	\$ 15,244.00
9	ROCK EXCAVATION				CUYD	0.00	\$ 106.00	\$ -
10	RAILROAD PROTECTION SERVICES (ONE YEAR)				LS	0.00	\$ 100,000.00	\$ -
11	ASPHALT CEMENT ESCALATION				LS	1.00	\$ -	\$ -
12	FUEL ESCALATION				LS	1.00	\$ -	\$ -
13	TESTING CONTAMINATED MEDIA				LS	0.00	\$ 5,000.00	\$ -
14	BOLI FEE PAYMENT				LS	1.00	\$ 1,887.18	\$ 1,887.18
15	CONTRACT CONTINGENCY (REQUIREMENT TO ACCEPT BIDS UP TO 10% OVER ESTIMATE)				LS	1.00	\$ 188,718.35	\$ 188,718.35

TOTAL ANTICIPATED ITEMS

\$ 205,849.53

SCHEDULE SUMMARY

BID ITEMS		\$ 1,887,183
CONSTRUCTION CONTINGENCY	5% of Bid Items*	\$ 94,359
SUBTOTAL		\$ 1,981,542

ANTICIPATED ITEMS		\$ 205,850
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TOTAL CONSTRUCTION		\$ 2,187,392
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PROJECT MANAGEMENT	5% of Bid Items	\$ 94,359
DESIGN ENGINEERING	25% of Bid Items	\$ 471,796
CONSTRUCTION MANAGEMENT	15% of Bid Items	\$ 283,078
SUBTOTAL		\$ 849,233

PROJECT ENGINEERING & MANAGEMENT OVERHEAD	73.35% of PM, Eng. and CM	\$ 622,913
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TOTAL PROJECT ENGINEERING & MANAGEMENT		\$ 1,472,146
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RIGHT-OF-WAY LAND, IMPROVEMENTS, AND DAMAGES		\$ -
RIGHT-OF-WAY APPRAISAL, TITLE INSURANCE, AND NEGOTIATION		\$ -

RIGHT-OF-WAY CONTINGENCY	of Land, Improve, and Damages 30%	\$ -
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TOTAL PROJECT RIGHT-OF-WAY		\$ -
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INFLATION RATE ON CONTRACT	Years 1	Inflation 4.5% of Construction	\$ 98,433
INFLATION RATE ON PERSONNEL	1	2.0% of Eng & Mgmt	\$ 29,443
ESTIMATE CONTINGENCY FOR UNDEFINED OR CHANGE IN SCOPE		10% of Const, Eng & Mgmt, and Inflation	\$ 378,741

TOTAL PROJECT CONTINGENCY		\$ 506,617
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TOTAL PROJECT ESTIMATE		\$ 4,166,155
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**CITY OF PORTLAND, OREGON
BUREAU OF TRANSPORTATION**

Date: November 17, 2015

By: C. Glasgow

FEASIBILITY STUDY ENGINEER'S ESTIMATE FOR THE IMPROVEMENT OF FLANDERS CROSSING - ALTERNATIVE "C" - 24 FT ENHANCED WIDTH TRUSS

VALUES IN BLUE ARE PERCENT OF CONTRACT.

BID ITEMS

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	MOBILIZATION	0210	0100000A	n/a	LS	1.00	\$ 239,424.93	\$ 239,424.93
2	TEMPORARY PROTECTION & DIRECTION OF TRAFFIC	0225	0100000A	13	LS	1.00	\$ 47,884.99	\$ 47,884.99
	TEMPORARY TRAFFIC CONTROL DEVICES	225	Special		LS	1.00	\$ 100,000.00	\$ 100,000.00
22	TEMPORARY CL-6R CHAIN LINK FENCE	0270	0137000F	12	FOOT	360.00	\$ 17.60	\$ 6,336.00
23	EROSION CONTROL	0280	0100000A	11	LS	1.00	\$ 23,942.49	\$ 23,942.49
28	SEDIMENT FENCE, UNSUPPORTED	0280	0113000F	11	FOOT	280.00	\$ 2.50	\$ 700.00
29	INLET PROTECTION	0280	0114000E	11	EACH	12.00	\$ 88.00	\$ 1,056.00
30	POLLUTION CONTROL PLAN	0290	0100000A	12	LS	1.00	\$ 2,394.25	\$ 2,394.25
33	HASP/CMDP WORKPLANS	0291	1105000A	12	LS	1.00	\$ 1,000.00	\$ 1,000.00
43	REMOVAL OF STRUCTURES & OBSTRUCTIONS	0310	0106000A	1	LS	1.00	\$ 10,000.00	\$ 10,000.00
45	CLEARING AND GRUBBING	0320	0100000A	1	LS	1.00	\$ 30,000.00	\$ 30,000.00
49	GENERAL EXCAVATION	0330	0105000K	1	CUYD	50.00	\$ 35.00	\$ 1,750.00
66	TRENCH EXCAVATION, COMMON	0405	1101000K	1	CUYD	100.00	\$ 16.70	\$ 1,670.00
70	TRENCH BACKFILL, CLASS B	0405	1109000K	1	CUYD	75.00	\$ 33.00	\$ 2,475.00
82	10 INCH PIPE, HDPE ASTM F714 SDR 26 BEDDING TYPE:D, COMPLETE	0445	Special	1	FOOT	100.00	\$ 122.00	\$ 12,200.00
100	CONCRETE INLETS, TYPE G-2	0470	0315000E	1	EACH	2.00	\$ 1,770.00	\$ 3,540.00
112	CONNECTION TO EXISTING STRUCTURES	0490	0104000E	1	EACH	2.00	\$ 841.00	\$ 1,682.00
118	TRENCH RESURFACING	0495	0100000J	1	SQYD	33.33	\$ 109.00	\$ 3,632.97
	STRUCTURE DEMOLITION	0501	Special		LS	1.00	\$ 22,500.00	\$ 22,500.00
120	SHORING, CRIBBING AND COFFERDAMS	0510	0100000A	2	LS	1.00	\$ 7,500.00	\$ 7,500.00
121	STRUCTURE EXCAVATION	0510	0101000K	2	CUYD	60.00	\$ 48.30	\$ 2,898.00
123	GRANULAR STRUCTURAL BACKFILL	0510	0108000K	2	CUYD	75.00	\$ 50.00	\$ 3,750.00
	FURNISH DRILLING EQUIPMENT		Special		LS	1.00	\$ 45,000.00	\$ 45,000.00
	PERMANENT SHAFT CASINGS		Special		FOOT	300.00	\$ 500.00	\$ 150,000.00
	CSL TEST ACCESS TUBES	0512	0105000F		FOOT	900.00	\$ 8.00	\$ 7,200.00
	CSL TESTS	0512	0106000E		EACH	6.00	\$ 1,500.00	\$ 9,000.00
	DRILLED SHAFT EXC, 36 INCH DIA	0512	0110000F		FOOT	300.00	\$ 250.00	\$ 75,000.00
	DRILLED SHAFT CONCRETE	0512	Special		CUYD	55.00	\$ 500.00	\$ 27,500.00
	DRILLED SHAFT REINFORCEMENT	0530	Special		LB	30000.00	\$ 1.00	\$ 30,000.00
124	REINFORCEMENT	0530	0100000A	2	LS*	1.00	\$ 17,400.00	\$ 17,400.00
	FOUNDATION CONCRETE	0540	0111000K		CUYD	75.00	\$ 600.00	\$ 45,000.00
	DECK CONCRETE, CLASS HPC4000	0540	0207000K		CUYD	82.50	\$ 1,000.00	\$ 82,500.00
	GENERAL STRC CONCRETE, CLASS 4000	0540	0312000K		CUYD	60.00	\$ 1,500.00	\$ 90,000.00
	PREFABRICATED BRIDGE, DELIVERED	0561	Special		LS	1.00	\$ 1,259,276.70	\$ 1,259,276.70
	PREFABRICATED BRIDGE INSTALLATION	0561	Special		LS	1.00	\$ 60,000.00	\$ 60,000.00
	BRIDGE LIGHTING	0580	Special		LS	1	\$ 100,000.00	\$ 100,000.00
	2 INCH ELECTRICAL CONDUIT	0583	0105000F		FOOT	816	\$ 10.00	\$ 8,160.00
	EXPANSION JOINTS	0585	Special		FOOT	54	\$ 250.00	\$ 13,500.00
	ORNAMENTAL BRIDGE RAIL	0587	Special		FOOT	80.00	\$ 250.00	\$ 20,000.00
138	CONCRETE SLOPE PAVING	0599	0100000J	2	SQFT	525.00	\$ 11.25	\$ 5,905.62
143	AGGREGATE BASE	0640	0102000M	5	TON	10.00	\$ 36.90	\$ 369.00
154	16 INCH ASPHALT CONCRETE PAVEMENT REPAIR	0748	Special		SQYD	20.00	\$ 68.80	\$ 1,376.00
168	CONCRETE DRIVEWAYS	0759	0126000J	12	SQFT	400.00	\$ 8.40	\$ 3,360.00
170	CONCRETE WALKS	0759	0128000J	12	SQFT	100.00	\$ 7.40	\$ 740.00
179	DETECTABLE WARNING SURFACE	0759	1158000J	12	SQFT	240.00	\$ 42.30	\$ 10,152.00
193	REMOVABLE BOLLARDS	0815	0101000E	12	EACH	26.00	\$ 750.00	\$ 19,500.00
	FREEWAY SIGNS MOUNTED ON BRIDGE		Special		LS	1.00	\$ 18,000.00	\$ 18,000.00
	PERMANENT SIGNING AND STRIPING		Special		LS	1.00	\$ 7,500.00	\$ 7,500.00
238	POLE FOUNDATIONS	0970	0100000A	10	LS*	3.00	\$ 2,000.00	\$ 6,000.00
243	TRAFFIC SIGNAL INSTALLATION	0990	0101000A	10	LS*	1.00	\$ 120,000.00	\$ 120,000.00
245	FLASHING BEACON INSTALLATION	0990	Special		LS*	1.00	\$ 40,000.00	\$ 40,000.00
246	LOOP DETECTOR INSTALLATION	0990	0103000A	10	LS*	1.00	\$ 9,120.00	\$ 9,120.00
	LANDSCAPING		Special		LS	1.00	\$ 40,000.00	\$ 40,000.00

* Unit Price Shown is on Pound, Each, or Foot Basis as Applicable

TOTAL BID ITEMS

\$ 2,847,895.95

ANTICIPATED ITEMS

NO.	ITEMS OF WORK AND MATERIALS	REFERENCE	NUMBER	OF	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	RIGHT OF WAY MONUMENTATION				LS	0.00	\$ -	\$ -
2	RELOCATE WATER FACILITIES - FIRE HYDRANT				EACH	0.00	\$ 20,000.00	\$ -
3	RELOCATE WATER FACILITIES - METER				EACH	0.00	\$ 6,000.00	\$ -
4	STREET LIGHTING - UPGRADE LUMINAIRES				EACH	0.00	\$ 600.00	\$ -
5	STREET LIGHTING - INSTALL ARMS AND LUMINAIRES				EACH	0.00	\$ 5,000.00	\$ -
6	CONNECT CONTRACTOR INSTALLED TRAFFIC SIGNAL LOOPS TO CONTROLLER BY BOM				EACH	0.00	\$ 1,000.00	\$ -
7	STORMWATER PLANTINGS AND PLANT ESTABLISHMENT				SQFT	0.00	\$ 15.00	\$ -

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
8	STORMWATER OFFSITE MANAGEMENT FEE				SQFT	6120.00	\$ 3.70	\$ 22,644.00
9	ROCK EXCAVATION				CUYD	0.00	\$ 106.00	\$ -
10	RAILROAD PROTECTION SERVICES (ONE YEAR)				LS	0.00	\$ 100,000.00	\$ -
11	ASPHALT CEMENT ESCALATION				LS	1.00	\$ -	\$ -
12	FUEL ESCALATION				LS	1.00	\$ -	\$ -
13	TESTING CONTAMINATED MEDIA				LS	0.00	\$ 5,000.00	\$ -
14	BOLI FEE PAYMENT				LS	1.00	\$ 2,847.90	\$ 2,847.90
15	CONTRACT CONTINGENCY (REQUIREMENT TO ACCEPT BIDS UP TO 10% OVER ESTIMATE)				LS	1.00	\$ 284,789.60	\$ 284,789.60

TOTAL ANTICIPATED ITEMS	\$ 310,281.49
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SCHEDULE SUMMARY

BID ITEMS		\$ 2,847,896
CONSTRUCTION CONTINGENCY	5% of Bid Items*	\$ 142,395
SUBTOTAL		\$ 2,990,291
ANTICIPATED ITEMS		\$ 310,281
TOTAL CONSTRUCTION		\$ 3,300,572
PROJECT MANAGEMENT	5% of Bid Items	\$ 142,395
DESIGN ENGINEERING	20% of Bid Items	\$ 569,579
CONSTRUCTION MANAGEMENT	15% of Bid Items	\$ 427,184
SUBTOTAL		\$ 1,139,158
PROJECT ENGINEERING & MANAGEMENT OVERHEAD	73.35% of PM, Eng. and CM	\$ 835,572
TOTAL PROJECT ENGINEERING & MANAGEMENT		\$ 1,974,730
RIGHT-OF-WAY LAND, IMPROVEMENTS, AND DAMAGES		\$ -
RIGHT-OF-WAY APPRAISAL, TITLE INSURANCE, AND NEGOTIATION		\$ -
RIGHT-OF-WAY CONTINGENCY	of Land, Improve, and Damages 30%	\$ -
TOTAL PROJECT RIGHT-OF-WAY		\$ -
INFLATION RATE ON CONTRACT	Years 1	Inflation 4.5% of Construction \$ 148,526
INFLATION RATE ON PERSONNEL	1	2.0% of Eng & Mgmt \$ 39,495
ESTIMATE CONTINGENCY FOR UNDEFINED OR CHANGE IN SCOPE		10% of Const, Eng & Mgmt, and Inflation \$ 546,332
TOTAL PROJECT CONTINGENCY		\$ 734,353
TOTAL PROJECT ESTIMATE		\$ 6,009,656

**CITY OF PORTLAND, OREGON
BUREAU OF TRANSPORTATION**

Date: November 17, 2015

By: C. Glasgow

FEASIBILITY STUDY ENGINEER'S ESTIMATE FOR THE IMPROVEMENT OF FLANDERS CROSSING - ALTERNATIVE "D" - 24 FT ENHANCED WIDTH SIGNATURE BRIDGE

VALUES IN BLUE ARE PERCENT OF CONTRACT.

BID ITEMS

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
	TEMPORARY TRAFFIC CONTROL DEVICES	225	Special		LS	1.00	\$ 100,000.00	\$ 100,000.00
	BRIDGE REMOVAL	0501	Special		LS	1.00	\$22,500.00	\$22,500.00
	BRIDGE SUBSTRUCTURE AND SUPERSTRUCTURE, COMPLETE		Special		SF	5400.00	\$455.00	\$2,457,000.00
	BRIDGE LIGHTING	0580	Special		LS	1	\$100,000.00	\$100,000.00
	FREEWAY SIGNS MOUNTED ON BRIDGE		Special		LS	1.00	\$ 18,000.00	\$ 18,000.00
238	POLE FOUNDATIONS	0970	0100000A	10	LS*	3.00	\$ 2,000.00	\$ 6,000.00
243	TRAFFIC SIGNAL INSTALLATION	0990	0101000A	10	LS*	1.00	\$ 120,000.00	\$ 120,000.00
245	FLASHING BEACON INSTALLATION	0990	Special		LS*	1.00	\$ 40,000.00	\$ 40,000.00
246	LOOP DETECTOR INSTALLATION	0990	0103000A	10	LS*	1.00	\$ 9,120.00	\$ 9,120.00

* Unit Price Shown is on Pound, Each, or Foot Basis as Applicable

TOTAL BID ITEMS

\$ 2,872,620.00

ANTICIPATED ITEMS

NO.	ITEMS OF WORK AND MATERIALS	REFERENCE	NUMBER	OF	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	RIGHT OF WAY MONUMENTATION				LS	0.00	\$ -	\$ -
2	RELOCATE WATER FACILITIES - FIRE HYDRANT				EACH	0.00	\$ 20,000.00	\$ -
3	RELOCATE WATER FACILITIES - METER				EACH	0.00	\$ 6,000.00	\$ -
4	STREET LIGHTING - UPGRADE LUMINAIRES				EACH	0.00	\$ 600.00	\$ -
5	STREET LIGHTING - INSTALL ARMS AND LUMINAIRES				EACH	0.00	\$ 5,000.00	\$ -
6	CONNECT CONTRACTOR INSTALLED TRAFFIC SIGNAL LOOPS TO CONTROLLER BY BOM				EACH	0.00	\$ 1,000.00	\$ -
7	STORMWATER PLANTINGS AND PLANT ESTABLISHMENT				SQFT	0.00	\$ 15.00	\$ -
8	STORMWATER OFFSITE MANAGEMENT FEE				SQFT	6120.00	\$ 3.70	\$ 22,644.00
9	ROCK EXCAVATION				CUYD	0.00	\$ 106.00	\$ -
10	RAILROAD PROTECTION SERVICES (ONE YEAR)				LS	0.00	\$ 100,000.00	\$ -
11	ASPHALT CEMENT ESCALATION				LS	1.00	\$ -	\$ -
12	FUEL ESCALATION				LS	1.00	\$ -	\$ -
13	TESTING CONTAMINATED MEDIA				LS	0.00	\$ 5,000.00	\$ -
14	BOLI FEE PAYMENT				LS	1.00	\$ 2,872.62	\$ 2,872.62
15	CONTRACT CONTINGENCY (REQUIREMENT TO ACCEPT BIDS UP TO 10% OVER ESTIMATE)				LS	1.00	\$ 287,262.00	\$ 287,262.00

TOTAL ANTICIPATED ITEMS

\$ 312,778.62

SCHEDULE SUMMARY

BID ITEMS			\$ 2,872,620
CONSTRUCTION CONTINGENCY	5% of Bid Items*		\$ 143,631
SUBTOTAL			\$ 3,016,251
ANTICIPATED ITEMS			\$ 312,779
TOTAL CONSTRUCTION			\$ 3,329,030
PROJECT MANAGEMENT	5% of Bid Items		\$ 143,631
DESIGN ENGINEERING	25% of Bid Items		\$ 718,155
CONSTRUCTION MANAGEMENT	15% of Bid Items		\$ 430,893
SUBTOTAL			\$ 1,292,679
PROJECT ENGINEERING & MANAGEMENT OVERHEAD	73.35% of PM, Eng, and CM		\$ 948,180
TOTAL PROJECT ENGINEERING & MANAGEMENT			\$ 2,240,859
RIGHT-OF-WAY LAND, IMPROVEMENTS, AND DAMAGES			\$ -
RIGHT-OF-WAY APPRAISAL, TITLE INSURANCE, AND NEGOTIATION			\$ -
RIGHT-OF-WAY CONTINGENCY	30% of Land, Improve, and Damages		\$ -
TOTAL PROJECT RIGHT-OF-WAY			\$ -
INFLATION RATE ON CONTRACT	Years 1	Inflation 4.5% of Construction	\$ 149,806
INFLATION RATE ON PERSONNEL	1	2.0% of Eng & Mgmt	\$ 44,817
ESTIMATE CONTINGENCY FOR UNDEFINED OR CHANGE IN SCOPE		20% of Const, Eng & Mgmt,	\$ 1,152,902

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
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and Inflation

TOTAL PROJECT CONTINGENCY\$ 1,347,525

TOTAL PROJECT ESTIMATE\$ 6,917,414

**CITY OF PORTLAND, OREGON
BUREAU OF TRANSPORTATION**

Date: November 17, 2015

By: C. Glasgow

FEASIBILITY STUDY ENGINEER'S ESTIMATE FOR THE IMPROVEMENT OF FLANDERS CROSSING - ALTERNATIVE "E" - TWO COMPANION TRUSS BRIDGES - 14 FT EACH

VALUES IN BLUE ARE PERCENT OF CONTRACT.

BID ITEMS

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	MOBILIZATION	0210	0100000A	n/a	LS	1.00	\$ 263,628.89	\$ 263,628.89
2	TEMPORARY PROTECTION & DIRECTION OF TRAFFIC	0225	0100000A	13	LS	1.00	\$ 52,725.78	\$ 52,725.78
	TEMPORARY TRAFFIC CONTROL DEVICES	225	Special		LS	1.00	\$ 200,000.00	\$ 200,000.00
22	TEMPORARY CL-6R CHAIN LINK FENCE	0270	0137000F	12	FOOT	360.00	\$ 17.60	\$ 6,336.00
23	EROSION CONTROL	0280	0100000A	11	LS	1.00	\$ 26,362.89	\$ 26,362.89
28	SEDIMENT FENCE, UNSUPPORTED	0280	0113000F	11	FOOT	280.00	\$ 2.50	\$ 700.00
29	INLET PROTECTION	0280	0114000E	11	EACH	12.00	\$ 88.00	\$ 1,056.00
30	POLLUTION CONTROL PLAN	0290	0100000A	12	LS	1.00	\$ 2,636.29	\$ 2,636.29
33	HASP/CMDP WORKPLANS	0291	1105000A	12	LS	1.00	\$ 1,000.00	\$ 1,000.00
43	REMOVAL OF STRUCTURES & OBSTRUCTIONS	0310	0106000A	1	LS	1.00	\$ 10,000.00	\$ 10,000.00
45	CLEARING AND GRUBBING	0320	0100000A	1	LS	1.00	\$ 40,000.00	\$ 40,000.00
49	GENERAL EXCAVATION	0330	0105000K	1	CUYD	50.00	\$ 35.00	\$ 1,750.00
66	TRENCH EXCAVATION, COMMON	0405	1101000K	1	CUYD	100.00	\$ 16.70	\$ 1,670.00
70	TRENCH BACKFILL, CLASS B	0405	1109000K	1	CUYD	75.00	\$ 33.00	\$ 2,475.00
82	10 INCH PIPE, HDPE ASTM F714 SDR 26 BEDDING TYPE:D, COMPLETE	0445	Special	1	FOOT	100.00	\$ 122.00	\$ 12,200.00
100	CONCRETE INLETS, TYPE G-2	0470	0315000E	1	EACH	2.00	\$ 1,770.00	\$ 3,540.00
112	CONNECTION TO EXISTING STRUCTURES	0490	0104000E	1	EACH	2.00	\$ 841.00	\$ 1,682.00
118	TRENCH RESURFACING	0495	0100000J	1	SQYD	33.33	\$ 109.00	\$ 3,632.97
	STRUCTURE DEMOLITION	0501	Special		LS	1.00	\$ 30,000.00	\$ 30,000.00
120	SHORING, CRIBBING AND COFFERDAMS	0510	0100000A	2	LS	1.00	\$ 10,000.00	\$ 10,000.00
121	STRUCTURE EXCAVATION	0510	0101000K	2	CUYD	80.00	\$ 48.30	\$ 3,864.00
123	GRANULAR STRUCTURAL BACKFILL	0510	0108000K	2	CUYD	100.00	\$ 50.00	\$ 5,000.00
	FURNISH DRILLING EQUIPMENT		Special		LS	1.00	\$ 60,000.00	\$ 60,000.00
	PERMANENT SHAFT CASINGS		Special		FOOT	400.00	\$ 500.00	\$ 200,000.00
	CSL TEST ACCESS TUBES	0512	0105000F		FOOT	1200.00	\$ 8.00	\$ 9,600.00
	CSL TESTS	0512	0106000E		EACH	8.00	\$ 1,500.00	\$ 12,000.00
	DRILLED SHAFT EXC, 36 INCH DIA	0512	0110000F		FOOT	400.00	\$ 250.00	\$ 100,000.00
	DRILLED SHAFT CONCRETE	0512	Special		CUYD	110.00	\$ 500.00	\$ 55,000.00
	DRILLED SHAFT REINFORCEMENT	0530	Special		LB	40000.00	\$ 1.00	\$ 40,000.00
124	REINFORCEMENT	0530	0100000A	2	LS*	1.00	\$ 22,800.00	\$ 22,800.00
	FOUNDATION CONCRETE	0540	0111000K		CUYD	87.50	\$ 600.00	\$ 52,500.00
	DECK CONCRETE, CLASS HPC4000	0540	0207000K		CUYD	96.00	\$ 1,000.00	\$ 96,000.00
	GENERAL STRC CONCRETE, CLASS 4000	0540	0312000K		CUYD	40.00	\$ 1,500.00	\$ 60,000.00
	PREFABRICATED BRIDGE, DELIVERED	0561	Special		LS	1.00	\$ 1,335,596.00	\$ 1,335,596.00
	PREFABRICATED BRIDGE INSTALLATION	0561	Special		LS	1.00	\$ 60,000.00	\$ 60,000.00
	BRIDGE LIGHTING	0580	Special		LS	1	\$ 100,000.00	\$ 100,000.00
	2 INCH ELECTRICAL CONDUIT	0583	0105000F		FOOT	1088	\$ 10.00	\$ 10,880.00
	EXPANSION JOINTS	0585	Special		FOOT	56	\$ 250.00	\$ 14,000.00
	ORNAMENTAL BRIDGE RAIL	0587	Special		FOOT	160.00	\$ 250.00	\$ 40,000.00
138	CONCRETE SLOPE PAVING	0599	0100000J	2	SQFT	612.50	\$ 11.25	\$ 6,889.89
143	AGGREGATE BASE	0640	0102000M	5	TON	10.00	\$ 36.90	\$ 369.00
154	16 INCH ASPHALT CONCRETE PAVEMENT REPAIR	0748	Special		SQYD	20.00	\$ 68.80	\$ 1,376.00
168	CONCRETE DRIVEWAYS	0759	0126000J	12	SQFT	400.00	\$ 8.40	\$ 3,360.00
170	CONCRETE WALKS	0759	0128000J	12	SQFT	100.00	\$ 7.40	\$ 740.00
179	DETECTABLE WARNING SURFACE	0759	1158000J	12	SQFT	240.00	\$ 42.30	\$ 10,152.00
193	REMOVABLE BOLLARDS	0815	0101000E	12	EACH	26.00	\$ 750.00	\$ 19,500.00
	FREEWAY SIGNS MOUNTED ON BRIDGE		Special		LS	1.00	\$ 18,000.00	\$ 18,000.00
	PERMANENT SIGNING AND STRIPING		Special		LS	1.00	\$ 7,500.00	\$ 7,500.00
238	POLE FOUNDATIONS	0970	0100000A	10	LS*	3.00	\$ 2,000.00	\$ 6,000.00
243	TRAFFIC SIGNAL INSTALLATION	0990	0101000A	10	LS*	1.00	\$ 120,000.00	\$ 120,000.00
245	FLASHING BEACON INSTALLATION	0990	Special		LS*	1.00	\$ 40,000.00	\$ 40,000.00
246	LOOP DETECTOR INSTALLATION	0990	0103000A	10	LS*	1.00	\$ 9,120.00	\$ 9,120.00
	LANDSCAPING		Special		LS	1.00	\$ 40,000.00	\$ 40,000.00

* Unit Price Shown is on Pound, Each, or Foot Basis as Applicable

TOTAL BID ITEMS

\$ 3,231,642.71

ANTICIPATED ITEMS

NO.	ITEMS OF WORK AND MATERIALS	REFERENCE	NUMBER	OF	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	RIGHT OF WAY MONUMENTATION				LS	0.00	\$ -	\$ -
2	RELOCATE WATER FACILITIES - FIRE HYDRANT				EACH	0.00	\$ 20,000.00	\$ -
3	RELOCATE WATER FACILITIES - METER				EACH	0.00	\$ 6,000.00	\$ -
4	STREET LIGHTING - UPGRADE LUMINAIRES				EACH	0.00	\$ 600.00	\$ -
5	STREET LIGHTING - INSTALL ARMS AND LUMINAIRES				EACH	0.00	\$ 5,000.00	\$ -
6	CONNECT CONTRACTOR INSTALLED TRAFFIC SIGNAL LOOPS TO CONTROLLER BY BOM				EACH	0.00	\$ 1,000.00	\$ -
7	STORMWATER PLANTINGS AND PLANT ESTABLISHMENT				SQFT	0.00	\$ 15.00	\$ -

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
8	STORMWATER OFFSITE MANAGEMENT FEE				SQFT	4120.00	\$ 3.70	\$ 15,244.00
9	ROCK EXCAVATION				CUYD	0.00	\$ 106.00	\$ -
10	RAILROAD PROTECTION SERVICES (ONE YEAR)				LS	0.00	\$ 100,000.00	\$ -
11	ASPHALT CEMENT ESCALATION				LS	1.00	\$ -	\$ -
12	FUEL ESCALATION				LS	1.00	\$ -	\$ -
13	TESTING CONTAMINATED MEDIA				LS	0.00	\$ 5,000.00	\$ -
14	BOLI FEE PAYMENT				LS	1.00	\$ 3,231.64	\$ 3,231.64
15	CONTRACT CONTINGENCY (REQUIREMENT TO ACCEPT BIDS UP TO 10% OVER ESTIMATE)				LS	1.00	\$ 323,164.27	\$ 323,164.27

TOTAL ANTICIPATED ITEMS	\$ 341,639.91
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SCHEDULE SUMMARY

BID ITEMS		\$ 3,231,643
CONSTRUCTION CONTINGENCY	5% of Bid Items*	\$ 161,582
SUBTOTAL		\$ 3,393,225
ANTICIPATED ITEMS		\$ 341,640
TOTAL CONSTRUCTION		\$ 3,734,865
PROJECT MANAGEMENT	5% of Bid Items	\$ 161,582
DESIGN ENGINEERING	15% of Bid Items	\$ 484,746
CONSTRUCTION MANAGEMENT	15% of Bid Items	\$ 484,746
SUBTOTAL		\$ 1,131,074
PROJECT ENGINEERING & MANAGEMENT OVERHEAD	73.35% of PM, Eng. and CM	\$ 829,643
TOTAL PROJECT ENGINEERING & MANAGEMENT		\$ 1,960,717
RIGHT-OF-WAY LAND, IMPROVEMENTS, AND DAMAGES		\$ -
RIGHT-OF-WAY APPRAISAL, TITLE INSURANCE, AND NEGOTIATION		\$ -
RIGHT-OF-WAY CONTINGENCY	of Land, Improve, and Damages 30%	\$ -
TOTAL PROJECT RIGHT-OF-WAY		\$ -
INFLATION RATE ON CONTRACT	Years 1 Inflation 4.5% of Construction	\$ 168,069
INFLATION RATE ON PERSONNEL	1 2.0% of Eng & Mgmt	\$ 39,214
ESTIMATE CONTINGENCY FOR UNDEFINED OR CHANGE IN SCOPE	10% of Const, Eng & Mgmt, and Inflation	\$ 590,286
TOTAL PROJECT CONTINGENCY		\$ 797,569
TOTAL PROJECT ESTIMATE		\$ 6,493,151

**CITY OF PORTLAND, OREGON
BUREAU OF TRANSPORTATION**

Date: November 17, 2015

By: C. Glasgow

FEASIBILITY STUDY ENGINEER'S ESTIMATE FOR THE IMPROVEMENT OF FLANDERS CROSSING - ALTERNATIVE "F" - 60 FT CONCRETE 2-SPAN PLAZA BRIDGE

VALUES IN BLUE ARE PERCENT OF CONTRACT.

BID ITEMS

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	MOBILIZATION	0210	0100000A	n/a	LS	1.00	\$ 266,658.94	\$ 266,658.94
2	TEMPORARY PROTECTION & DIRECTION OF TRAFFIC	0225	0100000A	13	LS	1.00	\$ 53,331.79	\$ 53,331.79
	TEMPORARY TRAFFIC CONTROL DEVICES	225	Special		LS	1.00	\$ 600,000.00	\$ 600,000.00
22	TEMPORARY CL-6R CHAIN LINK FENCE	0270	0137000F	12	FOOT	360.00	\$ 17.60	\$ 6,336.00
23	EROSION CONTROL	0280	0100000A	11	LS	1.00	\$ 26,665.89	\$ 26,665.89
28	SEDIMENT FENCE, UNSUPPORTED	0280	0113000F	11	FOOT	280.00	\$ 2.50	\$ 700.00
29	INLET PROTECTION	0280	0114000E	11	EACH	16.00	\$ 88.00	\$ 1,408.00
30	POLLUTION CONTROL PLAN	0290	0100000A	12	LS	1.00	\$ 2,666.59	\$ 2,666.59
33	HASP/CMDP WORKPLANS	0291	1105000A	12	LS	1.00	\$ 1,000.00	\$ 1,000.00
43	REMOVAL OF STRUCTURES & OBSTRUCTIONS	0310	0106000A	1	LS	1.00	\$ 15,000.00	\$ 15,000.00
45	CLEARING AND GRUBBING	0320	0100000A	1	LS	1.00	\$ 40,000.00	\$ 40,000.00
49	GENERAL EXCAVATION	0330	0105000K	1	CUYD	50.00	\$ 35.00	\$ 1,750.00
66	TRENCH EXCAVATION, COMMON	0405	1101000K	1	CUYD	100.00	\$ 16.70	\$ 1,670.00
70	TRENCH BACKFILL, CLASS B	0405	1109000K	1	CUYD	75.00	\$ 33.00	\$ 2,475.00
82	10 INCH PIPE, HDPE ASTM F714 SDR 26 BEDDING TYPE:D, COMPLETE	0445	Special	1	FOOT	100.00	\$ 122.00	\$ 12,200.00
100	CONCRETE INLETS, TYPE G-2	0470	0315000E	1	EACH	2.00	\$ 1,770.00	\$ 3,540.00
112	CONNECTION TO EXISTING STRUCTURES	0490	0104000E	1	EACH	2.00	\$ 841.00	\$ 1,682.00
118	TRENCH RESURFACING	0495	0100000J	1	SQYD	33.33	\$ 109.00	\$ 3,632.97
	STRUCTURE DEMOLITION	0501	Special		LS	1.00	\$ 37,500.00	\$ 37,500.00
120	SHORING, CRIBBING AND COFFERDAMS	0510	0100000A	2	LS	1.00	\$ 12,500.00	\$ 12,500.00
121	STRUCTURE EXCAVATION	0510	0101000K	2	CUYD	100.00	\$ 48.30	\$ 4,830.00
123	GRANULAR STRUCTURAL BACKFILL	0510	0108000K	2	CUYD	125.00	\$ 50.00	\$ 6,250.00
	FURNISH DRILLING EQUIPMENT		Special		LS	1.00	\$ 100,000.00	\$ 100,000.00
	PERMANENT SHAFT CASINGS		Special		FOOT	250.00	\$ 1,050.00	\$ 262,500.00
	CSL TEST ACCESS TUBES	0512	0105000F		FOOT	3150.00	\$ 8.00	\$ 25,200.00
	CSL TESTS	0512	0106000E		EACH	21.00	\$ 1,500.00	\$ 31,500.00
	DRILLED SHAFT EXC, 36 INCH DIA	0512	0110000F		FOOT	250.00	\$ 250.00	\$ 62,500.00
	DRILLED SHAFT CONCRETE	0512	Special		CUYD	275.00	\$ 500.00	\$ 137,500.00
	DRILLED SHAFT REINFORCEMENT	0530	Special		LB	25000.00	\$ 1.00	\$ 25,000.00
124	REINFORCEMENT	0530	0100000A	2	LS*	1.00	\$ 90,000.00	\$ 90,000.00
	FOUNDATION CONCRETE	0540	0111000K		CUYD	270.00	\$ 600.00	\$ 162,000.00
	DECK CONCRETE, CLASS HPC4000	0540	0207000K		CUYD	300.00	\$ 1,500.00	\$ 450,000.00
	GENERAL STRC CONCRETE, CLASS 4000	0540	0312000K		CUYD	51.00	\$ 1,500.00	\$ 76,500.00
	BT 60 PRECAST PRESRESSTED GIRDERS	0550	Special		FOOT	1773.00	\$ 300.00	\$ 531,900.00
	BRIDGE LIGHTING	0580	Special		LS	1	\$ 100,000.00	\$ 100,000.00
	2 INCH ELECTRICAL CONDUIT	0583	0105000F		FOOT	544	\$ 10.00	\$ 5,440.00
	EXPANSION JOINTS	0585	Special		FOOT	120	\$ 250.00	\$ 30,000.00
	ORNAMENTAL BRIDGE RAIL	0587	Special		FOOT	500.00	\$ 250.00	\$ 125,000.00
138	CONCRETE SLOPE PAVING	0599	0100000J	2	SQFT	1,312.00	\$ 11.25	\$ 14,758.43
143	AGGREGATE BASE	0640	0102000M	5	TON	10.00	\$ 36.90	\$ 369.00
154	16 INCH ASPHALT CONCRETE PAVEMENT REPAIR	0748	Special		SQYD	20.00	\$ 68.80	\$ 1,376.00
168	CONCRETE DRIVEWAYS	0759	0126000J	12	SQFT	400.00	\$ 8.40	\$ 3,360.00
170	CONCRETE WALKS	0759	0128000J	12	SQFT	100.00	\$ 7.40	\$ 740.00
179	DETECTABLE WARNING SURFACE	0759	1158000J	12	SQFT	240.00	\$ 42.30	\$ 10,152.00
193	REMOVABLE BOLLARDS	0815	0101000E	12	EACH	26.00	\$ 750.00	\$ 19,500.00
	FREEWAY SIGNS MOUNTED ON BRIDGE		Special		LS	1.00	\$ 18,000.00	\$ 18,000.00
	PERMANENT SIGNING AND STRIPING		Special		LS	1.00	\$ 7,500.00	\$ 7,500.00
238	POLE FOUNDATIONS	0970	0100000A	10	LS*	3.00	\$ 2,000.00	\$ 6,000.00
243	TRAFFIC SIGNAL INSTALLATION	0990	0101000A	10	LS*	1.00	\$ 120,000.00	\$ 120,000.00
245	FLASHING BEACON INSTALLATION	0990	Special		LS*	1.00	\$ 40,000.00	\$ 40,000.00
246	LOOP DETECTOR INSTALLATION	0990	0103000A	10	LS*	1.00	\$ 9,120.00	\$ 9,120.00
	LANDSCAPING		Special		LS	1.00	\$ 40,000.00	\$ 40,000.00
278	ORNAMENTAL PROTECTIVE SCREENING	1050	Special	12	FOOT	400.00	\$ 158.00	\$ 63,200.00

* Unit Price Shown is on Pound, Each, or Foot Basis as Applicable

TOTAL BID ITEMS

\$ 3,670,912.61

ANTICIPATED ITEMS

NO.	ITEMS OF WORK AND MATERIALS	REFERENCE	NUMBER	OF	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	RIGHT OF WAY MONUMENTATION				LS	0.00	\$ -	\$ -
2	RELOCATE WATER FACILITIES - FIRE HYDRANT				EACH	0.00	\$ 20,000.00	\$ -
3	RELOCATE WATER FACILITIES - METER				EACH	0.00	\$ 6,000.00	\$ -
4	STREET LIGHTING - UPGRADE LUMINAIRES				EACH	0.00	\$ 600.00	\$ -
5	STREET LIGHTING - INSTALL ARMS AND LUMINAIRES				EACH	0.00	\$ 5,000.00	\$ -
6	CONNECT CONTRACTOR INSTALLED TRAFFIC SIGNAL LOOPS TO CONTROLLER BY BOM				EACH	0.00	\$ 1,000.00	\$ -
7	STORMWATER PLANTINGS AND PLANT ESTABLISHMENT				SQFT	0.00	\$ 15.00	\$ -

NO.	ITEMS OF WORK AND MATERIALS	SPEC REFERENCE	ITEM NUMBER	CLASS OF WORK	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL AMOUNT
8	STORMWATER OFFSITE MANAGEMENT FEE				SQFT	12720.00	\$ 3.70	\$ 47,064.00
9	ROCK EXCAVATION				CUYD	0.00	\$ 106.00	\$ -
10	RAILROAD PROTECTION SERVICES (ONE YEAR)				LS	0.00	\$ 100,000.00	\$ -
11	ASPHALT CEMENT ESCALATION				LS	1.00	\$ -	\$ -
12	FUEL ESCALATION				LS	1.00	\$ -	\$ -
13	TESTING CONTAMINATED MEDIA				LS	0.00	\$ 5,000.00	\$ -
14	BOLI FEE PAYMENT				LS	1.00	\$ 3,670.91	\$ 3,670.91
15	CONTRACT CONTINGENCY (REQUIREMENT TO ACCEPT BIDS UP TO 10% OVER ESTIMATE)				LS	1.00	\$ 367,091.26	\$ 367,091.26

TOTAL ANTICIPATED ITEMS

\$ 417,826.17

SCHEDULE SUMMARY

BID ITEMS							\$ 3,670,913
CONSTRUCTION CONTINGENCY						5% of Bid Items*	\$ 183,546
SUBTOTAL							\$ 3,854,459
ANTICIPATED ITEMS							\$ 417,826
TOTAL CONSTRUCTION							\$ 4,272,285
PROJECT MANAGEMENT						5% of Bid Items	\$ 183,546
DESIGN ENGINEERING						25% of Bid Items	\$ 917,728
CONSTRUCTION MANAGEMENT						15% of Bid Items	\$ 550,637
SUBTOTAL							\$ 1,651,911
PROJECT ENGINEERING & MANAGEMENT OVERHEAD						73.35% of PM, Eng. and CM	\$ 1,211,676
TOTAL PROJECT ENGINEERING & MANAGEMENT							\$ 2,863,587
RIGHT-OF-WAY LAND, IMPROVEMENTS, AND DAMAGES							\$ -
RIGHT-OF-WAY APPRAISAL, TITLE INSURANCE, AND NEGOTIATION							\$ -
RIGHT-OF-WAY CONTINGENCY						of Land, Improve, and 30% Damages	\$ -
TOTAL PROJECT RIGHT-OF-WAY							\$ -
INFLATION RATE ON CONTRACT				Years		Inflation	
INFLATION RATE ON PERSONNEL				1		4.5% of Construction	\$ 192,253
ESTIMATE CONTINGENCY FOR UNDEFINED OR CHANGE IN SCOPE				1		2.0% of Eng & Mgmt	\$ 57,272
						10% of Const, Eng & Mgmt, and Inflation	\$ 738,540
TOTAL PROJECT CONTINGENCY							\$ 988,065
TOTAL PROJECT ESTIMATE							\$ 8,123,937