Washington State Department of Transportation

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JUN 15 2020

Change Record

Contract Number	Contract Title	Federal Aid Number
009143	SR 530, Trafton Creek & Schoolyard Creek - Fish Passage	STP-0530(027)
Change Order Number	**Change Description**	**Date**
004	Add'l Height Trafton Structure	Jun 11, 2020
Region	**Project Engineer**	**Phone Number**
Northwest Region	Mikkel Lamay	360-757-5856
Prime Contractor / Design-Builder		
Kiewit Infrastructure West Co.		

☒ Ordered by Engineer under the terms of Section 1-04.4 of the Standard Specifications or the RFP

☐ Change proposed by Contractor / Design-Builder

Evolution & Description Of Change

At Trafton Creek, the contract as awarded called for a culvert that met stream simulation requirements. The existing culvert is approximately 285' in length and under approximately 50' of fill which led to Kiewit's proposal of a 225' long, 23' wide and 10' tall concrete box culvert structure. We agree that this design technically met contractual requirements. The only contractual requirement for the height of the culvert was to provide 3' of freeboard above the 100yr water surface elevation or 5' above the channel thalweg, whichever was greater. The Contractor's design met these requirements. This design was submitted to the agencies for permitting.

During permitting, the Tulalip and Stillaguamish Tribes and WDFW raised concerns about the design of the Trafton Creek structure and channel, regarding WSDOT's ability to keep the portion of the stream channel, which lay inside the structure, fish passable over the structure's useful life. It became apparent that the project was going to struggle to obtain the needed permits in time for a 2019 construction season. Specifically, the concerns were related to the length of the culvert, the steep grades present, and length to width ratio, all of which were at the maximum limit allowed by the contract and the injunction. WSDOT has seen failures within other recently constructed injunction culverts that bare these same characteristics. As more design information became available to WSDOT Subject Matter Experts (HQ Hydraulics, HQ and Region Environmental) it became apparent that not only was the project at risk of permits being denied but there would be a high risk of failure to provide fish passage over the structures life. In consultation with HQ Hydraulics, Region and HQ environmental and Region Maintenance, it was determined that added vertical clearance was needed to perform the routine duties associated with structural inspection as well as fish passage monitoring activities required by the injunction.

As a result of these concerns discussed above, we asked Kiewit to put the permitting process on hold.

On July 8, 2019, WSDOT directed Kiewit to add 5' of vertical clearance to the culvert requirement. In addition, and based on our knowledge of the struggles the project was having with permitting a design that was at the limits of the contract requirements, we strongly recommended a change in the design to minimize the length. Bob Dyer, ASCE for Headquarters Construction, has agreed that there is entitlement to payment for this added work on the basis that the Design-Builder's proposed design met contract requirements, and could not reasonably have been expected to include the costs for the increased height or the shortened length, because these needs were not expressed in the contract.

During this time Kiewit noted an efficient method of limiting the length was to use a multi-plate metal structure which was not previously allowed by the contract. The WSDOT Bridge and Structures office developed a list of criteria that would need to be met in order for a multi-plate metal structure to be used.

Kiewit revised the structural design to utilize a multi-plate pipe structure with a diameter of 26' and reduced the overall length of the structure by ~100' to a total length of 129'. The revised structure provides 18' of height above the streambed and the reduced length allows for the elimination of many of the at risk channel features in the previous design. With these design revisions, the risk of a future barrier to fish passage is reduced and, most significantly, WSDOT will have the ability to place small equipment inside the structure, if that becomes necessary, to restore streambed gravels, cobbles, and boulders to ensure fish passage and compliance with the injunction. Additionally, the shorter structure is preferred by both the Tulalip and Stillaguamish tribes, and WDFW because it allows for more natural channel to be constructed.

Contract Number	Contract Title	Change Order Number
009143	SR 530, Trafton Creek & Schoolyard Creek - Fish Passage	004

Basis of Cost & Justification:

See attached page 3 of Change Record

Contract Time:

The original contract time was set at 465 calendar days based on Kiewit's original proposal to complete both crossings in the 2019 CN season. An increase in contract time of 384 calendar days was agreed and is justified, because the change delayed completion of the project to the 2020 CN season. The revised design has additional backfill requirements that have a slower production rate, thus the somewhat longer extension then just one calendar year.

Impact on UDBE

Kiewit has indicated that they are still on track to meet or exceed the projects 15% UDBE goal for the entire contract amount, including the increase with this change.

Prior Approvals:

Mikkel Lamay, PE, approved this change 7/8/19
Chris Damitio, Engineering Manager, approved this change
Bob Dyer, Asst. State Const. Eng., Approved this change
Angel Rivera, FHWA, approved this change May 7, 2020

List Attachments:

Change Order Checklist
WSDOT SL #W013 Trafton Structure Height
Kiewit Cost Estimate
WSDOT Engineers Estimate

Distribution By: Project Office
Copy of Change Records & Change Order w/Backup - Project Engineer
Copy of ONLY Change Order - Prime Contractor / Design-Builder
Electronic Copy of Change Records & Change Order w/Backup - State Construction Office
Original of Change Records & Change Order w/Backup - Region Construction Office
Region
Original of Change Records & Change Order w/Backup - State Construction Office

DOT Form 422-002
Revised 06/2016

Basis of Cost & Justification

In pricing this change order, WSDOT takes a credit for work that was not completed as a result of the change, which includes construction, engineering, and other sub consultant work. We then pay the cost of the engineering, permitting, construction of the revised design, and other increased costs caused by the delay. Our construction estimate is based on revised quantities and unit costs to reflect 2020 construction.

In February of 2020 WSODT received Kiewit's cost breakdown structure and time impact analysis for the change; the total requested dollar amount was $2,482,982.59.

While cost of providing and installing the multi-plate pipe structure is ~$112,000 less expensive than the cost to provide and install the original concrete box structure (this number factors in retaining walls, excavation, backfill and the structure for both options), the additional costs that led to the overall cost increase are as follows:

1. **Project Re-Design.** On top of the costs for engineering, plan prep, and specification changes, this change also requires additional geotechnical work, revision to some environmental documentation, complete redo of the permitting applications/drawings, additional meetings with the Tulalip and Stillaguamish tribes and WDFW, revising hydraulic models and hydraulic reports to reflect the new design. Our estimate for total cost of this work is $418,000.
2. **Cost of work already completed on the Conc. box culvert**. Kiewit's supplier of the original box culvert had already begun work on the structure (setting forms and preparing for casting). The total cost for this element is $60,425.
3. **Increased footprint of impacts.** While shorter than the Design-Builder's original design, the new design for the multi-plate structure is wider and taller. Therefore, the foot print of the work has increased which results in increased quantities for excavation, backfill, clearing/grubbing, planting, etc. Our estimate for this work is $222,266.
4. **Additional costs for QA/QC and Env. Compliance.** Kiewit's original proposal included construction of both Trafton and Schoolyard crossings during the 2019 construction season. This change delayed construction of Trafton Creek to the 2020 construction season. Due to this change, there is increased cost for the Design-Builder's QA/QC and environmental compliance efforts caused by the loss of efficiency for not constructing both culverts in the same season. Additionally, construction duration of the multi-plate structure will require approximately 20 calendar days more than the concrete box culvert. This is largely due to slower production rates associated with the backfill material required for the structure. Our estimate for this work is $312,521.
5. **Additional costs for Key Kiewit personnel.** The Project Manager for Kiewit was working with the multi-plate supplier, re-calculating quantities and estimates, resequencing and scheduling work and aligning subs and conducting general project management duties like running task force meetings with WSDOT. This also includes increased supervision, staff equipment and

staging area lease costs for the additional time it will take to construct the multi-plate structure. Our estimate for this work is $353,362.

6. **Added scope.** The redesign impacted development on an adjacent residence that the original design did not. This work includes temporary impacts to a septic drain field and temporary relocation of a tool shed. Our estimate for this work is $60,199.
7. **Added enhancement.** The shorter culvert meant more open channel to construct and additional channel bank to restore. Also additional habitat features (logs, boulders, plants) needed to be provided within the channel itself. Our estimate for this work is $231,275.
8. **Subcontractor Escalation.** Increase in cost from 2019 to 2020 for items like temp & perm barrier, surveying, temp. marking, paving, landscaping and saw cutting. Our estimate for this work is $57,991.
9. **Mark-ups.** This includes G&A, bond and profit. The total cost agreed for this element is $472,195.

WSDOT conducted an evaluation of the costs provided, verified quantities/unit costs and ultimately arrived at an equitable amount of $2.18M. After negotiating with Kiewit, payment of $2,210,000 was agreed to compensate for all issues related to this change.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION
CHANGE ORDER

CONTRACT NO: 009143 FEDERAL AID NO:FEDERAL
CONTRACT TITLE: SR 530, TRAFTON CREEK & SCHOOL YARD CREEK FISH PAS
CHANGE ORDER NO: 4 ADD'L HEIGHT TRAFTON STRCTURE

PRIME CONTRACTOR: [redacted] KIEWIT INFRASTRUCTURE WEST CO.
2200 COLUMBIA HOUSE BLVD.
VANCOUVER WA 98661-

(X)Ordered by Engineer under the terms of Section 1-04.4 of the Standard Specifications

( )Change proposed by Contractor

ENDORSED BY: Kiewit Infrastructure West Co.	SURETY CONSENT:
CONTRACTOR	ATTORNEY IN FACT
5-01-2020	
DATE	DATE

ORIGINAL CONTRACT AMOUNT: 12,572,772.00
CURRENT CONTRACT AMOUNT: 13,173,753.74
ESTIMATED NET CHANGE THIS ORDER: 2,210,000.00
ESTIMATED CONTRACT TOTAL AFTER CHANGE: 15,383,753.74

Approval Required: ( )Region ( )Olympia Service Center ( )Local Agency

(X) APPROVAL RECOMMENDED ( ) EXECUTED	EXECUTED:
PROJECT ENGINEER DATE 5/6/2020	FOR STATE CONSTRUCTION ENGINEER DATE 6-17-2020
(X) APPROVAL RECOMMENDED ( ) EXECUTED Regional Admin:	OTHER APPROVAL WHEN REQUIRED
BY: 5/7/20 DATE	SIGNATURE DATE REPRESENTING CCIS 5/14/2020 SM

CG02v04(revised Feb 2005)

CONTRACT NO:009143 CHANGE ORDER NO: 4

All work, materials, and measurements to be in accordance with the provisions of the Standard Specifications and Special Provisions for the type of construction involved.

This contract is revised as follows:

Section 4.2 of the Contract Form, first sentence shall be replaced with: The deadline for Substantial Completion of the Project is 849 Calendar Days starting on the first Calendar Day after the effective date of the Notice to Proceed 1. Substantial Completion shall be accomplished no later than October 23, 2020.

Section 2.13.4.4.1 General Provisions after line 19 the following is added: Metal culvert or arch structures may also be used as buried structures. Aluminum is an acceptable material for metal culvert or arch structures.

Section 2.13.4.4.1 after line 24, the following section shall be added:

"2.13.4.4.1.1 ***Metal Culvert or Arch Structure Requirements***

The Design-Builder shall demonstrate how the 75 year service life requirement will be achieved for metal culverts or arch structures including, but not limited to, abrasion, corrosion and protection from de-icing salts on the roadway. The design and construction of metal culverts and arch structures, as well as the backfill for these structures, shall meet the requirements of the RFP and the Mandatory Standards listed in this Section including, but not limited to, WSDOT Bridge Design Manual, WSDOT Geotechnical Design Manual, AASHTO LRFD Bridge Design Specifications, and AASHTO LRFD Bridge Construction Specifications.

The Design-Builder shall provide an installation plan including the Manufacturer's installation instructions, working drawings and substantiating calculations for WSDOT review and comment in accordance with the AASHTO LRFD Bridge Construction Specifications. The installation plan shall cover all aspects of installation, including erection and assembly of the culvert, backfilling requirements, and anticipated deflections during backfilling. The installation plan shall address how the structure is monitored during and after construction and backing to insure the finished project meets all design and construction requirements and all geometric tolerances. The installation plan shall include any hold points necessary to insure the system is protected from damage or excessive deformation during construction.

The metal culvert or arch structure Manufacturer's Representative shall attend a preconstruction meeting prior to construction and shall be on site for installation and backfilling to insure all Manufacturer requirements are met.

Section 2.13.7.2, after line 38, insert the following:

For metal culvert or arch structures, the following additional information

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shall be provided:

*Bedding preparation procedures and details
*Backfill specifications and details
*Details on the connection of end treatments such as headwalls, wingwalls, and/or cut-off walls
*Scour protection (if applicable)
*Standard or special joint details

Section 2.14.4.10.1, after line 14 the following shall be added:

At Trafton Creek, the minimum vertical clearance in the finished condition (streambed material in place) shall be the greater of 8 feet above the 100-year water surface at the bottom of the top slab or 10 feet above the channel thalweg at the bottom of the top slab.

As a Fish Passage contract, WSDOT has given no direction to slow or stop work on this contract related to the corona virus.

Material Requirements:
Material requirements remain unchanged.

Construction Requirements:
Construction requirements remain unchanged.

Measurement:
No specific unit of measurement will apply to the new lump sum item "CO# 4, Trafton Structure Height Change".

Payment:
The new lump sum item "CO# 4, Trafton Structure Height Change" in the amount of $2,210,000, shall be full payment for incurred costs including but not limited to preliminary engineering and construction of the Trafton Creek structure.

Time Statement:
The Contract Time of 465 day shall be increase by 384 Calendar Days for a total of 849 Calendar Days. The Substantial Completion date shall be October 23, 2020.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION
CHANGE ORDER

CONTRACT NO:009143 CHANGE ORDER NO: 4

ITEM NO	GROUP NO	STD ITEM	UNIT OF MEASURE	UNIT PRICE	EST QTY CHANGE	EST AMT CHANGE
ITEM DESCRIPTION: CO#4, TRAFTON STRUCTURE HEIGHT CHANGE						
1007	03		L.S.	0.00	0.00	2,210,000.00

AMOUNT TOTAL

2,210,000.00

Washington State Department of Transportation

Design-Build Change Order Checklist

Cont. #: 9143	Cont. Title: SR 530 / Trafton Creek & Schoolyard Creek	If Yes, Approval from State Construction Office Required
C.O. # 004	C.O. Title: Add'l Height Trafton Structure	

I. Executed by the State Construction Office		
1. Cost or credit equal to or exceeding $500,000. *3	☑ Yes ☐ No	X
2. Change in the contract documents beyond the scope, intent or termini of the original contract. *2	☐ Yes ☑ No	X
3. Termination of or Changes in Work Committed to DBEs.	☐ Yes ☑ No	X
4. Change in contract time greater than 30 working days.	☑ Yes ☐ No	X
I. Executed by the Region		
5. Determination of impacts and/or overhead.	☐ Yes ☑ No	X
6. Design or construction work that does not comply with the Mandatory Standards	☐ Yes ☑ No	X
7. A change to a Chapter 1 General Provisions.	☐ Yes ☑ No	X
8. A change to a technical requirement in any of the following sections: Geotechnical, Environmental, Pavement, Project Documentation, Bridges and Structures, Control of Materials, Minority, Small, Veteran and Women's Business Enterprises (MSVWBE) Goals, Quality Management Plan, or WSDOT Standard Specifications.	☑ Yes ☐ No	X
9. Determination of changed condition (Section 1-04.7 of the Request For Proposal).	☐ Yes ☑ No	X
10. Settlement of a claim (Section 1-09.11(2) of the Request For Proposal).	☐ Yes ☑ No	X
11. Repair of damage regarding "Acts of God" or "acts of the public enemy or of government authorities (Section 1-07.13 of the Request For Proposal).	☐ Yes ☑ No	X
12. A "no-cost" change based upon a determination of "equal or better".	☐ Yes ☑ No	X

Approvals obtained:

Project Engineer: *(REQUIRED)* Mikkel Lamay Date: 7/8/19

Region: *(REQUIRED)* Chris Damitio Date: 5/7/2020

State Construction Office: *(REQUIRED)* Bob Dyer Date:

To be completed by the Project Engineer :

CO Reason(s) (See CCIS Source/Outcome): AE/09/PD/DS/SA

Change Order Prepared By: Shawna Biggs Date: 5/1/20

Has change been entered as lesson learned? ☐ Yes ☐ No ☑ N/A

Has design documentation been updated? ☑ Yes ☐ No ☐ N/A

Is change approved by program management? ☑ Yes ☐ No ☐ N/A

Is this project under full FHWA stewardship oversight (Project Of Division Interest)? *1 ☑ Yes ☐ No ☐ N/A

To be completed by the Region :

Is the change eligible for Federal participation? ☑ Yes ☐ No ☐ N/A

Change Order Reviewed By: Samantha McDougle Date: 5/14/2020

This form represents the minimum information required by the State Construction Office. *3

*1 Projects of Division (PODI) require FHWA approval as outlined in the project specific PODI agreement.

*2 Per RCW 47.28.050, any change beyond $7,500 that is beyond the original scope shall go through the competitive bidding process.

*3 Changes that do not meet any of the itemized criteria above may be executed by the PE with Region approval.